



**Groundwater Sample Results,  
Combined Level 2 and Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Report, SDG 18-0312**

*Naval Air Station Willow Grove  
Willow Grove, Pennsylvania*

August 2019

N00158\_000817  
WILLOW\_GROVE\_NAS  
SSIC 5000-33c

**LABORATORY DATA PACKAGE, 18-0312 REVISION 01, NAWC  
WARMINSTER NAS WILLOW GROVE PA**

05/16/2018  
BATTELLE

Approved for public release: distribution unlimited.

Naval Air Station Joint Reserve Base Willow Grove,  
PA

Project No 100117920-WE04

PFAS in drinking water

*DW*

*Batch 18-0312*

*Package DP-18-0111*

Submitted to:

Tetra Tech

661 Anderson Drive Foster Plaza 7

Pittsburgh, PA 15220 USA

Submitted by:

Battelle Norwell Operations

141 Longwater Drive Suite 202

Norwell, MA 02061

**BATTELLE**

**It can be done**

**Naval Air Station Joint Reserve Base Willow Grove,  
PA**

**Project No 100117920-WE04**

**PFAS in drinking water**

*DW*

*Batch 18-0312*

*Package DP-18-0111*

Submitted to:

Tetra Tech

661 Anderson Drive Foster Plaza 7

Pittsburgh, PA 15220 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)

Submitted by:

Battelle Norwell Operations

141 Longwater Drive Suite 202

Norwell, MA 02061

Analyst Approval:



schumitzd@battelle.org  
2018.05.16 18:39:01 -04'00'

QC Chemist Approval:



Digitally signed by devinec@battelle.org  
DN: cn=devinec@battelle.org  
Date: 2018.05.21 14:47:04 -04'00'

Project Manager Approval:



Digitally signed by Jonathan Thorn  
Date: 2018.05.22 07:45:31 -04'00'

**BATTELLE**

**It can be done**



# Naval Air Station Joint Reserve Base Willow Grove, PA

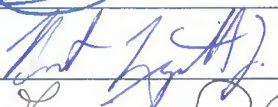
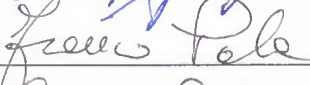
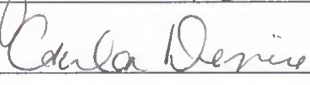
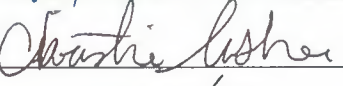
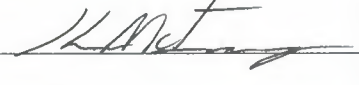
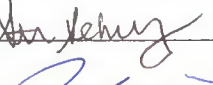
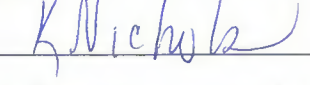
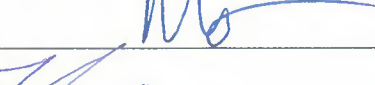
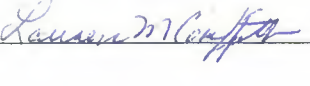
## Project No 100117920-WE04 PFAS in drinking water DW

*Batch 18-0312*

*Package DP-18-0111*

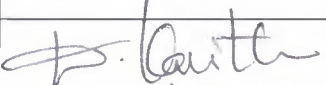
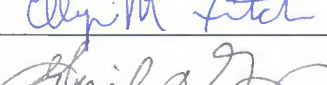
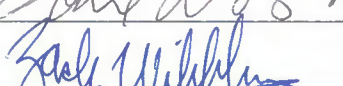
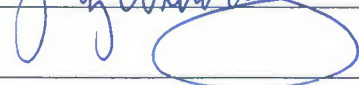
|          |                                                                                                                                                                                                                                     |            |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>1</b> | <b><i>Work Plan</i></b><br>Laboratory Work Plan, Addendums To Work Plan, Memos From Project Manager, Special Instructions, Chain-of-Custody Reports.                                                                                | <b>1</b>   |
| <b>2</b> | <b><i>Tables</i></b><br>Analytical Data Tables, Qualifier Definitions.                                                                                                                                                              | <b>22</b>  |
| <b>3</b> | <b><i>Miscellaneous Documentation</i></b><br>Case Narrative, Miscellaneous Documentation Form, Quality Control Summary, Example Calculations, Internal Standard Recovery Report, Retention Time Window Report.                      | <b>33</b>  |
| <b>4</b> | <b><i>Sample Preparation Records</i></b><br>Sample Preparation Records, Dilution Worksheets, Standard Preparation Records, Certificates Of Analysis, GPC Check Report.                                                              | <b>136</b> |
| <b>5</b> | <b><i>Analytical Calibrations</i></b><br>Analytical Sequence, Analytical Method, Tune Report, Initial Calibration, Pesticide Degradation Report, RF Summary, Calibration Verifications, Independent Calibration Verification Check. | <b>148</b> |
| <b>6</b> | <b><i>Analytical Data</i></b><br>Raw Data Quantification Reports.                                                                                                                                                                   | <b>230</b> |
| <b>7</b> | <b><i>Chromatograms</i></b><br>Sample And Standard Chromatograms.                                                                                                                                                                   | <b>267</b> |
| <b>8</b> | <b><i>Unused Data</i></b>                                                                                                                                                                                                           | <b>508</b> |

## Signature Page

| Battelle 2018 (1 of 2)<br>Signature Page |                                                                                     |          |          |
|------------------------------------------|-------------------------------------------------------------------------------------|----------|----------|
| Name (Printed)                           | Signature                                                                           | Initials | Date     |
| Jonathan Thorn                           |    | JRT      | 4/4/2018 |
| Robert Lizotte, Jr.                      |    | BL       | 4-4-2018 |
| FRANC PALA                               |    | FP       | 4-4-2018 |
| Carla Devine                             |    | CRD      | 4/4/18   |
| Denise Schumitz                          |    | DNS      | 4/4/18   |
| Carolus Peummeay                         |   | CPM      | 4/4/2018 |
| Rich Rostucci                            |   | RR       | 4/4/2018 |
| Monica Mena                              |  | MM       | 4/4/2018 |
| Christie Usher                           |  | CU       | 4/4/18   |
| Kevin Matrone                            |  | KM       | 4/4/18   |
| Stephanie Schultze                       |  | SAS      | 4/4/18   |
| Jordan Tower                             |  | JT       | 4/4/18   |
| KRISTEN NICHOLS                          |  | KN       | 4/4/18   |
| Quimiao H Brown                          |  | CB       | 4/4/18   |
| Matt Schumitz                            |  | MS       | 4-4-18   |
| Sam Guimaraes                            |  | SG       | 4-4-18   |
| Lauren Griffith                          |  | LG       | 4.4.18   |

## Signature Page

Battelle 2018 (2 of 2)  
Signature Page

| Name (Printed)     | Signature                                                                           | Initials | Date          |
|--------------------|-------------------------------------------------------------------------------------|----------|---------------|
| KAVITHA DASU       |    | KD       | 04/04/18      |
| Kayla Lamarre      |    | KAL      | 04/04/18      |
| Weidong Li         |    | W.L      | 04/04/18      |
| Tracy W Stender    |    | Trs      | 04/04/18      |
| Ellyn M Fitch      |    | EF       | 12-April-2018 |
| Gail DeRuzzo       |   | GD       | 4/18/18       |
| Zachary Willenberg |  | Z/W      | 4/20/18       |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |
|                    |                                                                                     |          |               |

# Work Plan



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

### 1.0 GENERAL PROJECT INFORMATION

**Project Title:** WE04 PFAS Analysis  
**Project Number:** 100117920-WE04  
**Client:** Tetra Tech  
 661 Anderson Drive Foster Plaza 7  
 Pittsburgh, PA 15220  
 USA  
  
**Client Contact Information:** Andrew Frebowitz  
 Project Manager  
 (610) 382-1170(V)  
 NA  
 andy.frebowitz@tetrattech.com  
  
**Effective Date of QAPP:** 5/4/2018  
**Version Number:** 100117920-WE04(L)-01  
**Project Manager:** Thorn, Jonathan  
**Laboratory Task Manager:** Thorn, Jonathan  
**Deliverable Due Date:** 5/22/2018

### 2.0 SCOPE OF WORK

**Overview:** Analysis of drinking water samples collected at Naval Air Station Joint Reserve Base Willow Grove.  
**Matrix:** Water

### 2.1 TECHNICAL APPROACH

#### 2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

**Storage Directions:** Store refrigerated.  
**Sub\_Sampling:** None  
**Procedures:** NA  
**Contact:** NA  
**Comment:** NA  
  
**Archiving:** Store for six months after delivery of final data. Notify client prior to disposal of samples.  
  
**Disposal:** Dispose of samples in the proper waste stream.



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

### 2.1.2 Sample Preparation

Up to 150 field samples and 150 field reagent blanks (FRB) per quarter. FRB samples will only be analyzed if the corresponding sample has detected levels of any PFAS analyte at or above the LOQ.

| Samples Expected: | Samples Per Batch: | Batches Expected: |
|-------------------|--------------------|-------------------|
| 300               | 20                 | 15                |

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

**Table 1: Quality Control Samples**

| Type: | Description:                                                                                 | Count:      | Rgt: | Reference: | Comment:                    |
|-------|----------------------------------------------------------------------------------------------|-------------|------|------------|-----------------------------|
| PB    | Laboratory control reagent blank.                                                            | 1 per batch | --   | NA         | Millipore water with Trizma |
| LCS   | Laboratory Control Sample                                                                    | 1 per batch | No   | NA         | Millipore water with Trizma |
| MS    | Spiked field sample for determining method accuracy in the presence of matrix.               | 1 per batch | --   | NA         | MS/MSD indicated on COC     |
| MSD   | Spiked field sample for determining method accuracy and precision in the presence of matrix. | 1 per batch | --   | NA         | MS/MSD indicated on COC     |

### 2.1.3 Extraction/Preparation

#### 2.1.3.1 Extraction

|                           |                                                                                                                                                                                                                                             |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOP No.-Rev:              | <b>5-371-03</b>                                                                                                                                                                                                                             |
| SOP Title:                | <i>ANALYSIS OF POLY AND PERFLUOROALKYL SUBSTANCES IN DRINKING WATER SAMPLES BY LIQUID CHROMATOGRAPHY AND TANDEM MASS SPECTROMETRY (LC-MS/MS) FOLLOWING EPA METHOD 537.1</i>                                                                 |
| Sample Size:              | 250 ml                                                                                                                                                                                                                                      |
| SIS and LCS/MS Compounds: | Defined in Table 2.                                                                                                                                                                                                                         |
| Deviations:               | None                                                                                                                                                                                                                                        |
| Comments:                 | <ul style="list-style-type: none"> <li>• MQO requirements per SOP 5-371 (EPA Method 537 Version 1.1).</li> <li>• FRB samples will only be analyzed if associated field sample has hits above the LOQ for any individual analyte.</li> </ul> |

**Table 2: SIS and LCS/MS Spiking Level**



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

| Standard Type                              | Standard Contents |        | Spike Amount (ng) | Volume (uL) | Comment                                                    |
|--------------------------------------------|-------------------|--------|-------------------|-------------|------------------------------------------------------------|
| PFAS - 537.1 Surrogate Solution            | JV60              | SIS    | ~ 0.100 - 0.40 ng | 50 uL       | NA                                                         |
| PFAS - 537.1 Second Source LCS/MS Solution | JV41              | LCS/MS | ~ 2.00 - 2.50     | 50 uL       | LCS samples - vary each batch (50, 75, 100, 150 µL spikes) |
| PFAS - 537.1 Second Source LCS/MS Solution | JV41              | LCS/MS | ~ 3.00 - 3.8 ng   | 75 uL       | MS/MSD samples - vary each batch (75, 100, 150 µL spikes)  |

### 2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 1000

**Table 3: RIS Spiking Level**

| Standard Type                           | Standard Contents |     | Spike Amount (ng) | Volume (uL) | Comment |
|-----------------------------------------|-------------------|-----|-------------------|-------------|---------|
| PFAS - 537.1 Internal Standard Solution | JV59              | RIS | ~ 0.100 - 0.40 ng | 50 uL       | NA      |

### 2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

- 1) SOP\_No-Rev: **5-371-03**
- SOP\_Title: *ANALYSIS OF POLY AND PERFLUOROALKYL SUBSTANCES IN DRINKING WATER SAMPLES BY LIQUID CHROMATOGRAPHY AND TANDEM MASS SPECTROMETRY (LC-MS/MS) FOLLOWING EPA METHOD 537.1*
- Deviations: None
- Comments:
  - MQO requirements per SOP 5-371 (EPA Method 537 Version 1.1).
  - FRB samples will only be analyzed if associated field sample has hits above the LOQ for any individual analyte.



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

### 2.2. DELIVERABLES

|                          |                                                                                                                                               |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Deliverables Due:</b> | 5/22/2018                                                                                                                                     |
| <b>LIMS Reports:</b>     | Yes                                                                                                                                           |
| <b>Histograms:</b>       | No                                                                                                                                            |
| <b>Excel Tables:</b>     | Yes                                                                                                                                           |
| <b>EICs:</b>             | No                                                                                                                                            |
| <b>Chromatograms:</b>    | No                                                                                                                                            |
| <b>EDDs:</b>             | Yes                                                                                                                                           |
| <b>Comments:</b>         | Each data set will be due 21 days from receipt of samples<br>Full QSM data package showing all aspects of Table B-15<br>Tetra Tech EDD format |

### 3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

### 4.0 ORGANIZATION AND COMMUNICATION

#### 4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

**Table 4: Project Team and Roles**

| Staff Member          | Role                      | Comment |
|-----------------------|---------------------------|---------|
| Jonathan R. Thorn     | Project Manager           | NA      |
| Stephanie A. Schultz  | Sample Preparation        | NA      |
| Denise M. Schumitz    | LC-MS/MS Analysis         | NA      |
| Matt D. Schumitz      | Sample Custody            | NA      |
| Carla R. Devine       | Quality Control Officer   | NA      |
| Zachary J. Willenberg | Quality Assurance Officer | NA      |

#### 4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

### 5.0 SCHEDULE

The project schedule is presented in Table 5.





It can be done

**WORK/QUALITY ASSURANCE PROJECT PLAN****Table 5. Schedule of Laboratory Activities**

| <b>Activity:</b>         | <b>Start Date:</b> | <b>End Date:</b> | <b>TAT<br/>(days):</b> | <b>Comment:</b> |
|--------------------------|--------------------|------------------|------------------------|-----------------|
| Sample Receipt           | 05/01/2018         | 12/31/2018       | 244                    | NA              |
| Sample Preparation       | 05/04/2018         | 01/31/2019       | 272                    | NA              |
| Instrument Analysis      | 05/07/2018         | 01/31/2019       | 269                    | NA              |
| Quality Control Review   | 05/14/2018         | 01/31/2019       | 262                    | NA              |
| Final Data Reporting     | 05/18/2018         | 01/31/2019       | 258                    | NA              |
| Quality Assurance Review | 05/21/2018         | 01/31/2019       | 255                    | NA              |

**6.0 BUDGET**

The labor budget for the analytical task is presented in Table 6.

**Table 6. Labor Budget (Laboratory Analytical Task)**

| <b>Labor Activity:</b>   | <b>Hours/<br/>Batch:</b> | <b>Batches:</b> | <b>Total<br/>Hours:</b> | <b>Comment:</b>                                           |
|--------------------------|--------------------------|-----------------|-------------------------|-----------------------------------------------------------|
| Sample Receipt           | 2                        | 1               | 2                       | All labor hours are based on a batch of 20 field samples. |
| Sample Preparation       | 8                        | 1               | 8                       | All labor hours are based on a batch of 20 field samples. |
| Instrument Analysis      | 8                        | 1               | 8                       | All labor hours are based on a batch of 20 field samples. |
| Quality Control Review   | 3                        | 1               | 3                       | All labor hours are based on a batch of 20 field samples. |
| Final Data Reporting     | 1                        | 1               | 1                       | All labor hours are based on a batch of 20 field samples. |
| Quality Assurance Review | 1                        | 1               | 1                       | All labor hours are based on a batch of 20 field samples. |

**7.0 STAFF DEVELOPMENT**

None anticipated



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

### Attachment 1: Target Samples

**Shipment:** SHP-180501-01

**Status:** Approved

**Description:** WE04

**Range:** J5964-J5969

**Comment:** NA

| No: | BDO Id: | Client Sample ID:    | Collection Date:    | Matrix: | Storage Facility: | Location: | No: | Comments: |
|-----|---------|----------------------|---------------------|---------|-------------------|-----------|-----|-----------|
| 1   | J5964   | WGNA-043018-RW-3103  | 04/30/2018 10:10 am | DW      | R0118 (NA)        |           |     | MSMSD     |
| 2   | J5965   | WGNA-043018-FRB-3103 | 04/30/2018 10:05 am | DW      | R0118 (NA)        |           |     |           |
| 3   | J5966   | NAWC-043018-RW-207   | 04/30/2018 10:40 am | DW      | R0118 (NA)        |           |     |           |
| 4   | J5967   | NAWC-043018-FRB-207  | 04/30/2018 10:35 am | DW      | R0118 (NA)        |           |     |           |
| 5   | J5968   | WGNA-043018-RW-3409  | 04/30/2018 1:40 pm  | DW      | R0118 (NA)        |           |     |           |
| 6   | J5969   | WGNA-043018-FRB-3409 | 04/30/2018 1:35 pm  | DW      | R0118 (NA)        |           |     |           |

**Shipment:** SHP-180502-02

**Status:** Approved

**Description:** WE04

**Range:** J5970-J5977

**Comment:** NA

| No: | BDO Id: | Client Sample ID:    | Collection Date:    | Matrix: | Storage Facility: | Location: | No: | Comments: |
|-----|---------|----------------------|---------------------|---------|-------------------|-----------|-----|-----------|
| 1   | J5970   | WGNA-050118-RW-3385  | 05/01/2018 9:10 am  | DW      | R0118 (NA)        |           |     |           |
| 2   | J5971   | WGNA-050118-FRB-3385 | 05/01/2018 9:05 am  | DW      | R0118 (NA)        |           |     |           |
| 3   | J5972   | WGNA-050118-RW-3178  | 05/01/2018 9:40 am  | DW      | R0118 (NA)        |           |     |           |
| 4   | J5973   | WGNA-050118-FRB-3178 | 05/01/2018 9:35 am  | DW      | R0118 (NA)        |           |     |           |
| 5   | J5974   | NAWC-050118-RW-304   | 05/01/2018 10:10 am | DW      | R0118 (NA)        |           |     |           |
| 6   | J5975   | NAWC-050118-FRB-304  | 05/01/2018 10:05 am | DW      | R0118 (NA)        |           |     |           |
| 7   | J5976   | NAWC-050118-RW-098   | 05/01/2018 10:40 am | DW      | R0118 (NA)        |           |     |           |
| 8   | J5977   | NAWC-050118-FRB-098  | 05/01/2018 10:35 am | DW      | R0118 (NA)        |           |     |           |

**Shipment:** SHP-180508-02

**Status:** Pending

**Description:** WE04

**Range:** J6148-J6170

**Comment:** NA

| No: | BDO Id: | Client Sample ID:   | Collection Date:    | Matrix: | Storage Facility: | Location: | No: | Comments: |
|-----|---------|---------------------|---------------------|---------|-------------------|-----------|-----|-----------|
| 1   | J6148   | NAWC-050718-RW-316  | 05/07/2018 10:10 am | DW      | R0118 (NA)        |           |     |           |
| 2   | J6149   | NAWC-050718-FRB-316 | 05/07/2018 10:05 am | DW      | R0118 (NA)        |           |     |           |
| 3   | J6150   | NAWC-050718-RW-180  | 05/07/2018 10:40 am | DW      | R0118 (NA)        |           |     |           |
| 4   | J6151   | NAWC-050718-FRB-180 | 05/07/2018 10:35 am | DW      | R0118 (NA)        |           |     |           |
| 5   | J6152   | NAWC-050718-RW-275  | 05/07/2018 11:10 am | DW      | R0118 (NA)        |           |     |           |
| 6   | J6153   | NAWC-050718-FRB-275 | 05/07/2018 11:05 am | DW      | R0118 (NA)        |           |     |           |
| 7   | J6154   | NAWC-050718-RW-145  | 05/07/2018 12:40 pm | DW      | R0118 (NA)        |           |     |           |



It can be done

**WORK/QUALITY ASSURANCE PROJECT PLAN****Shipment:** SHP-180508-02**Status:** Pending**Description:** WE04**Range:** J6148-J6170**Comment:** NA

| No: | BDO Id: | Client Sample ID:    | Collection Date:    | Matrix: | Storage Facility: Location: | No: | Comments: |
|-----|---------|----------------------|---------------------|---------|-----------------------------|-----|-----------|
| 8   | J6155   | NAWC-050718-FRB-145  | 05/07/2018 12:35 pm | DW      | R0118 (NA)                  |     |           |
| 9   | J6156   | NAWC-050718-RW-357   | 05/07/2018 1:10 pm  | DW      | R0118 (NA)                  |     |           |
| 10  | J6157   | NAWC-050718-FRB-357  | 05/07/2018 1:05 pm  | DW      | R0118 (NA)                  |     |           |
| 11  | J6158   | NAWC-050718-RW-162   | 05/07/2018 1:40 pm  | DW      | R0118 (NA)                  |     |           |
| 12  | J6159   | NAWC-050718-FRB-162  | 05/07/2018 1:35 pm  | DW      | R0118 (NA)                  |     |           |
| 13  | J6160   | WGNA-050718-RW-0800  | 05/07/2018 2:10 pm  | DW      | R0118 (NA)                  |     |           |
| 14  | J6161   | WGNA-050718-FRB-0800 | 05/07/2018 2:05 pm  | DW      | R0118 (NA)                  |     |           |
| 15  | J6162   | WGNA-050718-RW-0335  | 05/07/2018 2:40 pm  | DW      | R0118 (NA)                  |     |           |
| 16  | J6163   | WGNA-050718-FRB-0335 | 05/07/2018 2:35 pm  | DW      | R0118 (NA)                  |     |           |
| 17  | J6164   | WGNA-050718-RW-3556  | 05/07/2018 3:10 pm  | DW      | R0118 (NA)                  |     |           |
| 18  | J6165   | WGNA-050718-FRB-3556 | 05/07/2018 3:05 pm  | DW      | R0118 (NA)                  |     |           |
| 19  | J6166   | NAWC-050718-RW-356   | 05/07/2018 3:40 pm  | DW      | R0118 (NA)                  |     |           |
| 20  | J6167   | NAWC-050718-FRB-356  | 05/07/2018 3:35 pm  | DW      | R0118 (NA)                  |     |           |
| 21  | J6168   | NAWC-050718-RW-289   | 05/07/2018 4:10 pm  | DW      | R0118 (NA)                  |     |           |
| 22  | J6169   | NAWC-050718-FRB-289  | 05/07/2018 4:05 pm  | DW      | R0118 (NA)                  |     |           |
| 23  | J6170   | WGNA-050718-DUP-35   | 05/07/2018 7:00 am  | DW      | R0118 (NA)                  |     |           |

**Shipment:** SHP-180511-02**Status:** Pending**Description:** WE04**Range:** J6204-J6212**Comment:** NA

| No: | BDO Id: | Client Sample ID:   | Collection Date:    | Matrix: | Storage Facility: Location: | No: | Comments: |
|-----|---------|---------------------|---------------------|---------|-----------------------------|-----|-----------|
| 1   | J6204   | NAWC-051018-RW-303  | 05/10/2018 9:10 am  | DW      | R0118 (NA)                  |     |           |
| 2   | J6206   | WGNA-051018-RW-3220 | 05/10/2018 9:40 am  | DW      | R0118 (NA)                  |     |           |
| 3   | J6208   | NAWC-051018-RW-177  | 05/10/2018 10:40 am | DW      | R0118 (NA)                  |     |           |
| 4   | J6210   | WGNA-051018-RW-3295 | 05/10/2018 3:10 pm  | DW      | R0118 (NA)                  |     |           |
| 5   | J6212   | WGNA-051018-DUP-36  | 05/10/2018 7:00 am  | DW      | R0118 (NA)                  |     |           |



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

## Attachment 2: Test Codes

|                                |                                                                                                                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Test Code Name:</b> | Master_371                                                                                                                                                                   |
| <b>SOP Reference:</b>          | 5-371 - ANALYSIS OF POLY AND PERFLUOROALKYL SUBSTANCES IN DRINKING WATER SAMPLES BY LIQUID CHROMATOGRAPHY AND TANDEM MASS SPECTROMETRY (LC-MS/MS) FOLLOWING EPA METHOD 537.1 |
| <b>Description:</b>            | PFAS in drinking water                                                                                                                                                       |
| <b>Matrix:</b>                 | L - Liquid Samples, like water or sea water, prepared and analyzed under the same class of detection limits.                                                                 |
| <b>Detection Limit Study:</b>  | 5-371                                                                                                                                                                        |
| <b>Instrument:</b>             | LC-MS/MS                                                                                                                                                                     |
| <b>MQO Criteria</b>            | Universal_LC                                                                                                                                                                 |
| <b>Standard Report:</b>        | Standard Result Report                                                                                                                                                       |

| Method Specific Reporting    |           | Holding Times (days)        |              | Data Flags                           |
|------------------------------|-----------|-----------------------------|--------------|--------------------------------------|
| <b>Result Units:</b>         | ng/L      | <b>Unit Conversion:</b>     | (none)       | <b>Sample:</b> 14 <b>DL_Flag:</b> U  |
| <b>Weight Basis:</b>         | Liquid    | <b>Result Format:</b>       | Fixed Digits | <b>Frozen:</b> 40 <b>RL_Flag:</b> J  |
| <b>Standard Basis:</b>       | RIS       | <b># of Figures/Digits:</b> | 2            | <b>Extract:</b> 28 <b>PB_Flag:</b> B |
| <b>Oil Weight Basis:</b>     | No        | <b>Oil Weight Source:</b>   | Oil Weight   | <b>DIL_Flag:</b> D                   |
| <b>U-Value Substitution:</b> | U-Flag=MD | <b>Histograms:</b>          | No           | <b>HT_Flag:</b> T                    |
| <b>ECD_Reporting:</b>        | No        |                             |              |                                      |

| No: | Analyte:                                         | Report Name: | Type | RIS        | SIS | Hidden: | Graph: |
|-----|--------------------------------------------------|--------------|------|------------|-----|---------|--------|
| 1   | Perfluoro-n-hexanoic acid                        | PFHxA        | T    | 13C2-PFOA  |     | No      | No     |
| 2   | Perfluoro-n-heptanoic Acid                       | PFHpA        | T    | 13C2-PFOA  |     | No      | No     |
| 3   | Perfluoro-n-octanoic Acid                        | PFOA         | T    | 13C2-PFOA  |     | No      | No     |
| 4   | Perfluorononanoic Acid                           | PFNA         | T    | 13C2-PFOA  |     | No      | No     |
| 5   | Perfluoro-n-decanoic Acid                        | PFDA         | T    | 13C2-PFOA  |     | No      | No     |
| 6   | Perfluoro-n-undecanoic acid                      | PFUnA        | T    | 13C2-PFOA  |     | No      | No     |
| 7   | Perfluoro-n-dodecanoic acid                      | PFDoA        | T    | 13C2-PFOA  |     | No      | No     |
| 8   | Perfluoro-n-tridecanoic acid                     | PFTTrDA      | T    | 13C2-PFOA  |     | No      | No     |
| 9   | Perfluoro-n-tetradecanoic acid                   | PFTeDA       | T    | 13C2-PFOA  |     | No      | No     |
| 10  | N-methylperfluoro-1-octanesulfonamidoacetic acid | NMeFOSAA     | T    | d3-MeFOSAA |     | No      | No     |
| 11  | N-ethylperfluoro-octanesulfonamidoacetic acid    | NEtFOSAA     | T    | d3-MeFOSAA |     | No      | No     |
| 12  | Perfluoro-1-butanefulfonate                      | PFBS         | T    | 13C4-PFOS  |     | No      | No     |
| 13  | Perfluoro-1-octanesulfonate                      | PFOS         | T    | 13C4-PFOS  |     | No      | No     |
| 14  | Perfluoro-1-hexanesulfonate                      | PFHxS        | T    | 13C4-PFOS  |     | No      | No     |
| 1   | 13C2-PFHxA                                       | 13C2-PFHxA   | SIS  |            |     | No      | No     |
| 2   | 13C2-PFDA                                        | 13C2-PFDA    | SIS  |            |     | No      | No     |



It can be done

**WORK/QUALITY ASSURANCE PROJECT PLAN****Attachment 2: Test Codes****Project Test Code Name:** Master\_371

| No:                    | Analyte:   | Report Name: | Type | RIS | SIS | Hidden: | Graph: |
|------------------------|------------|--------------|------|-----|-----|---------|--------|
| 3                      | d5-EtFOSAA | d5-EtFOSAA   | SIS  |     |     | No      | No     |
| <b>Total Analytes:</b> |            | 17           |      |     |     |         |        |

**Subtract Peaks:**

None

**Sum Peaks:**

None



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

## Attachment 2: Test Codes

**Project Test Code Name:** Master\_371

## ICAL Acceptance Criteria:

| Curve Fit:      | Limit<br>Mean(%): | Mean<br>Qual: | Limit<br>Ind.: | Ind.<br>Qual: | Min<br>Points: | Points<br>Qual: | Comments: |
|-----------------|-------------------|---------------|----------------|---------------|----------------|-----------------|-----------|
| Linear          | NA                | NA            | 0.995          | N             | 5              | N               | NA        |
| Average RF      | 15                | N             | 25             | N             | 5              | N               | NA        |
| Linear (0,0)    | NA                | NA            | 0.995          | N             | 5              | N               | NA        |
| Quadratic       | NA                | NA            | 0.995          | N             | 6              | N               | NA        |
| Quadratic (0,0) | NA                | NA            | 0.995          | N             | 6              | N               | NA        |

## Continuing Calibration Verification Criteria:

CCV Name: Standard

| Frequency<br>Hrs: | Mean<br>PD(%): | Individual<br>PD(%): | RIS/SIS RT<br>Window (min): | Area Limit<br>Low(%): | Area Limit<br>High(%): | Comment:                                                 |
|-------------------|----------------|----------------------|-----------------------------|-----------------------|------------------------|----------------------------------------------------------|
| 12 (N)            | 20 (N)         | 25 (N)               | 0.07 (N)                    | -50                   | 100 (N)                | Lab Default Continuing Calibration Verification Criteria |

## Independent Calibration Verification:

ICC Name: Standard

| Mean PD<br>Limit(%): | Ind. PD<br>Limit(%): | RIS/SIS Window<br>Limit (Secs): | Area Limit<br>High(%): | Area Limit<br>Low(%): | Comment:                              |
|----------------------|----------------------|---------------------------------|------------------------|-----------------------|---------------------------------------|
| 15 (N)               | 20 (N)               | 0.07 (N)                        | -50                    | 100 (N)               | Standard laboratory criteria for ICCs |

## Mass Discrimination Criteria:

None

## Degredation Check Criteria:

None



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

### Attachment 3: Method Quality Objectives

| <b>MQO Application</b>                         | <b>Universal_LC</b>                                                                                                                                                               |              |                                                                                              |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------|
| <b>MQO:</b>                                    | <b>Acceptance Criteria</b>                                                                                                                                                        | <b>Qual:</b> | <b>Corrective Action:</b>                                                                    |
| Procedural Blank                               | Samples must be greater than five times the blank concentration (>5xPB).                                                                                                          | B            | Review with Project Manager; re-analyze or justify results in project records.               |
| PB Measurement Quality Objective               | Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)                                                                                                | N            | Review with Project Manager; re-analyze or justify results in project records.               |
| Laboratory Control Sample                      | Recovery values 70-130%.                                                                                                                                                          | N            | Review with project manager; re-analyze or justify reporting the results in project records. |
| Matrix Spike / Matrix Spike Duplicate Recovery | Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.                                                              | N            | Review with Project Manager; re-analyze or justify reporting results in the project records. |
|                                                | Organics Results in the Target is less than 5 times the Original                                                                                                                  | n            |                                                                                              |
| Matrix Spike/Spike Duplicate Precision         | Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.              | N            | Review with Project Manager; re-analyze or justify reporting results in the project records. |
|                                                | Organics Results in the Target is less than 5 times the Original                                                                                                                  | n            |                                                                                              |
| Standard Reference Material Accuracy           | Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL). | N            | Review with Project Manager; re-analyze or justify reporting results in the project records. |
|                                                | Organics Results in the Target is less than 5 times the MDL                                                                                                                       | n            |                                                                                              |
| Analytical Duplicate Precision                 | Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.                                                                         | N            | Review with Project Manager; re-analyze or justify reporting results in the project records. |
|                                                | Organics Results in the Original is less than 5 times the MDL                                                                                                                     | n            |                                                                                              |



It can be done

## WORK/QUALITY ASSURANCE PROJECT PLAN

### Attachment 3: Method Quality Objectives

| <b>MQO Application</b>                 | <b>Universal_LC</b>                                                                                                                                                            |              |                                                                                                                                        |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>MQO:</b>                            | <b>Acceptance Criteria</b>                                                                                                                                                     | <b>Qual:</b> | <b>Corrective Action:</b>                                                                                                              |
| Analytical Triplicate Precision        | Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL.<br><br>Organics Results in the Original is less than 5 times the MDL | N<br><br>n   | Review with Project Manager; re-analyze or justify reporting results in the project records.                                           |
| Surrogate Compound Recovery            | Recovery results between 50% and 150%.                                                                                                                                         | N            | Review with Project Manager; re-analyze or justify reporting results in the project records.                                           |
| Control Oil                            | RPD < 30% for at least 90% of analytes                                                                                                                                         | N            | Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented. |
| Instrument Calibration                 | 5-371-3: R-squared greater than or equal to 0.995<br>Mean RSD less than or equal to 15%,<br>Individual RSD less than or equal to 25%                                           | N            | Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented. |
| Independent Calibration Check Solution | 5-371-3: Individual PD less than or equal to 20%.<br>Mean Percent Difference less than or equal to 15%.                                                                        | N            | Review with Project Manager; re-analyze or justify in project records.                                                                 |
| Continuing Calibration Verification    | 5-371-3: Individual PD less than or equal to 25%.<br>Mean Percent Difference less than or equal to 20%.                                                                        | N            | Review with Project Manager; re-analyze or justify in project records.                                                                 |



It can be done

Battelle Project No:

## Sample Receipt Form

Approved: ☐ Authorized: ☐

Project Number: 112G08005-WE04

Client: Tetra Tech

Received by: Schumitz, Matt

Date/Time Received: Tuesday, May 01, 2018 11:45 AM

No. of Shipping Containers: 1

### SHIPMENT

Method of Delivery: Commercial Carrier

Tracking Number: 7721 0074 3919

COC Forms: ☒ Shipped with samples ☐ No Forms

### Cooler(s)/Box(es)

| Cntr   | Type   | Tracking No.   | Seal          | Seal   | Container | Therm.  | Temp C | Smps |
|--------|--------|----------------|---------------|--------|-----------|---------|--------|------|
| 1 of 1 | Cooler | 7721 0074 3919 | Custody Seals | Intact | Intact    | Therm_2 | 1.9    | 6    |

### Samples

Sample Labels: ☒ Sample labels agree with COC forms  
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals: ☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)  
☒ Seals intact for each shipping container  
☐ Seals broken (See sample log for impacted samples)

Condition of Samples: ☒ Sample containers intact  
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 1.9 Temperature Blank used ☒ Yes ☐ No  
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☒ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☒ NA  
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☒ NA  
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☒ NA  
Individual sample deviations noted on sample log

Samples Containers: ☐ Yes ☐ No ☒ Unknown /Lot No.: UnKnown

Storage Location: Custody: Refrigerator - R0118 (NA) BDO IDs Assigned: J5964 - J5969

Samples logged in by: Schumitz, Matt Date/Time: 05/01/2018 11:45 AM

Approved By: Approved On:

Authorized By: Authorized On:



It can be done

ShpNo SHP-180501-01

Battelle Project No: \_\_\_\_\_

Sample Receipt Form Details

Approved: ☐ ☐

Project Number: 112G08005-WE04

Client: Tetra Tech

Received by: Schumitz, Matt

Date/Time Received: Tuesday, May 01, 2018 11:45 AM

No. of Shipping Containers: 1

| BDO Id: | Client Sample ID:    | Collection Date: | Login Date:    | Ctrs: | Matrix: | Temp: | pH: | TRC: | VOC: | Stored In: | Loc: | No: | Comments: |
|---------|----------------------|------------------|----------------|-------|---------|-------|-----|------|------|------------|------|-----|-----------|
| J5964   | WGNA-043018-RW-3103  | 04/30/18 10:10   | 05/01/18 14:43 | 6     | DW      | 1.9   | NA  | NA   | NA   | R0118 (NA) |      |     | MSMSD     |
| J5965   | WGNA-043018-FRB-3103 | 04/30/18 10:05   | 05/01/18 14:43 | 2     | DW      | 1.9   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5966   | NAWC-043018-RW-207   | 04/30/18 10:40   | 05/01/18 14:44 | 2     | DW      | 1.9   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5967   | NAWC-043018-FRB-207  | 04/30/18 10:35   | 05/01/18 14:44 | 2     | DW      | 1.9   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5968   | WGNA-043018-RW-3409  | 04/30/18 13:40   | 05/01/18 14:45 | 2     | DW      | 1.9   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5969   | WGNA-043018-FRB-3409 | 04/30/18 13:35   | 05/01/18 14:45 | 2     | DW      | 1.9   | NA  | NA   | NA   | R0118 (NA) |      |     |           |

Total Samples: 6

|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------|--|--------------------------|-------------|----------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------|--|-------------------------|--|------------------------|--|--|--|--|--|--------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|
| <b>Battelle</b><br><i>The Business of Innovation</i>                                                                              |  |                          |             |                            |        | <u>Chain-of-Custody</u>                                                                                                                                      |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| <u>Client Contact Information</u><br>Andy Frebowitz<br>234 Mall Boulevard, Suite 260<br>King of Prussia, PA 19406<br>610-382-1170 |  |                          |             |                            |        | Project Manager: Jonathan Thorn<br>Sampler Information (print name): Mary Kay Bond<br>Phone: 610-382-1169<br>Email: mary.bond@tetrattech.com                 |   |                   |  |                         |  | Sampling Site: WE04    |  |  |  |  |  | Site Information: NAS JRB Willow Grove/NAWC Warminster |  |  |  |  |  |  |  |  |  |  |  |
| Project Name: WE04<br>Project No.: 112G08005-WE04                                                                                 |  |                          |             |                            |        | Turnaround Time (TAT) Requested: 21 days<br>Normal <input checked="" type="checkbox"/><br>Priority <input type="checkbox"/><br>RUSH <input type="checkbox"/> |   |                   |  |                         |  | Preservative<br>Trizma |  |  |  |  |  | COC #                                                  |  |  |  |  |  |  |  |  |  |  |  |
| Time Zone: Eastern                                                                                                                |  |                          |             |                            |        | Analysis<br>PFAS EPA 537<br>14 analytes                                                                                                                      |   |                   |  |                         |  | Page# 1 of 1           |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| Sample Identification                                                                                                             |  | Sample Date              | Sample Time | Sample Type                | Matrix | Total # of Cont.                                                                                                                                             |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| WGNA-043018-RW-3103 JS964                                                                                                         |  | 4/30/2018                | 10:10       | G                          | DW     | 6                                                                                                                                                            | X |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| WGNA-043018-FRB-3103 JS965                                                                                                        |  | 4/30/2018                | 10:05       | G                          | DW     | 2                                                                                                                                                            | X |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| NAWC-043018-RW-207 JS966                                                                                                          |  | 4/30/2018                | 10:40       | G                          | DW     | 2                                                                                                                                                            | X |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| NAWC-043018-FRB-207 JS967                                                                                                         |  | 4/30/2018                | 10:35       | G                          | DW     | 2                                                                                                                                                            | X |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| WGNA-043018-RW-3409 JS968                                                                                                         |  | 4/30/2018                | 13:40       | G                          | DW     | 2                                                                                                                                                            | X |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| WGNA-043018-FRB-3409 JS969                                                                                                        |  | 4/30/2018                | 13:35       | G                          | DW     | 2                                                                                                                                                            | X |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
|                                                                                                                                   |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| Receipt Temperature: (°C)                                                                                                         |  | Samples Intact: Yes - No |             |                            |        | Samples on Ice: Yes - No                                                                                                                                     |   |                   |  |                         |  |                        |  |  |  |  |  | Receipt Comments:                                      |  |  |  |  |  |  |  |  |  |  |  |
| Relinquished by (Print/Sign):<br>Mary Kay Bond                                                                                    |  | Company: Tetra Tech      |             | Date/Time: 4/30/2018 16:00 |        | Received by (Print/Sign):<br>Matt Schumitz MB                                                                                                                |   | Company: Battelle |  | Date/Time: 5-1-18 11:45 |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| Relinquished by (Print/Sign):                                                                                                     |  | Company:                 |             | Date/Time:                 |        | Received by (Print/Sign):                                                                                                                                    |   | Company:          |  | Date/Time:              |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| Relinquished by (Print/Sign):                                                                                                     |  | Company:                 |             | Date/Time:                 |        | Received by (Print/Sign):                                                                                                                                    |   | Company:          |  | Date/Time:              |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |
| Comments: FedEx Tracking # 7721 0074 3919                                                                                         |  |                          |             |                            |        |                                                                                                                                                              |   |                   |  |                         |  |                        |  |  |  |  |  |                                                        |  |  |  |  |  |  |  |  |  |  |  |



It can be done

Battelle Project No:

## Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: 112G08005-WE04

Client: Tetra Tech

Received by: Schumitz, Matt

Date/Time Received: Wednesday, May 02, 2018 11:30 AM

No. of Shipping Containers: 1

### SHIPMENT

Method of Delivery: Commercial Carrier

Tracking Number: 7721 2279 0356

COC Forms: ☒ Shipped with samples ☐ No Forms

### Cooler(s)/Box(es)

| Cntr   | Type   | Tracking No.   | Seal          | Seal   | Container | Therm.  | Temp C | Smps |
|--------|--------|----------------|---------------|--------|-----------|---------|--------|------|
| 1 of 1 | Cooler | 7721 2279 0356 | Custody Seals | Intact | Intact    | Therm_2 | 1.7    | 8    |

### Samples

Sample Labels:

- ☒ Sample labels agree with COC forms  
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:

- ☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)  
☒ Seals intact for each shipping container  
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:

- ☒ Sample containers intact  
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 1.7 Temperature Blank used ☒ Yes ☐ No

(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☒ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☒ NA

If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☒ NA

If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☒ NA

Individual sample deviations noted on sample log

Samples Containers:

Samples returned in PC-grade jars: ☐ Yes ☐ No ☒ Unknown /Lot No.: UnKnown

Storage Location: Custody: Refrigerator - R0118 (NA)

BDO IDs Assigned: J5970 - J5977

Samples logged in by: Schumitz, Matt

Date/Time: 05/02/2018 11:30 AM

Approved By:

Approved On:

Authorized By:

Authorized On:





It can be done

Battelle Project No: \_\_\_\_\_

## Sample Receipt Form Details

Approved: ☐ Authorized ☐

Project Number: 112G08005-WE04 Client: Tetra Tech

Received by: Schumitz, Matt Date/Time Received: Wednesday, May 02, 2018 11:30 AM

No. of Shipping Containers: 1

| BDO Id: | Client Sample ID:    | Collection Date: | Login Date:    | Ctrs: | Matrix: | Temp: | pH: | TRC: | VOC: | Stored In: | Loc: | No: | Comments: |
|---------|----------------------|------------------|----------------|-------|---------|-------|-----|------|------|------------|------|-----|-----------|
| J5970   | WGNA-050118-RW-3385  | 05/01/18 9:10    | 05/02/18 13:34 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5971   | WGNA-050118-FRB-3385 | 05/01/18 9:05    | 05/02/18 13:34 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5972   | WGNA-050118-RW-3178  | 05/01/18 9:40    | 05/02/18 13:34 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5973   | WGNA-050118-FRB-3178 | 05/01/18 9:35    | 05/02/18 13:34 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5974   | NAWC-050118-RW-304   | 05/01/18 10:10   | 05/02/18 13:35 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5975   | NAWC-050118-FRB-304  | 05/01/18 10:05   | 05/02/18 13:35 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5976   | NAWC-050118-RW-098   | 05/01/18 10:40   | 05/02/18 13:35 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |
| J5977   | NAWC-050118-FRB-098  | 05/01/18 10:35   | 05/02/18 13:36 | 2     | DW      | 1.7   | NA  | NA   | NA   | R0118 (NA) |      |     |           |

Total Samples: 8

[illegible]

ORIGIN ID: KPDA (610) 382-1530  
N. SOMA  
TETRA TECH  
234 MALL BLVD  
SUITE 260  
KING OF PRUSSIA, PA 19406  
UNITED STATES US

SHIP DATE: 01MAY18  
ACTWGT: 40.00 LB  
CAD: 111283035/INET3980  
DIMS: 24x16x18 IN  
BILL SENDER

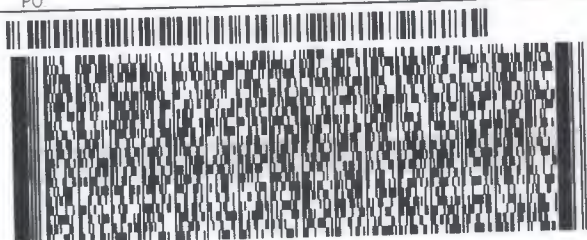
TO JONATHAN THORN  
BATTELLE  
141 LONGWATER DRIVE  
SUITE 202  
NORWELL MA 02061

(781) 681-5565

REF: 112G08005-WED4 LT WS

INV.  
PO

DEPT:



FedEx  
Express



1011180125101

RT 2  
ST

WED - 02 MAY 10:30A  
PRIORITY OVERNIGHT

TRK# 7721 2279 0356  
0201

EM XPUA

02061  
MA-US BOS





# Data Tables



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-043018-FRB-3103

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5965-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 04/30/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDaA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 105 |
| 13C2-PFDA  | 109 |
| d5-EtFOSAA | 111 |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID NAWC-043018-FRB-207

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5967-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 04/30/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDaA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 104 |
| 13C2-PFDA  | 101 |
| d5-EtFOSAA | 90  |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-043018-FRB-3409

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5969-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 04/30/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 104 |
| 13C2-PFDA  | 102 |
| d5-EtFOSAA | 83  |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-050118-FRB-3385

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5971-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 05/01/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDaA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 104 |
| 13C2-PFDA  | 100 |
| d5-EtFOSAA | 97  |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-050118-FRB-3178

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5973-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 05/01/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDaA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 120 |
| 13C2-PFDA  | 106 |
| d5-EtFOSAA | 90  |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID NAWC-050118-FRB-304

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5975-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 05/01/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDaA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 112 |
| 13C2-PFDA  | 100 |
| d5-EtFOSAA | 109 |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID NAWC-050118-FRB-098

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Battelle ID           | J5977-FS            |      |      |      |
| Sample Type           | SA                  |      |      |      |
| Collection Date       | 05/01/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | DW                  |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDaA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 106 |
| 13C2-PFDA  | 103 |
| d5-EtFOSAA | 101 |





Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

|                       |                     |      |      |      |
|-----------------------|---------------------|------|------|------|
| Client ID             | Procedural Blank    |      |      |      |
| Battelle ID           | CQ753PB-FS          |      |      |      |
| Sample Type           | PB                  |      |      |      |
| Collection Date       | 05/09/2018          |      |      |      |
| Extraction Date       | 05/09/2018          |      |      |      |
| Analysis Date         | 05/14/2018          |      |      |      |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture            | NA                  |      |      |      |
| Matrix                | WATER               |      |      |      |
| Sample Size           | 0.250               |      |      |      |
| Size Unit-Basis       | L                   |      |      |      |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                 | 0.50 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOA                  | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFNA                  | 1.00 U              | 0.37 | 1.00 | 2.50 |
| PFDA                  | 1.00 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                 | 1.00 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                 | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA               | 1.00 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                | 1.50 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA              | 1.00 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA              | 1.00 U              | 0.44 | 1.00 | 2.50 |
| PFBS                  | 0.50 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                 | 1.00 U              | 0.34 | 1.00 | 2.50 |
| PFOS                  | 1.00 U              | 0.30 | 1.00 | 2.50 |

#### Surrogate Recoveries (%)

|            |     |
|------------|-----|
| 13C2-PFHxA | 115 |
| 13C2-PFDA  | 117 |
| d5-EtFOSAA | 105 |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

| Client ID                       | Laboratory Control Sample |        |          |      |                |       |
|---------------------------------|---------------------------|--------|----------|------|----------------|-------|
| Battelle ID                     | CQ754LCS-FS               |        |          |      |                |       |
| Sample Type                     | LCS                       |        |          |      |                |       |
| Collection Date                 | 05/09/2018                |        |          |      |                |       |
| Extraction Date                 | 05/09/2018                |        |          |      |                |       |
| Analysis Date                   | 05/14/2018                |        |          |      |                |       |
| Analytical Instrument           | Sciex 5500 LC/MS/MS       |        |          |      |                |       |
| % Moisture                      | NA                        |        |          |      |                |       |
| Matrix                          | WATER                     |        |          |      |                |       |
| Sample Size                     | 0.250                     |        |          |      |                |       |
| Size Unit-Basis                 | L                         |        |          |      |                |       |
| Units                           | ng/L                      | Target | Recovery | Qual | Control Limits |       |
|                                 |                           |        |          |      | Lower          | Upper |
| PFHxA                           | 10.43                     | 10.00  | 104      |      | 70             | 130   |
| PFHpA                           | 9.94                      | 10.00  | 99       |      | 70             | 130   |
| PFOA                            | 10.21                     | 10.00  | 102      |      | 70             | 130   |
| PFNA                            | 9.64                      | 10.00  | 96       |      | 70             | 130   |
| PFDA                            | 9.74                      | 10.00  | 97       |      | 70             | 130   |
| PFUnA                           | 9.74                      | 10.00  | 97       |      | 70             | 130   |
| PFDoA                           | 9.50                      | 10.00  | 95       |      | 70             | 130   |
| PFTTrDA                         | 9.88                      | 10.00  | 99       |      | 70             | 130   |
| PFTeDA                          | 11.29                     | 10.00  | 113      |      | 70             | 130   |
| NMeFOSAA                        | 11.25                     | 10.00  | 113      |      | 70             | 130   |
| NEtFOSAA                        | 11.32                     | 10.00  | 113      |      | 70             | 130   |
| PFBS                            | 10.15                     | 8.85   | 115      |      | 70             | 130   |
| PFHxS                           | 9.51                      | 9.45   | 101      |      | 70             | 130   |
| PFOS                            | 8.34                      | 9.55   | 87       |      | 70             | 130   |
| <b>Surrogate Recoveries (%)</b> |                           |        |          |      |                |       |
| 13C2-PFHxA                      | 109                       |        |          |      |                |       |
| 13C2-PFDA                       | 99                        |        |          |      |                |       |
| d5-EtFOSAA                      | 100                       |        |          |      |                |       |



## Glossary of Data Qualifiers

Flag:      Application:

---

|    |                                                                                                                            |
|----|----------------------------------------------------------------------------------------------------------------------------|
| B  | Analyte found in the sample at a concentration <10x the level found in the procedural blank                                |
| D  | Dilution Run. Initial run outside the initial calibration range of the instrument                                          |
| E  | Estimate, result is greater than the highest concentration level in the calibration                                        |
| H  | Surrogate diluted out. Used when surrogate recovery is affected by excessive dilution of the sample extract.               |
| J  | Analyte detected below the Limit of Quantitation (LOQ)                                                                     |
| ME | Significant Matrix Interference - Estimated value.                                                                         |
| MI | Significant Matrix Interference - value could not be determined.                                                           |
| n  | Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO), but meets secondary criteria |
| N  | Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)                               |
| NA | Not Applicable                                                                                                             |
| T  | Holding Time (HT) exceeded                                                                                                 |
| U  | Analyte not detected or detected below the Method detection limit (MDL) value, Limit of Detection (LOD) reported           |

# Miscellaneous Documentation



Norwell Operations  
 141 Longwater Drive, Suite 202  
 Norwell, Massachusetts 02061  
 Telephone: 781-681-5400

July 13<sup>th</sup>, 2018

This data package has been revised to include the following updates to the reporting format:

- Use of LOD values for non-detected values (in place of the MDL value that was used in the original report).
- Use of sample specific MDL, LOD, and LOQ values (adjusted for dilution and sample size variations as compared to the MDL, LOD, and LOQ studies)

In addition to non-detect ("U" qualified) data changing to use the sample specific LOD value (not included in the table below), the information in the following table changed from the original report to the new report. The reason for these changes is the variation in sample size for individual samples when using sample specific values. This table includes information on all SDG updated and resubmitted on 7/13/2018.

| SDG     | Lab Sample ID | Client ID            | Analyte | New Result | New Qual | Old Result | Old Qual |
|---------|---------------|----------------------|---------|------------|----------|------------|----------|
| 18-0299 | J5972-FS      | WGNA-050118-RW-3178  | PFHpA   | 2.25       |          | 2.25       | J        |
| 18-0313 | J6148-FS      | NAWC-050718-RW-316   | PFNA    | 2.26       |          | 2.26       | J        |
| 18-0313 | J6150-FS      | NAWC-050718-RW-180   | PFDA    | 0.37       | J        | 0.39       | U        |
| 18-0323 | J6209-FS      | NAWC-051018-FRB-177  | PFOA    | 0.38       | J        | 0.38       | U        |
| 18-0343 | J6264-FS      | WGNA-052918-RW-3978  | PFNA    | 2.34       |          | 2.34       | J        |
| 18-0343 | J6273-FS      | NAWC-053018-RW-231   | PFHxS   | 37.20      | JD       | 37.20      | D        |
| 18-0343 | J6275-FS      | WGNA-053018-RW-3933  | PFNA    | 2.35       |          | 2.35       | J        |
| 18-0343 | J6285-FS      | NAWC-053018-RW-196   | PFHxS   | 2.31       |          | 2.31       | J        |
| 18-0360 | J6583-FS      | NAWC-060418-FRB-230  | PFHxS   | 0.33       | J        | 1.00       | U        |
| 18-0360 | J6643-FS      | WGNA-060718-FRB-0626 | PFOS    | 2.48       | B        | 2.48       | J        |

The original data tables have been moved to the unused data section of this complete data package.

## QA/QC Summary Batch 18-0312

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| Project:          | CTO-WE04 Naval Air Station Joint Reserve Base Willow Grove |
| Parameters:       | PFAS                                                       |
| Laboratory:       | Battelle, Norwell, MA                                      |
| Matrix:           | DW                                                         |
| Data Set:         | DP-18-0111                                                 |
| Analytical SOP:   | 5-371                                                      |
| Method Reference: | USEPA 537 rev. 1.1, QSM 5.1                                |

### Sample Custody

| Collection Date | Receipt Date | Temp (°C) |
|-----------------|--------------|-----------|
| 4/30/2018       | 5/1/2018     | 1.9       |
| 5/1/2018        | 5/2/2018     | 1.7       |

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Corrective Actions | None                                                         |
| Sample Storage     | The water samples were stored refrigerated until extraction. |
| Related samples    | FRB samples related to field samples reported in SDG 13-0299 |

### METHOD SUMMARIES

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Preparation | Water samples were spiked with surrogates in the original sample container from the field. The water was extracted using a weak ion exchange solid phase extraction (SPE) cartridge and eluted from the SPE with in methanol. Extracts were split and concentrated to dryness under nitrogen with a water bath set between 60 °C and 65 °C, reconstituted with 96:4 methanol/water (V/V) and fortified with internal standard. Extracts were transferred for LC-MS/MS analysis.                                                                    |
| Prep comments      | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Analysis           | PFAS were measured by liquid chromatography tandem mass spectrometry (LC-MS/MS) in the multiple reaction monitoring (MRM). An initial calibration consisting of representative target analytes, labelled analogs, and internal standards was analyzed prior to analysis to demonstrate the linear range of analysis. Calibration verification was performed at the beginning and end of 10 injections and at the end of each sequence. Target PFAS were quantified using the isotope dilution method. Samples are reported in ng/L concentrations. |
| Analysis Comments  | Samples analyzed on the Sciex 5500.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Holding Times | Extraction Date(s) | Analysis Date(s) |
|---------------|--------------------|------------------|
|               | 5/9/2018           | 5/14/2018        |

|                       |                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------|
| Procedural Blank (PB) | A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods are free of contamination. |
| ≤ 1/3 the MRL         | No exceedances noted.<br>No comments.                                                                                        |
|                       |                                                                                                                              |

**QA/QC Summary**  
**Batch 18-0312**

|                                                                                                               |                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laboratory Control Spike (LCS)                                                                                | A LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.                                         |
| 70-130% of true value                                                                                         | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No comments.                                                                                                                                                          |
| Surrogates Standard Analytes                                                                                  | Labelled surrogate compounds were added prior to extraction. The recoveries are calculated to measure extraction efficiency.                                          |
| 70-130% of true value                                                                                         | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No Comments.                                                                                                                                                          |
| Internal Standard Analytes                                                                                    | Labelled analog compounds were added prior to analysis.                                                                                                               |
| ICal high and low points RPD $\leq 20\%$ , 50-150% of average area of the ICAL and 70-140% of most recent CCV | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No Comments.                                                                                                                                                          |
| Initial Calibration (ICAL)                                                                                    | The LC-MS/MS was calibrated with multi-level calibration curve for all compounds using linear or quadratic curve fitting.                                             |
| R <sup>2</sup> >0.99                                                                                          | No exceedances noted.                                                                                                                                                 |
| Target and SIS compounds +/- 30% of true value, Low point 50-150% of true value                               | No comments.                                                                                                                                                          |
| Independent Calibration Check (ICC)                                                                           | The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.                       |
| Target and SIS compounds +/- 30% of true value                                                                | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No comments.                                                                                                                                                          |
| Continuing Calibration Verification (CCV)                                                                     | Continuing calibration standards were run at the beginning and end of 10 injections and at the end of the sequence to ensure that initial calibration is still valid. |
| Target and SIS compounds +/- 30% of true value Low point 50-150% of true value                                | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No comments.                                                                                                                                                          |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project Number: 100117920-WE04  
 Preparation Batch: 18-0312  
 Data Set: DP-18-0111  
 Test Code: Master\_371

| QC Parameter:                                     | Exceed: | Justification: |
|---------------------------------------------------|---------|----------------|
| Procedural Blank                                  | 0       | None           |
| PB Measurement Quality Objective                  | 0       | None           |
| Laboratory Control Sample                         | 0       | None           |
| Matrix Spike / Matrix Spike Duplicate Recovery    | N/A     | None           |
| Matrix Spike / Matrix Spike Duplicate Precision   | 0       | None           |
| Extracted Internal Standard Analytes (Surrogates) | 0       | None           |
| Instrument Calibration                            | 0       | None           |
| Instrument Blank                                  | 0       | None           |
| Independent Calibration Check                     | 0       | None           |
| Continuing Calibration Verification               | 0       | None           |





## BATTELLE - NORWELL OPERATIONS MISCELLANEOUS DOCUMENTATION FORM

**Project Title:** Naval Air Station Joint Reserve Base Wi      **Data Set Number:** DP-18-0111  
**Project Number:** 100117920-WE04      **Prep Batch Number:** 18-0312  
**Entered By:** Denise Schumitz      **Entered On:** 05/16/2018  
**Test Code (Matrix Type):** Master\_371(L)

---

Samples that were manually integrated are noted on the quant reports with the comment (TRUE).  
DMS 5/16/2018

JV64 is not being used in the calibration curve for PFHxA, PFHpA, NMeFOSAA and NEtFOSAA. There is no impact on the data once this point is removed from the calibration.  
DMS 5/16/2018

---

**Task Leader Approval:**

**Supervisor Approval:**

**PM Approval:**

Digitally signed by Jonathan  
Thorn

Date: 2018.05.22 07:24:01 -04'00'

---



## Example Calculation for PFAS

Calculation of final concentration from area:

$$\text{Concentration} = \left[ \frac{PA - b}{m} \right] * C_{IS} * PIV * DF / S$$

Where:

PA = Area of target / area of internal standard  
 b = y intercept from calibration curve  
 CIS = concentration of internal standard (ng/L)  
 m = slope of calibration  
 DF = dilution factor  
 S = Sample Size  
 PIV = Pre-injection volume (L)

Sample ID: CQ754LCS-FS(0)  
 Client Sample ID: Laboratory Control Sample  
 Sample Size: 0.25  
 Units: L  
 Dilution Factor: 1  
 PIV (L): 0.001  
 Target Analyte: PFNA  
 MRM Transition: 463.0 / 419.0  
 Data file: 18-0312.wiff  
 Result table: 18-0312\_BASE  
 Area: 698989.3  
 IS Name: 13C2-PFOS  
 IS Area: 29190.46  
 IS Amount (ng/L): 100  
 y-intercept 0.08354  
 slope 0.99005

$$\text{Concentration} = \frac{[(698989.28/29190.46) - 0.08354]}{0.99005} * 100 * 0.001 * 1 / 0.25$$

$$\text{ng/L} = 9.64$$



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Preparation Batch: 18-0312

Data Set: DP-18-0111

|          | CQ753PB-FS (Procedural Blank) | CQ754LCS-FS (Laboratory Control Sample) | J5965-FS (WGNA-043018-FRB-3103) | J5967-FS (NAWC-043018-FRB-207) | J5969-FS (WGNA-043018-FRB-3409) | J5971-FS (WGNA-050118-FRB-3385) | J5973-FS (WGNA-050118-FRB-3178) | J5975-FS (NAWC-050118-FRB-304) | J5977-FS (NAWC-050118-FRB-098) |
|----------|-------------------------------|-----------------------------------------|---------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|
| PFHxA    | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFHpA    | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFOA     | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFNA     | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFDA     | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFUnA    | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFDoA    | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFTTrDA  | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFTeDA   | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| NMeFOSAA | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| NEtFOSAA | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFBS     | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFHxS    | -                             | L                                       | -                               | -                              | -                               | -                               | -                               | -                              | -                              |
| PFOS     | -                             | Br                                      | -                               | -                              | -                               | -                               | -                               | -                              | -                              |

"L": Linear

"Br": branched

"L/Br": Linear/Branched

"-": Not detected

Project Client: Tetra Tech  
Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA  
Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte   | Area       | RPD (L1/L9) |
|-------------|-----------|---------------|-----------|------------|-------------|
| JV64        | L1        | 5/14/18 16:27 | 13C4-PFOS | 117,641.83 | -           |
| JV65        | L2        | 5/14/18 16:36 | 13C4-PFOS | 128,859.01 | -           |
| JV66        | L3        | 5/14/18 16:45 | 13C4-PFOS | 105,963.04 | -           |
| JV67        | L4        | 5/14/18 16:53 | 13C4-PFOS | 131,015.70 | -           |
| JV68        | L5        | 5/14/18 17:02 | 13C4-PFOS | 118,468.59 | -           |
| JV69        | L6        | 5/14/18 17:11 | 13C4-PFOS | 124,400.13 | -           |
| JV70        | L7        | 5/14/18 17:20 | 13C4-PFOS | 118,733.91 | -           |
| JV71        | L8        | 5/14/18 17:29 | 13C4-PFOS | 101,181.69 | -           |
| JV72        | L9        | 5/14/18 17:38 | 13C4-PFOS | 105,473.33 | 10.9        |

PASS

Average      Lower      Upper  
116,859.69    58,429.85    175,289.54

| Sample Name    | Sample ID                 | Analysis Date | Analyte   | Area       | Lower     | Upper      | Qualifier | CCV Lower | CCV Upper  | Qualifier |
|----------------|---------------------------|---------------|-----------|------------|-----------|------------|-----------|-----------|------------|-----------|
| JV64           | L1                        | 5/14/18 16:27 | 13C4-PFOS | 117,641.83 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV65           | L2                        | 5/14/18 16:36 | 13C4-PFOS | 128,859.01 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV66           | L3                        | 5/14/18 16:45 | 13C4-PFOS | 105,963.04 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV67           | L4                        | 5/14/18 16:53 | 13C4-PFOS | 131,015.70 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV68           | L5                        | 5/14/18 17:02 | 13C4-PFOS | 118,468.59 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV69           | L6                        | 5/14/18 17:11 | 13C4-PFOS | 124,400.13 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV70           | L7                        | 5/14/18 17:20 | 13C4-PFOS | 118,733.91 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV71           | L8                        | 5/14/18 17:29 | 13C4-PFOS | 101,181.69 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV72           | L9                        | 5/14/18 17:38 | 13C4-PFOS | 105,473.33 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV63 ICC       | ICC                       | 5/14/18 17:47 | 13C4-PFOS | 103,611.84 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| CQ753PB-FS(0)  | Procedural Blank          | 5/14/18 18:05 | 13C4-PFOS | 103,853.95 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| CQ754LCS-FS(0) | Laboratory Control Sample | 5/14/18 18:14 | 13C4-PFOS | 84,459.89  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5965-FS(0)    | WGNA-043018-FRB-3103      | 5/14/18 18:23 | 13C4-PFOS | 116,949.30 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5967-FS(0)    | NAWC-043018-FRB-207       | 5/14/18 18:32 | 13C4-PFOS | 94,129.68  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5969-FS(0)    | WGNA-043018-FRB-3409      | 5/14/18 18:41 | 13C4-PFOS | 111,823.48 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5971-FS(0)    | WGNA-050118-FRB-3385      | 5/14/18 18:49 | 13C4-PFOS | 90,706.52  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5973-FS(0)    | WGNA-050118-FRB-3178      | 5/14/18 18:58 | 13C4-PFOS | 94,076.63  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5975-FS(0)    | NAWC-050118-FRB-304       | 5/14/18 19:07 | 13C4-PFOS | 88,279.99  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5977-FS(0)    | NAWC-050118-FRB-098       | 5/14/18 19:16 | 13C4-PFOS | 109,495.96 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV68 CCV       | CCV                       | 5/14/18 19:25 | 13C4-PFOS | 121,468.05 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |

Project Client: Tetra Tech

Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA

Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte   | Area      | RPD (L1/L9) |
|-------------|-----------|---------------|-----------|-----------|-------------|
| JV64        | L1        | 5/14/18 16:27 | 13C2-PFOA | 38,439.74 | -           |
| JV65        | L2        | 5/14/18 16:36 | 13C2-PFOA | 39,205.09 | -           |
| JV66        | L3        | 5/14/18 16:45 | 13C2-PFOA | 34,066.69 | -           |
| JV67        | L4        | 5/14/18 16:53 | 13C2-PFOA | 39,739.37 | -           |
| JV68        | L5        | 5/14/18 17:02 | 13C2-PFOA | 34,175.48 | -           |
| JV69        | L6        | 5/14/18 17:11 | 13C2-PFOA | 38,237.89 | -           |
| JV70        | L7        | 5/14/18 17:20 | 13C2-PFOA | 39,542.23 | -           |
| JV71        | L8        | 5/14/18 17:29 | 13C2-PFOA | 35,226.63 | -           |
| JV72        | L9        | 5/14/18 17:38 | 13C2-PFOA | 38,024.48 | 1.1         |

PASS

Average      Lower      Upper  
37,406.40    18,703.20    56,109.60

| Sample Name    | Sample ID                 | Analysis Date | Analyte   | Area      | Lower     | Upper     | Qualifier | CCV Lower | CCV Upper | Qualifier |
|----------------|---------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| JV64           | L1                        | 5/14/18 16:27 | 13C2-PFOA | 38,439.74 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV65           | L2                        | 5/14/18 16:36 | 13C2-PFOA | 39,205.09 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV66           | L3                        | 5/14/18 16:45 | 13C2-PFOA | 34,066.69 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV67           | L4                        | 5/14/18 16:53 | 13C2-PFOA | 39,739.37 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV68           | L5                        | 5/14/18 17:02 | 13C2-PFOA | 34,175.48 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV69           | L6                        | 5/14/18 17:11 | 13C2-PFOA | 38,237.89 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV70           | L7                        | 5/14/18 17:20 | 13C2-PFOA | 39,542.23 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV71           | L8                        | 5/14/18 17:29 | 13C2-PFOA | 35,226.63 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV72           | L9                        | 5/14/18 17:38 | 13C2-PFOA | 38,024.48 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV63 ICC       | ICC                       | 5/14/18 17:47 | 13C2-PFOA | 35,637.34 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| CQ753PB-FS(0)  | Procedural Blank          | 5/14/18 18:05 | 13C2-PFOA | 31,105.55 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| CQ754LCS-FS(0) | Laboratory Control Sample | 5/14/18 18:14 | 13C2-PFOA | 29,190.46 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5965-FS(0)    | WGNA-043018-FRB-3103      | 5/14/18 18:23 | 13C2-PFOA | 37,306.55 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5967-FS(0)    | NAWC-043018-FRB-207       | 5/14/18 18:32 | 13C2-PFOA | 29,453.32 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5969-FS(0)    | WGNA-043018-FRB-3409      | 5/14/18 18:41 | 13C2-PFOA | 33,204.68 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5971-FS(0)    | WGNA-050118-FRB-3385      | 5/14/18 18:49 | 13C2-PFOA | 27,675.77 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5973-FS(0)    | WGNA-050118-FRB-3178      | 5/14/18 18:58 | 13C2-PFOA | 27,255.88 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5975-FS(0)    | NAWC-050118-FRB-304       | 5/14/18 19:07 | 13C2-PFOA | 28,391.02 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5977-FS(0)    | NAWC-050118-FRB-098       | 5/14/18 19:16 | 13C2-PFOA | 34,760.01 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV68 CCV       | CCV                       | 5/14/18 19:25 | 13C2-PFOA | 36,497.99 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |

Project Client: Tetra Tech  
Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA  
Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte    | Area      | RPD (L1/L9) |
|-------------|-----------|---------------|------------|-----------|-------------|
| JV64        | L1        | 5/14/18 16:27 | d3-MeFOSAA | 36,112.58 | -           |
| JV65        | L2        | 5/14/18 16:36 | d3-MeFOSAA | 36,897.69 | -           |
| JV66        | L3        | 5/14/18 16:45 | d3-MeFOSAA | 30,420.23 | -           |
| JV67        | L4        | 5/14/18 16:53 | d3-MeFOSAA | 35,707.97 | -           |
| JV68        | L5        | 5/14/18 17:02 | d3-MeFOSAA | 33,628.73 | -           |
| JV69        | L6        | 5/14/18 17:11 | d3-MeFOSAA | 34,298.33 | -           |
| JV70        | L7        | 5/14/18 17:20 | d3-MeFOSAA | 36,446.02 | -           |
| JV71        | L8        | 5/14/18 17:29 | d3-MeFOSAA | 31,869.23 | -           |
| JV72        | L9        | 5/14/18 17:38 | d3-MeFOSAA | 35,734.85 | 1.1         |

PASS

Average      Lower      Upper  
34,568.40    17,284.20    51,852.60

| Sample Name    | Sample ID                 | Analysis Date | Analyte    | Area      | Lower     | Upper     | Qualifier | CCV Lower | CCV Upper | Qualifier |
|----------------|---------------------------|---------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| JV64           | L1                        | 5/14/18 16:27 | d3-MeFOSAA | 36,112.58 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV65           | L2                        | 5/14/18 16:36 | d3-MeFOSAA | 36,897.69 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV66           | L3                        | 5/14/18 16:45 | d3-MeFOSAA | 30,420.23 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV67           | L4                        | 5/14/18 16:53 | d3-MeFOSAA | 35,707.97 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV68           | L5                        | 5/14/18 17:02 | d3-MeFOSAA | 33,628.73 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV69           | L6                        | 5/14/18 17:11 | d3-MeFOSAA | 34,298.33 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV70           | L7                        | 5/14/18 17:20 | d3-MeFOSAA | 36,446.02 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV71           | L8                        | 5/14/18 17:29 | d3-MeFOSAA | 31,869.23 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV72           | L9                        | 5/14/18 17:38 | d3-MeFOSAA | 35,734.85 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV63 ICC       | ICC                       | 5/14/18 17:47 | d3-MeFOSAA | 32,603.64 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| CQ753PB-FS(0)  | Procedural Blank          | 5/14/18 18:05 | d3-MeFOSAA | 33,816.55 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| CQ754LCS-FS(0) | Laboratory Control Sample | 5/14/18 18:14 | d3-MeFOSAA | 26,148.55 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5965-FS(0)    | WGNA-043018-FRB-3103      | 5/14/18 18:23 | d3-MeFOSAA | 33,389.17 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5967-FS(0)    | NAWC-043018-FRB-207       | 5/14/18 18:32 | d3-MeFOSAA | 29,381.71 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5969-FS(0)    | WGNA-043018-FRB-3409      | 5/14/18 18:41 | d3-MeFOSAA | 32,886.89 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5971-FS(0)    | WGNA-050118-FRB-3385      | 5/14/18 18:49 | d3-MeFOSAA | 26,728.75 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5973-FS(0)    | WGNA-050118-FRB-3178      | 5/14/18 18:58 | d3-MeFOSAA | 26,940.76 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5975-FS(0)    | NAWC-050118-FRB-304       | 5/14/18 19:07 | d3-MeFOSAA | 24,390.83 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5977-FS(0)    | NAWC-050118-FRB-098       | 5/14/18 19:16 | d3-MeFOSAA | 30,654.25 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV68 CCV       | CCV                       | 5/14/18 19:25 | d3-MeFOSAA | 32,203.27 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | JV70                 | Injection Vial   | 8            |
| Sample ID          | L7                   | Injection Volume | 10.00        |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 5/14/2018 5:20:42 PM | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

---

## Results Summary

| Analyte | MRM Transition | RT   | Asymmetry Factor | Passing Range |
|---------|----------------|------|------------------|---------------|
| PFBS_1  | 298.9 / 80.0   | 1.44 | 1.50             | 0.8 – 1.5     |
| PFHxA_1 | 313.0 / 269.0  | 1.72 | 1.36             | 0.8 – 1.5     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | JV70                 | Injection Vial   | 8            |
| Sample ID          | L7                   | Injection Volume | 10.00        |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 5/14/2018 5:20:42 PM | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Spectra Acquisition Rate | Passing Range |
|------------|----------------|------|--------------------------|---------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 24                       | >10           |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 24                       | >10           |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 62                       | >10           |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 57                       | >10           |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 28                       | >10           |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 45                       | >10           |
| PFHxS_1    | 399.0 / 80.0   | 2.09 | 64                       | >10           |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 52                       | >10           |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 62                       | >10           |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 55                       | >10           |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 54                       | >10           |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 51                       | >10           |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 70                       | >10           |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 67                       | >10           |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 51                       | >10           |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 46                       | >10           |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 56                       | >10           |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 29                       | >10           |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 55                       | >10           |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 37                       | >10           |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 62                       | >10           |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 39                       | >10           |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 71                       | >10           |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 48                       | >10           |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 58                       | >10           |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 52                       | >10           |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 47                       | >10           |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | 39                       | >10           |



Mass Spectral Acquisition Rate  
ReportCreated with Analyst Reporter  
Printed: 22/05/2018 8:33:26 AM

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | JV70                 | Injection Vial   | 8            |
| Sample ID          | L7                   | Injection Volume | 10.00        |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 5/14/2018 5:20:42 PM | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

---

Results Summary

| Analyte    | MRM Transition | RT   | Spectra<br>Acquisition Rate | Passing Range |
|------------|----------------|------|-----------------------------|---------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 40                          | >10           |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 39                          | >10           |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 36                          | >10           |



### Precision and Bias at the LOQ for PFAS in Drinking Water

| Analyte  | CAS No.    | Average (ng/L) | ST DEV | 3 Sigma | n  |
|----------|------------|----------------|--------|---------|----|
| PFHxA    | 307-24-4   | 10.85          | 1.18   | 3.54    | 10 |
| PFHpA    | 375-85-9   | 11.32          | 1.25   | 3.75    | 10 |
| PFOA     | 335-67-1   | 11.36          | 1.21   | 3.63    | 10 |
| PFNA     | 375-95-1   | 11.19          | 1.18   | 3.54    | 10 |
| PFDA     | 335-76-2   | 11.20          | 1.25   | 3.75    | 10 |
| PFUnA    | 2058-94-8  | 11.01          | 1.52   | 4.56    | 10 |
| PFDoA    | 307-55-1   | 10.77          | 1.77   | 5.31    | 10 |
| PFTTrDA  | 72629-94-8 | 10.72          | 1.69   | 5.07    | 10 |
| PFTeDA   | 376-06-7   | 11.83          | 1.43   | 4.29    | 10 |
| NMeFOSAA | 2355-31-9  | 10.84          | 0.95   | 2.85    | 10 |
| NEtFOSAA | 2991-50-6  | 10.16          | 1.00   | 3.00    | 10 |
| PFBS     | 375-73-5   | 9.01           | 1.35   | 4.05    | 10 |
| PFHxS    | 355-46-4   | 10.58          | 1.28   | 3.84    | 10 |
| PFOS     | 1763-23-1  | 9.81           | 1.25   | 3.75    | 10 |

## Analytical Transitions for PFAS in drinking water

## SOP 5-371 (EPA 537 Version 1.1)

| Analyte                                | CAS No.    | Type   | Primary Transition | Secondary Transition |
|----------------------------------------|------------|--------|--------------------|----------------------|
| <b>PFHxA</b>                           | 307-24-4   | Target | 313.0 / 269.0      | 313.0 / 119.0        |
| <b>PFHpA</b>                           | 375-85-9   | Target | 363.0 / 319.0      | 363.0 / 169.0        |
| <b>PFOA</b>                            | 335-67-1   | Target | 413.0 / 369.0      | 413.0 / 169.0        |
| <b>PFNA</b>                            | 375-95-1   | Target | 463.0 / 419.0      | 463.0 / 219.0        |
| <b>PFDA</b>                            | 335-76-2   | Target | 513.0 / 469.0      | 513.0 / 219.0        |
| <b>PFUnA</b>                           | 2058-94-8  | Target | 563.0 / 519.0      | 563.0 / 269.0        |
| <b>PFDoA</b>                           | 307-55-1   | Target | 613.0 / 569.0      | 613.0 / 319.0        |
| <b>PFTTrDA</b>                         | 72629-94-8 | Target | 663.0 / 619.0      | 663.0 / 169.0        |
| <b>PFTeDA</b>                          | 376-06-7   | Target | 713.0 / 669.0      | 713.0 / 169.0        |
| <b>NMeFOSAA</b>                        | 2355-31-9  | Target | 570.0 / 419.0      | 570.0 / 512.0        |
| <b>NEtFOSAA</b>                        | 2991-50-6  | Target | 584.0 / 419.0      | 584.0 / 483.0        |
| <b>PFBS</b>                            | 375-73-5   | Target | 298.9.0 / 80.0     | 298.9.0 / 99.0       |
| <b>PFHxS</b>                           | 355-46-4   | Target | 399.0 / 80.0       | 399.0 / 99.0         |
| <b>PFOS</b>                            | 1763-23-1  | Target | 499.0 / 80.0       | 499.0 / 99.0         |
| <b>13C2-PFHxA</b>                      | NA         | SIS    | 315.0 / 270.0      | NA                   |
| <b>13C2-PFDA</b>                       | NA         | SIS    | 515.0 / 470.0      | NA                   |
| <b>d5-EtFOSAA</b>                      | NA         | SIS    | 589.0 / 419.0      | NA                   |
| <b><sup>13</sup>C<sub>2</sub>-PFOA</b> | NA         | IS     | 415.0 / 270.0      | NA                   |
| <b><sup>13</sup>C<sub>4</sub>-PFOS</b> | NA         | IS     | 503.0 / 80.0       | NA                   |
| <b>d3-MeFOSAA</b>                      | NA         | IS     | 573.0 / 419.0      | NA                   |

# BATTELLE DETECTION LIMITS FOR PFAS IN DRINKING WATER

Page 49 of 518

Battelle SOP 5-371 (EPA Method 537 Version 1.1)

| Analyte         | CAS No.    | MDL (ng/L) | LOD (ng/L) | LOQ (ng/L) | MRL (ng/L) |
|-----------------|------------|------------|------------|------------|------------|
| <b>PFHxA</b>    | 307-24-4   | 0.22       | 0.5        | 2.5        | 2.5        |
| <b>PFHpA</b>    | 375-85-9   | 0.34       | 1.0        | 2.5        | 2.5        |
| <b>PFOA</b>     | 335-67-1   | 0.38       | 1.0        | 2.5        | 2.5        |
| <b>PFNA</b>     | 375-95-1   | 0.37       | 1.0        | 2.5        | 2.5        |
| <b>PFDA</b>     | 335-76-2   | 0.39       | 1.0        | 2.5        | 2.5        |
| <b>PFUnA</b>    | 2058-94-8  | 0.38       | 1.0        | 2.5        | 2.5        |
| <b>PFDoA</b>    | 307-55-1   | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>PFTTrDA</b>  | 72629-94-8 | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>PFTeDA</b>   | 376-06-7   | 0.73       | 1.5        | 2.5        | 2.5        |
| <b>NMeFOSAA</b> | 2355-31-9  | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>NEtFOSAA</b> | 2991-50-6  | 0.44       | 1.0        | 2.5        | 2.5        |
| <b>PFBS</b>     | 375-73-5   | 0.21       | 0.5        | 2.5        | 2.5        |
| <b>PFHxS</b>    | 3871-99-6  | 0.34       | 1.0        | 2.5        | 2.5        |
| <b>PFOS</b>     | 1763-23-1  | 0.30       | 1.0        | 2.5        | 2.5        |

*Analytes on NELAP and ELAP QSM 5.1 Scope of accreditation*

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## QTRAP 5500 Preventive Maintenance Checklist

|                              |                             |
|------------------------------|-----------------------------|
| Preventive Maintenance Date: | 22-Feb-2017                 |
| Request ID:                  | 3683                        |
| Company Name:                | Battelle Memorial Institute |
| Instrument ID:               | X60666                      |
| Instrument Model:            | QTRAP 5500                  |
| Instrument Serial Number:    | AU23051004                  |

☒ **PASS**

☐ **FAIL**

**Any failure will lead to an automatic Service Call being open to investigate fault.**

Preventive Maintenance is performed twice every year unless specified in the Service Contract. It is designed to help maintain optimum system performance and to help diagnose any system deficiencies.

Engineer is required the assigned Request ID for this PM otherwise making this job invalid.

**Comments:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Performed By:** Kaustubh Dhayagude **Date:** 22-Feb-2017

**Approved By :** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## PRE PM PPG PERFORMANCE EVALUATION:

- ☒ Consult Customer concerning the unit overall performance.
- ☒ Check Logbook for Services recently performed.
- ☒ Check Vacuum Pressure:

| CAD Settings                                   | Vacuum Reading<br>( x 10 <sup>-5</sup> Torr) | Acceptance Criteria               |
|------------------------------------------------|----------------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> CAD 0      | 0.5                                          | 0.4 to 1.1 x10 <sup>-5</sup> Torr |
| <input checked="" type="checkbox"/> CAD Low    | 1.9                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD Medium | 2.4                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD High   | 3.4                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD 12     | 3.4                                          | 2.4 to 4.5 x10 <sup>-5</sup> Torr |

- ☒ Check for Front end contamination symptoms. Run Q1 POS PPG using PPG 2e-7for a few minutes and check for any TIC signal degradation or huge sensitivity drop where the sensitivity result can't pass specification
  - ☒ No degradation or Sensitivity drop
- ☒ Check for Q3 contamination symptoms. Run Q3 POS PPG using PPG 2e-7for a few minutes and check for any TIC signal degradation or huge sensitivity drop where the sensitivity result can't pass specification
  - ☒ No degradation or Sensitivity drop

**Pre PM PPG Test:** Perform each of the following tests. Optimize ion source position only. The specifications listed for these Pre PM tests are guidelines only, not required to be met.

- ☒ Perform Q1 POS using POS PPG 2e-7M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q1 Intensity |           | Q1 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q1 175.133 | 1.64 e6      | Read Only | 0.8095         | Read Only   |
| Q1 500.380 | 2.40 e7      | Read Only | 0.8592         | Read Only   |
| Q1 906.673 | 2.86 e7      | Read Only | 0.9633         | Read Only   |

- ☒ Perform Q3 POS using POS PPG 2e-7M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q3 Intensity |           | Q3 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q3 175.133 | 1.26 e6      | Read Only | 0.6252         | Read Only   |
| Q3 500.380 | 2.19 e7      | Read Only | 0.7275         | Read Only   |
| Q3 906.673 | 3.02 e7      | Read Only | 0.7662         | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

☒ Perform MSMS POS in Product Ion scan with 609.3 parent and record daughter 195.1 using Reserpine 0.167 pmol/ul at the scan rate of 10 Da/s for 10 MCA. Calculate transmission efficiency comparing Q1POS 609 intensity. Transmission Efficiency: : 19.51% (Read Only)

| Mass        | MSMS Intensity |           | MSMS Width Value | Width Specs |
|-------------|----------------|-----------|------------------|-------------|
|             | Value          | Spec      |                  |             |
| Q1 609.3    | 7.43 e7        | Read Only | 0.9981           | Read Only   |
| MS/MS 195.1 | 1.45 e7        | Read Only | 0.6582           | Read Only   |

☒ Perform Q1 NEG using NEG PPG 3e-5M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q1 Intensity |           | Q1 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q1 933.636 | 1.43 e7      | Read Only | 0.7330         | Read Only   |

☒ Perform Q3 NEG using NEG PPG 3e-5M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q3 Intensity |           | Q3 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q3 933.636 | 2.22 e7      | Read Only | 0.8138         | Read Only   |

☒ Perform Product Ion scan using NEG PPG 3e-5M. Record 10mca.

| Mass    | Scan Rate | MCA | MSMS Intensity |           | MSMS Width Value | Width Specs |
|---------|-----------|-----|----------------|-----------|------------------|-------------|
|         |           |     | Value          | Spec      |                  |             |
| MSMS 45 | 10        | 10  | 3.35 e6        | Read Only | 0.6495           | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## PREVENTIVE MAINTENANCE CHECKLIST:

- ☒ Check Cooling Fans for Turbo Pumps while MS is ON.
- ☒ Check QJet and QPS tuning voltage for reference.
- ☐ Record AC input Voltage while MS is OFF: \_\_\_\_\_ (200-240VAC).  
If Out-of-Range, notify customer.
- ☒ Clean Interface
  - ☒ Curtain Plate
  - ☒ Orifice Plate
  - ☒ QJet
  - ☒ Q0 Rods.
- ☒ Replace Roughing Pump Oil.
- ☒ Inspect Oil Exhaust Filter, if Applicable. ☐ N/A
- ☒ Clean and inspect built-in divert valve if used. ☐ N/A
- ☒ Check Multiplier Voltage, optimize if necessary.
- ☒ Replace four Air Filters at the bottom of the mass spectrometer.
- ☒ Pump down overnight if possible. ☐ N/A
- ☒ Perform Maintenance on Turbo V source.
- ☒ Replace Electrode, if necessary. ☐ N/A
- ☒ Check Turbo heaters resistances.
- ☒ Check if Temperature is reached at 500C with TIS Probe installed.
- ☐ Check if Temperature is reached at 500C with APCI Probe installed. ☒ N/A



**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

### POST PM PPG PERFORMANCE TESTS:

- ☒ Set-up Sample for Infusion.
- ☒ Check spray and adjust sprayer's position of the TIS source.
- ☒ Check Vacuum Pressure:

| CAD Settings                                   | Vacuum Reading<br>( x 10 <sup>-5</sup> Torr) | Acceptance Criteria               |
|------------------------------------------------|----------------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> CAD 0      | 0.8                                          | 0.4 to 1.1 x10 <sup>-5</sup> Torr |
| <input checked="" type="checkbox"/> CAD Low    | 2.1                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD Medium | 2.6                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD High   | 3.7                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD 12     | 3.7                                          | 2.4 to 4.5 x10 <sup>-5</sup> Torr |

- ☒ Perform Q1 POS using POS PPG 2e-7M. Mass calibrate to less than 0.1 amu.

| Mass                              | Q1 Intensity |                    | Q1 Width Value | Width Specs |
|-----------------------------------|--------------|--------------------|----------------|-------------|
|                                   | Value        | Spec               |                |             |
| Scan Rate 10 Da/s Record 10 mca   |              |                    |                |             |
| Q1 175.133                        | 5.94 e6      | ≥1.2 <sup>e6</sup> | 0.6933         | 0.6 to 0.8  |
| Q1 500.380                        | 2.25 e7      | ≥9.0 <sup>e6</sup> | 0.7444         | 0.6 to 0.8  |
| Q1 906.673                        | 2.74 e7      | ≥1.4 <sup>e7</sup> | 0.7347         | 0.6 to 0.8  |
| Scan Rate 1000 Da/s Record 50 mca |              |                    |                |             |
| Q1 906.673                        | 1.33 e8      | ≥6.8 <sup>e7</sup> | 0.7656         | 0.6 to 0.8  |

- ☒ Perform Q3 POS using POS PPG 2e-7M. Mass calibrate to less than 0.1 amu.

| Mass                              | Q3 Intensity |                    | Q3 Width Value | Width Specs |
|-----------------------------------|--------------|--------------------|----------------|-------------|
|                                   | Value        | Spec               |                |             |
| Scan Rate 10 Da/s Record 10 mca   |              |                    |                |             |
| Q3 175.133                        | 4.54 e6      | ≥1.2 <sup>e6</sup> | 0.6390         | 0.6 to 0.8  |
| Q3 500.380                        | 2.13 e7      | ≥9.0 <sup>e6</sup> | 0.7008         | 0.6 to 0.8  |
| Q3 906.673                        | 3.04 e7      | ≥1.4 <sup>e7</sup> | 0.7683         | 0.6 to 0.8  |
| Scan Rate 1000 Da/s Record 50 mca |              |                    |                |             |
| Q3 906.673                        | 1.51 e8      | ≥6.8 <sup>e7</sup> | 0.7118         | 0.6 to 0.8  |

- ☒ Perform "Product of 609.3" POS and record product ion 195.1 using Reserpine 0.167pmol/uL. Record 10 mca. Calculate Transmission efficiency comparing Q1POS 609 intensity.

Transmission Efficiency: 16.93% (≥ 10.0%)

| Mass        | MSMS Intensity |      | Width<br>Value | Width Specs |
|-------------|----------------|------|----------------|-------------|
|             | Value          | Spec |                |             |
| Q1 609.3    | 5.74 e7        | N/A  | 0.7667         | Read Only   |
| MS/MS 195.1 | 9.72 e6        | N/A  | 0.6751         | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

### Appendix ZEFPM003-2L

☒ Perform Q1 NEG using NEG PPG 3e-5M. Mass calibrate to less than 0.1 amu.

| Mass       | Scan Rate | Mca | Q1 Intensity |               | Q1 Width Value | Width Specs |
|------------|-----------|-----|--------------|---------------|----------------|-------------|
|            |           |     | Value        | Spec          |                |             |
| Q1 933.636 | 10        | 10  | 1.31 e7      | $\geq 1.0^e7$ | 0.6895         | 0.6 to 0.8  |
| Q1 933.636 | 1000      | 50  | 6.32 e7      | $\geq 4.0^e7$ | 0.6740         | 0.6 to 0.8  |

☒ Perform Q3 NEG using NEG PPG 3e-5M. Mass calibrate to less than 0.1 amu.

| Mass       | Scan Rate | Mca | Q3 Intensity |               | Q3 Width Value | Width Specs |
|------------|-----------|-----|--------------|---------------|----------------|-------------|
|            |           |     | Value        | Spec          |                |             |
| Q3 933.636 | 10        | 10  | 1.70 e7      | $\geq 8.0^e6$ | 0.7665         | 0.6 to 0.8  |
| Q3 933.636 | 1000      | 50  | 7.41 e7      | $\geq 4.0^e7$ | 0.7292         | 0.6 to 0.8  |

☒ Perform Product Ion scan using NEG PPG 3e-5M.

| Mass    | Scan Rate | Mca | MSMS Intensity |           | MSMS Width Value | Width Specs |
|---------|-----------|-----|----------------|-----------|------------------|-------------|
|         |           |     | Value          | Spec      |                  |             |
| MSMS 45 | 10        | 10  | 3.33 e6        | Read Only | 0.6387           | Read Only   |

☒ Perform ER POS 118.087 and 922.01 using ESI Tuning Mix 1:100 in ES Tuning Dilution Solvent. Apply suggested Scan Rate and Record number of MCA. Mass calibrate to less than 0.1 amu.

| Mass                           | Fill Time (ms) | ER Intensity |         | ER Width Value | Width Specs |
|--------------------------------|----------------|--------------|---------|----------------|-------------|
|                                |                | Value        | Spec    |                |             |
| ScanRate : 1000 Da/s ; 50 Mca  |                |              |         |                |             |
| ER 118.087                     | 0.05           | 8.08 e6      | ≥7.2 e6 | 0.1302         | <0.35       |
| ER 922.010                     | 0.05           | 3.89 e7      | ≥2.8 e6 | 0.2603         | <0.35       |
| ScanRate : 10000 Da/s ; 50 Mca |                |              |         |                |             |
| ER 118.087                     | 0.05           | 2.55 e7      | ≥2.4 e7 | 0.3740         | <0.65       |
| ER 922.010                     | 0.05           | 2.37 e8      | ≥6.8 e7 | 0.5407         | <0.65       |

☒ Perform ER NEG 431.982 and 601.978 using ESI Tuning Mix 1:100 in ES Tuning Dilution Solvent. Apply suggested Scan Rate and Record number of MCA. Mass calibrate to less than 0.1 amu.

| Mass                           | Fill Time<br>(ms) | ER Intensity |                    | ER Width<br>Value | Width Specs |
|--------------------------------|-------------------|--------------|--------------------|-------------------|-------------|
|                                |                   | Value        | Spec               |                   |             |
| ScanRate : 1000 Da/s ; 50 Mca  |                   |              |                    |                   |             |
| ER 431.982                     | 0.05              | 1.05 e8      | ≥4.4 <sup>e7</sup> | 0.1840            | <0.35       |
| ER 601.978                     | 0.05              | 7.74 e7      | ≥5.6 <sup>e7</sup> | 0.1849            | <0.35       |
| ScanRate : 10000 Da/s ; 50 Mca |                   |              |                    |                   |             |
| ER 431.982                     | 0.05              | 3.43 e8      | ≥1.2 <sup>e8</sup> | 0.4382            | <0.65       |
| ER 601.978                     | 0.05              | 2.55 e8      | ≥1.6 <sup>e8</sup> | 0.6205            | <0.65       |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

- ☒ Perform EPI POS 397.2 using Reserpine 0.167pmol/uL. Record 20 mca.

| Mass      | Scan Rate<br>(Da/s) | Q0 Trapping OFF |         | Q0 Trapping ON |         |
|-----------|---------------------|-----------------|---------|----------------|---------|
|           |                     | Intensity       | Spec    | Intensity      | Spec    |
| EPI 397.2 | 10000               | > 3.5 e6        | ≥2.0 e6 | > 4.0 e7       | ≥6.4 e6 |

- ☒ Perform MS3 POS full scan Fragmentation ON & OFF using Reserpine 0.167pmol/uL. Record 20 mca.

| Mass                                                                    | Scan Rate<br>(Da/s) | Fragamentation OFF |                     | Fragmentation ON |                        |
|-------------------------------------------------------------------------|---------------------|--------------------|---------------------|------------------|------------------------|
|                                                                         |                     | Intensity          | Spec                | Intensity        | Spec                   |
| MS3 397.2                                                               | 1000                | 3.2 e7             | Contains only 397.2 | N/A              | N/A                    |
| <input type="checkbox"/> 236 OR <input checked="" type="checkbox"/> 365 | 1000                | 1.19 e8            | Fragment Intensity  | > 4.4 e6         | ≥1.6x 10 <sup>e6</sup> |

## REVIEW:

- ☒ Attach all spectrums printouts to this procedure.
- ☒ If any parameter setting access modes were changed during the PM, ensure they are returned to their normal access mode and that their offsets are adjusted to match optimized values from the post-PM acquisition files.
- ☐ Empty tuning cache folder, if necessary. ☒ N/A
- ☒ Update Service Work Order status
- ☒ Fill and replace PM Label.

## END OF PREVENTIVE MAINTENANCE CHECKLIST

## Document history:

06 OCT 2016: Appendix ZEFPM003-2L: Removed requirements to fit Manufacturer's testing criteria.

It can be done

## Standard Solution Prep Form II

Approved: ☐

Standard Laboratory ID Number: JV35

Description: PFAS - 537.1 Internal Standard Stock

| Assigned Lab ID<br>(from receipt log) | Chemical Name: | Source | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|----------------|--------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| 180425-01                             | EPA-537IS      | Neat   | ~2.66666<br>6    | 12/13/22       | ---           | ---               | 1000 uL         | 1              | 10                 | ~0.3000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



It can be done

## Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: JV35

Description: PFAS - 537.1 Internal Standard Stock

Stock ID: 180425-01

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity  | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|---------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 1000               | 1.00                     | 1                 | 100.000 | 1               | 10              | 0.10000                  |
| 13C4-PFOS     | 1000               | 2.87                     | 1                 | 100.000 | 1               | 10              | 0.28700                  |
| d3-MeFOSAA    | 1000               | 4.00                     | 1                 | 100.000 | 1               | 10              | 0.40000                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFOA  | .10000        |
| 13C4-PFOS  | .28700        |
| d3-MeFOSAA | .40000        |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| 180425-01 | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



It can be done

Standard Solution Prep Form II

Approved: ☐

Standard Laboratory ID Number: JV37

Description: PFAS - 537.1 Surrogate Standard Stock

| Assigned Lab ID<br>(from receipt log) | Chemical Name: | Source | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|----------------|--------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| 180425-02                             | EPA-537SS      | Neat   | ~2.00000<br>0    | 11/08/22       | ---           | ---               | 1000 uL         | 1              | 10                 | ~0.2000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_





It can be done

## Standard Solution Concentrations

Approved: ☐

Standard Laboratory ID Number: JV37

Description: PFAS - 537.1 Surrogate Standard Stock

Stock ID: 180425-02

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity  | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|---------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 1000               | 1.00                     | 1                 | 100.000 | 1               | 10              | 0.10000                  |
| 13C2-PFHxA    | 1000               | 1.00                     | 1                 | 100.000 | 1               | 10              | 0.10000                  |
| d5-EtFOSAA    | 1000               | 4.00                     | 1                 | 100.000 | 1               | 10              | 0.40000                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .10000        |
| 13C2-PFHxA | .10000        |
| d5-EtFOSAA | .40000        |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| 180425-02 | Pipette | C0982448K    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV41

Description: PFAS - 537.1 Second Source LCS/MS Solution

| Assigned Lab ID<br>(from receipt log) | Chemical Name:.              | Source | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|------------------------------|--------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| 180425-04                             | EPA-537PDS-L (second source) | Neat   | ~2.00000<br>0    | 03/05/23       | ---           | ---               | 500 uL          | 1              | 20                 | ~0.0500               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Thorn, Jonathan Date: 5/3/2018 8:26:00 AM





It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV41

Description: PFAS - 537.1 Second Source LCS/MS Solution

Stock Id: 180425-04

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity  | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|---------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-1-butanefluorobutylsulfonate           | 500                | 1.77                     | 1                 | 100.000 | 1               | 20              | 0.04425                  |
| Perfluoro-1-hexanesulfonate                      | 500                | 1.89                     | 1                 | 100.000 | 1               | 20              | 0.04725                  |
| Perfluoro-1-octanesulfonate                      | 500                | 1.91                     | 1                 | 100.000 | 1               | 20              | 0.04775                  |
| Perfluoro-n-decanoic Acid                        | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-dodecanoic acid                      | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-heptanoic Acid                       | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-hexanoic acid                        | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-octanoic Acid                        | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluorononanoic Acid                           | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-tetradecanoic acid                   | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-tridecanoic acid                     | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |
| Perfluoro-n-undecanoic acid                      | 500                | 2.00                     | 1                 | 100.000 | 1               | 20              | 0.05000                  |

## Final Concentrations:

| Analyte:                                         | Conc (ug/mL): |
|--------------------------------------------------|---------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .05000        |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .05000        |
| Perfluoro-1-butanefluorobutylsulfonate           | .04425        |
| Perfluoro-1-hexanesulfonate                      | .04725        |
| Perfluoro-1-octanesulfonate                      | .04775        |
| Perfluoro-n-decanoic Acid                        | .05000        |
| Perfluoro-n-dodecanoic acid                      | .05000        |
| Perfluoro-n-heptanoic Acid                       | .05000        |
| Perfluoro-n-hexanoic acid                        | .05000        |
| Perfluoro-n-octanoic Acid                        | .05000        |
| Perfluorononanoic Acid                           | .05000        |
| Perfluoro-n-tetradecanoic acid                   | .05000        |
| Perfluoro-n-tridecanoic acid                     | .05000        |
| Perfluoro-n-undecanoic acid                      | .05000        |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| 180425-04 | Pipette | B1100330B    |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Thorn, Jonathan Date: 5/3/2018 8:26:00 AM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV42

Description: PFAS - 537.1 High ICAL Stock

| Assigned Lab ID<br>(from receipt log) | Chemical Name:           | Source | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------|--------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| 180425-03                             | EPA-537PDS (calibration) | Neat   | ~2.00000<br>0    | 03/05/23       | ---           | ---               | 250 uL          | 1              | 10                 | ~0.0500               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM

It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV42

Description: PFAS - 537.1 High ICAL Stock

Stock Id: 180425-03

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity  | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|---------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-1-butanefluoride                       | 250                | 1.77                     | 1                 | 100.000 | 1               | 10              | 0.04425                  |
| Perfluoro-1-hexanesulfonate                      | 250                | 1.82                     | 1                 | 100.000 | 1               | 10              | 0.04560                  |
| Perfluoro-1-octanesulfonate                      | 250                | 1.85                     | 1                 | 100.000 | 1               | 10              | 0.04628                  |
| Perfluoro-n-decanoic Acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-dodecanoic acid                      | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-heptanoic Acid                       | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-hexanoic acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-nonanoic Acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-octanoic Acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-tetradecanoic acid                   | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-tridecanoic acid                     | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |
| Perfluoro-n-undecanoic acid                      | 250                | 2.00                     | 1                 | 100.000 | 1               | 10              | 0.05000                  |

### Final Concentrations:

| Analyte:                                         | Conc (ug/mL): |
|--------------------------------------------------|---------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .05000        |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .05000        |
| Perfluoro-1-butanefluoride                       | .04425        |
| Perfluoro-1-hexanesulfonate                      | .04560        |
| Perfluoro-1-octanesulfonate                      | .04628        |
| Perfluoro-n-decanoic Acid                        | .05000        |
| Perfluoro-n-dodecanoic acid                      | .05000        |
| Perfluoro-n-heptanoic Acid                       | .05000        |
| Perfluoro-n-hexanoic acid                        | .05000        |
| Perfluoro-n-nonanoic Acid                        | .05000        |
| Perfluoro-n-octanoic Acid                        | .05000        |
| Perfluoro-n-tetradecanoic acid                   | .05000        |
| Perfluoro-n-tridecanoic acid                     | .05000        |
| Perfluoro-n-undecanoic acid                      | .05000        |

### Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| 180425-03 | Pipette | B1100330B    |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM





It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV43

Description: PFAS - 537.1 Low ICAL Stock

| Assigned Lab ID<br>(from receipt log) | Chemical Name:           | Source | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------|--------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| 180425-03                             | EPA-537PDS (calibration) | Neat   | ~2.00000<br>0    | 03/05/23       | ---           | ---               | 250 uL          | 1              | 100                | ~0.0050               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 4 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV43

Description: PFAS - 537.1 Low ICAL Stock

Stock Id: 180425-03

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity  | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|---------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-1-butanefluoride                       | 250                | 1.77                     | 1                 | 100.000 | 1               | 100             | 0.00443                  |
| Perfluoro-1-hexanesulfonate                      | 250                | 1.82                     | 1                 | 100.000 | 1               | 100             | 0.00456                  |
| Perfluoro-1-octanesulfonate                      | 250                | 1.85                     | 1                 | 100.000 | 1               | 100             | 0.00463                  |
| Perfluoro-n-decanoic Acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-dodecanoic acid                      | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-heptanoic Acid                       | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-hexanoic acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-nonanoic Acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-octanoic Acid                        | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-tetradecanoic acid                   | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-tridecanoic acid                     | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |
| Perfluoro-n-undecanoic acid                      | 250                | 2.00                     | 1                 | 100.000 | 1               | 100             | 0.00500                  |

## Final Concentrations:

| Analyte:                                         | Conc (ug/mL): |
|--------------------------------------------------|---------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00500        |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00500        |
| Perfluoro-1-butanefluoride                       | .00443        |
| Perfluoro-1-hexanesulfonate                      | .00456        |
| Perfluoro-1-octanesulfonate                      | .00463        |
| Perfluoro-n-decanoic Acid                        | .00500        |
| Perfluoro-n-dodecanoic acid                      | .00500        |
| Perfluoro-n-heptanoic Acid                       | .00500        |
| Perfluoro-n-hexanoic acid                        | .00500        |
| Perfluoro-n-nonanoic Acid                        | .00500        |
| Perfluoro-n-octanoic Acid                        | .00500        |
| Perfluoro-n-tetradecanoic acid                   | .00500        |
| Perfluoro-n-tridecanoic acid                     | .00500        |
| Perfluoro-n-undecanoic acid                      | .00500        |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| 180425-03 | Pipette | B1100330B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 4 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM

It can be done

## Standard Solution Prep Form II

Approved: ☒Standard Laboratory ID Number: **JV59**

Description: PFAS - 537.1 Internal Standard Solution

| Assigned Lab ID<br>(from receipt lcg) | Chemical Name:                       | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV35                                  | PFAS - 537.1 Internal Standard Stock | Solution | ~0               | 05/02/19       | ---           | ---               | 500 uL          | 1              | 25                 | ~0.0000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Thorn, Jonathan Date: 5/3/2018 8:27:00 AM



It can be done

## Standard Solution Concentrations

Approved: ☒Standard Laboratory ID Number: **JV59**

Description: PFAS - 537.1 Internal Standard Solution

Stock Id: **JV35**

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 500                | 0.10                     | ---               | ---    | 1               | 25              | 0.00200                  |
| 13C4-PFOS     | 500                | 0.29                     | ---               | ---    | 1               | 25              | 0.00574                  |
| d3-MeFOSAA    | 500                | 0.40                     | ---               | ---    | 1               | 25              | 0.00800                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFOA  | .00200        |
| 13C4-PFOS  | .00574        |
| d3-MeFOSAA | .00800        |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV35      | Pipette | I0400533B    |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Thorn, Jonathan Date: 5/3/2018 8:27:00 AM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV60

Description: PFAS - 537.1 Surrogate Solution

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                        | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|---------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV37                                  | PFAS - 537.1 Surrogate Standard Stock | Solution | ~0               | 05/02/19       | ---           | ---               | 500 uL          | 1              | 25                 | ~0.0000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Thorn, Jonathan Date: 5/3/2018 8:27:00 AM



It can be done

**Standard Solution Concentrations**Approved: ☒Standard Laboratory ID Number: **JV60**

Description: PFAS - 537.1 Surrogate Solution

Stock Id: **JV37**

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 500                | 0.10                     | ---               | ---    | 1               | 25              | 0.00200                  |
| 13C2-PFHxA    | 500                | 0.10                     | ---               | ---    | 1               | 25              | 0.00200                  |
| d5-EtFOSAA    | 500                | 0.40                     | ---               | ---    | 1               | 25              | 0.00800                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00200        |
| 13C2-PFHxA | .00200        |
| d5-EtFOSAA | .00800        |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV37      | Pipette | I0400533B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Thorn, Jonathan Date: 5/3/2018 8:27:00 AM

It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: **JV61**

Description: PFAS - 537.1 Internal Standard Calibration Stock Solution

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                       | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV35                                  | PFAS - 537.1 Internal Standard Stock | Solution | ~0               | 05/02/19       | ---           | ---               | 1000 uL         | 1              | 5                  | ~0.0000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:23:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒Standard Laboratory ID Number: **JV61**

Description: PFAS - 537.1 Internal Standard Calibration Stock Solution

Stock Id: **JV35**

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 1000               | 0.10                     | ---               | ---    | 1               | 5               | 0.02000                  |
| 13C4-PFOS     | 1000               | 0.29                     | ---               | ---    | 1               | 5               | 0.05740                  |
| d3-MeFOSAA    | 1000               | 0.40                     | ---               | ---    | 1               | 5               | 0.08000                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFOA  | .02000        |
| 13C4-PFOS  | .05740        |
| d3-MeFOSAA | .08000        |

Syringes/Pipettes:

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:23:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV62

Description: PFAS - 537.1 Surrogate Calibration Stock Solution

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                        | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|---------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV37                                  | PFAS - 537.1 Surrogate Standard Stock | Solution | ~0               | 05/02/19       | ---           | ---               | 1000 uL         | 1              | 5                  | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:23:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒Standard Laboratory ID Number: **JV62**

Description: PFAS - 537.1 Surrogate Calibration Stock Solution

Stock Id: **JV37**

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 1000               | 0.10                     | ---               | ---    | 1               | 5               | 0.02000                  |
| 13C2-PFHxA    | 1000               | 0.10                     | ---               | ---    | 1               | 5               | 0.02000                  |
| d5-EtFOSAA    | 1000               | 0.40                     | ---               | ---    | 1               | 5               | 0.08000                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .02000        |
| 13C2-PFHxA | .02000        |
| d5-EtFOSAA | .08000        |

Syringes/Pipettes:

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:23:00 PM





It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV63

Description: PFAS - 537.1 ICC

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                             | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV41                                  | PFAS - 537.1 Second Source LCS/MS Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 200 uL          | 1              | 10                 | ~0.0000               |
| JV59                                  | PFAS - 537.1 Internal Standard Solution    | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV60                                  | PFAS - 537.1 Surrogate Solution            | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date:

5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise

Date: 5/3/2018 3:23:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV63

Description: PFAS - 537.1 ICC

## Stock Id: JV41

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-1-butanedisulfonate                    | 200                | 0.04                     | ---               | ---    | 1               | 10              | 0.00089                  |
| Perfluoro-1-hexanesulfonate                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00095                  |
| Perfluoro-1-octanesulfonate                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00095                  |
| Perfluoro-n-decanoic Acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-dodecanoic acid                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-heptanoic Acid                       | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-hexanoic acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-octanoic Acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluorononanoic Acid                           | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-tetradecanoic acid                   | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-tridecanoic acid                     | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-undecanoic acid                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |

## Stock Id: JV59

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.00                     | ---               | ---    | 1               | 10              | 0.00001                  |
| 13C4-PFOS     | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| d3-MeFOSAA    | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00004                  |

## Stock Id: JV60

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.00                     | ---               | ---    | 1               | 10              | 0.00001                  |
| 13C2-PFHxA    | 50                 | 0.00                     | ---               | ---    | 1               | 10              | 0.00001                  |
| d5-EtFOSAA    | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00004                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00001        |
| 13C2-PFHxA | .00001        |
| 13C2-PFOA  | .00001        |
| 13C4-PFOS  | .00003        |
| d3-MeFOSAA | .00004        |
| d5-EtFOSAA | .00004        |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:23:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV63

Description: PFAS - 537.1 ICC

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00100 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00100 |
| Perfluoro-1-butanedisulfonate                    | .00089 |
| Perfluoro-1-hexanesulfonate                      | .00095 |
| Perfluoro-1-octanesulfonate                      | .00095 |
| Perfluoro-n-decanoic Acid                        | .00100 |
| Perfluoro-n-dodecanoic acid                      | .00100 |
| Perfluoro-n-heptanoic Acid                       | .00100 |
| Perfluoro-n-hexanoic acid                        | .00100 |
| Perfluoro-n-octanoic Acid                        | .00100 |
| Perfluorononanoic Acid                           | .00100 |
| Perfluoro-n-tetradecanoic acid                   | .00100 |
| Perfluoro-n-tridecanoic acid                     | .00100 |
| Perfluoro-n-undecanoic acid                      | .00100 |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV41      | Pipette | G0792979B    |
| JV59      | Pipette | I0793912B    |
| JV60      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:23:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: **JV64**

Description: PFAS - 537.1 ICAL L1

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                            | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|-----------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV43                                  | PFAS - 537.1 Low ICAL Stock                               | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV64

Description: PFAS - 537.1 ICAL L1

## Stock Id: JV43

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-1-butanedisulfonate                    | 50                 | 0.00                     | ---               | ---    | 1               | 10              | 0.00002                  |
| Perfluoro-1-hexanesulfonate                      | 50                 | 0.00                     | ---               | ---    | 1               | 10              | 0.00002                  |
| Perfluoro-1-octanesulfonate                      | 50                 | 0.00                     | ---               | ---    | 1               | 10              | 0.00002                  |
| Perfluoro-n-decanoic Acid                        | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-dodecanoic acid                      | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-heptanoic Acid                       | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-hexanoic acid                        | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-nonanoic Acid                        | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-octanoic Acid                        | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-tetradecanoic acid                   | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-tridecanoic acid                     | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |
| Perfluoro-n-undecanoic acid                      | 50                 | 0.01                     | ---               | ---    | 1               | 10              | 0.00003                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie

Date Prepared:

5/2/2018 Expiration Date:

5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise

Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV64

Description: PFAS - 537.1 ICAL L1

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00003 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00003 |
| Perfluoro-1-butanedisulfonate                    | .00002 |
| Perfluoro-1-hexanesulfonate                      | .00002 |
| Perfluoro-1-octanesulfonate                      | .00002 |
| Perfluoro-n-decanoic Acid                        | .00003 |
| Perfluoro-n-dodecanoic acid                      | .00003 |
| Perfluoro-n-heptanoic Acid                       | .00003 |
| Perfluoro-n-hexanoic acid                        | .00003 |
| Perfluoro-n-nonanoic Acid                        | .00003 |
| Perfluoro-n-octanoic Acid                        | .00003 |
| Perfluoro-n-tetradecanoic acid                   | .00003 |
| Perfluoro-n-tridecanoic acid                     | .00003 |
| Perfluoro-n-undecanoic acid                      | .00003 |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV43      | Pipette | I0793912B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: **JV65**

Description: PFAS - 537.1 ICAL L2

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV43                                  | PFAS - 537.1 Low ICAL Stock                                  | Solution | ~0               | 05/02/19       | ---           | ---               | 100 uL          | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV65

Description: PFAS - 537.1 ICAL L2

## Stock Id: JV43

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-1-butanedisulfonate                    | 100                | 0.00                     | ---               | ---    | 1               | 10              | 0.00004                  |
| Perfluoro-1-hexanesulfonate                      | 100                | 0.00                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-1-octanesulfonate                      | 100                | 0.00                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-decanoic Acid                        | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-dodecanoic acid                      | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-heptanoic Acid                       | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-hexanoic acid                        | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-nonanoic Acid                        | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-octanoic Acid                        | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-tetradecanoic acid                   | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-tridecanoic acid                     | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |
| Perfluoro-n-undecanoic acid                      | 100                | 0.01                     | ---               | ---    | 1               | 10              | 0.00005                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: **JV65**

Description: PFAS - 537.1 ICAL L2

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00005 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00005 |
| Perfluoro-1-butanedisulfonate                    | .00004 |
| Perfluoro-1-hexanesulfonate                      | .00005 |
| Perfluoro-1-octanesulfonate                      | .00005 |
| Perfluoro-n-decanoic Acid                        | .00005 |
| Perfluoro-n-dodecanoic acid                      | .00005 |
| Perfluoro-n-heptanoic Acid                       | .00005 |
| Perfluoro-n-hexanoic acid                        | .00005 |
| Perfluoro-n-nonanoic Acid                        | .00005 |
| Perfluoro-n-octanoic Acid                        | .00005 |
| Perfluoro-n-tetradecanoic acid                   | .00005 |
| Perfluoro-n-tridecanoic acid                     | .00005 |
| Perfluoro-n-undecanoic acid                      | .00005 |

### Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV43      | Pipette | I0793912B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie      Date Prepared: 5/2/2018      Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise      Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒Standard Laboratory ID Number: **JV66**

Description: PFAS - 537.1 ICAL L3

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV43                                  | PFAS - 537.1 Low ICAL Stock                                  | Solution | ~0               | 05/02/19       | ---           | ---               | 200 uL          | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID:

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV66

Description: PFAS - 537.1 ICAL L3

## Stock Id: JV43

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-1-butanedisulfonate                    | 200                | 0.00                     | ---               | ---    | 1               | 10              | 0.00009                  |
| Perfluoro-1-hexanedisulfonate                    | 200                | 0.00                     | ---               | ---    | 1               | 10              | 0.00009                  |
| Perfluoro-1-octanedisulfonate                    | 200                | 0.00                     | ---               | ---    | 1               | 10              | 0.00009                  |
| Perfluoro-n-decanoic Acid                        | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-dodecanoic acid                      | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-heptanoic Acid                       | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-hexanoic acid                        | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-nonanoic Acid                        | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-octanoic Acid                        | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-tetradecanoic acid                   | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-tridecanoic acid                     | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |
| Perfluoro-n-undecanoic acid                      | 200                | 0.01                     | ---               | ---    | 1               | 10              | 0.00010                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM





It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV66

Description: PFAS - 537.1 ICAL L3

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00010 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00010 |
| Perfluoro-1-butanedisulfonate                    | .00009 |
| Perfluoro-1-hexanedisulfonate                    | .00009 |
| Perfluoro-1-octanedisulfonate                    | .00009 |
| Perfluoro-n-decanoic Acid                        | .00010 |
| Perfluoro-n-dodecanoic acid                      | .00010 |
| Perfluoro-n-heptanoic Acid                       | .00010 |
| Perfluoro-n-hexanoic acid                        | .00010 |
| Perfluoro-n-nonanoic Acid                        | .00010 |
| Perfluoro-n-octanoic Acid                        | .00010 |
| Perfluoro-n-tetradecanoic acid                   | .00010 |
| Perfluoro-n-tridecanoic acid                     | .00010 |
| Perfluoro-n-undecanoic acid                      | .00010 |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV43      | Pipette | G0792979B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM

It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: **JV67**

Description: PFAS - 537.1 ICAL L4

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV43                                  | PFAS - 537.1 Low ICAL Stock                                  | Solution | ~0               | 05/02/19       | ---           | ---               | 500 uL          | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV67

Description: PFAS - 537.1 ICAL L4

## Stock Id: JV43

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-1-butanedisulfonate                    | 500                | 0.00                     | ---               | ---    | 1               | 10              | 0.00022                  |
| Perfluoro-1-hexanesulfonate                      | 500                | 0.00                     | ---               | ---    | 1               | 10              | 0.00023                  |
| Perfluoro-1-octanesulfonate                      | 500                | 0.00                     | ---               | ---    | 1               | 10              | 0.00023                  |
| Perfluoro-n-decanoic Acid                        | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-dodecanoic acid                      | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-heptanoic Acid                       | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-hexanoic acid                        | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-nonanoic Acid                        | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-octanoic Acid                        | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-tetradecanoic acid                   | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-tridecanoic acid                     | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |
| Perfluoro-n-undecanoic acid                      | 500                | 0.01                     | ---               | ---    | 1               | 10              | 0.00025                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie

Date Prepared:

5/2/2018 Expiration Date:

5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise

Date: 5/3/2018 3:22:00 PM





It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: **JV67**

Description: PFAS - 537.1 ICAL L4

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00025 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00025 |
| Perfluoro-1-butanedisulfonate                    | .00022 |
| Perfluoro-1-hexanesulfonate                      | .00023 |
| Perfluoro-1-octanesulfonate                      | .00023 |
| Perfluoro-n-decanoic Acid                        | .00025 |
| Perfluoro-n-dodecanoic acid                      | .00025 |
| Perfluoro-n-heptanoic Acid                       | .00025 |
| Perfluoro-n-hexanoic acid                        | .00025 |
| Perfluoro-n-nonanoic Acid                        | .00025 |
| Perfluoro-n-octanoic Acid                        | .00025 |
| Perfluoro-n-tetradecanoic acid                   | .00025 |
| Perfluoro-n-tridecanoic acid                     | .00025 |
| Perfluoro-n-undecanoic acid                      | .00025 |

### Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV43      | Pipette | I0400533B    |
| JV61      | Pipette | D1075429B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie      Date Prepared: 5/2/2018      Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise      Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV68

Description: PFAS - 537.1 ICAL L5

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV43                                  | PFAS - 537.1 Low ICAL Stock                                  | Solution | ~0               | 05/02/19       | ---           | ---               | 1000 uL         | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date:

5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID:

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise

Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV68

Description: PFAS - 537.1 ICAL L5

## Stock Id: JV43

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-1-butanedisulfonate                    | 1000               | 0.00                     | ---               | ---    | 1               | 10              | 0.00044                  |
| Perfluoro-1-hexanedisulfonate                    | 1000               | 0.00                     | ---               | ---    | 1               | 10              | 0.00046                  |
| Perfluoro-1-octanedisulfonate                    | 1000               | 0.00                     | ---               | ---    | 1               | 10              | 0.00046                  |
| Perfluoro-n-decanoic Acid                        | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-dodecanoic acid                      | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-heptanoic Acid                       | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-hexanoic acid                        | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-nonanoic Acid                        | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-octanoic Acid                        | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-tetradecanoic acid                   | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-tridecanoic acid                     | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |
| Perfluoro-n-undecanoic acid                      | 1000               | 0.01                     | ---               | ---    | 1               | 10              | 0.00050                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie

Date Prepared:

5/2/2018 Expiration Date:

5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise

Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV68

Description: PFAS - 537.1 ICAL L5

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00050 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00050 |
| Perfluoro-1-butanedisulfonate                    | .00044 |
| Perfluoro-1-hexanesulfonate                      | .00046 |
| Perfluoro-1-octanesulfonate                      | .00046 |
| Perfluoro-n-decanoic Acid                        | .00050 |
| Perfluoro-n-dodecanoic acid                      | .00050 |
| Perfluoro-n-heptanoic Acid                       | .00050 |
| Perfluoro-n-hexanoic acid                        | .00050 |
| Perfluoro-n-nonanoic Acid                        | .00050 |
| Perfluoro-n-octanoic Acid                        | .00050 |
| Perfluoro-n-tetradecanoic acid                   | .00050 |
| Perfluoro-n-tridecanoic acid                     | .00050 |
| Perfluoro-n-undecanoic acid                      | .00050 |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV43      | Pipette | I0400533B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: **JV69**

Description: PFAS - 537.1 ICAL L6

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV42                                  | PFAS - 537.1 High ICAL Stock                                 | Solution | ~0               | 05/02/19       | ---           | ---               | 200 uL          | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV69

Description: PFAS - 537.1 ICAL L6

## Stock Id: JV42

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-1-butanedisulfonate                    | 200                | 0.04                     | ---               | ---    | 1               | 10              | 0.00089                  |
| Perfluoro-1-hexanesulfonate                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00091                  |
| Perfluoro-1-octanesulfonate                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00093                  |
| Perfluoro-n-decanoic Acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-dodecanoic acid                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-heptanoic Acid                       | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-hexanoic acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-nonanoic Acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-octanoic Acid                        | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-tetradecanoic acid                   | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-tridecanoic acid                     | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |
| Perfluoro-n-undecanoic acid                      | 200                | 0.05                     | ---               | ---    | 1               | 10              | 0.00100                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV69

Description: PFAS - 537.1 ICAL L6

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00100 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00100 |
| Perfluoro-1-butanedisulfonate                    | .00089 |
| Perfluoro-1-hexanesulfonate                      | .00091 |
| Perfluoro-1-octanesulfonate                      | .00093 |
| Perfluoro-n-decanoic Acid                        | .00100 |
| Perfluoro-n-dodecanoic acid                      | .00100 |
| Perfluoro-n-heptanoic Acid                       | .00100 |
| Perfluoro-n-hexanoic acid                        | .00100 |
| Perfluoro-n-nonanoic Acid                        | .00100 |
| Perfluoro-n-octanoic Acid                        | .00100 |
| Perfluoro-n-tetradecanoic acid                   | .00100 |
| Perfluoro-n-tridecanoic acid                     | .00100 |
| Perfluoro-n-undecanoic acid                      | .00100 |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV42      | Pipette | G0792979B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM

It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV70

Description: PFAS - 537.1 ICAL L7

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV42                                  | PFAS - 537.1 High ICAL Stock                                 | Solution | ~0               | 05/02/19       | ---           | ---               | 500 uL          | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM





It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV70

Description: PFAS - 537.1 ICAL L7

## Stock Id: JV42

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-1-butanedisulfonate                    | 500                | 0.04                     | ---               | ---    | 1               | 10              | 0.00221                  |
| Perfluoro-1-hexanesulfonate                      | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00228                  |
| Perfluoro-1-octanesulfonate                      | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00231                  |
| Perfluoro-n-decanoic Acid                        | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-dodecanoic acid                      | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-heptanoic Acid                       | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-hexanoic acid                        | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-nonanoic Acid                        | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-octanoic Acid                        | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-tetradecanoic acid                   | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-tridecanoic acid                     | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |
| Perfluoro-n-undecanoic acid                      | 500                | 0.05                     | ---               | ---    | 1               | 10              | 0.00250                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie

Date Prepared:

5/2/2018 Expiration Date:

5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise

Date: 5/3/2018 3:22:00 PM

It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: **JV70**

Description: PFAS - 537.1 ICAL L7

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00250 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00250 |
| Perfluoro-1-butanedisulfonate                    | .00221 |
| Perfluoro-1-hexanedisulfonate                    | .00228 |
| Perfluoro-1-octanedisulfonate                    | .00231 |
| Perfluoro-n-decanoic Acid                        | .00250 |
| Perfluoro-n-dodecanoic acid                      | .00250 |
| Perfluoro-n-heptanoic Acid                       | .00250 |
| Perfluoro-n-hexanoic acid                        | .00250 |
| Perfluoro-n-nonanoic Acid                        | .00250 |
| Perfluoro-n-octanoic Acid                        | .00250 |
| Perfluoro-n-tetradecanoic acid                   | .00250 |
| Perfluoro-n-tridecanoic acid                     | .00250 |
| Perfluoro-n-undecanoic acid                      | .00250 |

### Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV42      | Pipette | I0400533B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie      Date Prepared: 5/2/2018      Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise      Date: 5/3/2018 3:22:00 PM

It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: JV71

Description: PFAS - 537.1 ICAL L8

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV42                                  | PFAS - 537.1 High ICAL Stock                                 | Solution | ~0               | 05/02/19       | ---           | ---               | 1000 uL         | 1              | 10                 | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 50 uL           | 1              | 10                 | ~0.0000               |

Solution Prepared By: Schultz, Stephanie

Date Prepared: 5/2/2018

Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials

Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: **JV71**

Description: PFAS - 537.1 ICAL L8

Stock Id: **JV42**

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-1-butanedisulfonate                    | 1000               | 0.04                     | ---               | ---    | 1               | 10              | 0.00443                  |
| Perfluoro-1-hexanesulfonate                      | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00456                  |
| Perfluoro-1-octanesulfonate                      | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00463                  |
| Perfluoro-n-decanoic Acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-dodecanoic acid                      | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-heptanoic Acid                       | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-hexanoic acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-nonanoic Acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-octanoic Acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-tetradecanoic acid                   | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-tridecanoic acid                     | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |
| Perfluoro-n-undecanoic acid                      | 1000               | 0.05                     | ---               | ---    | 1               | 10              | 0.00500                  |

Stock Id: **JV61**

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C4-PFOS     | 50                 | 0.06                     | ---               | ---    | 1               | 10              | 0.00029                  |
| d3-MeFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

Stock Id: **JV62**

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| 13C2-PFHxA    | 50                 | 0.02                     | ---               | ---    | 1               | 10              | 0.00010                  |
| d5-EtFOSAA    | 50                 | 0.08                     | ---               | ---    | 1               | 10              | 0.00040                  |

Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:22:00 PM

It can be done

**Standard Solution Concentrations**Approved: ☒Standard Laboratory ID Number: **JV71**

Description: PFAS - 537.1 ICAL L8

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .00500 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .00500 |
| Perfluoro-1-butanedisulfonate                    | .00443 |
| Perfluoro-1-hexanedisulfonate                    | .00456 |
| Perfluoro-1-octanedisulfonate                    | .00463 |
| Perfluoro-n-decanoic Acid                        | .00500 |
| Perfluoro-n-dodecanoic acid                      | .00500 |
| Perfluoro-n-heptanoic Acid                       | .00500 |
| Perfluoro-n-hexanoic acid                        | .00500 |
| Perfluoro-n-nonanoic Acid                        | .00500 |
| Perfluoro-n-octanoic Acid                        | .00500 |
| Perfluoro-n-tetradecanoic acid                   | .00500 |
| Perfluoro-n-tridecanoic acid                     | .00500 |
| Perfluoro-n-undecanoic acid                      | .00500 |

**Syringes/Pipettes:**

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV42      | Pipette | I0400533B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie      Date Prepared: 5/2/2018      Expiration Date: 5/2/2019

Solution Volume    40   mL X    1   Vials   Refrigerator/Freezer No:   LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise      Date: 5/3/2018 3:22:00 PM



It can be done

## Standard Solution Prep Form II

Approved: ☒

Standard Laboratory ID Number: **JV72**

Description: PFAS - 537.1 ICAL L9

| Assigned Lab ID<br>(from receipt log) | Chemical Name:                                               | Source   | Stock<br>(ug/mL) | Expir.<br>Date | Purity<br>(%) | Density<br>(g/mL) | Amount<br>Taken | Conv.<br>Fact. | Final Vol.<br>(mL) | Std. Conc.<br>(ug/mL) |
|---------------------------------------|--------------------------------------------------------------|----------|------------------|----------------|---------------|-------------------|-----------------|----------------|--------------------|-----------------------|
| JV42                                  | PFAS - 537.1 High ICAL Stock                                 | Solution | ~0               | 05/02/19       | ---           | ---               | 1000 uL         | 1              | 5                  | ~0.0000               |
| JV61                                  | PFAS - 537.1 Internal Standard Calibration Stock<br>Solution | Solution | ~0               | 05/02/19       | ---           | ---               | 25 uL           | 1              | 5                  | ~0.0000               |
| JV62                                  | PFAS - 537.1 Surrogate Calibration Stock<br>Solution         | Solution | ~0               | 05/02/19       | ---           | ---               | 25 uL           | 1              | 5                  | ~0.0000               |

|                                          |                                                              |                           |
|------------------------------------------|--------------------------------------------------------------|---------------------------|
| Solution Prepared By: Schultz, Stephanie | Date Prepared: 5/2/2018                                      | Expiration Date: 5/2/2019 |
| Solution Volume 40 mL X 1 Vials          | Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107 |                           |

Balance ID: \_\_\_\_\_

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM





It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV72

Description: PFAS - 537.1 ICAL L9

## Stock Id: JV42

| Chemical Name                                    | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|--------------------------------------------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-1-butanedisulfonate                    | 1000               | 0.04                     | ---               | ---    | 1               | 5               | 0.00885                  |
| Perfluoro-1-hexanedisulfonate                    | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.00912                  |
| Perfluoro-1-octanedisulfonate                    | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.00925                  |
| Perfluoro-n-decanoic Acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-dodecanoic acid                      | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-heptanoic Acid                       | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-hexanoic acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-nonanoic Acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-octanoic Acid                        | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-tetradecanoic acid                   | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-tridecanoic acid                     | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |
| Perfluoro-n-undecanoic acid                      | 1000               | 0.05                     | ---               | ---    | 1               | 5               | 0.01000                  |

## Stock Id: JV61

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFOA     | 25                 | 0.02                     | ---               | ---    | 1               | 5               | 0.00010                  |
| 13C4-PFOS     | 25                 | 0.06                     | ---               | ---    | 1               | 5               | 0.00029                  |
| d3-MeFOSAA    | 25                 | 0.08                     | ---               | ---    | 1               | 5               | 0.00040                  |

## Stock Id: JV62

| Chemical Name | Stock Amount<br>uL | Initial Conc.<br>(ug/mL) | Density<br>(g/mL) | Purity | Conv.<br>Factor | Final Vol<br>mL | Concentration<br>(ug/mL) |
|---------------|--------------------|--------------------------|-------------------|--------|-----------------|-----------------|--------------------------|
| 13C2-PFDA     | 25                 | 0.02                     | ---               | ---    | 1               | 5               | 0.00010                  |
| 13C2-PFHxA    | 25                 | 0.02                     | ---               | ---    | 1               | 5               | 0.00010                  |
| d5-EtFOSAA    | 25                 | 0.08                     | ---               | ---    | 1               | 5               | 0.00040                  |

## Final Concentrations:

| Analyte:   | Conc (ug/mL): |
|------------|---------------|
| 13C2-PFDA  | .00010        |
| 13C2-PFHxA | .00010        |
| 13C2-PFOA  | .00010        |
| 13C4-PFOS  | .00029        |
| d3-MeFOSAA | .00040        |
| d5-EtFOSAA | .00040        |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM



It can be done

## Standard Solution Concentrations

Approved: ☒

Standard Laboratory ID Number: JV72

Description: PFAS - 537.1 ICAL L9

|                                                  |        |
|--------------------------------------------------|--------|
| N-ethylperfluoro-octanesulfonamidoacetic acid    | .01000 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid | .01000 |
| Perfluoro-1-butanefulfonate                      | .00885 |
| Perfluoro-1-hexanesulfonate                      | .00912 |
| Perfluoro-1-octanesulfonate                      | .00925 |
| Perfluoro-n-decanoic Acid                        | .01000 |
| Perfluoro-n-dodecanoic acid                      | .01000 |
| Perfluoro-n-heptanoic Acid                       | .01000 |
| Perfluoro-n-hexanoic acid                        | .01000 |
| Perfluoro-n-nonanoic Acid                        | .01000 |
| Perfluoro-n-octanoic Acid                        | .01000 |
| Perfluoro-n-tetradecanoic acid                   | .01000 |
| Perfluoro-n-tridecanoic acid                     | .01000 |
| Perfluoro-n-undecanoic acid                      | .01000 |

## Syringes/Pipettes:

| Stock ID: | Type:   | Battelle ID: |
|-----------|---------|--------------|
| JV42      | Pipette | I0400533B    |
| JV61      | Pipette | I0793912B    |
| JV62      | Pipette | I0793912B    |

Solution Prepared By: Schultz, Stephanie Date Prepared: 5/2/2018 Expiration Date: 5/2/2019

Solution Volume 40 mL X 1 Vials Refrigerator/Freezer No: LC Laboratory: Refrigerator - R0107

Comment: 96/4 methanol/milli-q (RP-180502-2)

Approved By: Schumitz, Denise Date: 5/3/2018 3:21:00 PM



It can be done

BDO Id: 180425-01

## Reagent Receipt Report

Approved: ☐ Authorized ☐

**Name:** EPA-537IS **Received:** 4/25/2018  
**Vendor:** Wellington Laboratories **Custodian:** Schumitz, Matt  
**Catalogue No:** EPA-537IS **Expires:** 12/13/2022  
**Type:** Solution **Consumed:** \_\_\_\_\_  
**Lot No:** 537IS1217 **Stored In:** AqChem Laboratory - R0124  
**Quantity:** 1 ea mL **% Moisture:** \_\_\_\_\_  
**Description:** EPA-537IS

| Analyte:     | CAS No:  | Concentration<br>(ug/mL): | Purity: | Density: | Density<br>Units: | Cert<br>Val:             | Lower<br>Limit: | Upper<br>Limit: |
|--------------|----------|---------------------------|---------|----------|-------------------|--------------------------|-----------------|-----------------|
| d3-N-MeFOSAA | BDO-1838 | 4.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| M2PFOA       | BDO-1842 | 1.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| MPFOS        | BDO-1840 | 2.8700                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |

Total Analytes: 3

Notes:

Approved by: \_\_\_\_\_ Approved on: \_\_\_\_\_  
 Authorized by: \_\_\_\_\_ Authorized on: \_\_\_\_\_



**WELLINGTON  
LABORATORIES****CERTIFICATE OF ANALYSIS  
DOCUMENTATION****EPA-537IS**

**Internal Standard  
Primary Dilution Standard**

**PRODUCT CODE:** EPA-537IS  
**LOT NUMBER:** 537IS1217  
**SOLVENT(S):** Methanol / Water (<1%)  
**DATE PREPARED:** (mm/dd/yyyy) 12/13/2017  
**LAST TESTED:** (mm/dd/yyyy) 12/13/2017  
**EXPIRY DATE:** (mm/dd/yyyy) 12/13/2022  
**RECOMMENDED STORAGE:** Refrigerate ampoule

**DESCRIPTION:**

EPA-537IS is a solution/mixture of a mass-labelled ( $^{13}\text{C}$ ) perfluoroalkylcarboxylic acid, a mass-labelled ( $^{13}\text{C}$ ) perfluoroalkylsulfonate, and a mass-labelled ( $^2\text{H}$ ) perfluorooctanesulfonamidoacetic acid. The components and their concentrations are given in Table A.

The mass-labelled perfluoroalkylcarboxylic acid and the mass-labelled perfluoroalkylsulfonate both have chemical purities of >98% and isotopic purities of  $\geq 99\%$ . The mass-labelled perfluorooctanesulfonamidoacetic acid has a chemical purity of >98% and an isotopic purity of  $\geq 98\%$ .

**DOCUMENTATION/ DATA ATTACHED:**

Table A: Components and Concentrations of the Solution/Mixture  
Figure 1: LC/MS Data (TIC)  
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA  
519-822-2436 • Fax: 519-822-2849 • [info@well-labs.com](mailto:info@well-labs.com)**

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

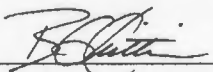


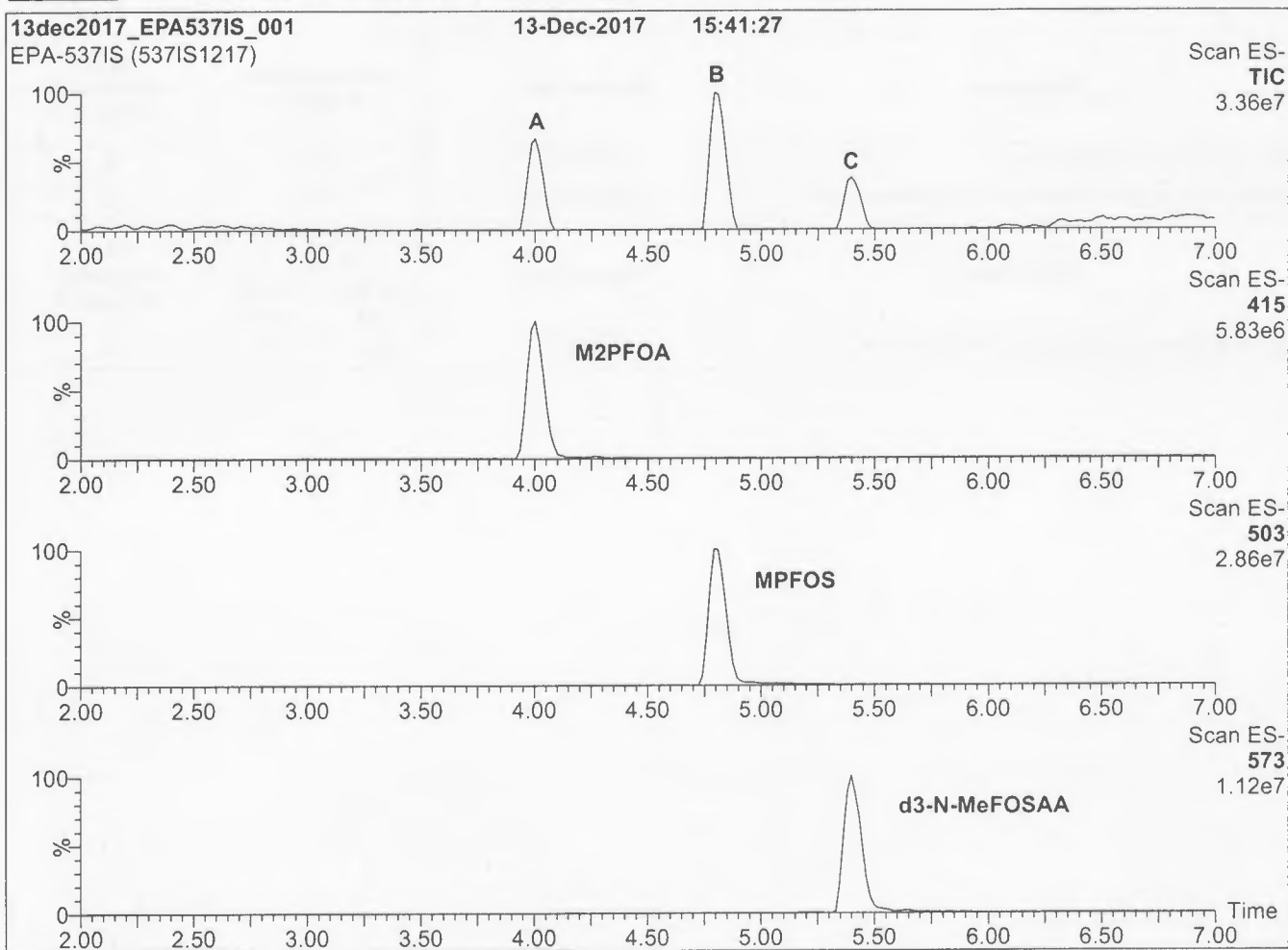
\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Table A: EPA-537IS; Components and Concentrations (ng/ml;  $\pm$  5% in Methanol / Water (<1%))**

| Compound                                                          | Abbreviation | Concentration (ng/ml) |              | Peak Assignment in Figure 1 |
|-------------------------------------------------------------------|--------------|-----------------------|--------------|-----------------------------|
| Perfluoro-n-[1,2- $^{13}\text{C}_2$ ]octanoic acid                | M2PFOA       | 1000                  |              | A                           |
| N-methyl-d <sub>3</sub> -perfluoro-1-octanesulfonamidoacetic acid | d3-N-MeFOSAA | 4000                  |              | C                           |
| Compound                                                          | Abbreviation | Concentration (ng/ml) |              | Peak Assignment in Figure 1 |
|                                                                   |              | as the salt           | as the anion |                             |
| Sodium perfluoro-1-[1,2,3,4- $^{13}\text{C}_4$ ]octanesulfonate   | MPFOS        | 3000                  | 2870         | B                           |

Certified By:

  
 B.G. Chittim, General Manager
Date: 12/22/2017  
(mm/dd/yyyy)

**Figure 1: EPA-537IS; LC/MS Data (Total Ion Current Chromatogram)****Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

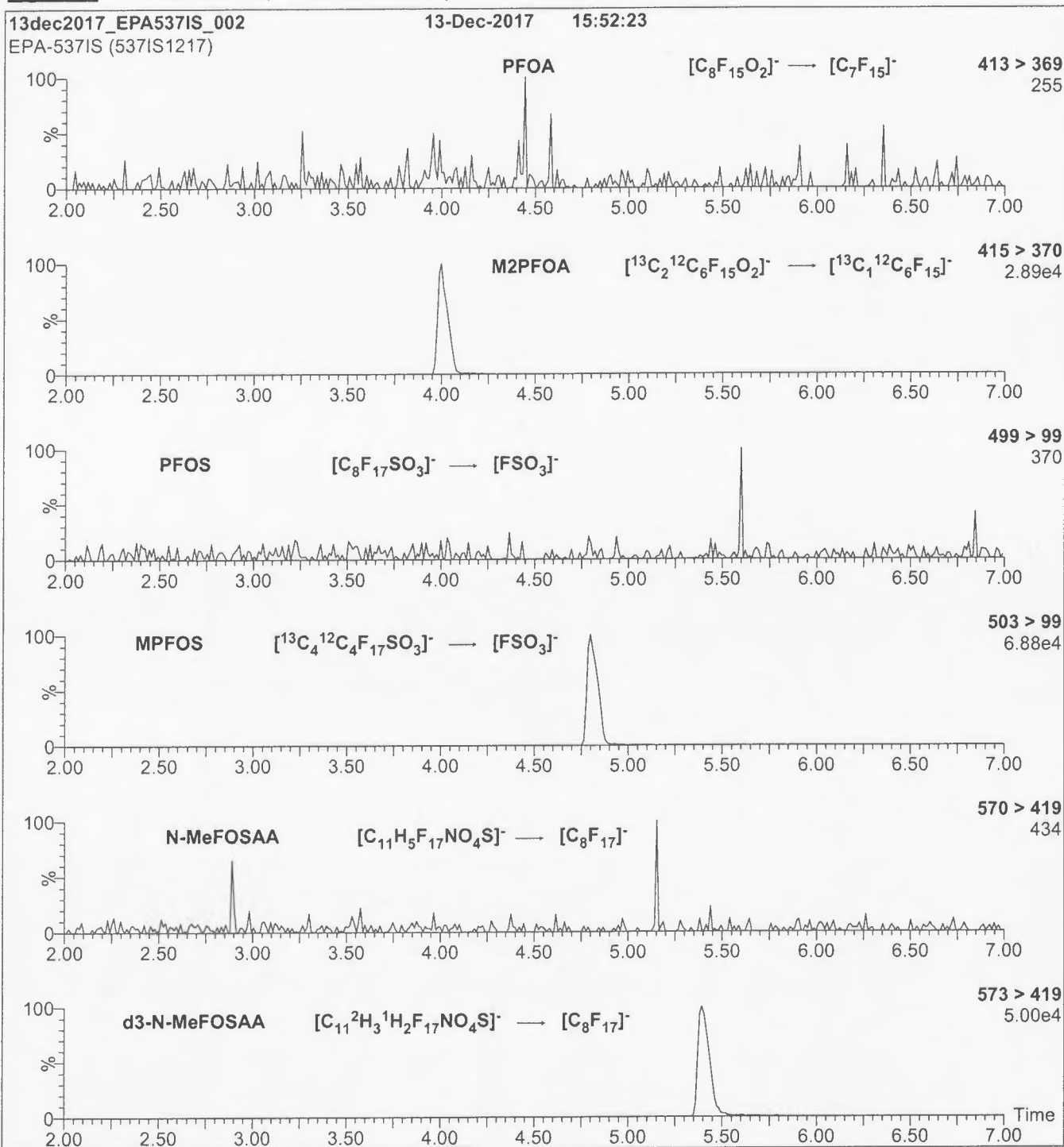
**Mobile phase:** Gradient  
 Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Ramp to 90% organic over 7 min  
 and hold for 2 min before returning  
 to initial conditions in 0.5 min.  
 Time: 10 min

**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (150 - 850 amu)

**Source:** Electrospray (negative)  
 Capillary Voltage (kV) = 3.00  
 Cone Voltage (V) = 25.00  
 Cone Gas Flow (l/hr) = 100  
 Desolvation Gas Flow (l/hr) = 750

**Figure 2: EPA-537IS; LC/MS/MS Data (Selected MRM Transitions)****Conditions for Figure 2:**

Injection: On-column (EPA-537IS)

Mobile phase: Same as Figure 1

Flow: 300  $\mu$ l/min**MS Parameters**

Collision Gas (mbar) = 3.28e-3

Collision Energy (eV) = 11-40 (variable)



It can be done

BDO Id: 180425-02

## Reagent Receipt Report

Approved: ☒ Authorized ☐

**Name:** EPA-537SS **Received:** 4/25/2018  
**Vendor:** Wellington Laboratories **Custodian:** Schumitz, Matt  
**Catalogue No:** EPA-537SS **Expires:** 11/8/2022  
**Type:** Solution **Consumed:** \_\_\_\_\_  
**Lot No:** 537SS1117 **Stored In:** AqChem Laboratory - R0124  
**Quantity:** 1 ea ml **% Moisture:** \_\_\_\_\_  
**Description:** EPA-537SS

| Analyte:   | CAS No:  | Concentration<br>(ug/mL): | Purity: | Density: | Density<br>Units: | Cert<br>Val:             | Lower<br>Limit: | Upper<br>Limit: |
|------------|----------|---------------------------|---------|----------|-------------------|--------------------------|-----------------|-----------------|
| 13C2-PFDA  | BDO-2110 | 1.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| 13C2-PFHxA | BDO-2106 | 1.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| d5-EtFOSAA | BDO-1839 | 4.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |

Total Analytes: 3

Notes:

**Approved by:** Thorn, Jonathan **Approved on:** 5/2/2018 10:00:00 AM  
**Authorized by:** \_\_\_\_\_ **Authorized on:** \_\_\_\_\_



**WELLINGTON**  
LABORATORIES**CERTIFICATE OF ANALYSIS**  
DOCUMENTATION**EPA-537SS****Surrogate Primary Dilution Standard**

**PRODUCT CODE:** EPA-537SS  
**LOT NUMBER:** 537SS1117  
**SOLVENT(S):** Methanol / Water (<1%)  
**DATE PREPARED:** (mm/dd/yyyy) 11/06/2017  
**LAST TESTED:** (mm/dd/yyyy) 11/08/2017  
**EXPIRY DATE:** (mm/dd/yyyy) 11/08/2022  
**RECOMMENDED STORAGE:** Refrigerate ampoule

**DESCRIPTION:**

EPA-537SS is a solution/mixture of two mass-labelled ( $^{13}\text{C}$ ) perfluoroalkylcarboxylic acids and a mass-labelled ( $^2\text{H}$ ) perfluorooctanesulfonamidoacetic acid. The components and their concentrations are given in Table A.

The mass-labelled perfluoroalkylcarboxylic acids both have chemical purities of >98% and isotopic purities of  $\geq 99\%$ . The mass-labelled perfluorooctanesulfonamidoacetic acid has a chemical purity of >98% and an isotopic purity of  $\geq 98\%$ .

**DOCUMENTATION/ DATA ATTACHED:**

Table A: Components and Concentrations of the Solution/Mixture  
Figure 1: LC/MS Data (TIC)  
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA  
519-822-2436 • Fax: 519-822-2849 • [info@well-labs.com](mailto:info@well-labs.com)

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

**HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

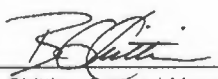


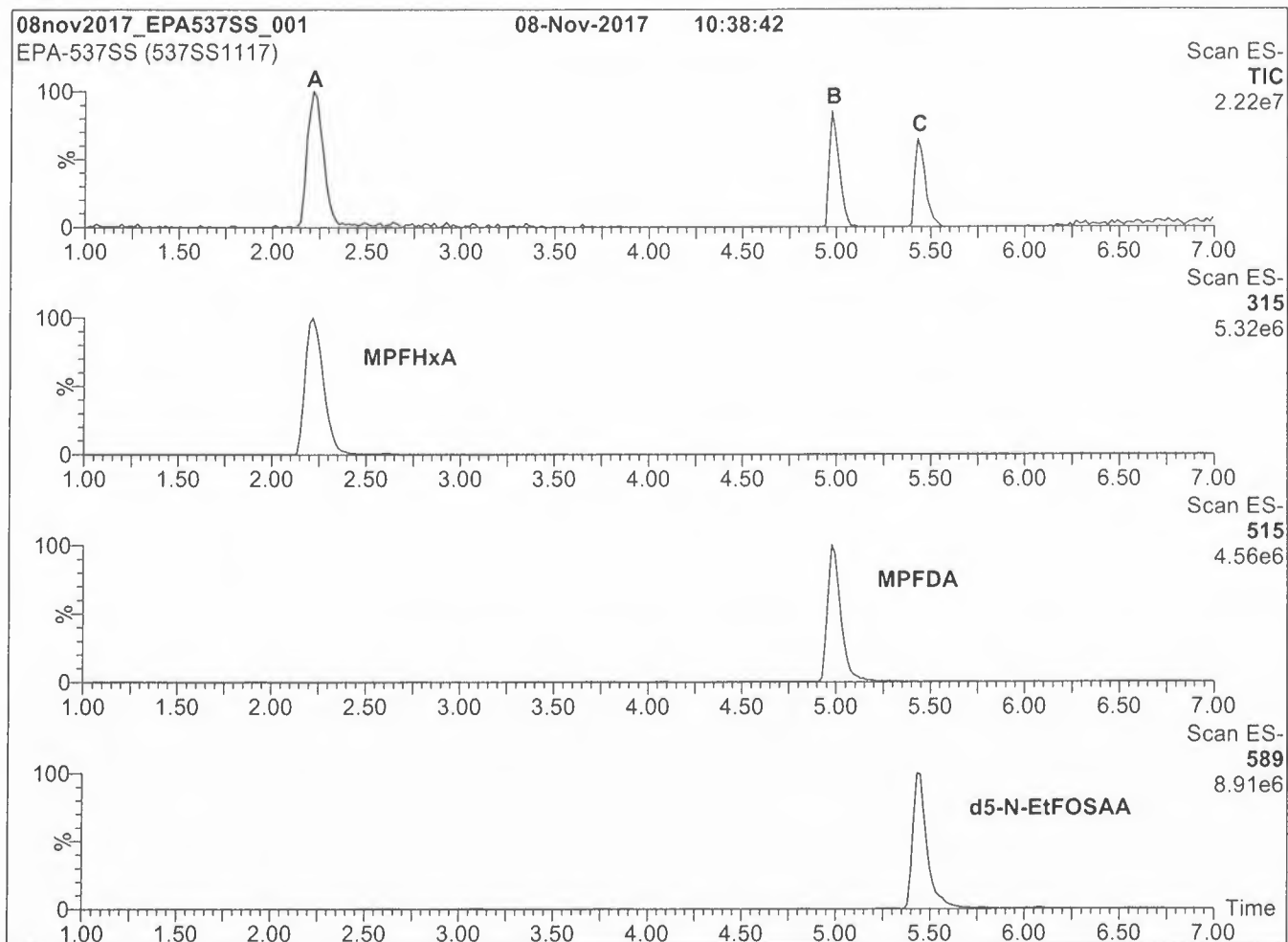
\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Table A:** EPA-537SS; Components and Concentrations (ng/ml;  $\pm 5\%$  in Methanol / Water (<1%))

| Compound                                                         | Abbreviation | Concentration (ng/ml) | Peak Assignment in Figure 1 |
|------------------------------------------------------------------|--------------|-----------------------|-----------------------------|
| Perfluoro-n-[1,2- $^{13}\text{C}_2$ ]hexanoic acid               | MPFHxA       | 1000                  | A                           |
| Perfluoro-n-[1,2- $^{13}\text{C}_2$ ]decanoic acid               | MPFDA        | 1000                  | B                           |
| N-ethyl-d <sub>5</sub> -perfluoro-1-octanesulfonamidoacetic acid | d5-N-EtFOSAA | 4000                  | C                           |

Certified By:

  
B.G. Chittim, General ManagerDate: 11/13/2017  
(mm/dd/yyyy)

**Figure 1: EPA-537SS; LC/MS Data (Total Ion Current Chromatogram)****Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

**Column:** Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

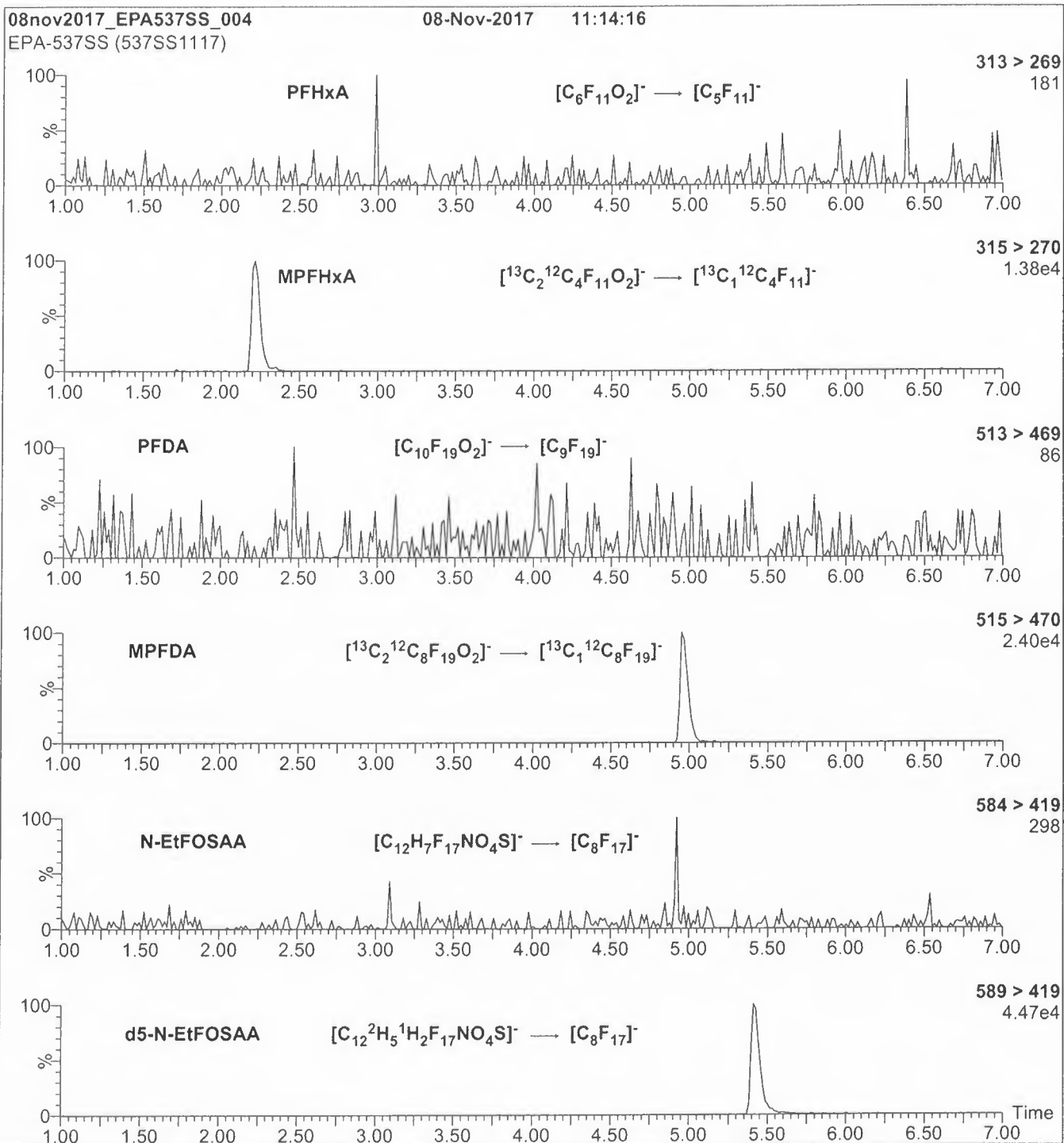
**Mobile phase:** Gradient  
 Start: 45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Ramp to 90% organic over 7 min  
 and hold for 2 min before returning  
 to initial conditions in 0.5 min.  
 Time: 10 min

**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (225 - 850 amu)

**Source:** Electrospray (negative)  
 Capillary Voltage (kV) = 3.00  
 Cone Voltage (V) = 25.00  
 Cone Gas Flow (l/hr) = 100  
 Desolvation Gas Flow (l/hr) = 750

**Figure 2:** EPA-537SS; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (EPA-537SS)

Mobile phase: Same as Figure 1

Flow: 300  $\mu$ l/min**MS Parameters**

Collision Gas (mbar) = 3.50e-3

Collision Energy (eV) = 9-40 (variable)







It can be done

BDO Id: 180425-03

## Reagent Receipt Report

Approved: ☒ Authorized ☐

|                      |                          |                    |                           |
|----------------------|--------------------------|--------------------|---------------------------|
| <b>Name:</b>         | EPA-537PDS (calibration) | <b>Received:</b>   | 4/25/2018                 |
| <b>Vendor:</b>       | Wellington Laboratories  | <b>Custodian:</b>  | Schumitz, Matt            |
| <b>Catalogue No:</b> | EPA-537PDS               | <b>Expires:</b>    | 3/5/2023                  |
| <b>Type:</b>         | Solution                 | <b>Consumed:</b>   |                           |
| <b>Lot No:</b>       | 537PDS0318               | <b>Stored In:</b>  | AqChem Laboratory - R0124 |
| <b>Quantity:</b>     | 1 ea ml                  | <b>% Moisture:</b> |                           |
| <b>Description:</b>  | EPA-537PDS               |                    |                           |

| Analyte:                            | CAS No:    | Concentration<br>(ug/mL): | Purity: | Density: | Density<br>Units: | Cert                     | Cert<br>Val: | Lower<br>Limit: | Upper<br>Limit: |
|-------------------------------------|------------|---------------------------|---------|----------|-------------------|--------------------------|--------------|-----------------|-----------------|
| N-ethylperfluoro-octanesulfonamidoa | 2991-50-6  | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 | 1               |
| N-methylperfluoro-1-octanesulfonami | 2355-31-9  | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 | 2               |
| Perfluoro-1-butanefulfonate         | 375-73-5   | 1.7700                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 | 3               |
| Perfluoro-1-hexanesulfonate         | 355-46-4   | 1.8240                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 | 4               |
| Perfluoro-1-octanesulfonate         | 1763-23-1  | 1.8510                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 | 5               |
| Perfluoro-n-decanoic Acid           | 335-76-2   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-dodecanoic acid         | 307-55-1   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-heptanoic Acid          | 375-85-9   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-hexanoic acid           | 307-24-4   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-nonanoic Acid           | 375-95-1   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-octanoic Acid           | 335-67-1   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-tetradecanoic acid      | 376-06-7   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-tridecanoic acid        | 72629-94-8 | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |
| Perfluoro-n-undecanoic acid         | 2058-94-8  | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |              |                 |                 |

Total Analytes: 14

## Notes:

| Analyte:                                           | Comment:                                                                             |
|----------------------------------------------------|--------------------------------------------------------------------------------------|
| 1 N-ethylperfluoro-octanesulfonamidoacetic acid    | sum of branched and linear isomers                                                   |
| 2 N-methylperfluoro-1-octanesulfonamidoacetic acid | sum of branched and linear isomers                                                   |
| 3 Perfluoro-1-butanefulfonate                      | 2000 ng/ml as the salt, 1770 ng/ml as the anion                                      |
| 4 Perfluoro-1-hexanesulfonate                      | 1998 ng/ml as the salt, 1824 ng/ml as the anion. sum of branched and linear isomers. |
| 5 Perfluoro-1-octanesulfonate                      | 2002 ng/ml as the salt, 1851 ng/ml as the anion. sum of branched and linear isomers. |

|                       |                 |                       |                      |
|-----------------------|-----------------|-----------------------|----------------------|
| <b>Approved by:</b>   | Thorn, Jonathan | <b>Approved on:</b>   | 5/2/2018 10:05:00 AM |
| <b>Authorized by:</b> |                 | <b>Authorized on:</b> |                      |

**WELLINGTON**  
LABORATORIES**CERTIFICATE OF ANALYSIS**  
DOCUMENTATION**EPA-537PDS****Native PFAS Primary Dilution  
Standard Solution/Mixture**

**PRODUCT CODE:** EPA-537PDS  
**LOT NUMBER:** 537PDS0318  
**SOLVENT(S):** Methanol / Water (<1%)  
**DATE PREPARED:** (mm/dd/yyyy) 03/02/2018  
**LAST TESTED:** (mm/dd/yyyy) 03/05/2018  
**EXPIRY DATE:** (mm/dd/yyyy) 03/05/2023  
**RECOMMENDED STORAGE:** Refrigerate ampoule

*for calibration*  
*Jnr 5/2/2018*

**DESCRIPTION:**

EPA-537PDS is a solution/mixture of nine native linear perfluoroalkylcarboxylic acids ( $C_6$ - $C_{14}$ ), three native perfluoroalkylsulfonates ( $C_4$  linear;  $C_6$  and  $C_8$  linear and branched), and two native perfluorooctanesulfonamidoacetic acids (linear and branched). The components and their concentrations are given in Table A.

The native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, and native perfluorooctanesulfonamidoacetic acids have chemical purities of >98%.

**DOCUMENTATION/ DATA ATTACHED:**

Table A: Components and Concentrations of the Solution/Mixture  
Table B: Isomeric Components and Percent Composition of N-MeFOSAA  
Table C: Isomeric Components and Percent Composition of N-EtFOSAA  
Table D: Isomeric Components and Percent Composition of PFHxSK  
Table E: Isomeric Components and Percent Composition of PFOSK  
Figure 1: LC/MS Data (SIR)  
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA  
519-822-2436 • Fax: 519-822-2849 • [info@well-labs.com](mailto:info@well-labs.com)

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

**HANDLING:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Table A:** EPA-537PDS; Components and Concentrations (ng/ml;  $\pm 5\%$  in Methanol / Water (<1%))

| Compound                                                     | Abbreviation                         | Concentration *<br>(ng/ml) |                 | Peak<br>Assignment<br>in Figure 1 |
|--------------------------------------------------------------|--------------------------------------|----------------------------|-----------------|-----------------------------------|
| Perfluoro-n-hexanoic acid ✓                                  | PFHxA                                | 2000                       |                 | B                                 |
| Perfluoro-n-heptanoic acid ✓                                 | PFHpA                                | 2000                       |                 | C                                 |
| Perfluoro-n-octanoic acid ✓                                  | PFOA                                 | 2000                       |                 | F                                 |
| Perfluoro-n-nonanoic acid ✓                                  | PFNA                                 | 2000                       |                 | G                                 |
| Perfluoro-n-decanoic acid ✓                                  | PFDA                                 | 2000                       |                 | J                                 |
| Perfluoro-n-undecanoic acid ✓                                | PFUdA                                | 2000                       |                 | O                                 |
| Perfluoro-n-dodecanoic acid ✓                                | PFDoA                                | 2000                       |                 | P                                 |
| Perfluoro-n-tridecanoic acid ✓                               | PFTTrDA                              | 2000                       |                 | Q                                 |
| Perfluoro-n-tetradecanoic acid ✓                             | PFTeDA                               | 2000                       |                 | R                                 |
| N-methylperfluorooctanesulfonamidoacetic acid <sup>a</sup> ✓ | N-MeFOSAA: linear isomer ✓           | 1520                       |                 | L                                 |
|                                                              | N-MeFOSAA: $\Sigma$ branched isomers | 480                        |                 | K                                 |
| N-ethylperfluorooctanesulfonamidoacetic acid <sup>b</sup> ✓  | N-EtFOSAA: linear isomer ✓           | 1550                       |                 | N                                 |
|                                                              | N-EtFOSAA: $\Sigma$ branched isomers | 450                        |                 | M                                 |
| Compound                                                     | Abbreviation                         | Concentration *<br>(ng/ml) |                 | Peak<br>Assignment<br>in Figure 1 |
|                                                              |                                      | as the<br>salt             | as the<br>anion |                                   |
| Potassium perfluoro-1-butanesulfonate ✓                      | L-PFBS ✓                             | 2000                       | 1770            | A                                 |
| Potassium perfluorohexanesulfonate <sup>c</sup>              | PFHxSK: linear isomer                | 1620                       | 1480            | E                                 |
|                                                              | PFHxSK: $\Sigma$ branched isomers    | 378                        | 344             | D                                 |
| Potassium perfluorooctanesulfonate <sup>d</sup>              | PFOSK: linear isomer                 | 1580                       | 1460            | I                                 |
|                                                              | PFOSK: $\Sigma$ branched isomers     | 422                        | 391             | H                                 |

<sup>a</sup> See Table B for percent composition of linear and branched N-MeFOSAA isomers.

<sup>b</sup> See Table C for percent composition of linear and branched N-EtFOSAA isomers.

<sup>c</sup> See Table D for percent composition of linear and branched PFHxSK isomers.

<sup>d</sup> See Table E for percent composition of linear and branched PFOSK isomers.

\* Concentrations have been rounded to three significant figures.

**Table B:** N-MeFOSAA; Isomeric Components and Percent Composition (by  $^{19}\text{F}$ -NMR)\*

| Isomer | Name                                                       | Structure                                                                                                                                           | Percent Composition by <sup>19</sup> F-NMR |      |
|--------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|------|
|        |                                                            |                                                                                                                                                     |                                            |      |
| 1      | N-methylperfluoro-1-octanesulfonamidoacetic acid           | $\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$                                                                              | 76.0                                       | 76.0 |
| 2      | N-methylperfluoro-3-methylheptanesulfonamidoacetic acid    | $\text{CF}_3(\text{CF}_2)_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$                              | 0.7                                        | 24.0 |
| 3      | N-methylperfluoro-4-methylheptanesulfonamidoacetic acid    | $\text{CF}_3(\text{CF}_2)_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$                              | 2.0                                        |      |
| 4      | N-methylperfluoro-5-methylheptanesulfonamidoacetic acid    | $\text{CF}_3\text{CF}_2\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$                                  | 6.0                                        |      |
| 5      | N-methylperfluoro-6-methylheptanesulfonamidoacetic acid    | $\text{CF}_3\underset{\text{CF}_3}{\text{CF}}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$                                             | 14.0                                       |      |
| 6      | N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid | $\begin{array}{c} \text{CF}_3 \\   \\ \text{CF}_3\text{C}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H} \\   \\ \text{CF}_3 \end{array}$ | 0.2                                        |      |
| 7      | Other Unidentified Isomers                                 |                                                                                                                                                     | 1.1                                        |      |

\* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

**Table C: N-EtFOSAA; Isomeric Components and Percent Composition (by  $^{19}\text{F}$ -NMR)\***

| Isomer | Name                                                      | Structure                                                                                                                                             | Percent Composition by $^{19}\text{F}$ -NMR |      |
|--------|-----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------|
|        |                                                           |                                                                                                                                                       |                                             |      |
| 1      | N-ethylperfluoro-1-octanesulfonamidoacetic acid           | $\text{CF}_3(\text{CF}_2)_7\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{C}_2\text{H}_5$                                                      | 77.5                                        | 77.5 |
| 2      | N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid    | $\text{CF}_3(\text{CF}_2)_3\text{CF}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$                | 2.3                                         | 22.5 |
| 3      | N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid    | $\text{CF}_3(\text{CF}_2)_2\text{CF}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$                | 2.2                                         |      |
| 4      | N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid    | $\text{CF}_3\text{CF}_2\text{CF}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$                    | 5.4                                         |      |
| 5      | N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid    | $\text{CF}_3\text{CF}(\text{CF}_2)_5\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$                               | 10.4                                        |      |
| 6      | N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid | $\text{CF}_3$<br>$\text{CF}_3\text{C}(\text{CF}_2)_4\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$               | 0.3                                         |      |
| 7      | N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid | $\text{CF}_3$<br>$\text{CF}_3\text{CFCF}(\text{CF}_2)_3\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$            | 0.3                                         |      |
| 8      | N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid | $\text{CF}_3$<br>$\text{CF}_3\text{CFCF}_2\text{CF}(\text{CF}_2)_2\text{SO}_2\text{NCH}_2\text{CO}_2\text{H}$<br>$\text{CF}_3$ $\text{C}_2\text{H}_5$ | 0.3                                         |      |
| 9      | Other Unidentified Isomers                                |                                                                                                                                                       | 1.3                                         |      |

\* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.



**Table D: PFHxSK; Isomeric Components and Percent Composition (by  $^{19}\text{F}$ -NMR)\***

| Isomer | Name                                                      | Structure                                                                                   | Percent Composition by $^{19}\text{F}$ -NMR |      |
|--------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------|------|
| 1      | Potassium perfluoro-1-hexanesulfonate                     | $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$ | 81.1                                        | 81.1 |
| 2      | Potassium 1-trifluoromethylperfluoropentanesulfonate**    | $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{SO}_3^-\text{K}^+$  | 2.9                                         | 18.9 |
| 3      | Potassium 2-trifluoromethylperfluoropentanesulfonate      | $\text{CF}_3\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{SO}_3^-\text{K}^+$  | 1.4                                         |      |
| 4      | Potassium 3-trifluoromethylperfluoropentanesulfonate      | $\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$  | 5.0                                         |      |
| 5      | Potassium 4-trifluoromethylperfluoropentanesulfonate      | $\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$  | 8.9                                         |      |
| 6      | Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate | $\text{CF}_3\text{C}(\text{CF}_3)_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+$           | 0.2                                         |      |
| 7      | Other Unidentified Isomers                                |                                                                                             | 0.5                                         |      |

\* Percent of total perfluorohexanesulfonate isomers only.  
 \*\* Systematic Name: Potassium perfluorohexane-2-sulfonate.

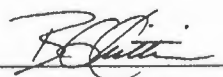
**Table E: PFOSK; Isomeric Components and Percent Composition (by  $^{19}\text{F}$ -NMR)\***

| Isomer | Name                                                      | Structure                                                                                                           | Percent Composition by $^{19}\text{F}$ -NMR |      |
|--------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------|
|        |                                                           |                                                                                                                     |                                             |      |
| 1      | Potassium perfluoro-1-octanesulfonate                     | $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$           | 78.8                                        | 78.8 |
| 2      | Potassium 1-trifluoromethylperfluoroheptanesulfonate**    | $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{SO}_3\cdot\text{K}^+)\text{CF}_3$ | 1.2                                         | 21.1 |
| 3      | Potassium 2-trifluoromethylperfluoroheptanesulfonate      | $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{SO}_3\cdot\text{K}^+$ | 0.6                                         |      |
| 4      | Potassium 3-trifluoromethylperfluoroheptanesulfonate      | $\text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$ | 1.9                                         |      |
| 5      | Potassium 4-trifluoromethylperfluoroheptanesulfonate      | $\text{CF}_3\text{CF}_2\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$ | 2.2                                         |      |
| 6      | Potassium 5-trifluoromethylperfluoroheptanesulfonate      | $\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$ | 4.5                                         |      |
| 7      | Potassium 6-trifluoromethylperfluoroheptanesulfonate      | $\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$ | 10.0                                        |      |
| 8      | Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate | $\text{CF}_3\text{C}(\text{CF}_3)_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$                     | 0.2                                         |      |
| 9      | Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate | $\text{CF}_3\text{CF}_2\text{C}(\text{CF}_3)_2\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$                     | 0.03                                        |      |
| 10     | Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate | $\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$  | 0.4                                         |      |
| 11     | Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate | $\text{CF}_3\text{C}(\text{CF}_3)\text{CF}_2\text{C}(\text{CF}_3)\text{CF}_2\text{CF}_2\text{SO}_3\cdot\text{K}^+$  | 0.07                                        |      |

\* Percent of total perfluorooctanesulfonate isomers only.

\*\* Systematic Name: Potassium perfluorooctane-2-sulfonate.

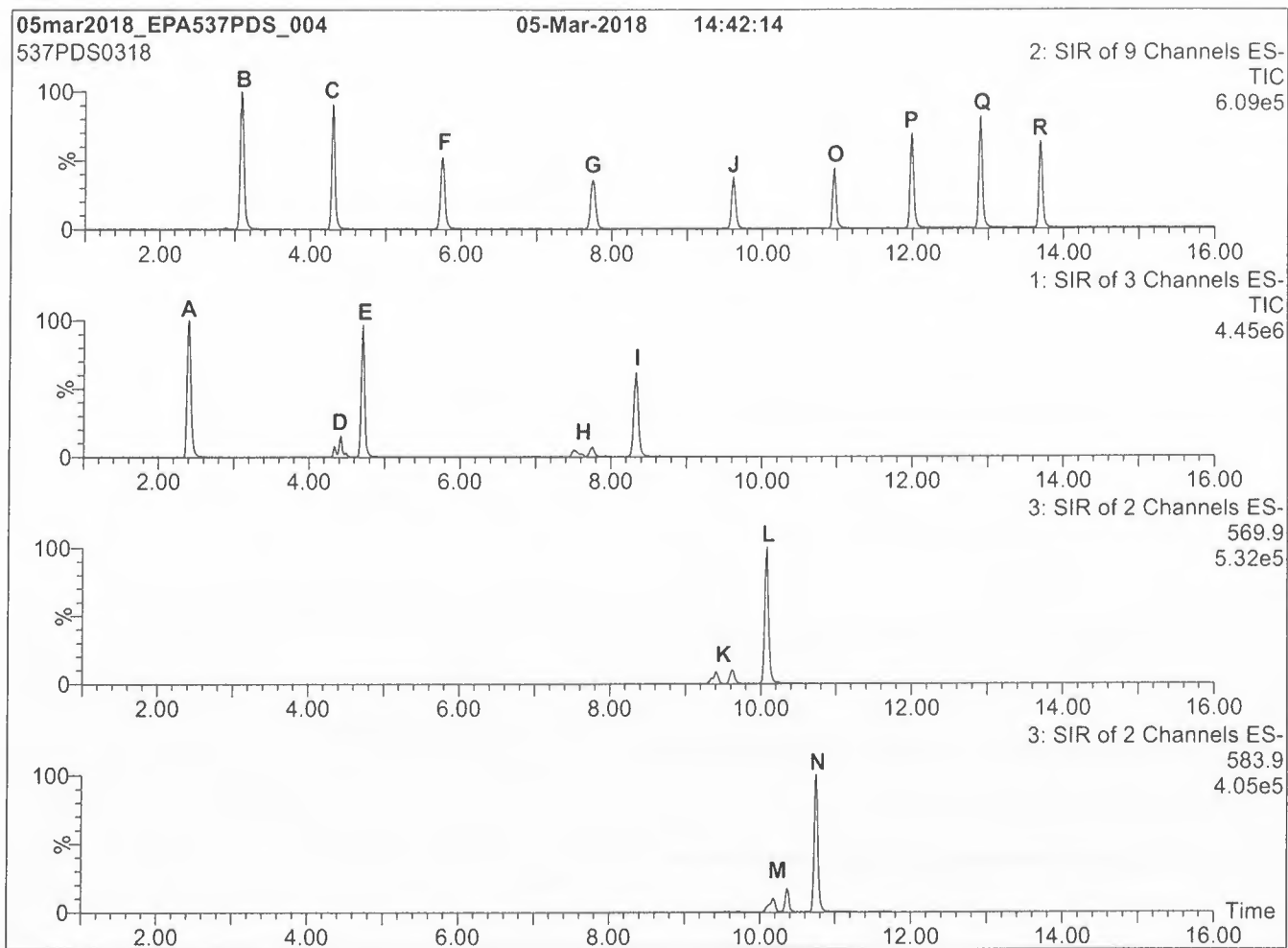
Certified By:



B.G. Chittim, General Manager

Date: 04/02/2018

(mm/dd/yyyy)

**Figure 1: EPA537PDS; LC/MS Data (SIR)****Conditions for Figure 1:****LC:** Waters Acquity Ultra Performance LC**MS:** Micromass Quattro *micro* API MS**Chromatographic Conditions**Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Ramp to 55% organic over 3.5 min.

Ramp to 70% organic over 6.5 min.

Ramp to 85% organic over 5 min and hold for  
1 min before returning to initial conditions in 0.5 min.

Time: 17 min

Flow: 300  $\mu$ l/min**MS Parameters**

Experiment: SIR

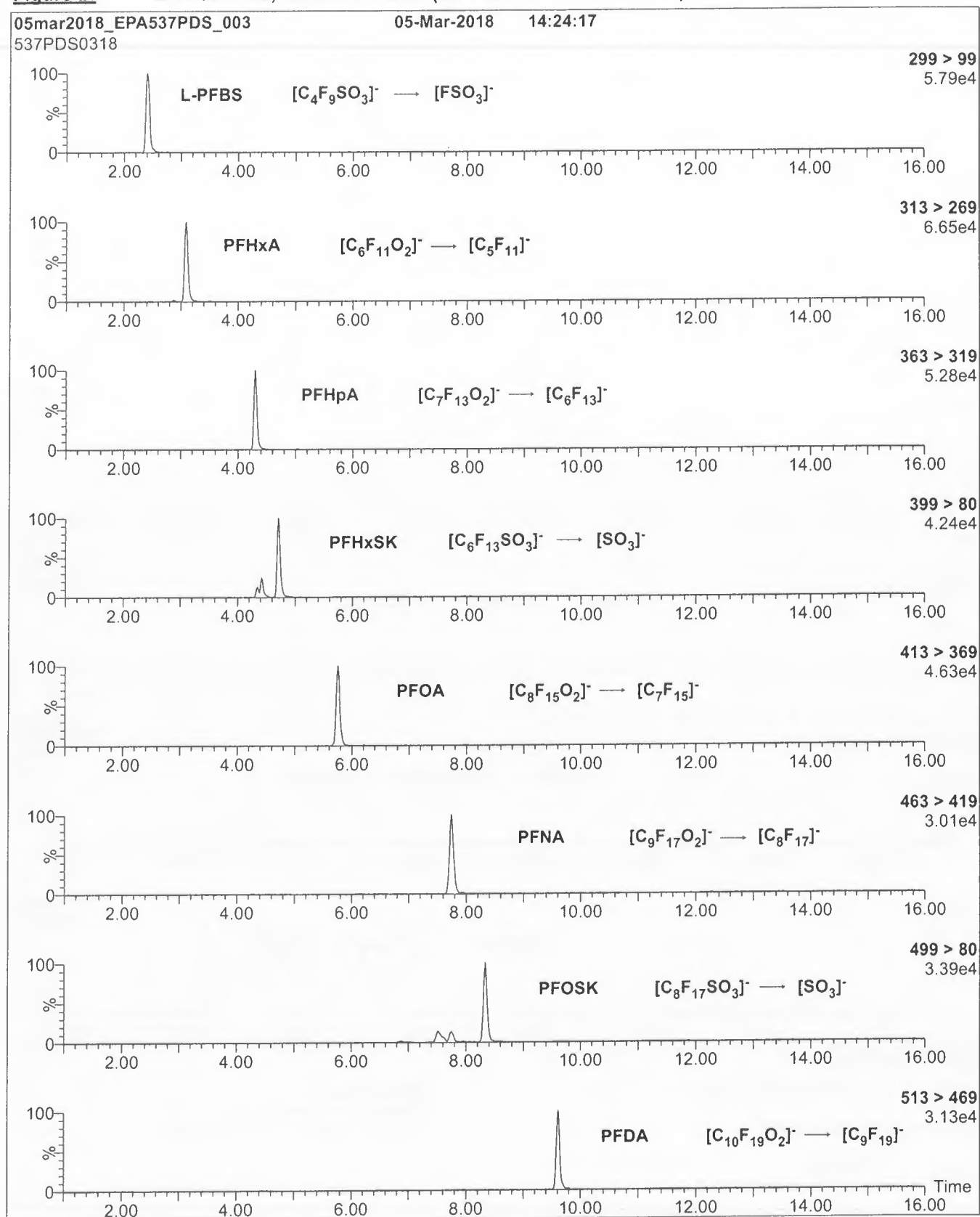
Source: Electrospray (negative)

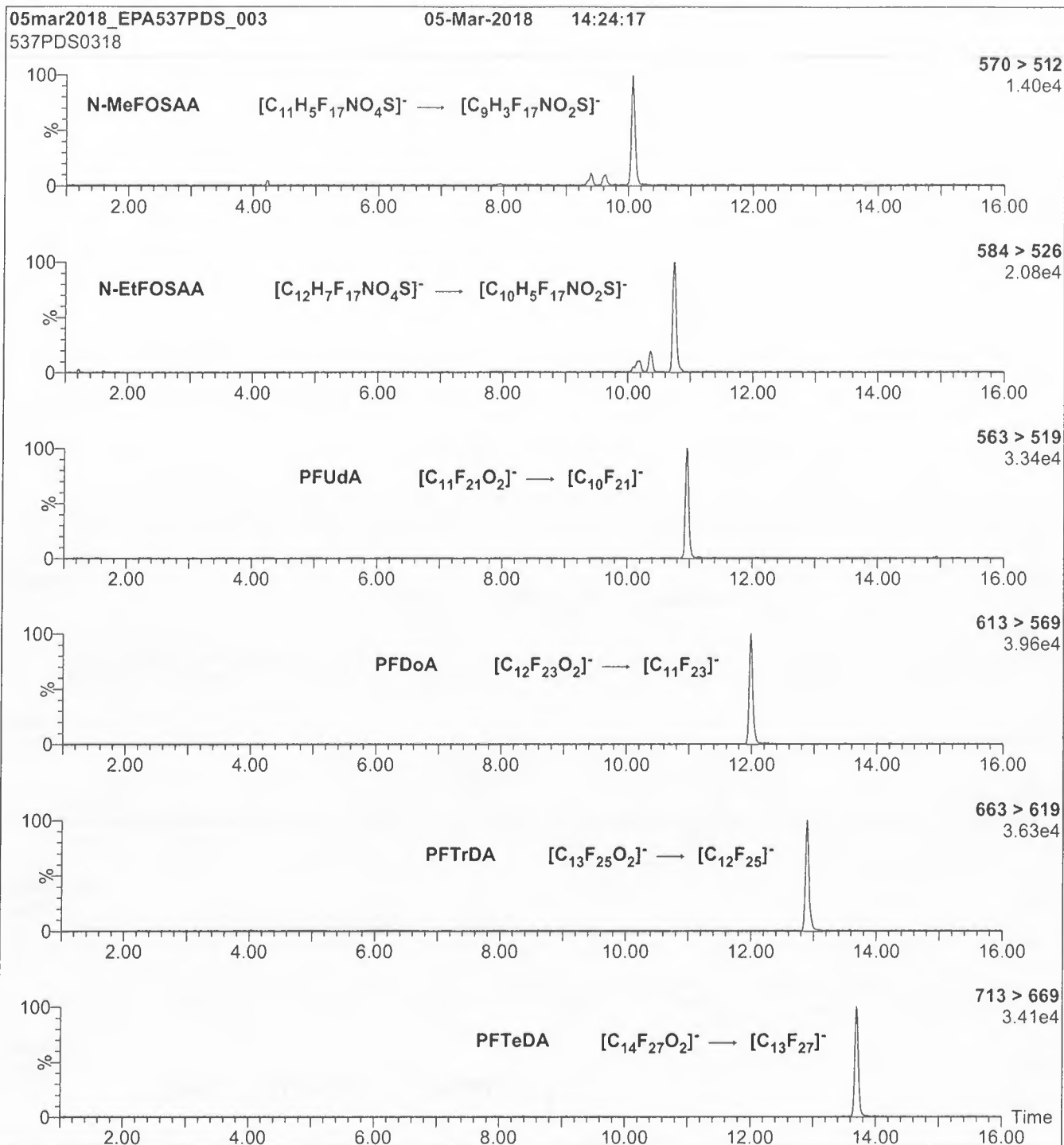
Capillary Voltage (kV) = 3.00

Cone Voltage (V) = variable (15-60)

Cone Gas Flow (l/hr) = 100

Desolvation Gas Flow (l/hr) = 750

**Figure 2:** EPA-537PDS; LC/MS/MS Data (Selected MRM Transitions)

**Figure 2:** EPA-537PDS; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (EPA-537PDS)

Mobile phase: Same as Figure 1

Flow: 300  $\mu$ l/min**MS Parameters**

Collision Gas (mbar) = 3.10e-3

Collision Energy (eV) = 10-40 (variable)



It can be done

BDO Id: 180425-04

## Reagent Receipt Report

Approved: ☐ Authorized ☐

**Name:** EPA-537PDS-L (second source) **Received:** 4/25/2018  
**Vendor:** Wellington Laboratories **Custodian:** Schumitz, Matt  
**Catalogue No:** EPA-537PDS-L **Expires:** 3/5/2023  
**Type:** Solution **Consumed:** \_\_\_\_\_  
**Lot No:** 537PDSL0318 **Stored In:** AqChem Laboratory - R0124  
**Quantity:** 1 ea ml **% Moisture:** \_\_\_\_\_  
**Description:** EPA-537PDS-L

| Analyte:                            | CAS No:    | Concentration<br>(ug/mL): | Purity: | Density: | Density<br>Units: | Cert<br>Val:             | Lower<br>Limit: | Upper<br>Limit: |
|-------------------------------------|------------|---------------------------|---------|----------|-------------------|--------------------------|-----------------|-----------------|
| N-ethylperfluoro-octanesulfonamidoa | 2991-50-6  | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| N-methylperfluoro-1-octanesulfonami | 2355-31-9  | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-1-butanefulfonic Acid     | 375-73-5   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 | 1               |
| Perfluoro-n-decanoic Acid           | 335-76-2   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-dodecanoic acid         | 307-55-1   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-heptanoic Acid          | 375-85-9   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-hexanoic acid           | 307-24-4   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-octanoic Acid           | 335-67-1   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluorononanoic Acid              | 375-95-1   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-tetradecanoic acid      | 376-06-7   | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-tridecanoic acid        | 72629-94-8 | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Perfluoro-n-undecanoic acid         | 2058-94-8  | 2.0000                    | 100.00  | --       | --                | <input type="checkbox"/> |                 |                 |
| Sodium perfluoro-1-hexanesulfonate  | 82382-12-5 | 1.8900                    | 100.00  | --       | --                | <input type="checkbox"/> |                 | 2               |
| Sodium perfluoro-1-octanesulfonate  | 4021-47-0  | 1.9100                    | 100.00  | --       | --                | <input type="checkbox"/> |                 | 3               |

Total Analytes: 14

## Notes:

| Analyte:                             | Comment:                                        |
|--------------------------------------|-------------------------------------------------|
| 1 Perfluoro-1-butanefulfonic Acid    | 2000 ng/ml as the salt, 1770 ng/ml as the anion |
| 2 Sodium perfluoro-1-hexanesulfonate | 2000 ng/ml as the salt, 1890 ng/ml as the anion |
| 3 Sodium perfluoro-1-octanesulfonate | 2000 ng/ml as the salt, 1910 ng/ml as the anion |

Approved by: \_\_\_\_\_ Approved on: \_\_\_\_\_  
 Authorized by: \_\_\_\_\_ Authorized on: \_\_\_\_\_



**WELLINGTON**  
LABORATORIES**CERTIFICATE OF ANALYSIS**  
DOCUMENTATION**EPA-537PDS-L****Native PFAS Linear Primary Dilution  
Standard Solution/Mixture**

**PRODUCT CODE:** EPA-537PDS-L  
**LOT NUMBER:** 537PDSL0318  
**SOLVENT(S):** Methanol / Water (<1%)  
**DATE PREPARED:** (mm/dd/yyyy) 03/02/2018  
**LAST TESTED:** (mm/dd/yyyy) 03/05/2018  
**EXPIRY DATE:** (mm/dd/yyyy) 03/05/2023  
**RECOMMENDED STORAGE:** Refrigerate ampoule

**DESCRIPTION:**

EPA-537PDS-L is a solution/mixture of native linear perfluoroalkylcarboxylic acids ( $C_6$ - $C_{14}$ ), native linear perfluoroalkylsulfonates ( $C_4$ ,  $C_6$ , and  $C_8$ ), and native linear perfluorooctanesulfonamidoacetic acids. The components and their concentrations are given in Table A.

The native perfluoroalkylcarboxylic acids, native perfluoroalkylsulfonates, and native perfluorooctanesulfonamidoacetic acids have chemical purities of >98%.

**DOCUMENTATION/ DATA ATTACHED:**

Table A: Components and Concentrations of the Solution/Mixture  
Figure 1: LC/MS Data (SIR)  
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

**ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE**

**Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA**  
519-822-2436 • Fax: 519-822-2849 • [info@well-labs.com](mailto:info@well-labs.com)

**INTENDED USE:**

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

**HANDLING:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

**SYNTHESIS / CHARACTERIZATION:**

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

**HOMOGENEITY:**

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

**UNCERTAINTY:**

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty,  $u_c(y)$ , of a value  $y$  and the uncertainty of the independent parameters

$x_1, x_2, \dots, x_n$  on which it depends is:

$$u_c(y(x_1, x_2, \dots, x_n)) = \sqrt{\sum_{i=1}^n u(y, x_i)^2}$$

where  $x$  is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

**TRACEABILITY:**

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

**EXPIRY DATE / PERIOD OF VALIDITY:**

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**LIMITED WARRANTY:**

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

**QUALITY MANAGEMENT:**

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

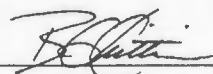


\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at [www.well-labs.com](http://www.well-labs.com) or contact us directly at [info@well-labs.com](mailto:info@well-labs.com)\*\*

**Table A:** EPA-537PDS-L; Components and Concentrations (ng/ml;  $\pm$  5% in Methanol / Water (<1%))

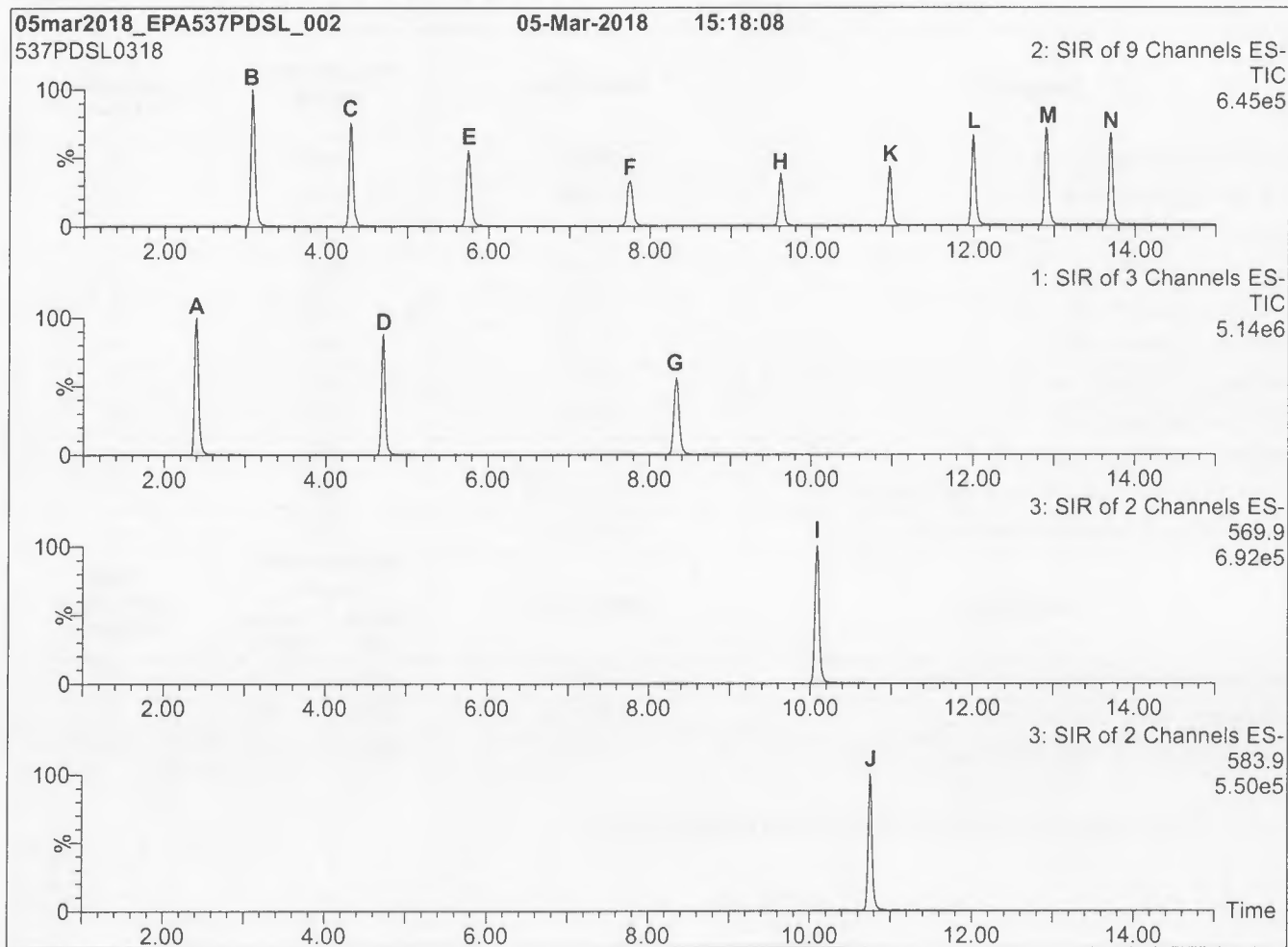
| Compound                                           | Abbreviation | Concentration *<br>(ng/ml) |                 | Peak<br>Assignment<br>in Figure 1 |
|----------------------------------------------------|--------------|----------------------------|-----------------|-----------------------------------|
| Perfluoro-n-hexanoic acid ✓                        | PFHxA        | 2000                       |                 | B                                 |
| Perfluoro-n-heptanoic acid ✓                       | PFHpA        | 2000                       |                 | C                                 |
| Perfluoro-n-octanoic acid ✓                        | PFOA         | 2000                       |                 | E                                 |
| Perfluoro-n-nonanoic acid ✓                        | PFNA         | 2000                       |                 | F                                 |
| Perfluoro-n-decanoic acid ✓                        | PFDA         | 2000                       |                 | H                                 |
| Perfluoro-n-undecanoic acid ✓                      | PFUdA        | 2000                       |                 | K                                 |
| Perfluoro-n-dodecanoic acid ✓                      | PFDoA        | 2000                       |                 | L                                 |
| Perfluoro-n-tridecanoic acid ✓                     | PFTDA        | 2000                       |                 | M                                 |
| Perfluoro-n-tetradecanoic acid ✓                   | PFTeDA       | 2000                       |                 | N                                 |
| N-methylperfluoro-1-octanesulfonamidoacetic acid ✓ | N-MeFOSAA    | 2000                       |                 | I                                 |
| N-ethylperfluoro-1-octanesulfonamidoacetic acid ✓  | N-EtFOSAA    | 2000                       |                 | J                                 |
| Compound                                           | Abbreviation | Concentration<br>(ng/ml)   |                 | Peak<br>Assignment<br>in Figure 1 |
|                                                    |              | as the<br>salt             | as the<br>anion |                                   |
| Potassium perfluoro-1-butanefulfonate ✓            | L-PFBS       | 2000                       | 1770            | A                                 |
| Sodium perfluoro-1-hexanesulfonate ✓               | L-PFHxS      | 2000                       | 1890            | D                                 |
| Sodium perfluoro-1-octanesulfonate ✓               | L-PFOS       | 2000                       | 1910            | G                                 |

\* Concentrations have been rounded to three significant figures.

Certified By: 

B.G. Chittim, General Manager

Date: 04/02/2018  
(mm/dd/yyyy)

**Figure 1: EPA537PDS-L; LC/MS Data (SIR)****Conditions for Figure 1:**

**LC:** Waters Acquity Ultra Performance LC  
**MS:** Micromass Quattro micro API MS

**Chromatographic Conditions**

Column: Acquity UPLC BEH Shield RP<sub>18</sub>  
 1.7  $\mu$ m, 2.1 x 100 mm

Mobile phase: Gradient

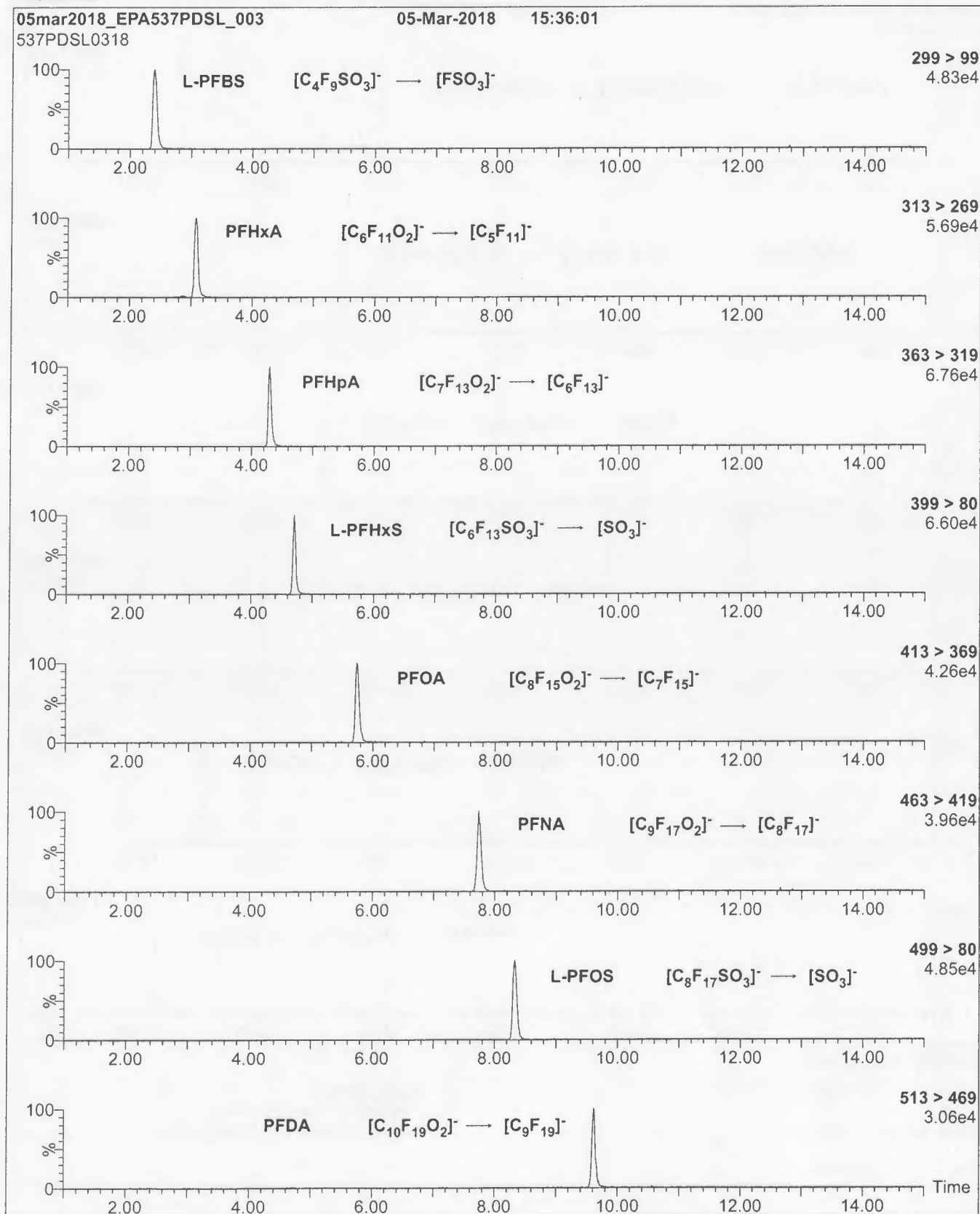
Start: 40% (80:20 MeOH:ACN) / 60% H<sub>2</sub>O  
 (both with 10 mM NH<sub>4</sub>OAc buffer)  
 Ramp to 55% organic over 3.5 min.  
 Ramp to 70% organic over 6.5 min.  
 Ramp to 85% organic over 5 min and hold for  
 1 min before returning to initial conditions in 0.5 min.  
 Time: 17 min

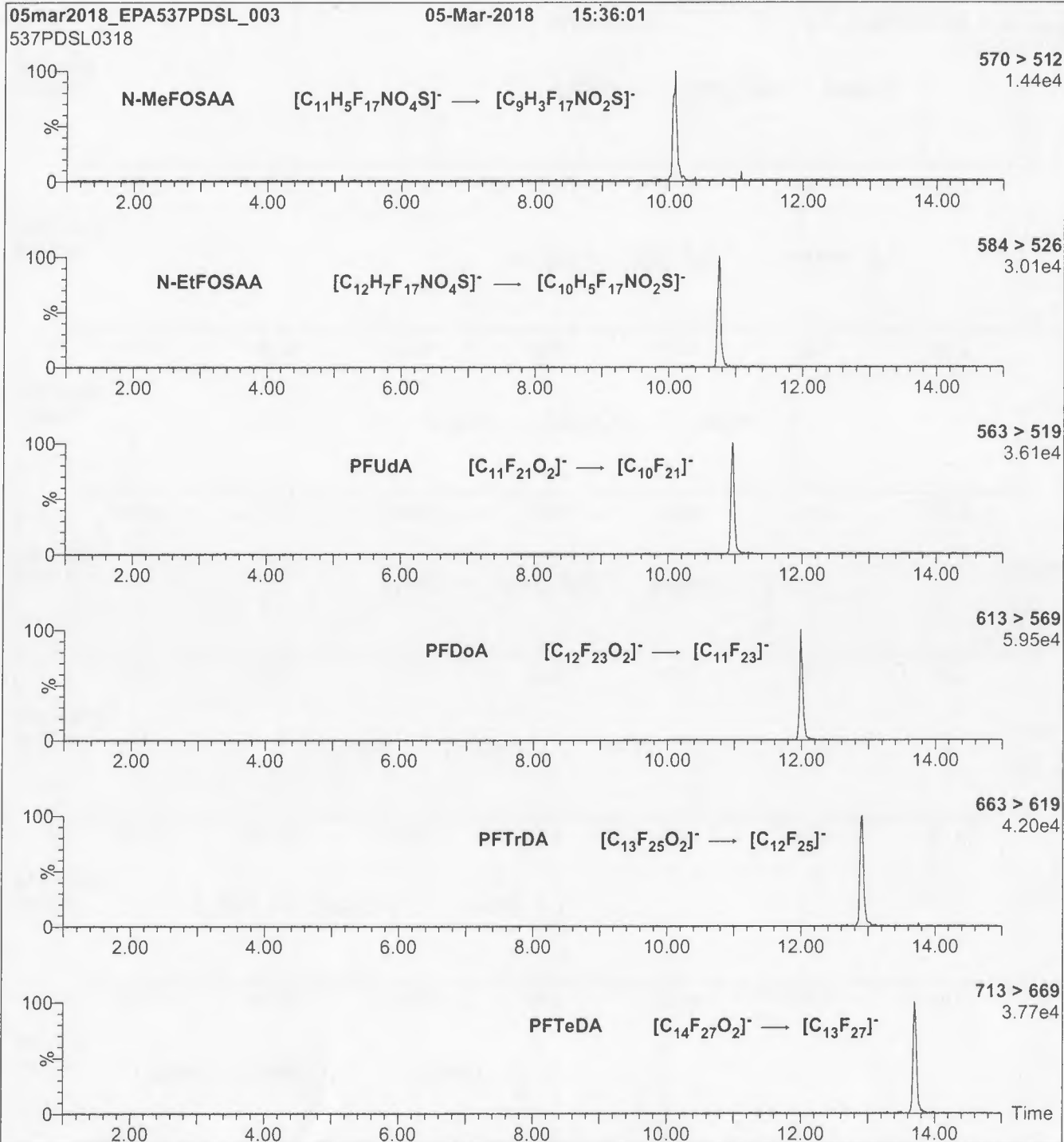
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: SIR

Source: Electrospray (negative)  
 Capillary Voltage (kV) = 3.00  
 Cone Voltage (V) = variable (15-60)  
 Cone Gas Flow (l/hr) = 100  
 Desolvation Gas Flow (l/hr) = 750

**Figure 2: EPA-537PDS-L; LC/MS/MS Data (Selected MRM Transitions)**

**Figure 2:** EPA-537PDS-L; LC/MS/MS Data (Selected MRM Transitions)**Conditions for Figure 2:**

Injection: On-column (EPA-537PDS-L)

Mobile phase: Same as Figure 1

Flow: 300  $\mu$ l/min**MS Parameters**

Collision Gas (mbar) = 3.17e-3

Collision Energy (eV) = 10-40 (variable)

# Sample Preparation





**It can be done**

## BATTELLE - NORWELL OPERATIONS SAMPLE PREPARATION RECORDS

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**

100117920-  
WE04

**18-0312**

**WE04 PFAS Analysis**

**DW**

SOP Numbers (see workplan for modifications)

VOASOP No.

5-371

### This Batch Contains The Following Samples:

|             |          |
|-------------|----------|
| CQ753PB-FS  | J5973-FS |
| CQ754LCS-FS | J5975-FS |
| J5965-FS    | J5977-FS |
| J5967-FS    |          |
| J5969-FS    |          |
| J5971-FS    |          |

Laboratory Preparation Records  
COMPLETE AND VALIDATED

Prep Task Leader: Stephanie Schultz

| Approved By:    | Date       | Initials |
|-----------------|------------|----------|
| Denise Schumitz | 05/16/2018 | DMS      |



## BATTELLE - NORWELL OPERATIONS SAMPLE IDENTIFICATION PAGE

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | Description               |
|-------------|---------------------------|
| CQ753PB-FS  | Procedural Blank          |
| CQ754LCS-FS | Laboratory Control Sample |
| J5965-FS    | WGNA-043018-FRB-3103      |
| J5967-FS    | NAWC-043018-FRB-207       |
| J5969-FS    | WGNA-043018-FRB-3409      |
| J5971-FS    | WGNA-050118-FRB-3385      |
| J5973-FS    | WGNA-050118-FRB-3178      |
| J5975-FS    | NAWC-050118-FRB-304       |
| J5977-FS    | NAWC-050118-FRB-098       |

Samples Assigned By:

Stephanie Schultz

Date :

May 9, 2018

Comments:



## BATTELLE - NORWELL OPERATIONS SAMPLE CUSTODY LOG

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

|                                                                                                                                                        |                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Requested On/By:</b> 05/09/2018 SAS<br><br><b>Relinquished On/By:</b> 05/09/2018 MDS                                                                | <b>Purpose:</b> Sample Preparation<br><br><b>Last Activity:</b> Transfer                  |
| <b>Accepted On/By:</b> 05/09/2018 SAS<br><b>Stored In Facility:</b> Sample Preparation<br><b>Stored Until:</b> 05/09/2018<br><b>Stored Comment:</b> NA | <b>Returned On/To:</b><br><b>Returned To Facility:</b><br><br><b>Returned Comment:</b> NA |

| No.                  | BDO-ID: | Ctrs | *                          | Condition: | Custody Comment: |
|----------------------|---------|------|----------------------------|------------|------------------|
| 1                    | J5965   | 1    | C                          | Consumed   | NA               |
| 2                    | J5967   | 1    | C                          | Consumed   | NA               |
| 3                    | J5969   | 1    | C                          | Consumed   | NA               |
| 4                    | J5971   | 1    | C                          | Consumed   | NA               |
| 5                    | J5973   | 1    | C                          | Consumed   | NA               |
| 6                    | J5975   | 1    | C                          | Consumed   | NA               |
| 7                    | J5977   | 1    | C                          | Consumed   | NA               |
| <b>Total Samples</b> |         | 7    | * "C" = Consumed Container |            |                  |

**It can be done****BATTELLE - NORWELL OPERATIONS  
LIQUID SAMPLE ID FORM****Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | Description               | Volume (mL) | Bottles | *  | Date<br>Initials |
|-------------|---------------------------|-------------|---------|----|------------------|
| CQ753PB-FS  | Procedural Blank          | 250.0       | NA      | -- | 05/09/18 SAS     |
| CQ754LCS-FS | Laboratory Control Sample | 250.0       | NA      | -- | 05/09/18 SAS     |
| J5965-FS    | WGNA-043018-FRB-3103      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5967-FS    | NAWC-043018-FRB-207       | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5969-FS    | WGNA-043018-FRB-3409      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5971-FS    | WGNA-050118-FRB-3385      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5973-FS    | WGNA-050118-FRB-3178      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5975-FS    | NAWC-050118-FRB-304       | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5977-FS    | NAWC-050118-FRB-098       | 250.0       | 1       | C  | 05/09/18 SAS     |

**Comments:**

| Sample ID:  | Comments:                                  |
|-------------|--------------------------------------------|
| CQ753PB-FS  | 1.23g Trizma(170526-01) weighed on BAL-009 |
| CQ754LCS-FS | 1.24g Trizma(170526-01) weighed on BAL-009 |

Samples Assigned By

Stephanie Schultz

Date :

May 9, 2018

\* - "C" = Sample is Consumed



It can be done

## BATTELLE - NORWELL OPERATIONS SURROGATE SPIKE FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | Standard ID | Type   | Vial No. | Vol Added (uL) | Date Spiked/<br>Spiked By | Witn'd By | Comment |
|-------------|-------------|--------|----------|----------------|---------------------------|-----------|---------|
| CQ753PB-FS  | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| CQ754LCS-FS | JV41        | LCS/MS | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| CQ754LCS-FS | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5965-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5967-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5969-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5971-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5973-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5975-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5977-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |

Syringes/Pipettes Used:

| Std ID | Type    | Syr/Pip   |
|--------|---------|-----------|
| JV41   | Pipette | I0793912B |
| JV60   | Pipette | I0793912B |



## BATTELLE - NORWELL OPERATIONS SAMPLE EXTRACTION FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | 1st<br>Extraction | 2nd<br>Extraction | 3rd<br>Extraction | Conc.<br>ID | Turbo<br>°C | Turbo<br>PSI | KD<br>°C | Comment |
|-------------|-------------------|-------------------|-------------------|-------------|-------------|--------------|----------|---------|
| CQ753PB-FS  | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| CQ754LCS-FS | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5965-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5967-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5969-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5971-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5973-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5975-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5977-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |

**Solvents/Reagent Preparations:**

| Name                  | ID          | Expires  | Lot No    | Procedure             | Comments |
|-----------------------|-------------|----------|-----------|-----------------------|----------|
| Pre-packed SPE Column | RP-180509-2 | 05/09/18 | S214-0071 | Pre-packed SPE Column |          |

**Solvents/Reagents:**

| Name                        | Lot No | Comments |
|-----------------------------|--------|----------|
| Methanol (HPLC) (180227-02) | 178212 |          |



It can be done

## BATTELLE - NORWELL OPERATIONS INTERNAL STANDARD SPIKING FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW****(N/A Fraction)**

| Extract Id     | Extr. Vol. (uL) | Added (uL) | Std. Id | Accm . (uL) | Vial No. | Pre Inj. Vol. (uL)^ | Final Dilution* | Date Spiked/ Spiked By | Witn'd By |
|----------------|-----------------|------------|---------|-------------|----------|---------------------|-----------------|------------------------|-----------|
| CQ753PB-FS(0)  | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| CQ754LCS-FS(0) | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5965-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5967-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5969-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5971-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5973-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5975-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |
| J5977-FS(0)    | 950             | 50         | JV59    | 50          | 1        | 1000                | 1.000           | 05/14/18 SAS           | JCT       |

Syringes/Pipettes Used:

| Std ID | Type    | Syr/Pip   |
|--------|---------|-----------|
| JV59   | Pipette | I0793912B |

| Extract Id: | Comments:                                                          |
|-------------|--------------------------------------------------------------------|
| CQ753PB-FS  | Samples reconstituted in 96/4 Methanol/Milli-q Water (RP-180511-2) |

\* - Final Dilution is any HPLC, dilutions, or other manipulation

^ - Pre Injection Volume (PIV) includes any RIS spikes.





**It can be done**

## BATTELLE - NORWELL OPERATIONS EXTRACT - INSTRUMENT FACILITY CUSTODY PAGE

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**

100117920-  
WE04

**18-0312**

**WE04 PFAS Analysis**

**DW**

|                                                    |  |                                               |  |
|----------------------------------------------------|--|-----------------------------------------------|--|
| <b>Purpose:</b> LC-MS/MS TRANSFER                  |  | <b>Last Activity:</b> Prep->Inst              |  |
| <b>Relinquished On/By:</b> May 14 2018 11:13AM SAS |  | <b>Received On/By:</b> May 14 2018 3:22PM DMS |  |
| <b>Relinquished From:</b> Sample Preparation: NA   |  | <b>Received Location:</b> LC Laboratory: NA   |  |
| <b>Relinquish Comment:</b> NA                      |  | <b>Received Comment:</b> NA                   |  |

| No. | BDO-ID:        | PIV: | DF: | Condition: | Custody Comment: |
|-----|----------------|------|-----|------------|------------------|
| 1   | CQ753PB-FS(0)  | 1000 | 1   | Intact     | NA               |
| 2   | CQ754LCS-FS(0) | 1000 | 1   | Intact     | NA               |
| 3   | J5965-FS(0)    | 1000 | 1   | Intact     | NA               |
| 4   | J5967-FS(0)    | 1000 | 1   | Intact     | NA               |
| 5   | J5969-FS(0)    | 1000 | 1   | Intact     | NA               |
| 6   | J5971-FS(0)    | 1000 | 1   | Intact     | NA               |
| 7   | J5973-FS(0)    | 1000 | 1   | Intact     | NA               |
| 8   | J5975-FS(0)    | 1000 | 1   | Intact     | NA               |
| 9   | J5977-FS(0)    | 1000 | 1   | Intact     | NA               |

**Total Extracts:** 9



It can be done

## BATTELLE - NORWELL OPERATIONS PREPARATION EXTRACT SPLIT FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Extract     |   | *  | Extract Date        | Source |   | Initial Extract<br>Vol (uL) | Extract<br>Split | Extract<br>Split | Total<br>Dilution | Date/Initials |
|-------------|---|----|---------------------|--------|---|-----------------------------|------------------|------------------|-------------------|---------------|
| Name        | # |    |                     | Name   | # |                             |                  |                  |                   |               |
| CQ753PB-FS  | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| CQ754LCS-FS | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5965-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5967-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5969-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5971-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5973-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5975-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |
| J5977-FS    | 0 | -- | 5/9/2018 2:42:00 PM | NA     |   | NA                          | NA               | 1.000            | 1.000             | 05/09/18 SAS  |

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] \* [Aliquot Weight (mg)]

Dilution Factor = [Sample Volume (uL) / Aliquot Volume (uL)] \* Prior Dilution Factor

\* - "C" = Extract is Consumed



**BATTELLE - NORWELL OPERATIONS  
MISCELLANEOUS DOCUMENTATION FORM**

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**

100117920-  
WE04

**18-0312**

**WE04 PFAS Analysis**

**DW**

---

Entered By:

On:

---

---

Task Leader Approval:

On:

Supervisor Approval:

On:

PM Approval:

On:

---



## BATTELLE - NORWELL OPERATIONS SAMPLE SPECIFIC COMMENTS

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID:  | Comment:                                           | Date/Initials: |
|-------------|----------------------------------------------------|----------------|
| CQ753PB-FS  | Sample extraction began at 2:42pm for all samples. | 05/09/18 SAS   |
| CQ753PB-FS  | Sample extraction ended at 3:09pm                  | 05/09/18 SAS   |
| CQ754LCS-FS | Sample extraction ended at 3:09pm                  | 05/09/18 SAS   |
| J5965-FS    | Sample extraction ended at 3:05pm                  | 05/09/18 SAS   |
| J5967-FS    | Sample extraction ended at 3:06pm                  | 05/09/18 SAS   |
| J5969-FS    | Sample extraction ended at 3:08pm                  | 05/09/18 SAS   |
| J5971-FS    | Sample extraction ended at 3:09pm                  | 05/09/18 SAS   |
| J5973-FS    | Sample extraction ended at 3:10pm                  | 05/09/18 SAS   |
| J5975-FS    | Sample extraction ended at 3:07pm                  | 05/09/18 SAS   |
| J5977-FS    | Sample extraction ended at 3:06pm                  | 05/09/18 SAS   |

# Analytical Calibrations



## Sequence Report

Created with Analyst Reporter  
Printed: 16/05/2018 6:10:32 PM

| Vial | Laboratory Sample ID | Client Sample ID          | Acquisition Date     | Acquisition Method | Data File    |
|------|----------------------|---------------------------|----------------------|--------------------|--------------|
| 1    | MeOH                 |                           | 5/14/2018 4:18:10 PM | 5-0371.dam         | 18-0313.wiff |
| 2    | JV64                 | L1                        | 5/14/2018 4:27:07 PM | 5-0371.dam         | 18-0313.wiff |
| 3    | JV65                 | L2                        | 5/14/2018 4:36:03 PM | 5-0371.dam         | 18-0313.wiff |
| 4    | JV66                 | L3                        | 5/14/2018 4:45:01 PM | 5-0371.dam         | 18-0313.wiff |
| 5    | JV67                 | L4                        | 5/14/2018 4:53:56 PM | 5-0371.dam         | 18-0313.wiff |
| 6    | JV68                 | L5                        | 5/14/2018 5:02:52 PM | 5-0371.dam         | 18-0313.wiff |
| 7    | JV69                 | L6                        | 5/14/2018 5:11:47 PM | 5-0371.dam         | 18-0313.wiff |
| 8    | JV70                 | L7                        | 5/14/2018 5:20:42 PM | 5-0371.dam         | 18-0313.wiff |
| 9    | JV71                 | L8                        | 5/14/2018 5:29:36 PM | 5-0371.dam         | 18-0313.wiff |
| 10   | JV72                 | L9                        | 5/14/2018 5:38:30 PM | 5-0371.dam         | 18-0313.wiff |
| 11   | JV63 ICC             | ICC                       | 5/14/2018 5:47:28 PM | 5-0371.dam         | 18-0313.wiff |
| 1    | MeOH                 |                           | 5/14/2018 5:56:24 PM | 5-0371.dam         | 18-0313.wiff |
| 12   | CQ753PB-FS(0)        | Procedural Blank          | 5/14/2018 6:05:20 PM | 5-0371.dam         | 18-0312.wiff |
| 13   | CQ754LCS-FS(0)       | Laboratory Control Sample | 5/14/2018 6:14:15 PM | 5-0371.dam         | 18-0312.wiff |
| 14   | J5965-FS(0)          | WGNA-043018-FRB-3103      | 5/14/2018 6:23:10 PM | 5-0371.dam         | 18-0312.wiff |
| 15   | J5967-FS(0)          | NAWC-043018-FRB-207       | 5/14/2018 6:32:06 PM | 5-0371.dam         | 18-0312.wiff |
| 16   | J5969-FS(0)          | WGNA-043018-FRB-3409      | 5/14/2018 6:41:03 PM | 5-0371.dam         | 18-0312.wiff |
| 17   | J5971-FS(0)          | WGNA-050118-FRB-3385      | 5/14/2018 6:49:59 PM | 5-0371.dam         | 18-0312.wiff |
| 18   | J5973-FS(0)          | WGNA-050118-FRB-3178      | 5/14/2018 6:58:53 PM | 5-0371.dam         | 18-0312.wiff |
| 19   | J5975-FS(0)          | NAWC-050118-FRB-304       | 5/14/2018 7:07:47 PM | 5-0371.dam         | 18-0312.wiff |
| 20   | J5977-FS(0)          | NAWC-050118-FRB-098       | 5/14/2018 7:16:43 PM | 5-0371.dam         | 18-0312.wiff |
| 6    | JV68 CCV             | CCV                       | 5/14/2018 7:25:38 PM | 5-0371.dam         | 18-0312.wiff |



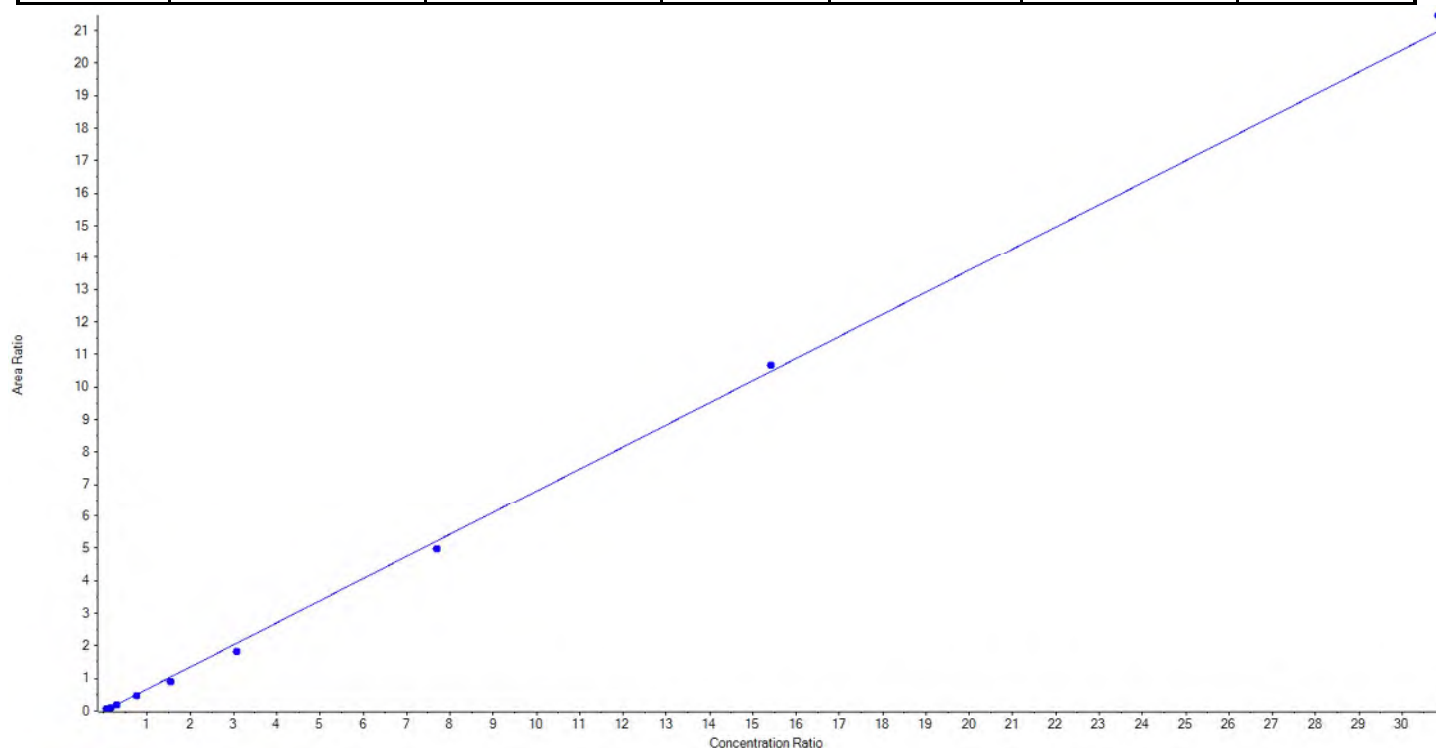
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFBS_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 298.9 / 80.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.68075x + -0.01541$  ( $r = 0.99887$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.15               | 28.045095               | 126.6        |
| 3    | JV65        | L2        | True          | 44.30               | 48.489227               | 109.5        |
| 4    | JV66        | L3        | True          | 88.60               | 86.791512               | 98.0         |
| 5    | JV67        | L4        | True          | 221.50              | 206.430305              | 93.2         |
| 6    | JV68        | L5        | True          | 443.00              | 379.492245              | 85.7         |
| 7    | JV69        | L6        | True          | 885.00              | 778.046261              | 87.9         |
| 8    | JV70        | L7        | True          | 2212.50             | 2102.243811             | 95.0         |
| 9    | JV71        | L8        | True          | 4425.00             | 4507.247954             | 101.9        |
| 10   | JV72        | L9        | True          | 8850.00             | 9055.263589             | 102.3        |







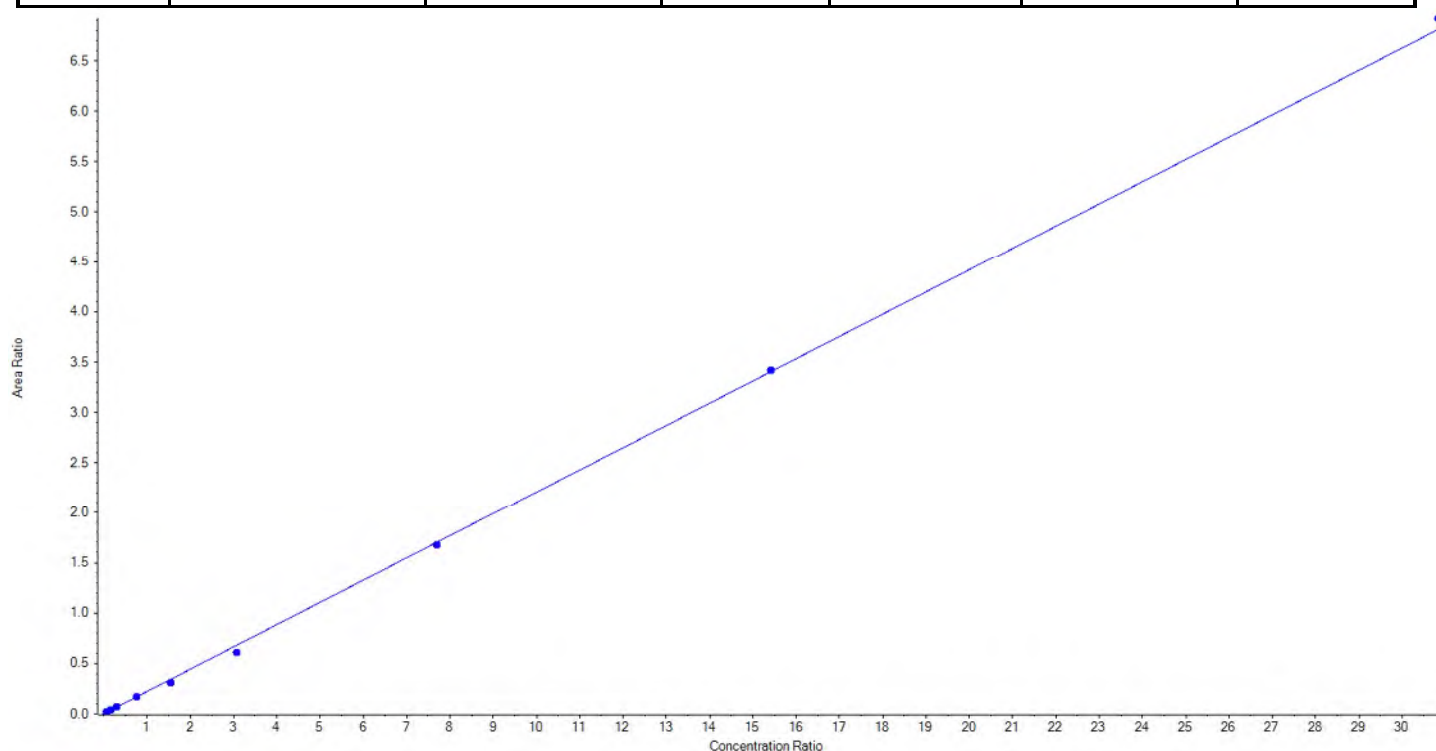
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFBS_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 298.9 / 99.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.22086x + 3.23106e-4$  ( $r = 0.99946$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.15               | 25.833478               | 116.6        |
| 3    | JV65        | L2        | True          | 44.30               | 47.169014               | 106.5        |
| 4    | JV66        | L3        | True          | 88.60               | 84.473566               | 95.3         |
| 5    | JV67        | L4        | True          | 221.50              | 224.337631              | 101.3        |
| 6    | JV68        | L5        | True          | 443.00              | 398.532474              | 90.0         |
| 7    | JV69        | L6        | True          | 885.00              | 793.604509              | 89.7         |
| 8    | JV70        | L7        | True          | 2212.50             | 2179.802809             | 98.5         |
| 9    | JV71        | L8        | True          | 4425.00             | 4448.710926             | 100.5        |
| 10   | JV72        | L9        | True          | 8850.00             | 8989.585593             | 101.6        |





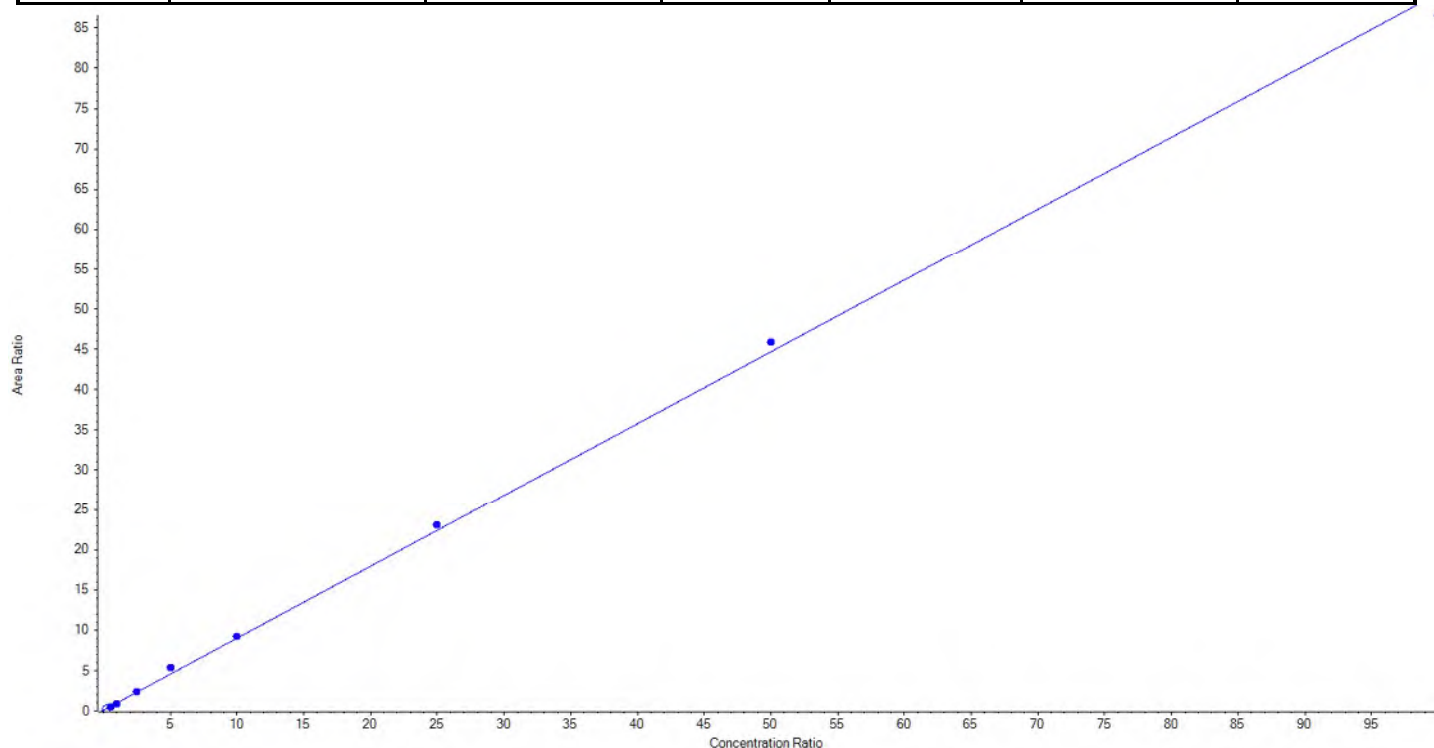
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 313.0 / 269.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.89190x + 0.09470$  ( $r = 0.99902$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 18.657460               | 74.6         |
| 3    | JV65        | L2        | True          | 50.00               | 42.893737               | 85.8         |
| 4    | JV66        | L3        | True          | 100.00              | 88.393959               | 88.4         |
| 5    | JV67        | L4        | True          | 250.00              | 258.426345              | 103.4        |
| 6    | JV68        | L5        | True          | 500.00              | 590.552971              | 118.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1017.252318             | 101.7        |
| 8    | JV70        | L7        | True          | 2500.00             | 2574.231542             | 103.0        |
| 9    | JV71        | L8        | True          | 5000.00             | 5136.044879             | 102.7        |
| 10   | JV72        | L9        | True          | 10000.00            | 9692.204248             | 96.9         |





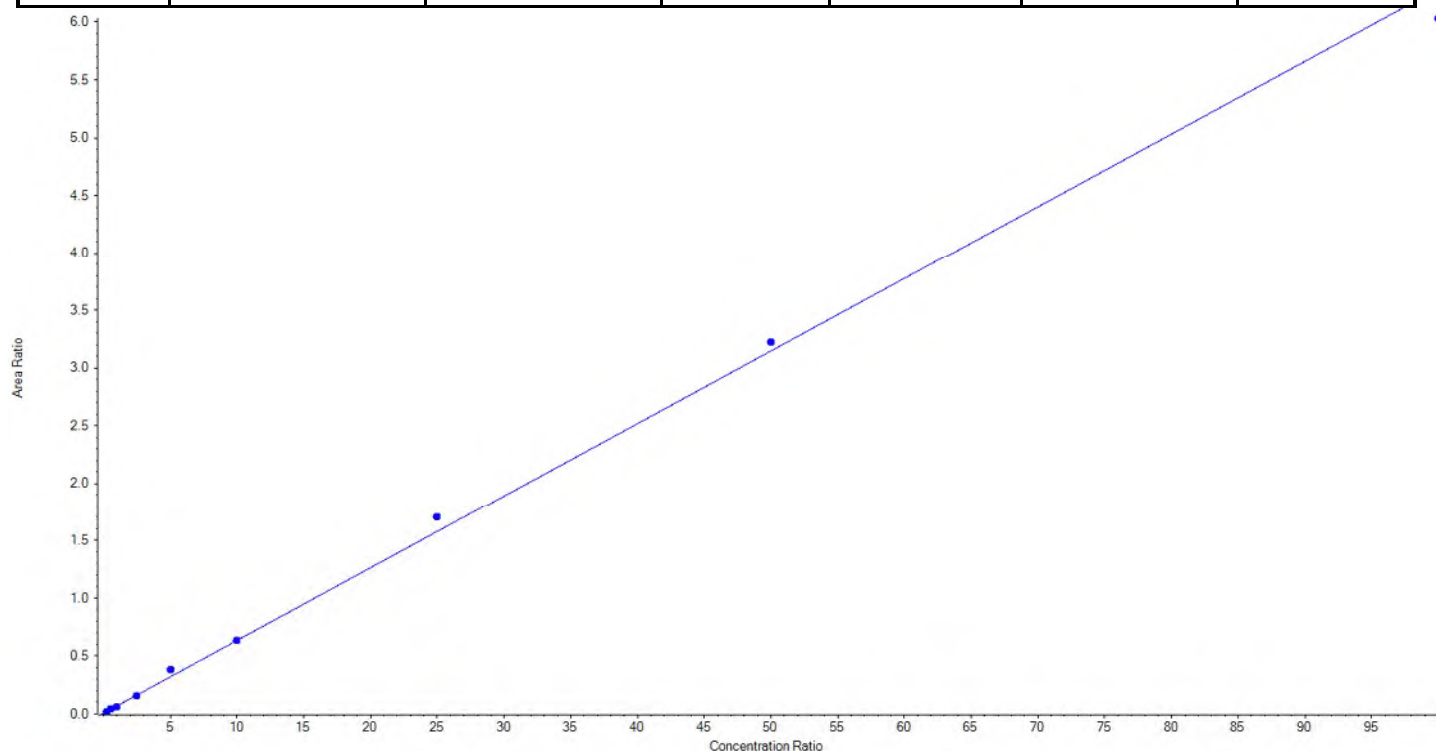
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 313.0 / 119.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.06281x + 0.00625$  ( $r = 0.99818$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 15.890183               | 63.6         |
| 3    | JV65        | L2        | True          | 50.00               | 63.552557               | 127.1        |
| 4    | JV66        | L3        | True          | 100.00              | 85.128911               | 85.1         |
| 5    | JV67        | L4        | True          | 250.00              | 244.158146              | 97.7         |
| 6    | JV68        | L5        | True          | 500.00              | 602.362054              | 120.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 994.796286              | 99.5         |
| 8    | JV70        | L7        | True          | 2500.00             | 2705.114914             | 108.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 5124.538112             | 102.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9589.458837             | 95.9         |





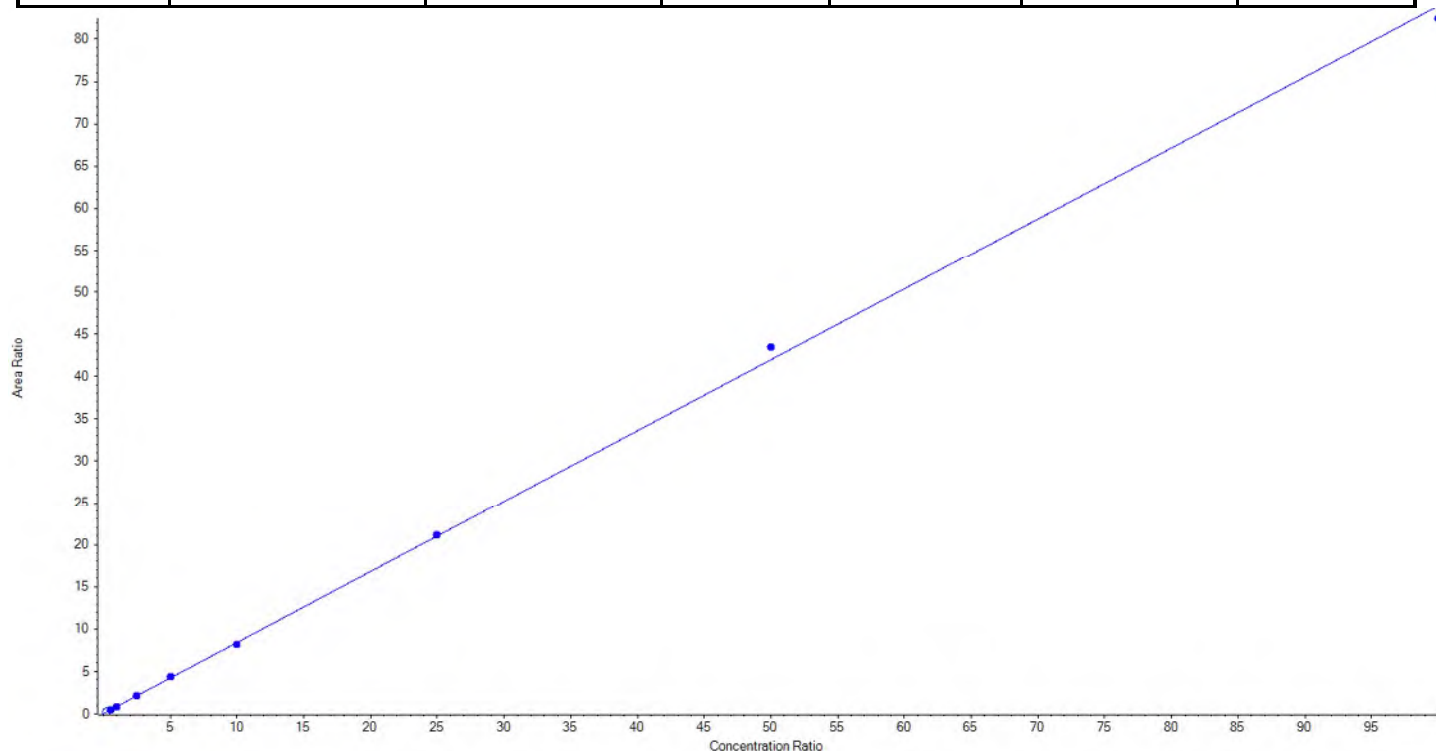
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHpA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 363.0 / 319.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.83876x + 0.04371$  ( $r = 0.99963$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 19.315174               | 77.3         |
| 3    | JV65        | L2        | True          | 50.00               | 54.414136               | 108.8        |
| 4    | JV66        | L3        | True          | 100.00              | 87.171830               | 87.2         |
| 5    | JV67        | L4        | True          | 250.00              | 253.853561              | 101.5        |
| 6    | JV68        | L5        | True          | 500.00              | 513.574414              | 102.7        |
| 7    | JV69        | L6        | True          | 1000.00             | 973.658392              | 97.4         |
| 8    | JV70        | L7        | True          | 2500.00             | 2512.774114             | 100.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5182.125230             | 103.6        |
| 10   | JV72        | L9        | True          | 10000.00            | 9822.428323             | 98.2         |





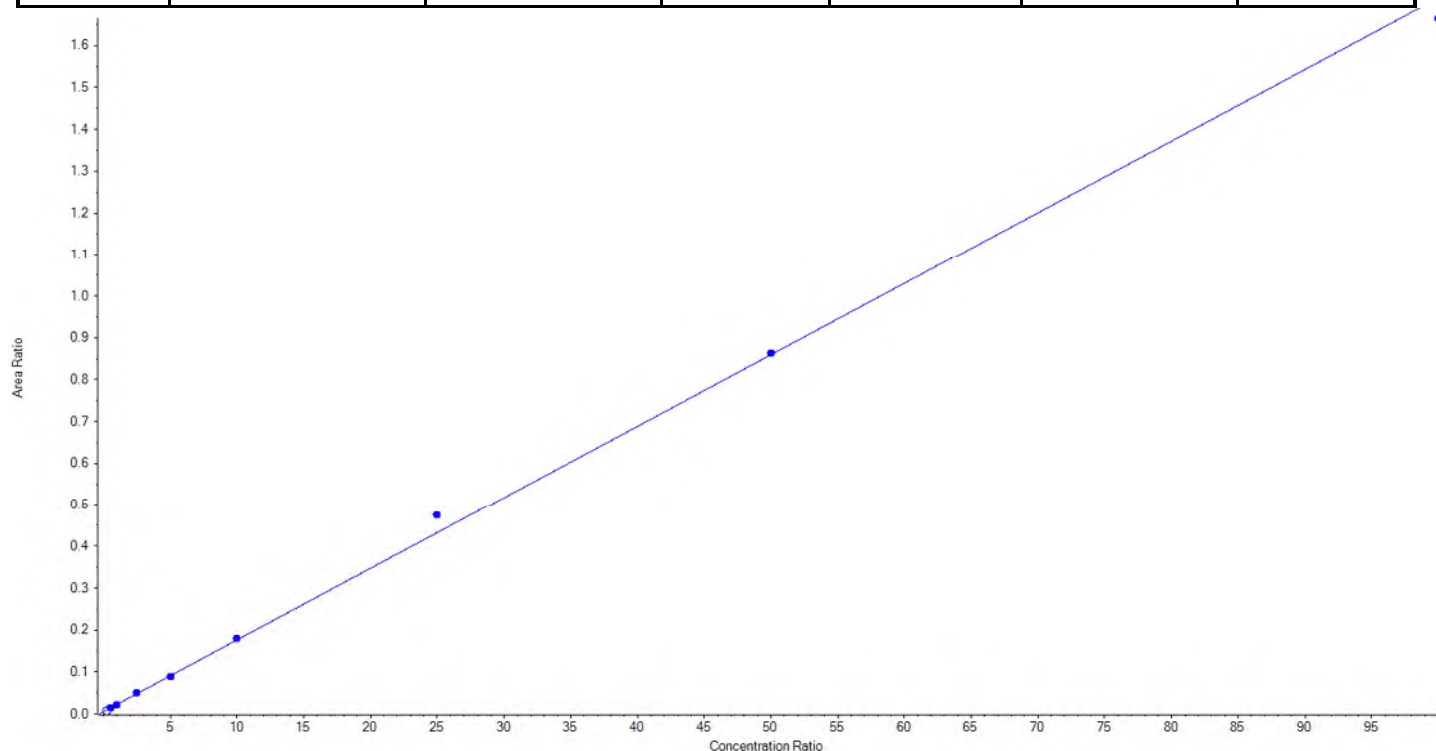
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHpA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 363.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.01708x + 0.00552$  ( $r = 0.99897$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 10.338123               | 41.4         |
| 3    | JV65        | L2        | True          | 50.00               | 48.862884               | 97.7         |
| 4    | JV66        | L3        | True          | 100.00              | 87.168294               | 87.2         |
| 5    | JV67        | L4        | True          | 250.00              | 268.362349              | 107.3        |
| 6    | JV68        | L5        | True          | 500.00              | 490.348842              | 98.1         |
| 7    | JV69        | L6        | True          | 1000.00             | 1022.051246             | 102.2        |
| 8    | JV70        | L7        | True          | 2500.00             | 2747.089212             | 109.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 5024.136423             | 100.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9711.980749             | 97.1         |





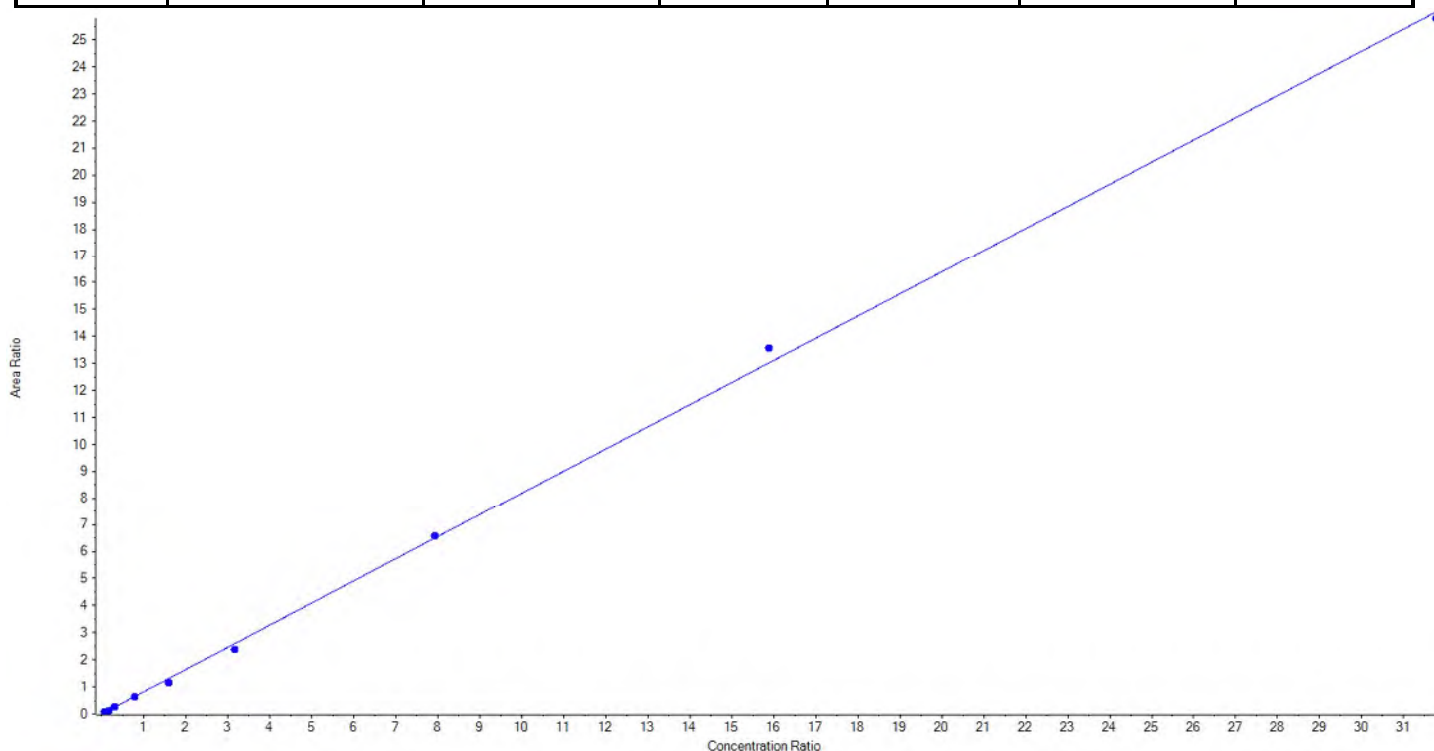
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxS_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 399.0 / 80.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.81953x + -0.00434$  ( $r = 0.99932$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.80               | 25.556500               | 112.1        |
| 3    | JV65        | L2        | True          | 45.60               | 45.328748               | 99.4         |
| 4    | JV66        | L3        | True          | 91.20               | 96.635739               | 106.0        |
| 5    | JV67        | L4        | True          | 228.00              | 225.752955              | 99.0         |
| 6    | JV68        | L5        | True          | 456.00              | 398.622698              | 87.4         |
| 7    | JV69        | L6        | True          | 912.00              | 837.957539              | 91.9         |
| 8    | JV70        | L7        | True          | 2280.00             | 2303.521436             | 101.0        |
| 9    | JV71        | L8        | True          | 4560.00             | 4749.618935             | 104.2        |
| 10   | JV72        | L9        | True          | 9120.00             | 9032.605450             | 99.0         |





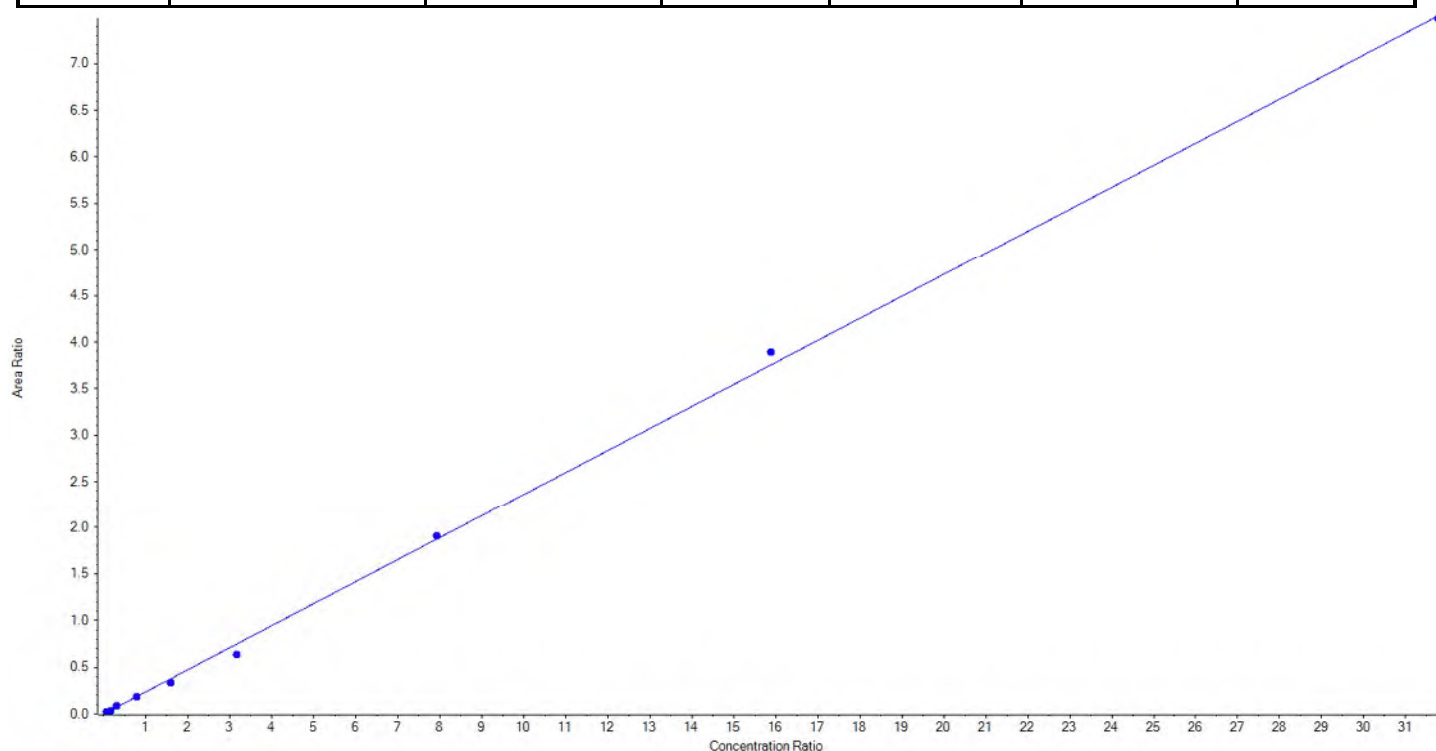
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxS_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 399.0 / 99.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.23641x + -9.70194e-4$  ( $r = 0.99901$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.80               | 24.128618               | 105.8        |
| 3    | JV65        | L2        | True          | 45.60               | 45.498258               | 99.8         |
| 4    | JV66        | L3        | True          | 91.20               | 106.207971              | 116.5        |
| 5    | JV67        | L4        | True          | 228.00              | 222.356004              | 97.5         |
| 6    | JV68        | L5        | True          | 456.00              | 410.686463              | 90.1         |
| 7    | JV69        | L6        | True          | 912.00              | 779.306332              | 85.5         |
| 8    | JV70        | L7        | True          | 2280.00             | 2318.419291             | 101.7        |
| 9    | JV71        | L8        | True          | 4560.00             | 4724.397363             | 103.6        |
| 10   | JV72        | L9        | True          | 9120.00             | 9084.599701             | 99.6         |







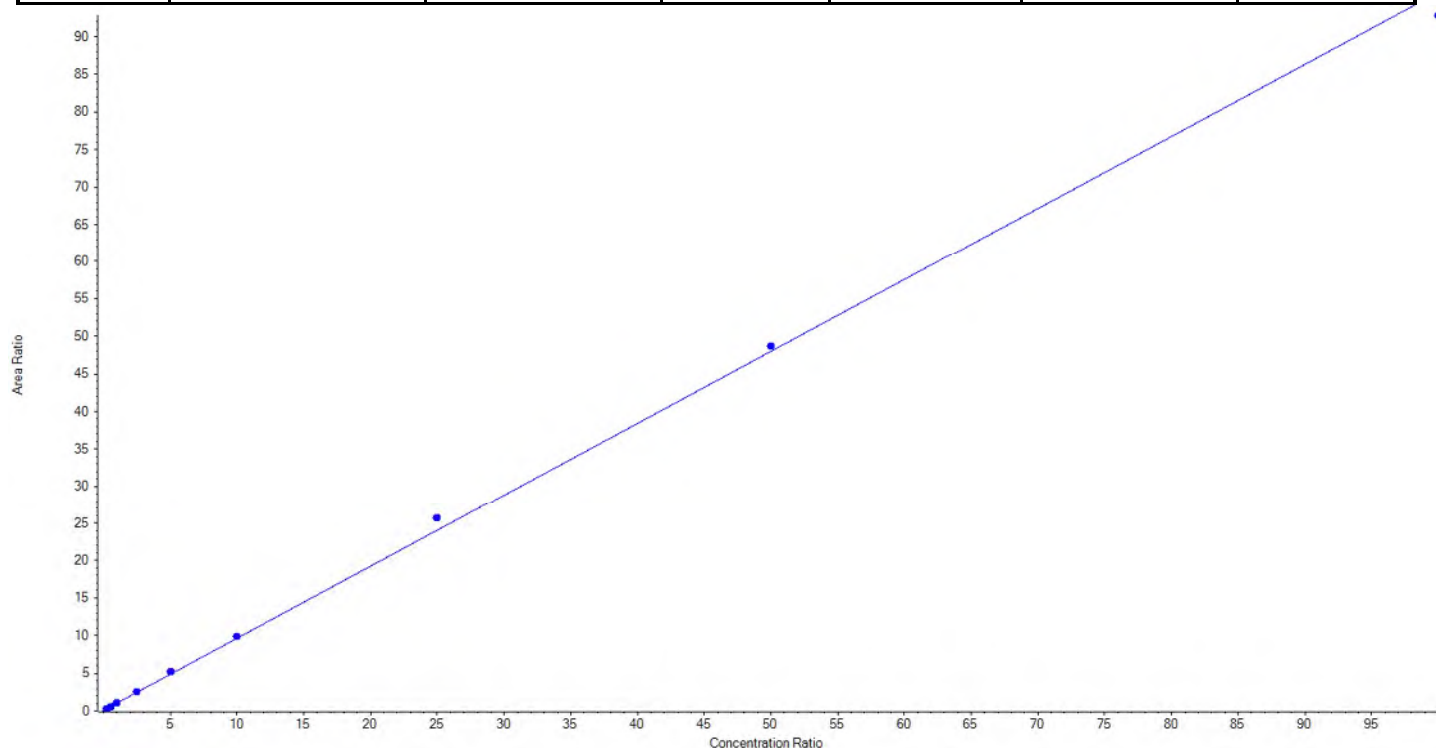
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOA_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 413.0 / 369.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.95821 x + 0.07420$  ( $r = 0.99920$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 20.271455               | 81.1         |
| 3    | JV65        | L2        | True          | 50.00               | 48.064799               | 96.1         |
| 4    | JV66        | L3        | True          | 100.00              | 104.359044              | 104.4        |
| 5    | JV67        | L4        | True          | 250.00              | 254.296931              | 101.7        |
| 6    | JV68        | L5        | True          | 500.00              | 542.897965              | 108.6        |
| 7    | JV69        | L6        | True          | 1000.00             | 1028.463388             | 102.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2676.545515             | 107.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5071.800474             | 101.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9678.300429             | 96.8         |





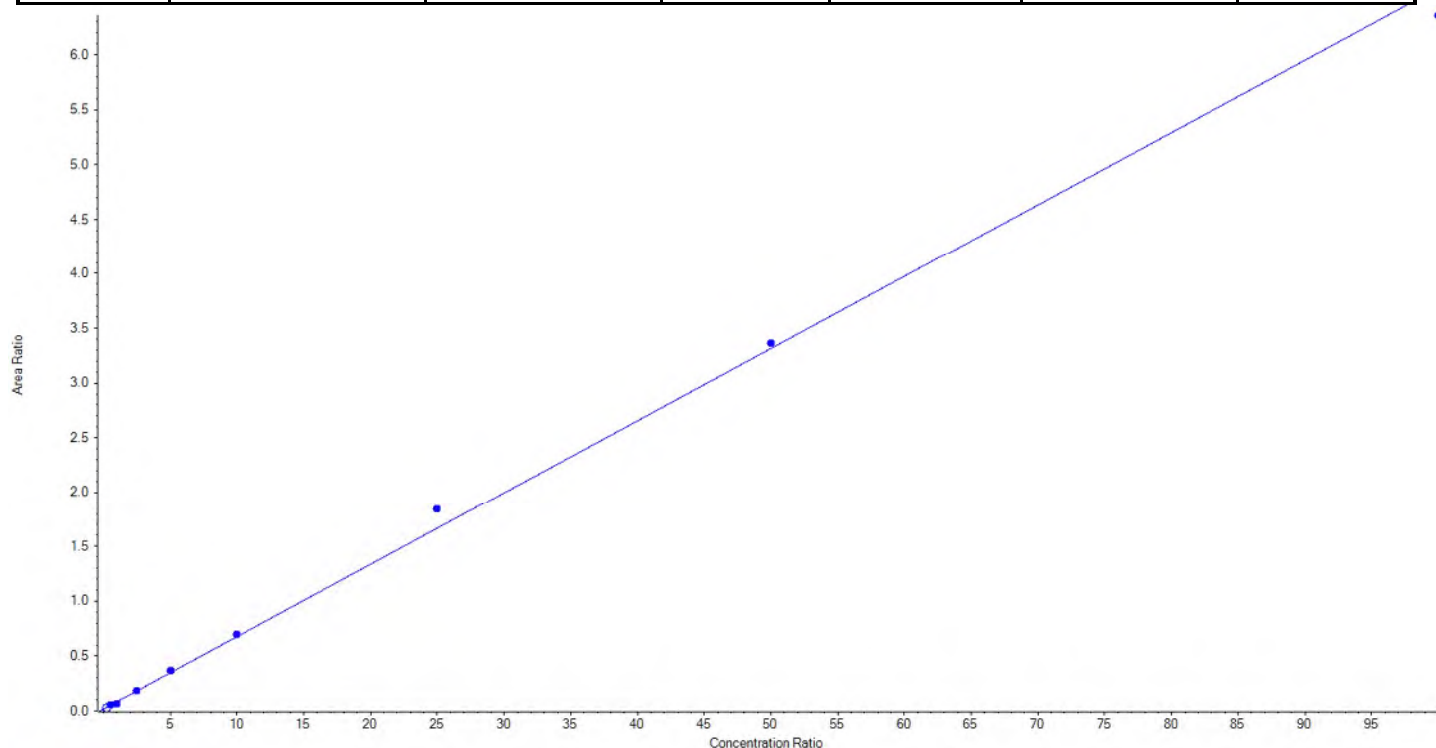
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOA_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 413.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.06594 x + 0.01732$  ( $r = 0.99846$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 8.864133                | 35.5         |
| 3    | JV65        | L2        | True          | 50.00               | 53.444479               | 106.9        |
| 4    | JV66        | L3        | True          | 100.00              | 72.590674               | 72.6         |
| 5    | JV67        | L4        | True          | 250.00              | 257.344048              | 102.9        |
| 6    | JV68        | L5        | True          | 500.00              | 535.062840              | 107.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 1023.026817             | 102.3        |
| 8    | JV70        | L7        | True          | 2500.00             | 2763.902729             | 110.6        |
| 9    | JV71        | L8        | True          | 5000.00             | 5076.510630             | 101.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9618.117783             | 96.2         |





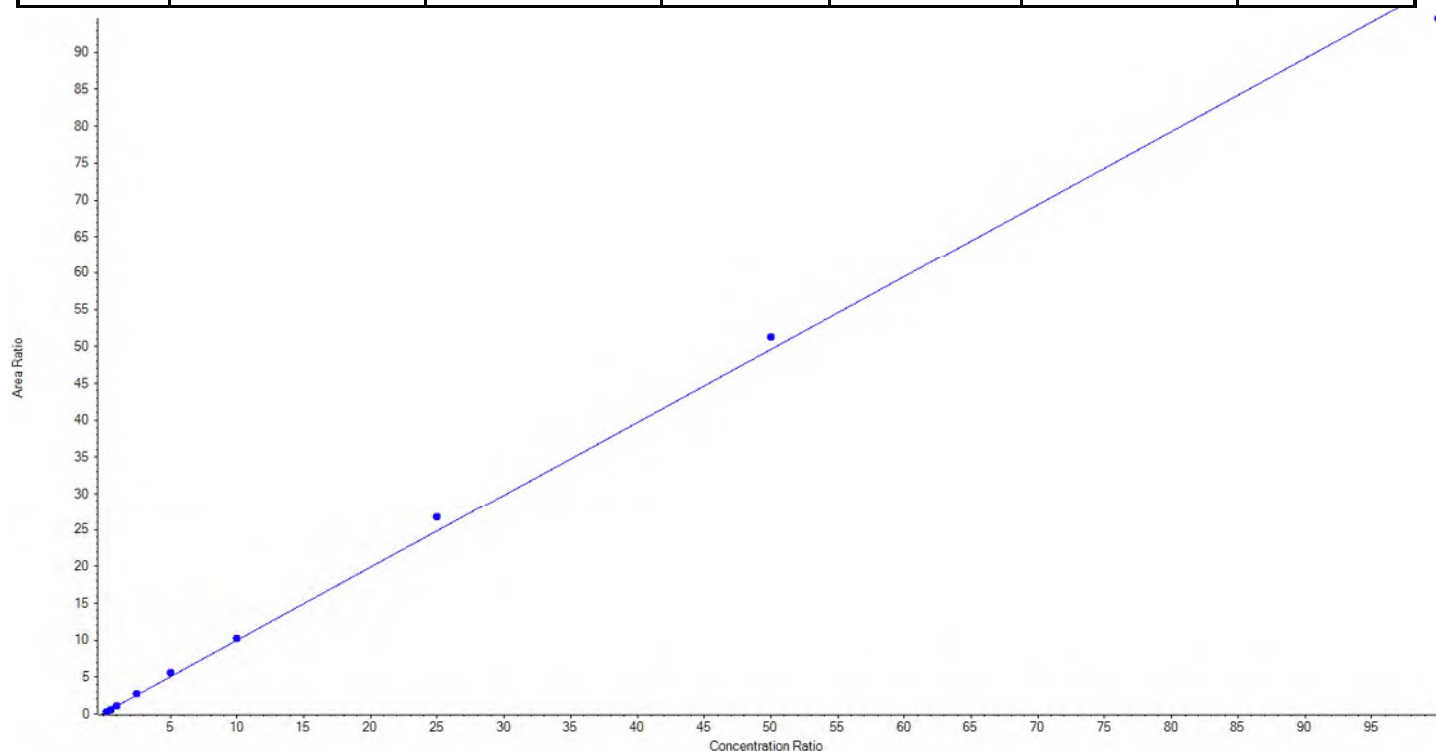
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFNA_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 463.0 / 419.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.99005x + 0.08354$  ( $r = 0.99862$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 18.792753               | 75.2         |
| 3    | JV65        | L2        | True          | 50.00               | 50.077219               | 100.2        |
| 4    | JV66        | L3        | True          | 100.00              | 97.651904               | 97.7         |
| 5    | JV67        | L4        | True          | 250.00              | 265.634549              | 106.3        |
| 6    | JV68        | L5        | True          | 500.00              | 556.615759              | 111.3        |
| 7    | JV69        | L6        | True          | 1000.00             | 1028.511506             | 102.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2695.858545             | 107.8        |
| 9    | JV71        | L8        | True          | 5000.00             | 5164.160418             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9547.697347             | 95.5         |





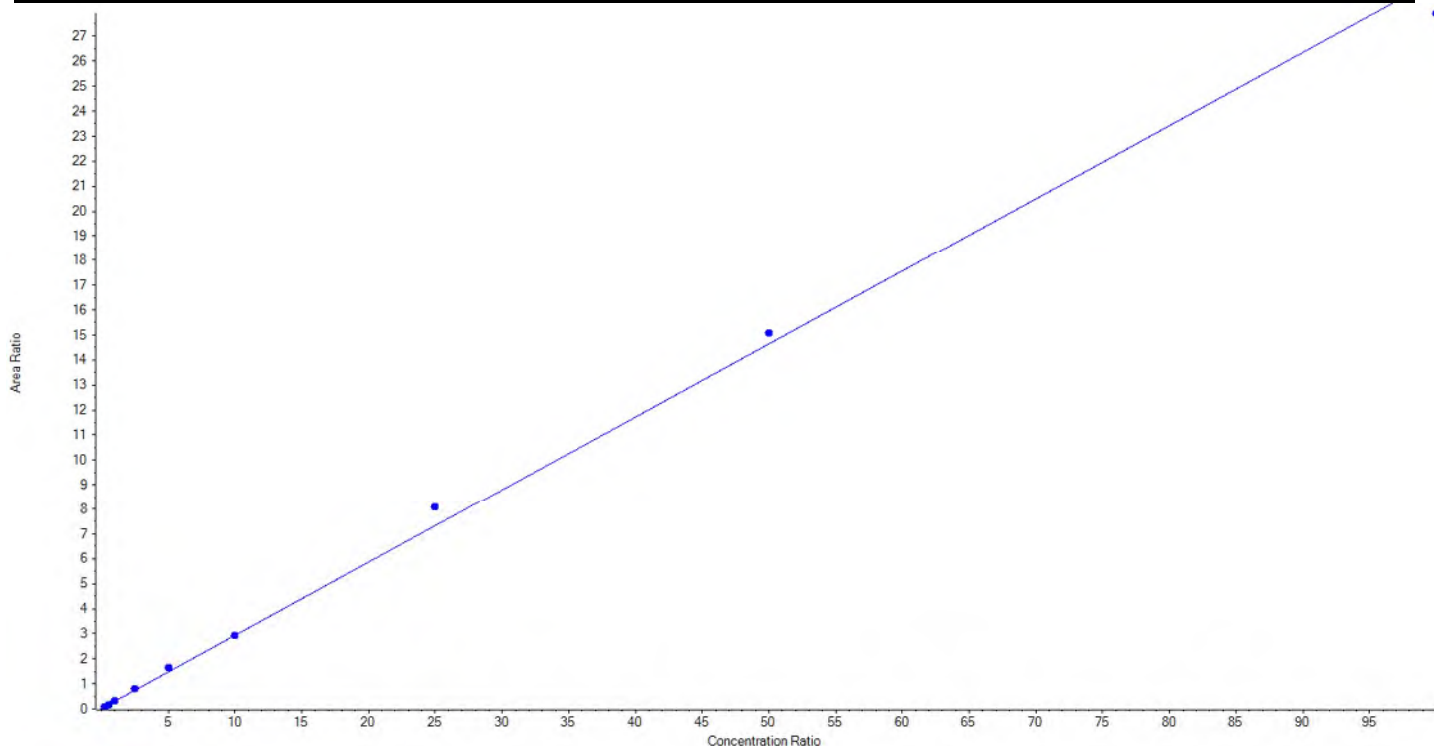
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFNA_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 463.0 / 219.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.29260x + 0.01417$  ( $r = 0.99832$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 18.357615               | 73.4         |
| 3    | JV65        | L2        | True          | 50.00               | 50.945275               | 101.9        |
| 4    | JV66        | L3        | True          | 100.00              | 98.707450               | 98.7         |
| 5    | JV67        | L4        | True          | 250.00              | 267.249370              | 106.9        |
| 6    | JV68        | L5        | True          | 500.00              | 552.006190              | 110.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1000.117057             | 100.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2760.876412             | 110.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 5145.638736             | 102.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9531.101896             | 95.3         |





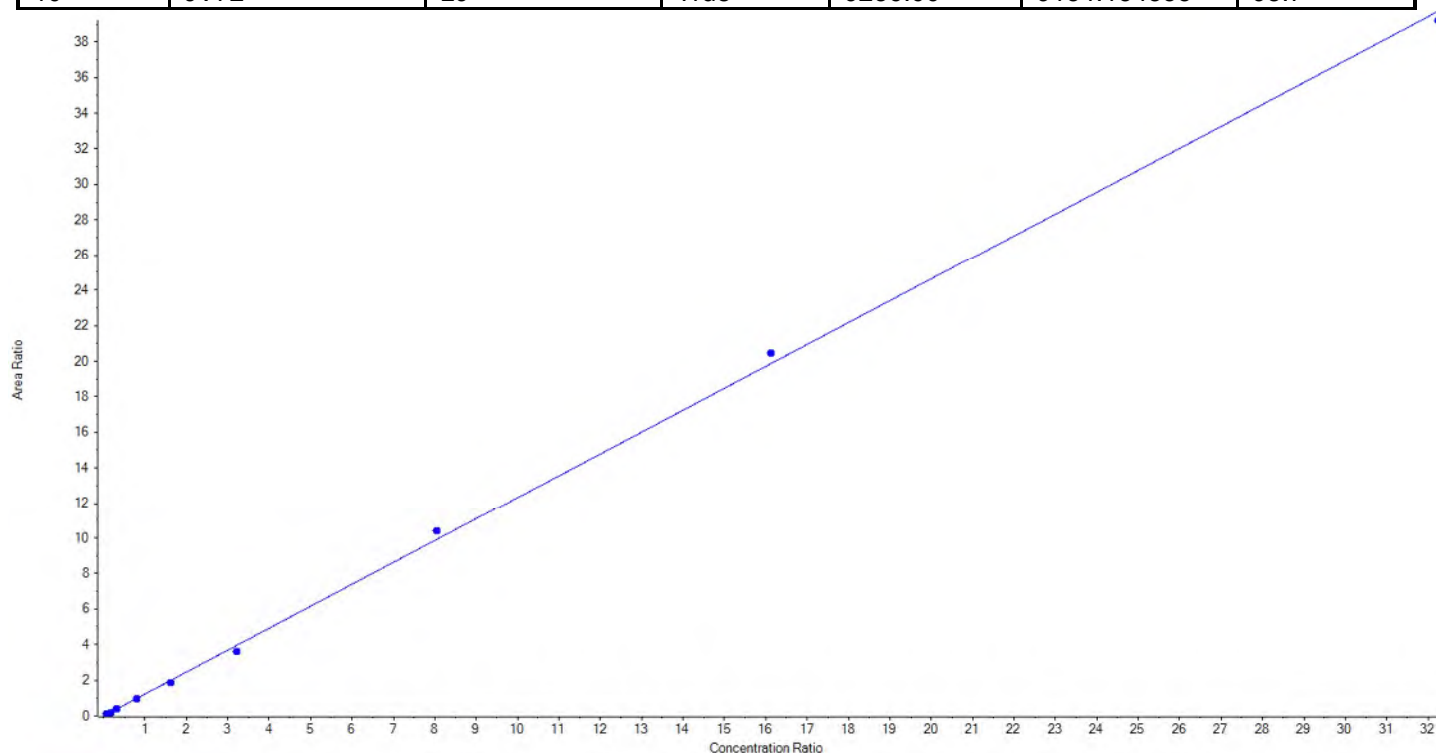
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOS_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 499.0 / 80.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.23183x + -0.00456$  ( $r = 0.99934$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 23.15               | 28.031094               | 121.1        |
| 3    | JV65        | L2        | True          | 46.30               | 42.301066               | 91.4         |
| 4    | JV66        | L3        | True          | 92.60               | 90.970659               | 98.2         |
| 5    | JV67        | L4        | True          | 231.50              | 230.459461              | 99.6         |
| 6    | JV68        | L5        | True          | 463.00              | 428.901519              | 92.6         |
| 7    | JV69        | L6        | True          | 925.00              | 840.100698              | 90.8         |
| 8    | JV70        | L7        | True          | 2314.00             | 2424.048404             | 104.8        |
| 9    | JV71        | L8        | True          | 4628.00             | 4760.602564             | 102.9        |
| 10   | JV72        | L9        | True          | 9256.00             | 9134.134535             | 98.7         |





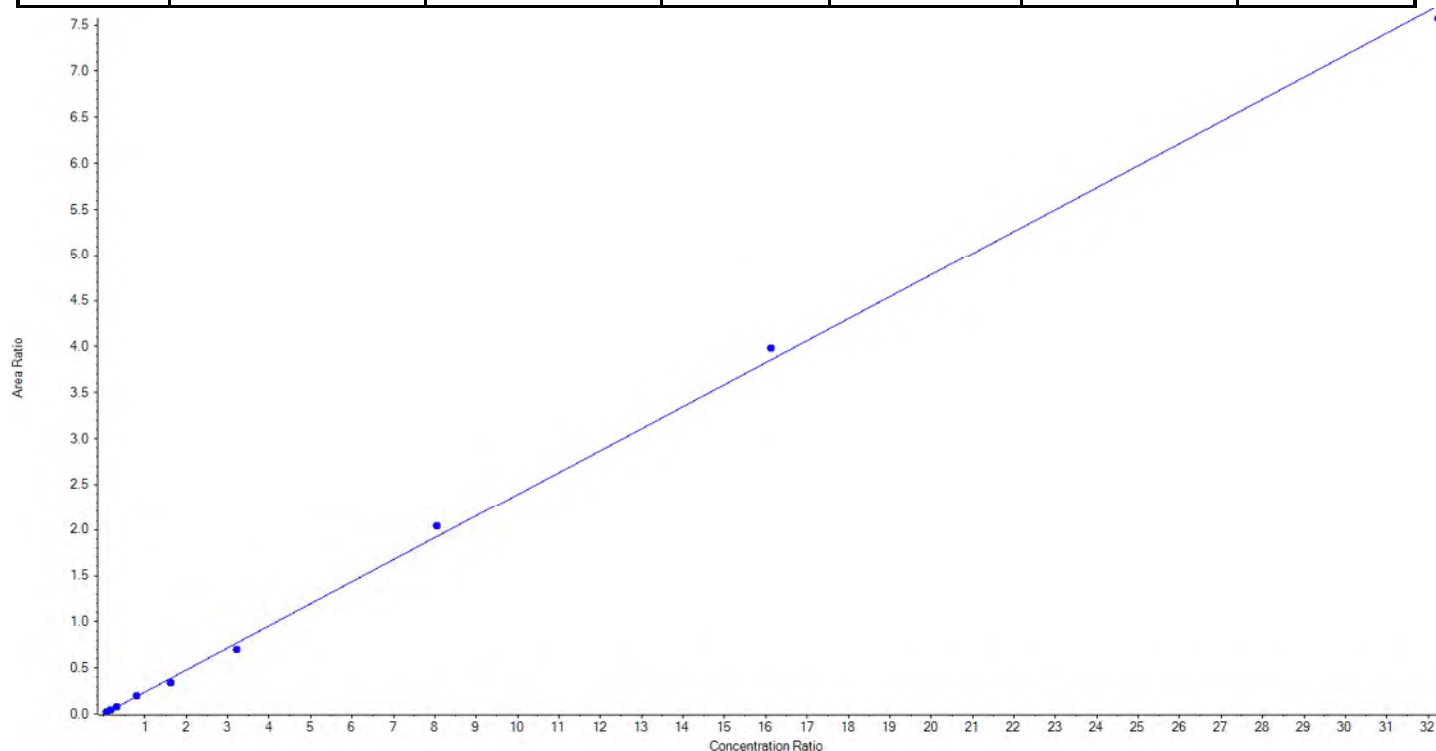
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOS_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 499.0 / 99.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.23915x + -0.00150$  ( $r = 0.99909$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 23.15               | 23.346458               | 100.9        |
| 3    | JV65        | L2        | True          | 46.30               | 50.287062               | 108.6        |
| 4    | JV66        | L3        | True          | 92.60               | 92.083626               | 99.4         |
| 5    | JV67        | L4        | True          | 231.50              | 241.652806              | 104.4        |
| 6    | JV68        | L5        | True          | 463.00              | 409.963845              | 88.6         |
| 7    | JV69        | L6        | True          | 925.00              | 839.354013              | 90.7         |
| 8    | JV70        | L7        | True          | 2314.00             | 2449.080596             | 105.8        |
| 9    | JV71        | L8        | True          | 4628.00             | 4785.237481             | 103.4        |
| 10   | JV72        | L9        | True          | 9256.00             | 9088.544113             | 98.2         |





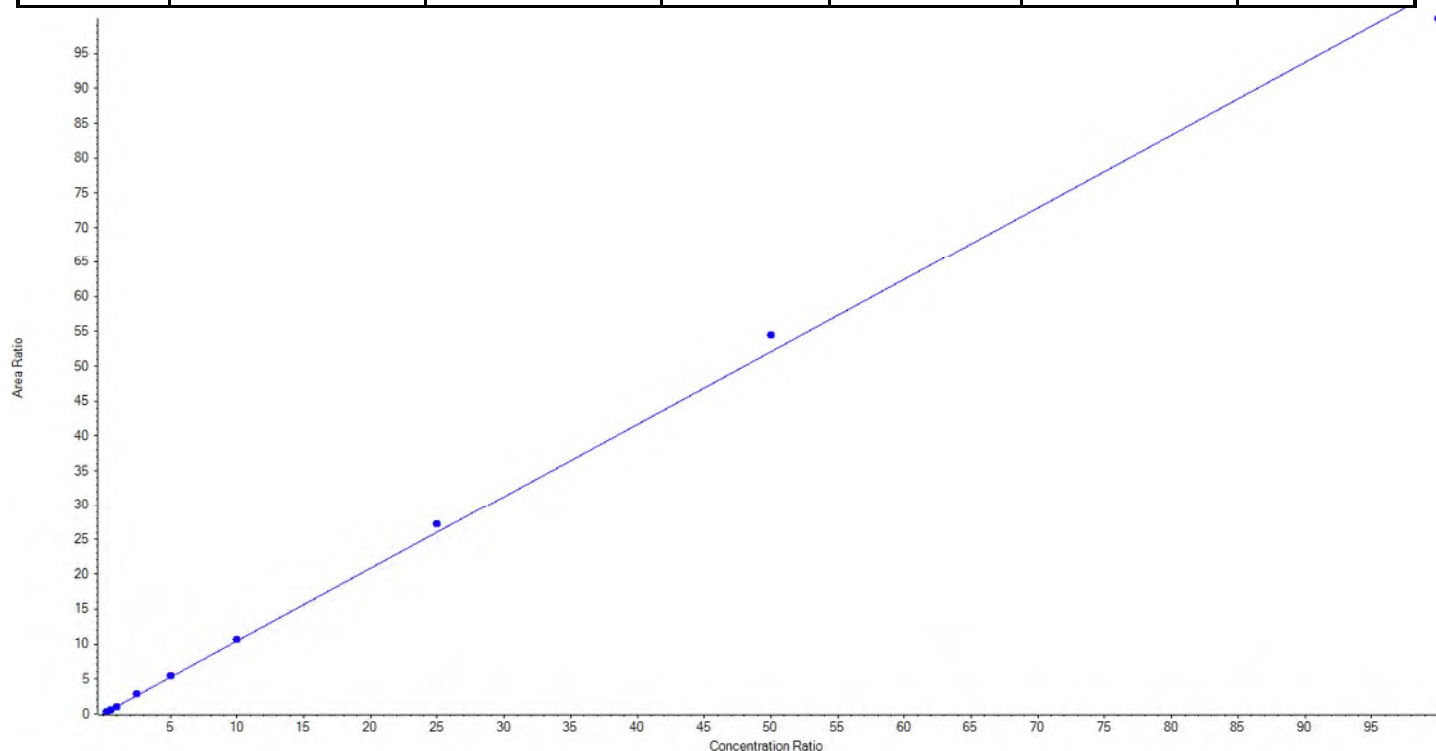
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDA_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 513.0 / 469.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.04056x + 0.03653$  ( $r = 0.99905$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.617757               | 86.5         |
| 3    | JV65        | L2        | True          | 50.00               | 46.915581               | 93.8         |
| 4    | JV66        | L3        | True          | 100.00              | 98.528321               | 98.5         |
| 5    | JV67        | L4        | True          | 250.00              | 274.358579              | 109.7        |
| 6    | JV68        | L5        | True          | 500.00              | 522.068312              | 104.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1020.948522             | 102.1        |
| 8    | JV70        | L7        | True          | 2500.00             | 2607.612929             | 104.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5228.352489             | 104.6        |
| 10   | JV72        | L9        | True          | 10000.00            | 9604.597509             | 96.1         |







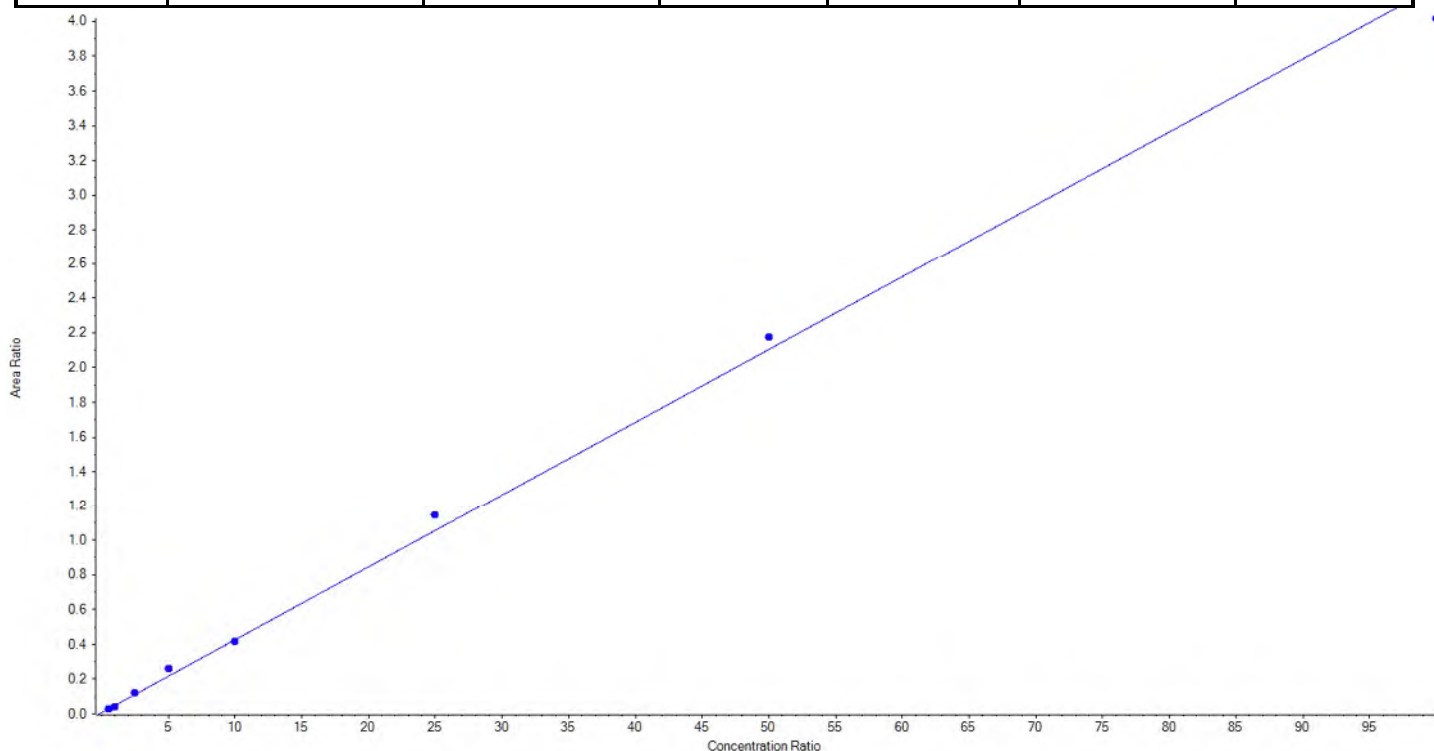
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDA_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 513.0 / 219.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.04197x + 0.00666$  ( $r = 0.99799$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | N/A                     | N/A          |
| 3    | JV65        | L2        | True          | 50.00               | 46.777482               | 93.6         |
| 4    | JV66        | L3        | True          | 100.00              | 74.434538               | 74.4         |
| 5    | JV67        | L4        | True          | 250.00              | 267.766863              | 107.1        |
| 6    | JV68        | L5        | True          | 500.00              | 598.449884              | 119.7        |
| 7    | JV69        | L6        | True          | 1000.00             | 978.090466              | 97.8         |
| 8    | JV70        | L7        | True          | 2500.00             | 2713.219176             | 108.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5166.334700             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9554.926891             | 95.6         |





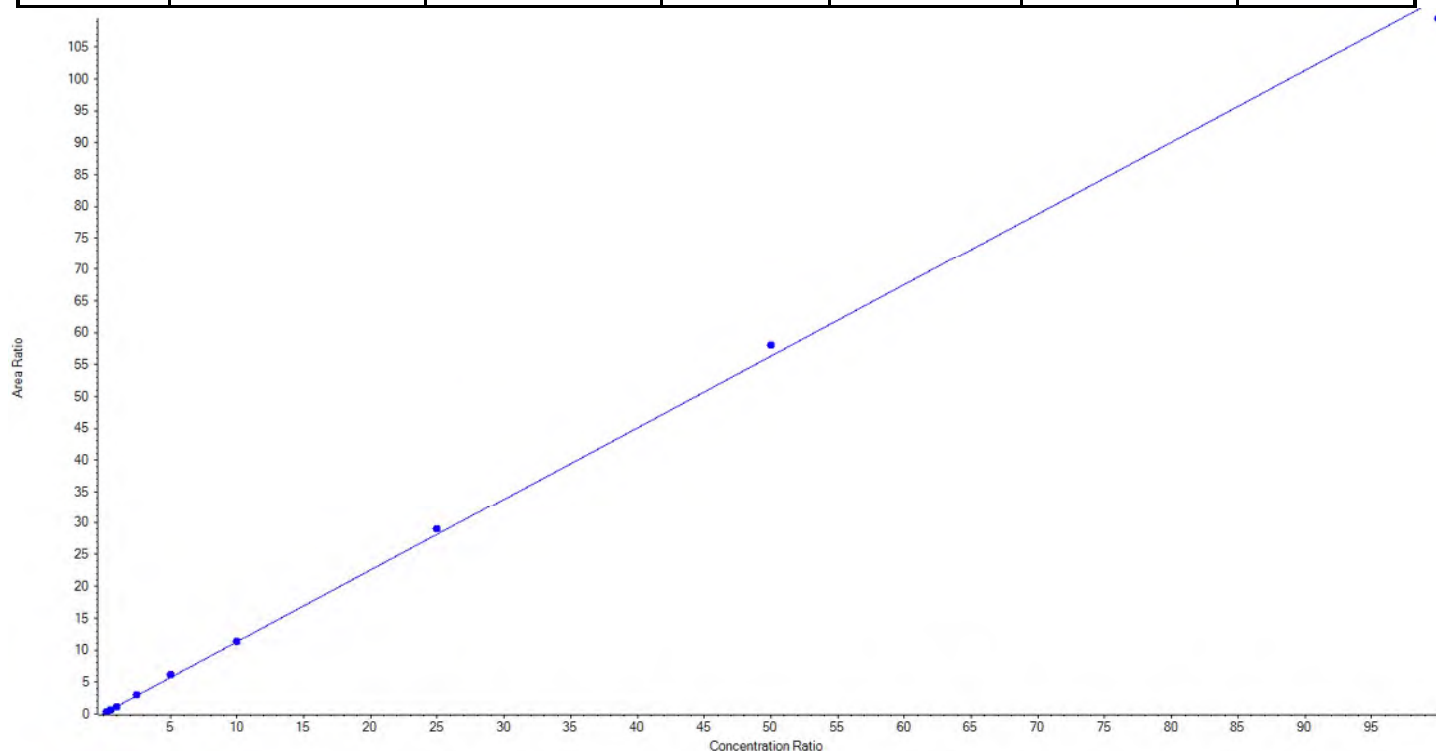
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFUnA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 563.0 / 519.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.12524 x + 0.05385$  ( $r = 0.99945$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 24.089066               | 96.4         |
| 3    | JV65        | L2        | True          | 50.00               | 45.924072               | 91.9         |
| 4    | JV66        | L3        | True          | 100.00              | 93.739853               | 93.7         |
| 5    | JV67        | L4        | True          | 250.00              | 263.505185              | 105.4        |
| 6    | JV68        | L5        | True          | 500.00              | 546.212628              | 109.2        |
| 7    | JV69        | L6        | True          | 1000.00             | 1000.964662             | 100.1        |
| 8    | JV70        | L7        | True          | 2500.00             | 2576.763887             | 103.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5150.610976             | 103.0        |
| 10   | JV72        | L9        | True          | 10000.00            | 9723.189670             | 97.2         |





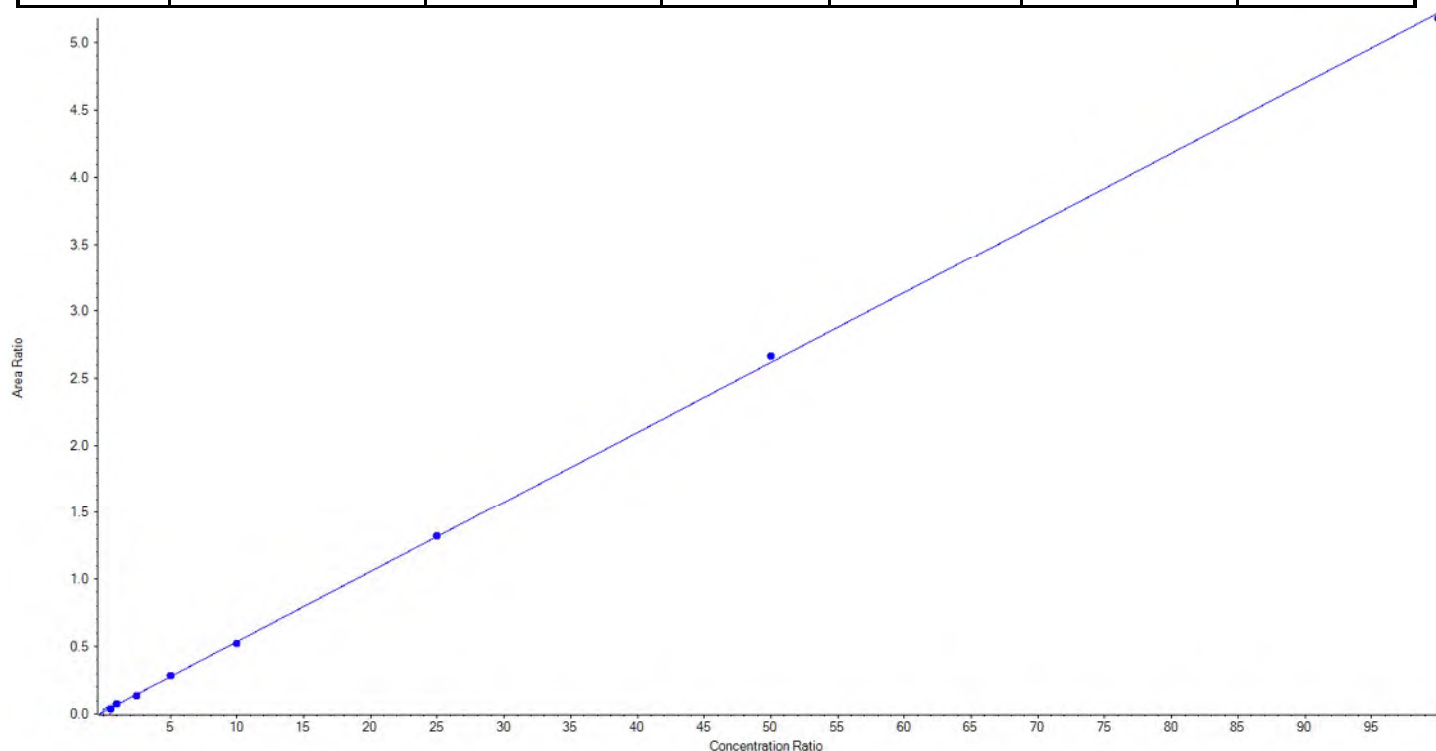
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFUnA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 563.0 / 269.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.05204 x + 0.01541$  ( $r = 0.99984$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 0.630758                | 2.5          |
| 3    | JV65        | L2        | True          | 50.00               | 46.402649               | 92.8         |
| 4    | JV66        | L3        | True          | 100.00              | 110.523860              | 110.5        |
| 5    | JV67        | L4        | True          | 250.00              | 233.942859              | 93.6         |
| 6    | JV68        | L5        | True          | 500.00              | 520.526486              | 104.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 978.427801              | 97.8         |
| 8    | JV70        | L7        | True          | 2500.00             | 2507.249455             | 100.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5082.637315             | 101.7        |
| 10   | JV72        | L9        | True          | 10000.00            | 9920.289573             | 99.2         |





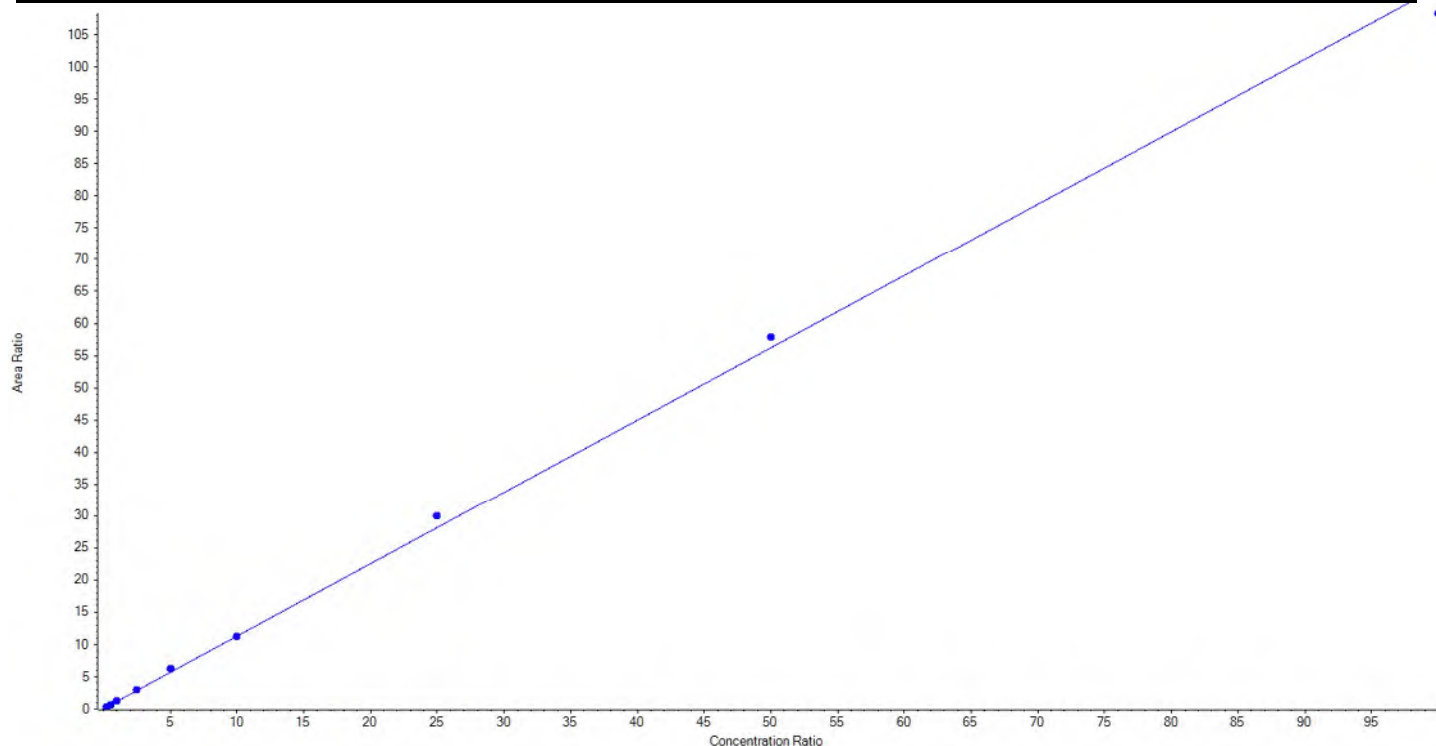
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDaA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 613.0 / 569.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.12396 x + 0.04546$  ( $r = 0.99903$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.386025               | 85.5         |
| 3    | JV65        | L2        | True          | 50.00               | 46.149854               | 92.3         |
| 4    | JV66        | L3        | True          | 100.00              | 100.371982              | 100.4        |
| 5    | JV67        | L4        | True          | 250.00              | 261.955860              | 104.8        |
| 6    | JV68        | L5        | True          | 500.00              | 555.474506              | 111.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1002.365324             | 100.2        |
| 8    | JV70        | L7        | True          | 2500.00             | 2661.890707             | 106.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5144.074612             | 102.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9631.331130             | 96.3         |





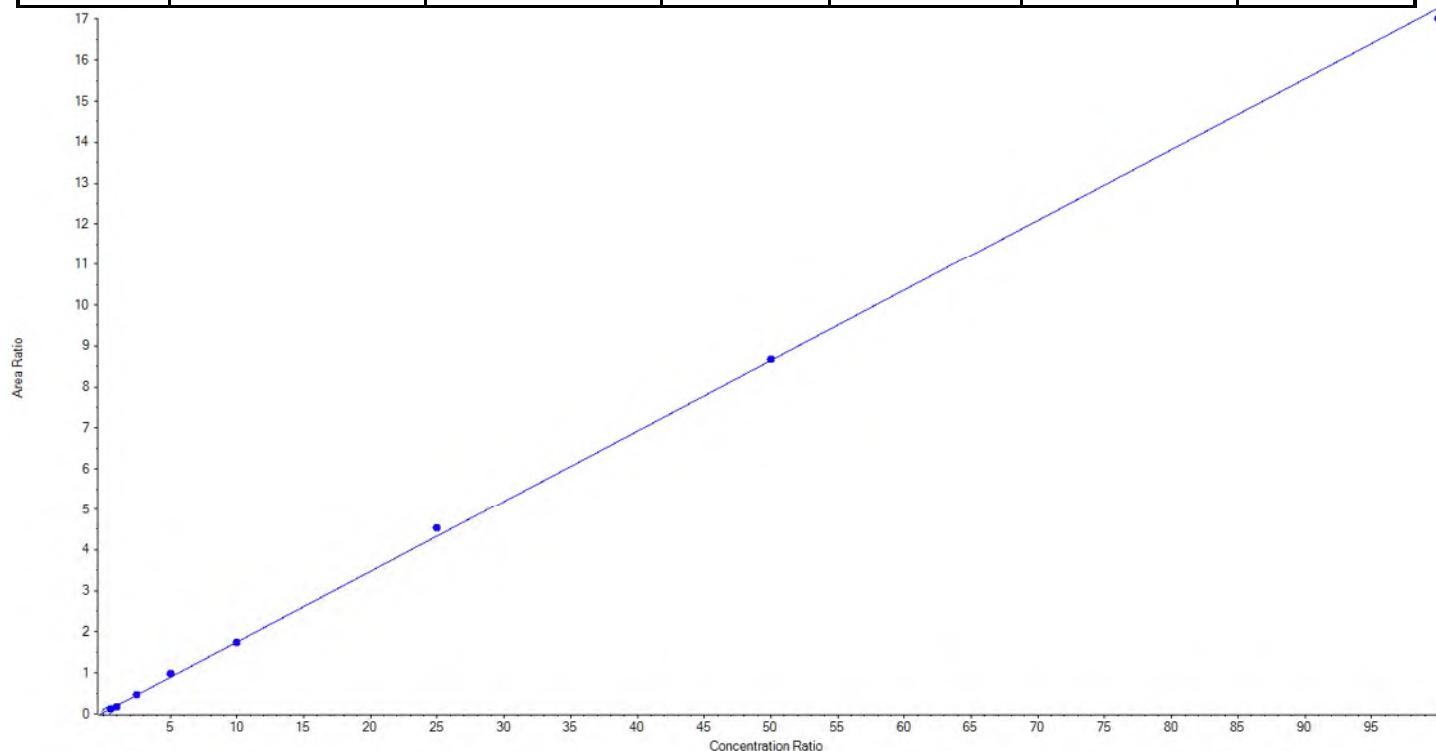
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDaA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 613.0 / 319.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.17236 x + 0.02845$  ( $r = 0.99959$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 7.804720                | 31.2         |
| 3    | JV65        | L2        | True          | 50.00               | 53.040734               | 106.1        |
| 4    | JV66        | L3        | True          | 100.00              | 83.092603               | 83.1         |
| 5    | JV67        | L4        | True          | 250.00              | 247.417961              | 99.0         |
| 6    | JV68        | L5        | True          | 500.00              | 547.673098              | 109.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 991.539776              | 99.2         |
| 8    | JV70        | L7        | True          | 2500.00             | 2607.895936             | 104.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5016.091027             | 100.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9853.248864             | 98.5         |





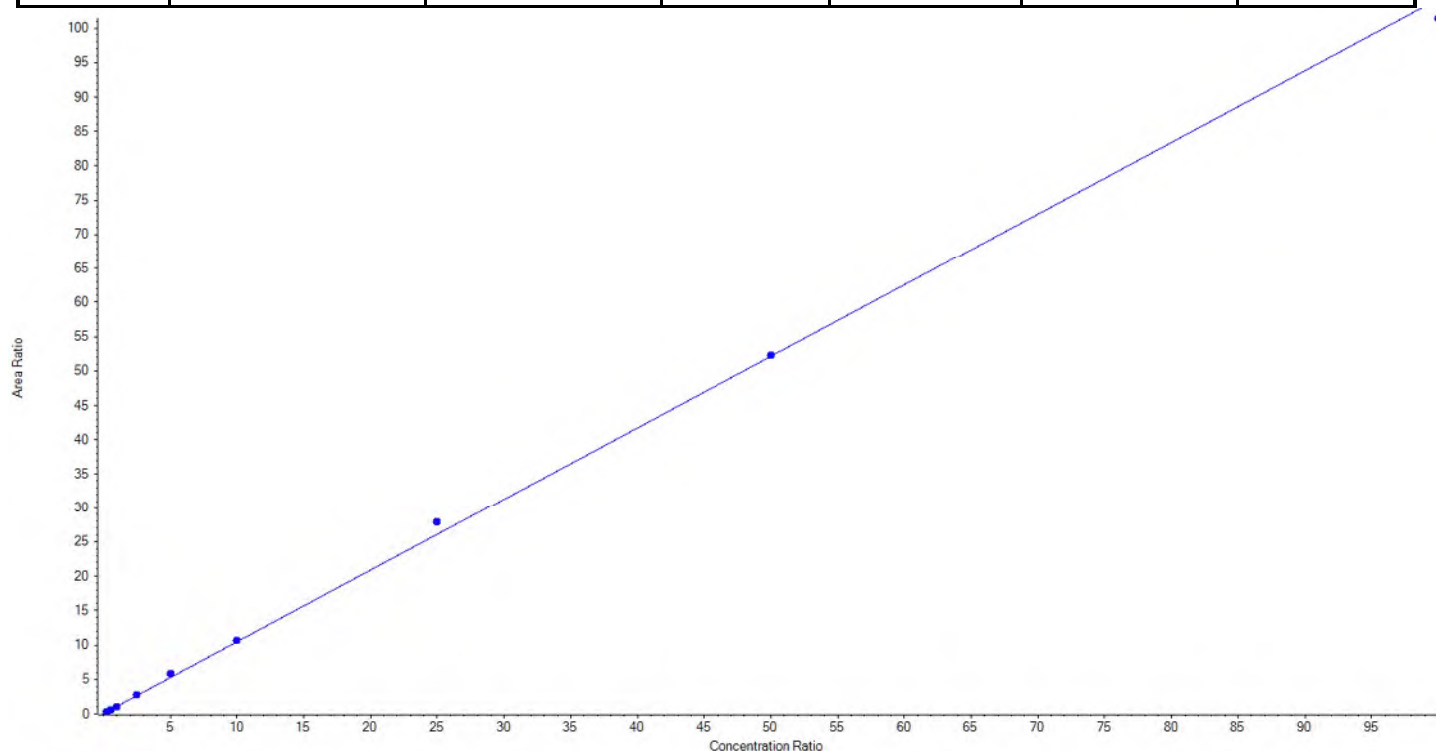
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTTrDA_1            | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 663.0 / 619.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.04170x + 0.05468$  ( $r = 0.99926$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.242461               | 85.0         |
| 3    | JV65        | L2        | True          | 50.00               | 47.209992               | 94.4         |
| 4    | JV66        | L3        | True          | 100.00              | 97.574463               | 97.6         |
| 5    | JV67        | L4        | True          | 250.00              | 266.206145              | 106.5        |
| 6    | JV68        | L5        | True          | 500.00              | 549.792324              | 110.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 1017.912346             | 101.8        |
| 8    | JV70        | L7        | True          | 2500.00             | 2679.029289             | 107.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 5018.204996             | 100.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9727.827984             | 97.3         |





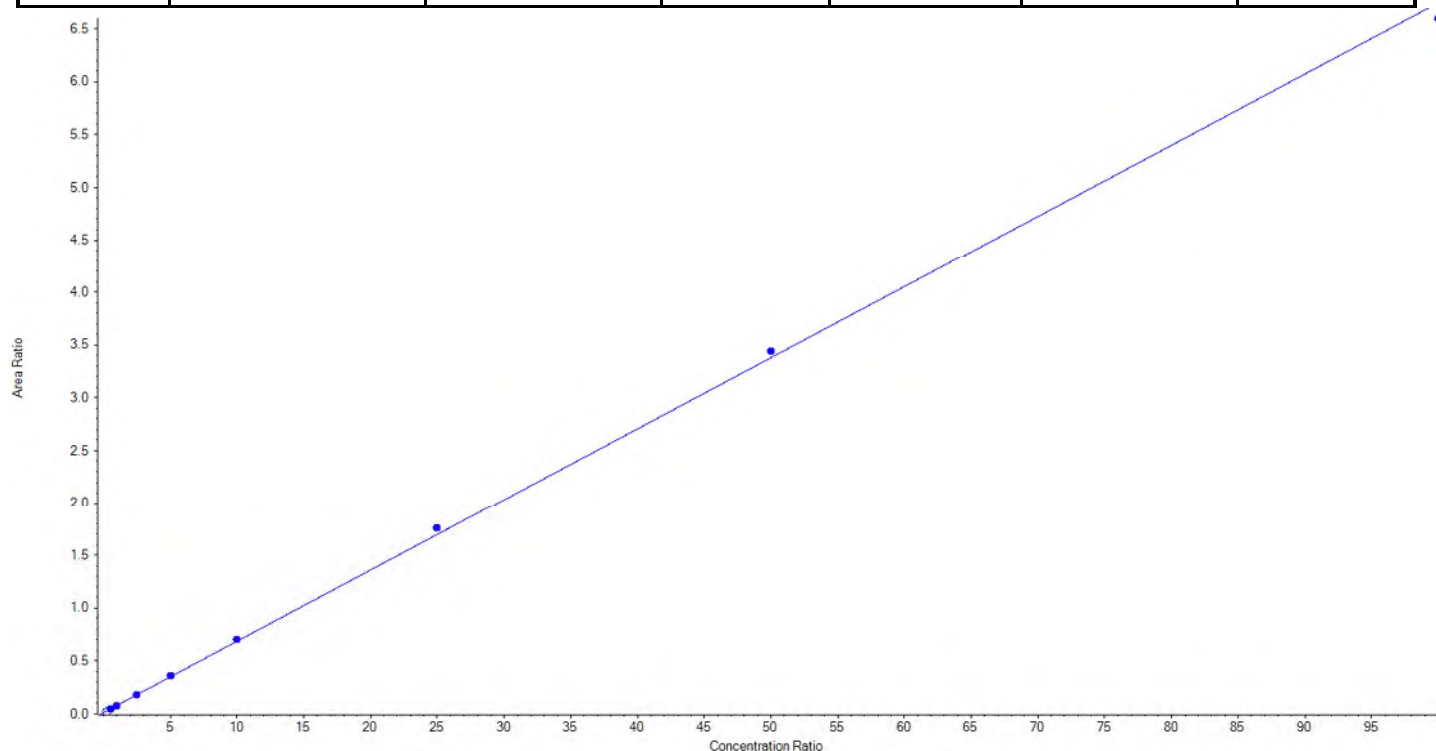
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTTrDA_2            | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 663.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.06731 x + 0.01330$  ( $r = 0.99966$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 2.049840                | 8.2          |
| 3    | JV65        | L2        | True          | 50.00               | 46.658919               | 93.3         |
| 4    | JV66        | L3        | True          | 100.00              | 98.013127               | 98.0         |
| 5    | JV67        | L4        | True          | 250.00              | 247.103066              | 98.8         |
| 6    | JV68        | L5        | True          | 500.00              | 522.356398              | 104.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 1018.579760             | 101.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2597.383911             | 103.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 5090.414923             | 101.8        |
| 10   | JV72        | L9        | True          | 10000.00            | 9779.489896             | 97.8         |







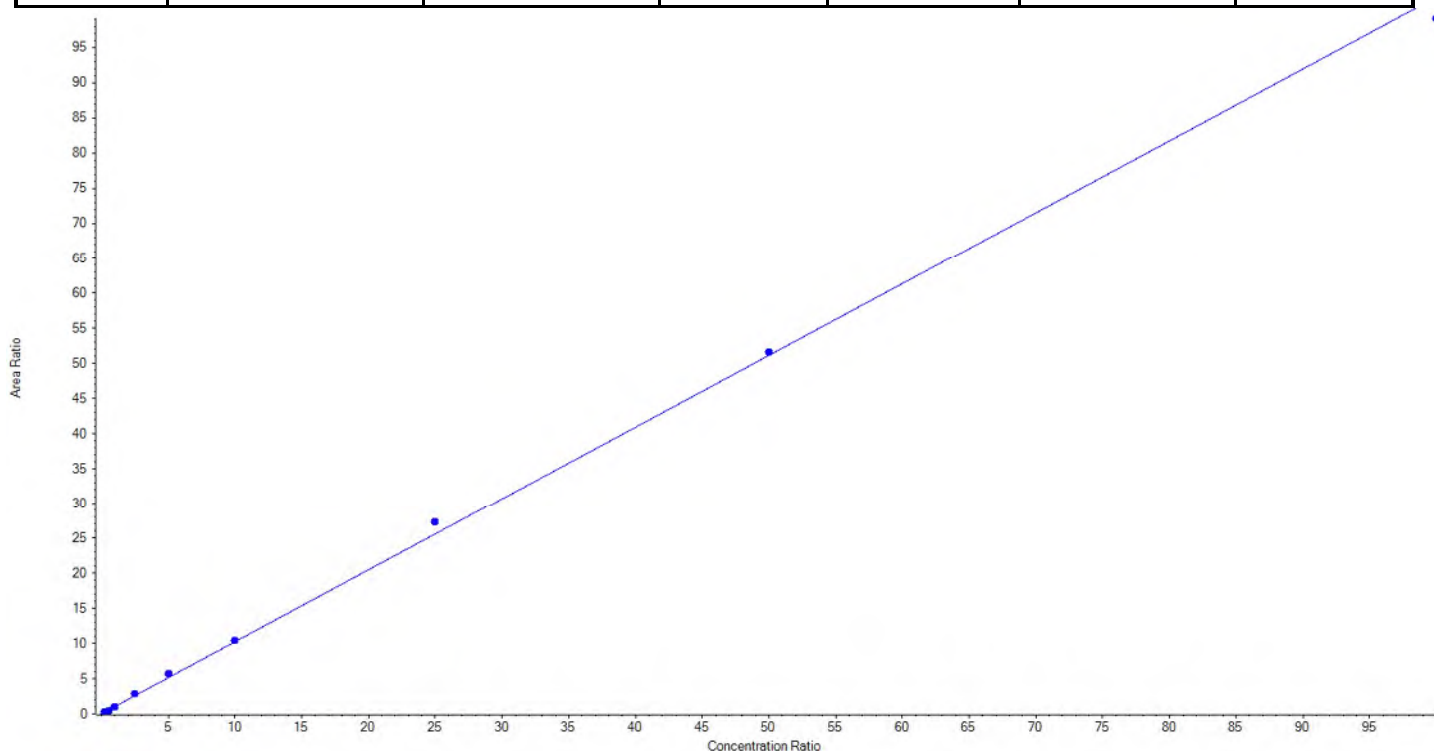
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTeDA_1             | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 713.0 / 669.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.02134 x + 0.03267$  ( $r = 0.99917$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 22.789628               | 91.2         |
| 3    | JV65        | L2        | True          | 50.00               | 44.447403               | 88.9         |
| 4    | JV66        | L3        | True          | 100.00              | 92.488743               | 92.5         |
| 5    | JV67        | L4        | True          | 250.00              | 276.378112              | 110.6        |
| 6    | JV68        | L5        | True          | 500.00              | 550.845491              | 110.2        |
| 7    | JV69        | L6        | True          | 1000.00             | 1020.383286             | 102.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2667.997144             | 106.7        |
| 9    | JV71        | L8        | True          | 5000.00             | 5048.267960             | 101.0        |
| 10   | JV72        | L9        | True          | 10000.00            | 9701.402232             | 97.0         |





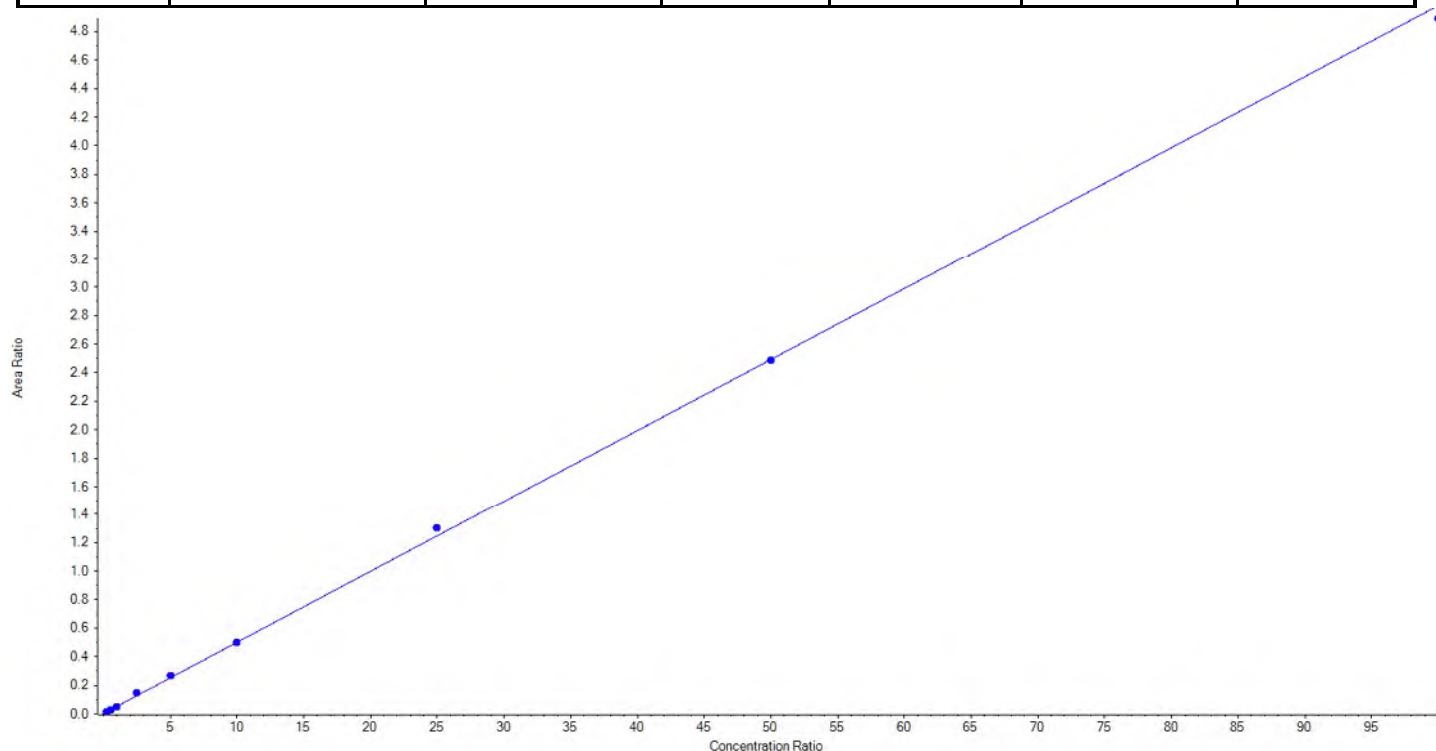
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTeDA_2             | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 713.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.04978x + 0.00345$  ( $r = 0.99942$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 20.961194               | 83.8         |
| 3    | JV65        | L2        | True          | 50.00               | 44.351644               | 88.7         |
| 4    | JV66        | L3        | True          | 100.00              | 98.814825               | 98.8         |
| 5    | JV67        | L4        | True          | 250.00              | 296.168648              | 118.5        |
| 6    | JV68        | L5        | True          | 500.00              | 535.567580              | 107.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1003.798782             | 100.4        |
| 8    | JV70        | L7        | True          | 2500.00             | 2617.205633             | 104.7        |
| 9    | JV71        | L8        | True          | 5000.00             | 4990.671418             | 99.8         |
| 10   | JV72        | L9        | True          | 10000.00            | 9817.460276             | 98.2         |





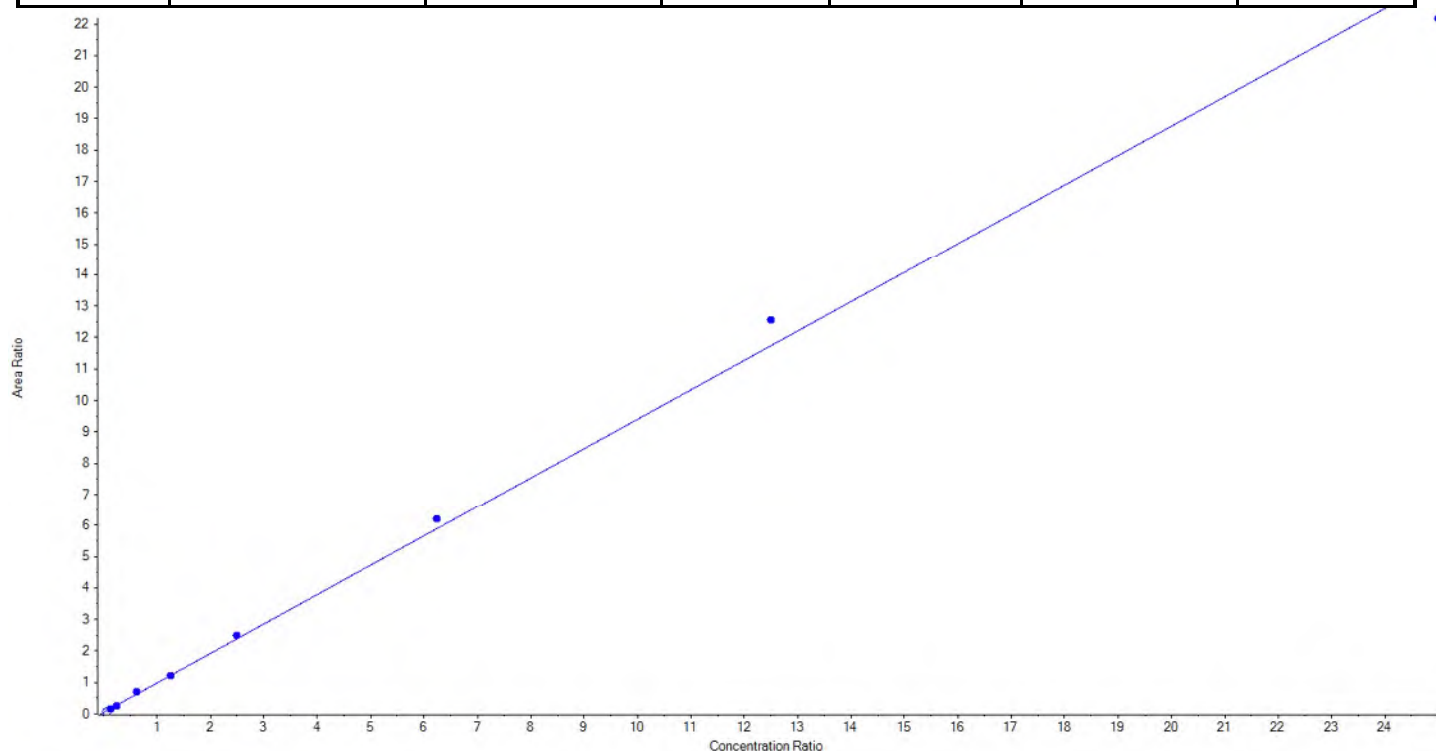
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NMeFOSAA_1           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 570.0 / 419.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.93548x + 0.04710$  ( $r = 0.99806$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 10.005275               | 40.0         |
| 3    | JV65        | L2        | True          | 50.00               | 45.576655               | 91.2         |
| 4    | JV66        | L3        | True          | 100.00              | 86.775272               | 86.8         |
| 5    | JV67        | L4        | True          | 250.00              | 279.677441              | 111.9        |
| 6    | JV68        | L5        | True          | 500.00              | 495.256714              | 99.1         |
| 7    | JV69        | L6        | True          | 1000.00             | 1040.135137             | 104.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2635.295656             | 105.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 5355.092820             | 107.1        |
| 10   | JV72        | L9        | True          | 10000.00            | 9462.190305             | 94.6         |





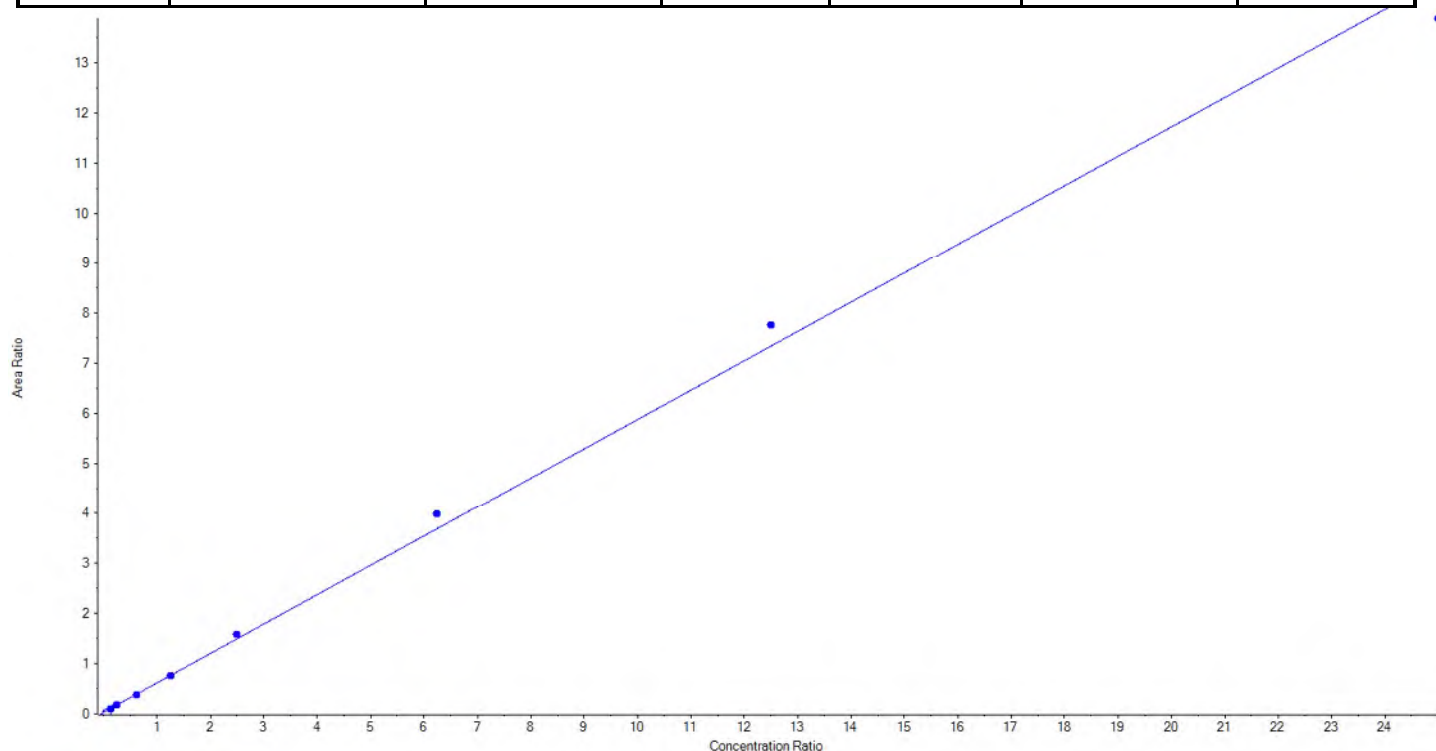
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NMeFOSAA_2           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 570.0 / 512.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.58489x + 0.03127$  ( $r = 0.99817$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | < 0                     | N/A          |
| 3    | JV65        | L2        | True          | 50.00               | 47.530013               | 95.1         |
| 4    | JV66        | L3        | True          | 100.00              | 97.243811               | 97.2         |
| 5    | JV67        | L4        | True          | 250.00              | 235.372178              | 94.2         |
| 6    | JV68        | L5        | True          | 500.00              | 496.856842              | 99.4         |
| 7    | JV69        | L6        | True          | 1000.00             | 1055.751249             | 105.6        |
| 8    | JV70        | L7        | True          | 2500.00             | 2699.865712             | 108.0        |
| 9    | JV71        | L8        | True          | 5000.00             | 5293.236830             | 105.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9474.143366             | 94.7         |





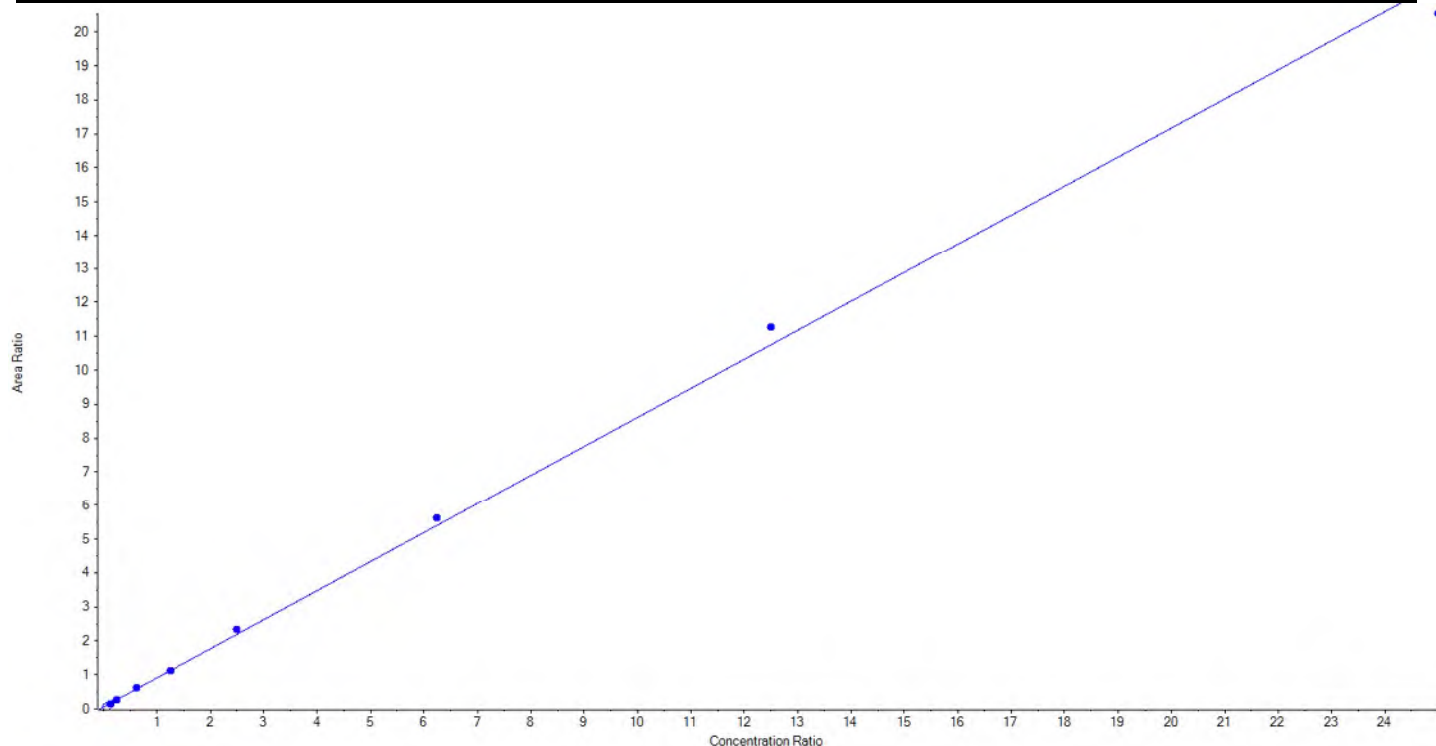
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NEtFOSAA_1           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 584.0 / 419.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.85558x + 0.05717$  ( $r = 0.99884$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 3.138261                | 12.6         |
| 3    | JV65        | L2        | True          | 50.00               | 42.784938               | 85.6         |
| 4    | JV66        | L3        | True          | 100.00              | 97.864659               | 97.9         |
| 5    | JV67        | L4        | True          | 250.00              | 260.601917              | 104.2        |
| 6    | JV68        | L5        | True          | 500.00              | 502.172020              | 100.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1069.526868             | 107.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2607.040747             | 104.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5245.588850             | 104.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9574.420001             | 95.7         |





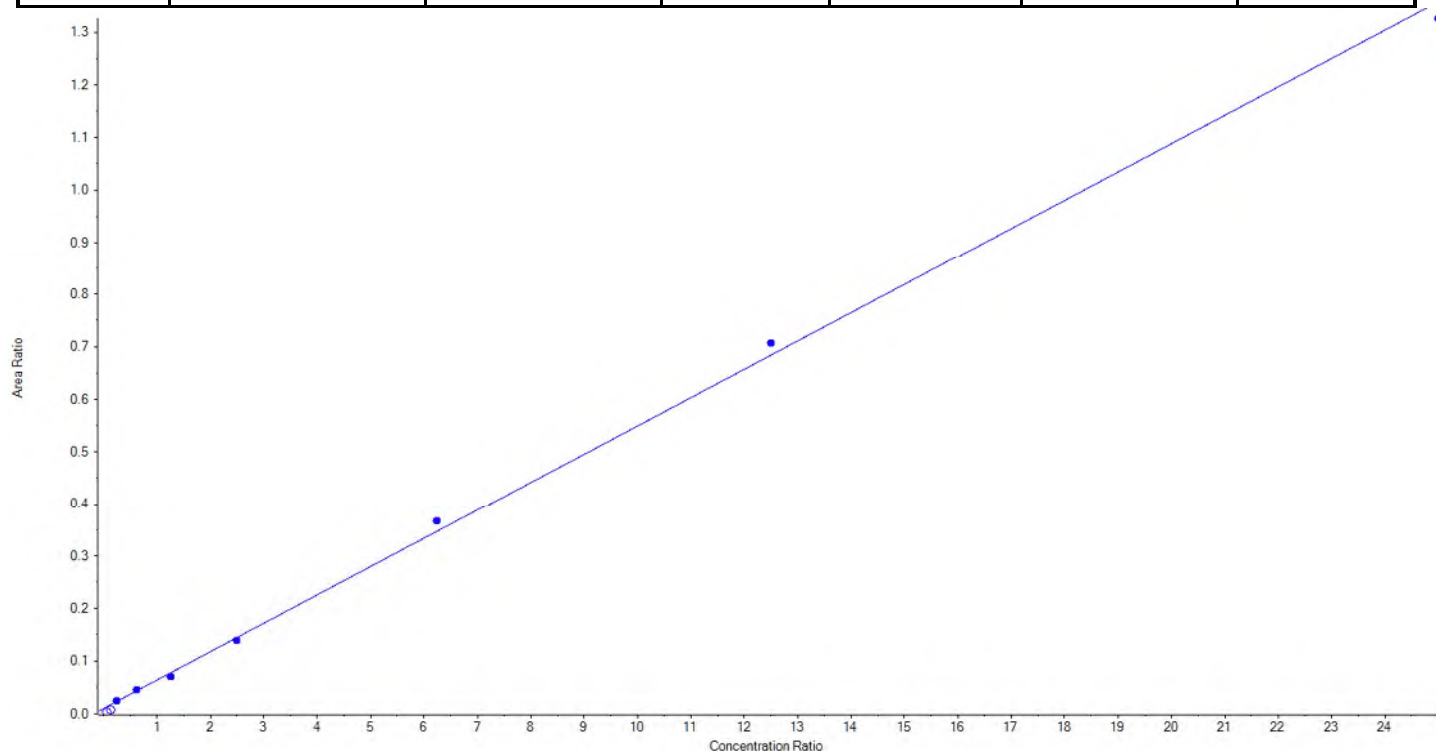
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NEtFOSAA_2           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 584.0 / 483.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.05390x + 0.01038$  ( $r = 0.99914$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | < 0                     | N/A          |
| 3    | JV65        | L2        | False         | 50.00               | < 0                     | N/A          |
| 4    | JV66        | L3        | True          | 100.00              | 102.682341              | 102.7        |
| 5    | JV67        | L4        | True          | 250.00              | 263.060335              | 105.2        |
| 6    | JV68        | L5        | True          | 500.00              | 448.299583              | 89.7         |
| 7    | JV69        | L6        | True          | 1000.00             | 953.973248              | 95.4         |
| 8    | JV70        | L7        | True          | 2500.00             | 2651.575627             | 106.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5166.916956             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9763.491910             | 97.6         |





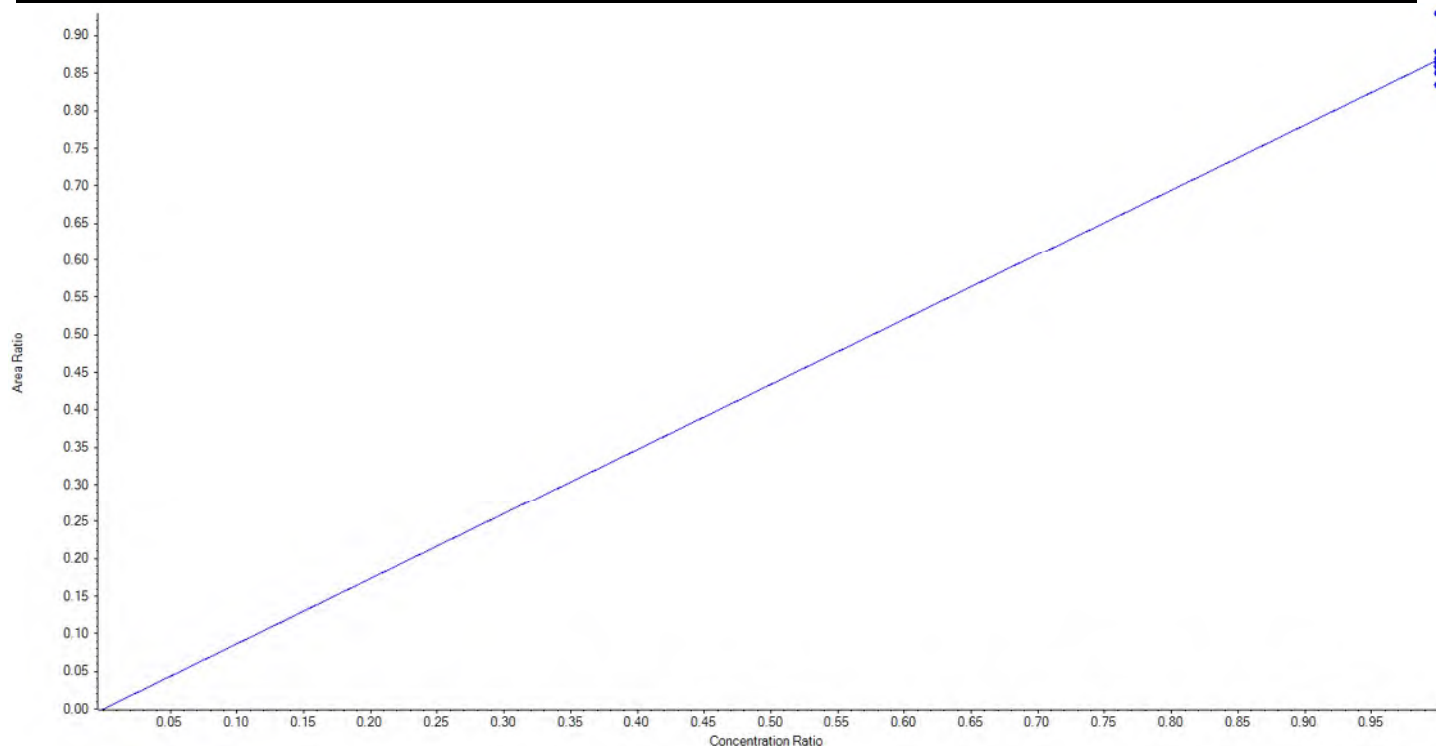
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 16/05/2018 6:13:54 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | 13C2-PFHxA           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 315.0 / 270.0        | <b>Result Table</b>       | 18-0312_SIS  |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.86776 x$  (std. dev. = 0.02626) (weighting: 1 / x)

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 100.00              | 98.020442               | 98.0         |
| 3    | JV65        | L2        | True          | 100.00              | 99.755684               | 99.8         |
| 4    | JV66        | L3        | True          | 100.00              | 96.076406               | 96.1         |
| 5    | JV67        | L4        | True          | 100.00              | 101.261699              | 101.3        |
| 6    | JV68        | L5        | True          | 100.00              | 107.090850              | 107.1        |
| 7    | JV69        | L6        | True          | 100.00              | 98.981712               | 99.0         |
| 8    | JV70        | L7        | True          | 100.00              | 100.110183              | 100.1        |
| 9    | JV71        | L8        | True          | 100.00              | 99.582207               | 99.6         |
| 10   | JV72        | L9        | True          | 100.00              | 99.120816               | 99.1         |







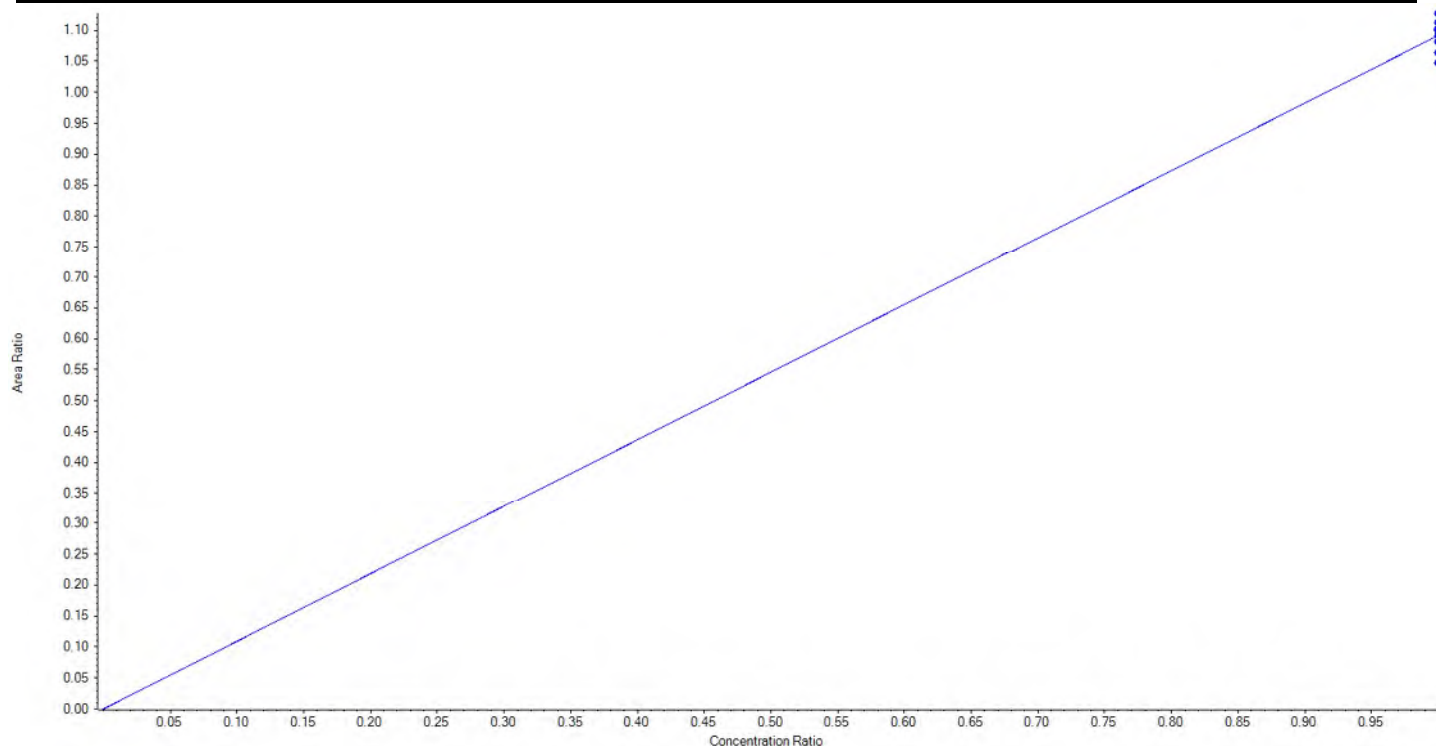
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 16/05/2018 6:13:54 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | 13C2-PFDA            | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 515.0 / 470.0        | <b>Result Table</b>       | 18-0312_SIS  |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.09175 x$  (std. dev. = 0.02453) (weighting: 1 / x)

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 100.00              | 100.899994              | 100.9        |
| 3    | JV65        | L2        | True          | 100.00              | 101.842030              | 101.8        |
| 4    | JV66        | L3        | True          | 100.00              | 95.955385               | 96.0         |
| 5    | JV67        | L4        | True          | 100.00              | 100.945624              | 101.0        |
| 6    | JV68        | L5        | True          | 100.00              | 99.030618               | 99.0         |
| 7    | JV69        | L6        | True          | 100.00              | 99.943881               | 99.9         |
| 8    | JV70        | L7        | True          | 100.00              | 100.762815              | 100.8        |
| 9    | JV71        | L8        | True          | 100.00              | 103.242191              | 103.2        |
| 10   | JV72        | L9        | True          | 100.00              | 97.377461               | 97.4         |





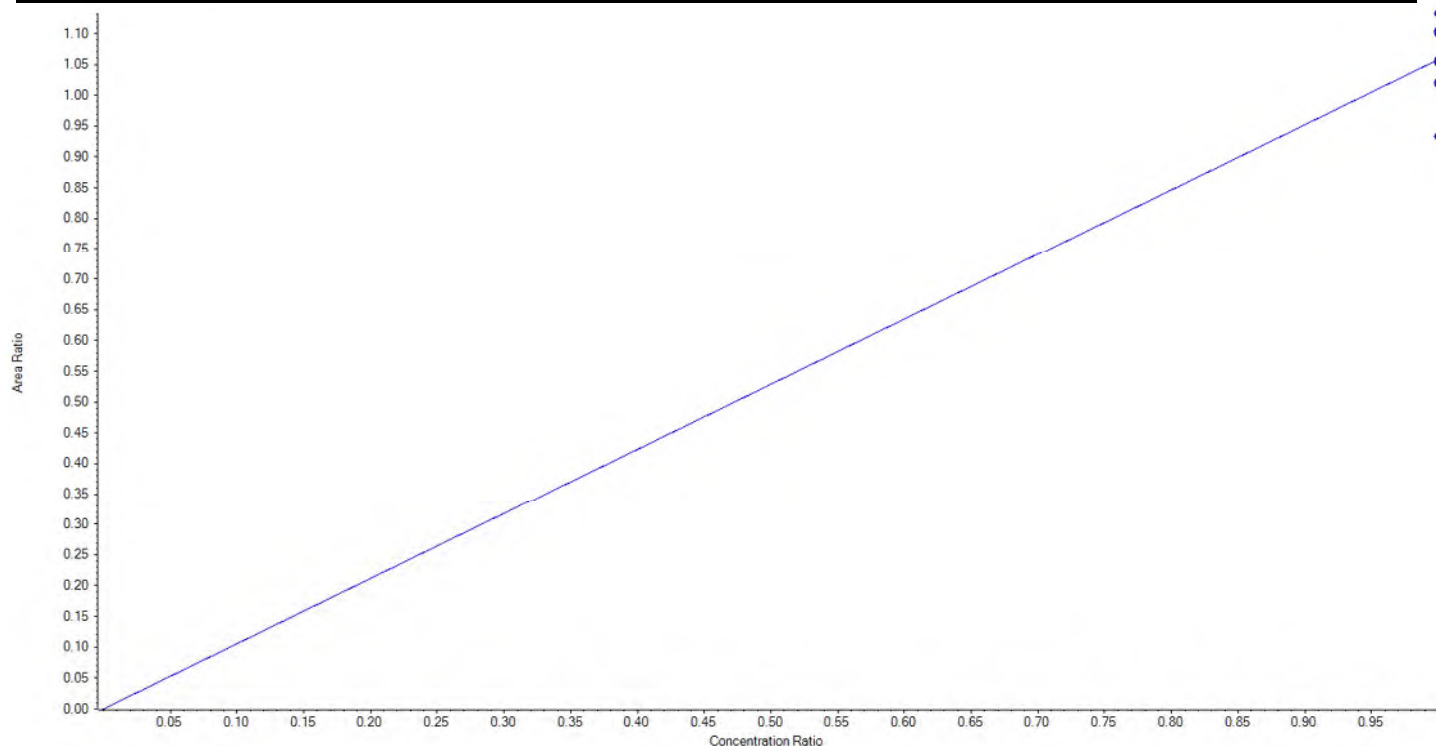
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 16/05/2018 6:13:54 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | d5-EtFOSAA           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 589.0 / 419.0        | <b>Result Table</b>       | 18-0312_SIS  |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.05792 x$  (std. dev. = 0.06113) (weighting: 1 / x)

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 400.00              | 417.483654              | 104.4        |
| 3    | JV65        | L2        | True          | 400.00              | 428.176230              | 107.0        |
| 4    | JV66        | L3        | True          | 400.00              | 416.843259              | 104.2        |
| 5    | JV67        | L4        | True          | 400.00              | 397.729721              | 99.4         |
| 6    | JV68        | L5        | True          | 400.00              | 384.986316              | 96.3         |
| 7    | JV69        | L6        | True          | 400.00              | 399.963901              | 100.0        |
| 8    | JV70        | L7        | True          | 400.00              | 415.707146              | 103.9        |
| 9    | JV71        | L8        | True          | 400.00              | 386.285043              | 96.6         |
| 10   | JV72        | L9        | True          | 400.00              | 352.824731              | 88.2         |



[illegible]

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 6012.46  | 28.045095    | 141.4              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 2376.78  | 25.833478    | 55.9               | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | 10036.96 | 18.657460    | 81.6               | true     |
| PFHxA_2    | 313.0 / 119.0  | 1.74 | 623.86   | 15.890183    | 54.1               | true     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 7907.92  | 19.315174    | 32.9               | true     |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | 280.19   | 10.338123    | 17.9               | true     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 8074.83  | 25.556500    | 93.6               | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 2224.06  | 24.128618    | 50.3               | false    |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 10318.88 | 20.271455    | 48.7               | true     |
| PFOA_2     | 413.0 / 169.0  | 2.48 | 890.28   | 8.864133     | 31.0               | true     |
| PFNA_1     | 463.0 / 419.0  | 2.85 | 10363.27 | 18.792753    | 43.4               | false    |
| PFNA_2     | 463.0 / 219.0  | 2.85 | 2609.30  | 18.357615    | 49.8               | false    |
| PFOS_1     | 499.0 / 80.0   | 2.85 | 13616.79 | 28.031094    | 80.4               | false    |
| PFOS_2     | 499.0 / 99.0   | 2.85 | 2111.68  | 23.346458    | 65.7               | false    |
| PFDA_1     | 513.0 / 469.0  | 3.21 | 10050.99 | 21.617757    | 49.0               | false    |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | 12489.37 | 24.089066    | 56.8               | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 604.82   | 0.630758     | 27.4               | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.81 | 10987.16 | 21.386025    | 70.8               | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.81 | 1610.52  | 7.804720     | 45.9               | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | 10607.99 | 21.242461    | 97.7               | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | 564.17   | 2.049840     | 33.2               | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | 10203.09 | 22.789628    | 141.0              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | 533.65   | 20.961194    | 45.6               | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | 2545.83  | 10.005275    | 171.3              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.35 | 668.28   | < 0          | 27.6               | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | 2307.12  | 3.138261     | 139.9              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.89 | 163.85   | < 0          | 18.5               | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 32696.33 | 98.020442    | 623.4              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.19 | 42344.22 | 100.899994   | 572.5              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.51 | 39874.15 | 417.483654   | 298.0              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 12834.48 | 48.489227    | 207.5              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 4719.14  | 47.169014    | 105.5              | false    |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 18711.51 | 42.893737    | 109.7              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 1810.00  | 63.552557    | 101.4              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 19607.26 | 54.414136    | 51.8               | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.07 | 543.70   | 48.862884    | 38.9               | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 16120.12 | 45.328748    | 115.4              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 4704.41  | 45.498258    | 90.3               | false    |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 20965.43 | 48.064799    | 72.4               | false    |
| PFOA_2     | 413.0 / 169.0  | 2.47 | 2060.46  | 53.444479    | 102.8              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 22712.64 | 50.077219    | 69.7               | false    |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 6399.55  | 50.945275    | 89.1               | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 22807.50 | 42.301066    | 89.8               | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 5205.78  | 50.287062    | 101.8              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 20571.42 | 46.915581    | 81.3               | false    |
| PFDA_2     | 513.0 / 219.0  | 3.21 | 1030.59  | 46.777482    | 42.6               | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 22370.56 | 45.924072    | 84.0               | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 1550.80  | 46.402649    | 39.6               | false    |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | 22118.07 | 46.149854    | 96.8               | false    |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | 4699.33  | 53.040734    | 98.8               | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 21424.28 | 47.209992    | 133.9              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 1752.54  | 46.658919    | 71.4               | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 19078.40 | 44.447403    | 175.9              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 1000.77  | 44.351644    | 79.1               | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 5670.73  | 45.576655    | 172.6              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 3718.16  | 47.530013    | 104.7              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 5486.30  | 42.784938    | 170.4              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 299.25   | < 0          | 25.4               | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 33937.67 | 99.755684    | 1048.7             | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 43590.53 | 101.842030   | 470.0              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.50 | 41784.49 | 428.176230   | 267.3              | false    |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 20180.95 | 86.791512    | 289.2              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 6922.62  | 84.473566    | 128.9              | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 30083.91 | 88.393959    | 161.0              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 2034.47  | 85.128911    | 83.5               | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 26397.60 | 87.171830    | 59.8               | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 695.28   | 87.168294    | 49.2               | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 28780.26 | 96.635739    | 138.9              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 9167.58  | 106.207971   | 122.1              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 36593.84 | 104.359044   | 87.3               | false    |
| PFOA_2     | 413.0 / 169.0  | 2.48 | 2220.48  | 72.590674    | 98.8               | false    |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 35781.62 | 97.651904    | 90.0               | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 10321.72 | 98.707450    | 112.2              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 40890.03 | 90.970659    | 128.5              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.84 | 7971.30  | 92.083626    | 130.9              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 36171.15 | 98.528321    | 103.7              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.20 | 1290.91  | 74.434538    | 65.4               | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 37767.85 | 93.739853    | 107.5              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | 2484.41  | 110.523860   | 54.1               | false    |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | 39980.56 | 100.371982   | 116.8              | false    |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 5847.96  | 83.092603    | 105.1              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 36489.21 | 97.574463    | 151.1              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | 2700.36  | 98.013127    | 106.1              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 33293.25 | 92.488743    | 242.9              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | 1793.20  | 98.814825    | 101.9              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 7606.26  | 86.775272    | 256.7              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 5276.76  | 97.243811    | 86.1               | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | 8107.08  | 97.864659    | 181.2              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 736.72   | 102.682341   | 68.4               | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

---

**Results Summary**

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 28401.98 | 96.076406    | 804.1              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 35687.97 | 95.955385    | 558.5              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.50 | 33537.35 | 416.843259   | 194.1              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 62131.84  | 206.430305   | 593.0              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 22661.03  | 224.337631   | 263.8              | false    |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 95358.92  | 258.426345   | 289.8              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 6342.83   | 244.158146   | 188.2              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 86351.57  | 253.853561   | 130.0              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 2040.70   | 268.362349   | 96.0               | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 83889.62  | 225.752955   | 241.2              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 23869.98  | 222.356004   | 161.7              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 99781.95  | 254.296931   | 208.8              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 7431.38   | 257.344048   | 202.5              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 107830.73 | 265.634549   | 133.5              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 31638.25  | 267.249370   | 240.1              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 128996.33 | 230.459461   | 203.1              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 26184.76  | 241.652806   | 243.5              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 114902.21 | 274.358579   | 170.1              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 4730.06   | 267.766863   | 208.8              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 119969.50 | 263.505185   | 185.5              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 5450.70   | 233.942859   | 144.6              | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | 118810.04 | 261.955860   | 179.6              | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 18077.08  | 247.417961   | 186.0              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 112372.62 | 266.206145   | 246.6              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | 7137.80   | 247.103066   | 150.8              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 113473.15 | 276.378112   | 381.5              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 5995.88   | 296.168648   | 250.0              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 25037.76  | 279.677441   | 380.9              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 13406.09  | 235.372178   | 175.6              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | 21945.82  | 260.601917   | 258.1              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | 1636.48   | 263.060335   | 79.2               | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 34919.51 | 101.261699   | 1017.6             | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 43795.66 | 100.945624   | 440.1              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.50 | 37561.82 | 397.729721   | 236.8              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 104812.63 | 379.492245   | 798.4              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 36371.94  | 398.532474   | 314.7              | false    |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 183243.64 | 590.552971   | 358.4              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13144.17  | 602.362054   | 234.9              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 148710.97 | 513.574414   | 171.4              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 3050.53   | 490.348842   | 132.4              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 134335.48 | 398.622698   | 254.3              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 39962.51  | 410.686463   | 225.0              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 180320.96 | 542.897965   | 251.5              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 12649.20  | 535.062840   | 337.4              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 191187.85 | 556.615759   | 217.6              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 55683.78  | 552.006190   | 310.9              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 217545.80 | 428.901519   | 249.8              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 40292.28  | 409.963845   | 312.3              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 186904.45 | 522.068312   | 184.4              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 8810.46   | 598.449884   | 260.4              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 211889.25 | 546.212628   | 188.2              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | 9784.88   | 520.526486   | 211.9              | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.78 | 214921.24 | 555.474506   | 232.6              | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 33232.43  | 547.673098   | 248.1              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 197597.30 | 549.792324   | 296.7              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 12469.98  | 522.356398   | 243.8              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 193388.13 | 550.845491   | 455.3              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 9229.15   | 535.567580   | 294.8              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 40534.67  | 495.256714   | 507.1              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.32 | 25483.38  | 496.856842   | 219.7              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | 38044.20  | 502.172020   | 388.0              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 2380.62   | 448.299583   | 130.8              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 31759.15 | 107.090850   | 808.3              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 36949.34 | 99.030618    | 670.5              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 34241.22 | 384.986316   | 294.4              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 227662.97 | 778.046261   | 1170.7             | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 76014.58  | 793.604509   | 476.8              | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 350548.82 | 1017.252318  | 557.0              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 24132.18  | 994.796286   | 313.1              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 313948.95 | 973.658392   | 246.4              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 6885.11   | 1022.051246  | 315.7              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 297124.53 | 837.957539   | 286.6              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 79736.77  | 779.306332   | 335.4              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 379667.20 | 1028.463388  | 331.5              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 26455.96  | 1023.026817  | 387.0              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 392561.23 | 1028.511506  | 261.2              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 112439.74 | 1000.117057  | 370.7              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 447991.80 | 840.100698   | 290.6              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 86820.14  | 839.354013   | 414.7              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 407620.22 | 1020.948522  | 291.1              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 15949.77  | 978.090466   | 427.6              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 432741.16 | 1000.964662  | 281.9              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 20060.62  | 978.427801   | 319.8              | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | 432532.43 | 1002.365324  | 313.8              | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | 66436.32  | 991.539776   | 274.5              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 407548.21 | 1017.912346  | 388.6              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 26723.53  | 1018.579760  | 333.5              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 399748.93 | 1020.383286  | 555.4              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 19238.84  | 1003.798782  | 427.1              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 85048.52  | 1040.135137  | 369.6              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 54020.37  | 1055.751249  | 278.7              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 80424.45  | 1069.526868  | 338.8              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 4765.15   | 953.973248   | 194.7              | false    |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 32843.60 | 98.981712    | 869.4              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 41722.73 | 99.943881    | 454.4              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 36281.67 | 399.963901   | 285.3              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area       | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|------------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 590230.90  | 2102.243811  | 2035.7             | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 199213.06  | 2179.802809  | 729.1              | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 911617.65  | 2574.231542  | 790.4              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 67435.46   | 2705.114914  | 526.2              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 835130.90  | 2512.774114  | 333.2              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 18768.55   | 2747.089212  | 331.4              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.09 | 780484.32  | 2303.521436  | 370.9              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 226637.88  | 2318.419291  | 353.9              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 1017075.48 | 2676.545515  | 422.8              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 72748.84   | 2763.902729  | 621.2              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 1058696.32 | 2695.858545  | 377.8              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 319997.78  | 2760.876412  | 455.4              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 1234790.84 | 2424.048404  | 402.5              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 242129.11  | 2449.080596  | 411.9              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 1074374.90 | 2607.612929  | 326.8              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 45286.88   | 2713.219176  | 499.9              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 1148645.00 | 2576.763887  | 351.0              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 52207.58   | 2507.249455  | 303.3              | false    |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 1184842.70 | 2661.890707  | 370.0              | false    |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 178864.29  | 2607.895936  | 366.2              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 1105680.40 | 2679.029289  | 424.6              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 69654.68   | 2597.383911  | 411.8              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 1078791.87 | 2667.997144  | 624.2              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 51653.36   | 2617.205633  | 486.6              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 226340.12  | 2635.295656  | 418.7              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 145021.56  | 2699.865712  | 321.6              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 205319.85  | 2607.040747  | 348.5              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | 13400.83   | 2651.575627  | 265.9              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 34351.16 | 100.110183   | 888.1              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 43499.48 | 100.762815   | 638.6              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 40071.08 | 415.707146   | 291.6              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area       | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|------------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 1080178.26 | 4507.247954  | 3186.6             | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 346433.03  | 4448.710926  | 1008.1             | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 1617011.52 | 5136.044879  | 1110.1             | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 113609.68  | 5124.538112  | 699.7              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 1532694.79 | 5182.125230  | 404.3              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 30418.15   | 5024.136423  | 351.7              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 1371846.24 | 4749.618935  | 376.3              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 393664.73  | 4724.397363  | 358.8              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 1714583.27 | 5071.800474  | 461.4              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 118525.69  | 5076.510630  | 538.1              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 1803996.93 | 5164.160418  | 420.3              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 530880.50  | 5145.638736  | 457.0              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 2066972.71 | 4760.602564  | 381.6              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 403302.53  | 4785.237481  | 479.3              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 1917762.25 | 5228.352489  | 427.4              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 76609.00   | 5166.334700  | 507.2              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 2043513.00 | 5150.610976  | 386.2              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 93725.92   | 5082.637315  | 400.6              | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 2038307.21 | 5144.074612  | 373.1              | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 305559.36  | 5016.091027  | 346.0              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 1843378.09 | 5018.204996  | 423.7              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 121162.66  | 5090.414923  | 385.6              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 1817436.98 | 5048.267960  | 710.3              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 87636.31   | 4990.671418  | 542.4              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 400631.03  | 5355.092820  | 475.4              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 247661.07  | 5293.236830  | 383.0              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 359398.31  | 5245.588850  | 365.3              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | 22520.08   | 5166.916956  | 359.6              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

---

**Results Summary**

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 30440.72 | 99.582207    | 761.9              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 39705.53 | 103.242191   | 615.2              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 32559.14 | 386.285043   | 233.3              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area       | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|------------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 2263813.37 | 9055.263589  | 4954.4             | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 729700.76  | 8989.585593  | 1413.6             | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 3290619.37 | 9692.204248  | 1470.9             | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 229274.08  | 9589.458837  | 866.8              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 3134387.25 | 9822.428323  | 437.2              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 63274.43   | 9711.980749  | 435.0              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 2719983.73 | 9032.605450  | 396.2              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 789184.55  | 9084.599701  | 412.0              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 3529169.20 | 9678.300429  | 642.0              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 241809.19  | 9618.117783  | 663.9              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 3597505.85 | 9547.697347  | 461.4              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 1060974.41 | 9531.101896  | 512.9              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 4134541.86 | 9134.134535  | 410.0              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 798619.80  | 9088.544113  | 471.4              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 3801617.95 | 9604.597509  | 407.9              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 152723.48  | 9554.926891  | 421.9              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 4162267.36 | 9723.189670  | 388.1              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 196906.06  | 9920.289573  | 394.5              | false    |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 4117957.79 | 9631.331130  | 408.2              | false    |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 646847.79  | 9853.248864  | 385.0              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 3855265.78 | 9727.827984  | 454.1              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 250794.63  | 9779.489896  | 451.2              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 3768874.99 | 9701.402232  | 643.7              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 185960.35  | 9817.460276  | 619.9              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 792470.19  | 9462.190305  | 443.0              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 496163.71  | 9474.143366  | 433.6              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | 733868.29  | 9574.420001  | 425.2              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.48 | 47385.98   | 9763.491910  | 365.5              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 32706.21 | 99.120816    | 747.9              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 40424.47 | 97.377461    | 537.2              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 33346.06 | 352.824731   | 259.6              | false    |



## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:23 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.3953    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.74 | PFHxA       | 0.0719             | 0.0622    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | PFHpA       | 0.0228             | 0.0354    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2754    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.48 | PFOA        | 0.0728             | 0.0863    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.85 | PFNA        | 0.2872             | 0.2518    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.85 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.85 | PFOS        | 0.1938             | 0.1551    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.21 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0484    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.81 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.81 | PFDoA       | 0.1596             | 0.1466    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.0677             | 0.0532    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.0503             | 0.0523    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.35 | NMeFOSAA    | 0.6292             | 0.2625    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.89 | NEtFOSSA    | 0.0685             | 0.0710    | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3677    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0967    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.07 | PFHpA       | 0.0228             | 0.0277    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2918    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.47 | PFOA        | 0.0728             | 0.0983    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.2872             | 0.2818    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.2282    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.21 | PFDA        | 0.0419             | 0.0501    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0693    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | PFDoA       | 0.1596             | 0.2125    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0818    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0525    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6557    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0545    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:27 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.3430    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0676    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0263    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.3185    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.48 | PFOA        | 0.0728             | 0.0607    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2885    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.1938             | 0.1949    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.20 | PFDA        | 0.0419             | 0.0357    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | PFUnA       | 0.0515             | 0.0658    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1463    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | PFTTrDA     | 0.0677             | 0.0740    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.0503             | 0.0539    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.6292             | 0.6937    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0909    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:29 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3647    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0665    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0236    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2845    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0745    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2934    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.2030    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0412    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0454    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1522    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | PFTTrDA     | 0.0677             | 0.0635    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0528    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.5354    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0746    | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3470    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0717    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0205    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2975    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0701    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2913    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1852    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0471    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | PFUnA       | 0.0515             | 0.0462    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.78 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1546    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0631    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.0503             | 0.0477    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.32 | NMeFOSAA    | 0.6292             | 0.6287    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0626    | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3339    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0688    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.0228             | 0.0219    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2684    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0697    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.2872             | 0.2864    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1938    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.19 | PFDA        | 0.0419             | 0.0391    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0464    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | PFDoA       | 0.1596             | 0.1536    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0656    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0481    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.6292             | 0.6352    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0592    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:36 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3375    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | PFHxA       | 0.0719             | 0.0740    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0225    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.09 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2904    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0715    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.3023    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1961    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0422    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0455    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1510    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0630    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0479    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6407    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0653    | ü                     |



## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:39 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3207    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0703    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0198    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2870    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0691    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2943    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1951    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.19 | PFDA        | 0.0419             | 0.0399    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0459    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1499    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0657    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0482    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6182    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0627    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:41 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3223    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | PFHxA       | 0.0719             | 0.0697    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0202    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2901    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0685    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2949    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.82 | PFOS        | 0.1938             | 0.1932    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0402    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0473    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1571    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0651    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.0503             | 0.0493    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6261    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.48 | NEtFOSSA    | 0.0685             | 0.0646    | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 117641.83 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 117641.83 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.74 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 117641.83 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 117641.83 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.48 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.85 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.85 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.85 | 13C4-PFOS  | 503.0 / 80.0      | 117641.83 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.85 | 13C4-PFOS  | 503.0 / 80.0      | 117641.83 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.21 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.81 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFTDA_1    | 663.0 / 619.0  | 4.06 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFTDA_2    | 663.0 / 169.0  | 4.06 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | 13C2-PFOA  | 415.0 / 370.0     | 38439.74  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | d3-MeFOSAA | 573.0 / 419.0     | 36112.58  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.35 | d3-MeFOSAA | 573.0 / 419.0     | 36112.58  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | d3-MeFOSAA | 573.0 / 419.0     | 36112.58  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.89 | d3-MeFOSAA | 573.0 / 419.0     | 36112.58  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 128859.01 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 128859.01 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.07 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 128859.01 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 128859.01 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.47 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 128859.01 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 128859.01 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.21 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 39205.09  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 36897.69  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 36897.69  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 36897.69  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 36897.69  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 105963.04 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 105963.04 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 105963.04 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 105963.04 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.48 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 105963.04 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.84 | 13C4-PFOS  | 503.0 / 80.0      | 105963.04 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.20 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | 13C2-PFOA  | 415.0 / 370.0     | 34066.69  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 30420.23  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 30420.23  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | d3-MeFOSAA | 573.0 / 419.0     | 30420.23  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 30420.23  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 131015.70 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 131015.70 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 131015.70 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 131015.70 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 131015.70 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 131015.70 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFTDA_1    | 663.0 / 619.0  | 4.05 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFTDA_2    | 663.0 / 169.0  | 4.05 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 39739.37  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 35707.97  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 35707.97  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | d3-MeFOSAA | 573.0 / 419.0     | 35707.97  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 35707.97  | 400.00          |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 118468.59 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 118468.59 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 118468.59 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 118468.59 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 13C4-PFOS  | 503.0 / 80.0      | 118468.59 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 118468.59 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.78 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 34175.48  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 33628.73  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.32 | d3-MeFOSAA | 573.0 / 419.0     | 33628.73  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 33628.73  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 33628.73  | 400.00          |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 124400.13 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 124400.13 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 124400.13 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 124400.13 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 124400.13 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 124400.13 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 38237.89  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 34298.33  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 34298.33  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 34298.33  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 34298.33  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 118733.91 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 118733.91 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.09 | 13C4-PFOS  | 503.0 / 80.0      | 118733.91 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 118733.91 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 13C4-PFOS  | 503.0 / 80.0      | 118733.91 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 118733.91 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 39542.23  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 36446.02  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 36446.02  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 36446.02  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 36446.02  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 101181.69 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 101181.69 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 101181.69 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 101181.69 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 101181.69 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 101181.69 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 35226.63  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 31869.23  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 31869.23  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 31869.23  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 31869.23  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 105473.33 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 105473.33 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 105473.33 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 105473.33 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 13C4-PFOS  | 503.0 / 80.0      | 105473.33 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 13C4-PFOS  | 503.0 / 80.0      | 105473.33 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 38024.48  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 35734.85  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 35734.85  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 35734.85  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.48 | d3-MeFOSAA | 573.0 / 419.0     | 35734.85  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 804.339298   | 885.00              | 90.89        |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 802.043754   | 885.00              | 90.63        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 969.289643   | 1000.00             | 96.93        |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 925.770240   | 1000.00             | 92.58        |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 924.919724   | 1000.00             | 92.49        |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 888.021349   | 1000.00             | 88.80        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 876.341070   | 912.00              | 96.09        |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 864.142918   | 912.00              | 94.75        |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 936.688375   | 1000.00             | 93.67        |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 930.333375   | 1000.00             | 93.03        |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 943.286988   | 1000.00             | 94.33        |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 1003.563557  | 1000.00             | 100.36       |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 792.672994   | 925.00              | 85.69        |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 849.682836   | 925.00              | 91.86        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 979.295546   | 1000.00             | 97.93        |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 926.354949   | 1000.00             | 92.64        |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 959.774620   | 1000.00             | 95.98        |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 927.941985   | 1000.00             | 92.79        |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 979.912690   | 1000.00             | 97.99        |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 948.169769   | 1000.00             | 94.82        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 937.629546   | 1000.00             | 93.76        |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 934.557623   | 1000.00             | 93.46        |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 952.033212   | 1000.00             | 95.20        |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 925.189660   | 1000.00             | 92.52        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 1046.178270  | 1000.00             | 104.62       |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 1030.939699  | 1000.00             | 103.09       |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 1116.177819  | 1000.00             | 111.62       |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 1220.574679  | 1000.00             | 122.06       |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 92.199053    | 100.00              | 92.20        |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 88.871352    | 100.00              | 88.87        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 373.700865   | 400.00              | 93.43        |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 393.941239   | 443.00              | 88.93        |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 389.069756   | 443.00              | 87.83        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 538.564060   | 500.00              | 107.71       |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 494.472205   | 500.00              | 98.89        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 501.861924   | 500.00              | 100.37       |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 526.266950   | 500.00              | 105.25       |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 415.104170   | 456.00              | 91.03        |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 417.708313   | 456.00              | 91.60        |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 508.842825   | 500.00              | 101.77       |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 513.589300   | 500.00              | 102.72       |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 503.011917   | 500.00              | 100.60       |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 512.620705   | 500.00              | 102.52       |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 433.102471   | 463.00              | 93.54        |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 438.321868   | 463.00              | 94.67        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 516.203166   | 500.00              | 103.24       |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 479.335212   | 500.00              | 95.87        |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 495.832201   | 500.00              | 99.17        |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | 527.429111   | 500.00              | 105.49       |
| PFDoA_1    | 613.0 / 569.0  | 3.78 | 529.388851   | 500.00              | 105.88       |
| PFDoA_2    | 613.0 / 319.0  | 3.78 | 527.919162   | 500.00              | 105.58       |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | 498.401940   | 500.00              | 99.68        |
| PFTTrDA_2  | 663.0 / 169.0  | 4.03 | 504.822257   | 500.00              | 100.96       |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 522.276225   | 500.00              | 104.46       |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 515.611624   | 500.00              | 103.12       |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 537.634252   | 500.00              | 107.53       |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 546.797228   | 500.00              | 109.36       |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | 511.007033   | 500.00              | 102.20       |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.47 | 606.078028   | 500.00              | 121.22       |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 98.408789    | 100.00              | 98.41        |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 94.732022    | 100.00              | 94.73        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 404.091728   | 400.00              | 101.02       |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 196080.48 | 804.339298   | 1090.8             | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 63984.82  | 802.043754   | 427.6              | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 311463.21 | 969.289643   | 524.6              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 20945.83  | 925.770240   | 348.1              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 278028.75 | 924.919724   | 222.1              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 5601.18   | 888.021349   | 216.4              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 258828.89 | 876.341070   | 402.4              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 73652.77  | 864.142918   | 347.7              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 322506.64 | 936.688375   | 310.5              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 22478.54  | 930.333375   | 298.3              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 335793.82 | 943.286988   | 265.1              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 105152.14 | 1003.563557  | 358.3              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 352037.06 | 792.672994   | 317.2              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 73203.54  | 849.682836   | 371.4              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 364452.03 | 979.295546   | 288.6              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 14091.30  | 926.354949   | 401.6              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 386793.19 | 959.774620   | 269.8              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 17759.93  | 927.941985   | 201.0              | false    |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 394122.68 | 979.912690   | 291.3              | false    |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 59254.05  | 948.169769   | 262.8              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 350027.41 | 937.629546   | 353.4              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 22890.67  | 934.557623   | 270.6              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 347684.17 | 952.033212   | 491.8              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 16535.88  | 925.189660   | 401.0              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 81307.05  | 1046.178270  | 509.4              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 50168.36  | 1030.939699  | 444.4              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 79704.01  | 1116.177819  | 339.2              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 5701.00   | 1220.574679  | 235.7              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 28512.40 | 92.199053    | 713.9              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 34577.19 | 88.871352    | 518.3              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 32224.32 | 373.700865   | 240.7              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 111629.36 | 393.941239   | 970.9              | false    |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 36408.28  | 389.069756   | 317.5              | false    |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 178772.89 | 538.564060   | 413.4              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 11564.01  | 494.472205   | 223.4              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 155231.57 | 501.861924   | 170.0              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 3481.71   | 526.266950   | 155.2              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 143453.32 | 415.104170   | 229.7              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 41676.89  | 417.708313   | 263.8              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 180665.23 | 508.842825   | 253.5              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 12992.04  | 513.589300   | 269.7              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 184811.08 | 503.011917   | 214.7              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 55261.83  | 512.620705   | 276.8              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 225243.92 | 433.102471   | 248.2              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 44182.73  | 438.321868   | 315.0              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 197378.71 | 516.203166   | 217.0              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 7584.77   | 479.335212   | 231.9              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 205598.24 | 495.832201   | 206.1              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | 10580.97  | 527.429111   | 210.1              | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.78 | 218826.06 | 529.388851   | 257.8              | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.78 | 34248.19  | 527.919162   | 183.1              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | 191487.20 | 498.401940   | 302.0              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.03 | 12886.68  | 504.822257   | 230.7              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 195880.77 | 522.276225   | 421.7              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 9493.78   | 515.611624   | 303.1              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 42008.10  | 537.634252   | 395.1              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 26754.80  | 546.797228   | 322.3              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | 37040.15  | 511.007033   | 316.8              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.47 | 2964.38   | 606.078028   | 185.7              | true     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

---

**Results Summary**

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 31167.70 | 98.408789    | 966.6              | false    |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 37747.52 | 94.732022    | 544.6              | false    |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 34417.03 | 404.091728   | 251.3              | false    |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.326                | 0.348              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | PFHxA       | 0.067                | 0.072              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.020                | 0.023              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.285                | 0.289              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.070                | 0.073              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.313                | 0.287              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.208                | 0.194              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.039                | 0.042              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.046                | 0.052              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | PFDaA       | 0.150                | 0.160              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.065                | 0.068              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.048                | 0.050              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.617                | 0.629              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.072                | 0.069              | ü        |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.326                | 0.348              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.065                | 0.072              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.022                | 0.023              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.291                | 0.289              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.072                | 0.073              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.299                | 0.287              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.82 | PFOS        | 0.196                | 0.194              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.038                | 0.042              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | PFUnA       | 0.052                | 0.052              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.78 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.78 | PFDaA       | 0.157                | 0.160              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.03 | PFTTrDA     | 0.067                | 0.068              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.049                | 0.050              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.637                | 0.629              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.47 | NEtFOSSA    | 0.080                | 0.069              | ü        |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 103611.84 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 103611.84 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 13C4-PFOS  | 503.0 / 80.0      | 103611.84 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 103611.84 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 103611.84 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 103611.84 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 35637.34  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 32603.64  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | d3-MeFOSAA | 573.0 / 419.0     | 32603.64  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 32603.64  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 32603.64  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 13C4-PFOS  | 503.0 / 80.0      | 121468.05 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 121468.05 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 121468.05 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 13C4-PFOS  | 503.0 / 80.0      | 121468.05 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 13C4-PFOS  | 503.0 / 80.0      | 121468.05 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 13C4-PFOS  | 503.0 / 80.0      | 121468.05 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | 3.78 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | 3.78 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.03 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 36497.99  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 32203.27  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 32203.27  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 32203.27  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.47 | d3-MeFOSAA | 573.0 / 419.0     | 32203.27  | 400.00          |

# Raw Analytical Data

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | CQ753PB-FS(0)       | Injection Vial   | 12           |
| Sample ID          | Procedural Blank    | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:05:20 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area    | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|---------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 5499.31 | 28.822603    | 75.7               | true     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 1855.42 | 22.795643    | 66.1               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A     | N/A          | N/A                | true     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | CQ753PB-FS(0)       | Injection Vial   | 12           |
| Sample ID          | Procedural Blank    | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:05:20 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 115.223972   | 100.00              | 115.22       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 117.194745   | 100.00              | 117.19       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 418.143954   | 400.00              | 104.54       |

|                    |                           |                  |              |
|--------------------|---------------------------|------------------|--------------|
| Sample Name        | CQ754LCS-FS(0)            | Injection Vial   | 13           |
| Sample ID          | Laboratory Control Sample | Injection Volume | 10.00        |
| Sample Type        | Unknown                   | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:14:15       | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam                | Result Table     | 18-0312_BASE |
| Sample Comment     |                           |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 506921.71 | 2536.854882  | 1353.5             | false    |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 141046.55 | 2169.630168  | 690.2              | true     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 681899.73 | 2608.549824  | 653.5              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 47804.17  | 2597.272054  | 411.2              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 609611.98 | 2484.634303  | 263.5              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 12294.81  | 2434.078670  | 219.4              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 573139.13 | 2377.953708  | 448.7              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | 165627.49 | 2381.827259  | 452.3              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 716212.02 | 2552.834225  | 389.7              | false    |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 46920.44  | 2411.471307  | 388.4              | false    |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 698989.28 | 2410.215694  | 334.8              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 203591.02 | 2378.793845  | 373.6              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 755433.26 | 2084.967155  | 361.7              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 162110.71 | 2305.217997  | 415.4              | false    |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 740500.47 | 2434.396633  | 287.3              | false    |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 28978.40  | 2349.723723  | 267.7              | false    |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 801024.21 | 2433.926514  | 279.7              | false    |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 36906.18  | 2399.696505  | 257.4              | false    |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 780728.53 | 2375.584276  | 309.5              | false    |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 119582.17 | 2360.298378  | 289.7              | false    |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 752580.43 | 2469.727661  | 383.2              | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 47626.08  | 2404.294946  | 321.7              | false    |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 842707.15 | 2823.405574  | 636.7              | false    |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 40996.53  | 2814.407744  | 555.2              | false    |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 173294.50 | 2813.609698  | 432.9              | false    |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 96740.74  | 2508.774501  | 414.2              | false    |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 159731.46 | 2829.150255  | 339.9              | false    |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | 9013.97   | 2481.129197  | 398.7              | false    |

|                    |                           |                  |              |
|--------------------|---------------------------|------------------|--------------|
| Sample Name        | CQ754LCS-FS(0)            | Injection Vial   | 13           |
| Sample ID          | Laboratory Control Sample | Injection Volume | 10.00        |
| Sample Type        | Quality Control           | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:14:15       | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam                | Result Table     | 18-0312_SIS  |
| Sample Comment     |                           |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 108.634377   | 100.00              | 108.63       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 99.065487    | 100.00              | 99.07        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 400.626986   | 400.00              | 100.16       |



|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5965-FS(0)          | Injection Vial   | 14           |
| Sample ID          | WGNA-043018-FRB-3103 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:23:10  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area    | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|---------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 2535.67 | 15.639199    | 60.4               | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 1105.31 | 11.861452    | 33.0               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A     | N/A          | N/A                | true     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5965-FS(0)          | Injection Vial   | 14           |
| Sample ID          | WGNA-043018-FRB-3103 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:23:10  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 105.444581   | 100.00              | 105.44       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 108.550057   | 100.00              | 108.55       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 443.136474   | 400.00              | 110.78       |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5967-FS(0)         | Injection Vial   | 15           |
| Sample ID          | NAWC-043018-FRB-207 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:32:06 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT  | Area | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|-----|------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | N/A | N/A  | N/A          | N/A                | true     |
| PFBS_2     | 298.9 / 99.0   | N/A | N/A  | N/A          | N/A                | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A | N/A  | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A | N/A  | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A | N/A  | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A | N/A  | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A | N/A  | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A | N/A  | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A | N/A  | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A | N/A  | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A | N/A  | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A | N/A  | N/A          | N/A                | true     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5967-FS(0)         | Injection Vial   | 15           |
| Sample ID          | NAWC-043018-FRB-207 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:32:06 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 103.781910   | 100.00              | 103.78       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 101.314112   | 100.00              | 101.31       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 359.714437   | 400.00              | 89.93        |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5969-FS(0)          | Injection Vial   | 16           |
| Sample ID          | WGNA-043018-FRB-3409 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:41:03  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area    | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|---------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 6186.06 | 29.820706    | 113.3              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 2537.64 | 29.068777    | 51.6               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A     | N/A          | N/A                | true     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5969-FS(0)          | Injection Vial   | 16           |
| Sample ID          | WGNA-043018-FRB-3409 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:41:03  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 103.935285   | 100.00              | 103.94       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 101.513784   | 100.00              | 101.51       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 332.815599   | 400.00              | 83.20        |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5971-FS(0)          | Injection Vial   | 17           |
| Sample ID          | WGNA-050118-FRB-3385 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:49:59  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area    | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|---------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 1144.97 | 11.820022    | 23.1               | true     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 594.54  | 8.097354     | 16.4               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A     | N/A          | N/A                | true     |



|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5971-FS(0)          | Injection Vial   | 17           |
| Sample ID          | WGNA-050118-FRB-3385 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:49:59  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 103.971446   | 100.00              | 103.97       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 99.676584    | 100.00              | 99.68        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 386.312573   | 400.00              | 96.58        |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5973-FS(0)          | Injection Vial   | 18           |
| Sample ID          | WGNA-050118-FRB-3178 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:58:53  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area    | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|---------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 1155.47 | 11.676447    | 29.7               | true     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 590.75  | 7.739934     | 23.2               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A     | N/A          | N/A                | true     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5973-FS(0)          | Injection Vial   | 18           |
| Sample ID          | WGNA-050118-FRB-3178 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:58:53  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 119.999780   | 100.00              | 120.00       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 106.050936   | 100.00              | 106.05       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 360.415182   | 400.00              | 90.10        |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5975-FS(0)         | Injection Vial   | 19           |
| Sample ID          | NAWC-050118-FRB-304 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:07:47 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area    | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|---------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 1268.41 | 12.555791    | 30.8               | true     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 600.28  | 8.416024     | 17.8               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOA_2     | 413.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A     | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A     | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A     | N/A          | N/A                | true     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5975-FS(0)         | Injection Vial   | 19           |
| Sample ID          | NAWC-050118-FRB-304 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:07:47 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 112.292408   | 100.00              | 112.29       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 99.597565    | 100.00              | 99.60        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 434.020632   | 400.00              | 108.51       |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5977-FS(0)         | Injection Vial   | 20           |
| Sample ID          | NAWC-050118-FRB-098 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:16:43 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Area     | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 1219.77  | 11.194835    | 30.9               | true     |
| PFBS_2     | 298.9 / 99.0   | 1.42 | 594.80   | 6.638973     | 18.1               | true     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | N/A      | N/A          | N/A                | true     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | N/A      | N/A          | N/A                | true     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 11003.87 | 25.293704    | 48.5               | true     |
| PFOA_2     | 413.0 / 169.0  | 2.44 | 1018.30  | 18.167677    | 33.6               | true     |
| PFNA_1     | 463.0 / 419.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFNA_2     | 463.0 / 219.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFOS_1     | 499.0 / 80.0   | N/A  | N/A      | N/A          | N/A                | true     |
| PFOS_2     | 499.0 / 99.0   | N/A  | N/A      | N/A          | N/A                | true     |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFDaA_1    | 613.0 / 569.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFDaA_2    | 613.0 / 319.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | 3376.17  | 4.074652     | 45.9               | false    |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 300.30   | < 0          | 23.7               | false    |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A      | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A      | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | N/A      | N/A          | N/A                | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | N/A      | N/A          | N/A                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A      | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A      | N/A          | N/A                | true     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5977-FS(0)         | Injection Vial   | 20           |
| Sample ID          |                     | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:16:43 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 105.843111   | 100.00              | 105.84       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 103.277809   | 100.00              | 103.28       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 405.504641   | 400.00              | 101.38       |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | CQ753PB-FS(0)       | Injection Vial   | 12           |
| Sample ID          | Procedural Blank    | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:05:20 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.3374    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A  | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A  | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                           |                  |              |
|--------------------|---------------------------|------------------|--------------|
| Sample Name        | CQ754LCS-FS(0)            | Injection Vial   | 13           |
| Sample ID          | Laboratory Control Sample | Injection Volume | 10.00        |
| Sample Type        | Unknown                   | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:14:15       | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam                | Result Table     | 18-0312_BASE |
| Sample Comment     |                           |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.2782    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0701    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.0228             | 0.0202    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.2893             | 0.2890    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0655    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2913    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.2146    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0391    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0461    | ü                     |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | PFDaA       | 1.0000             | 1.0000    | ü                     |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | PFDaA       | 0.1596             | 0.1532    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0633    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.0503             | 0.0486    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.5582    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0564    | ü                     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5965-FS(0)          | Injection Vial   | 14           |
| Sample ID          | WGNA-043018-FRB-3103 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:23:10  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.4359    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A  | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A  | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5967-FS(0)         | Injection Vial   | 15           |
| Sample ID          | NAWC-043018-FRB-207 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:32:06 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT  | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|-----|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | N/A | PFBS        | 1.0000             | N/A       | ü                     |
| PFBS_2     | 298.9 / 99.0   | N/A | PFBS        | 0.3480             | N/A       | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5969-FS(0)          | Injection Vial   | 16           |
| Sample ID          | WGNA-043018-FRB-3409 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:41:03  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.4102    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A  | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A  | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5971-FS(0)          | Injection Vial   | 17           |
| Sample ID          | WGNA-050118-FRB-3385 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:49:59  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.5193    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A  | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A  | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5973-FS(0)          | Injection Vial   | 18           |
| Sample ID          | WGNA-050118-FRB-3178 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:58:53  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.5113    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A  | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A  | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |



|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5975-FS(0)         | Injection Vial   | 19           |
| Sample ID          | NAWC-050118-FRB-304 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:07:47 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.4733    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | N/A  | PFOA        | 1.0000             | N/A       | ü                     |
| PFOA_2     | 413.0 / 169.0  | N/A  | PFOA        | 0.0728             | N/A       | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | PFTTrDA     | 1.0000             | N/A       | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | PFTTrDA     | 0.0677             | N/A       | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5977-FS(0)         | Injection Vial   | 20           |
| Sample ID          | NAWC-050118-FRB-098 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:16:43 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.42 | PFBS        | 0.3480             | 0.4876    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | N/A  | PFHxA       | 1.0000             | N/A       | ü                     |
| PFHxA_2    | 313.0 / 119.0  | N/A  | PFHxA       | 0.0719             | N/A       | ü                     |
| PFHpA_1    | 363.0 / 319.0  | N/A  | PFHpA       | 1.0000             | N/A       | ü                     |
| PFHpA_2    | 363.0 / 169.0  | N/A  | PFHpA       | 0.0228             | N/A       | ü                     |
| PFHxS_1    | 399.0 / 80.0   | N/A  | PFHxS       | 1.0000             | N/A       | ü                     |
| PFHxS_2    | 399.0 / 99.0   | N/A  | PFHxS       | 0.2893             | N/A       | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.44 | PFOA        | 0.0728             | 0.0925    | ü                     |
| PFNA_1     | 463.0 / 419.0  | N/A  | PFNA        | 1.0000             | N/A       | ü                     |
| PFNA_2     | 463.0 / 219.0  | N/A  | PFNA        | 0.2872             | N/A       | ü                     |
| PFOS_1     | 499.0 / 80.0   | N/A  | PFOS        | 1.0000             | N/A       | ü                     |
| PFOS_2     | 499.0 / 99.0   | N/A  | PFOS        | 0.1938             | N/A       | ü                     |
| PFDA_1     | 513.0 / 469.0  | N/A  | PFDA        | 1.0000             | N/A       | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | PFUnA       | 1.0000             | N/A       | ü                     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | PFUnA       | 0.0515             | N/A       | ü                     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | PFDoA       | 1.0000             | N/A       | ü                     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | PFDoA       | 0.1596             | N/A       | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0889    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | PFTeDA      | 1.0000             | N/A       | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | PFTeDA      | 0.0503             | N/A       | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | NMeFOSAA    | 1.0000             | N/A       | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | NMeFOSAA    | 0.6292             | N/A       | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | NEtFOSSA    | 1.0000             | N/A       | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | NEtFOSSA    | 0.0685             | N/A       | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | CQ753PB-FS(0)       | Injection Vial   | 12           |
| Sample ID          | Procedural Blank    | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:05:20 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 103853.95 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 103853.95 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 103853.95 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 103853.95 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 103853.95 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 103853.95 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 31105.55  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33816.55  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33816.55  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33816.55  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33816.55  | 400.00          |

|                    |                           |                  |              |
|--------------------|---------------------------|------------------|--------------|
| Sample Name        | CQ754LCS-FS(0)            | Injection Vial   | 13           |
| Sample ID          | Laboratory Control Sample | Injection Volume | 10.00        |
| Sample Type        | Unknown                   | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:14:15       | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam                | Result Table     | 18-0312_BASE |
| Sample Comment     |                           |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area  | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 84459.89 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 84459.89 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 13C4-PFOS  | 503.0 / 80.0      | 84459.89 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | 13C4-PFOS  | 503.0 / 80.0      | 84459.89 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 84459.89 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 13C4-PFOS  | 503.0 / 80.0      | 84459.89 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 13C2-PFOA  | 415.0 / 370.0     | 29190.46 | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 26148.55 | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | d3-MeFOSAA | 573.0 / 419.0     | 26148.55 | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | d3-MeFOSAA | 573.0 / 419.0     | 26148.55 | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | d3-MeFOSAA | 573.0 / 419.0     | 26148.55 | 400.00          |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5965-FS(0)          | Injection Vial   | 14           |
| Sample ID          | WGNA-043018-FRB-3103 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:23:10  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 116949.30 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 116949.30 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 116949.30 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 116949.30 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 116949.30 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 116949.30 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFDaA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFDaA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 37306.55  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33389.17  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33389.17  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33389.17  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 33389.17  | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5967-FS(0)         | Injection Vial   | 15           |
| Sample ID          | NAWC-043018-FRB-207 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:32:06 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT  | IS         | IS MRM Transition | IS Area  | IS Conc. (ng/L) |
|------------|----------------|-----|------------|-------------------|----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | N/A | 13C4-PFOS  | 503.0 / 80.0      | 94129.68 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | N/A | 13C4-PFOS  | 503.0 / 80.0      | 94129.68 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A | 13C4-PFOS  | 503.0 / 80.0      | 94129.68 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A | 13C4-PFOS  | 503.0 / 80.0      | 94129.68 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A | 13C4-PFOS  | 503.0 / 80.0      | 94129.68 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A | 13C4-PFOS  | 503.0 / 80.0      | 94129.68 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A | 13C2-PFOA  | 415.0 / 370.0     | 29453.32 | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A | d3-MeFOSAA | 573.0 / 419.0     | 29381.71 | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A | d3-MeFOSAA | 573.0 / 419.0     | 29381.71 | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A | d3-MeFOSAA | 573.0 / 419.0     | 29381.71 | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A | d3-MeFOSAA | 573.0 / 419.0     | 29381.71 | 400.00          |



|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5969-FS(0)          | Injection Vial   | 16           |
| Sample ID          | WGNA-043018-FRB-3409 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:41:03  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 111823.48 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 111823.48 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 111823.48 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 111823.48 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 111823.48 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 111823.48 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 33204.68  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 32886.89  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 32886.89  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 32886.89  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 32886.89  | 400.00          |



|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5971-FS(0)          | Injection Vial   | 17           |
| Sample ID          | WGNA-050118-FRB-3385 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:49:59  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area  | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 13C4-PFOS  | 503.0 / 80.0      | 90706.52 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 13C4-PFOS  | 503.0 / 80.0      | 90706.52 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 90706.52 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 90706.52 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 90706.52 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 90706.52 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27675.77 | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26728.75 | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26728.75 | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26728.75 | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26728.75 | 400.00          |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5973-FS(0)          | Injection Vial   | 18           |
| Sample ID          | WGNA-050118-FRB-3178 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:58:53  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area  | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 94076.63 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 94076.63 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 94076.63 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 94076.63 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 94076.63 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 94076.63 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 27255.88 | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26940.76 | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26940.76 | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26940.76 | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 26940.76 | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5975-FS(0)         | Injection Vial   | 19           |
| Sample ID          | NAWC-050118-FRB-304 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:07:47 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area  | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 88279.99 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 88279.99 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 88279.99 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 88279.99 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFOA_2     | 413.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 88279.99 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 88279.99 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 28391.02 | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 24390.83 | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 24390.83 | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 24390.83 | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 24390.83 | 400.00          |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5977-FS(0)         | Injection Vial   | 20           |
| Sample ID          | NAWC-050118-FRB-098 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:16:43 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

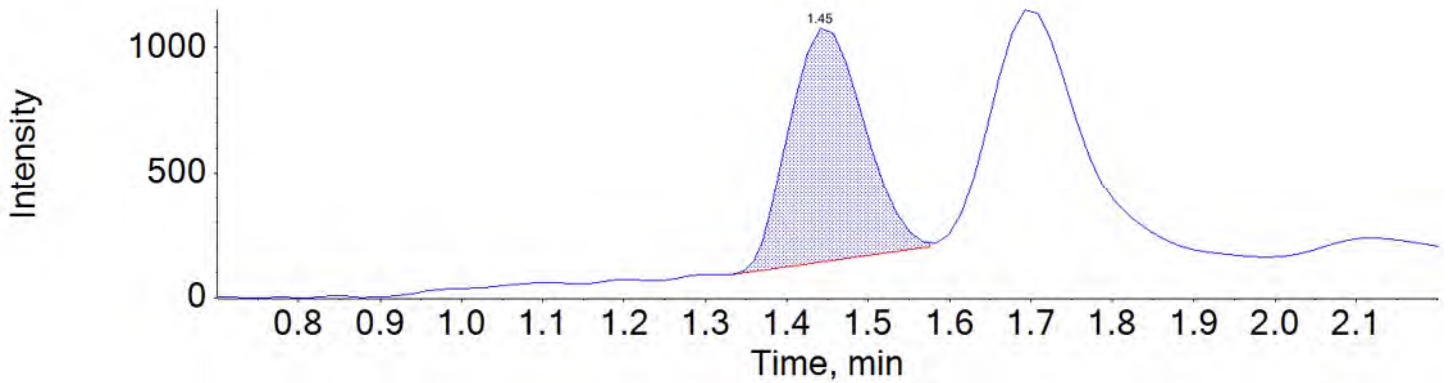
| Analyte    | MRM Transition | RT   | IS         | IS MRM Transition | IS Area   | IS Conc. (ng/L) |
|------------|----------------|------|------------|-------------------|-----------|-----------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 13C4-PFOS  | 503.0 / 80.0      | 109495.96 | 287.00          |
| PFBS_2     | 298.9 / 99.0   | 1.42 | 13C4-PFOS  | 503.0 / 80.0      | 109495.96 | 287.00          |
| PFHxA_1    | 313.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFHxA_2    | 313.0 / 119.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFHpA_1    | 363.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFHpA_2    | 363.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFHxS_1    | 399.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 109495.96 | 287.00          |
| PFHxS_2    | 399.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 109495.96 | 287.00          |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFOA_2     | 413.0 / 169.0  | 2.44 | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFNA_1     | 463.0 / 419.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFNA_2     | 463.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFOS_1     | 499.0 / 80.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 109495.96 | 287.00          |
| PFOS_2     | 499.0 / 99.0   | N/A  | 13C4-PFOS  | 503.0 / 80.0      | 109495.96 | 287.00          |
| PFDA_1     | 513.0 / 469.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFDA_2     | 513.0 / 219.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFUnA_1    | 563.0 / 519.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFUnA_2    | 563.0 / 269.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFDoA_1    | 613.0 / 569.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFDoA_2    | 613.0 / 319.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | 13C2-PFOA  | 415.0 / 370.0     | 34760.01  | 100.00          |
| NMeFOSAA_1 | 570.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 30654.25  | 400.00          |
| NMeFOSAA_2 | 570.0 / 512.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 30654.25  | 400.00          |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 30654.25  | 400.00          |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | d3-MeFOSAA | 573.0 / 419.0     | 30654.25  | 400.00          |

# Chromatograms

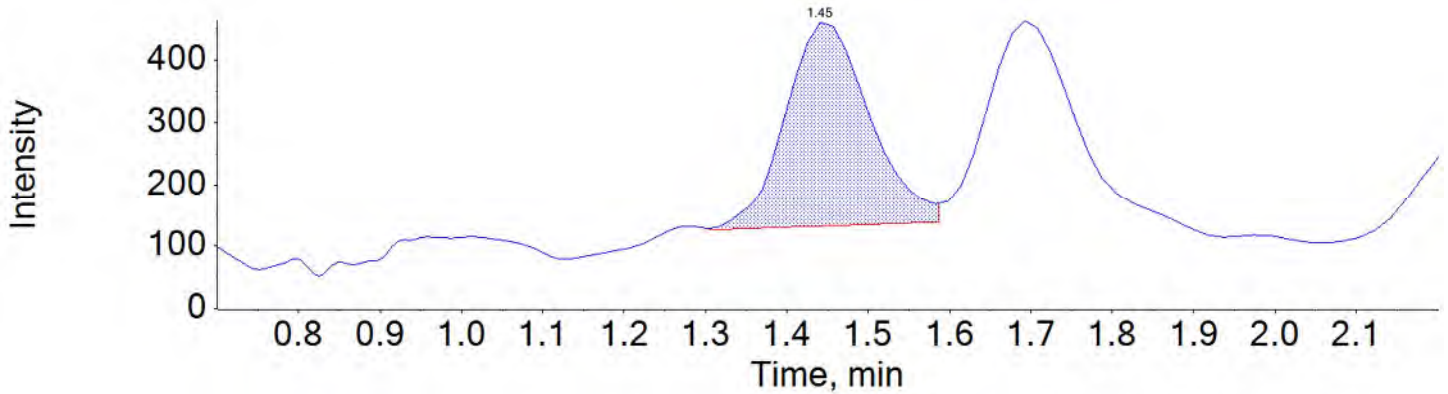
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

PFBS\_1 298.9 / 80.0

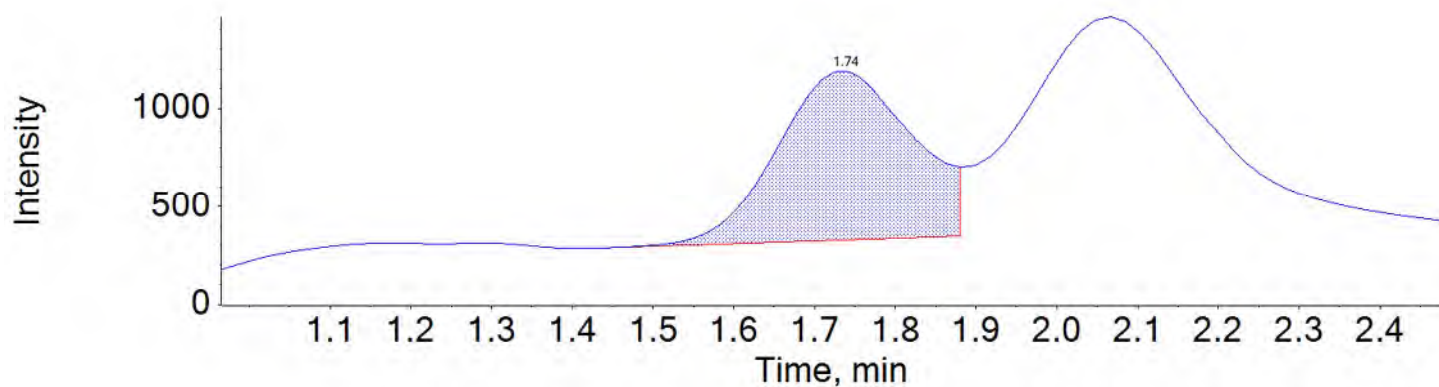


PFBS\_2 298.9 / 99.0

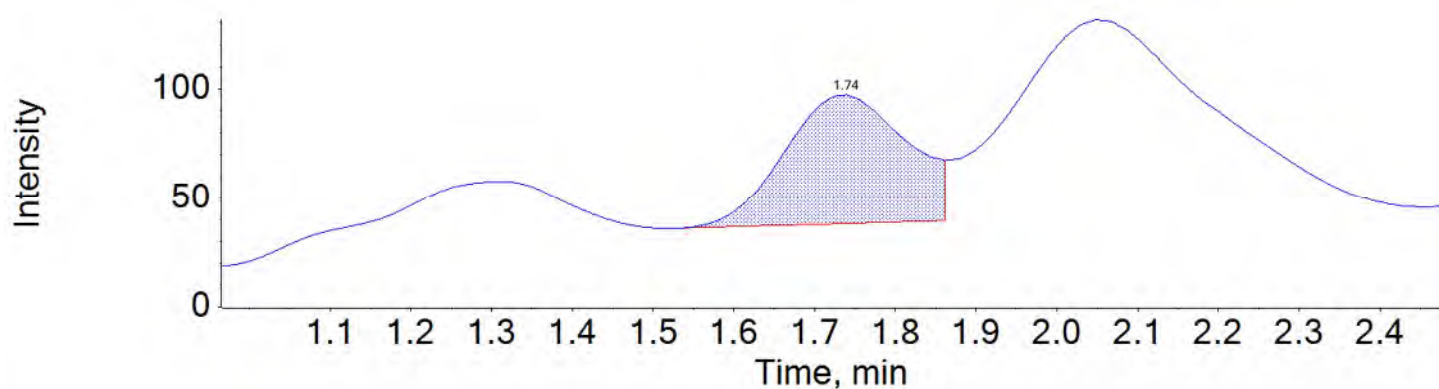




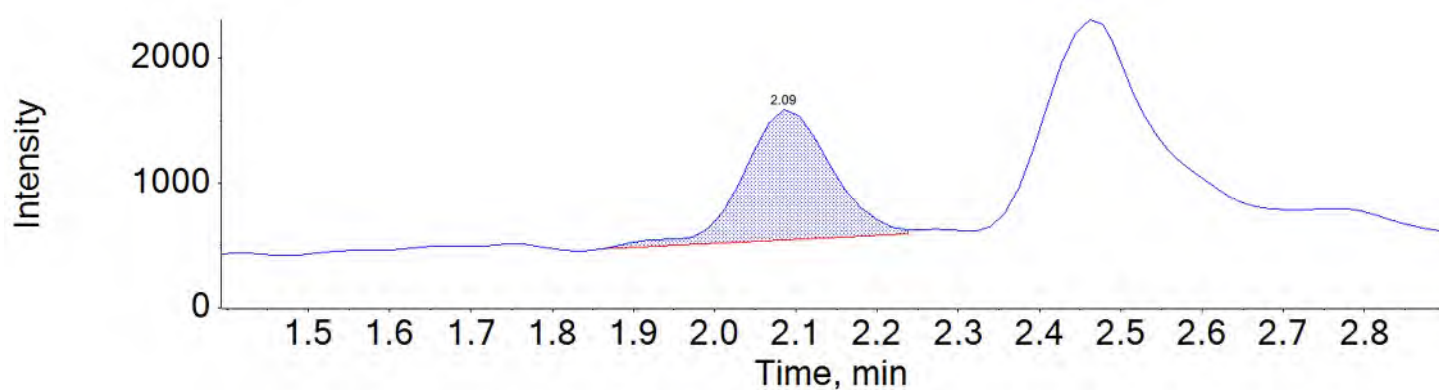
PFHxA\_1 313.0 / 269.0



PFHxA\_2 313.0 / 119.0

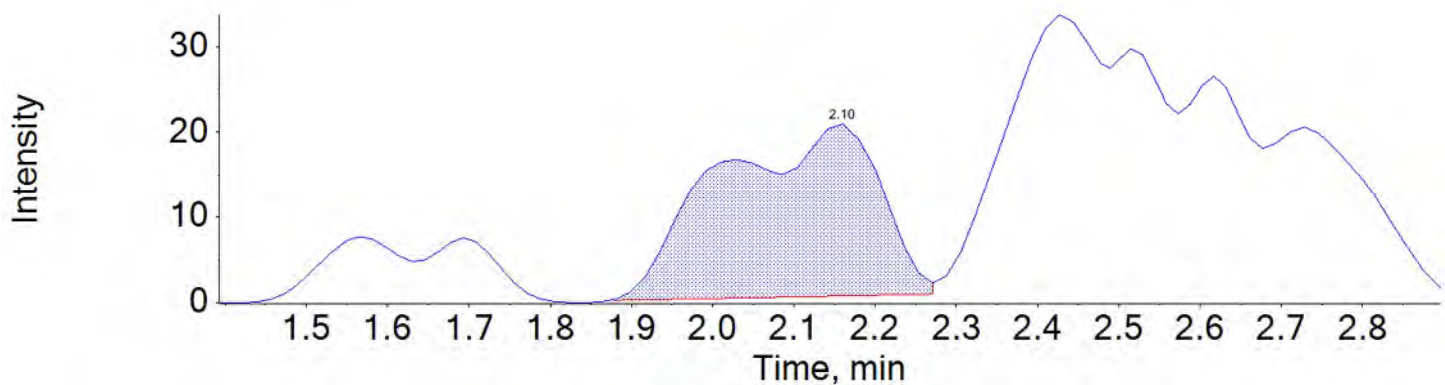


PFHpA\_1 363.0 / 319.0

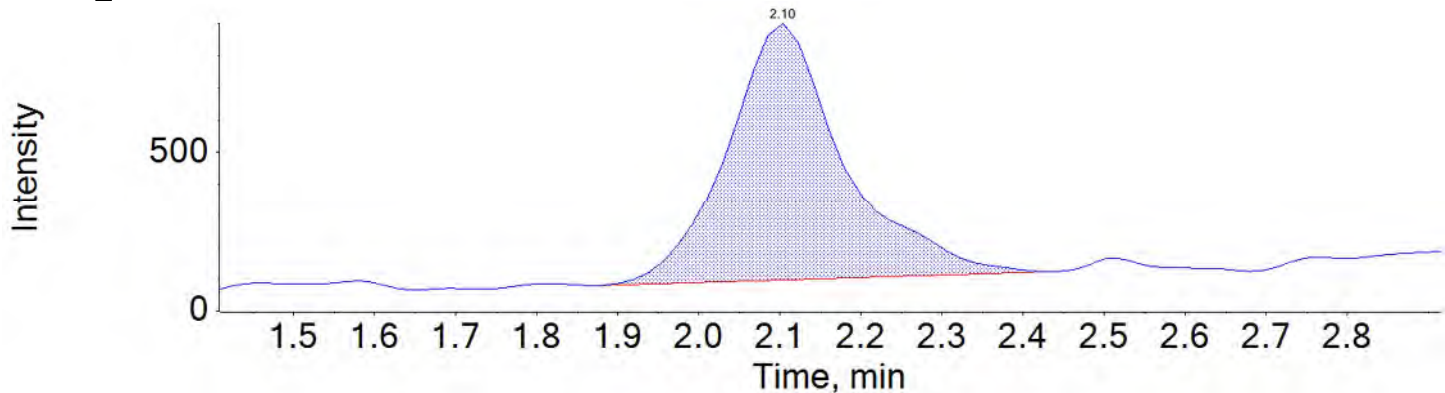




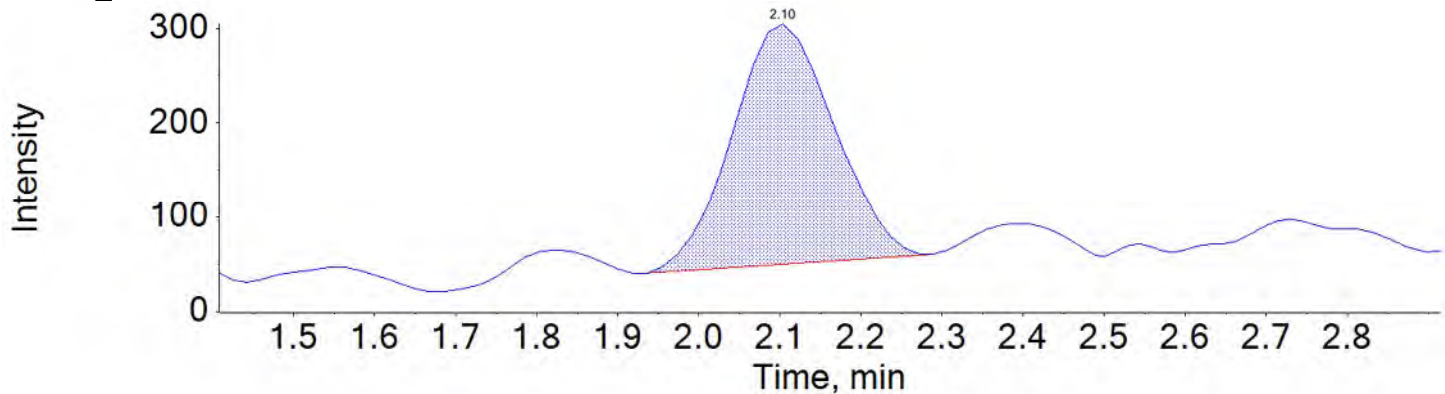
PFHpA\_2 363.0 / 169.0



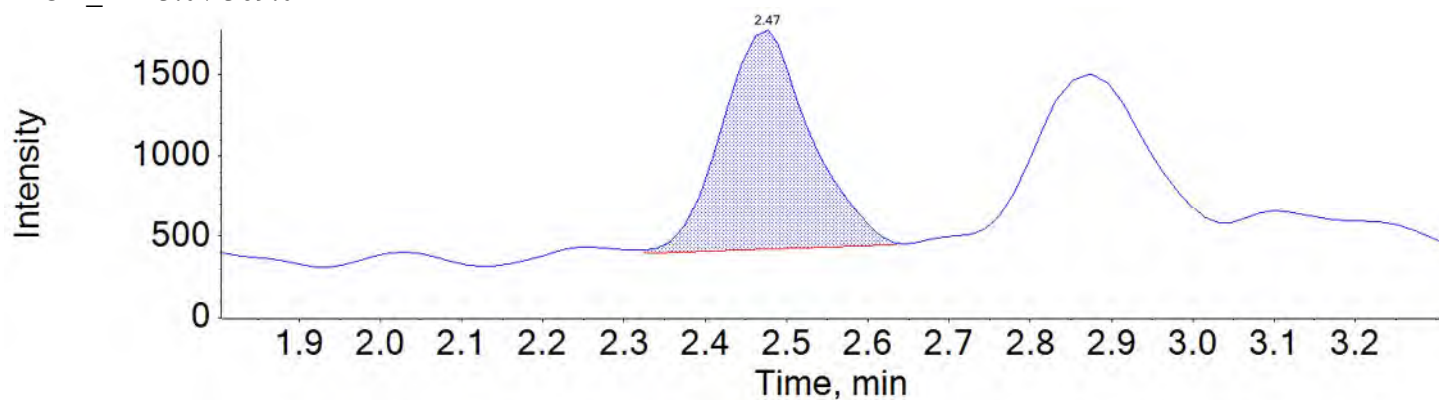
PFHxS\_1 399.0 / 80.0



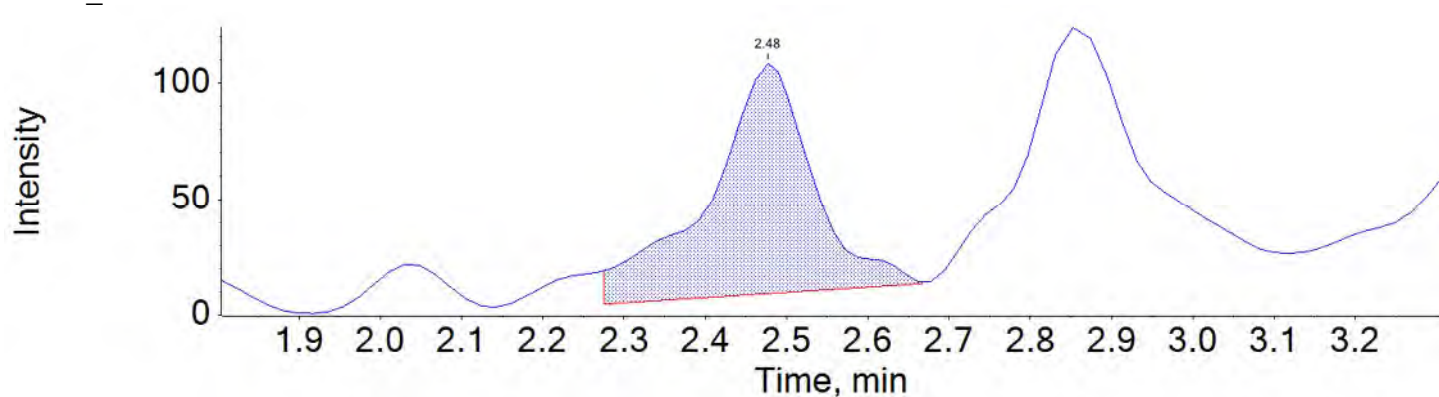
PFHxS\_2 399.0 / 99.0



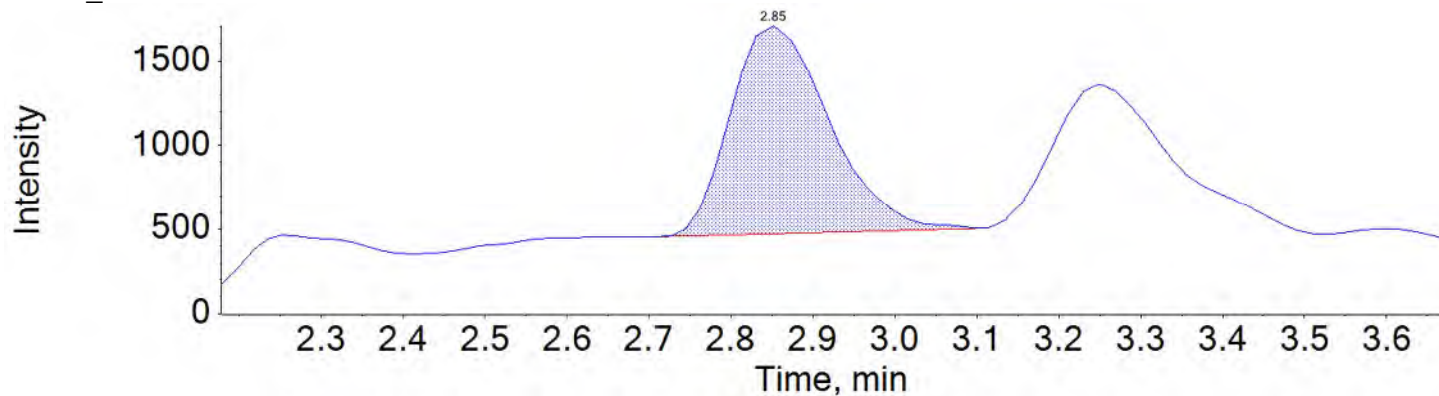
PFOA\_1 413.0 / 369.0



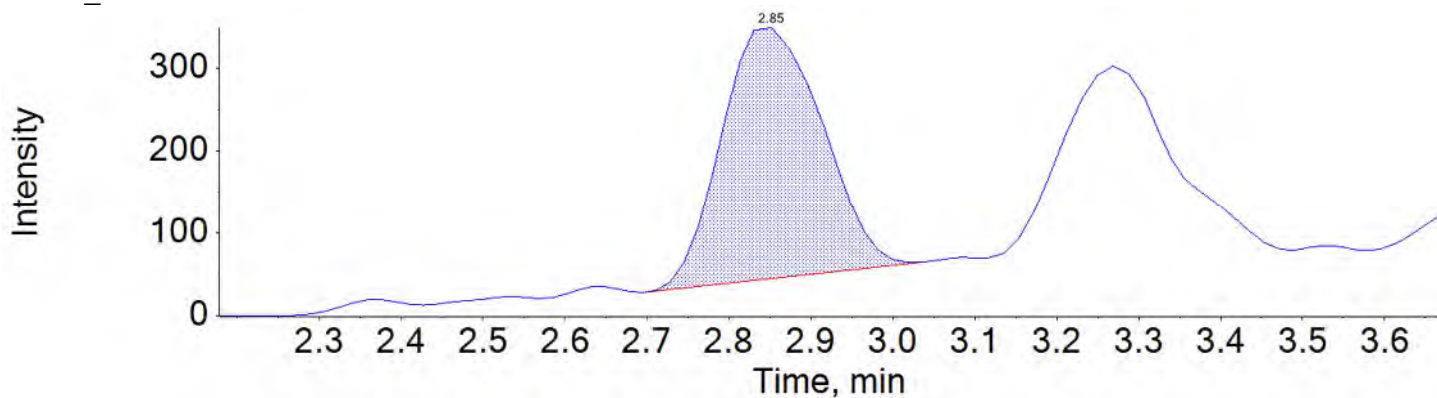
PFOA\_2 413.0 / 169.0



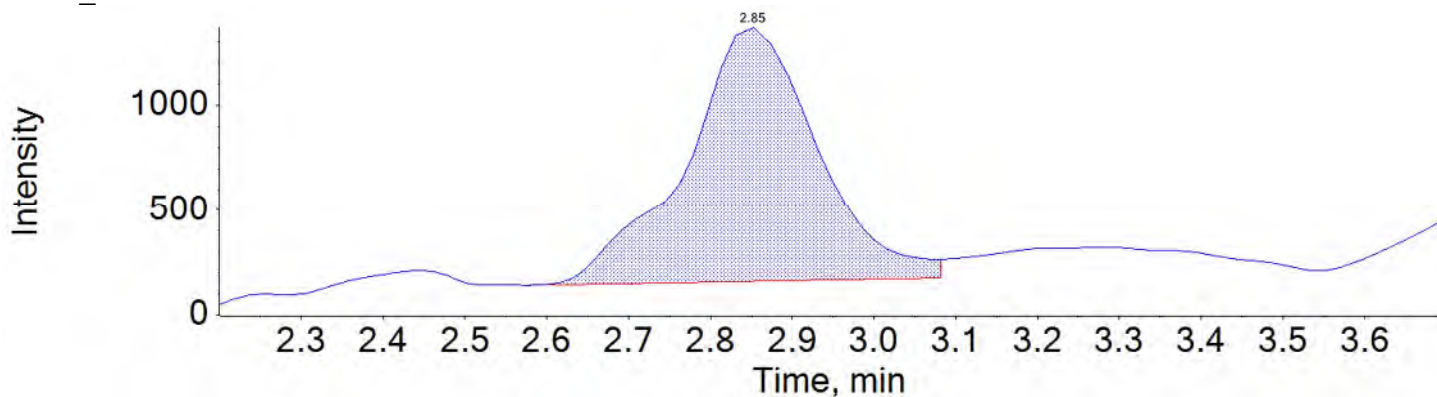
PFNA\_1 463.0 / 419.0



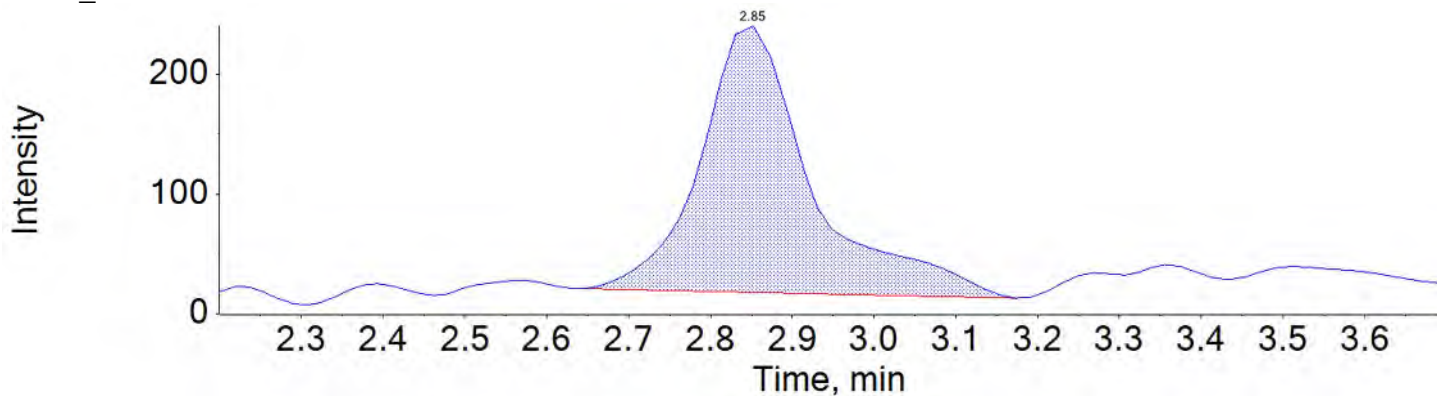
PFNA\_2 463.0 / 219.0



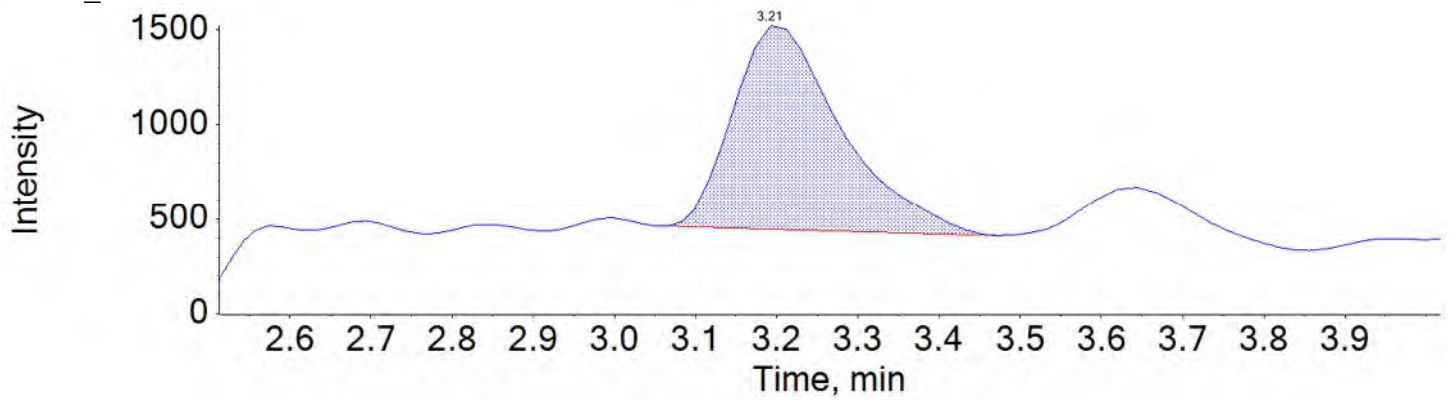
PFOS\_1 499.0 / 80.0



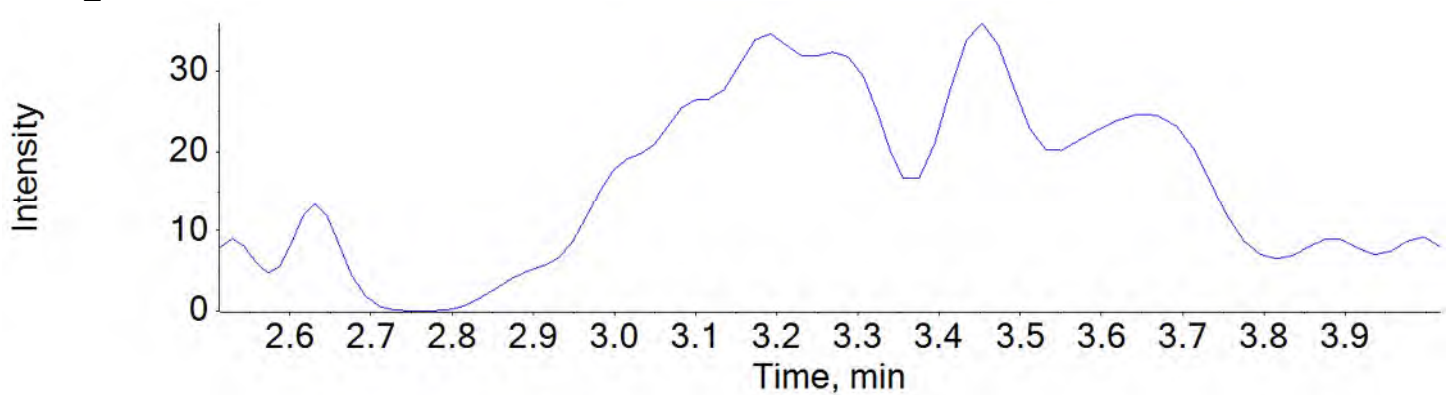
PFOS\_2 499.0 / 99.0



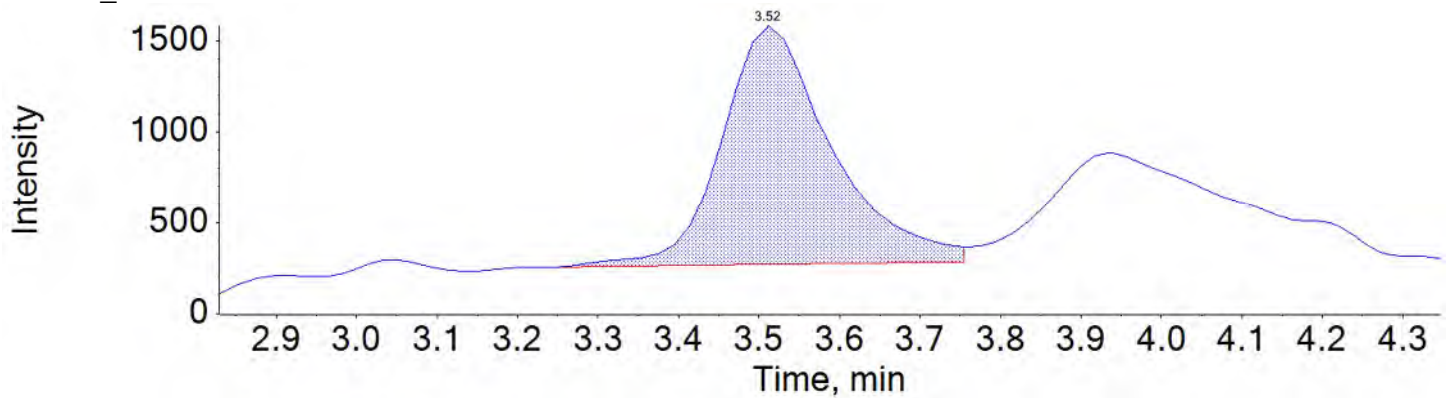
PFDA\_1 513.0 / 469.0



PFDA\_2 513.0 / 219.0

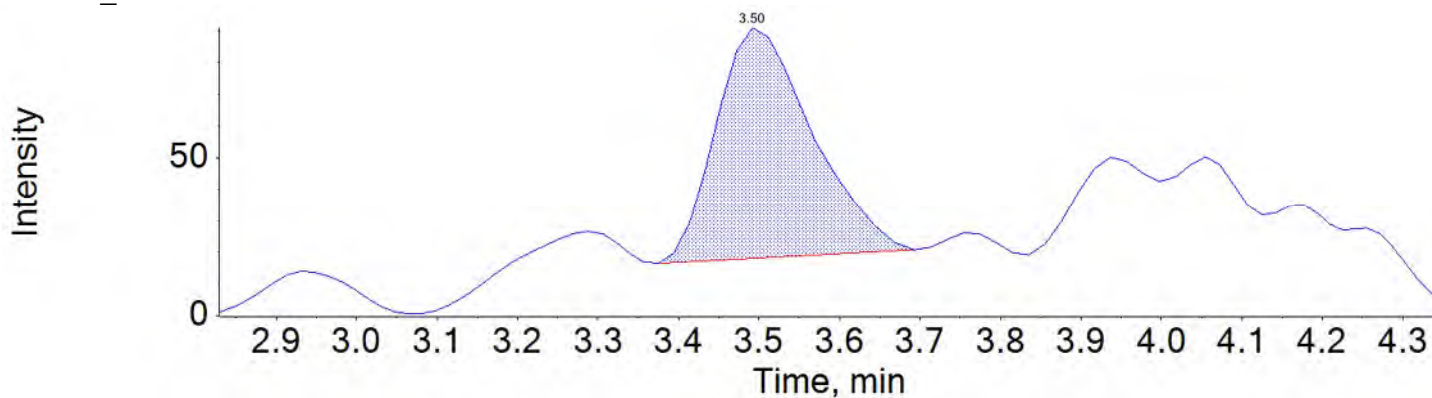


PFUnA\_1 563.0 / 519.0

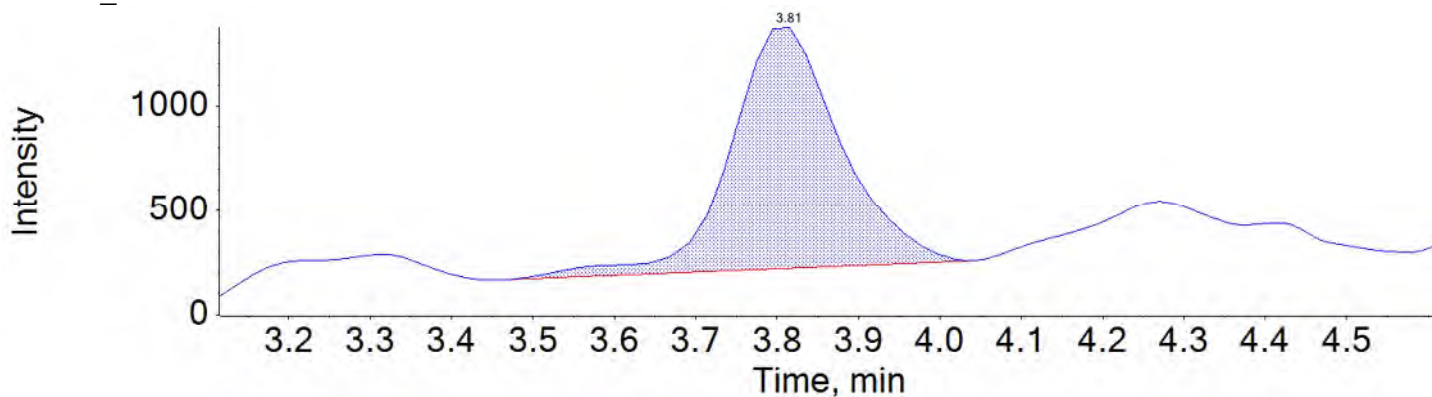




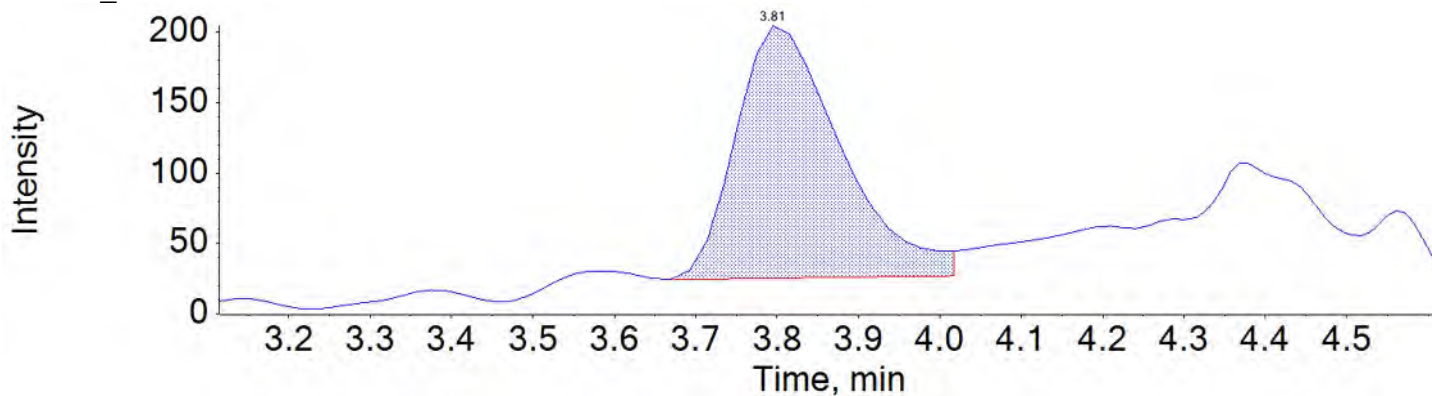
PUnA\_2 563.0 / 269.0



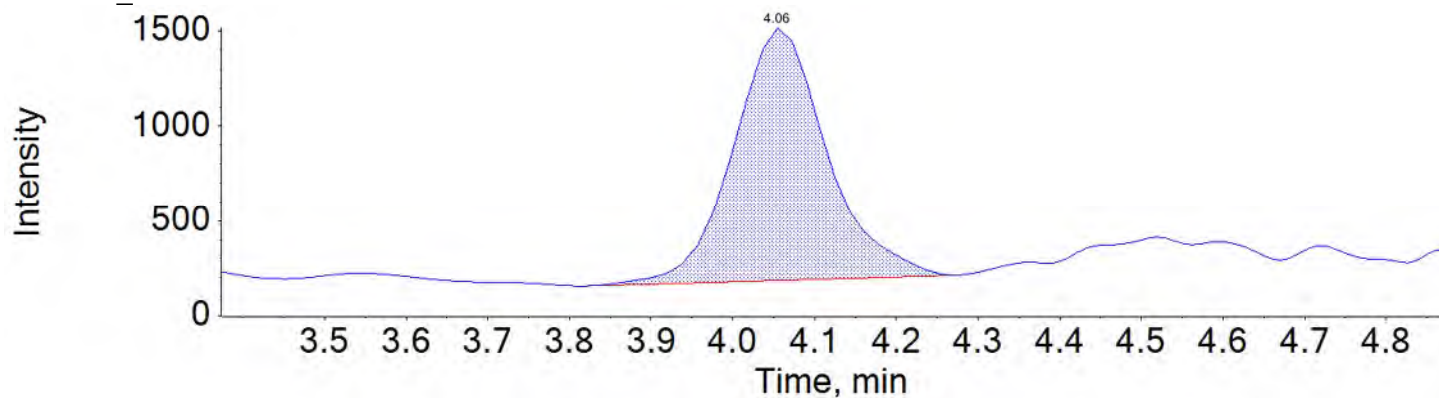
PDoA\_1 613.0 / 569.0



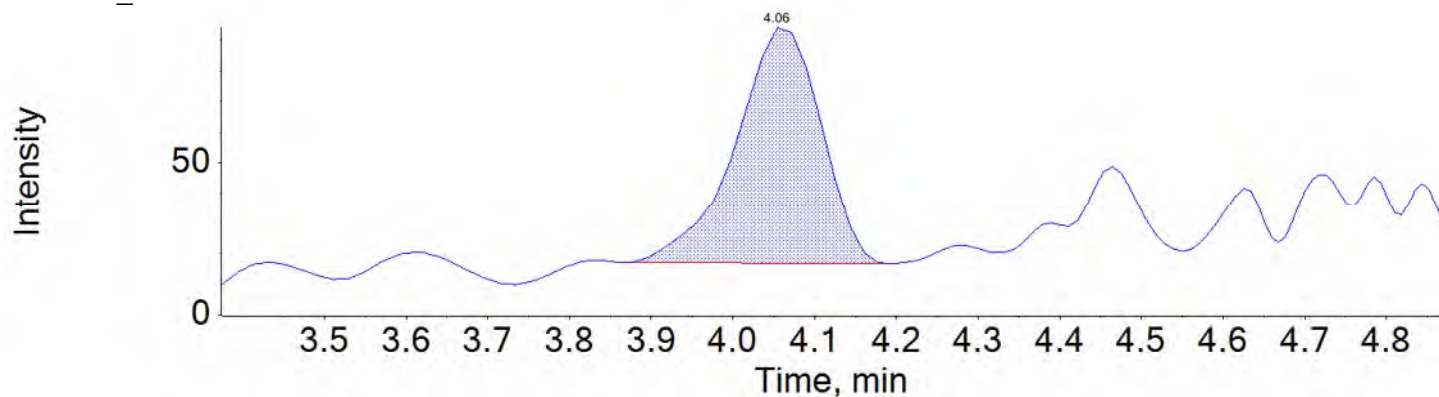
PDoA\_2 613.0 / 319.0



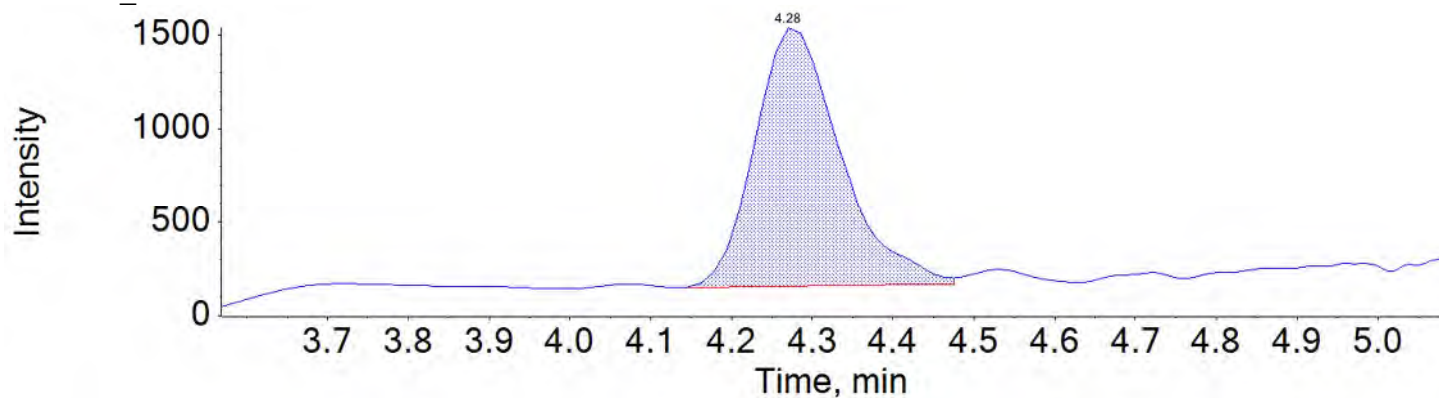
PFTTrDA\_1 663.0 / 619.0



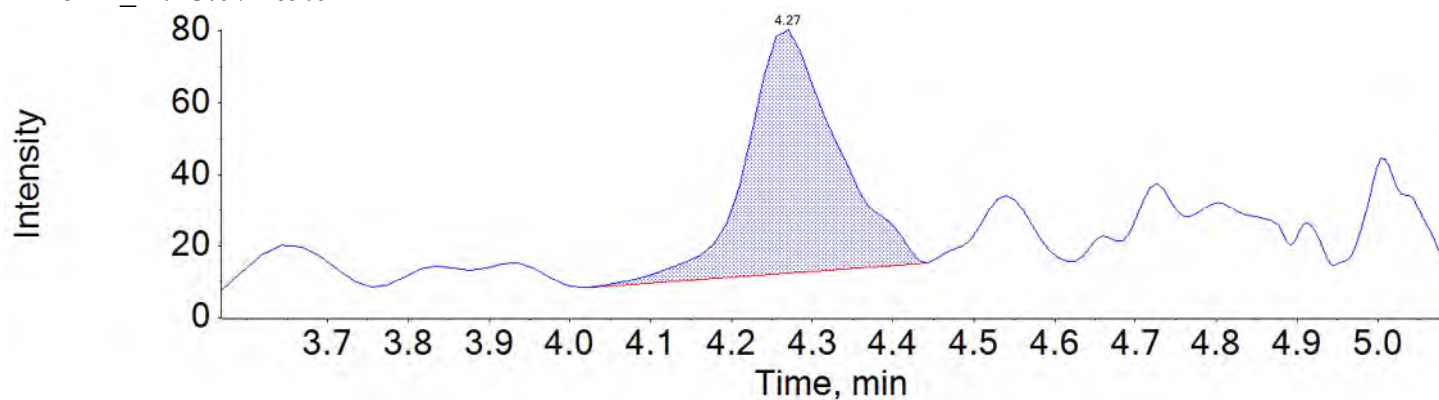
PFTTrDA\_2 663.0 / 169.0



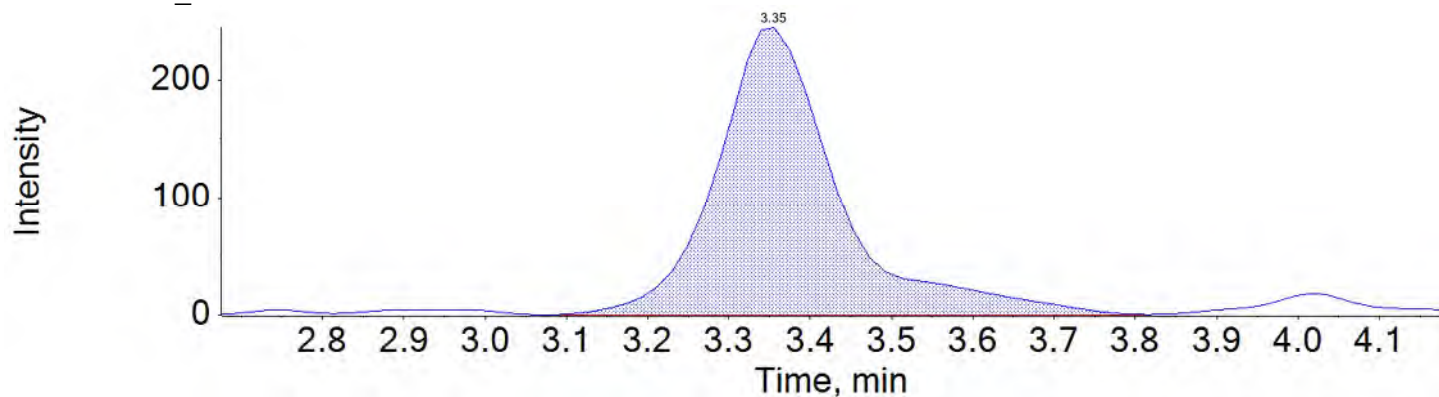
PFTTeDA\_1 713.0 / 669.0



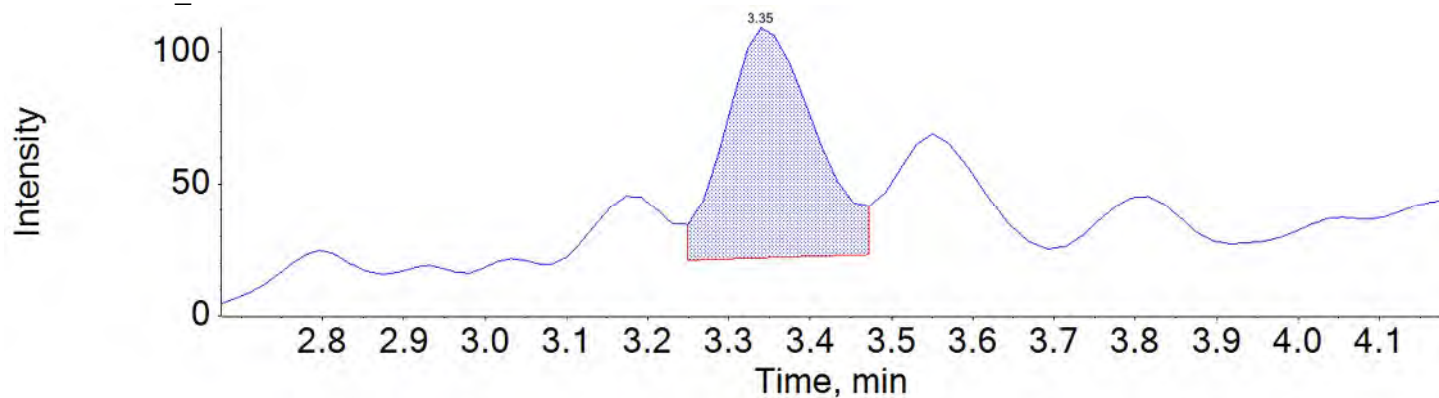
PFTeDA\_2 713.0 / 169.0



NMeFOSAA\_1 570.0 / 419.0

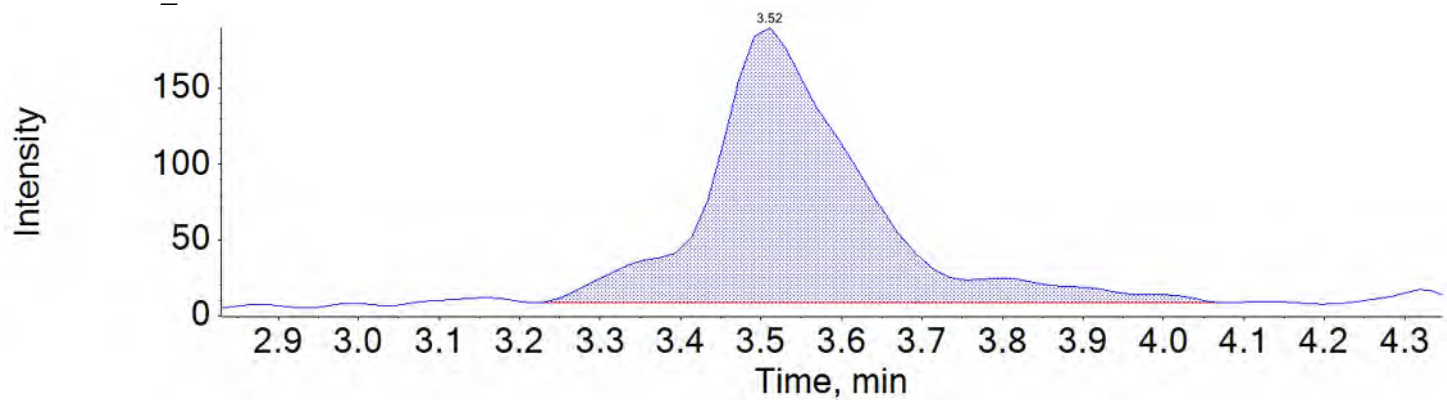


NMeFOSAA\_2 570.0 / 512.0

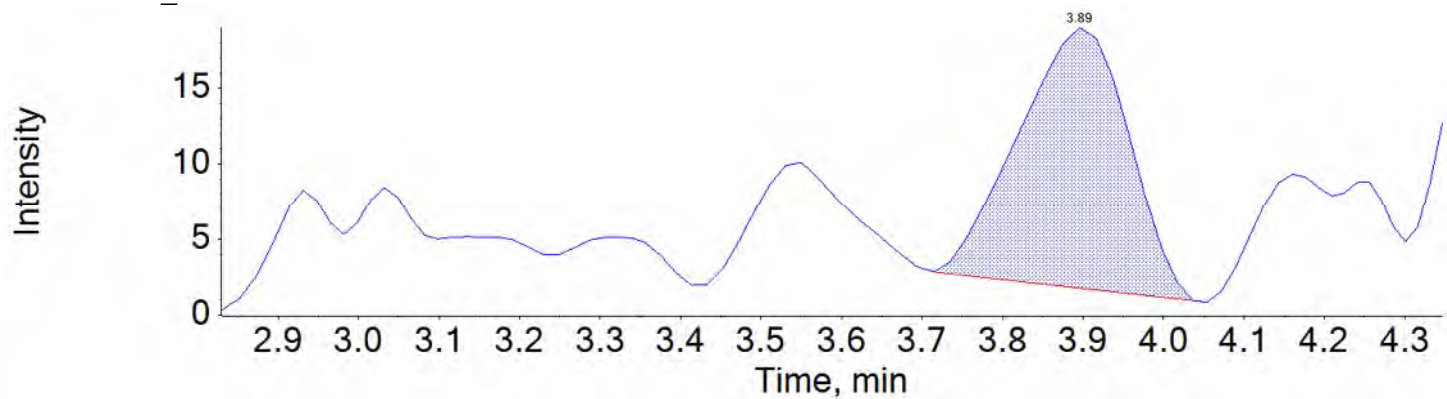




NEtFOSAA\_1 584.0 / 419.0

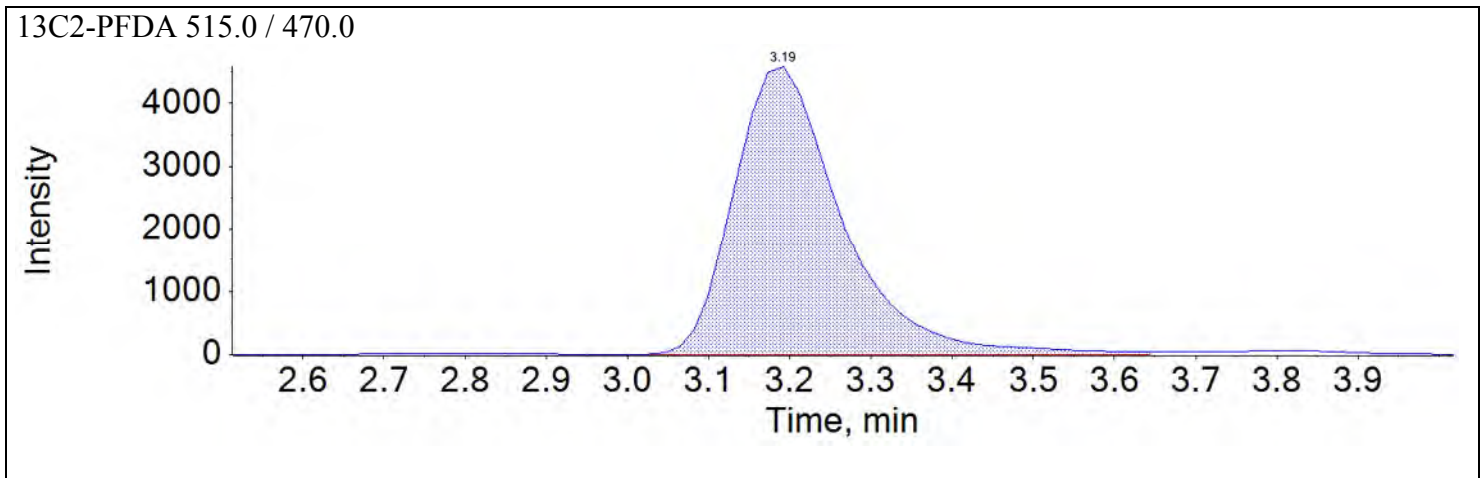
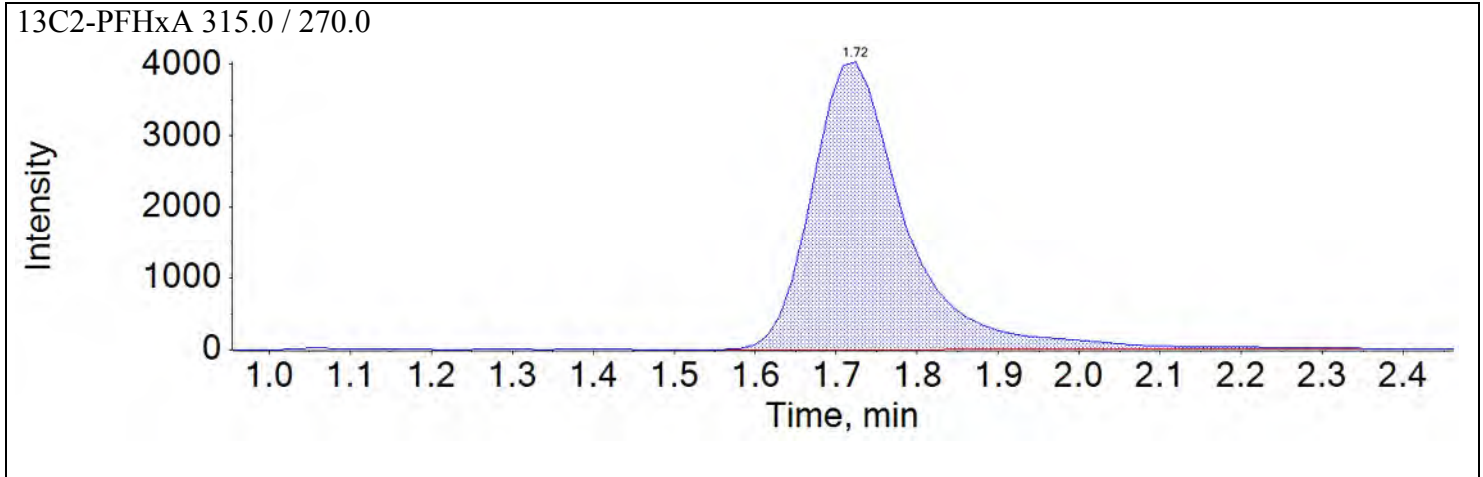


NEtFOSAA\_2 584.0 / 483.0

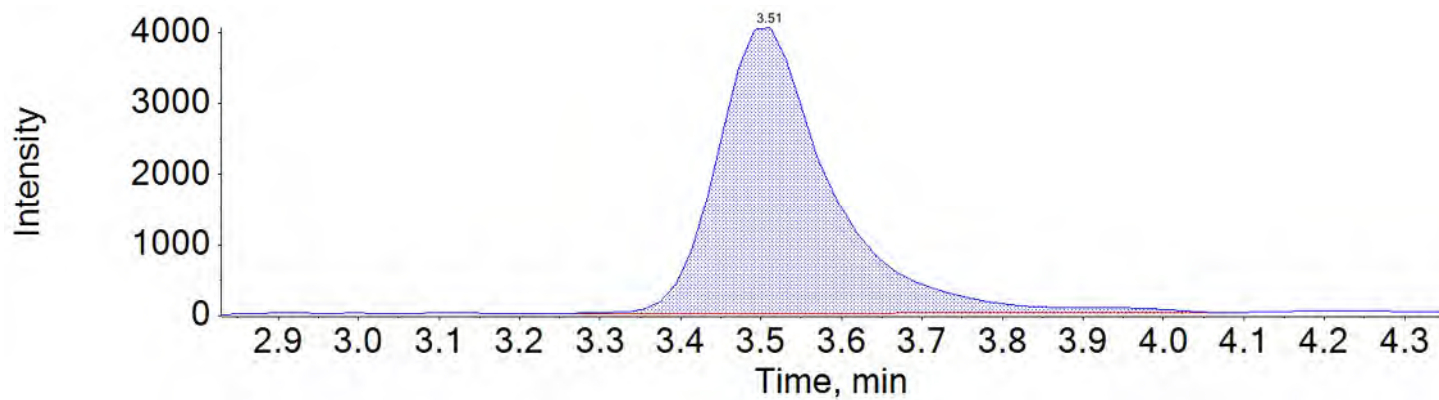


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms

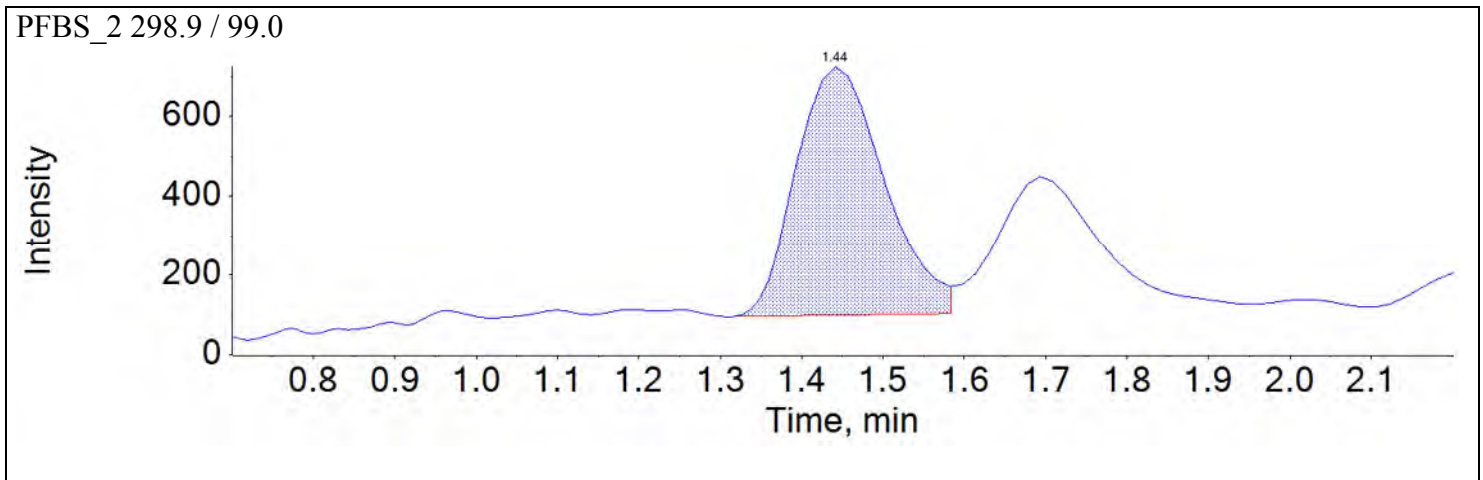
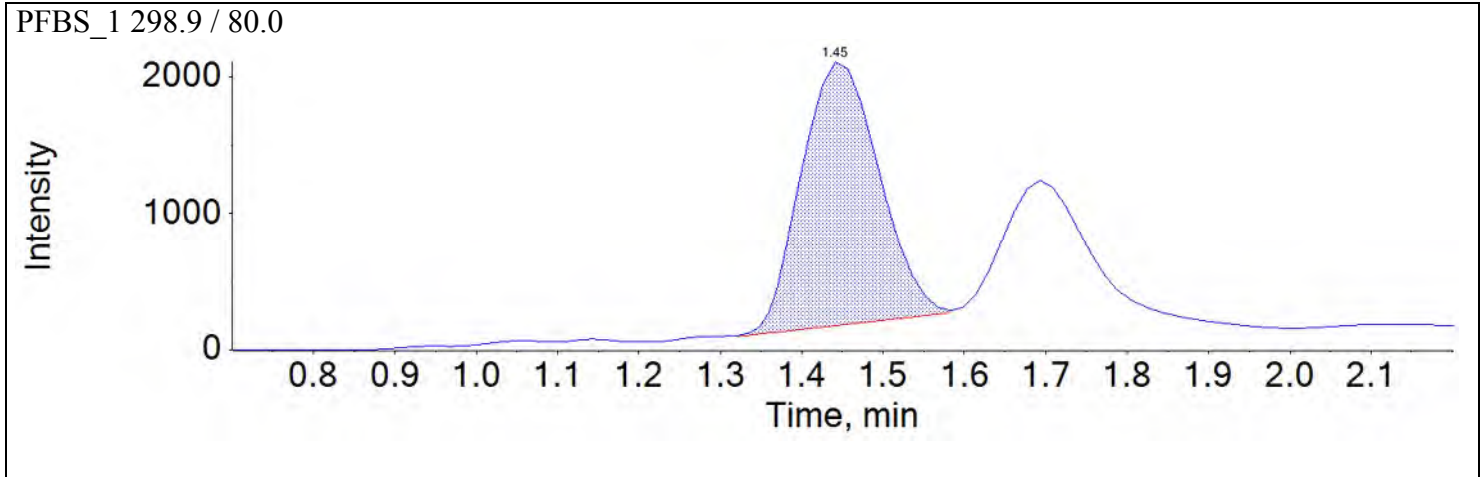


d5-EtFOSAA 589.0 / 419.0

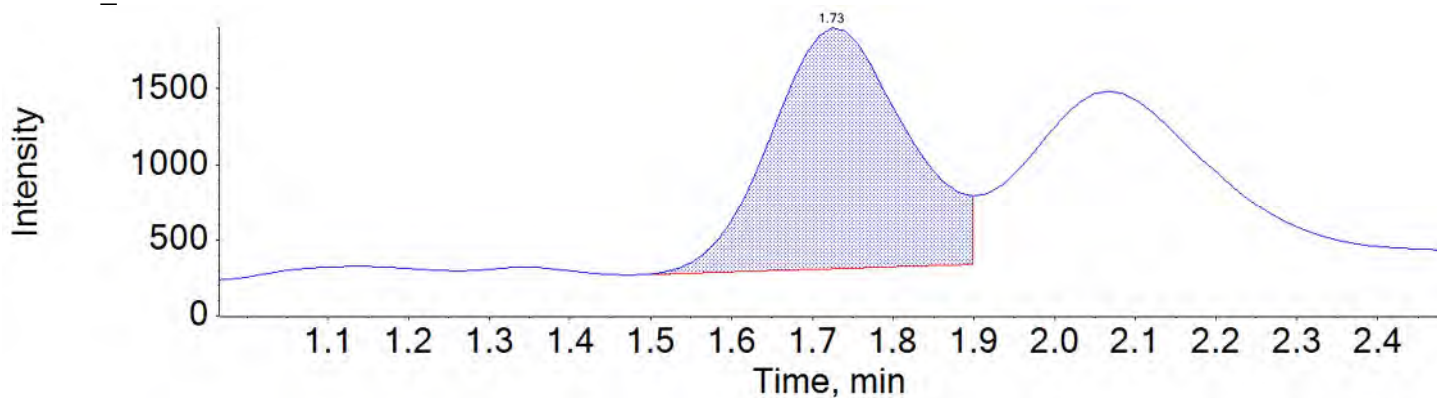


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

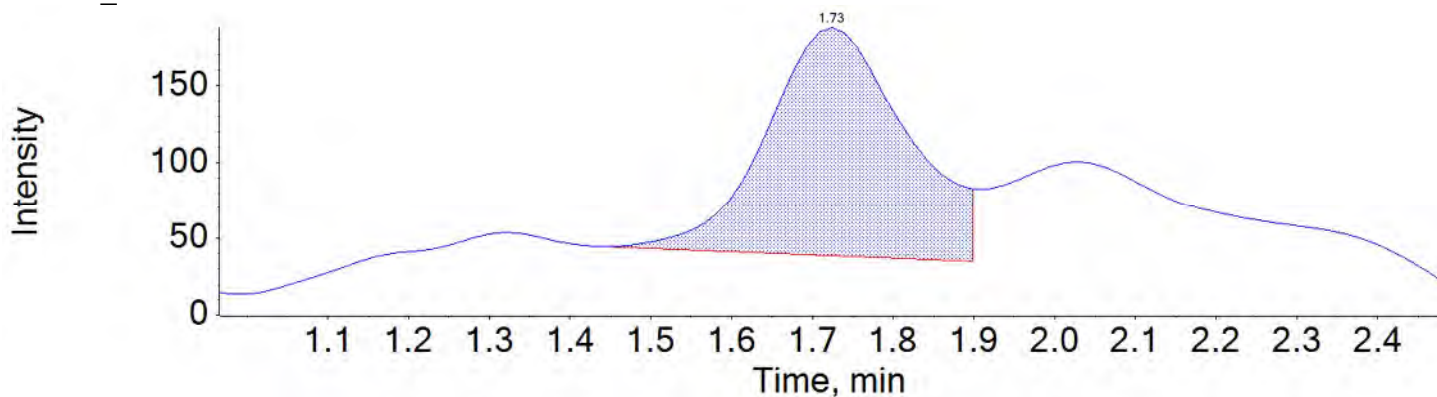
### Chromatograms



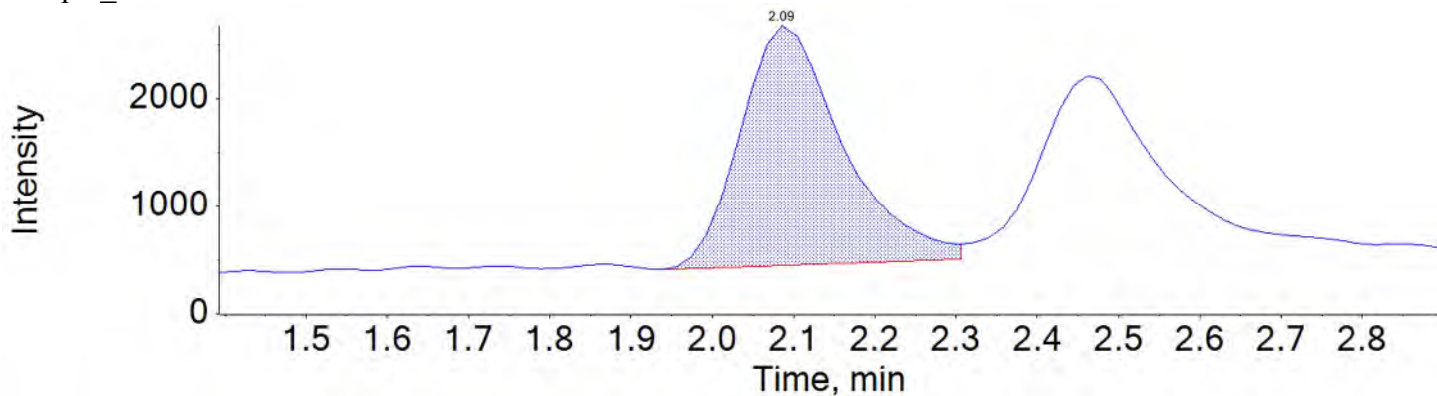
PFHxA\_1 313.0 / 269.0



PFHxA\_2 313.0 / 119.0

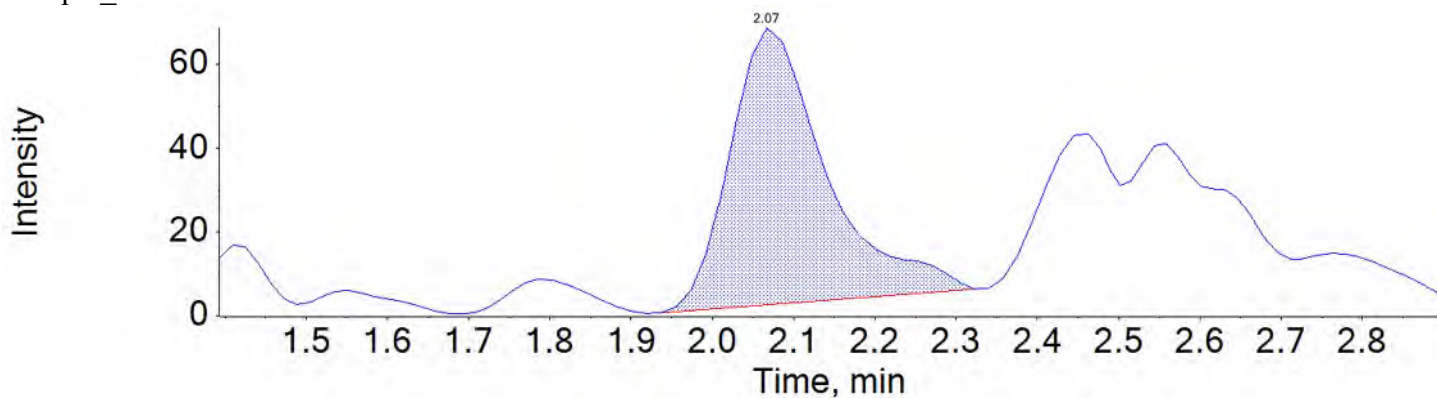


PFHpA\_1 363.0 / 319.0

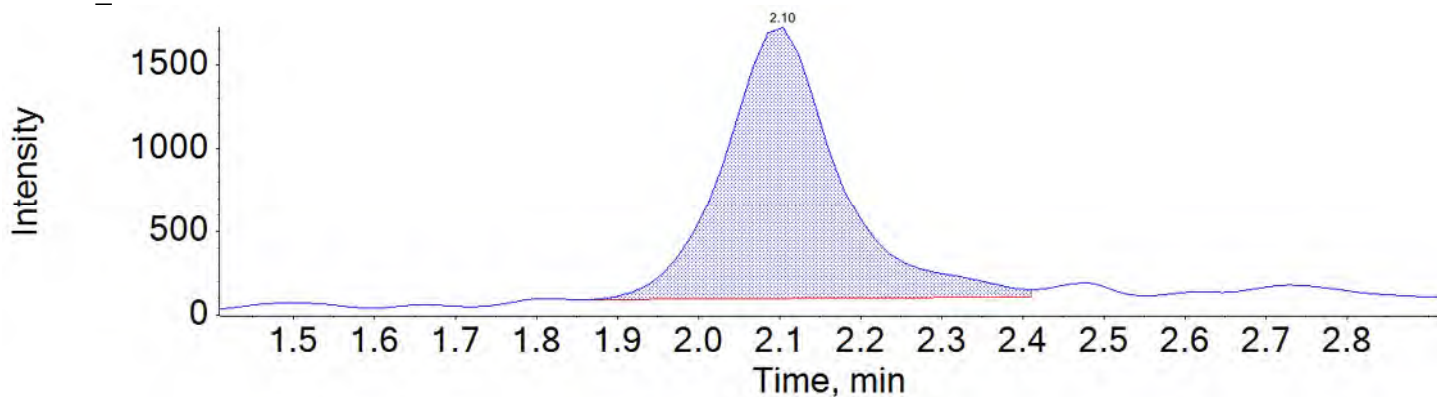




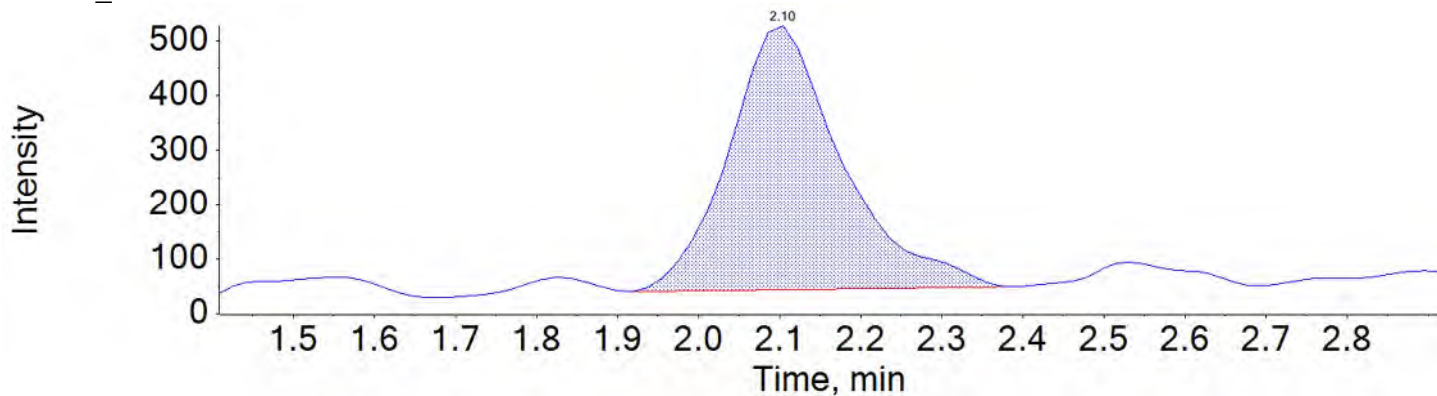
PFHpA\_2 363.0 / 169.0



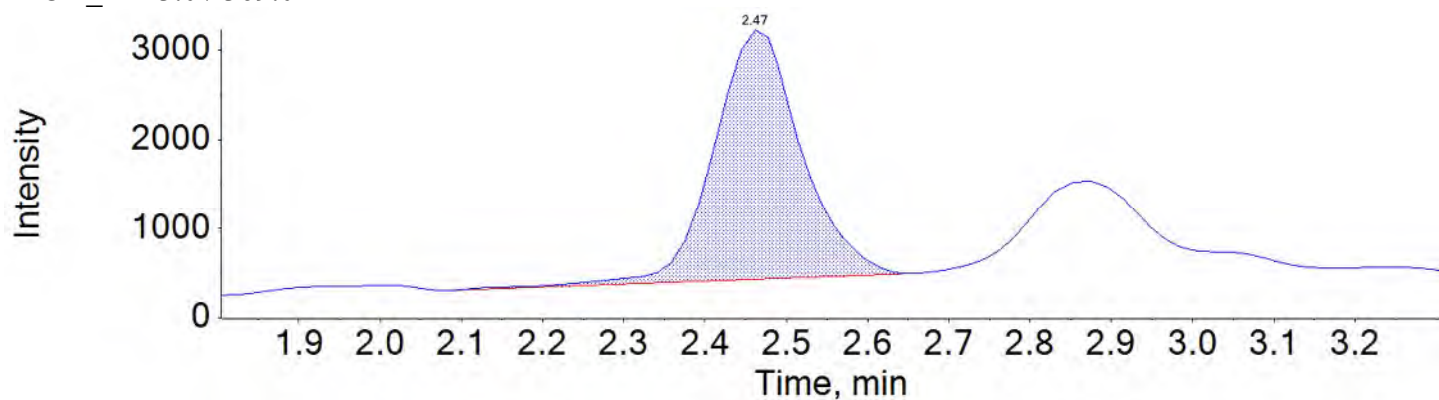
PFHxS\_1 399.0 / 80.0



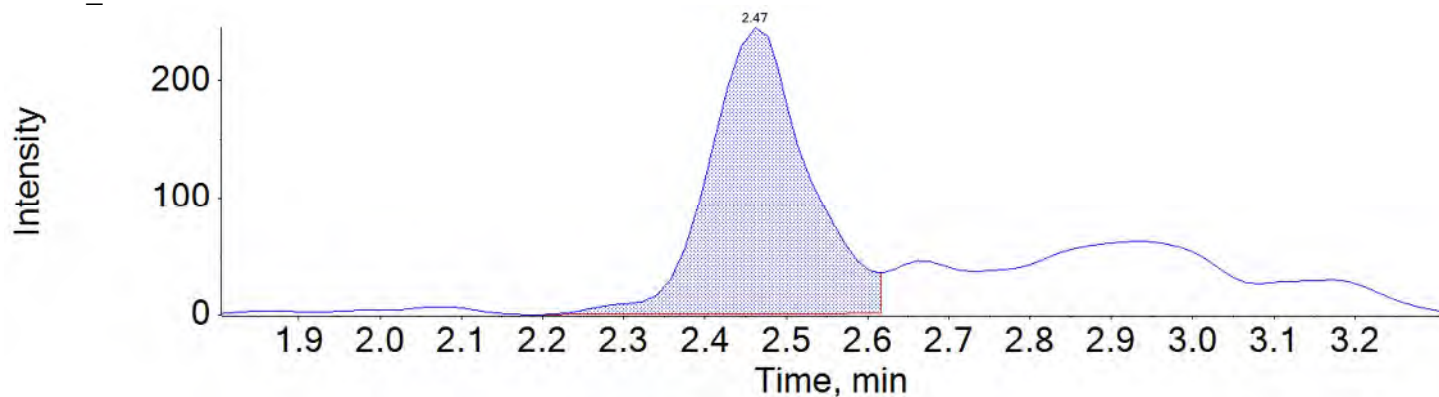
PFHxS\_2 399.0 / 99.0



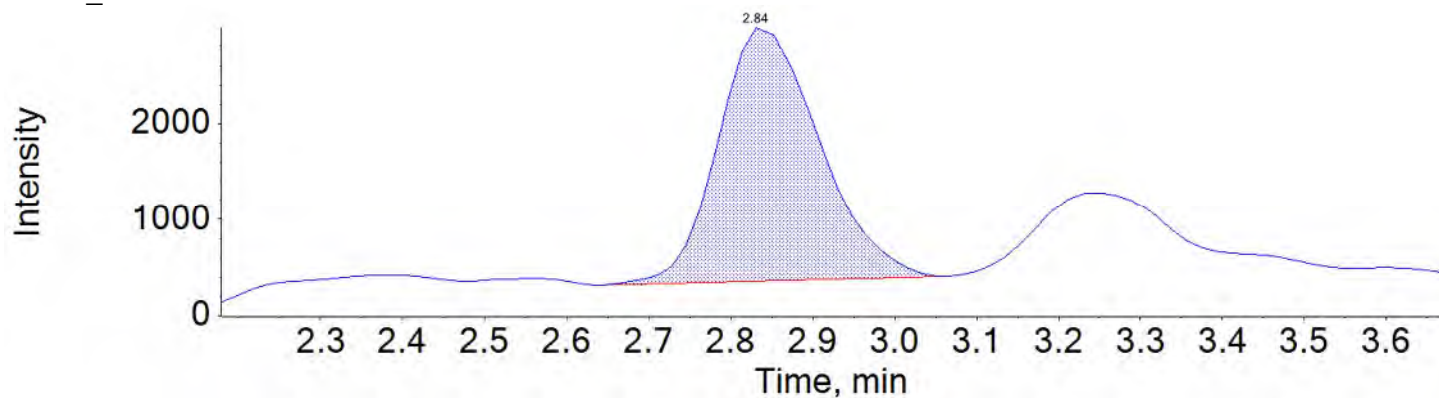
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

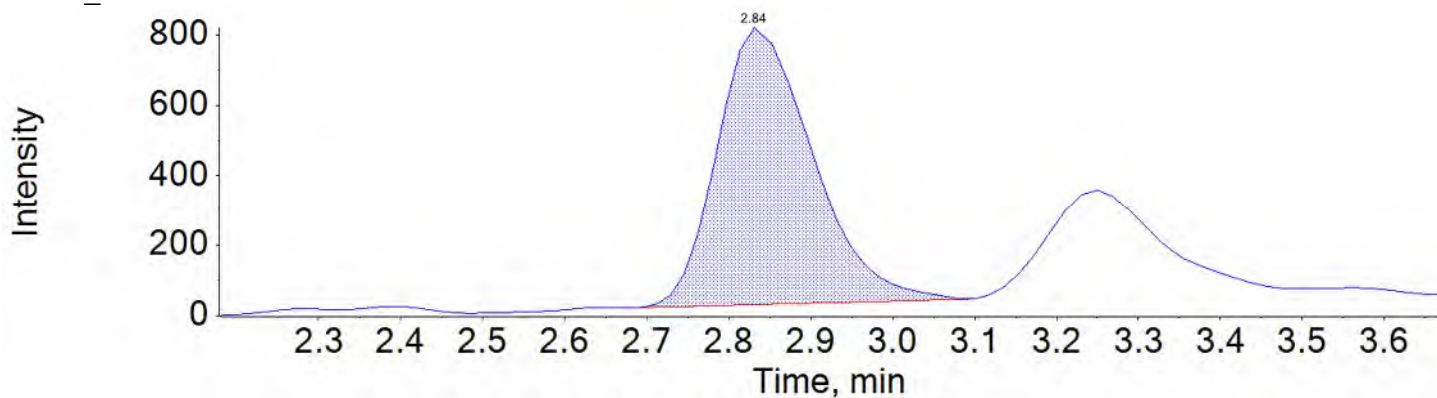


PFNA\_1 463.0 / 419.0

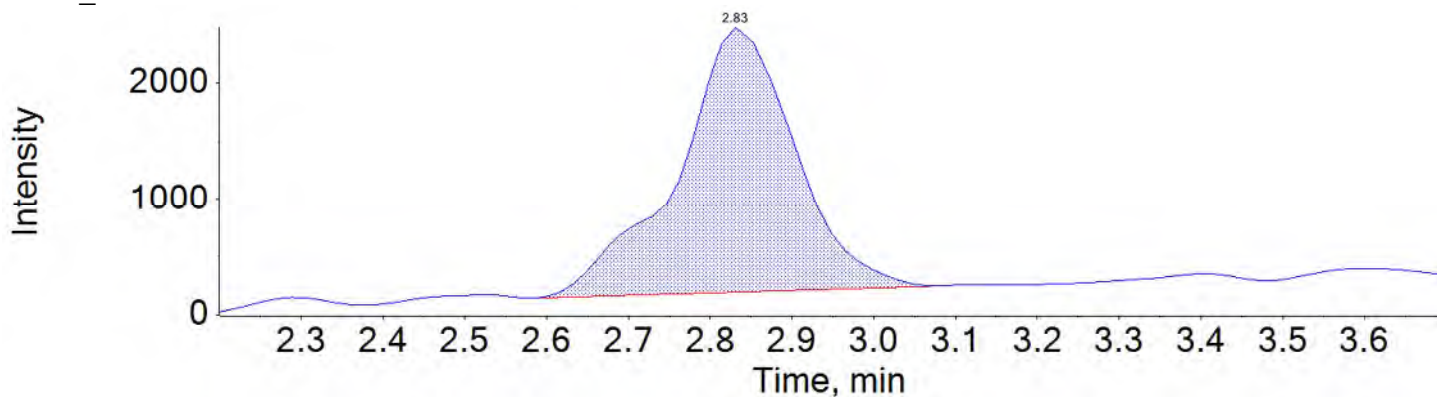




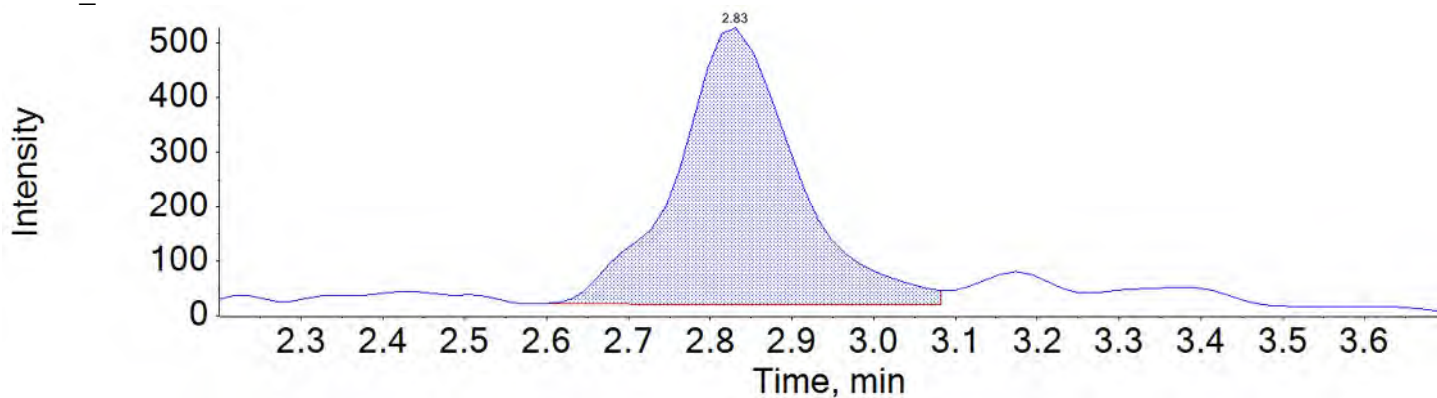
PFNA\_2 463.0 / 219.0



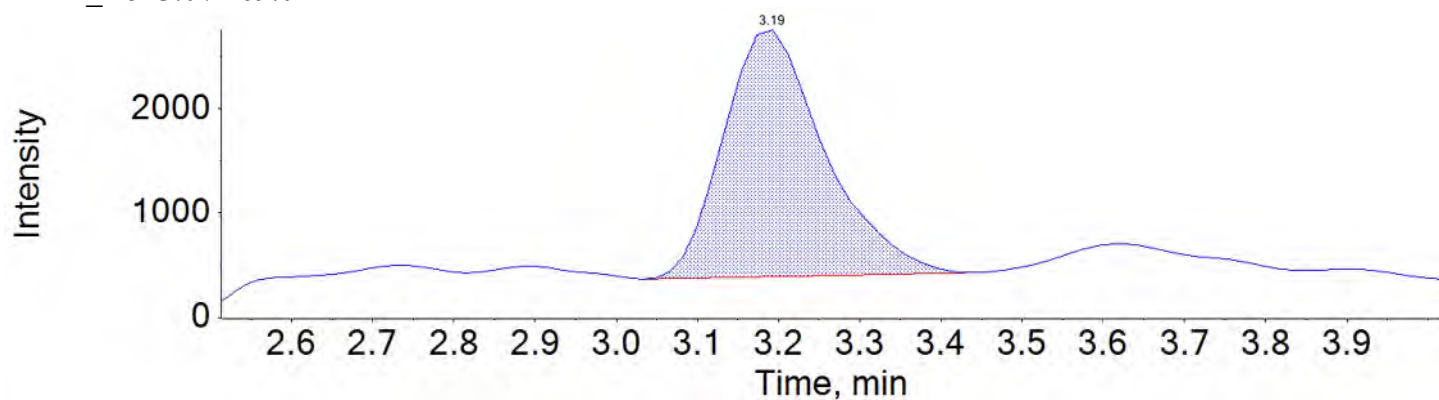
PFOS\_1 499.0 / 80.0



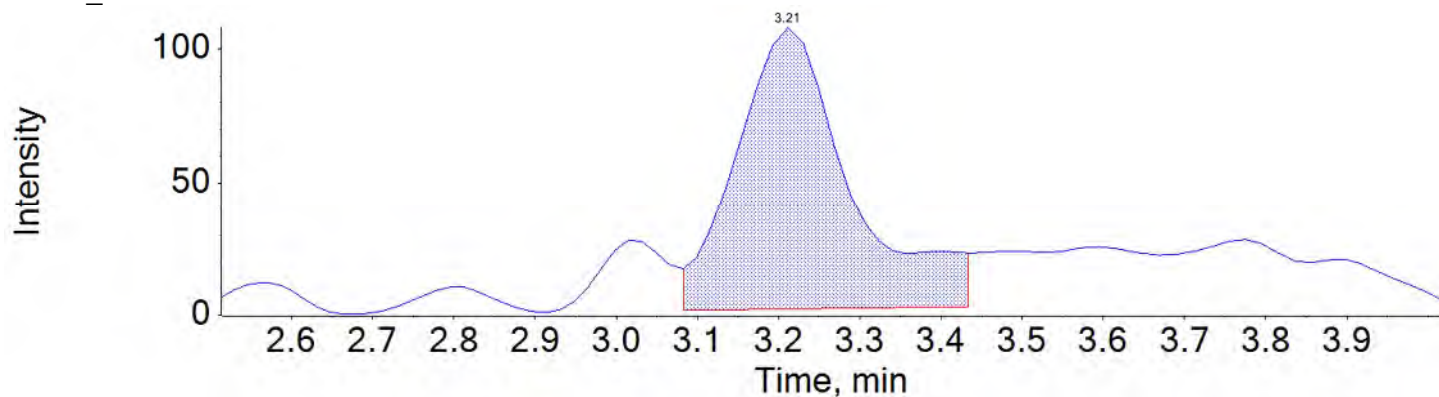
PFOS\_2 499.0 / 99.0



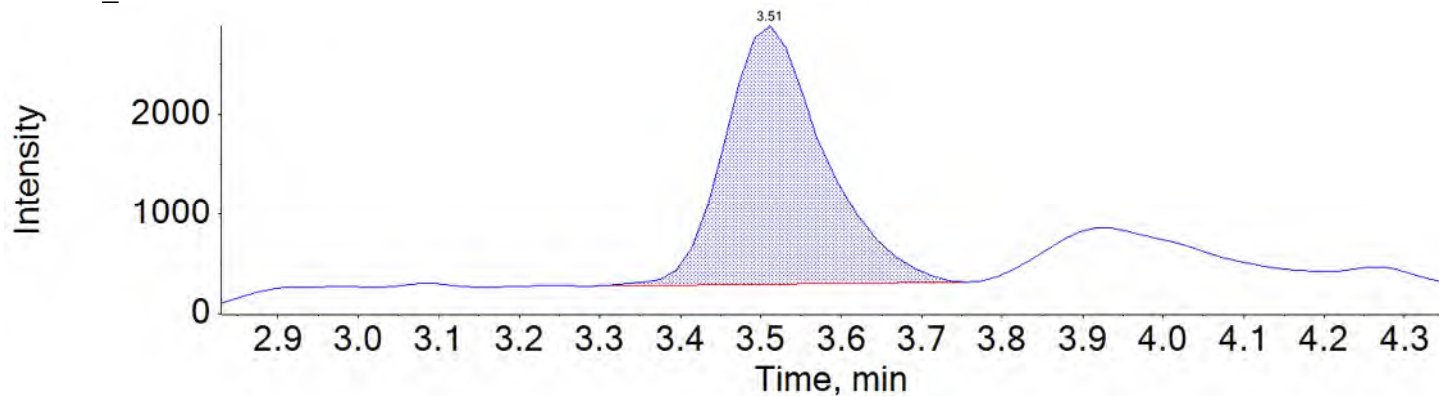
PFDA\_1 513.0 / 469.0



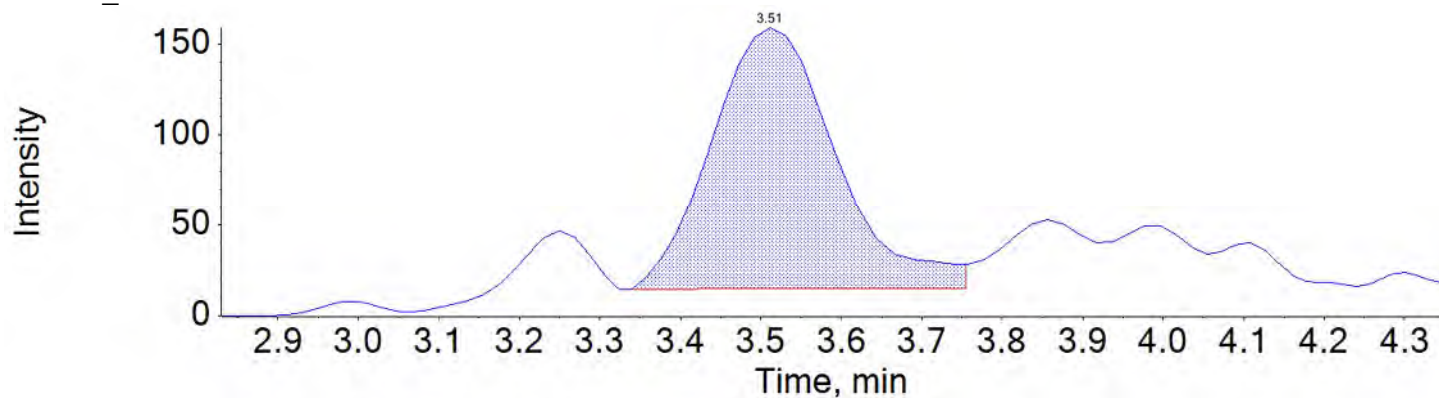
PFDA\_2 513.0 / 219.0



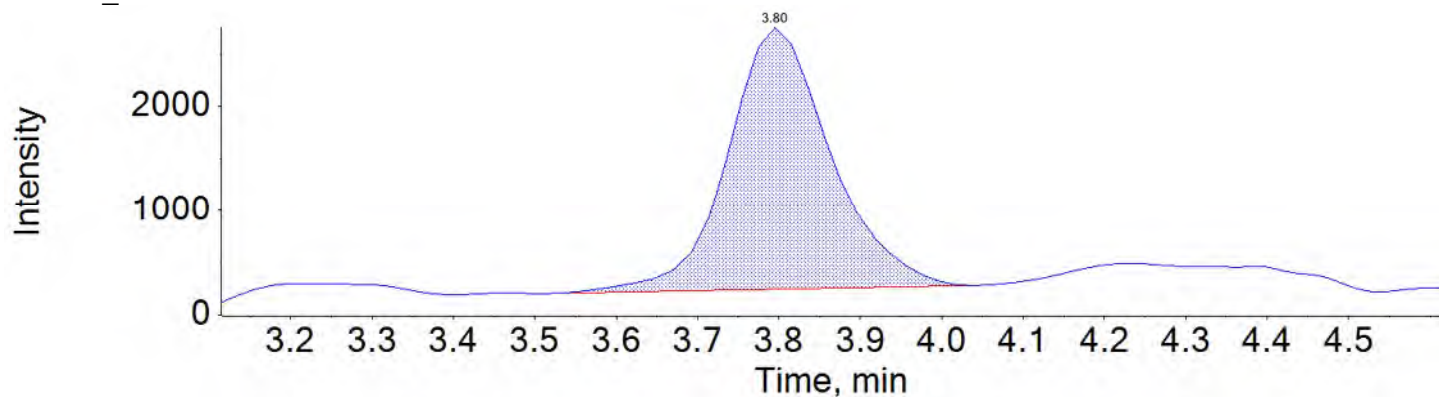
PFUnA\_1 563.0 / 519.0



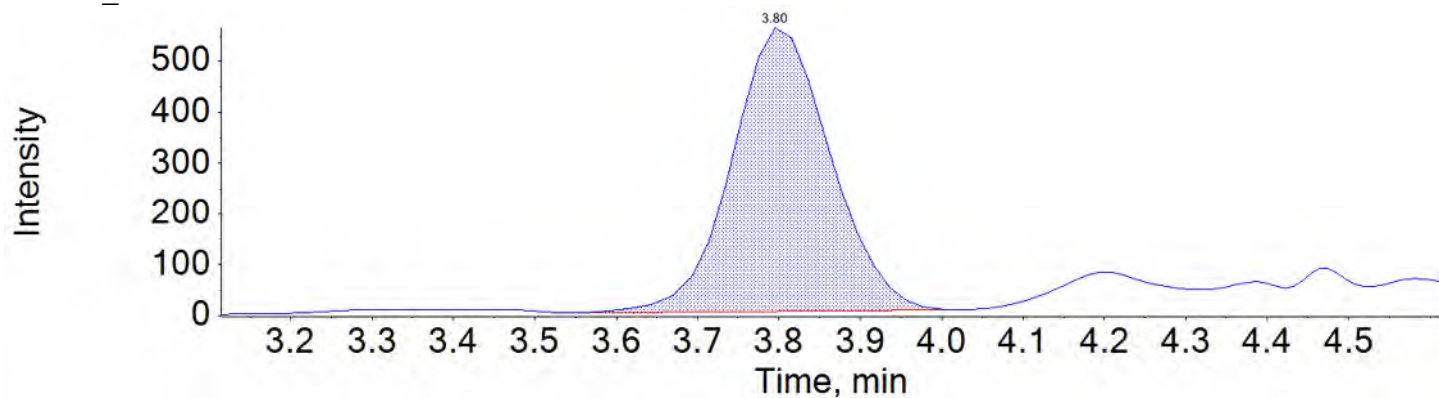
PFUnA\_2 563.0 / 269.0



PFDoA\_1 613.0 / 569.0

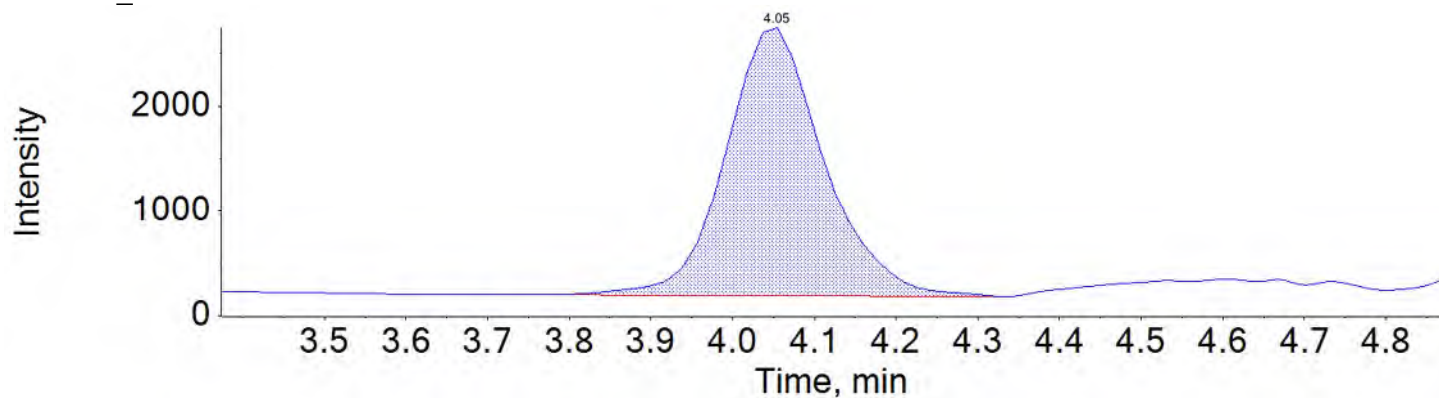


PFDoA\_2 613.0 / 319.0

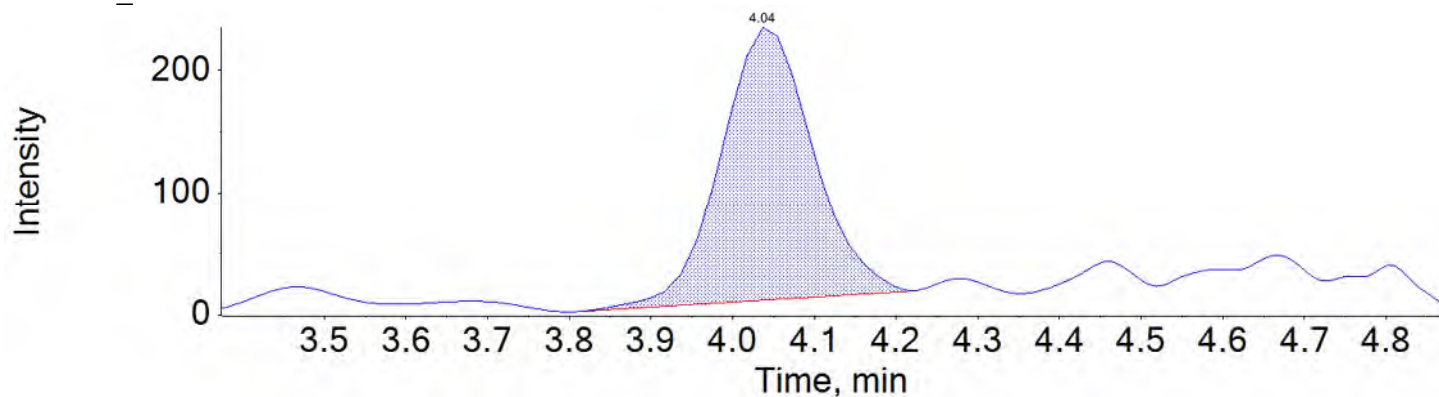




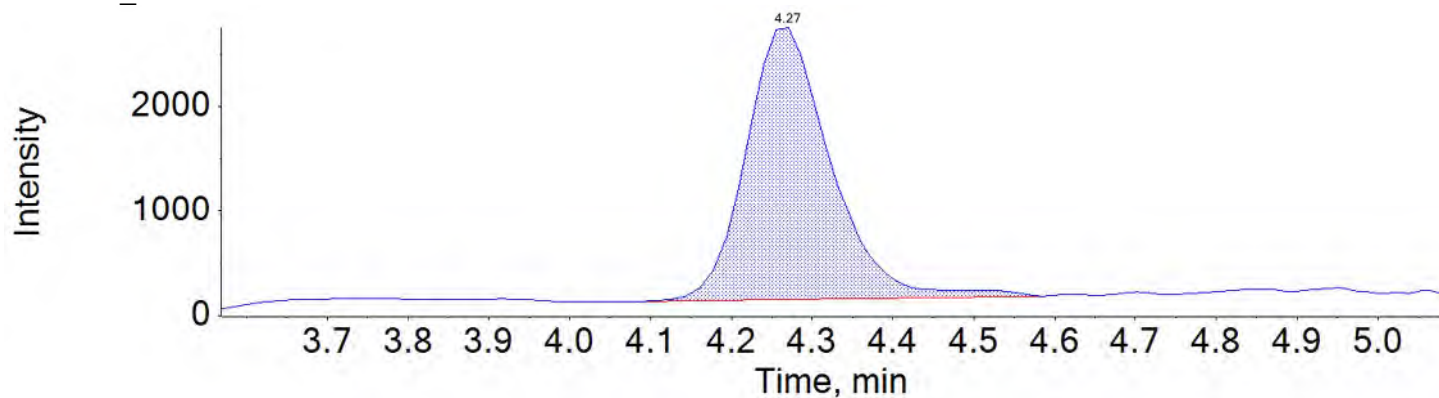
PFTTrDA\_1 663.0 / 619.0



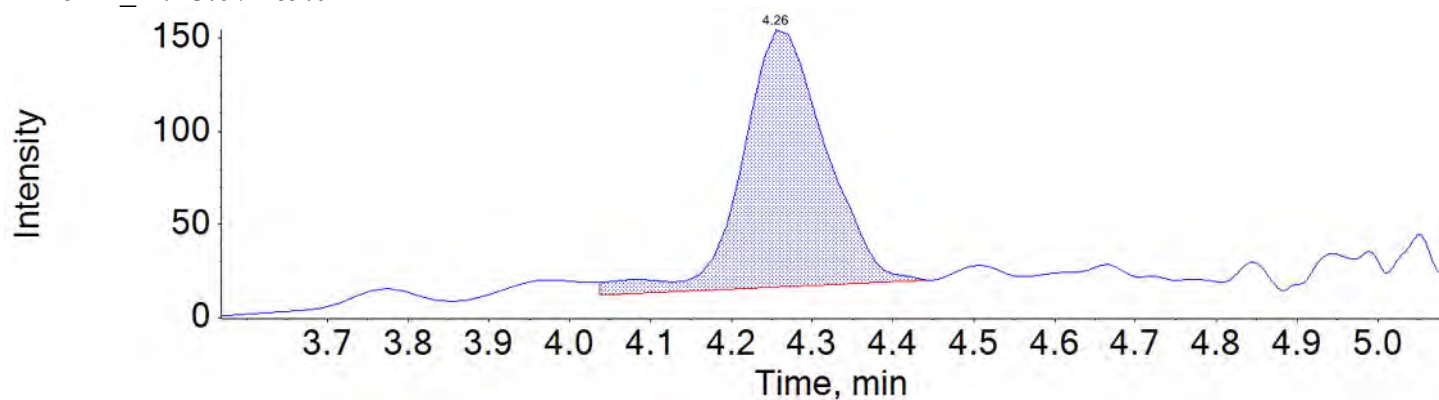
PFTTrDA\_2 663.0 / 169.0



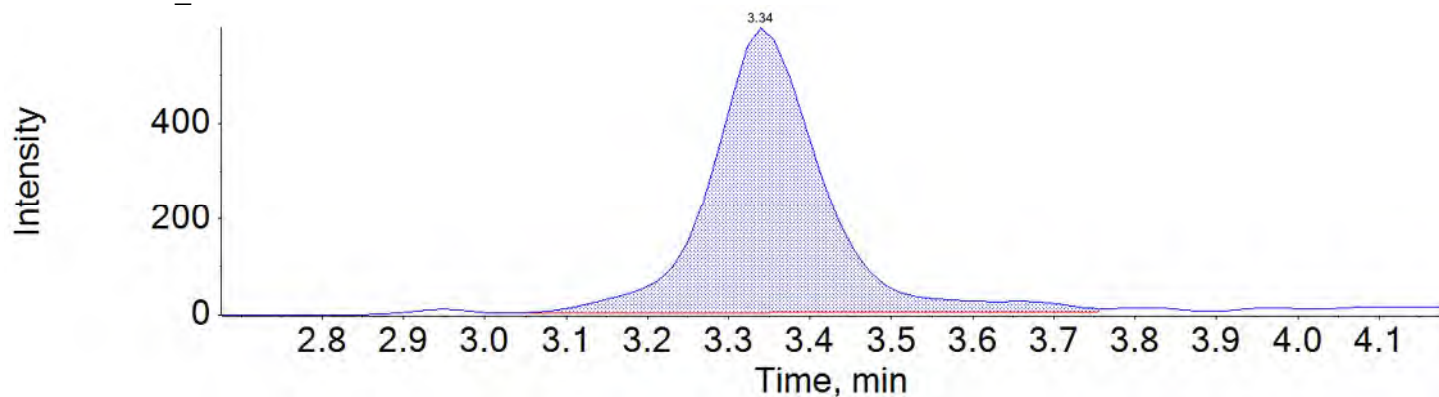
PFTTeDA\_1 713.0 / 669.0



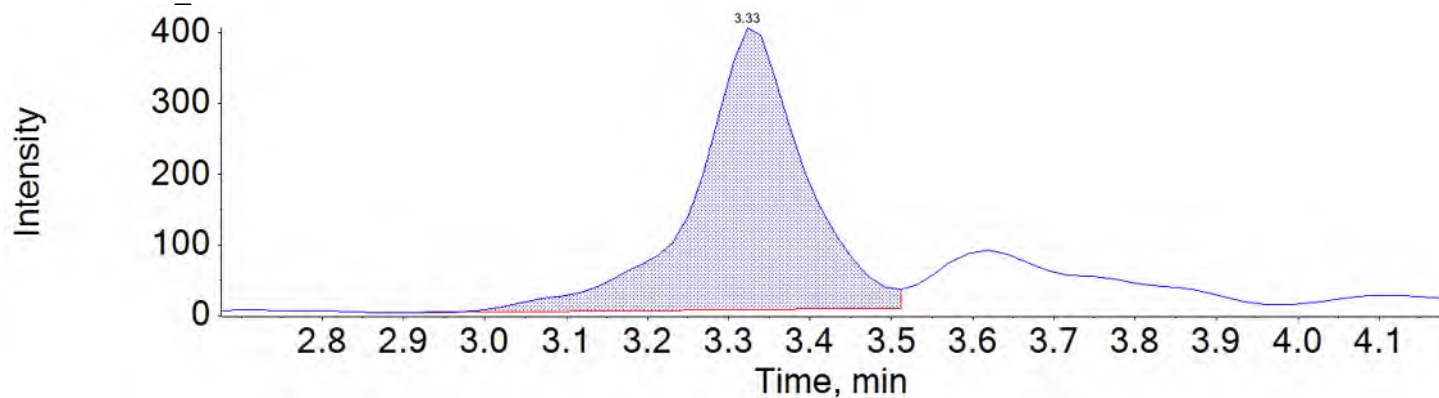
PFTeDA\_2 713.0 / 169.0



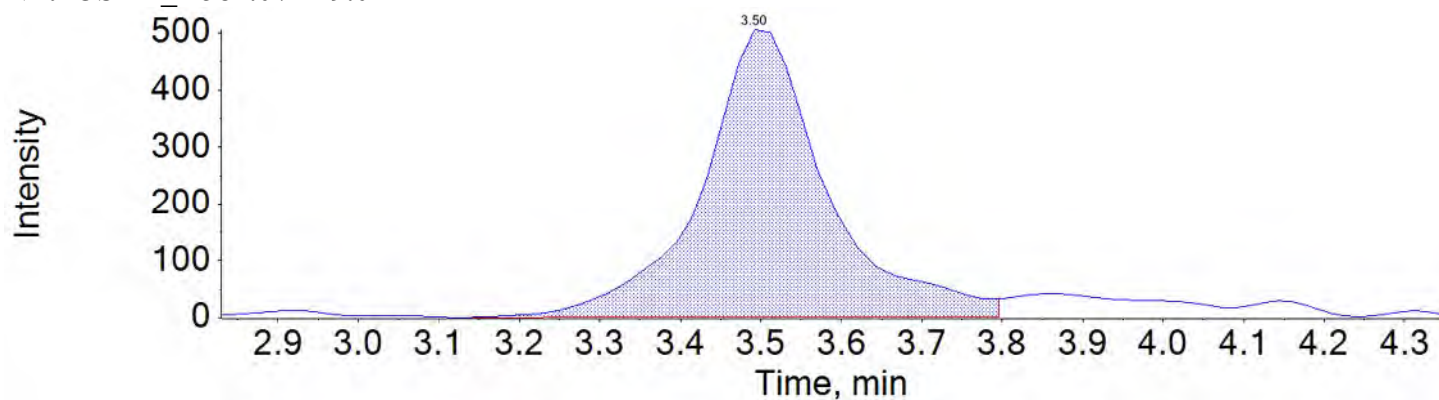
NMeFOSAA\_1 570.0 / 419.0



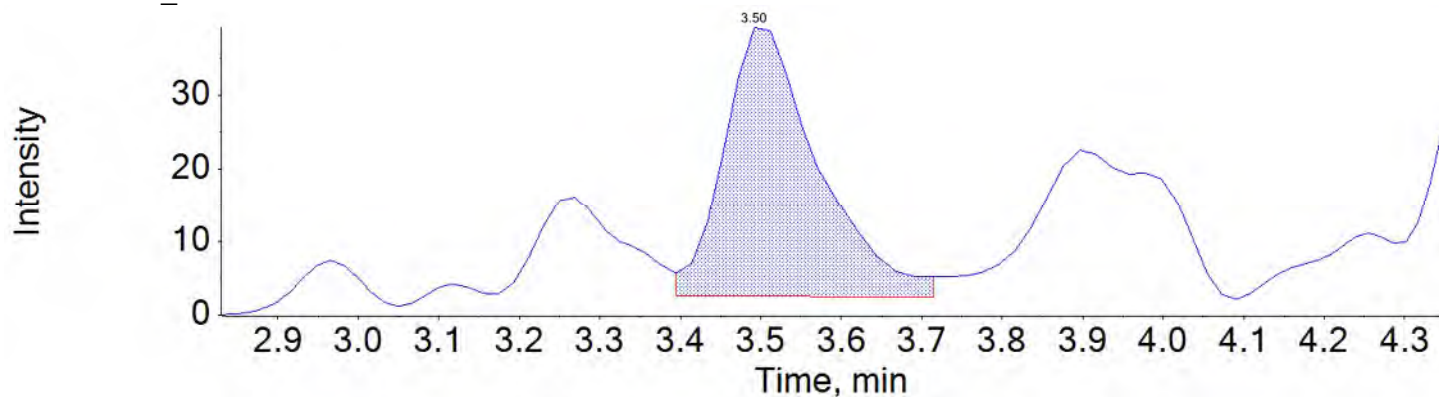
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0

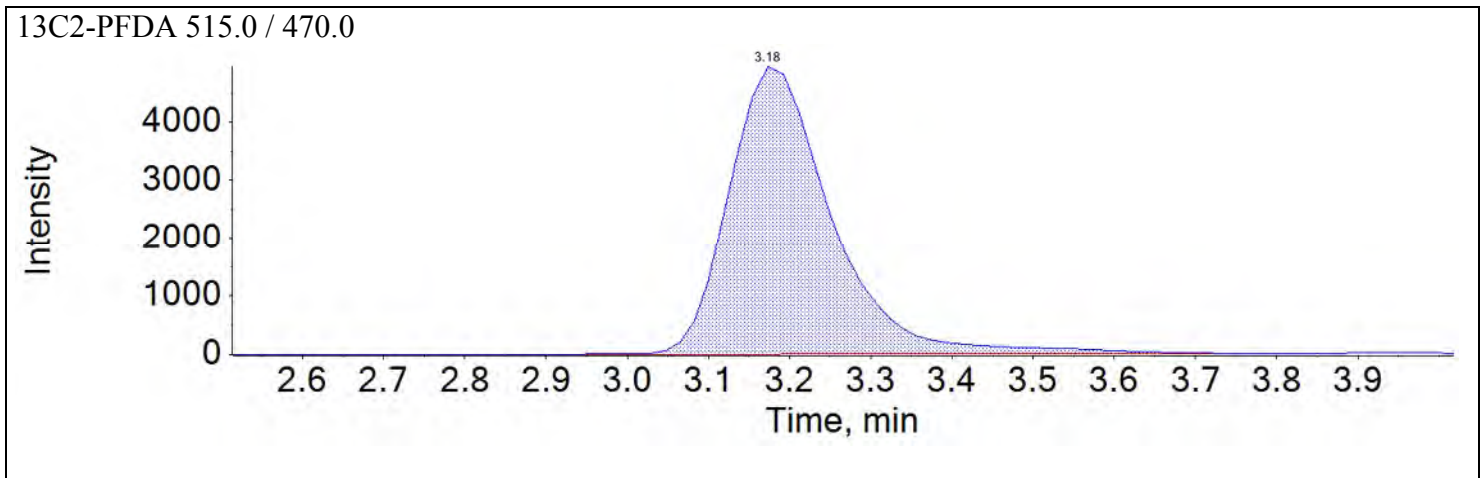
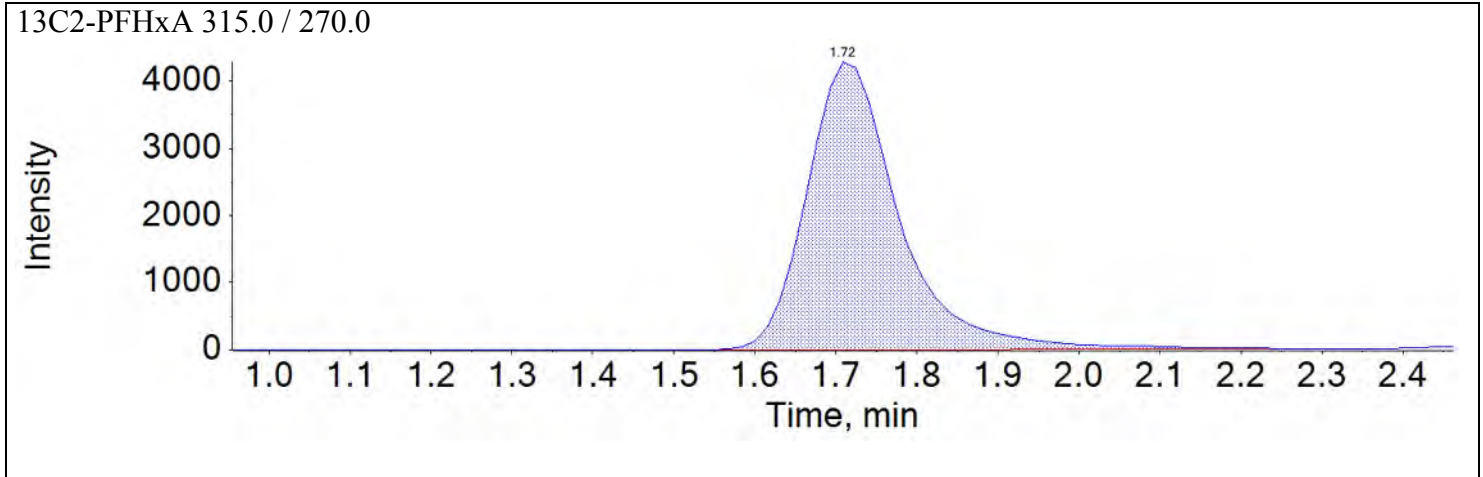


NEtFOSAA\_2 584.0 / 483.0



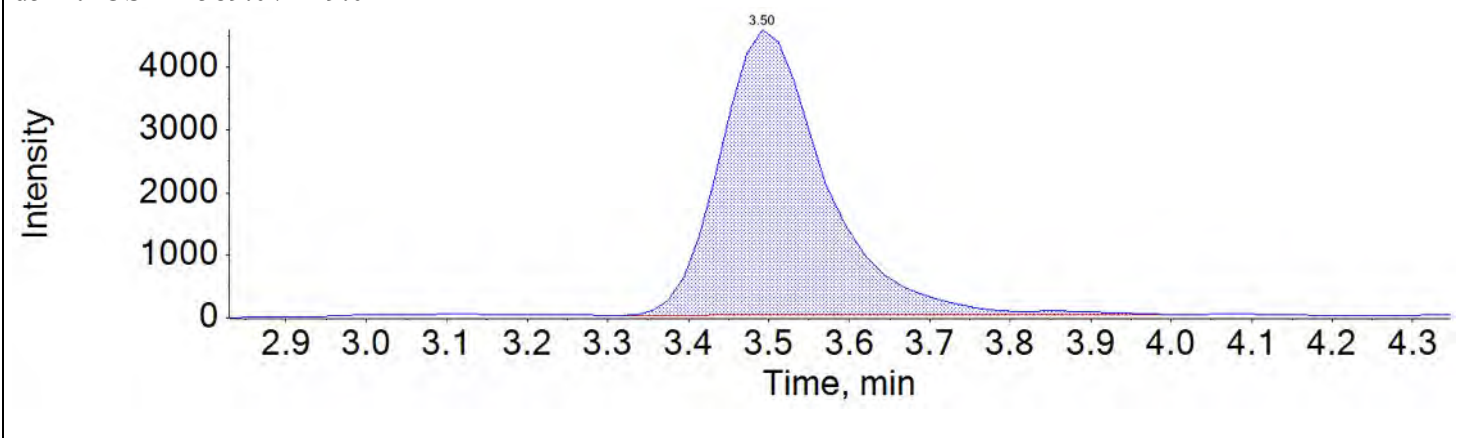
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



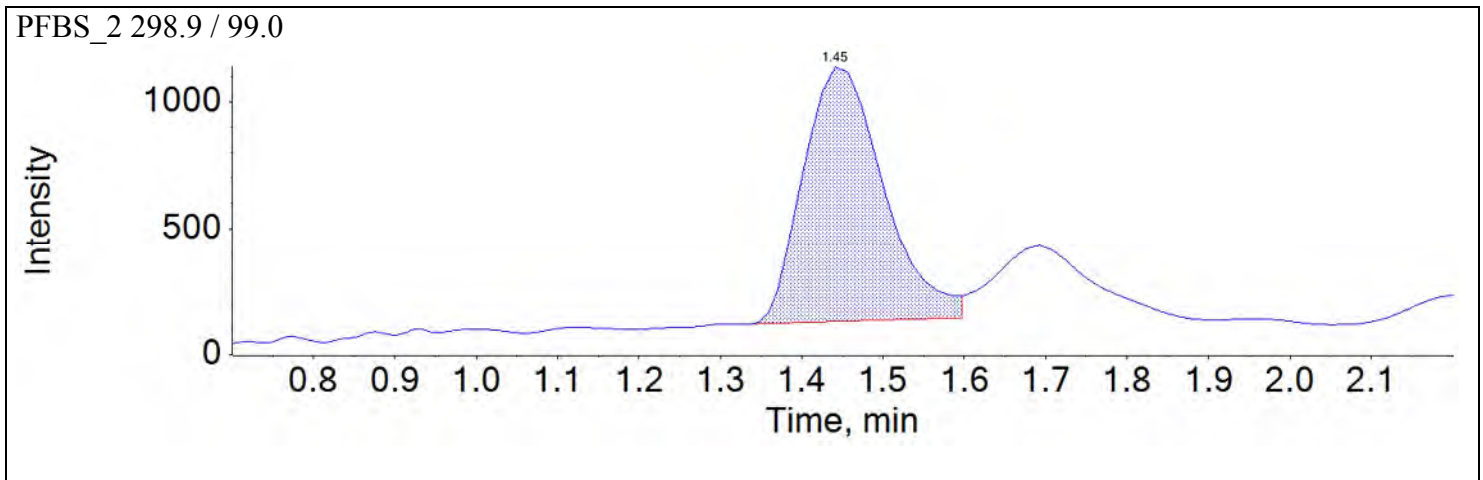
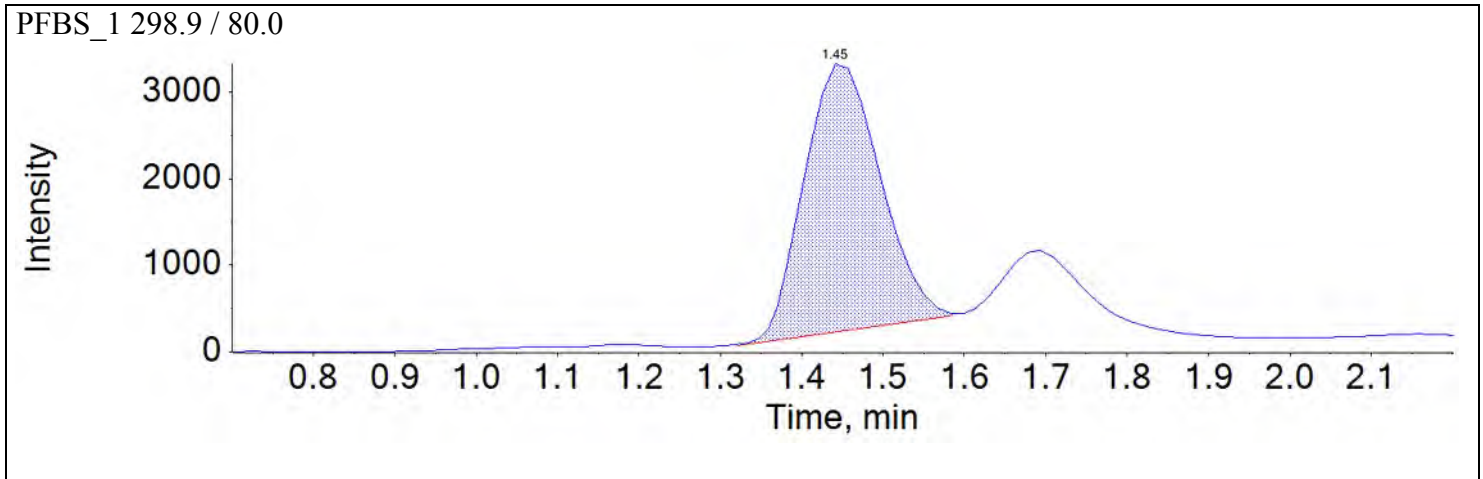


d5-EtFOSAA 589.0 / 419.0

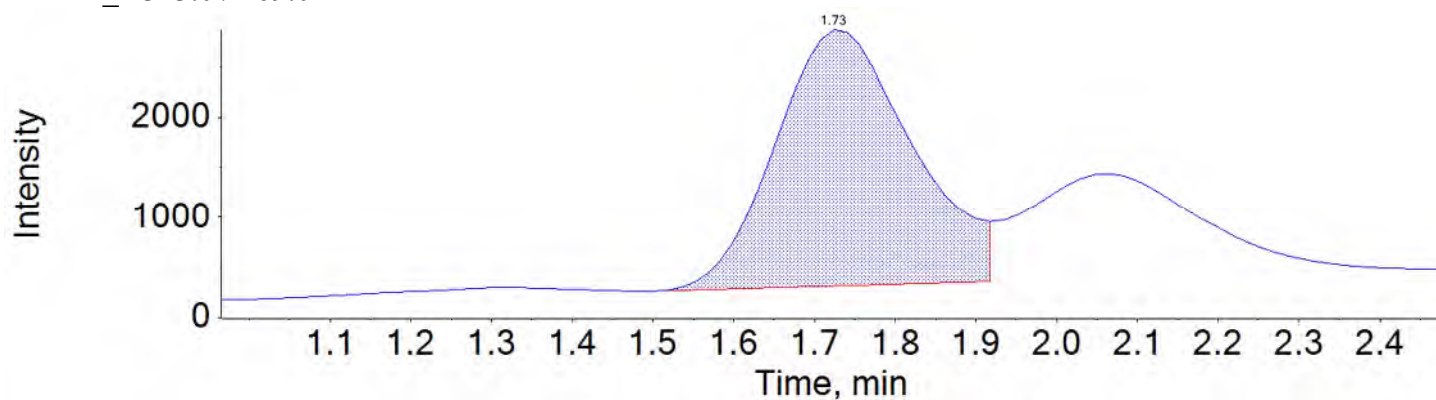


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

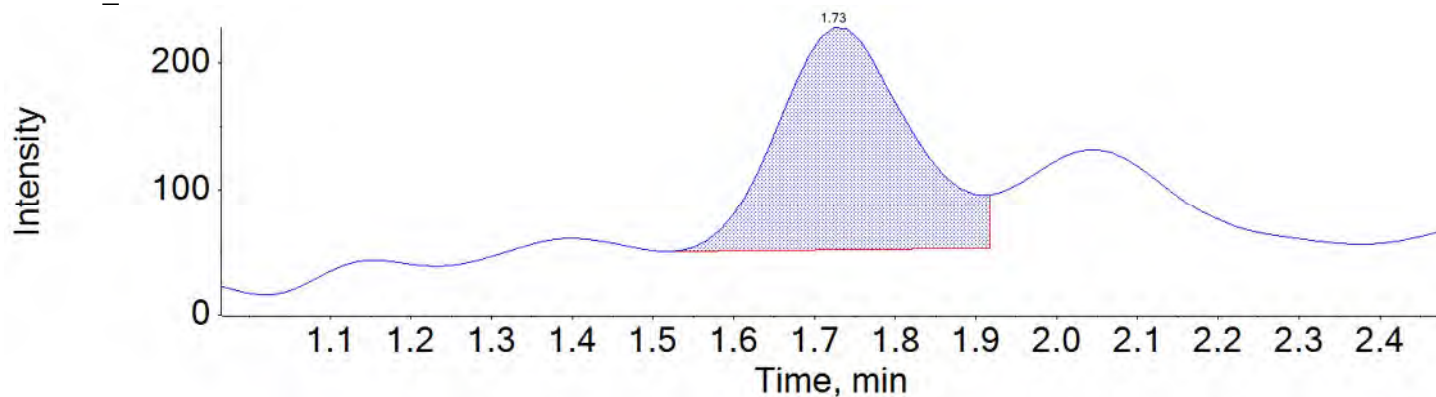
### Chromatograms



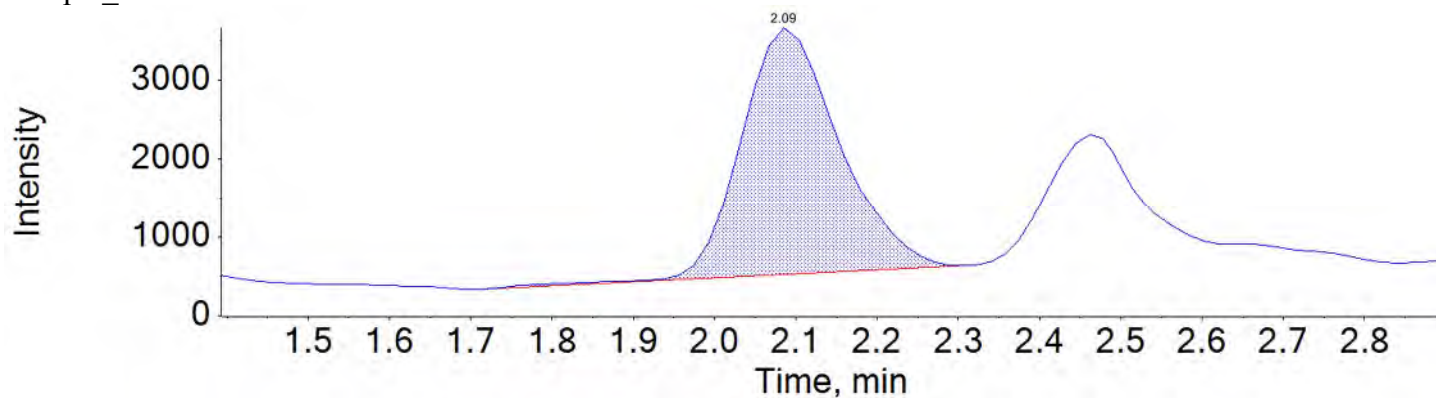
PFHxA\_1 313.0 / 269.0



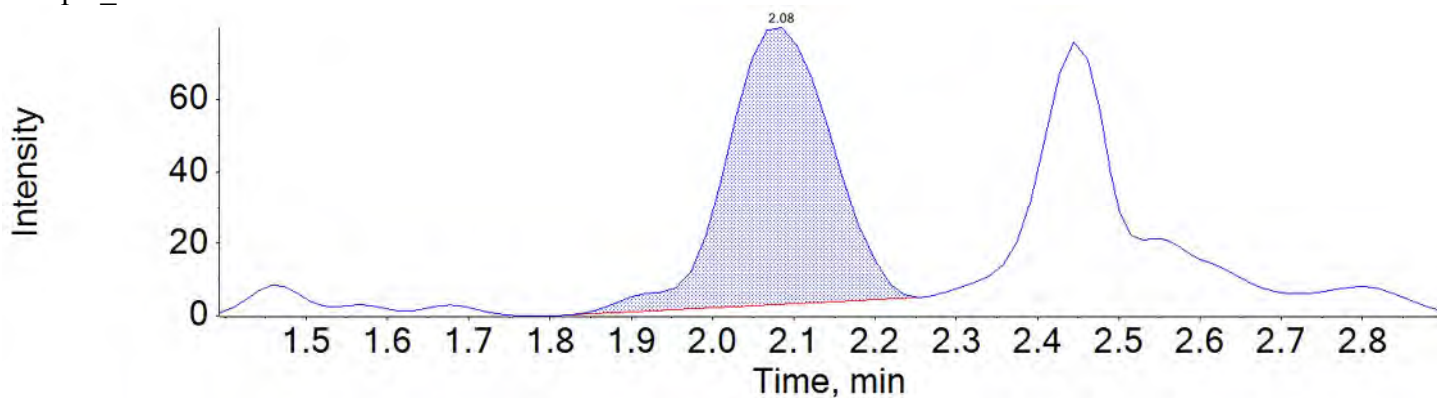
PFHxA\_2 313.0 / 119.0



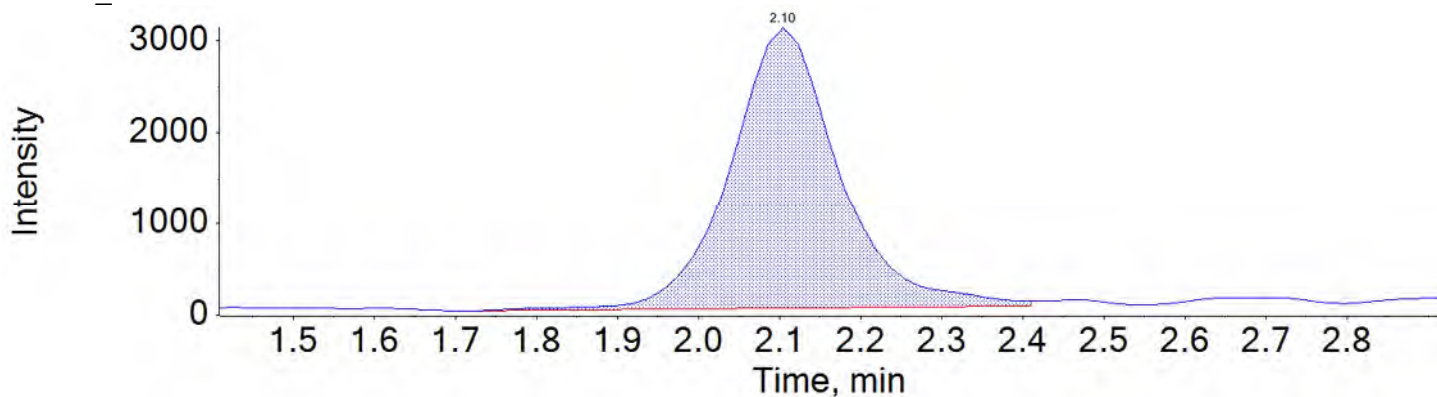
PFHpA\_1 363.0 / 319.0



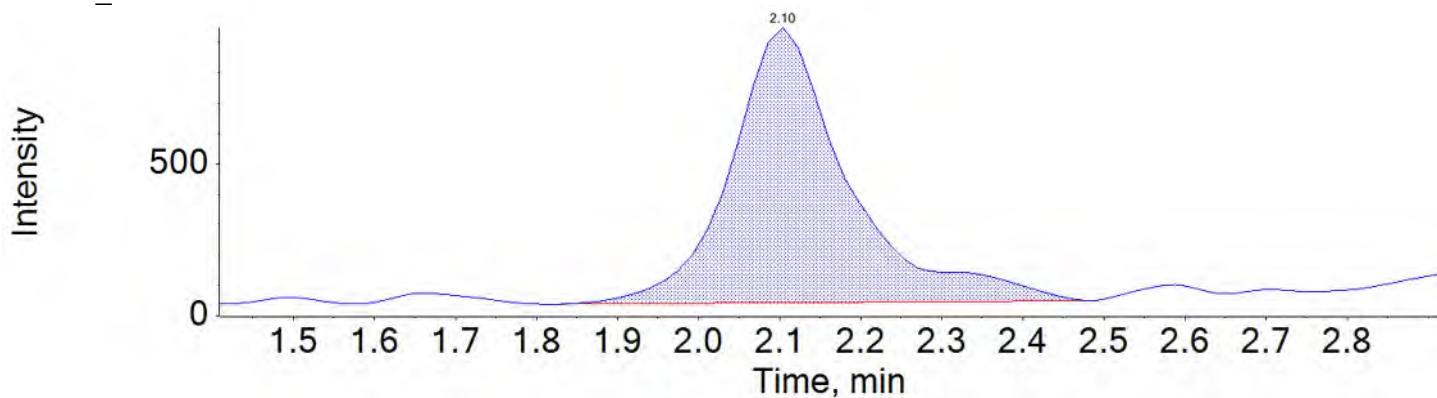
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

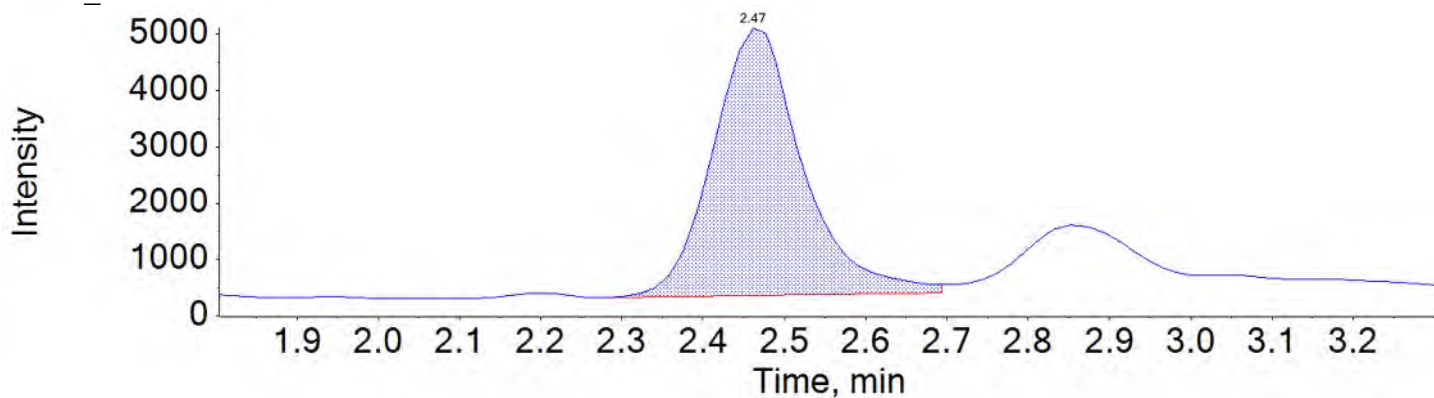


PFHxS\_2 399.0 / 99.0

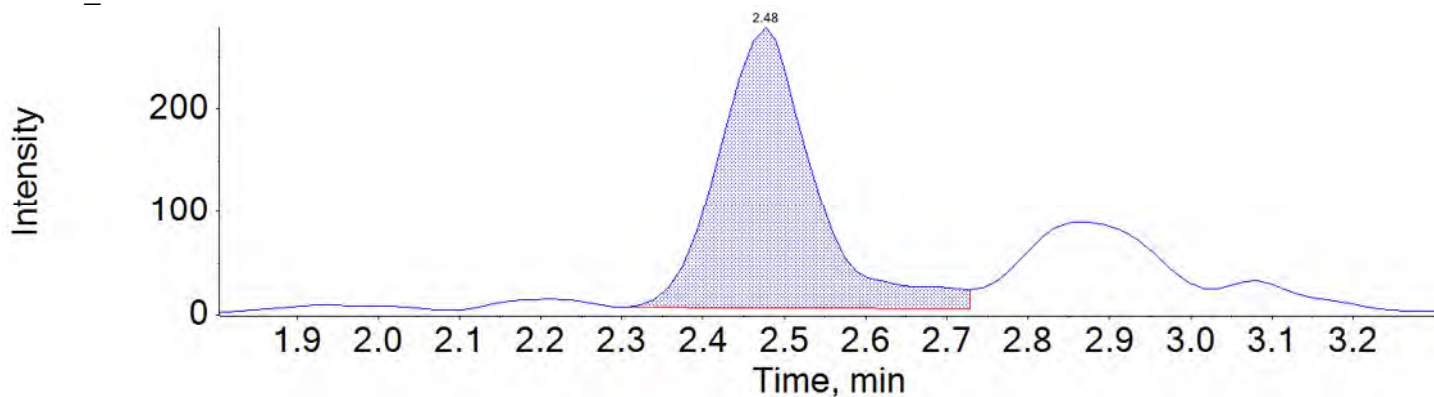




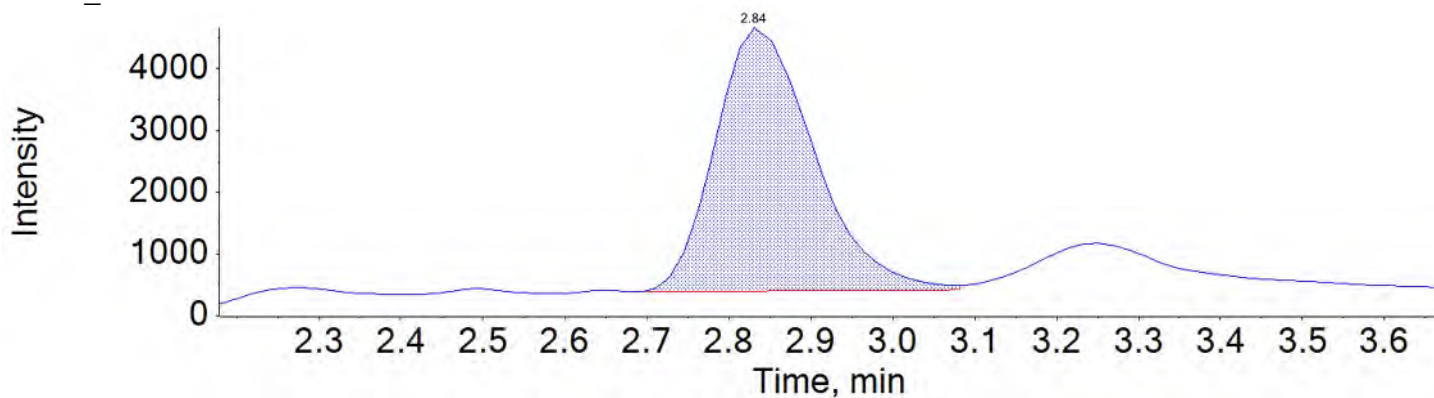
PFOA\_1 413.0 / 369.0



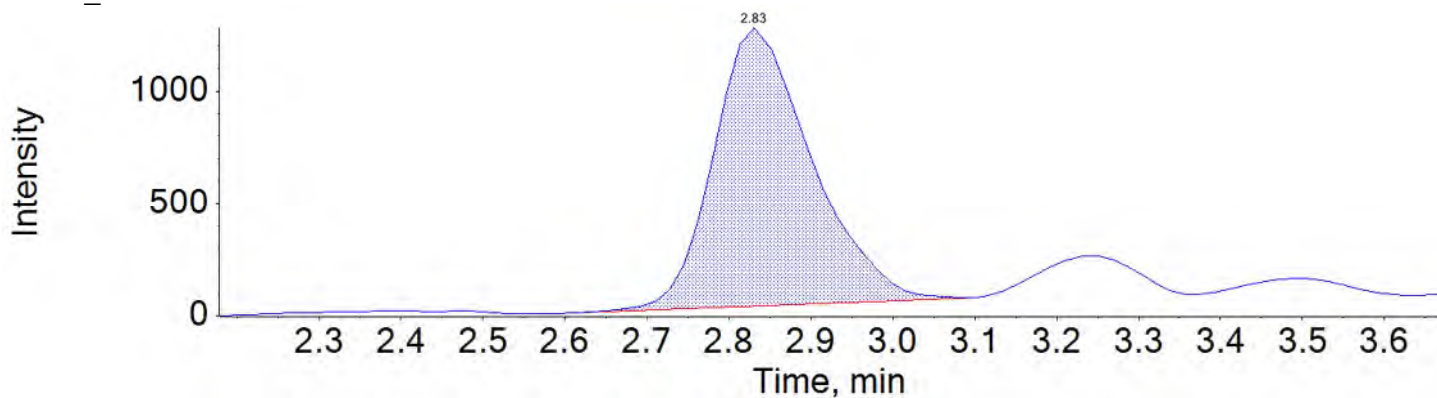
PFOA\_2 413.0 / 169.0



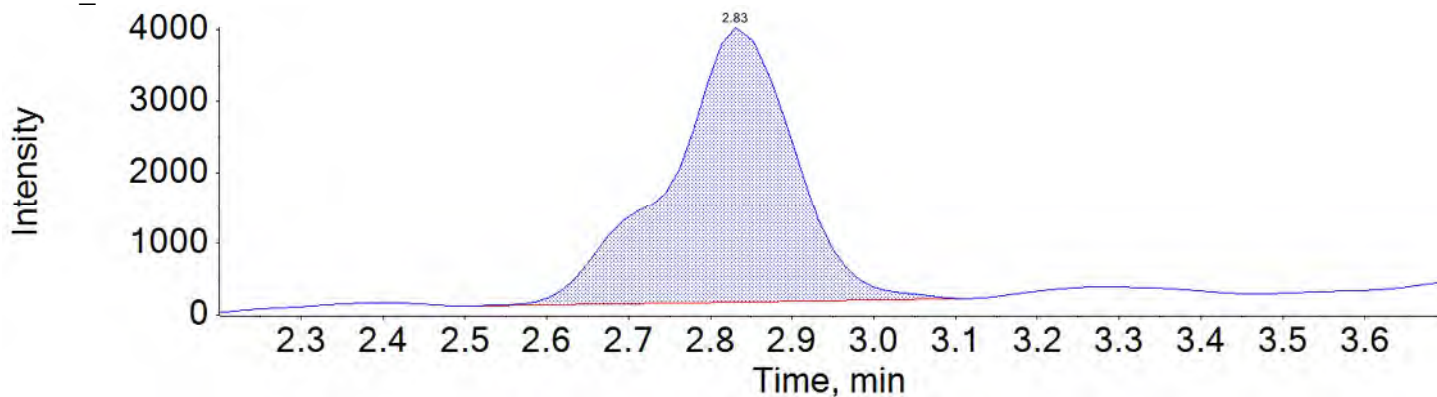
PFNA\_1 463.0 / 419.0



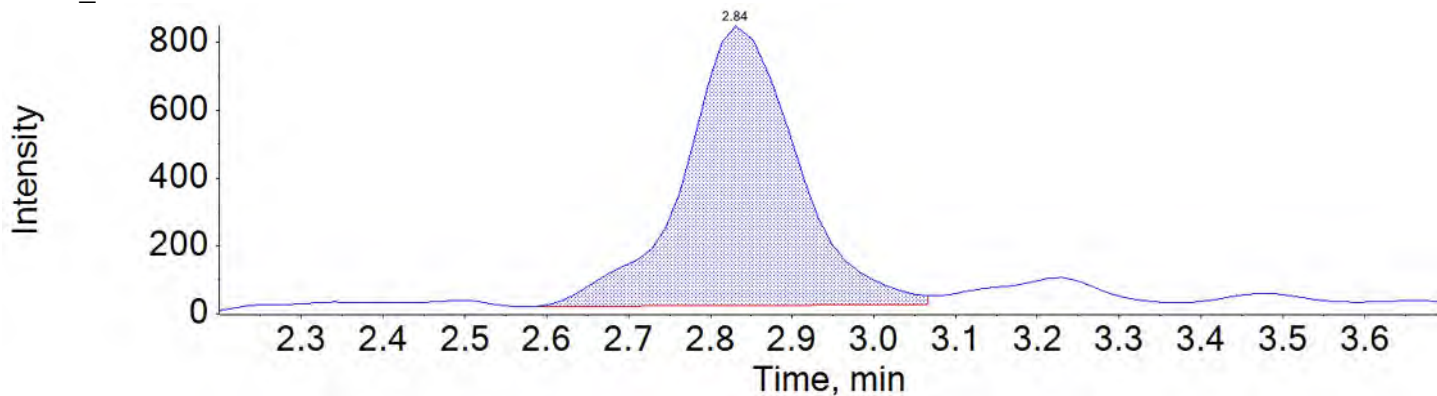
PFNA\_2 463.0 / 219.0



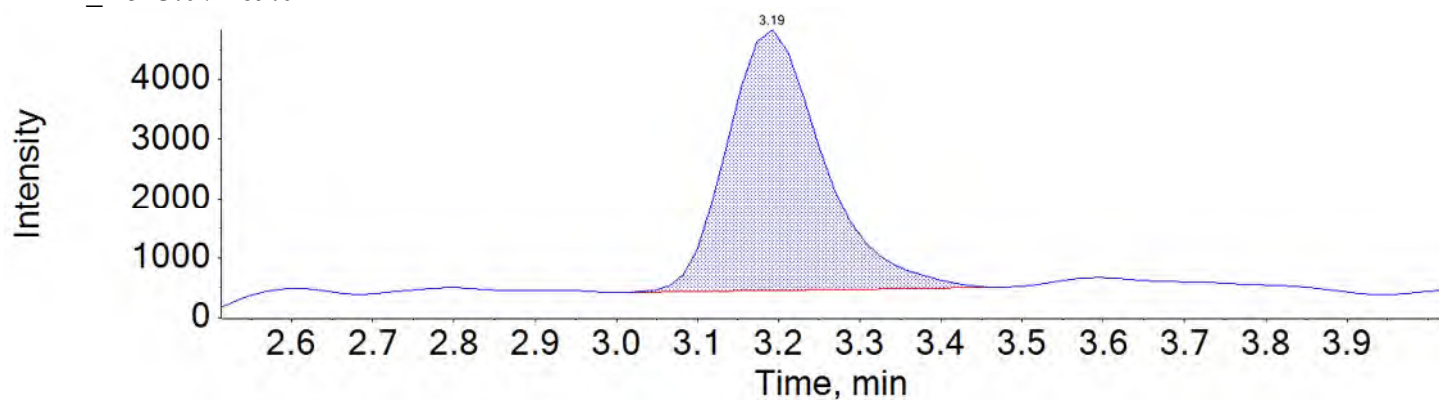
PFOS\_1 499.0 / 80.0



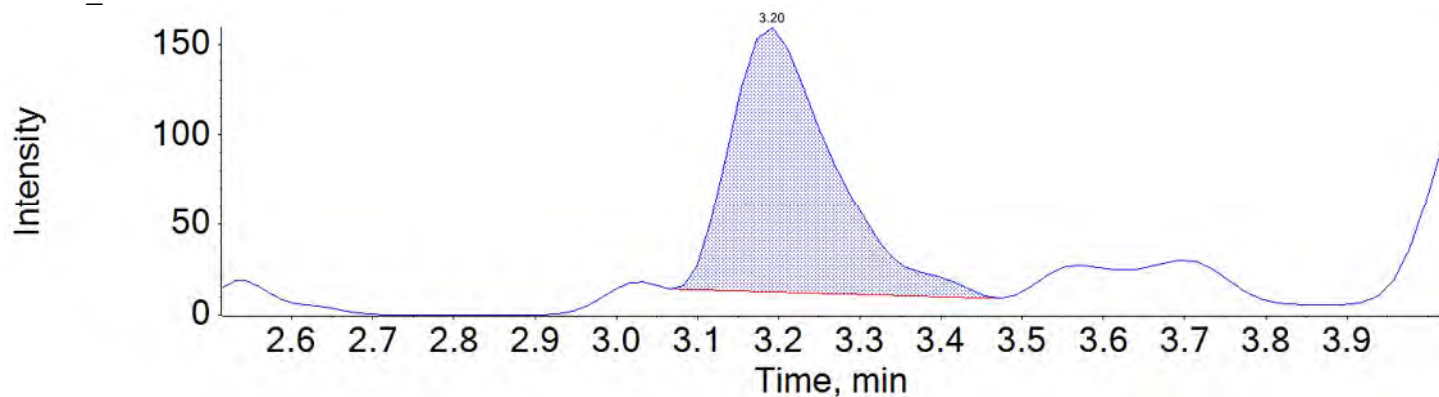
PFOS\_2 499.0 / 99.0



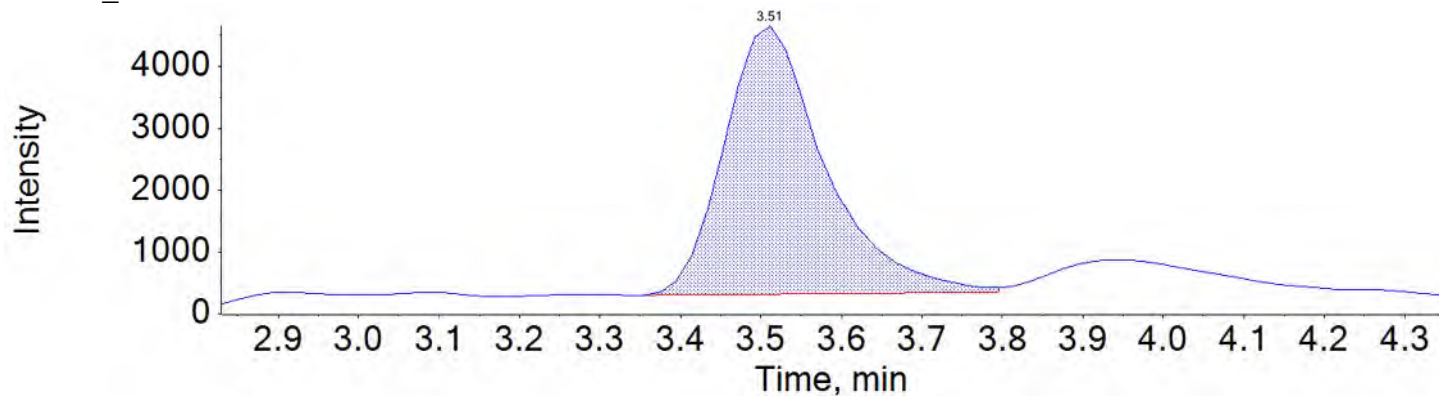
PFDA\_1 513.0 / 469.0



PFDA\_2 513.0 / 219.0

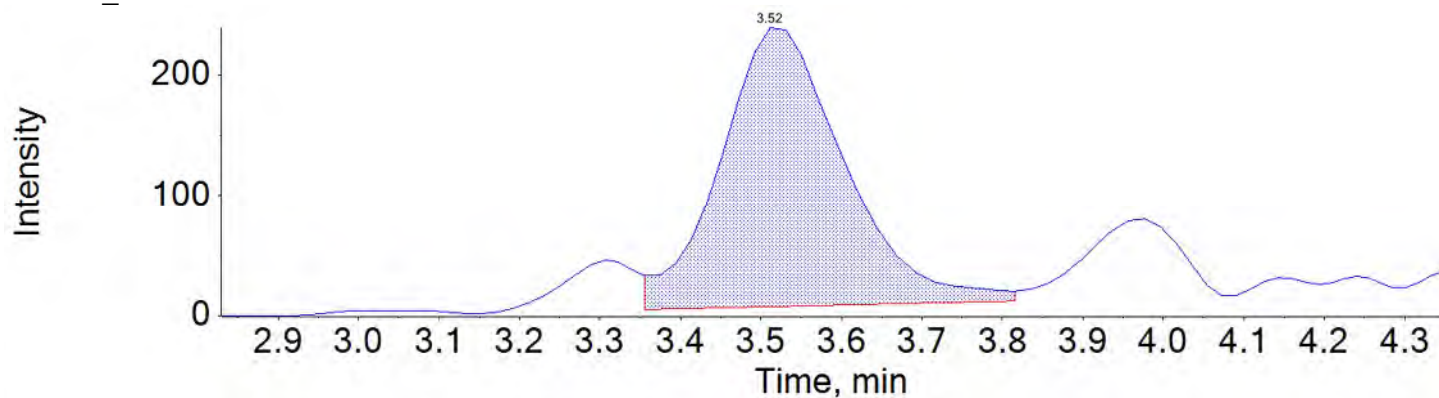


PFUnA\_1 563.0 / 519.0

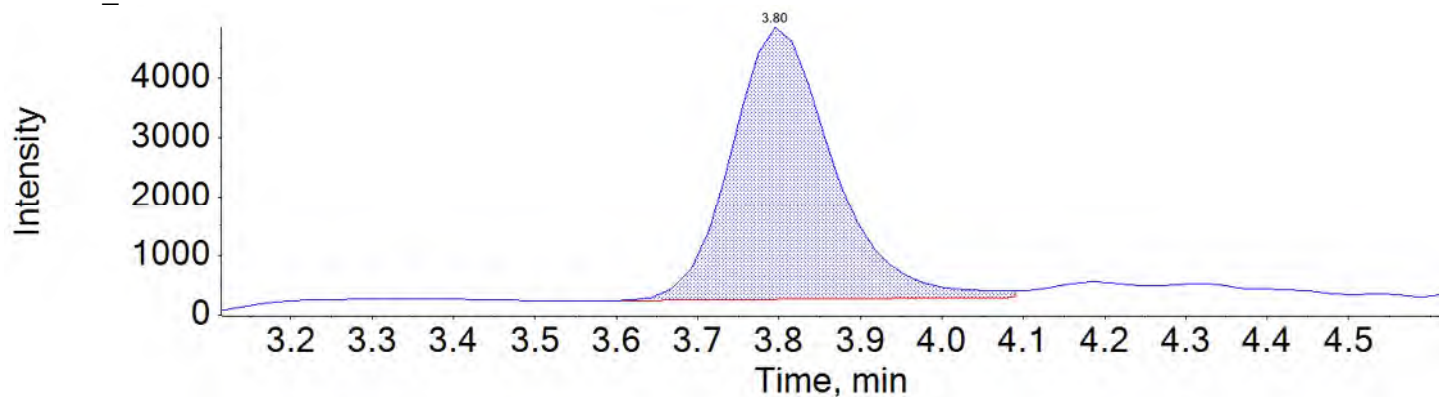




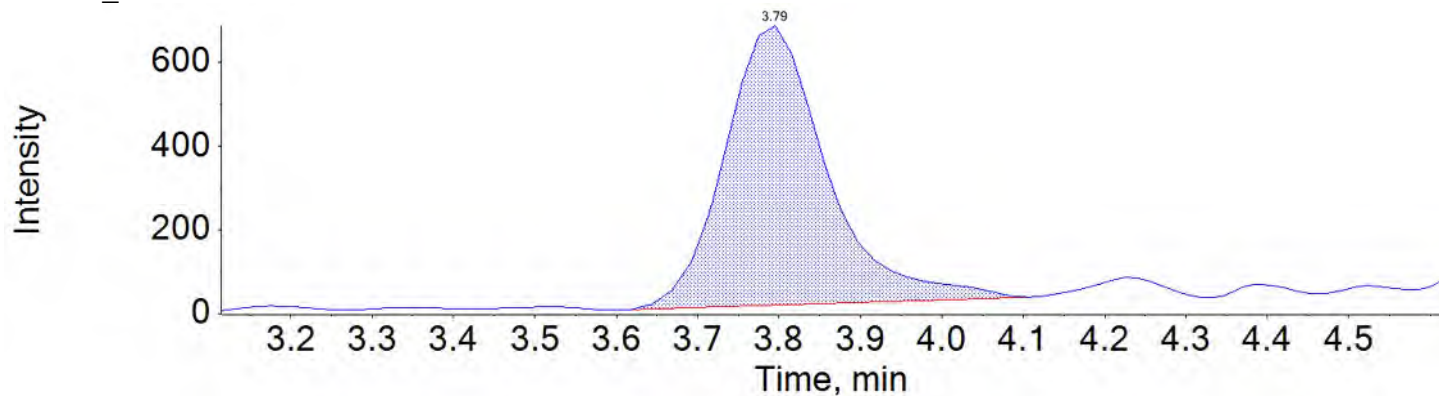
PUnA\_2 563.0 / 269.0



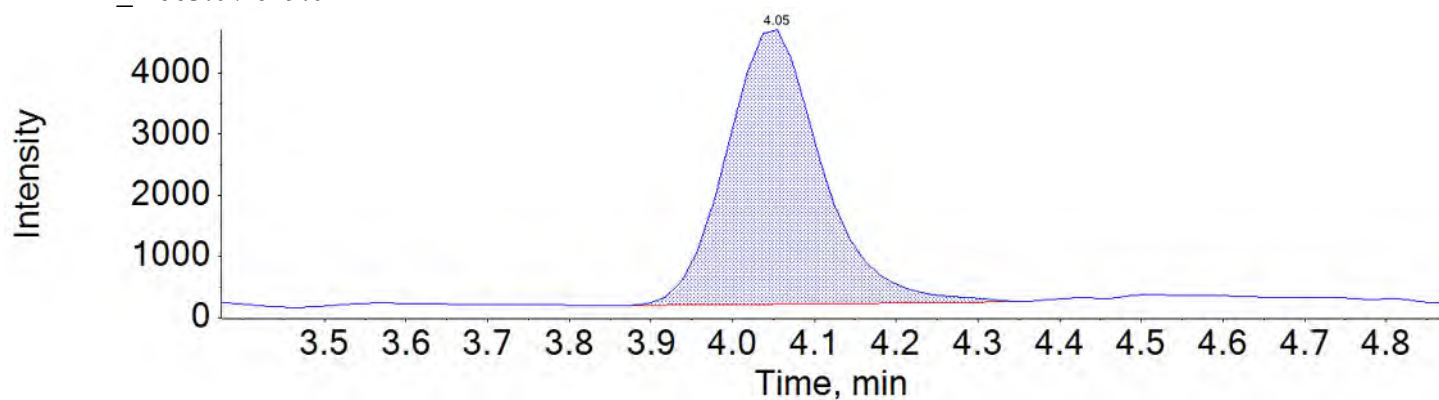
PDoA\_1 613.0 / 569.0



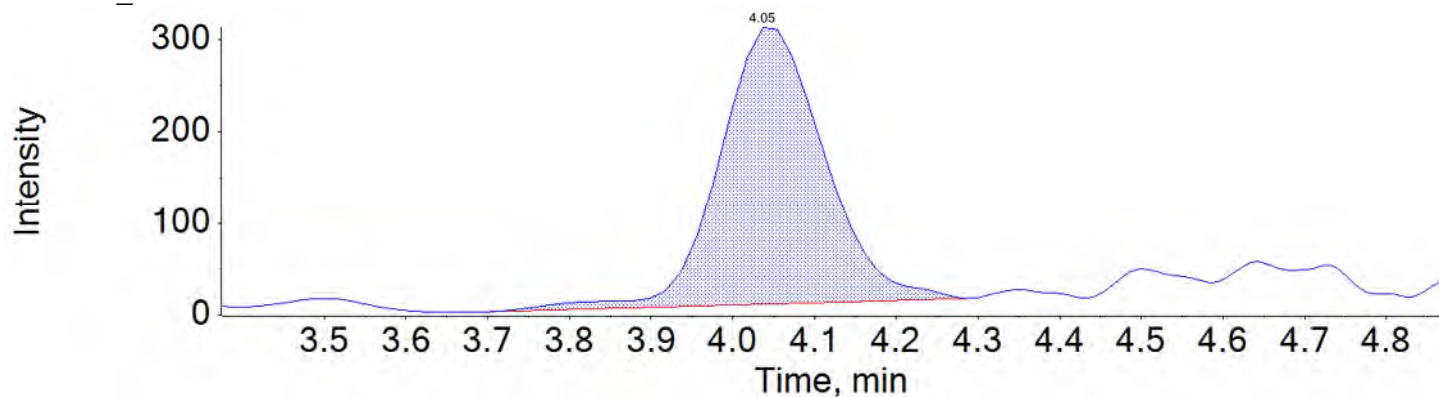
PDoA\_2 613.0 / 319.0



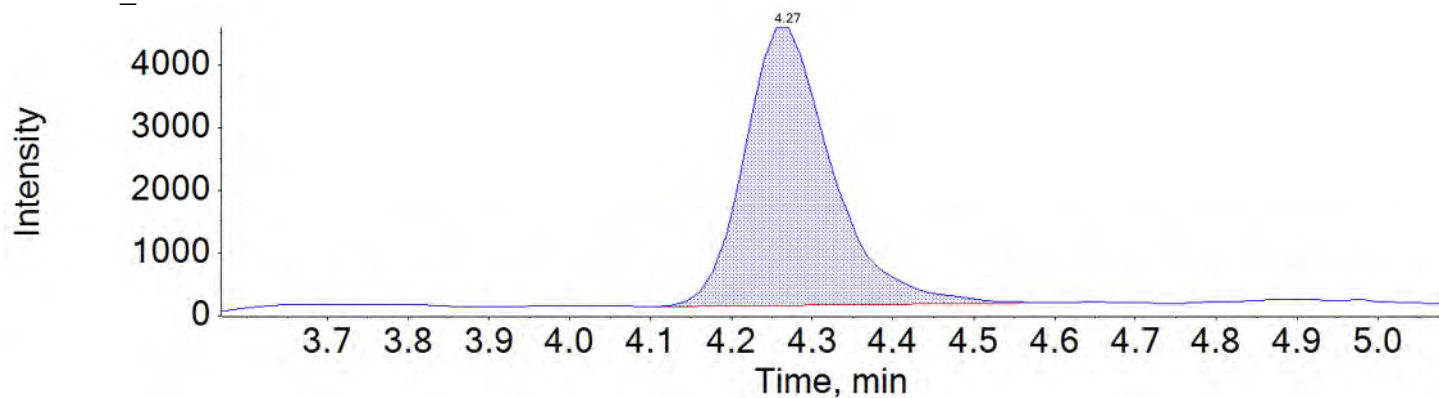
PFTTrDA\_1 663.0 / 619.0



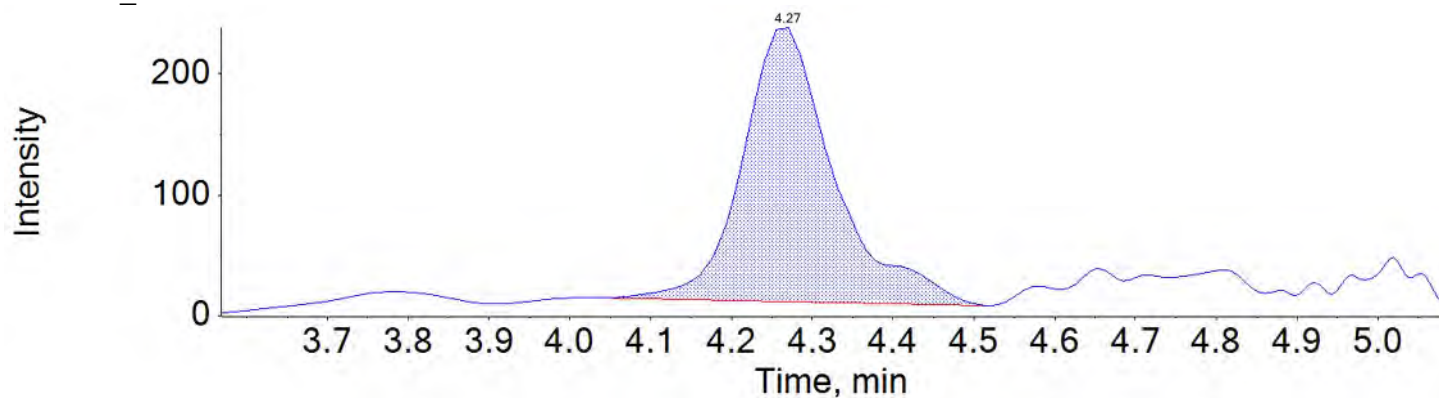
PFTTrDA\_2 663.0 / 169.0



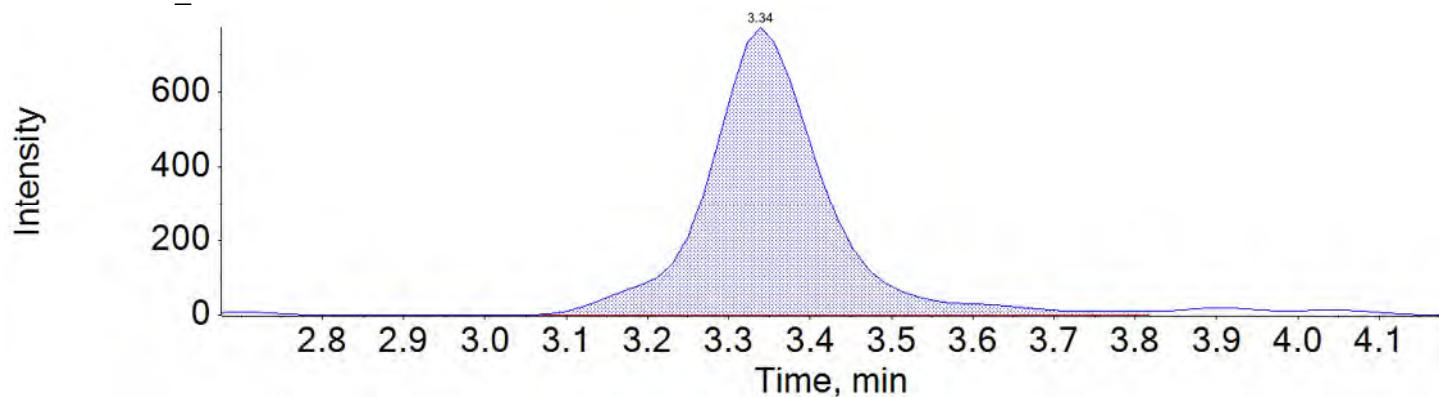
PFTTeDA\_1 713.0 / 669.0



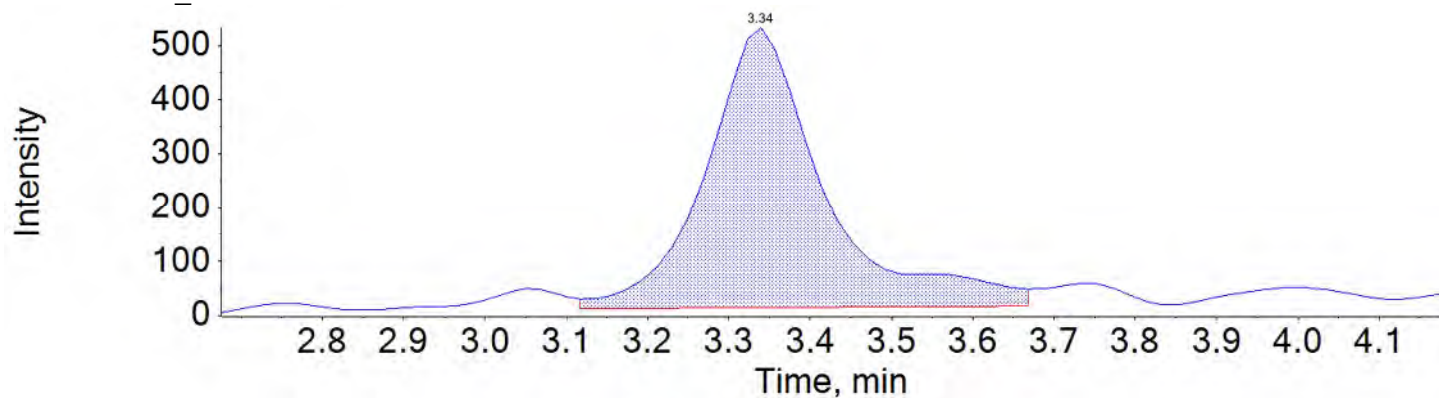
PFTeDA\_2 713.0 / 169.0



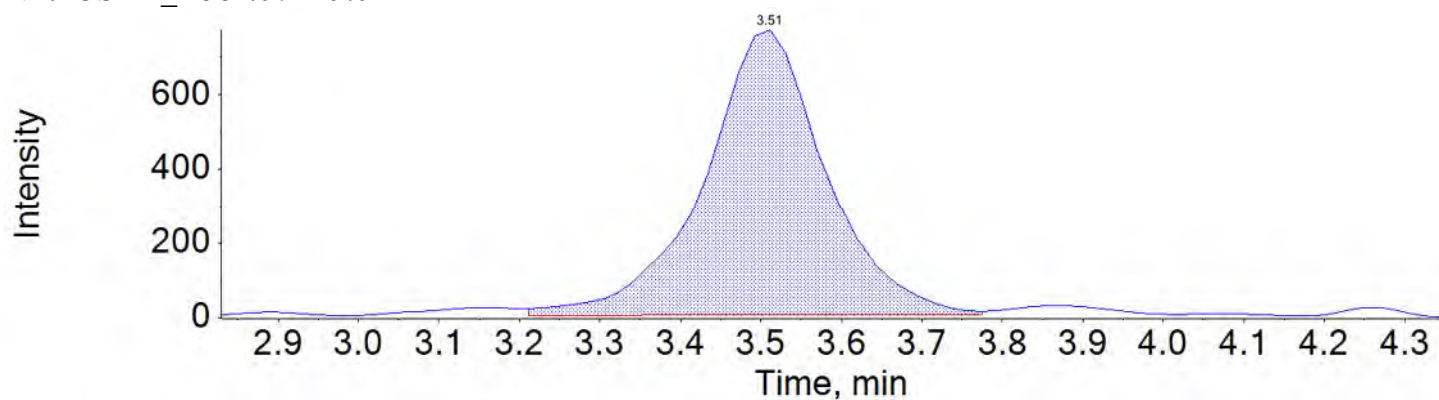
NMeFOSAA\_1 570.0 / 419.0



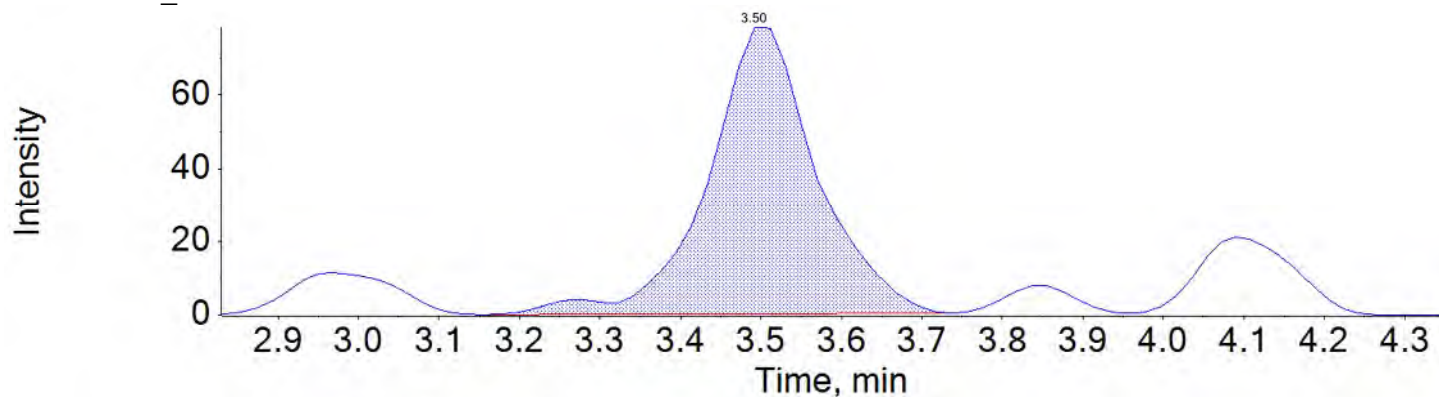
NMeFOSAA\_2 570.0 / 512.0



NetFOSAA\_1 584.0 / 419.0



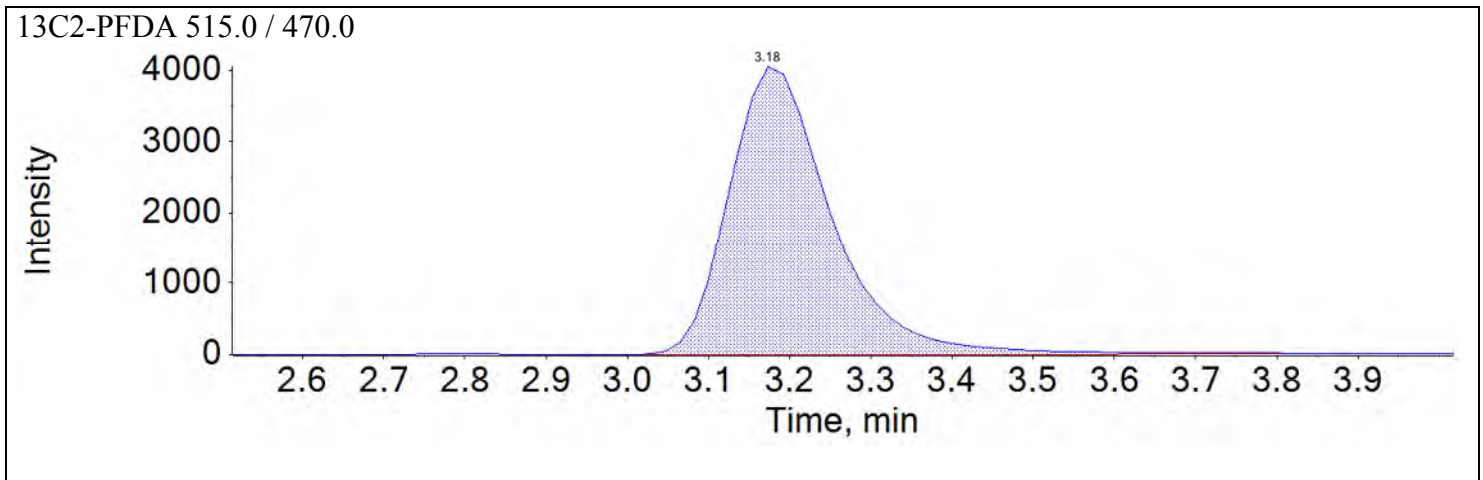
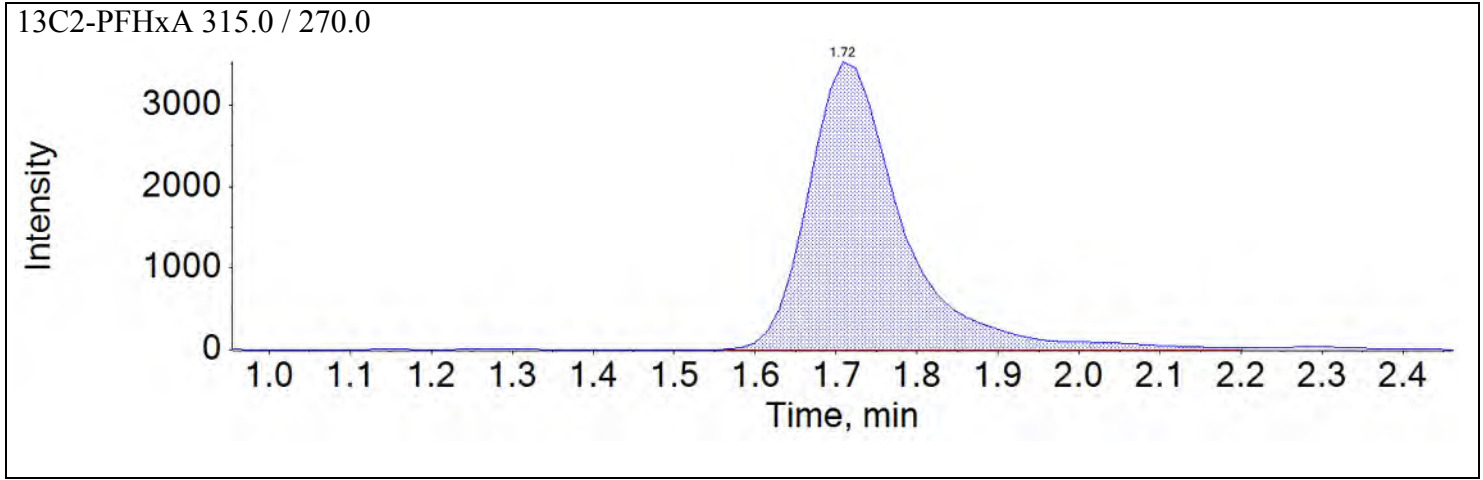
NetFOSAA\_2 584.0 / 483.0



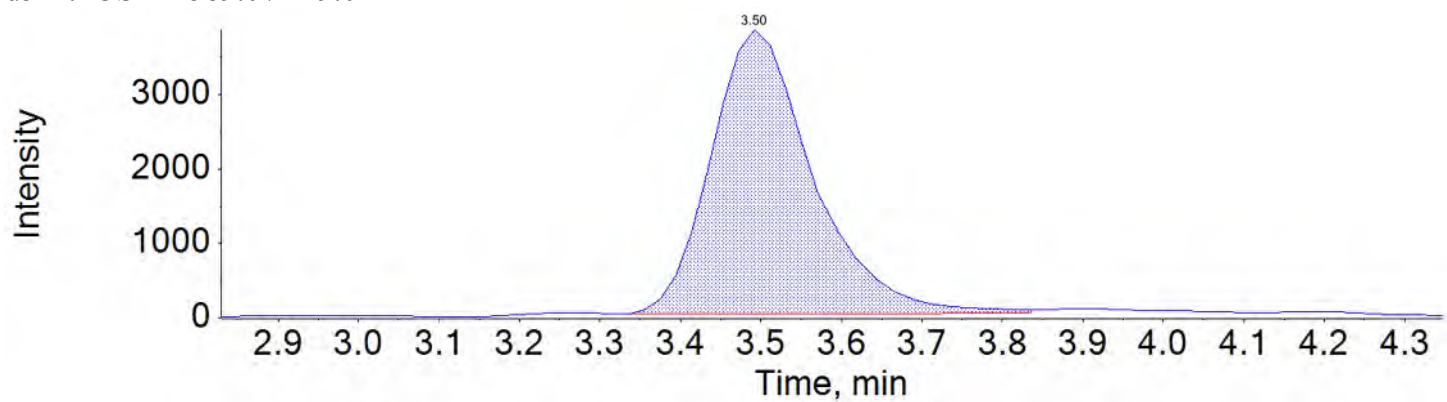


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



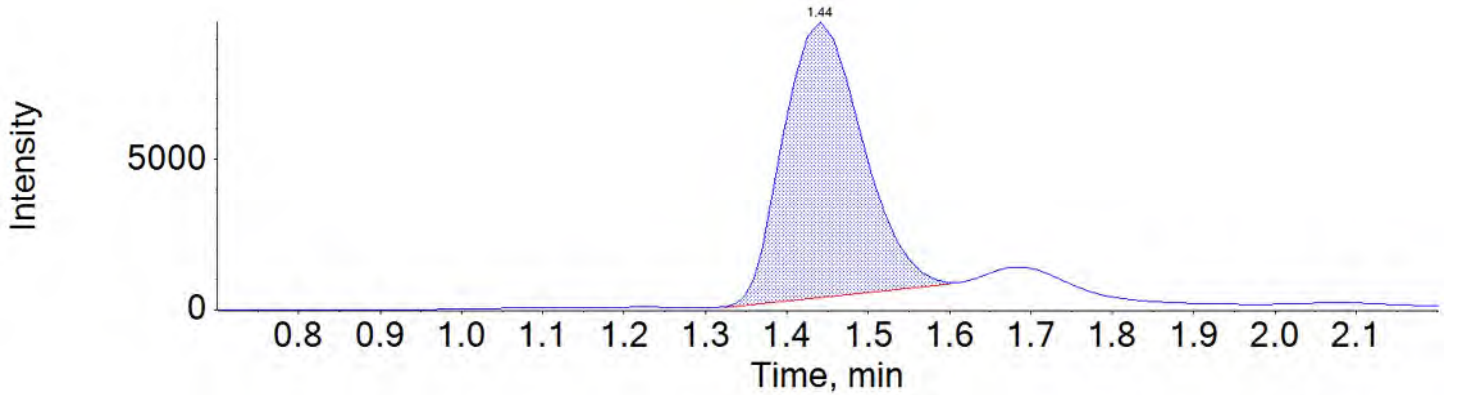
d5-EtFOSAA 589.0 / 419.0



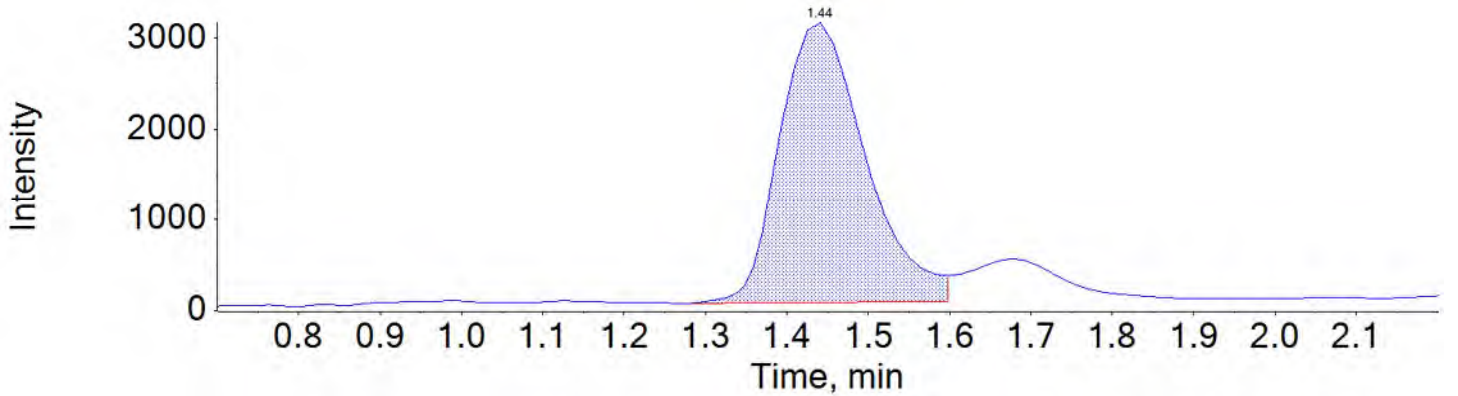
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

### Chromatograms

PFBS\_1 298.9 / 80.0

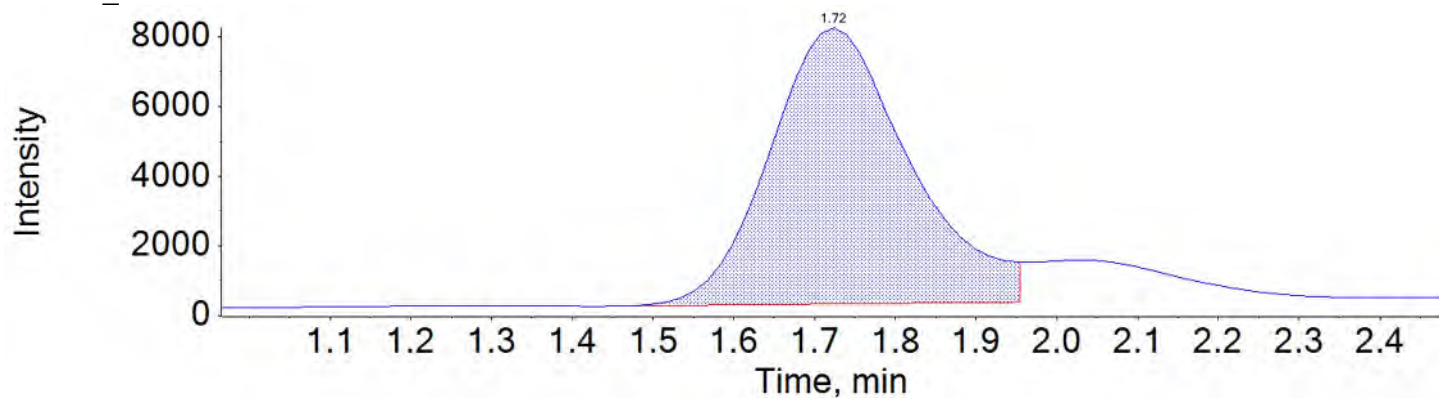


PFBS\_2 298.9 / 99.0

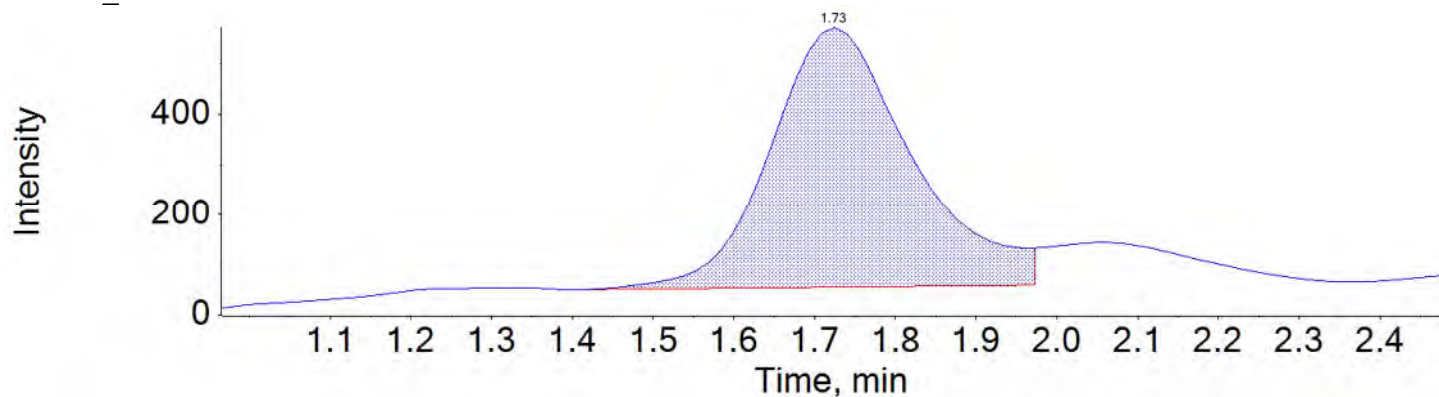




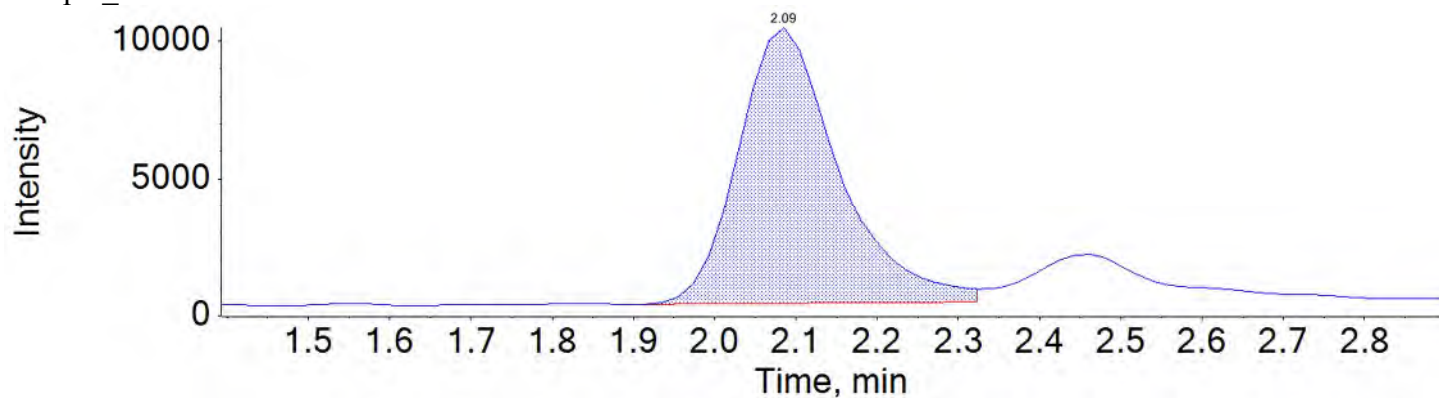
PFHxA\_1 313.0 / 269.0



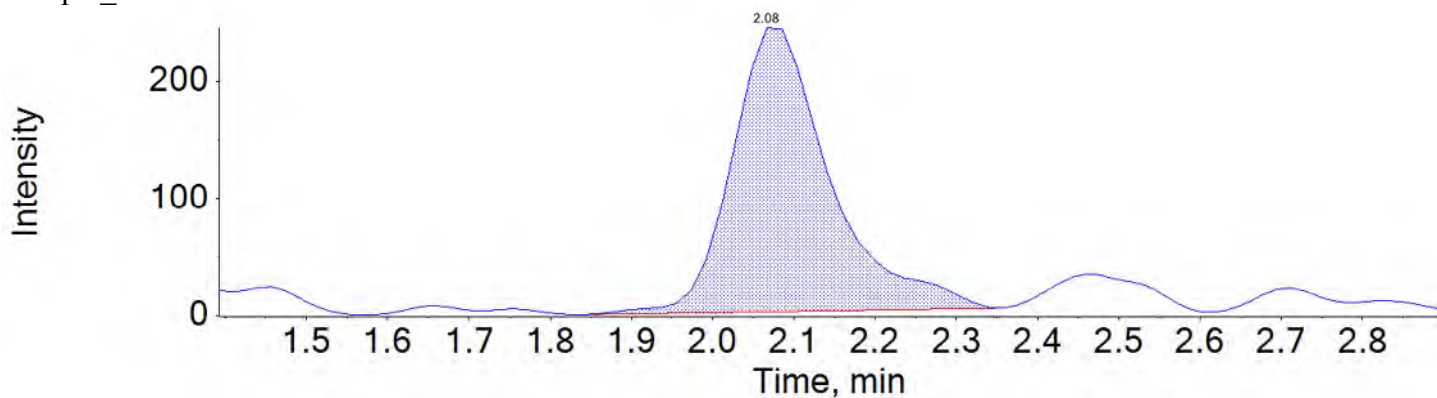
PFHxA\_2 313.0 / 119.0



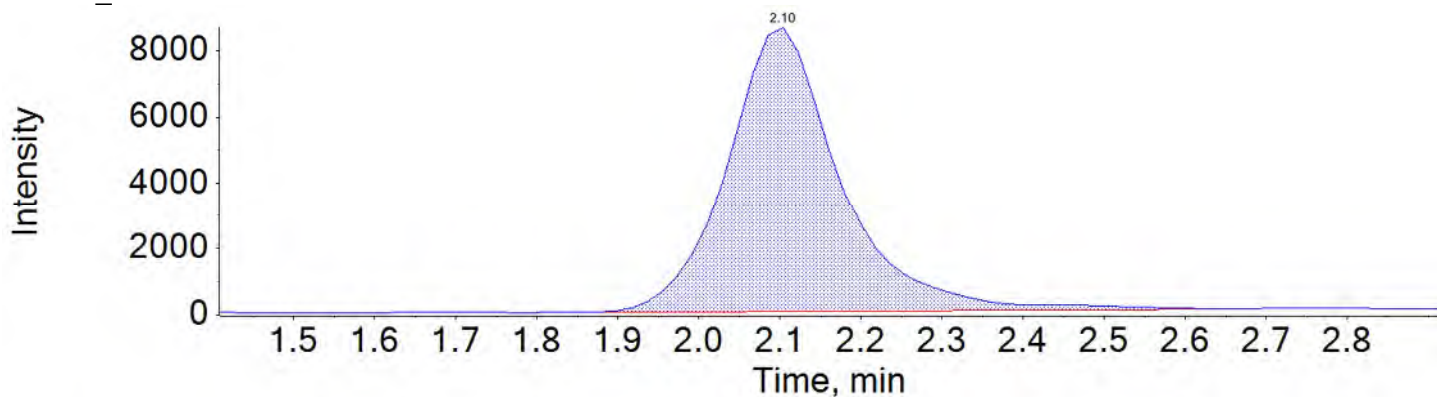
PFHpA\_1 363.0 / 319.0



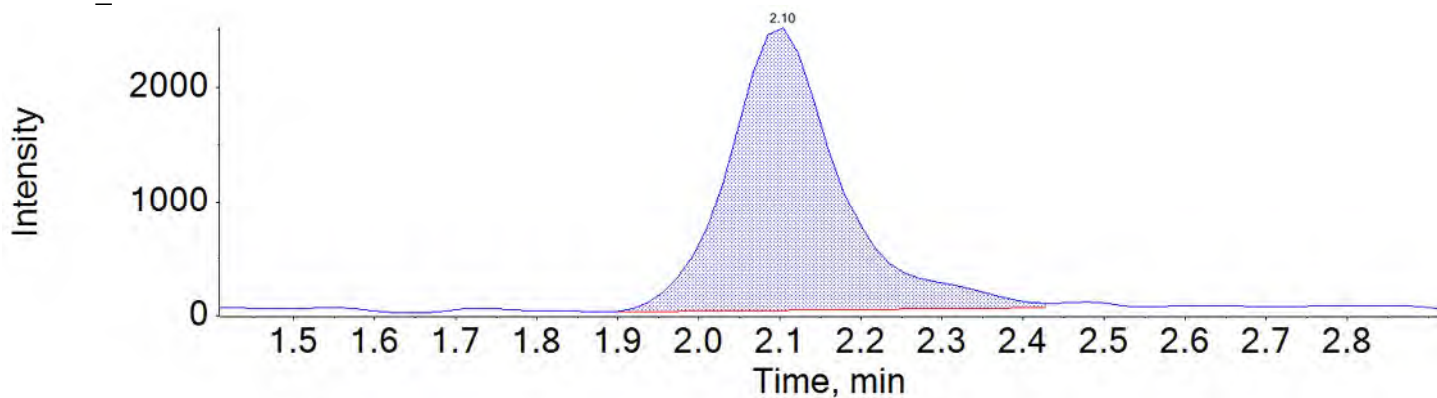
PFHpA\_2 363.0 / 169.0



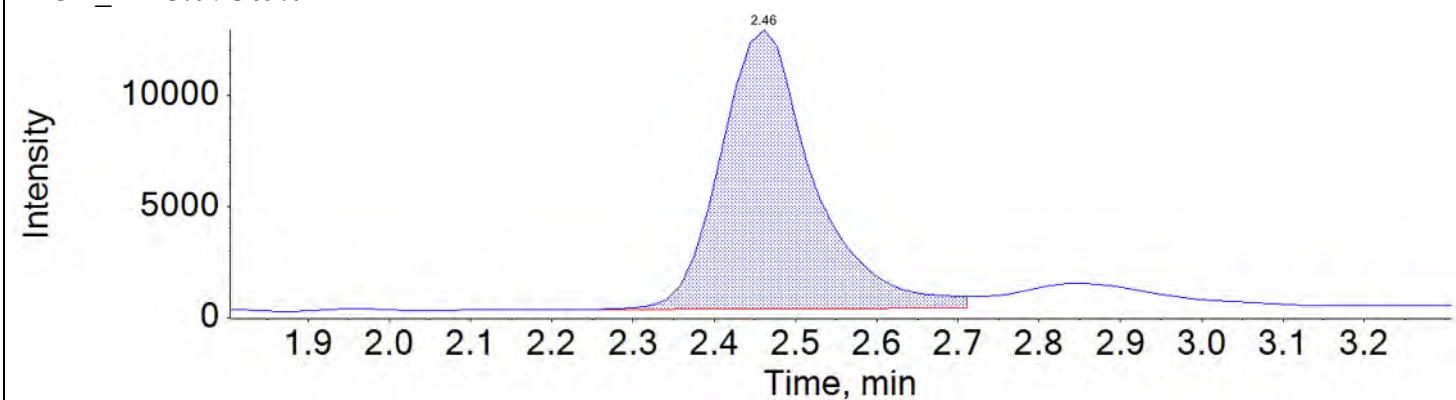
PFHxS\_1 399.0 / 80.0



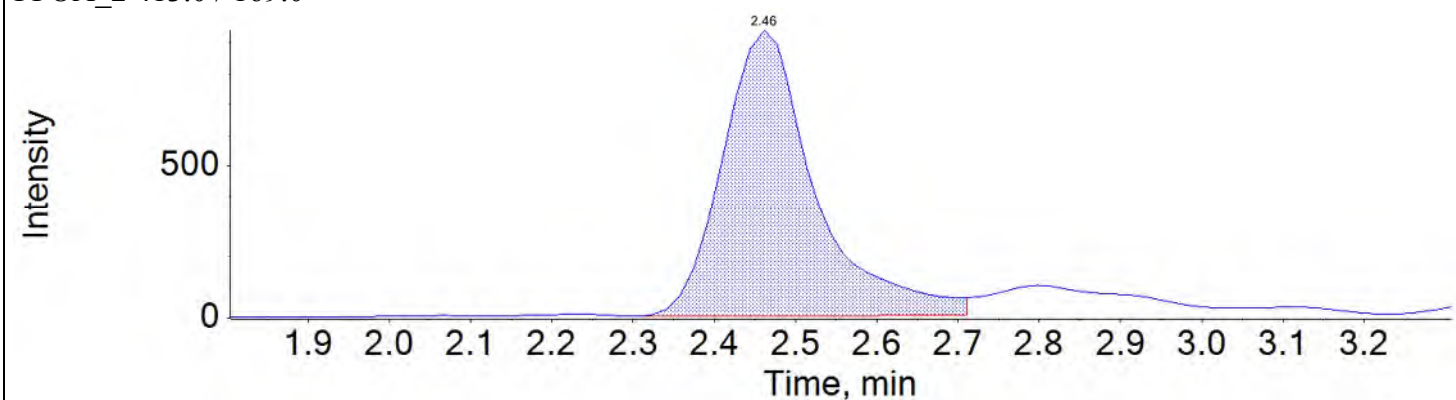
PFHxS\_2 399.0 / 99.0



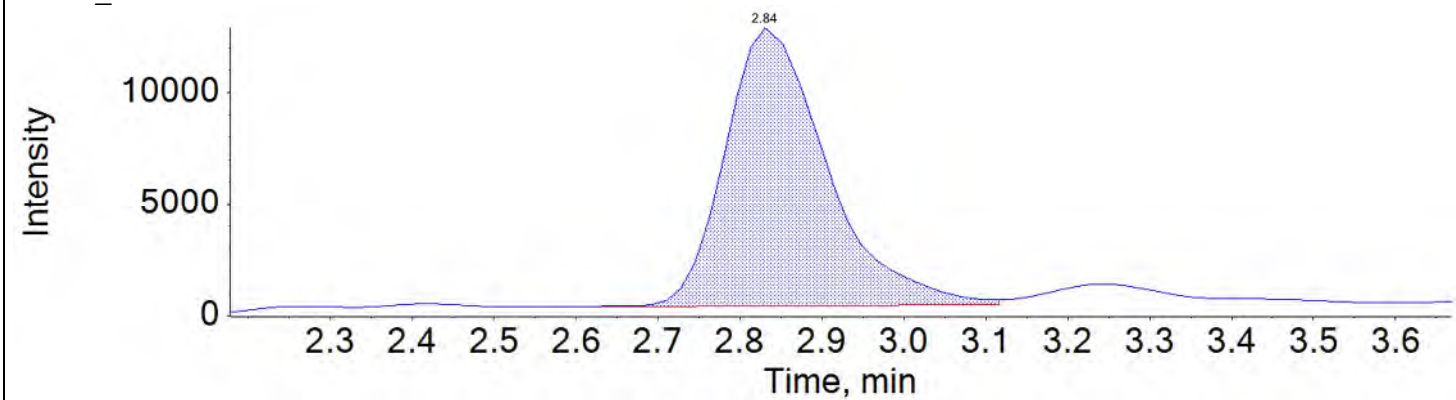
PFOA\_1 413.0 / 369.0



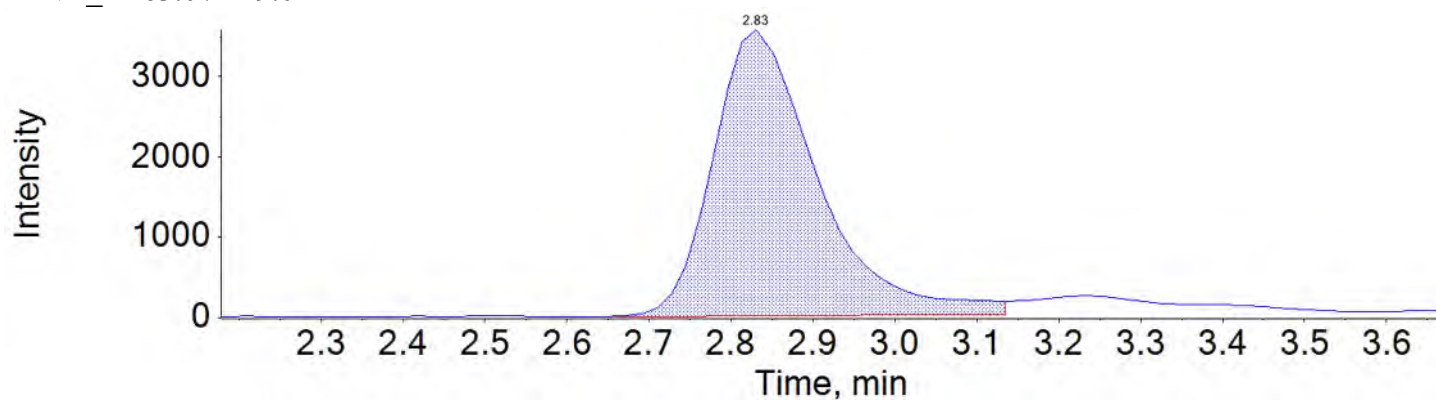
PFOA\_2 413.0 / 169.0



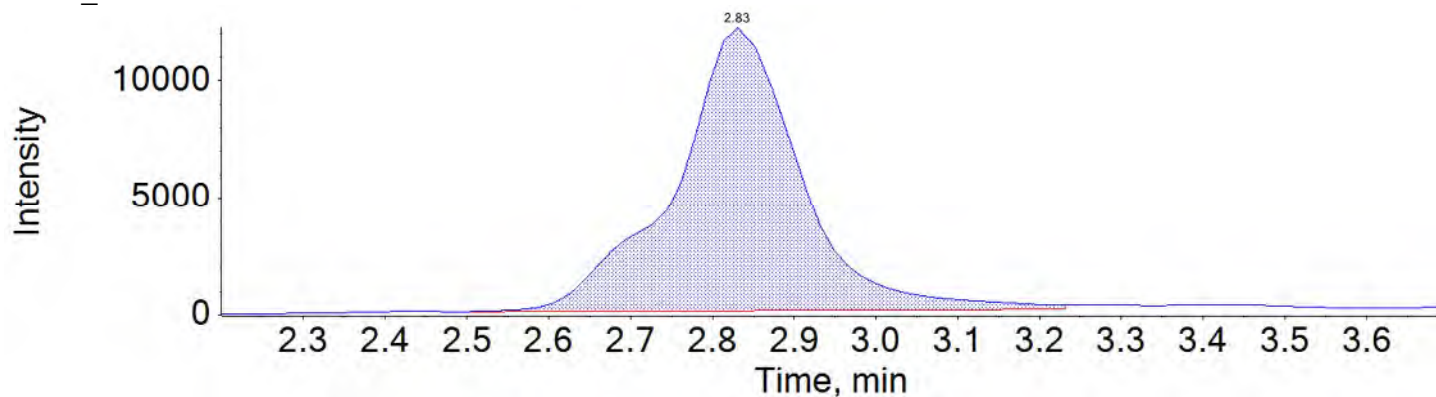
PFNA\_1 463.0 / 419.0



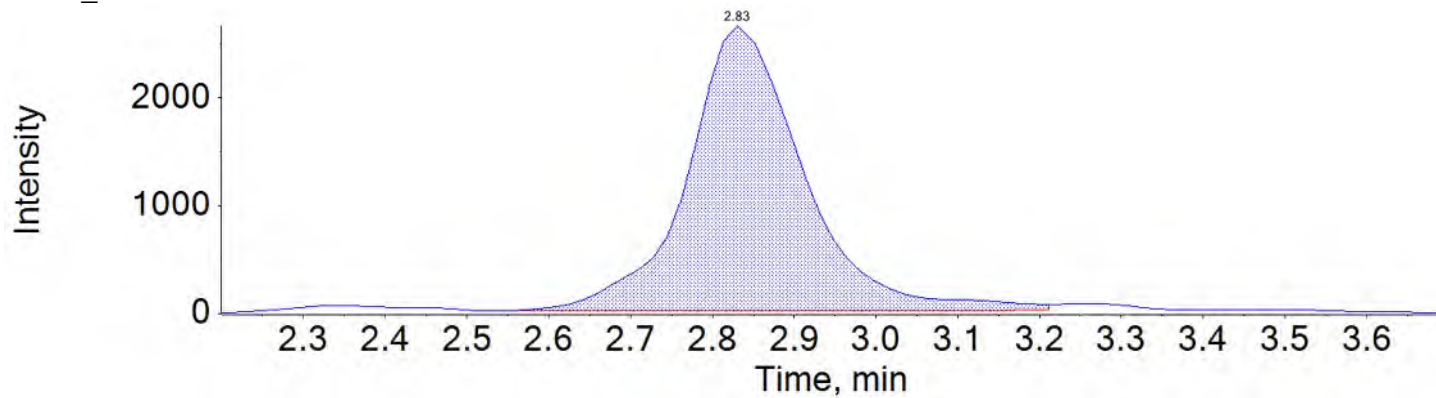
PFNA\_2 463.0 / 219.0



PFOS\_1 499.0 / 80.0

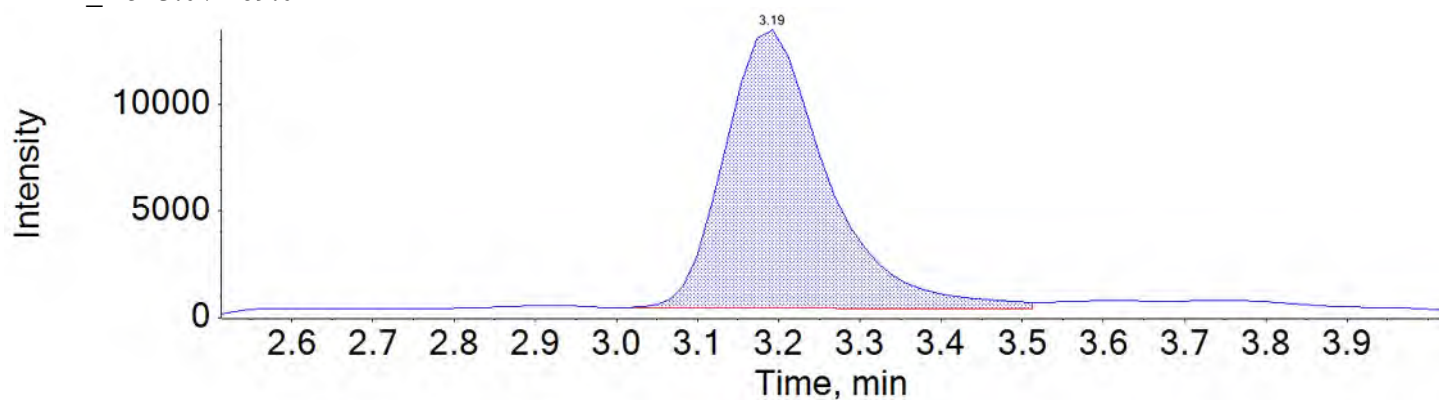


PFOS\_2 499.0 / 99.0

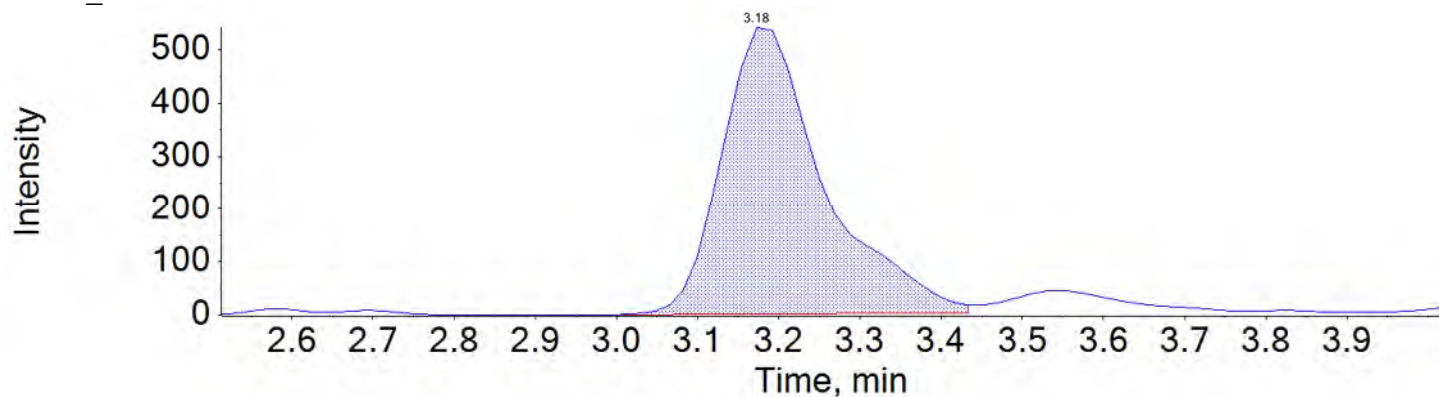




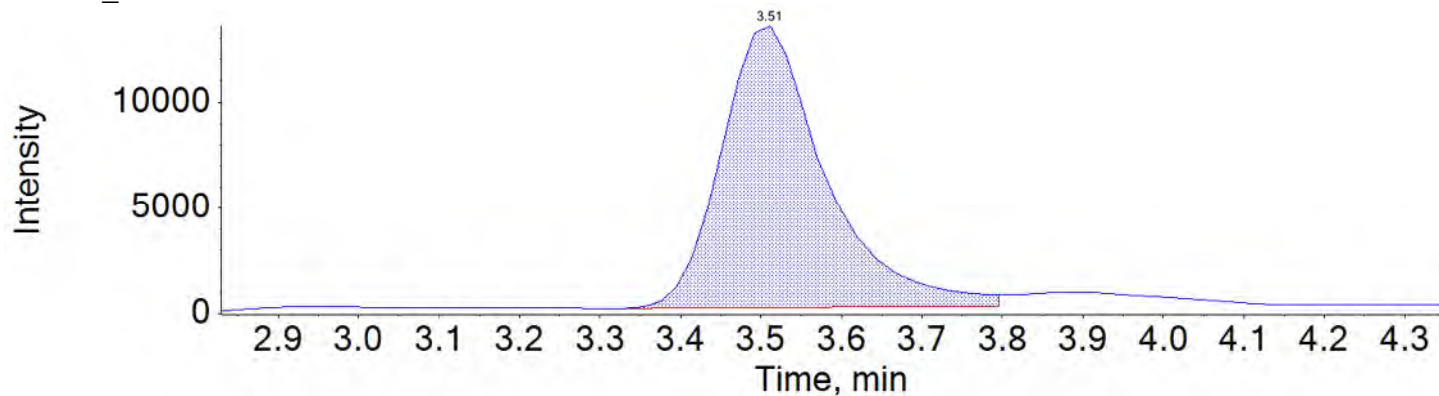
PFDA\_1 513.0 / 469.0



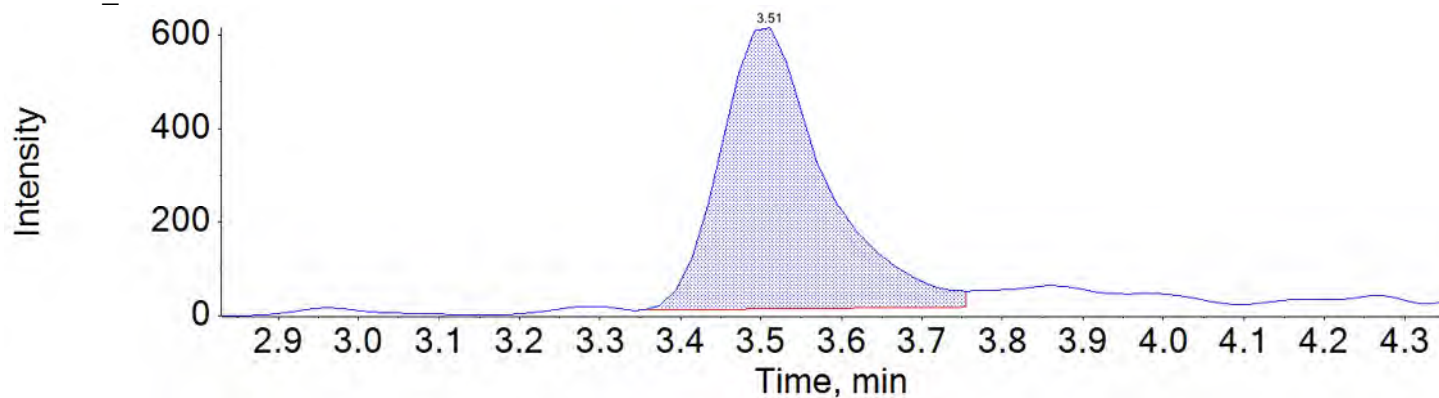
PFDA\_2 513.0 / 219.0



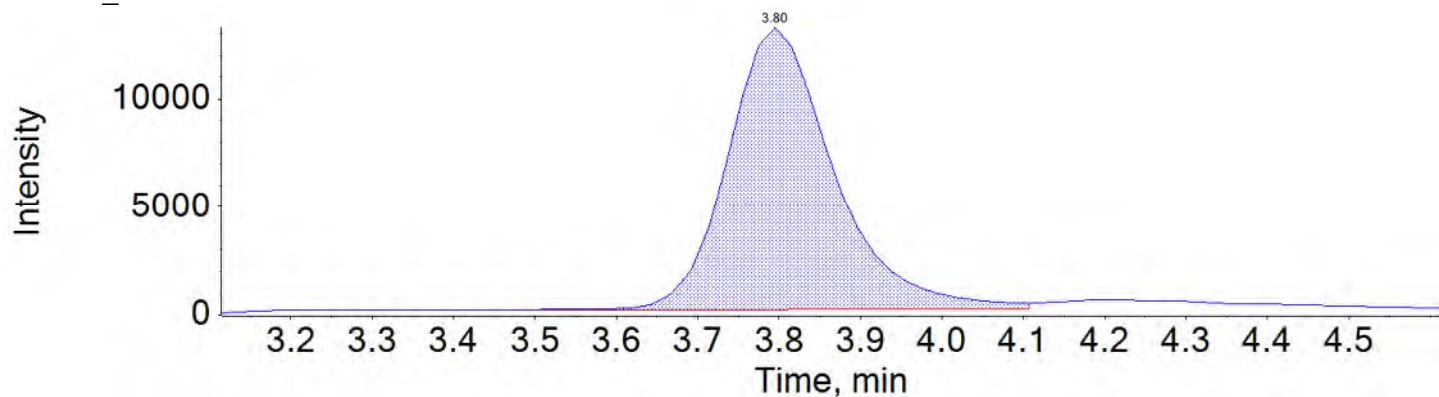
PFUnA\_1 563.0 / 519.0



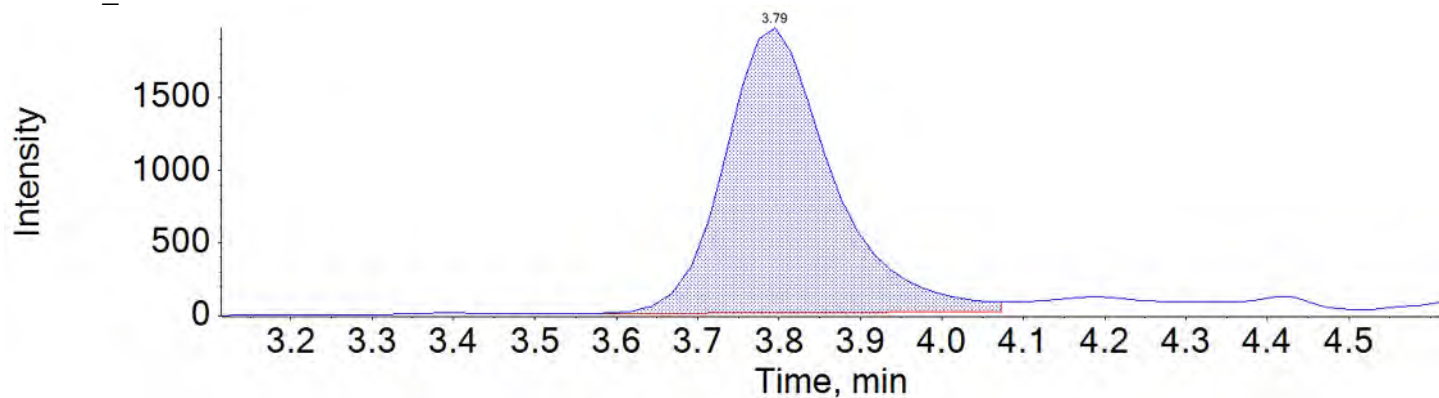
PFUnA\_2 563.0 / 269.0



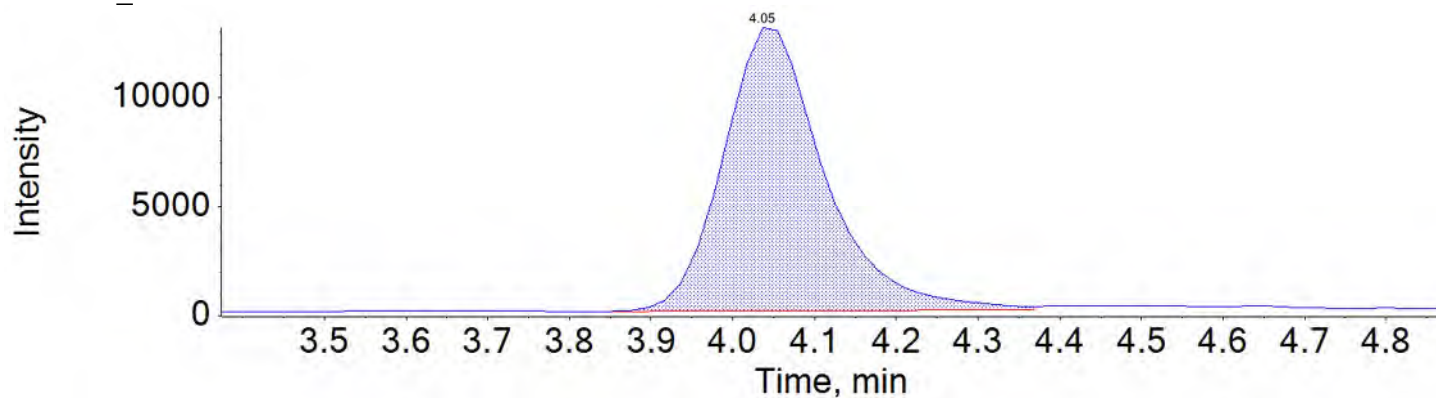
PFDaA\_1 613.0 / 569.0



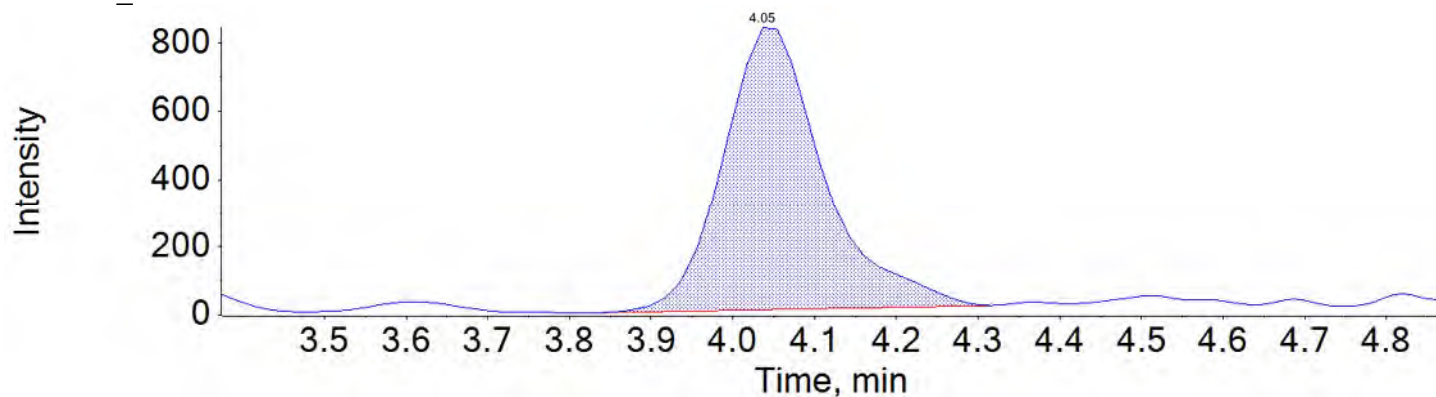
PFDaA\_2 613.0 / 319.0



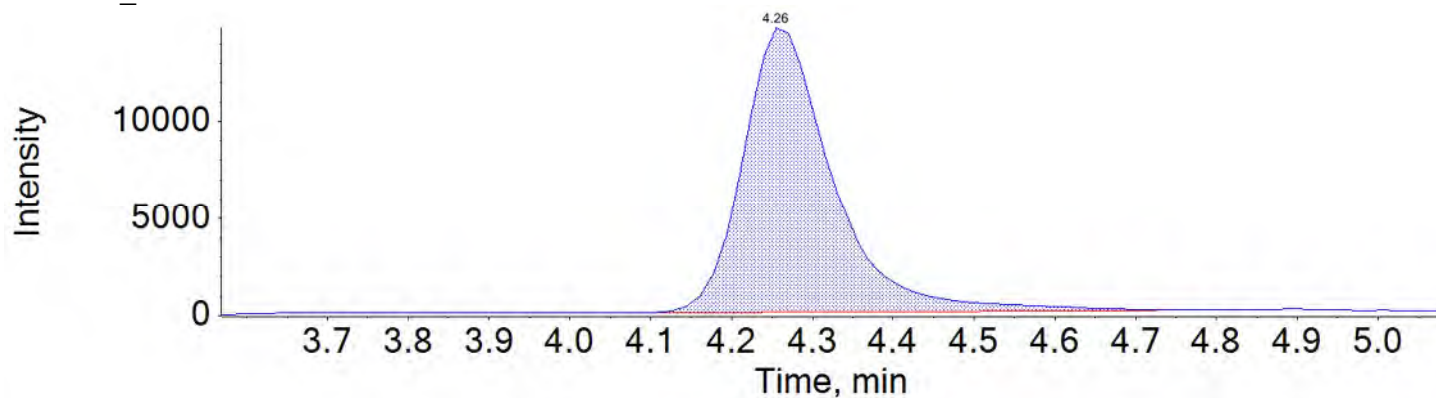
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

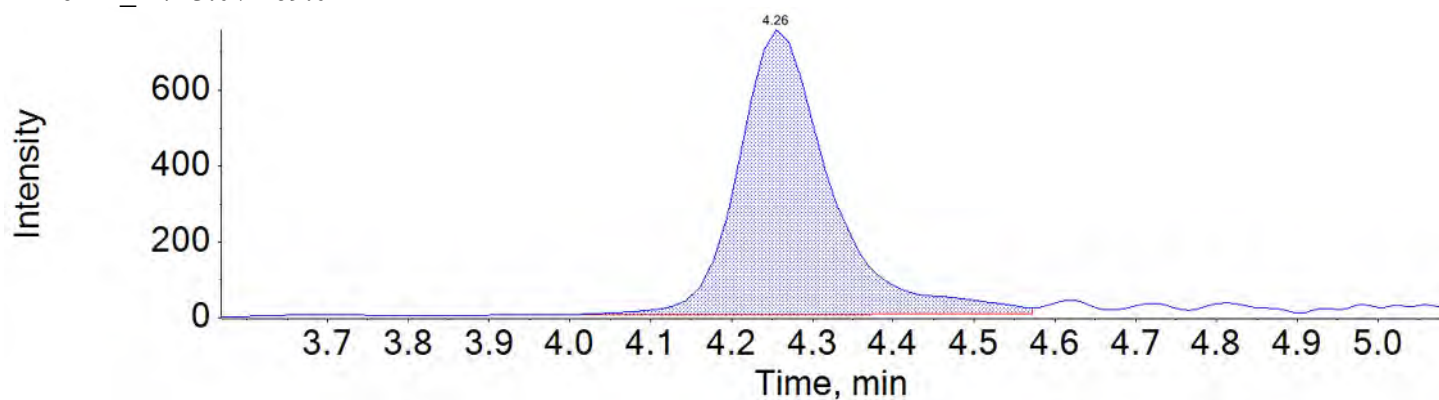


PFTTeDA\_1 713.0 / 669.0

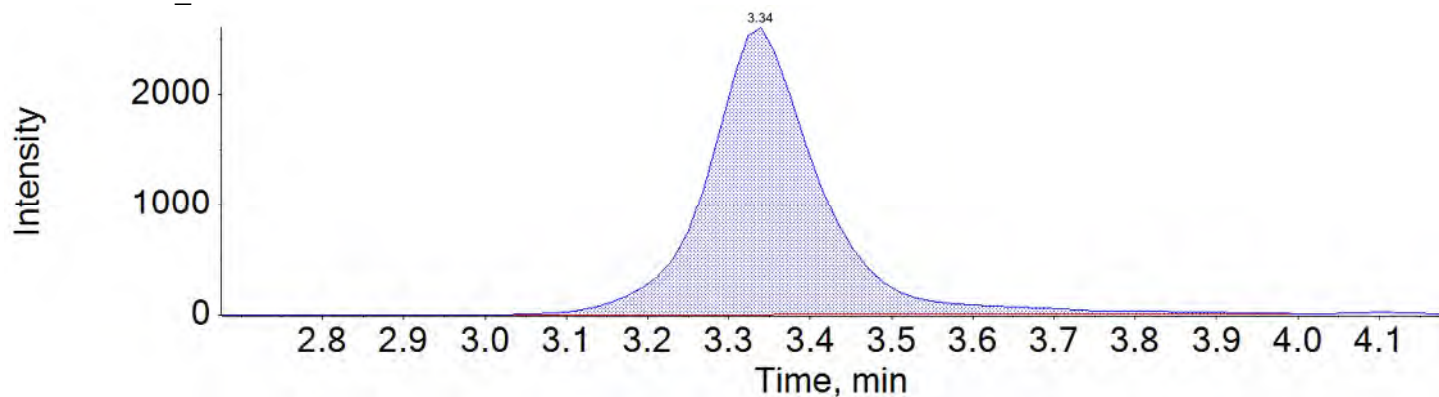




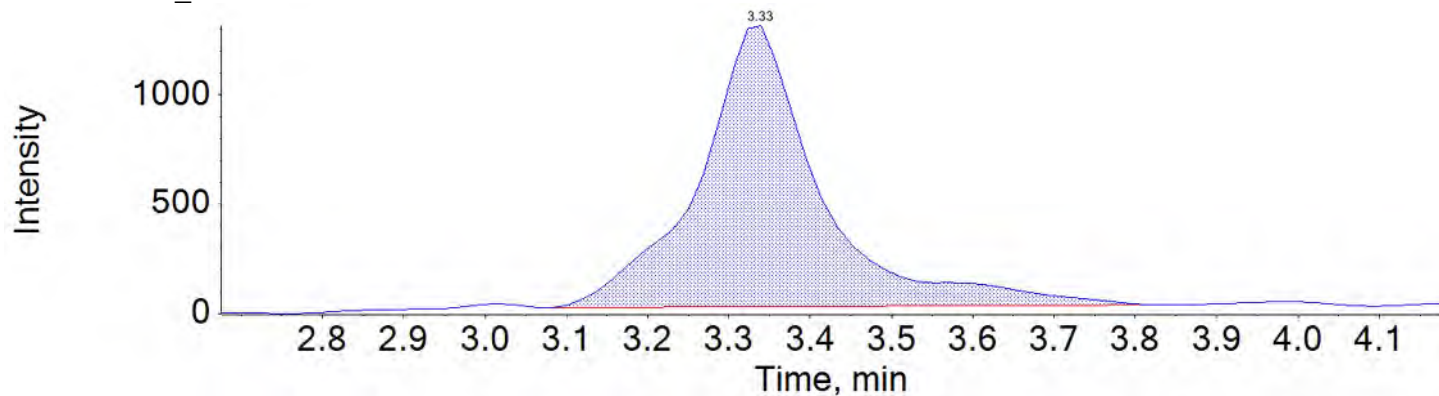
PFTeDA\_2 713.0 / 169.0



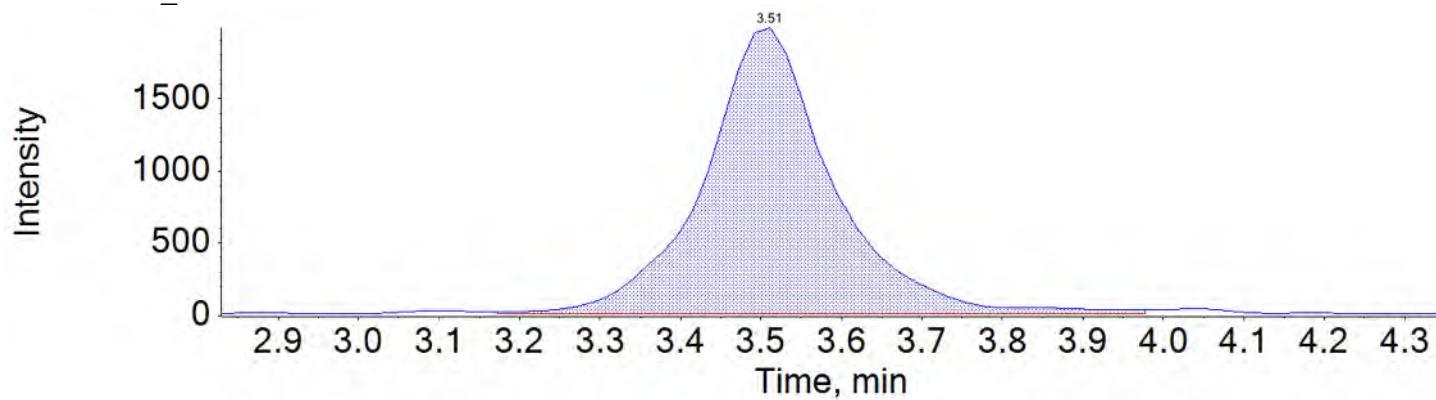
NMeFOSAA\_1 570.0 / 419.0



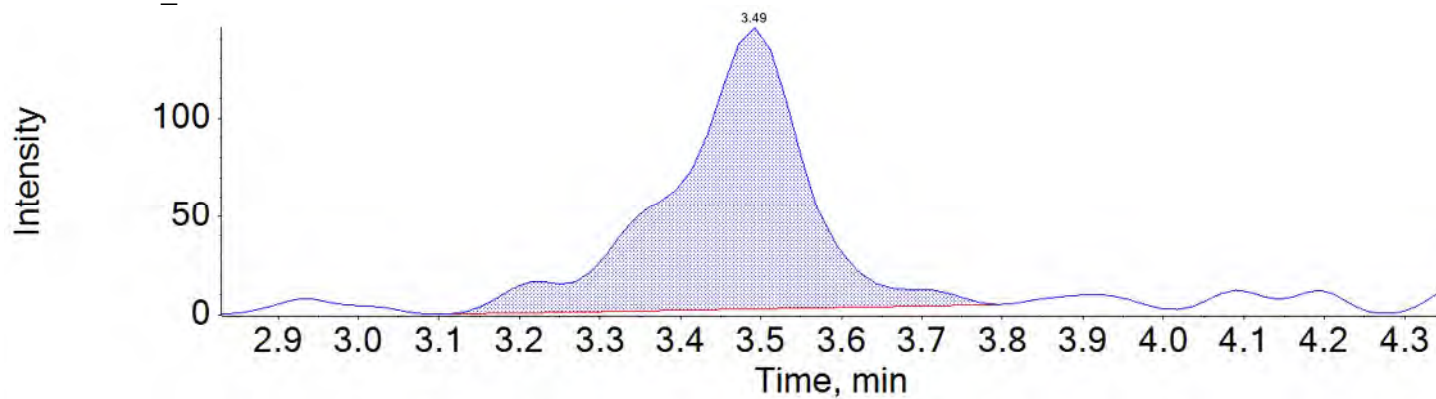
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0

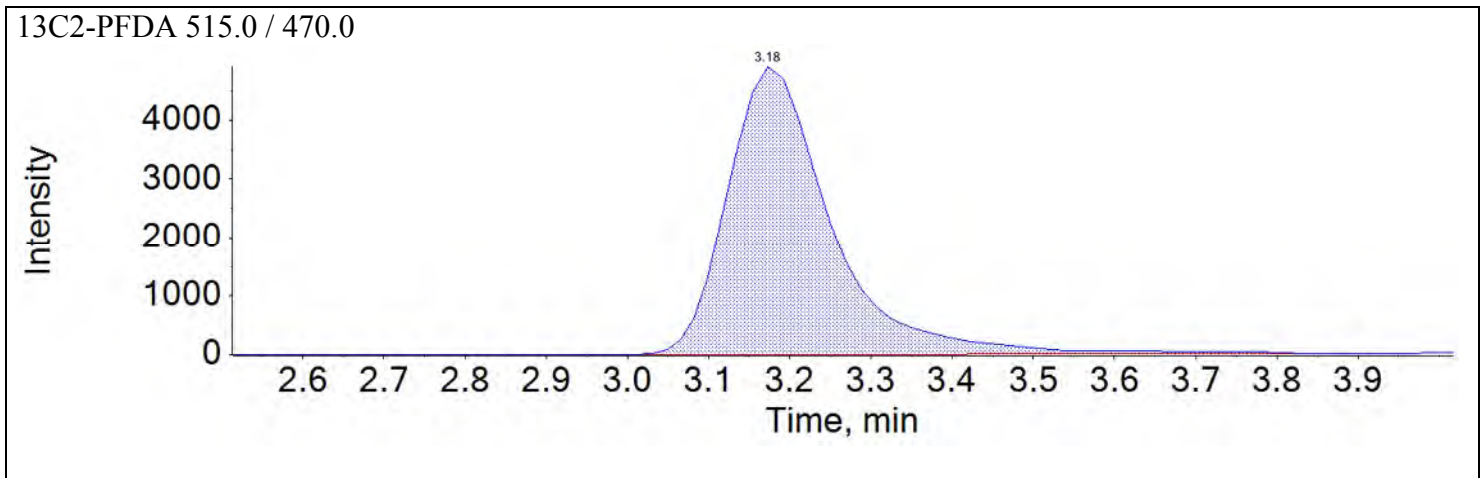
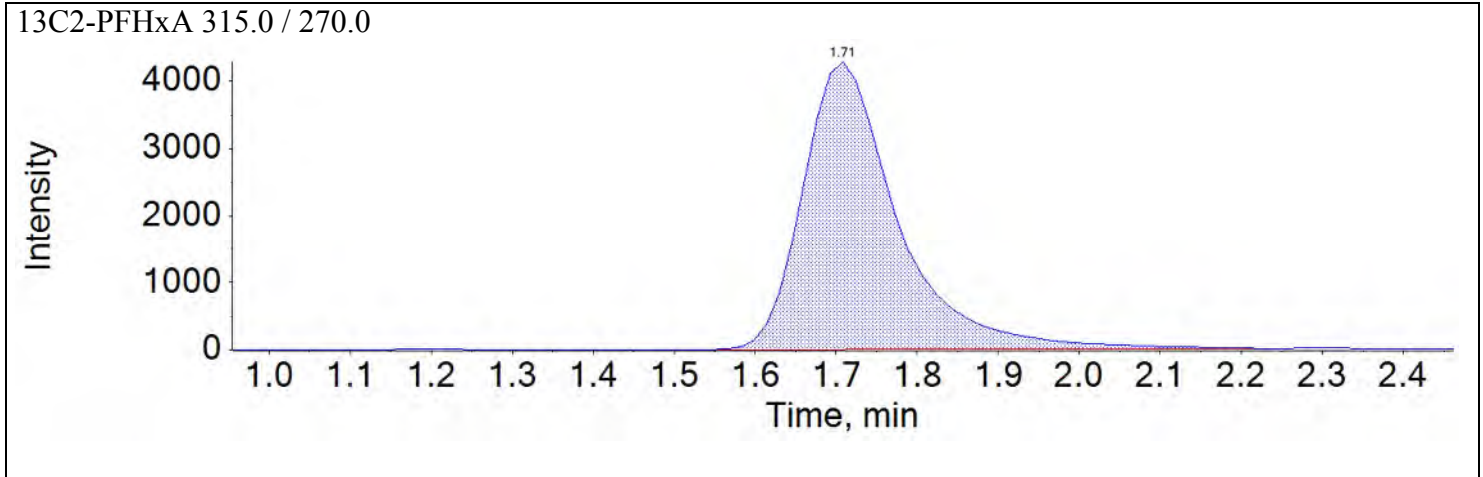


NEtFOSAA\_2 584.0 / 483.0

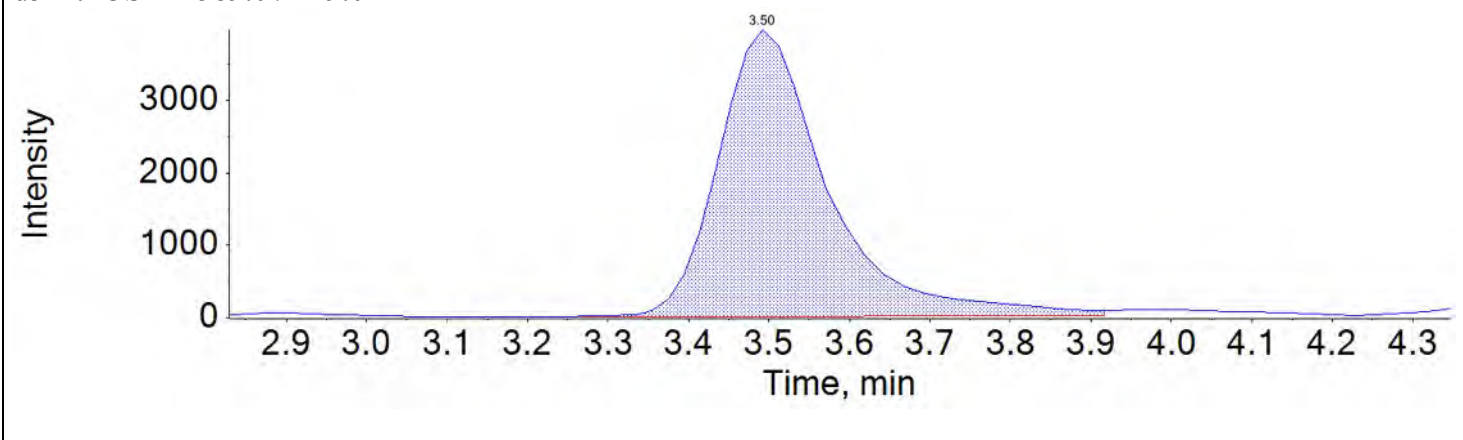


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

### Chromatograms

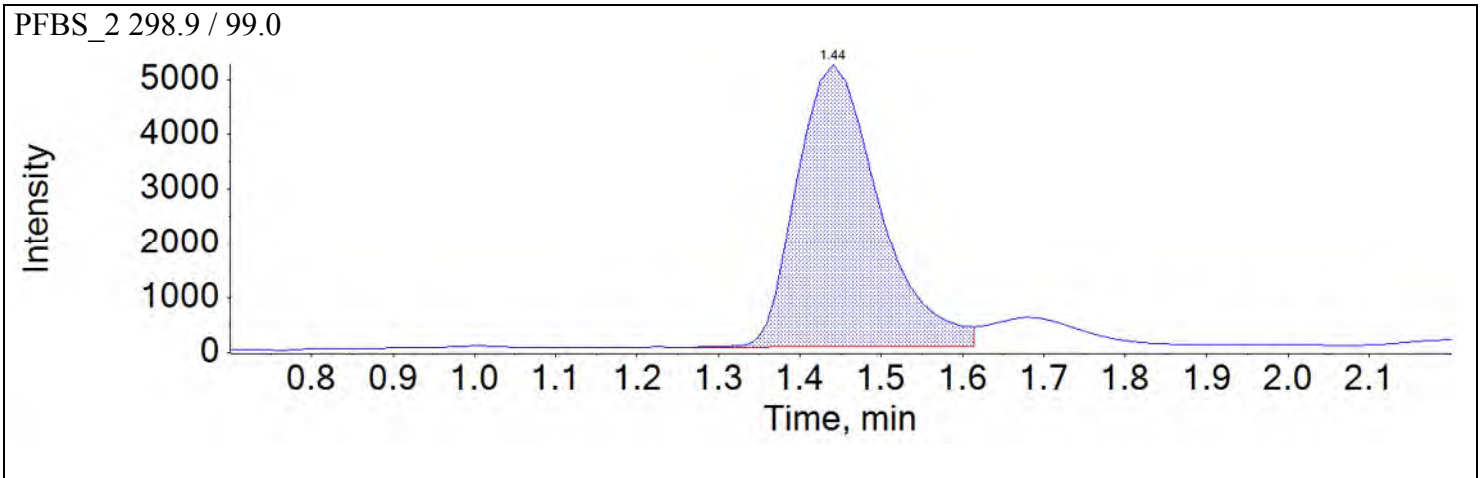
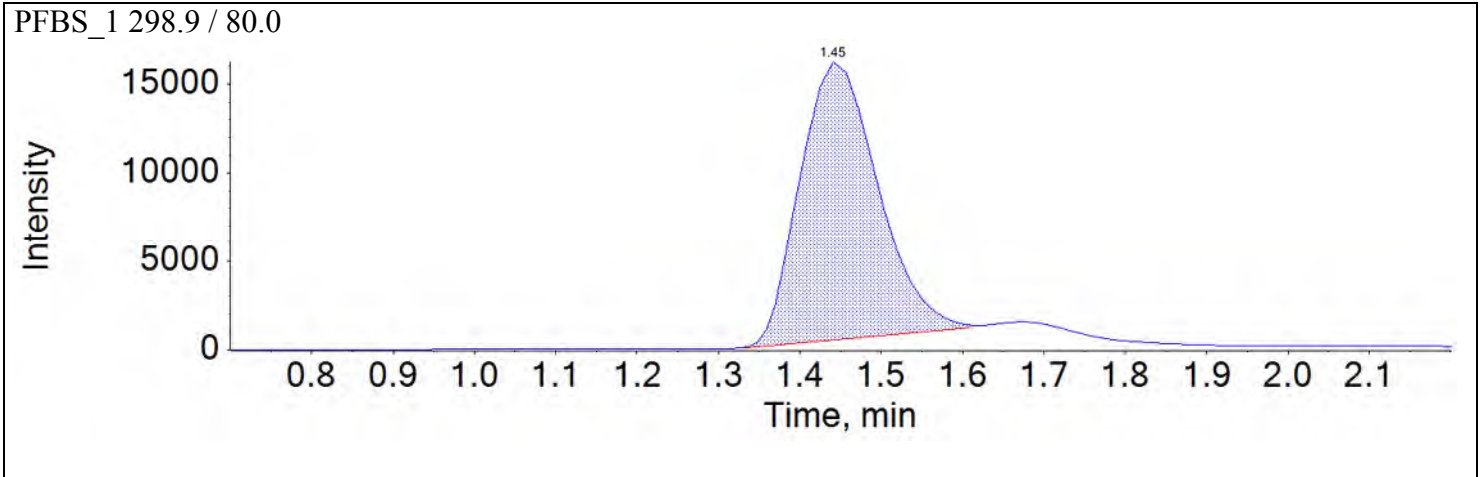


d5-EtFOSAA 589.0 / 419.0



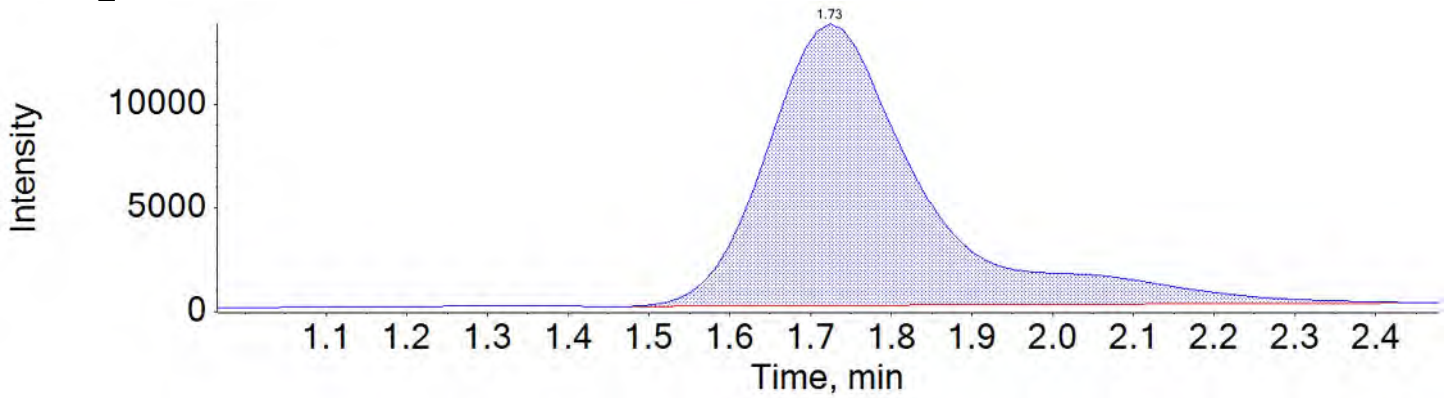
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

### Chromatograms

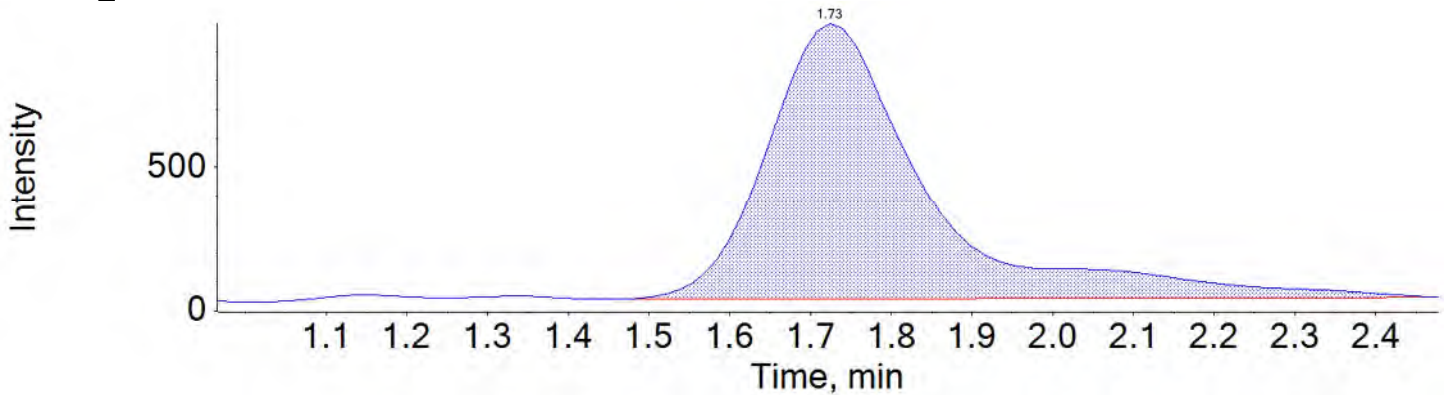




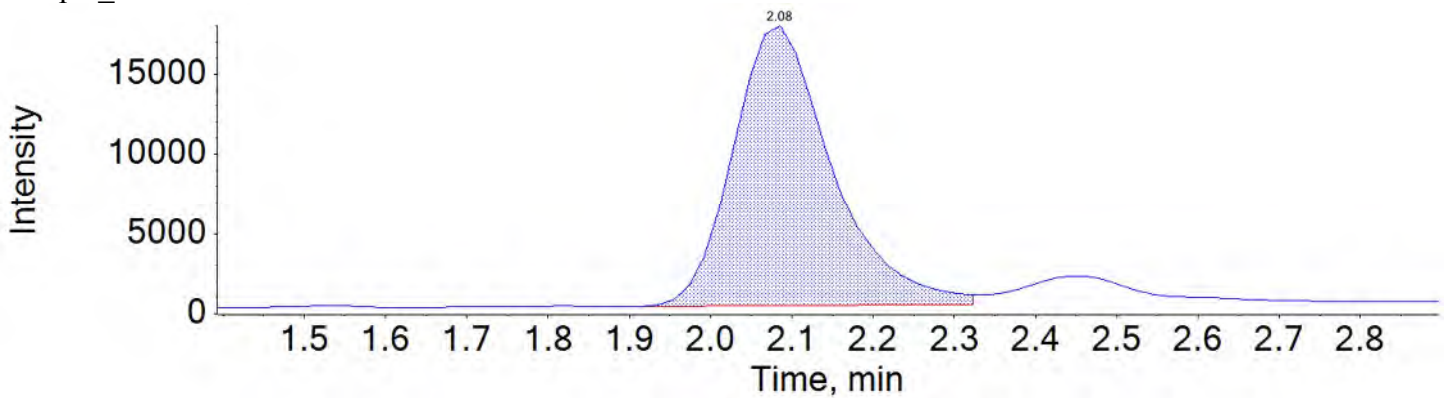
PFHxA\_1 313.0 / 269.0



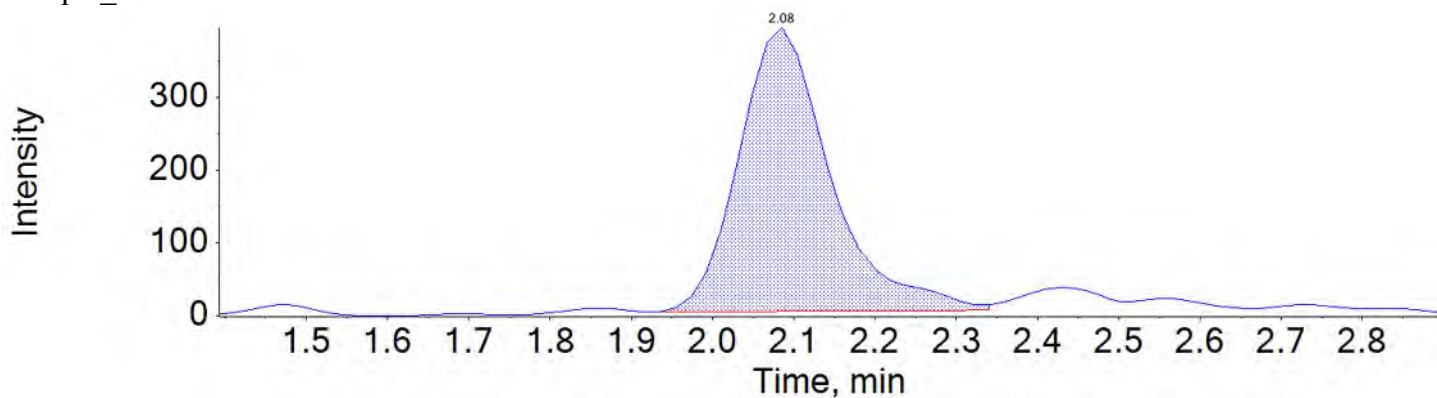
PFHxA\_2 313.0 / 119.0



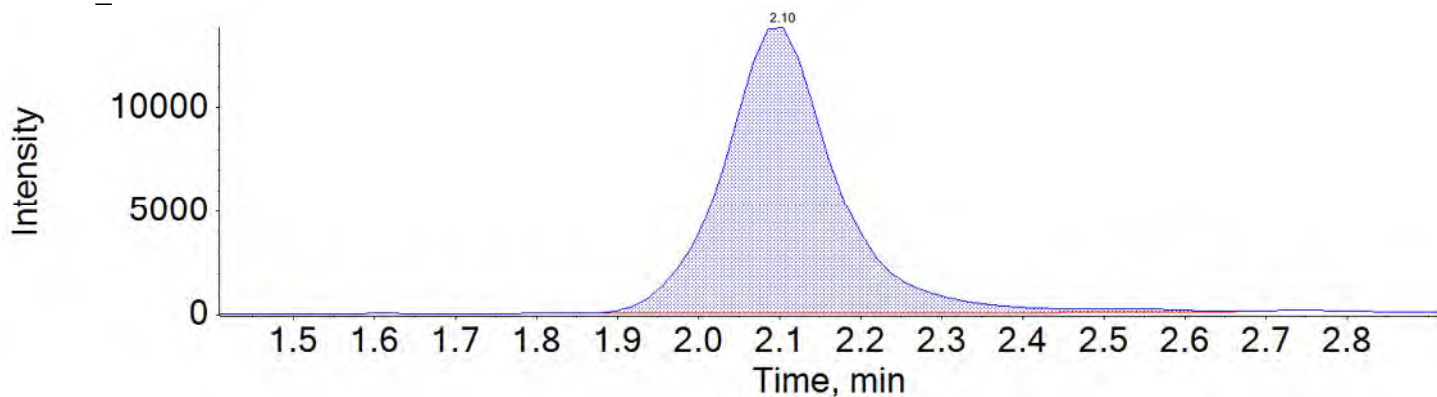
PFHpA\_1 363.0 / 319.0



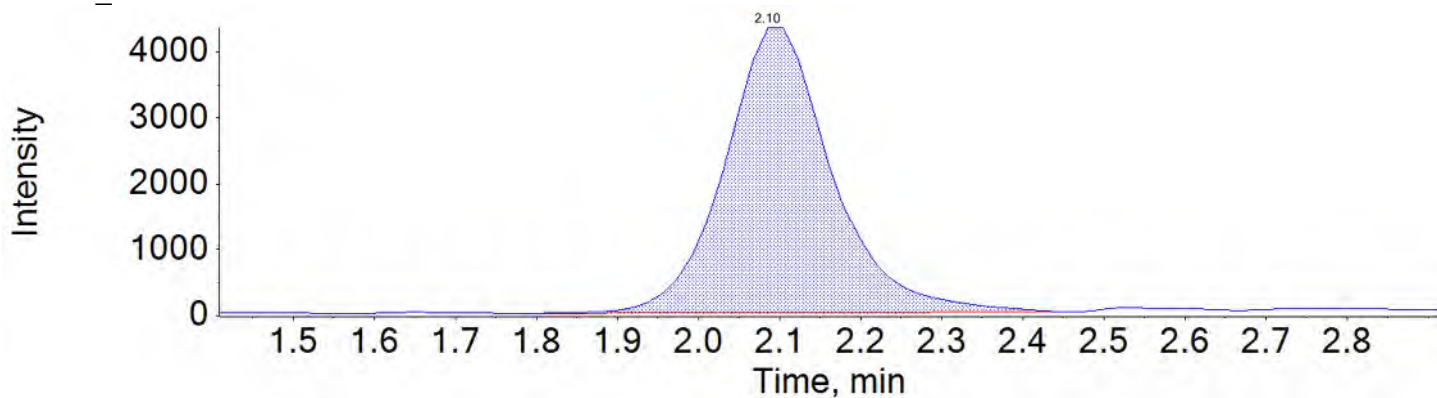
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

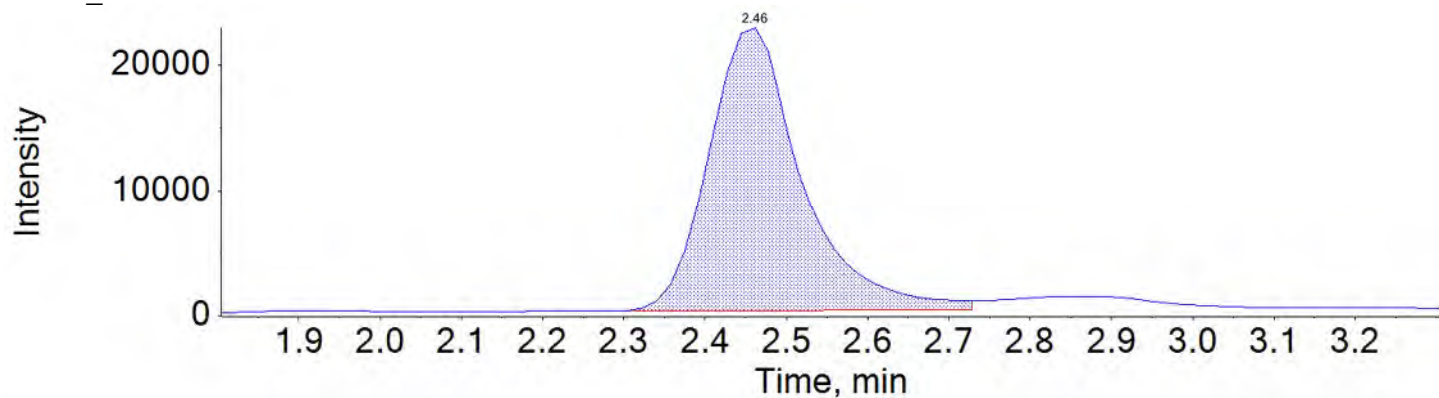


PFHxS\_2 399.0 / 99.0

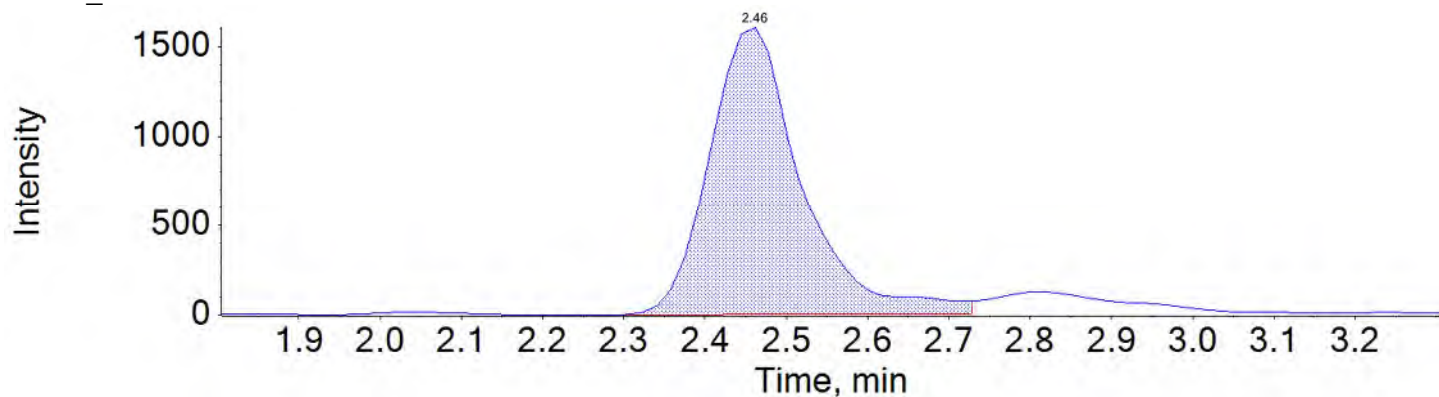




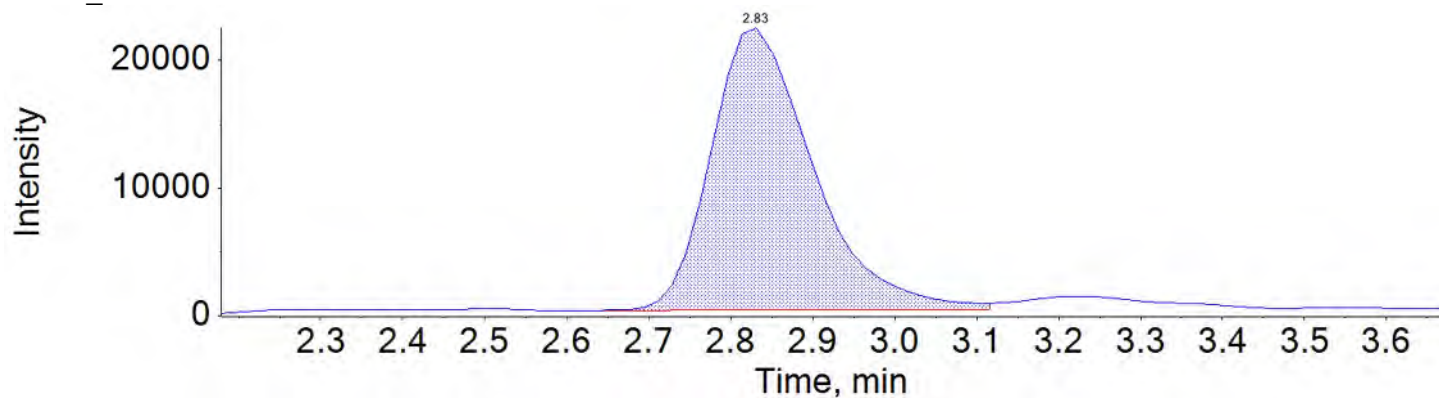
PFOA\_1 413.0 / 369.0



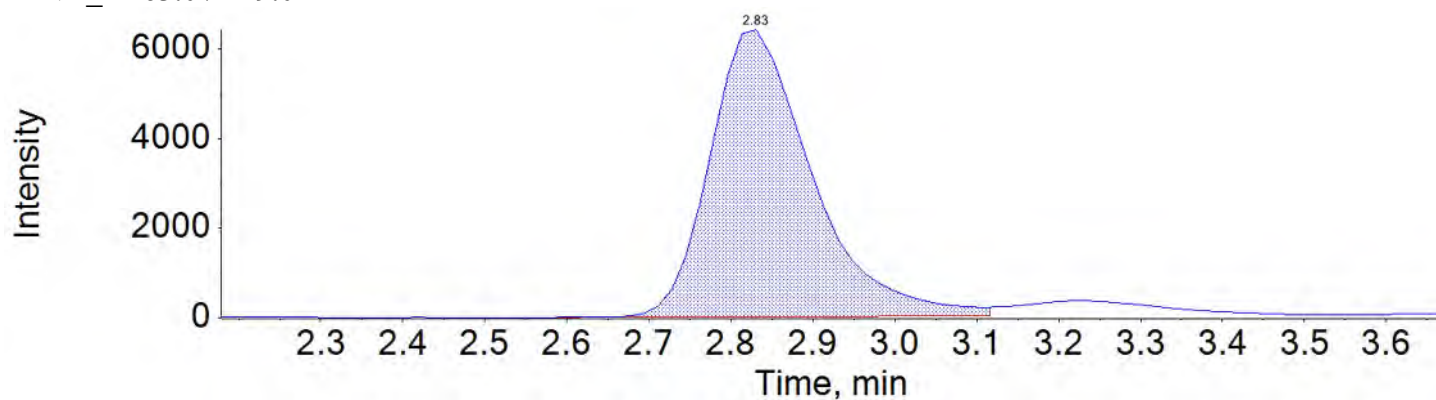
PFOA\_2 413.0 / 169.0



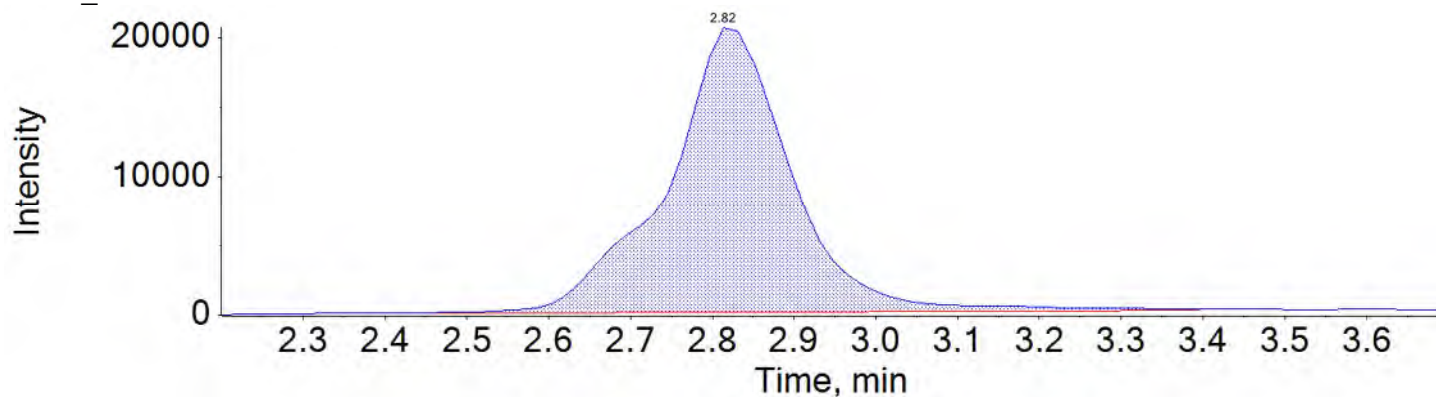
PFNA\_1 463.0 / 419.0



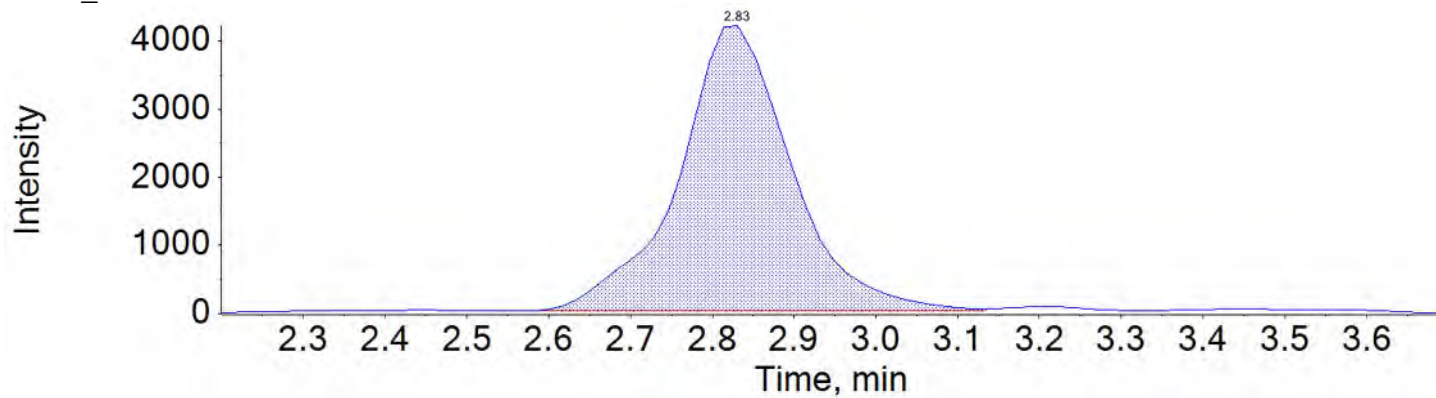
PFNA\_2 463.0 / 219.0



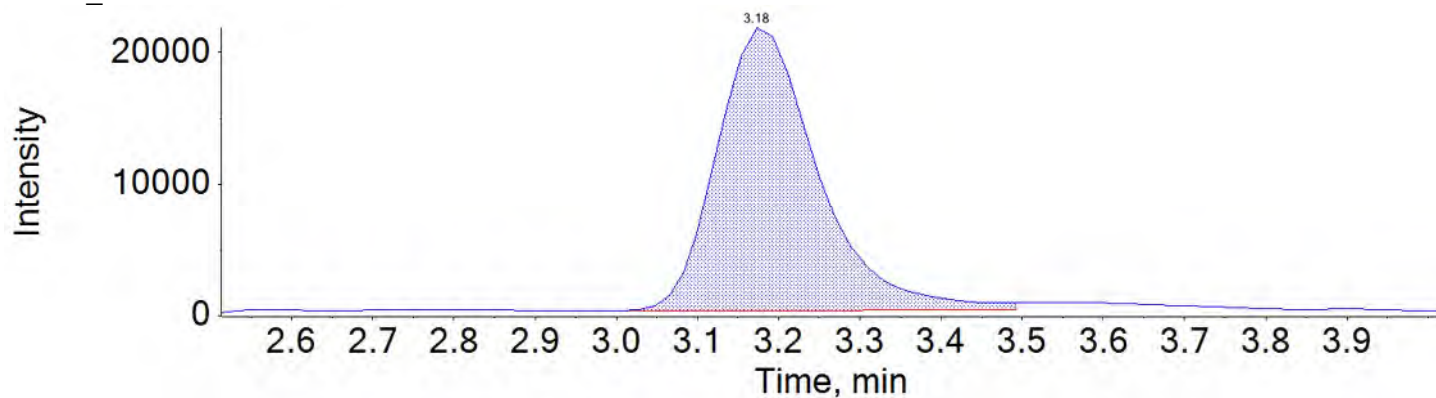
PFOS\_1 499.0 / 80.0



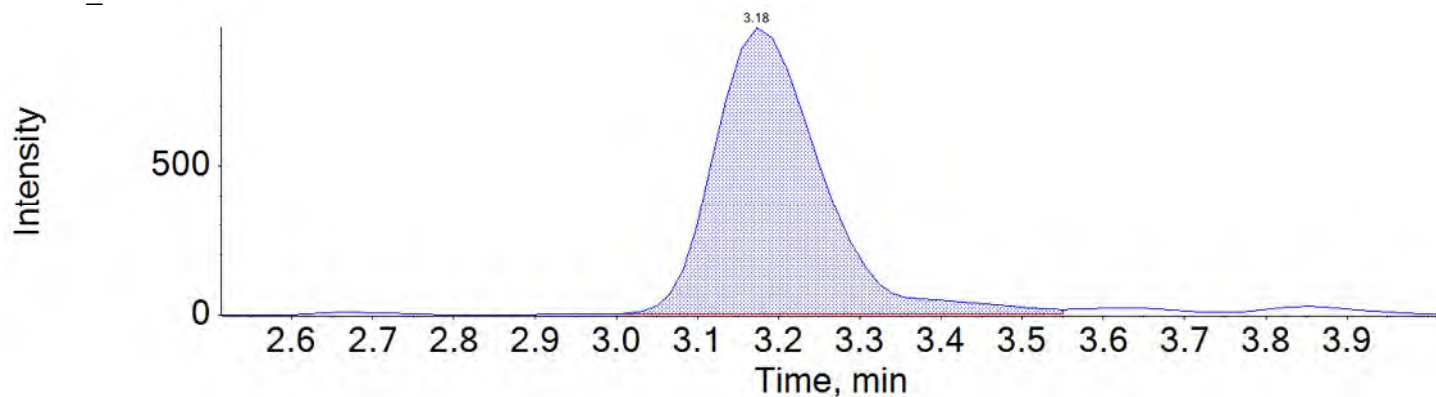
PFOS\_2 499.0 / 99.0



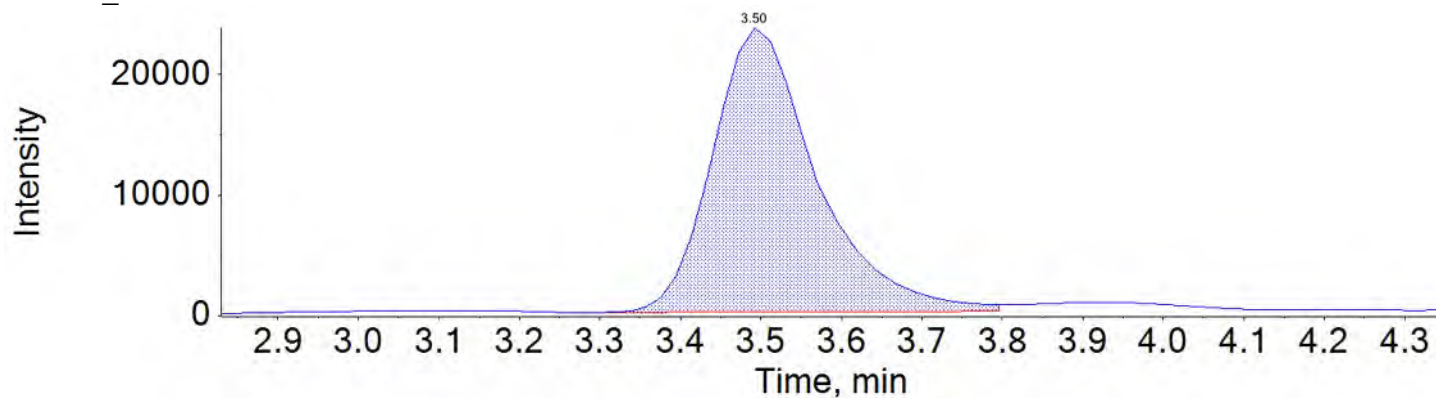
PFDA\_1 513.0 / 469.0



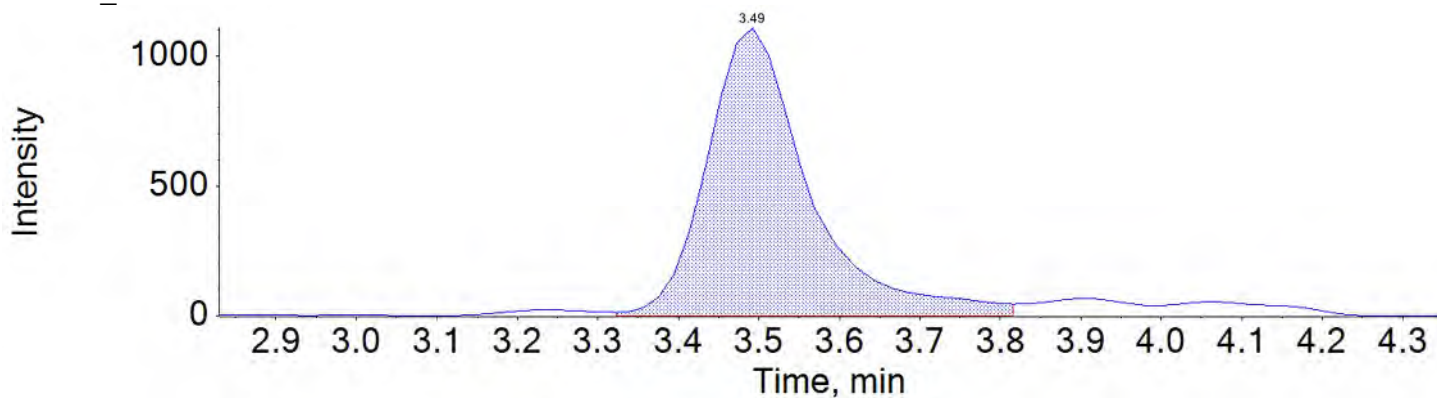
PFDA\_2 513.0 / 219.0



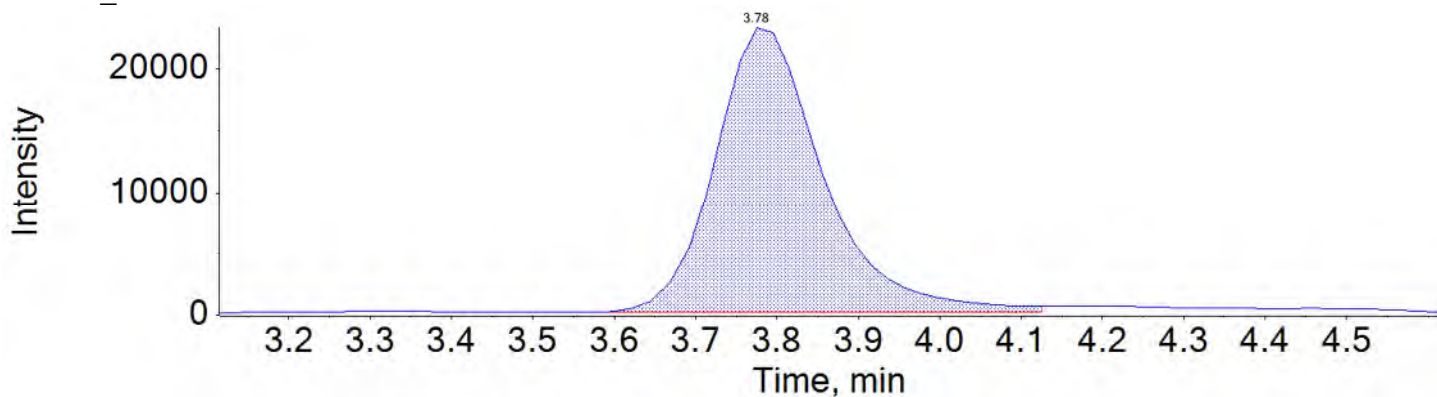
PFUnA\_1 563.0 / 519.0



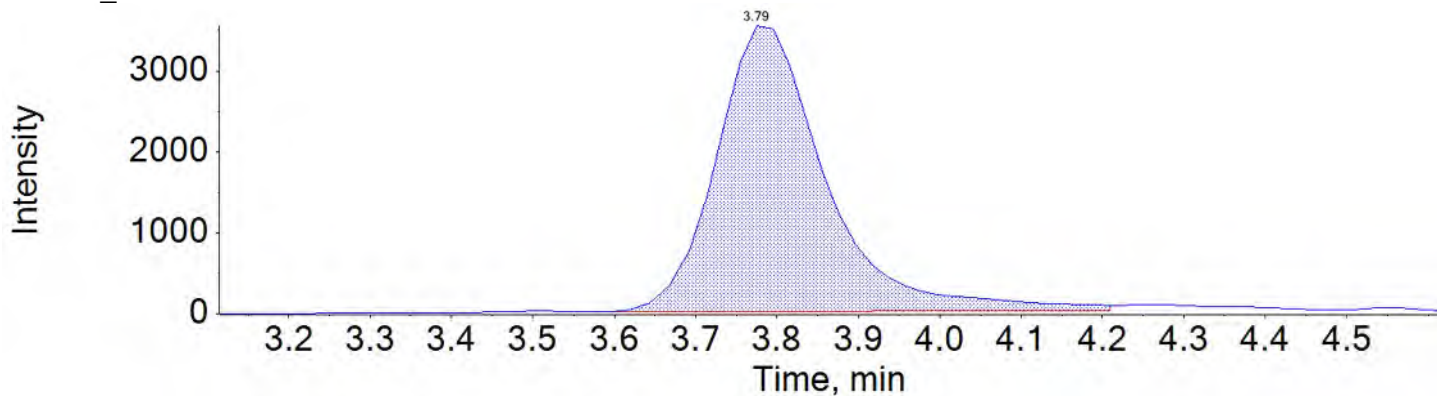
PFUnA\_2 563.0 / 269.0



PFDoA\_1 613.0 / 569.0

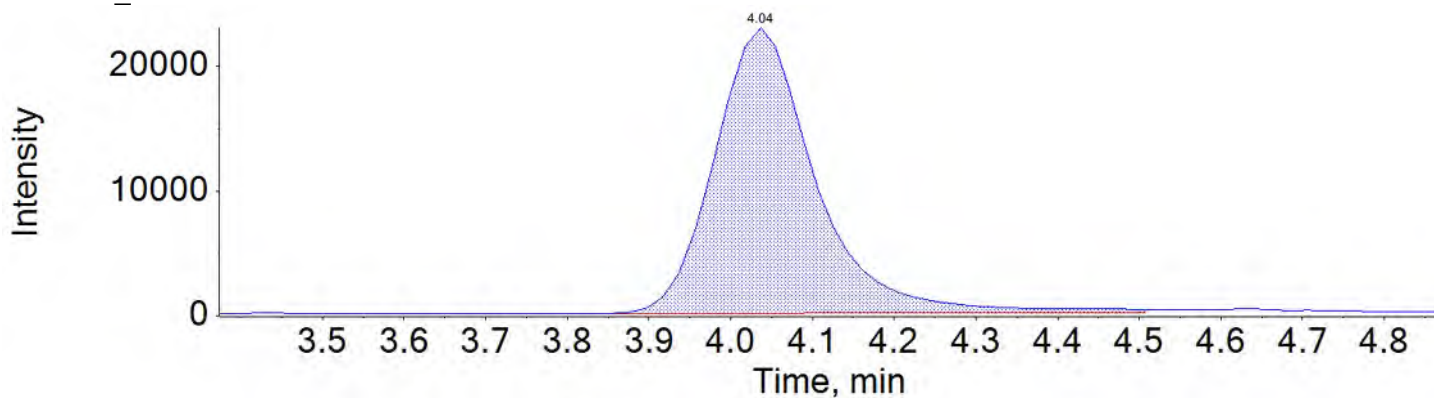


PFDoA\_2 613.0 / 319.0

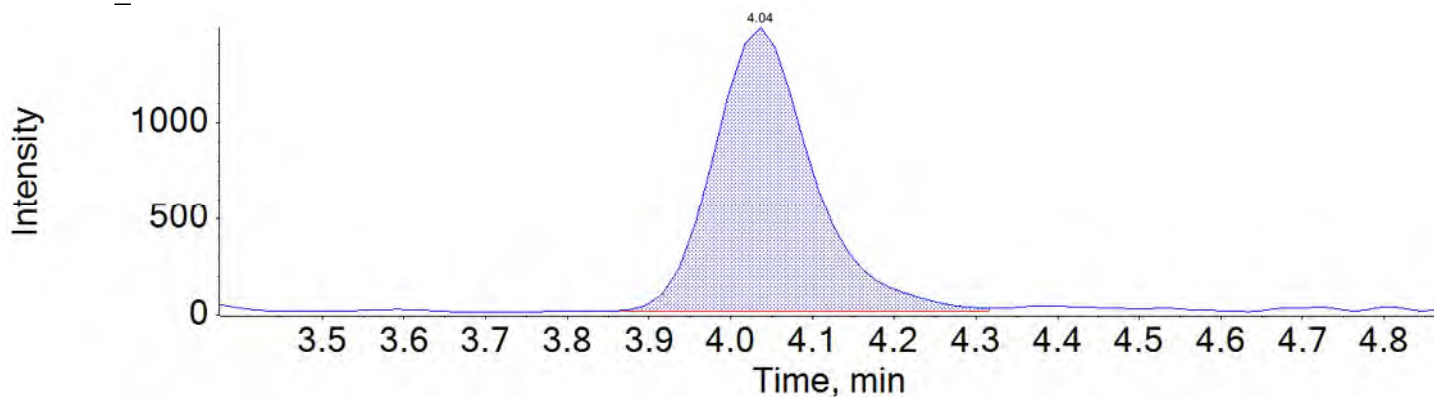




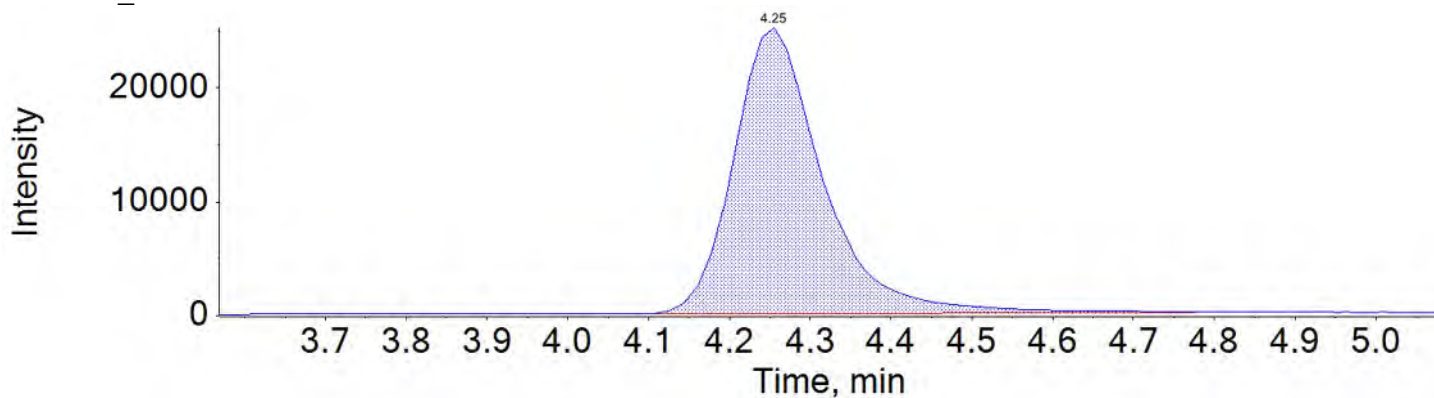
PFTTrDA\_1 663.0 / 619.0



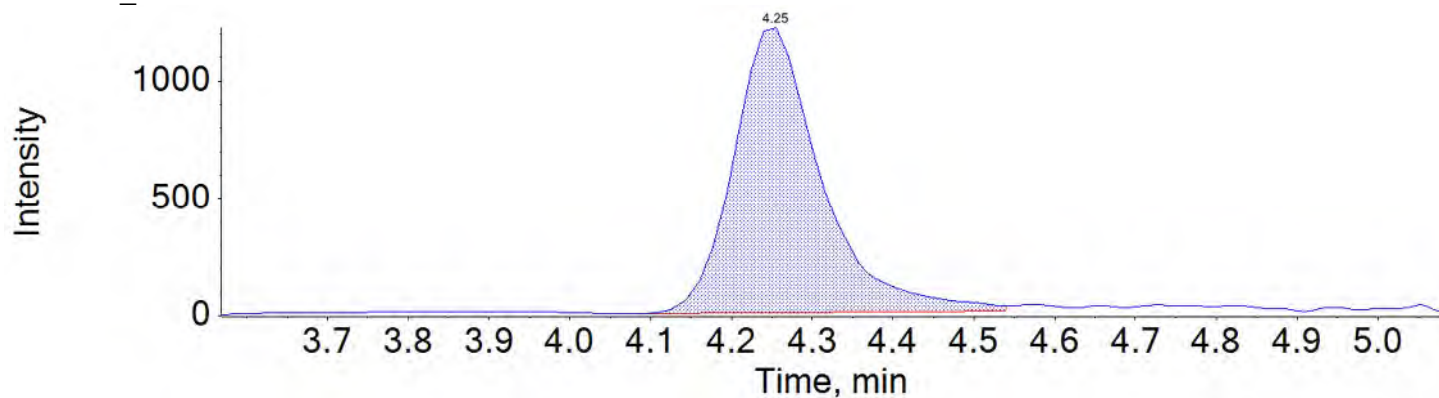
PFTTrDA\_2 663.0 / 169.0



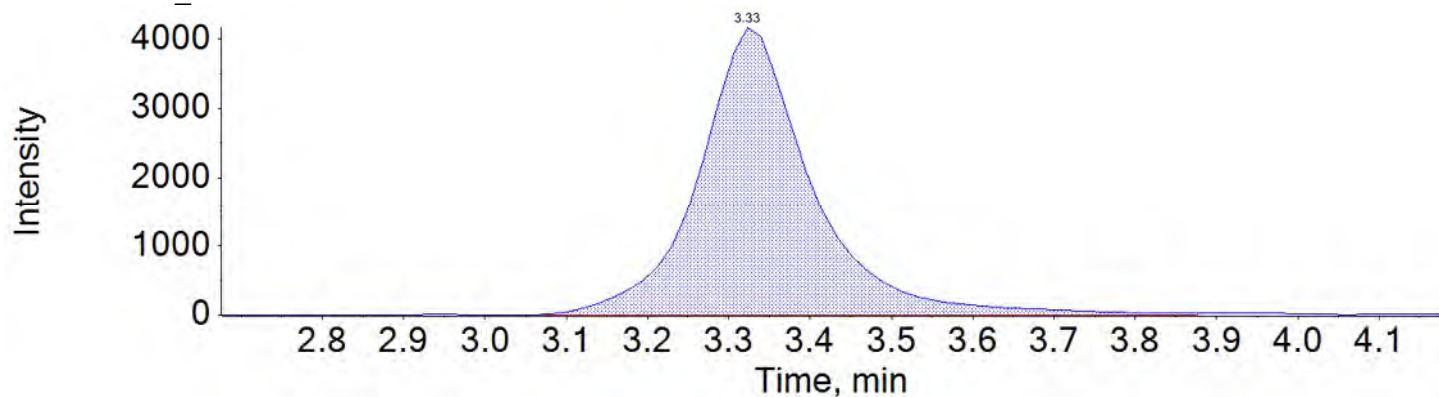
PFTTeDA\_1 713.0 / 669.0



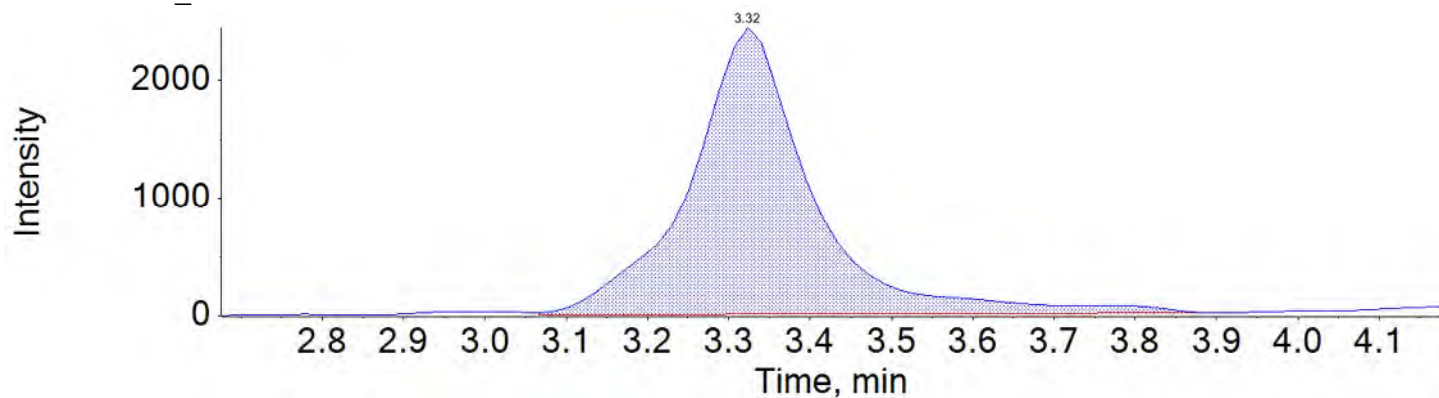
PFTeDA\_2 713.0 / 169.0



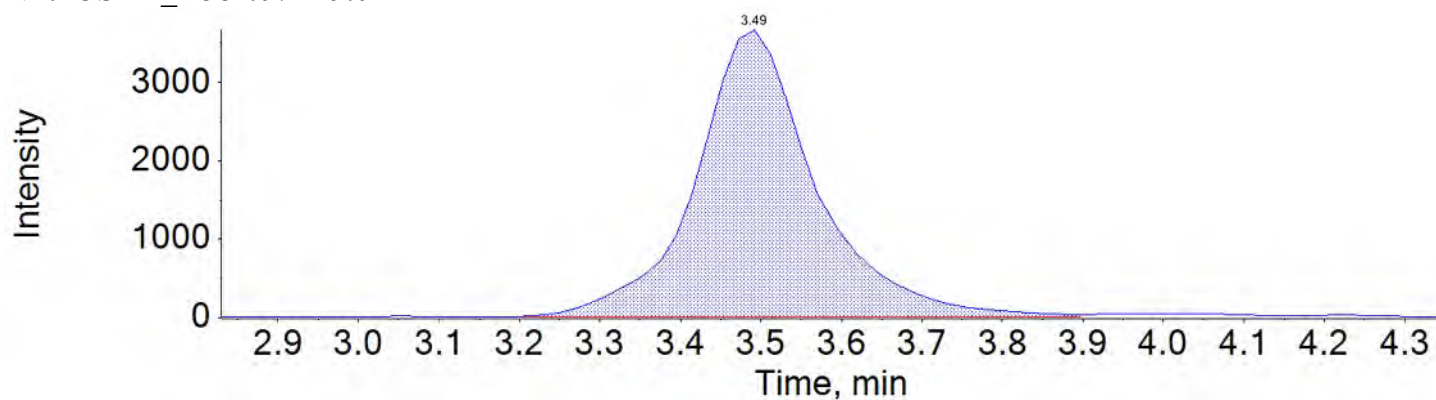
NMeFOSAA\_1 570.0 / 419.0



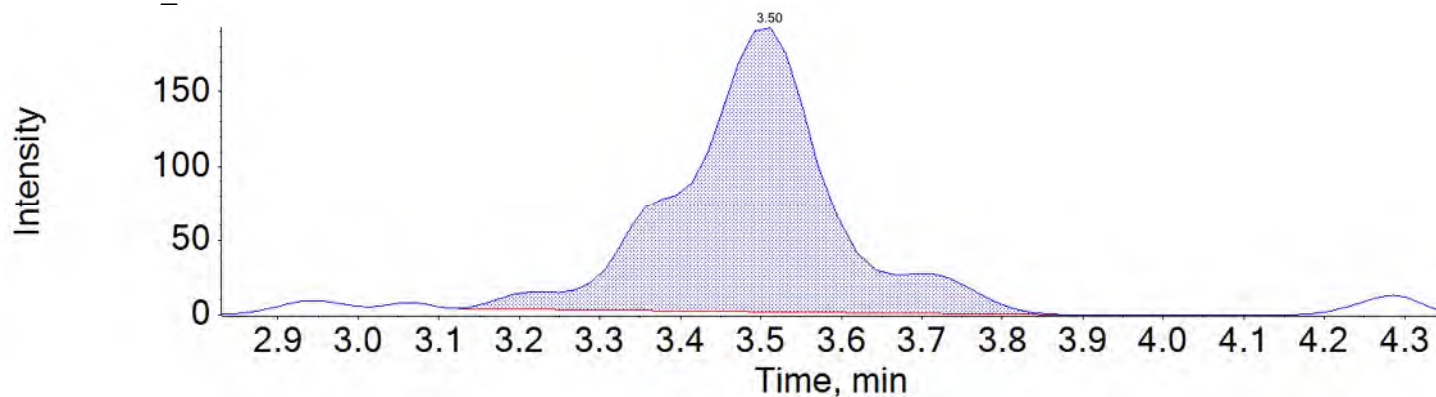
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



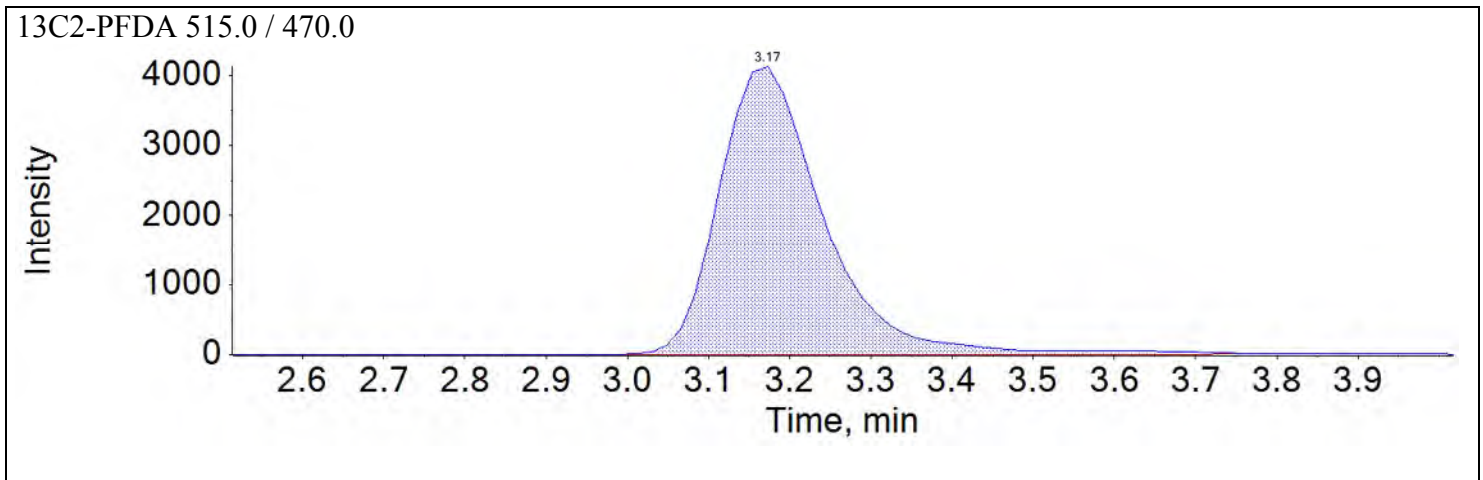
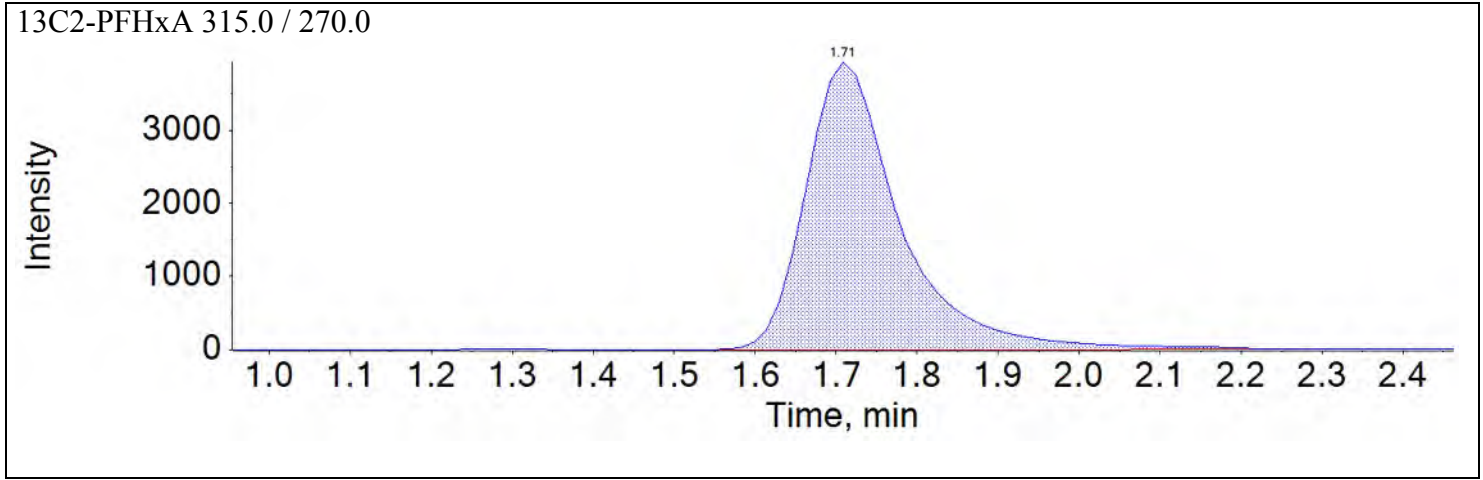
NEtFOSAA\_2 584.0 / 483.0



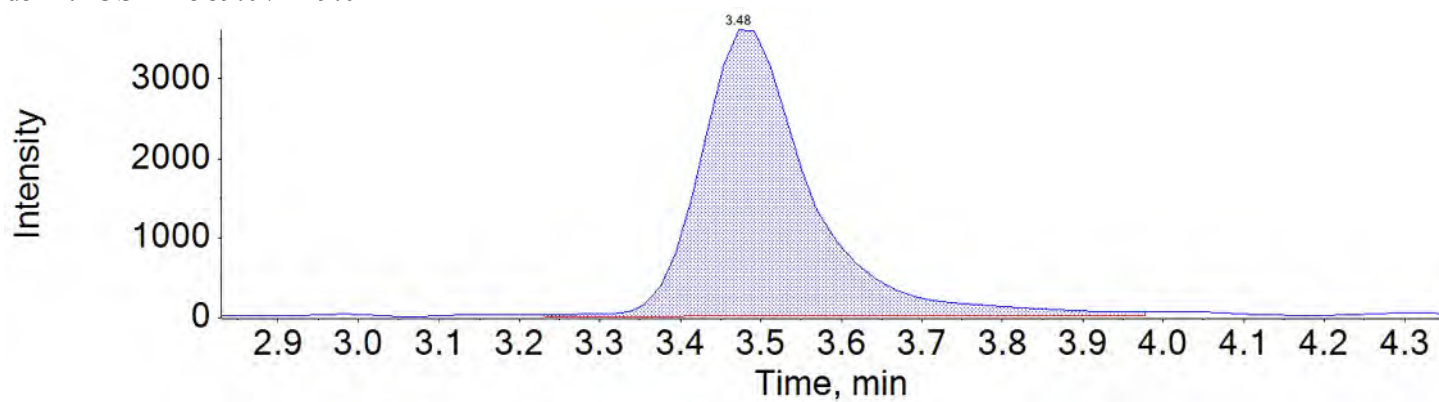


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



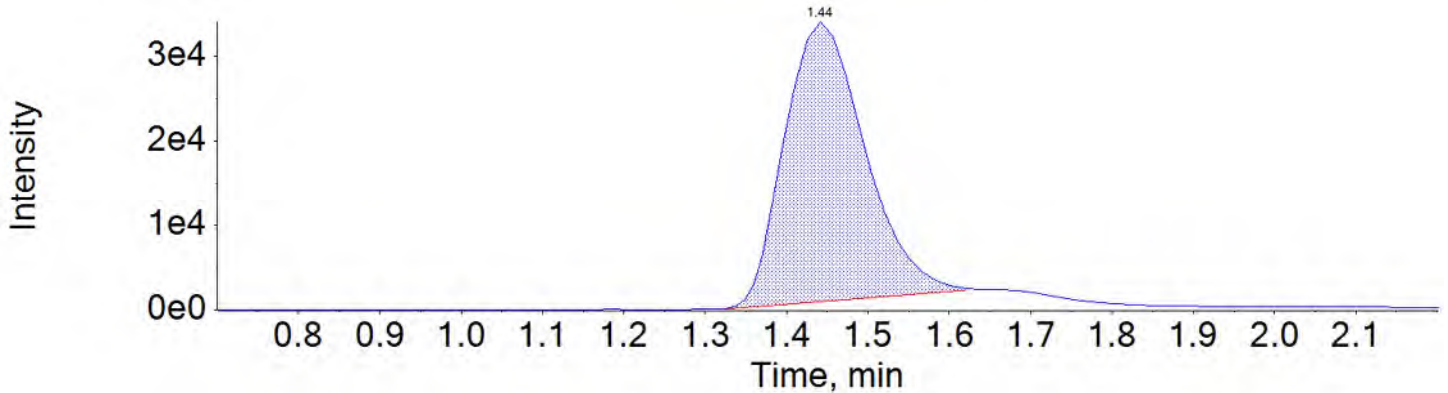
d5-EtFOSAA 589.0 / 419.0



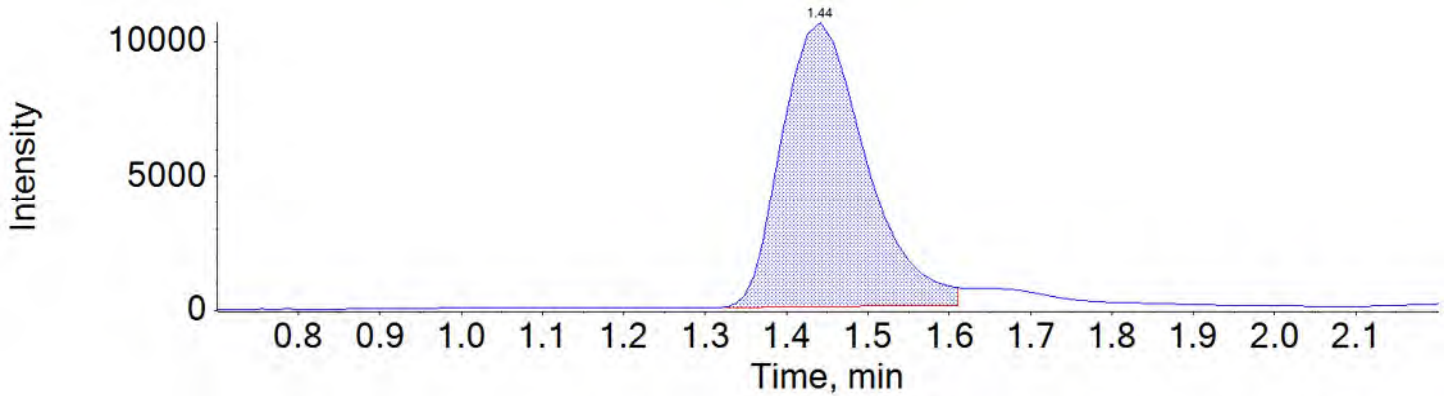
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

### Chromatograms

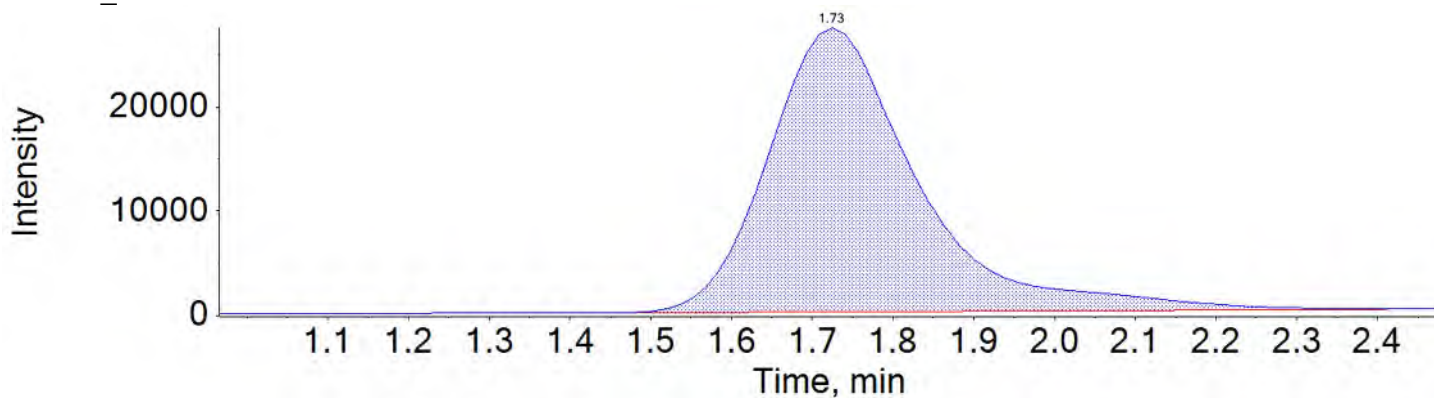
PFBS\_1 298.9 / 80.0



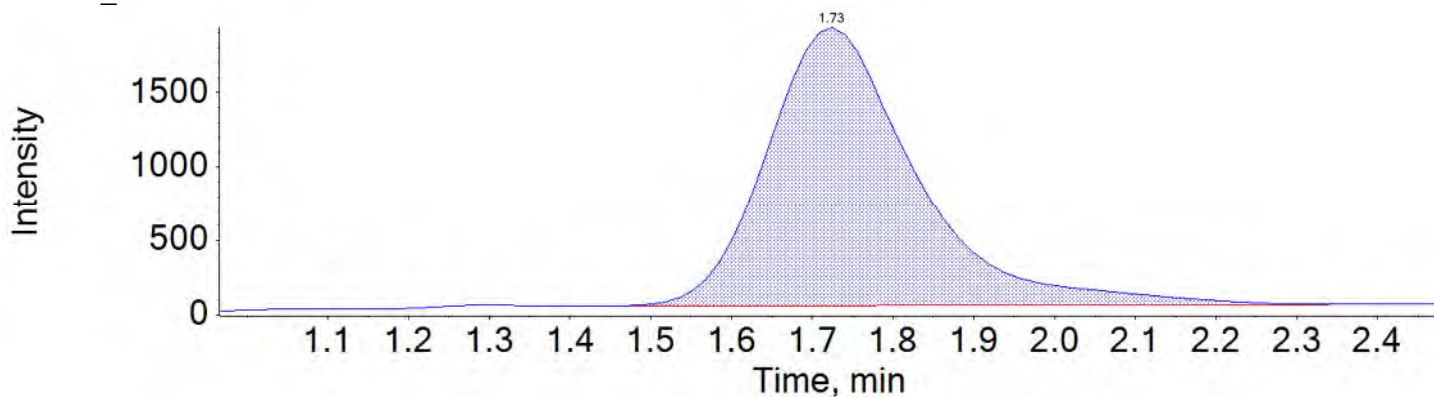
PFBS\_2 298.9 / 99.0



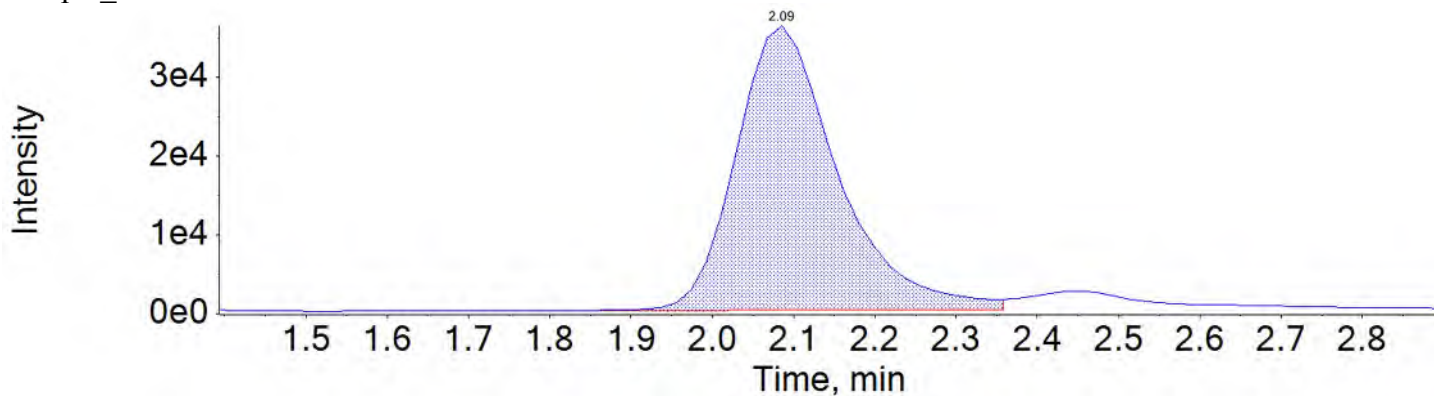
PFHxA\_1 313.0 / 269.0



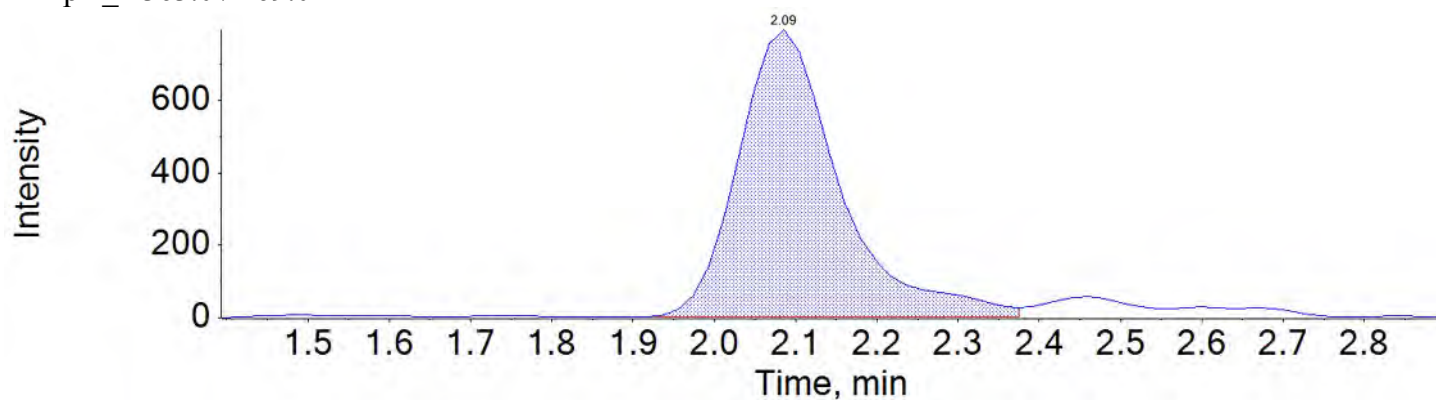
PFHxA\_2 313.0 / 119.0



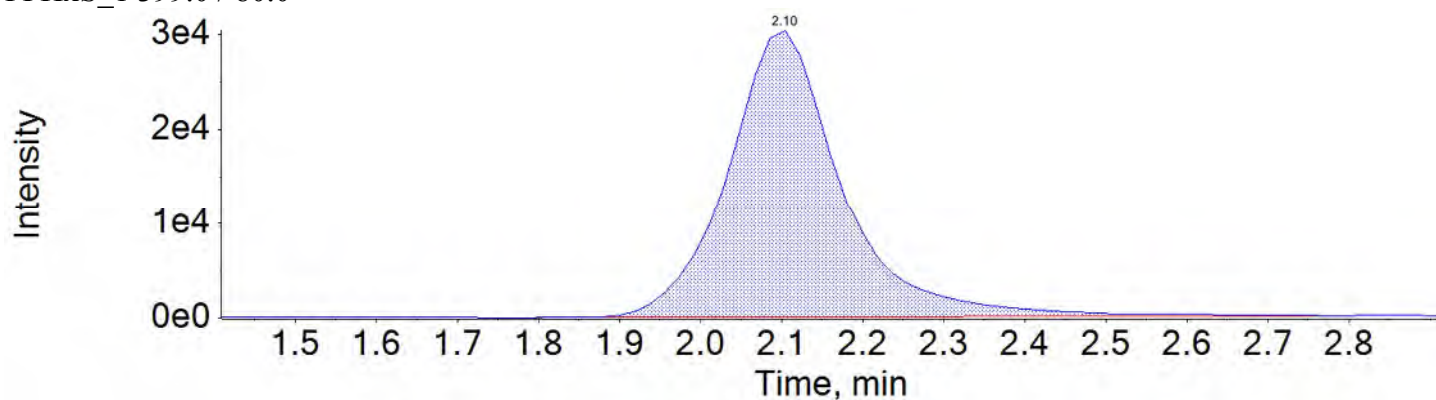
PFHpA\_1 363.0 / 319.0



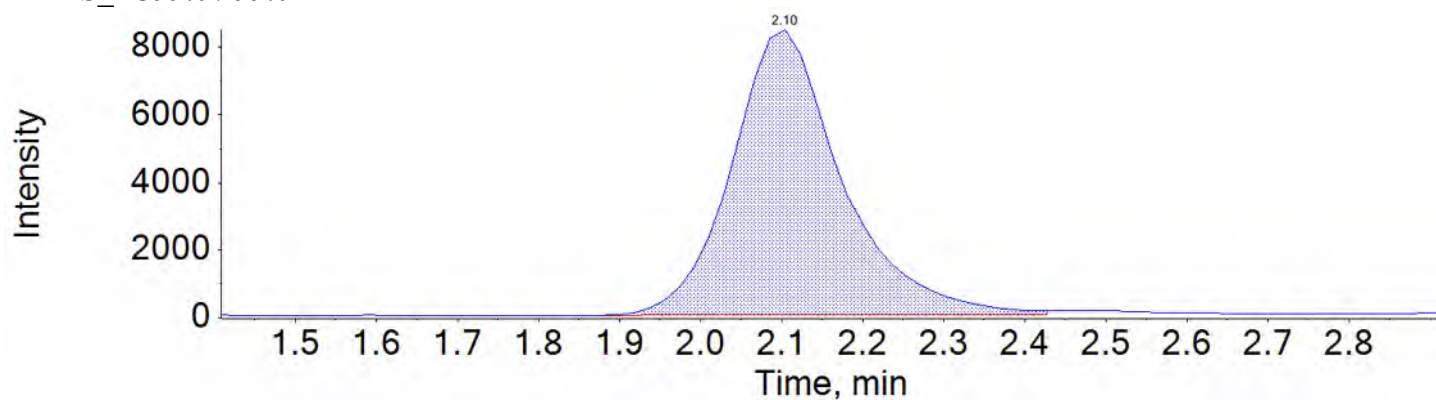
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

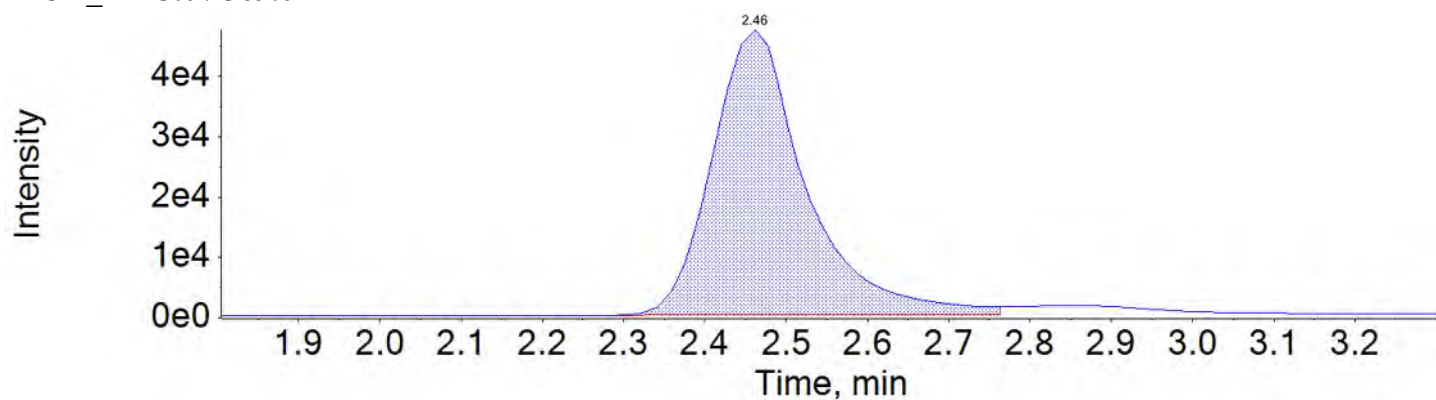


PFHxS\_2 399.0 / 99.0

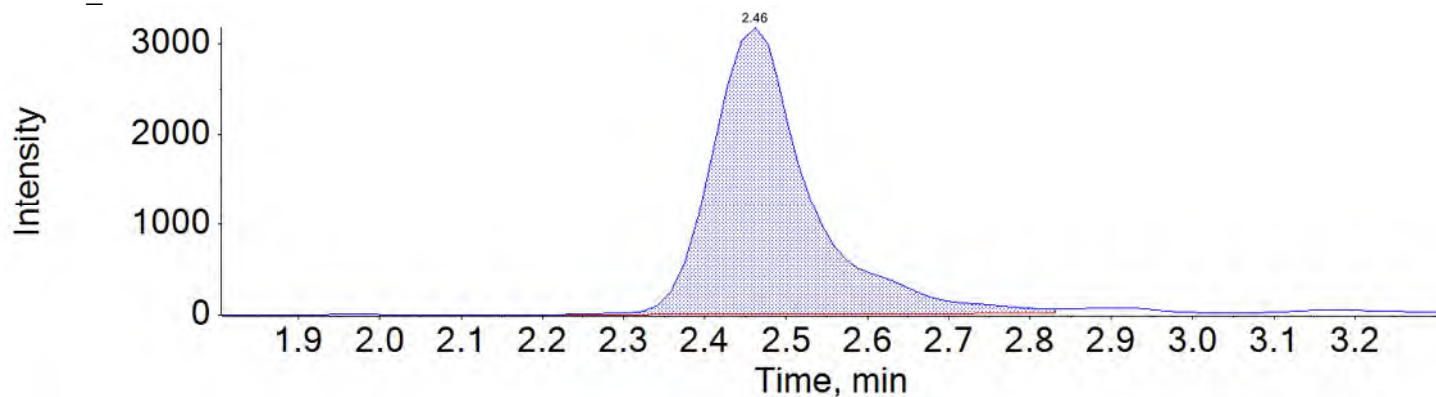




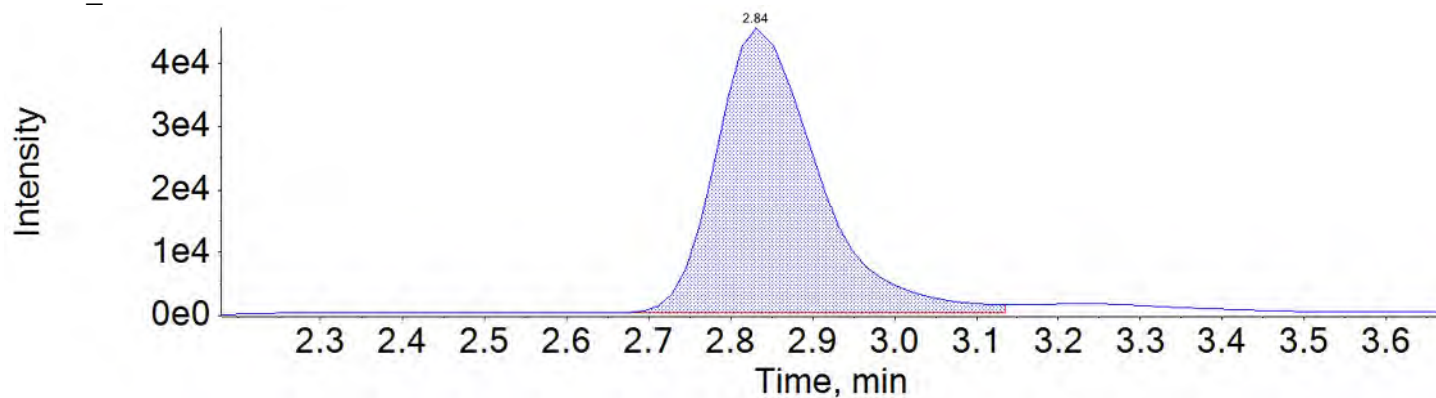
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

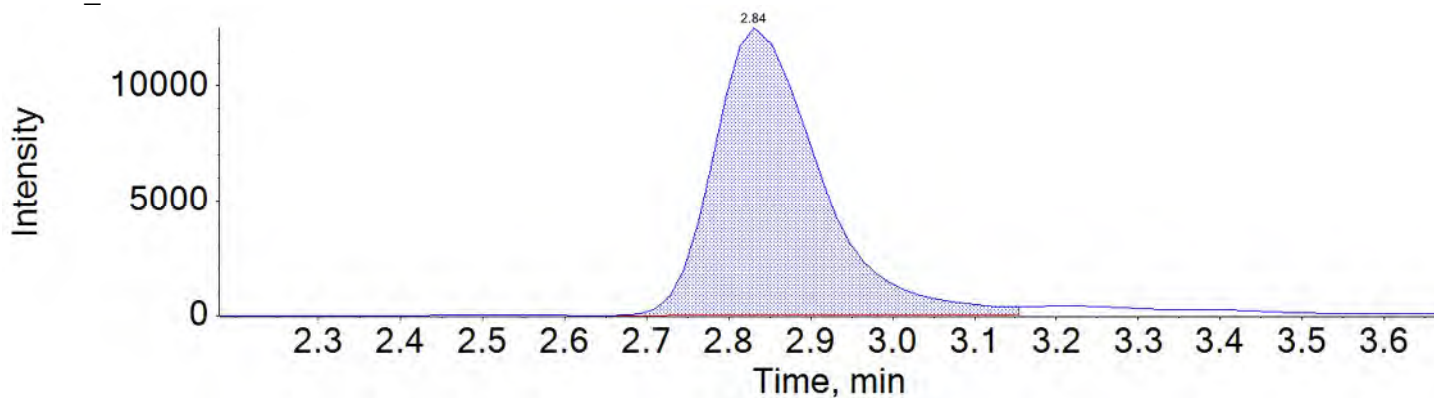


PFNA\_1 463.0 / 419.0

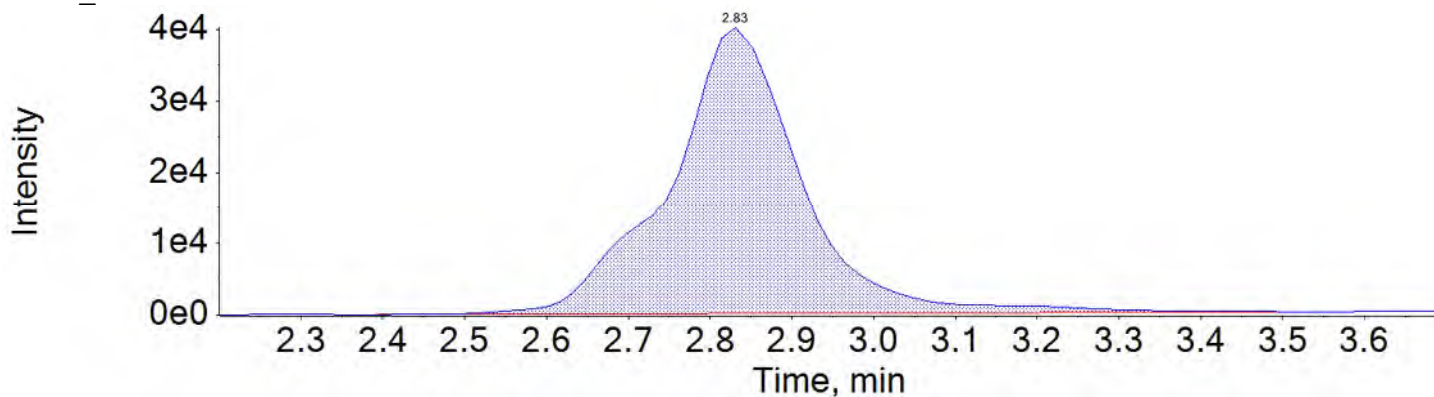




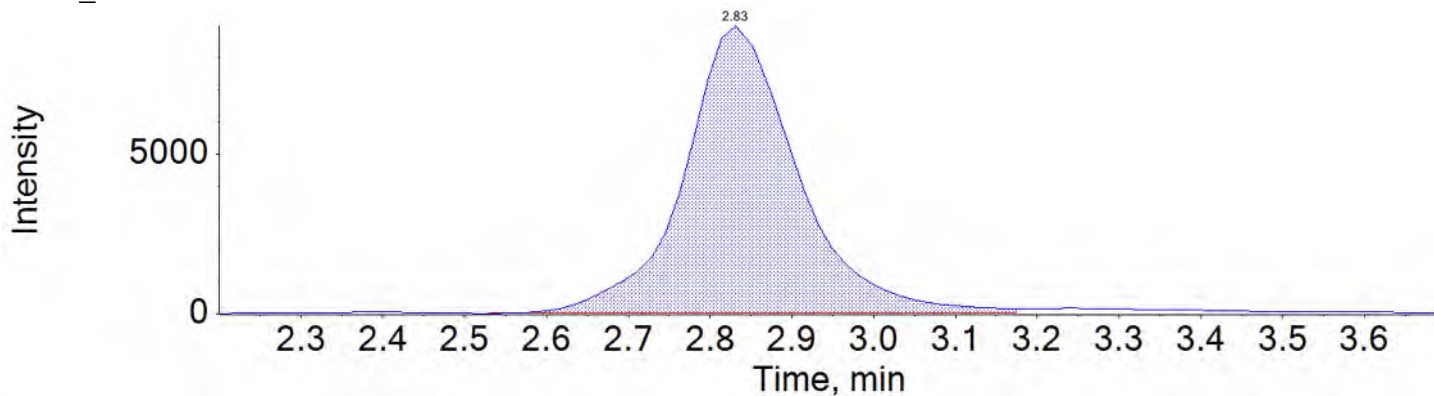
PFNA\_2 463.0 / 219.0



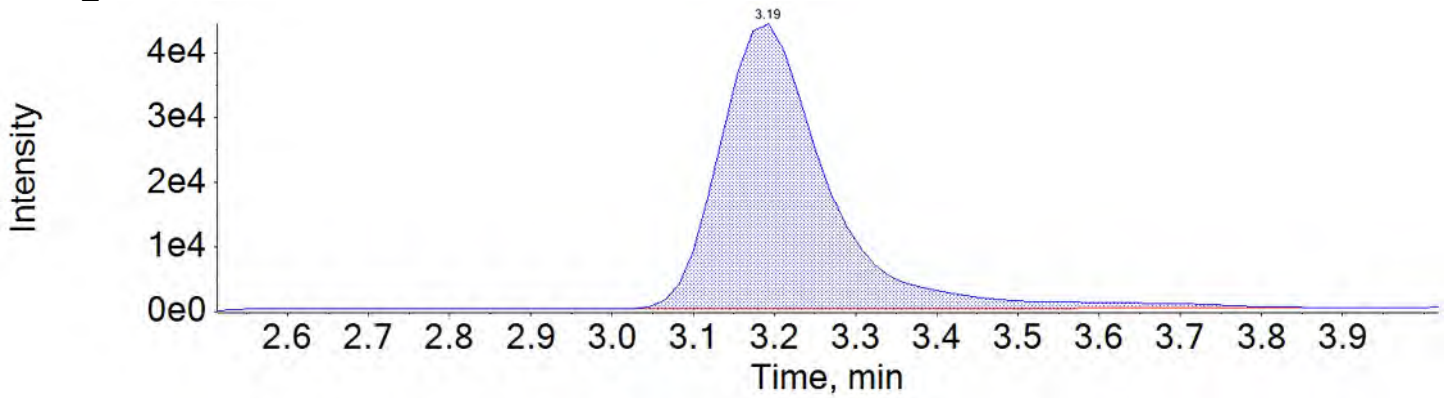
PFOS\_1 499.0 / 80.0



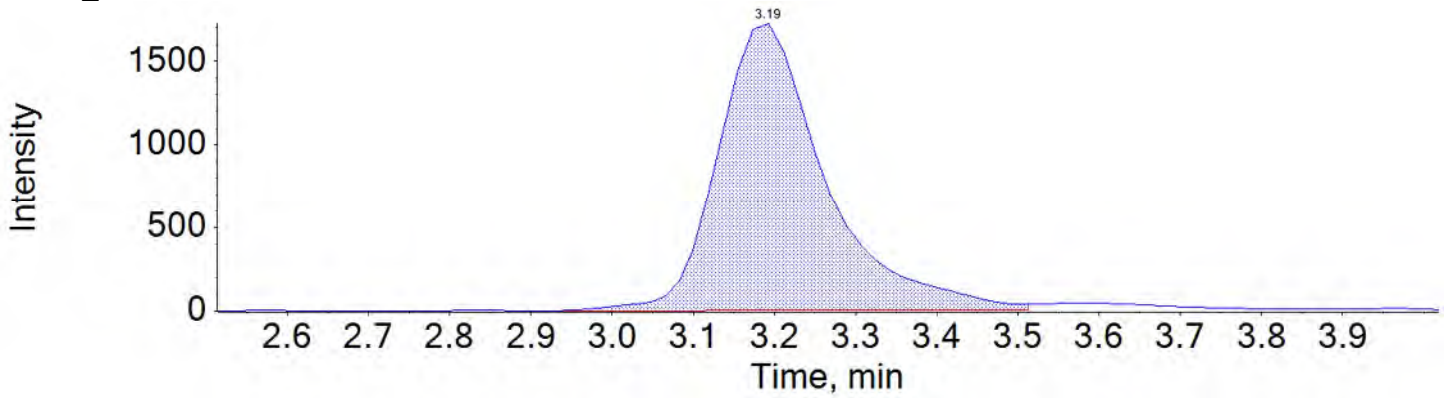
PFOS\_2 499.0 / 99.0



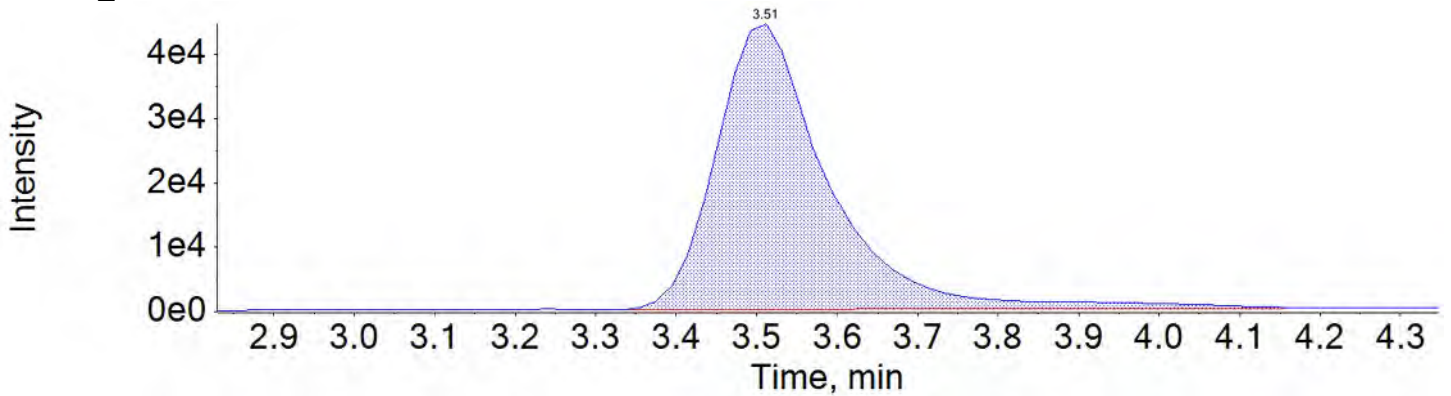
PFDA\_1 513.0 / 469.0



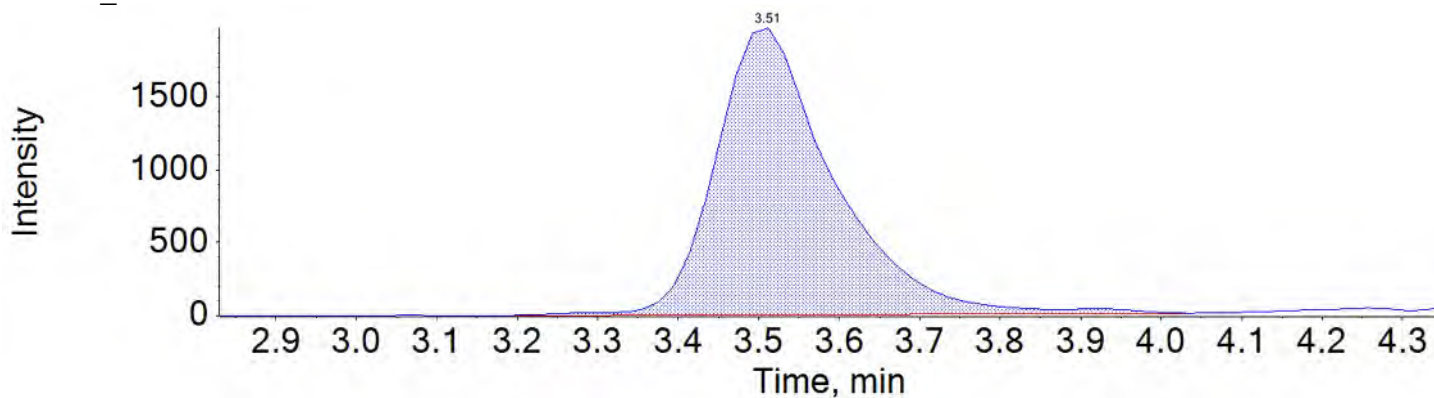
PFDA\_2 513.0 / 219.0



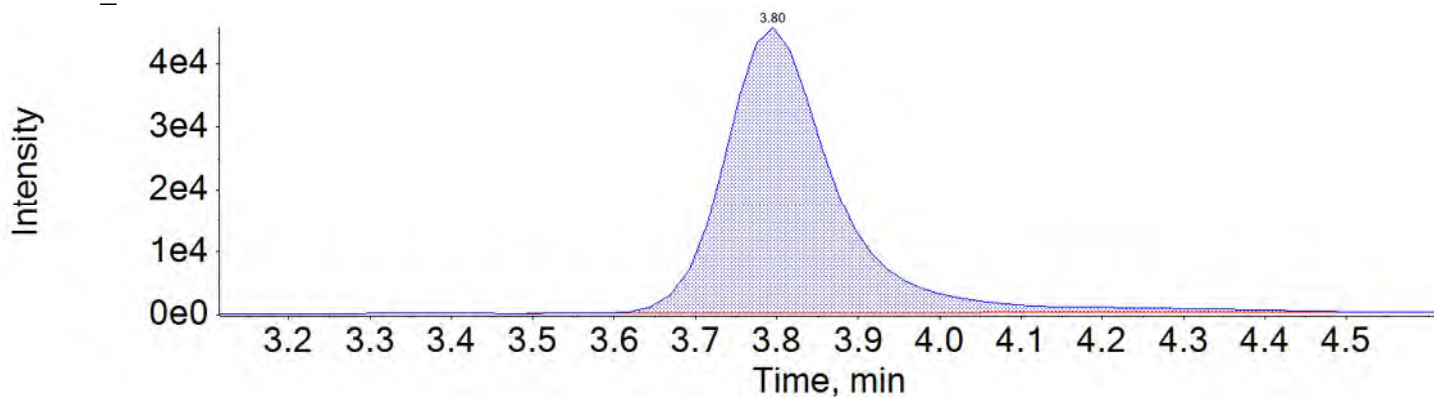
PFUnA\_1 563.0 / 519.0



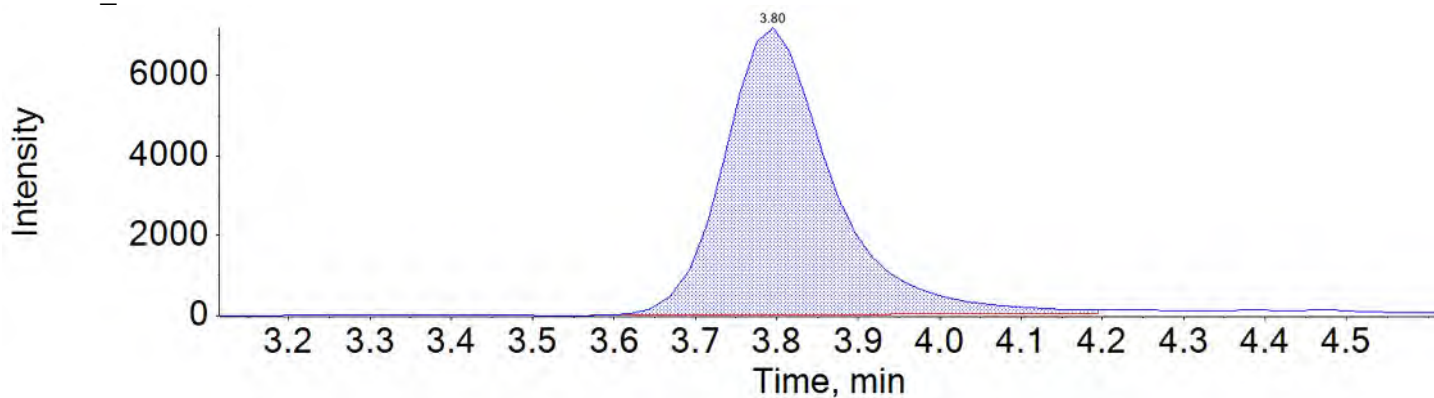
PUnA\_2 563.0 / 269.0



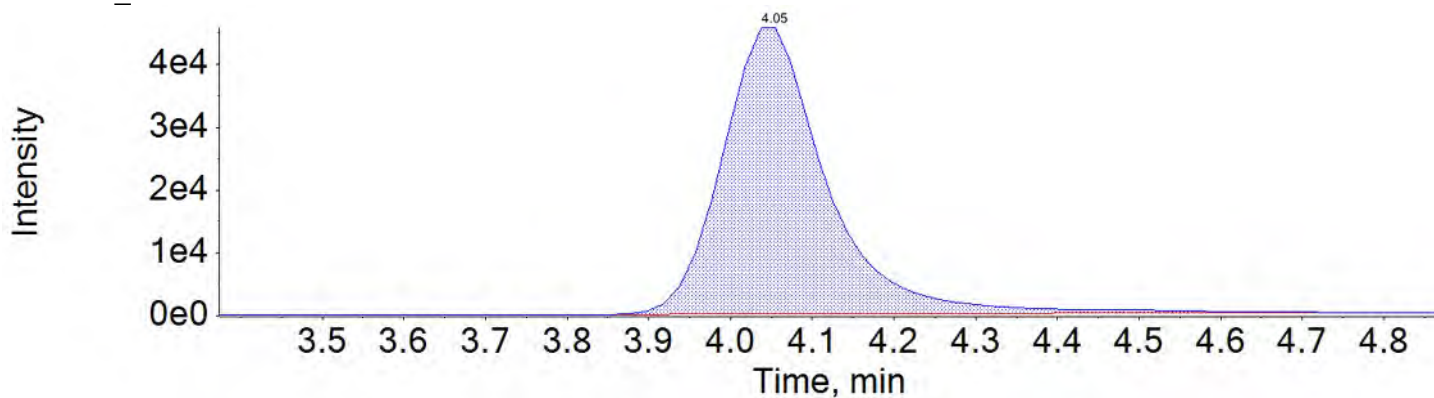
PDoA\_1 613.0 / 569.0



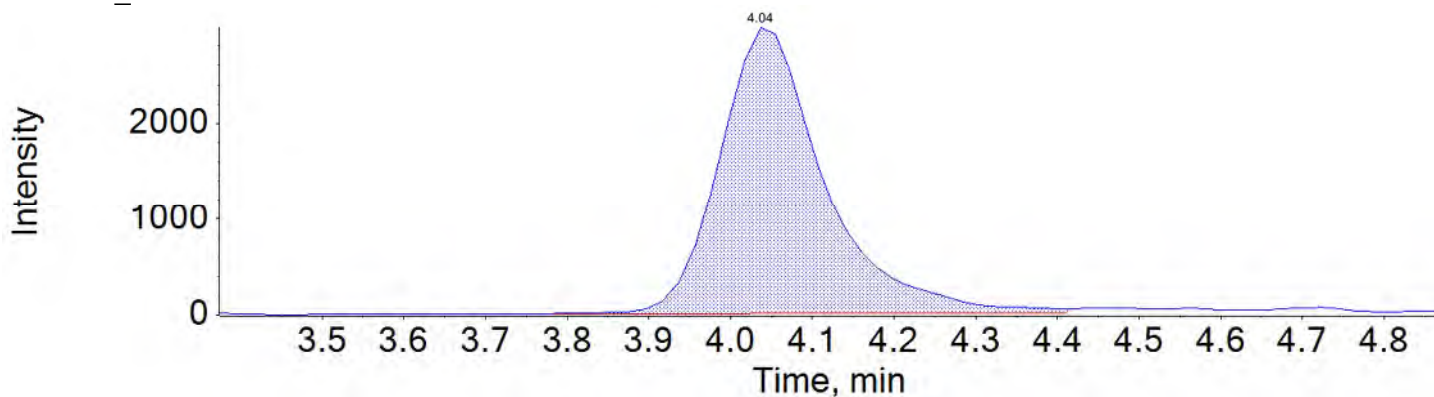
PDoA\_2 613.0 / 319.0



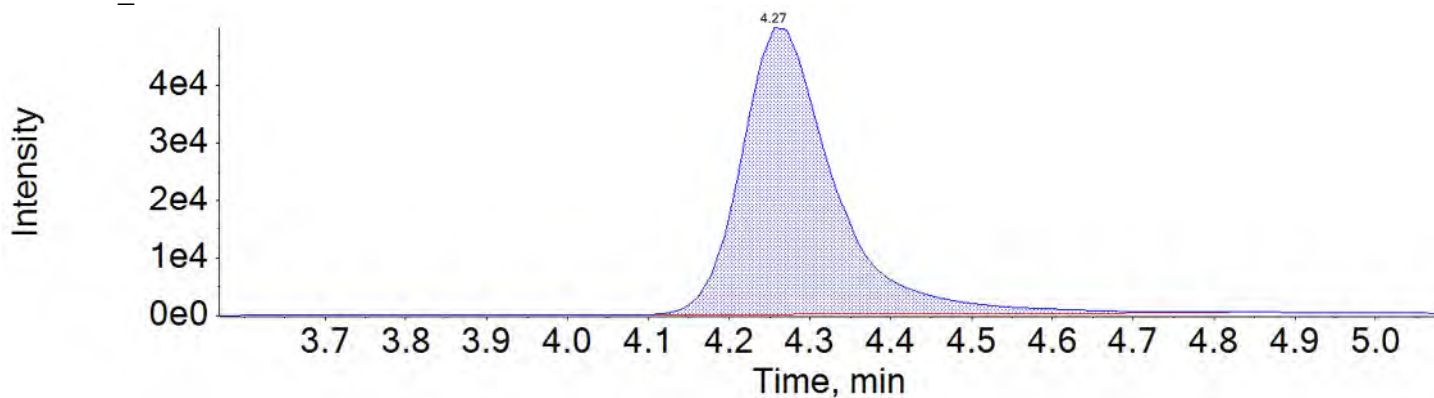
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

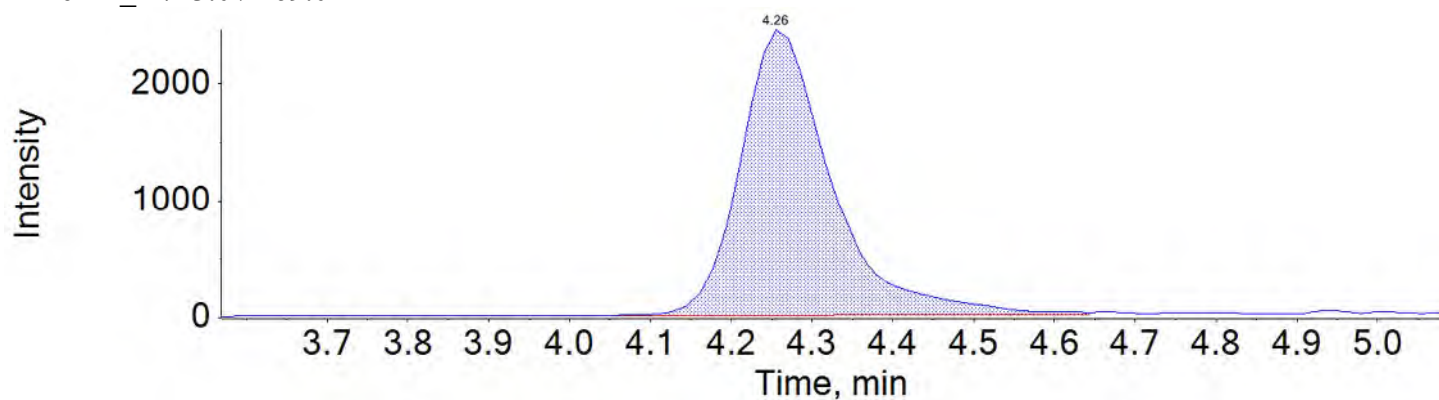


PFTTeDA\_1 713.0 / 669.0

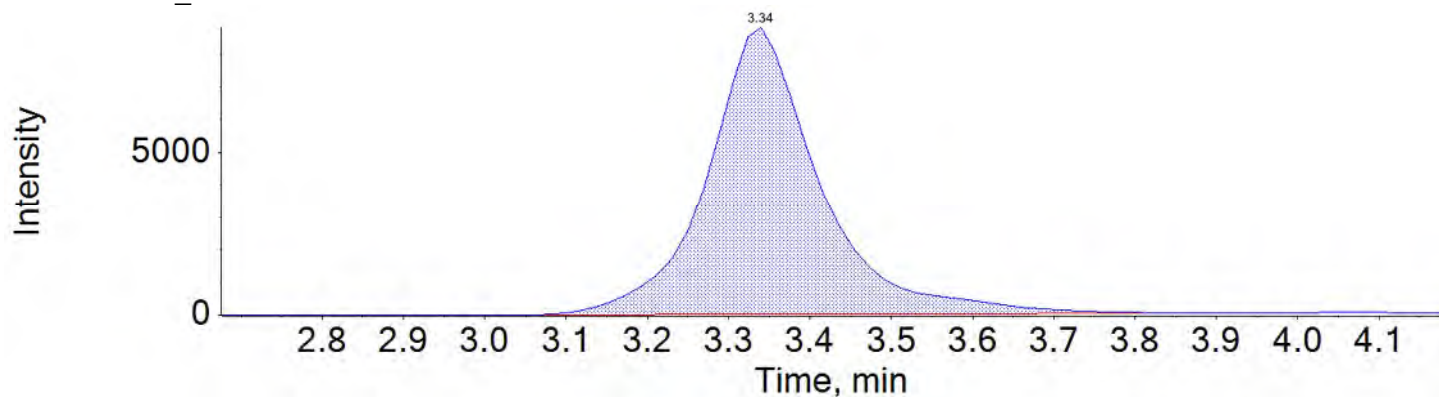




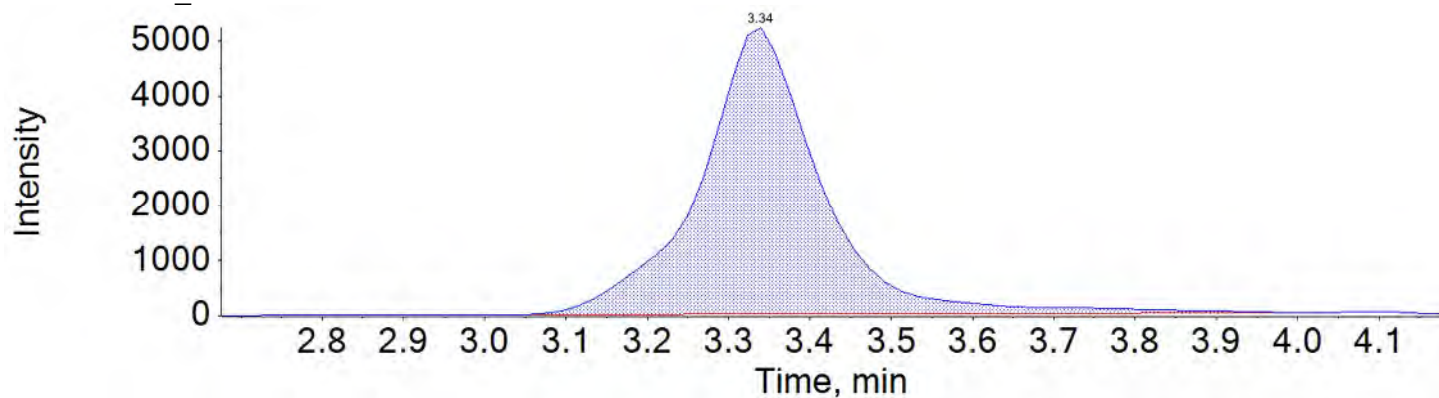
PFTeDA\_2 713.0 / 169.0



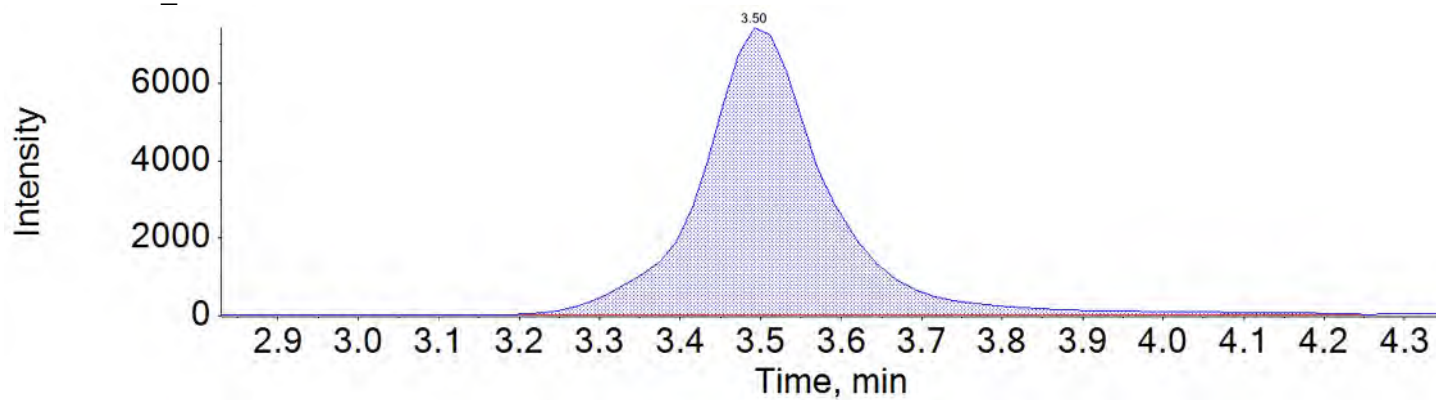
NMeFOSAA\_1 570.0 / 419.0



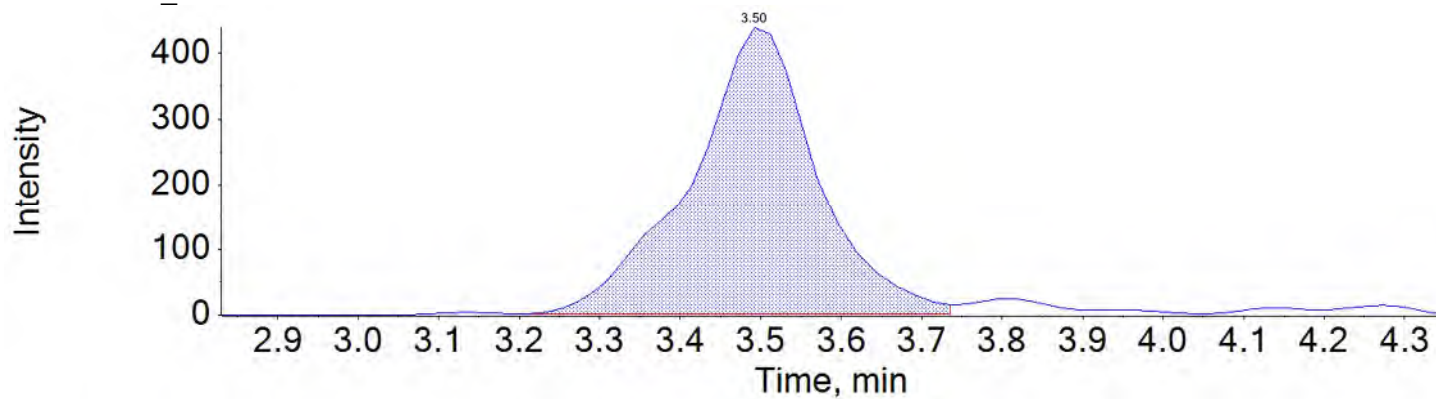
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



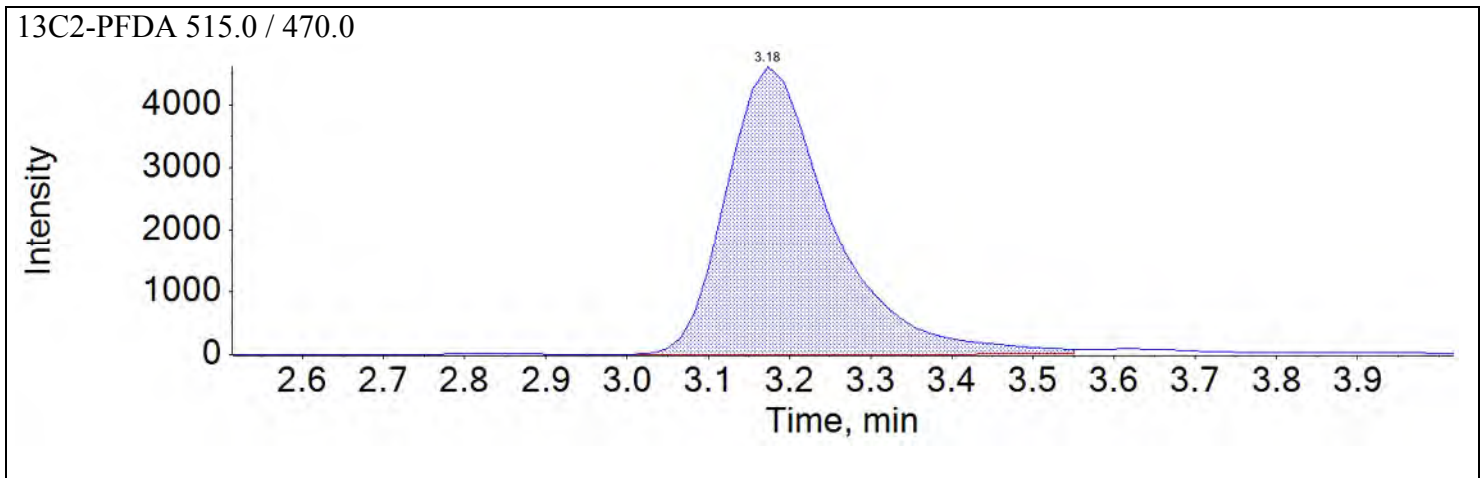
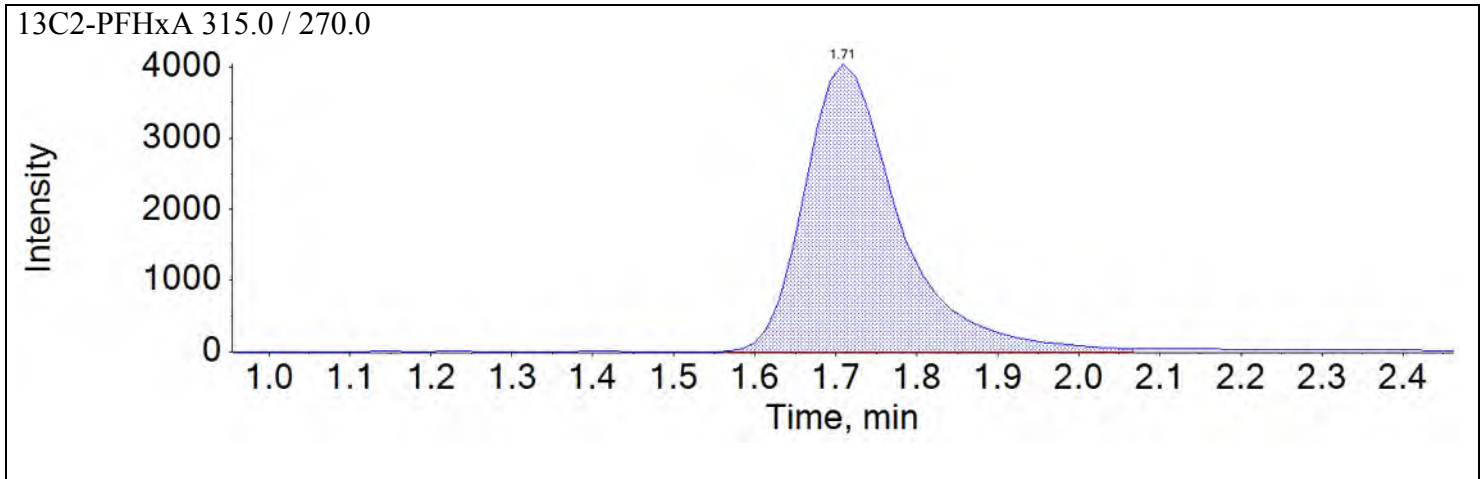
NEtFOSAA\_2 584.0 / 483.0



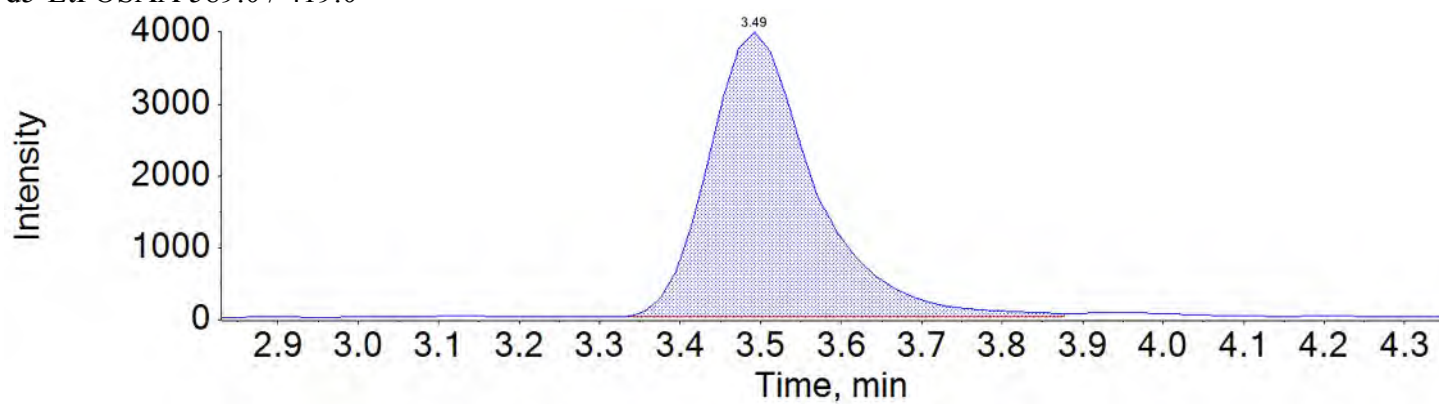


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



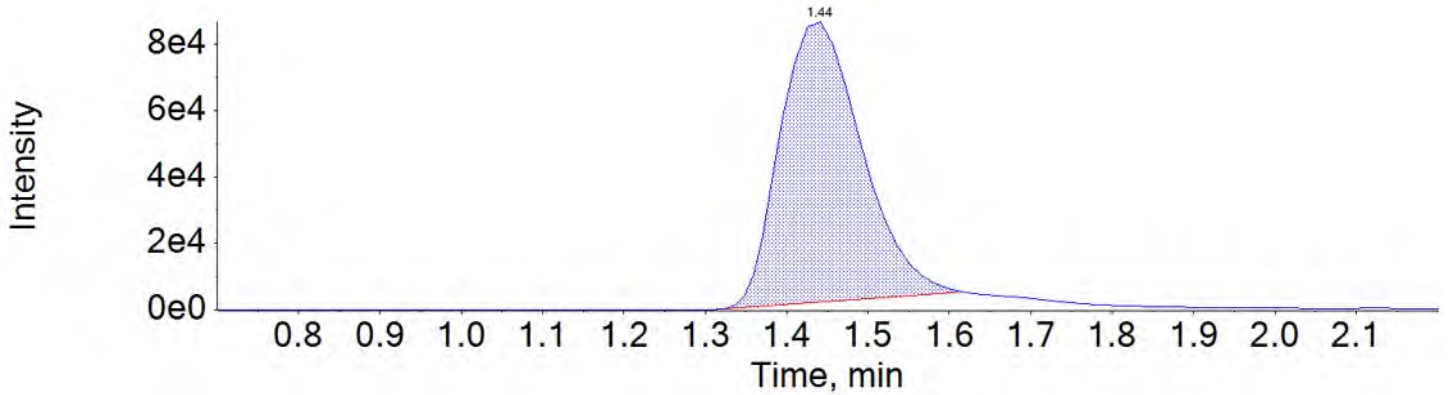
d5-EtFOSAA 589.0 / 419.0



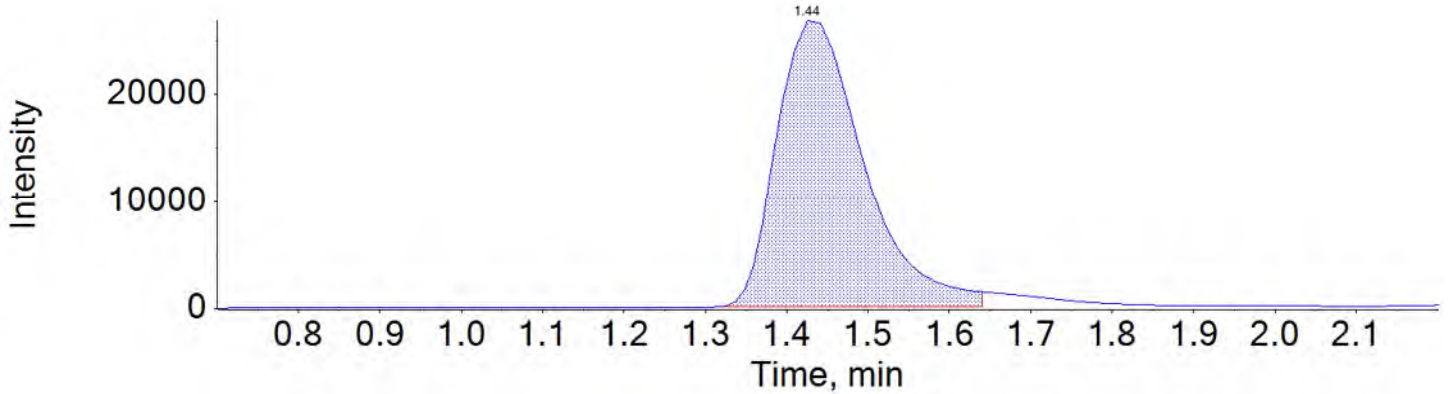
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

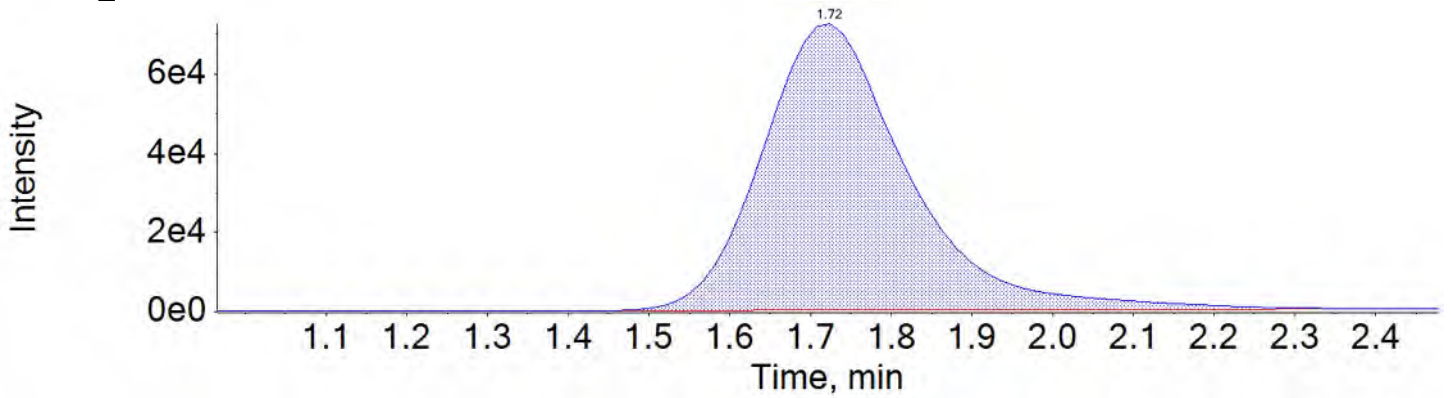
PFBS\_1 298.9 / 80.0



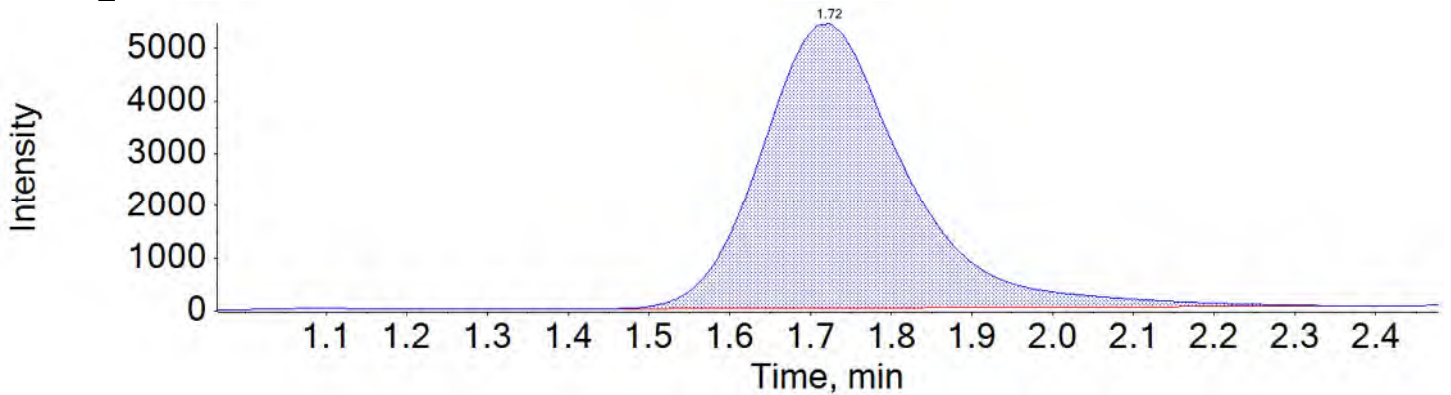
PFBS\_2 298.9 / 99.0



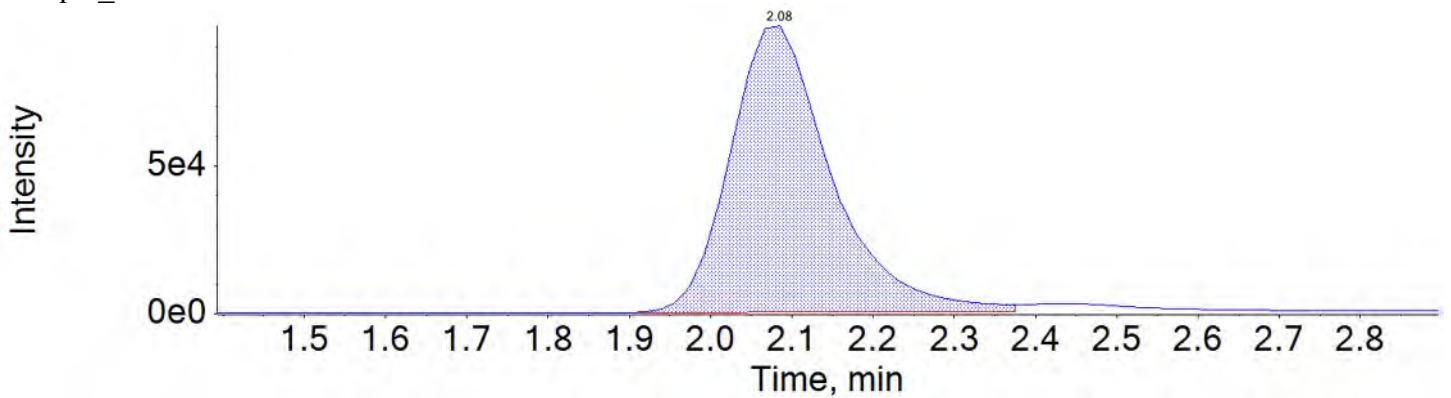
PFHxA\_1 313.0 / 269.0



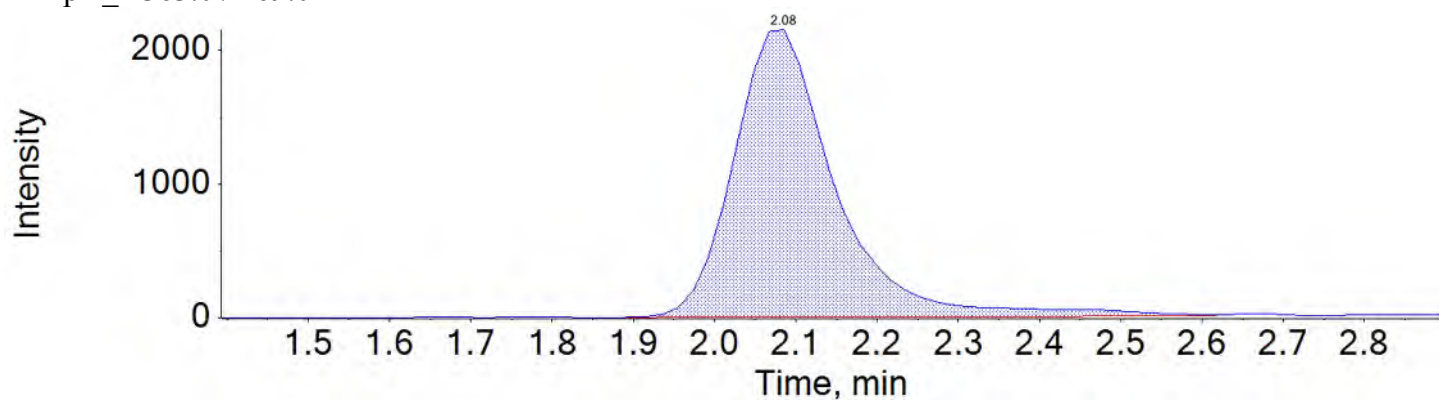
PFHxA\_2 313.0 / 119.0



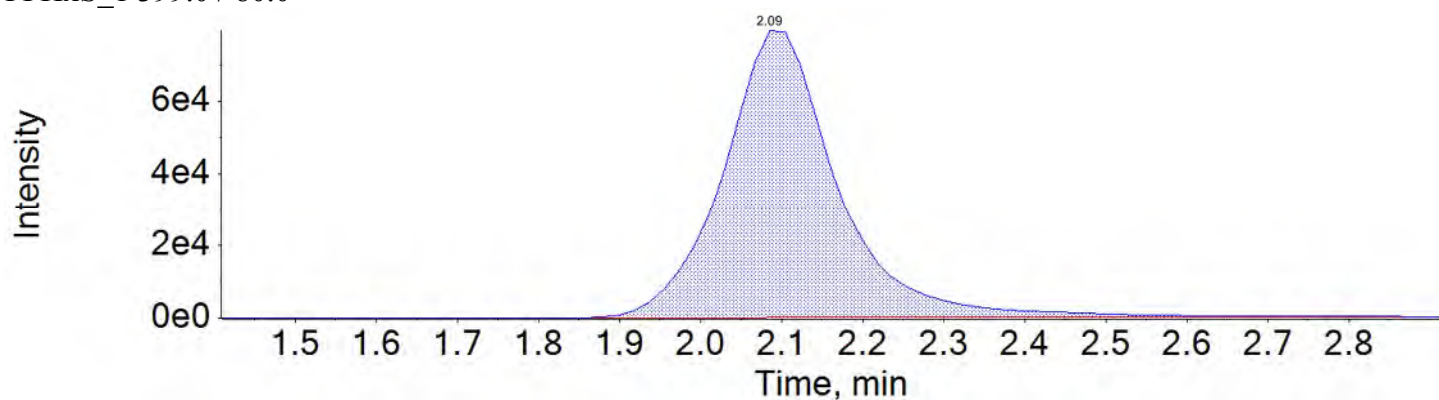
PFHpA\_1 363.0 / 319.0



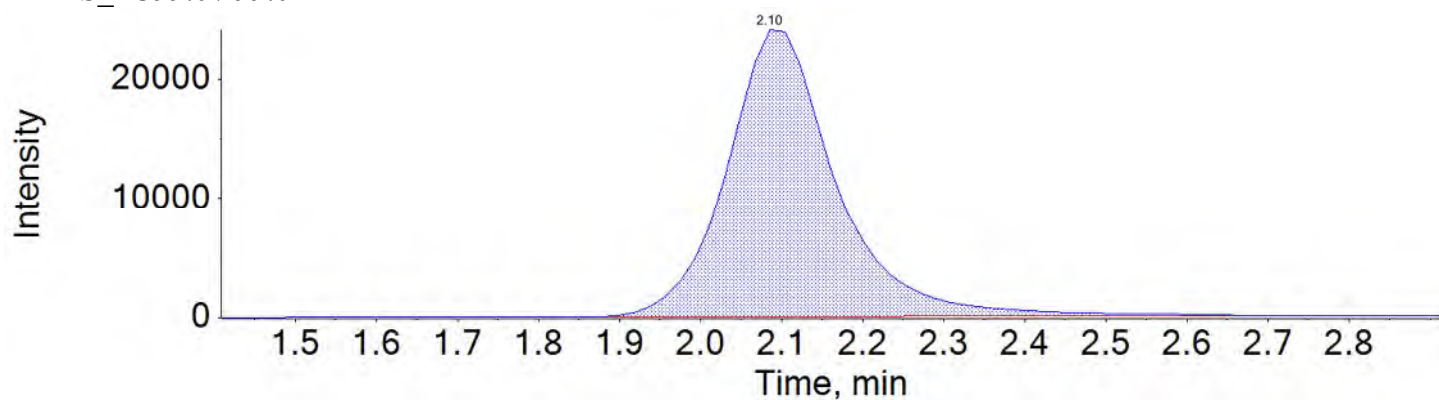
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

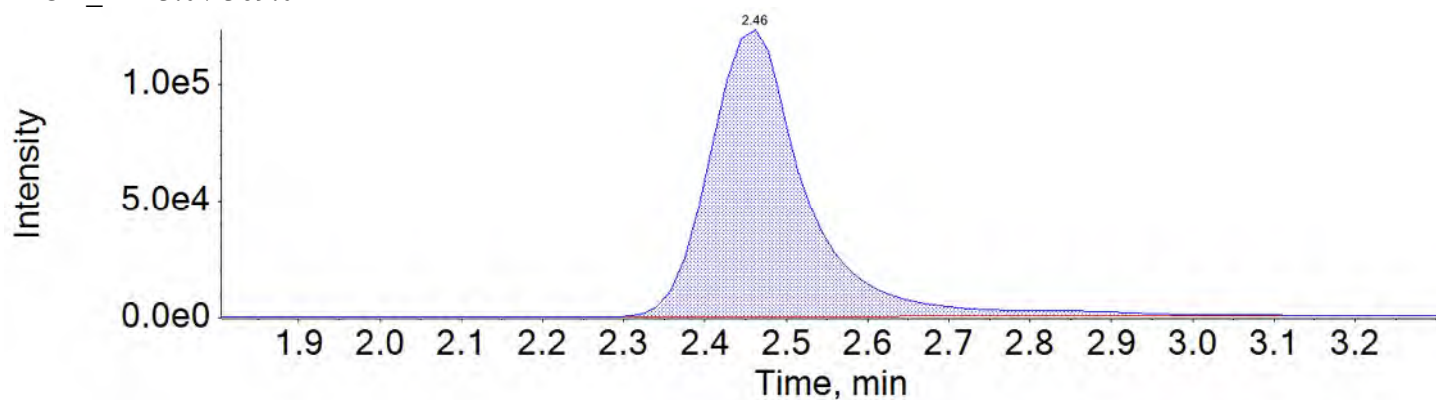


PFHxS\_2 399.0 / 99.0

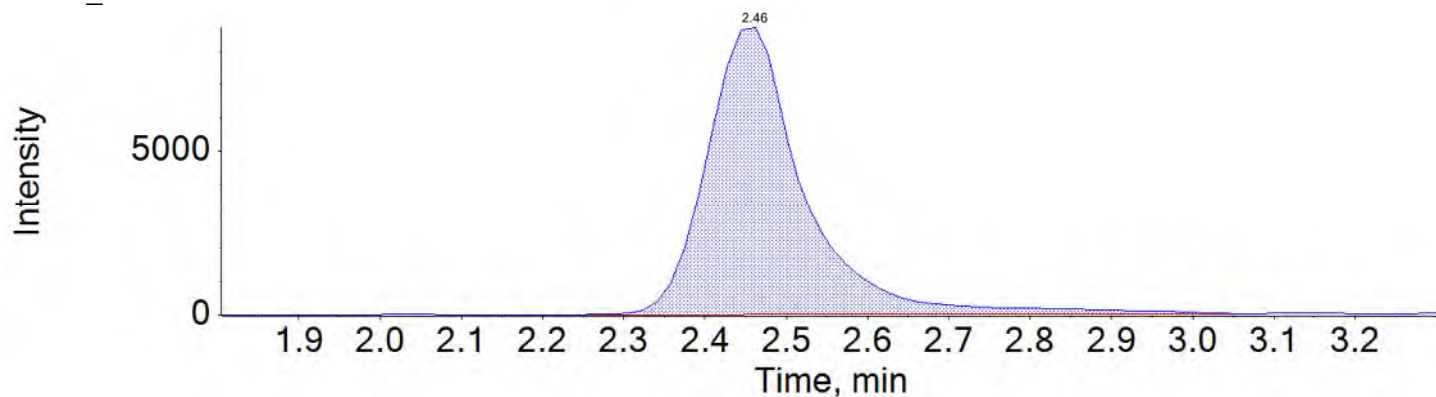




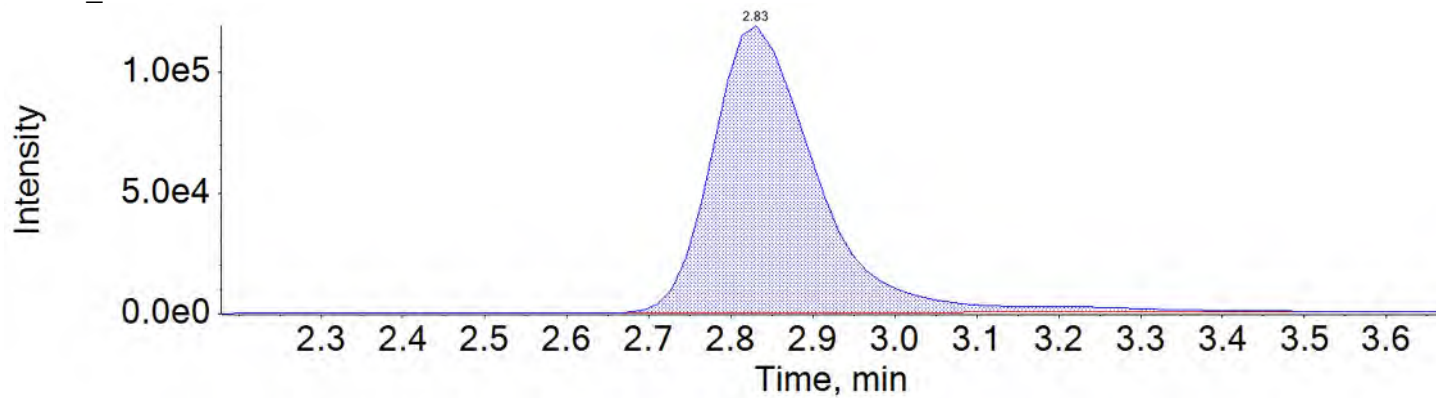
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

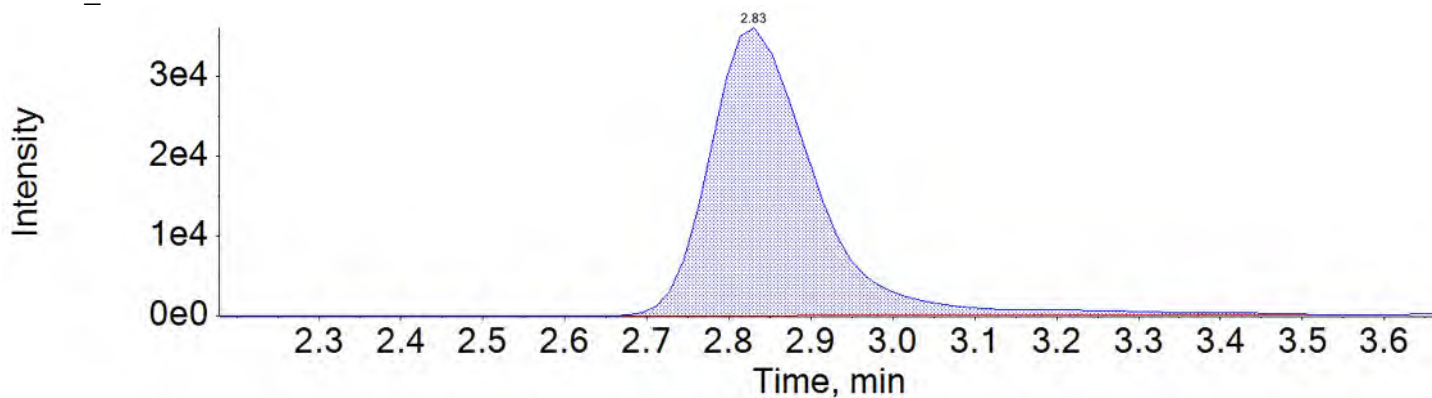


PFNA\_1 463.0 / 419.0

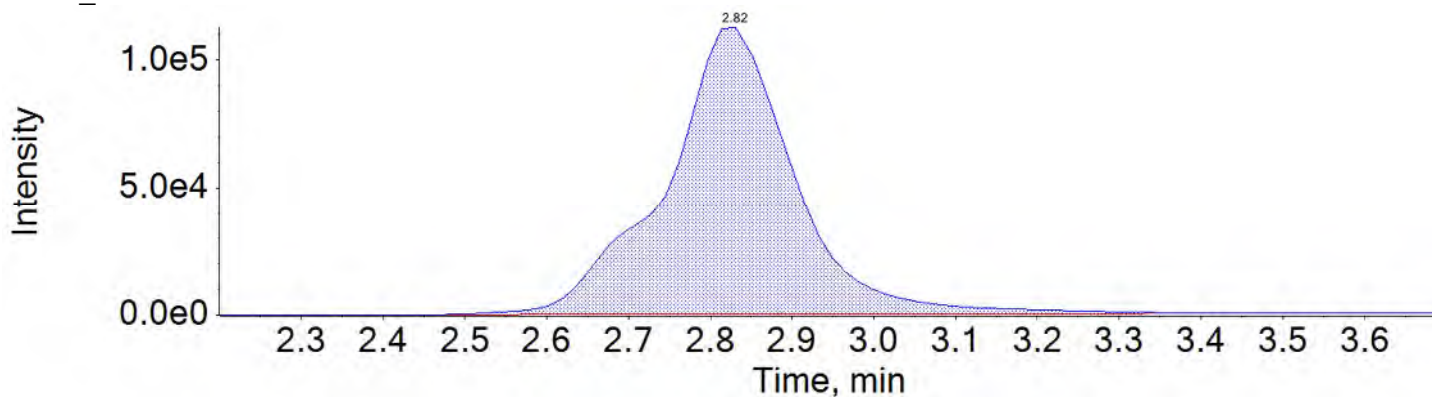




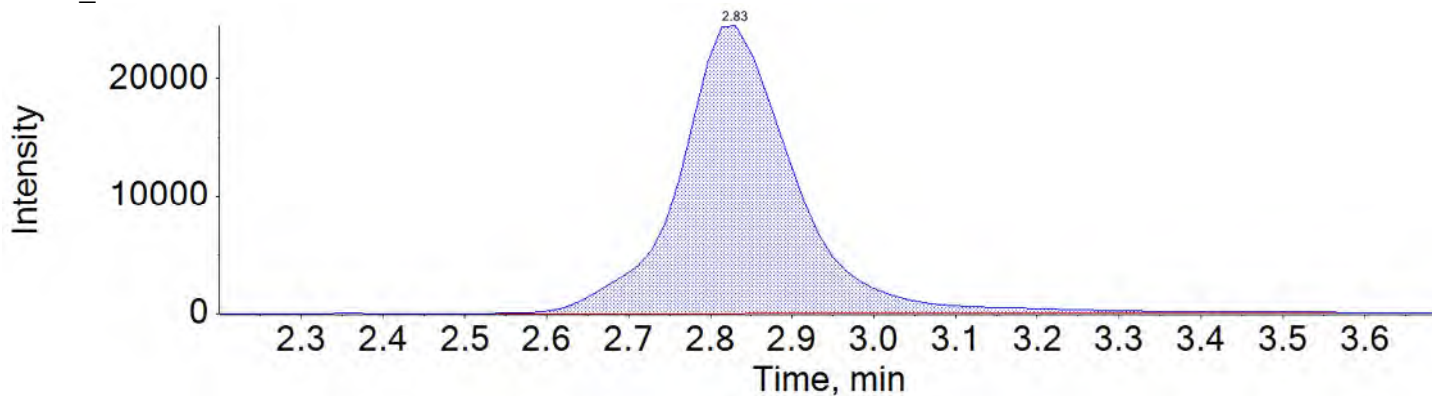
PFNA\_2 463.0 / 219.0



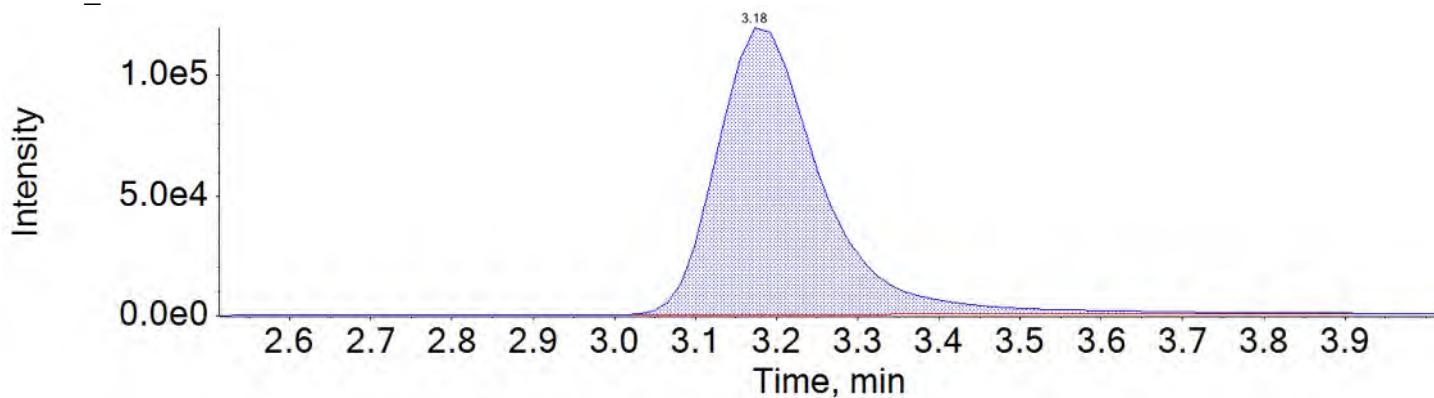
PFOS\_1 499.0 / 80.0



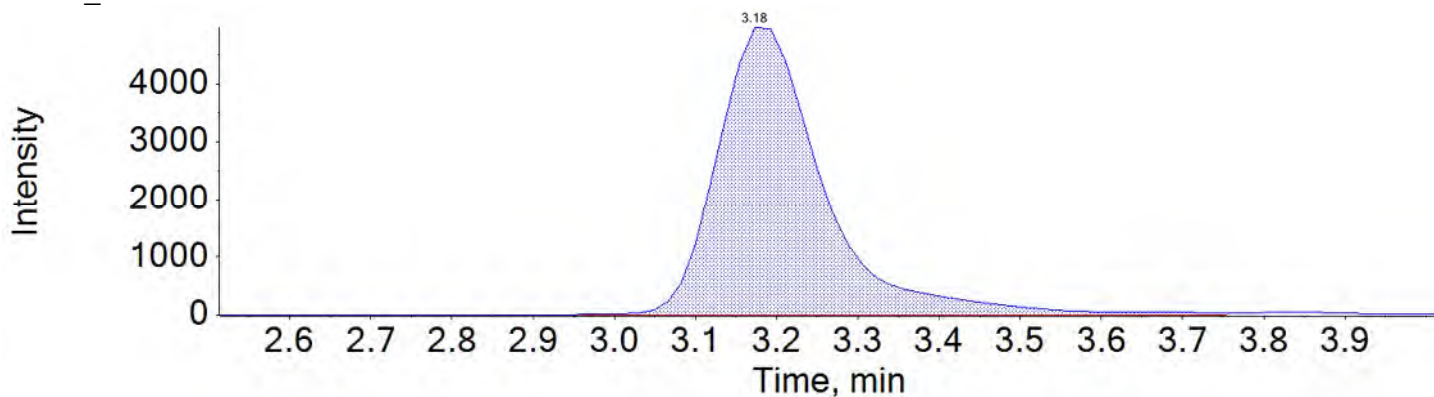
PFOS\_2 499.0 / 99.0



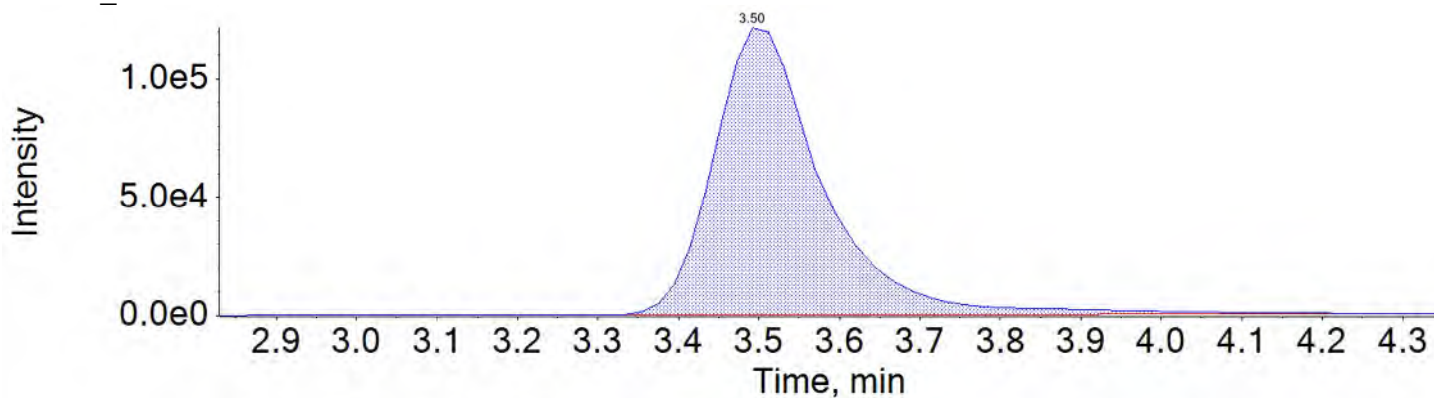
PFDA\_1 513.0 / 469.0



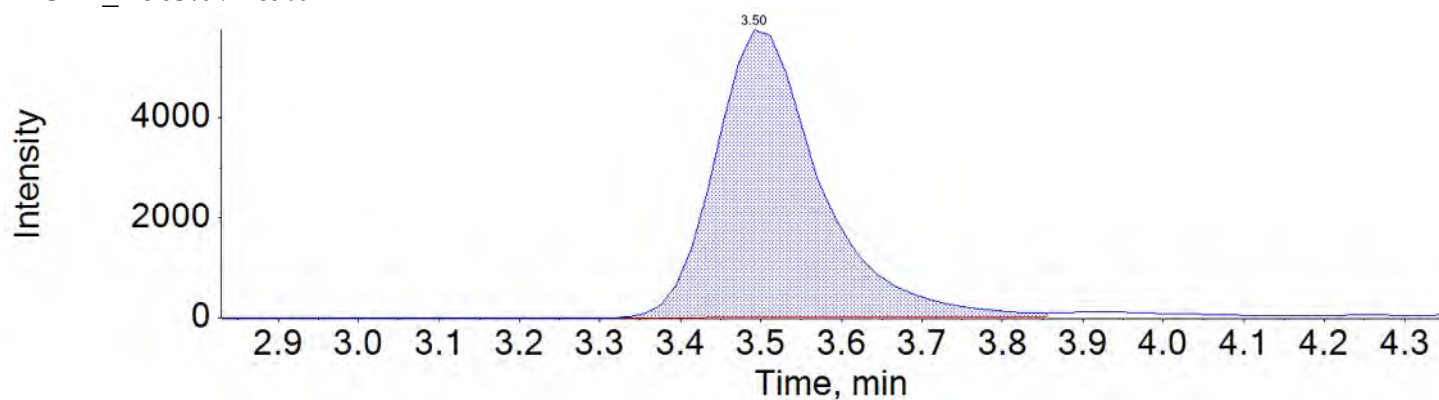
PFDA\_2 513.0 / 219.0



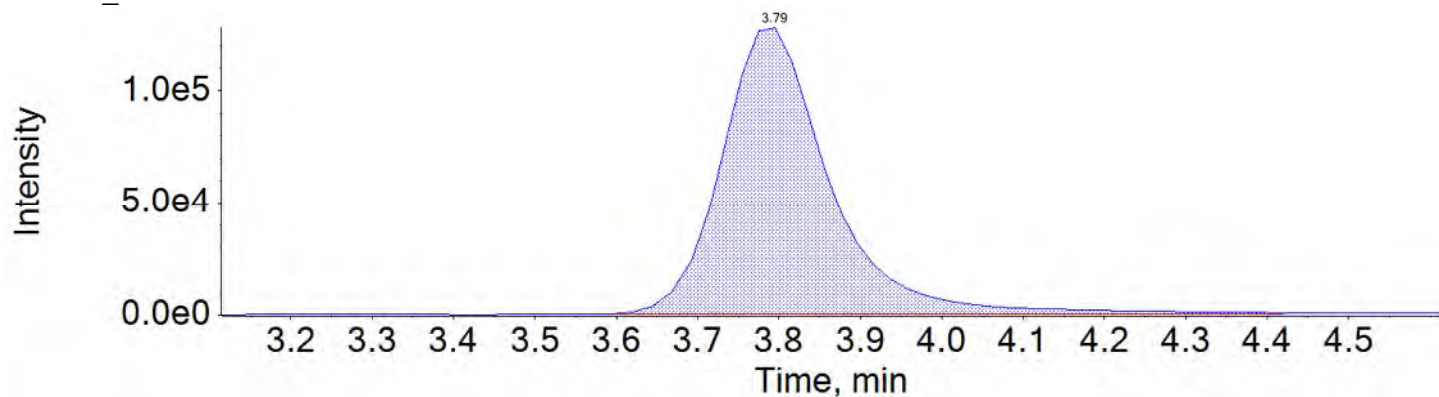
PFUnA\_1 563.0 / 519.0



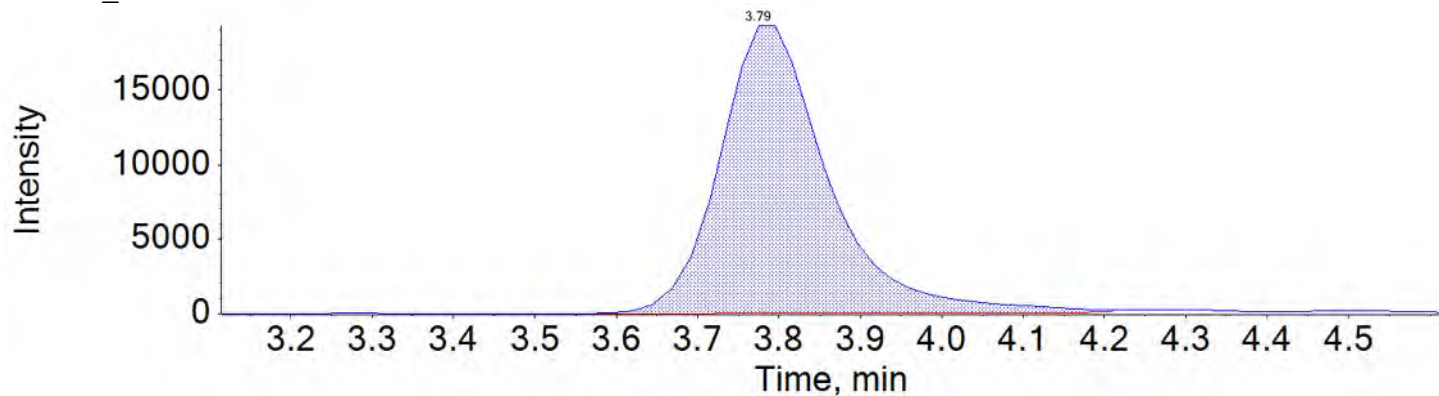
PUnA\_2 563.0 / 269.0



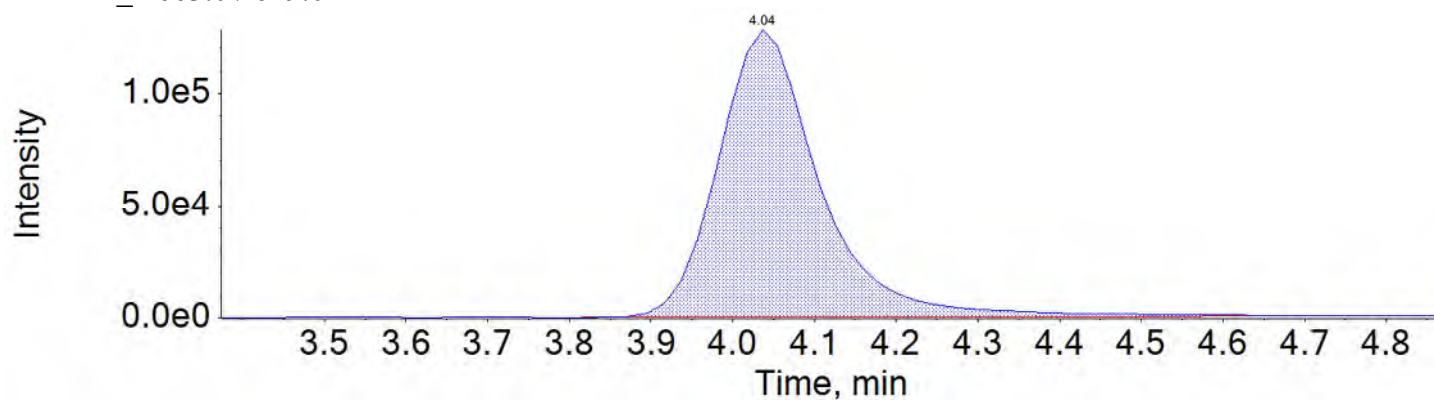
PDoA\_1 613.0 / 569.0



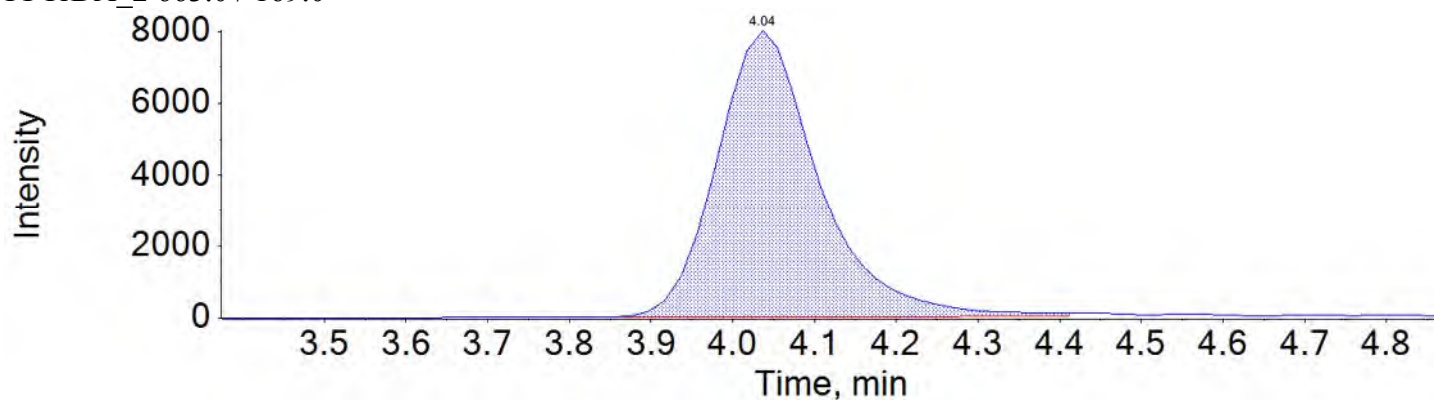
PDoA\_2 613.0 / 319.0



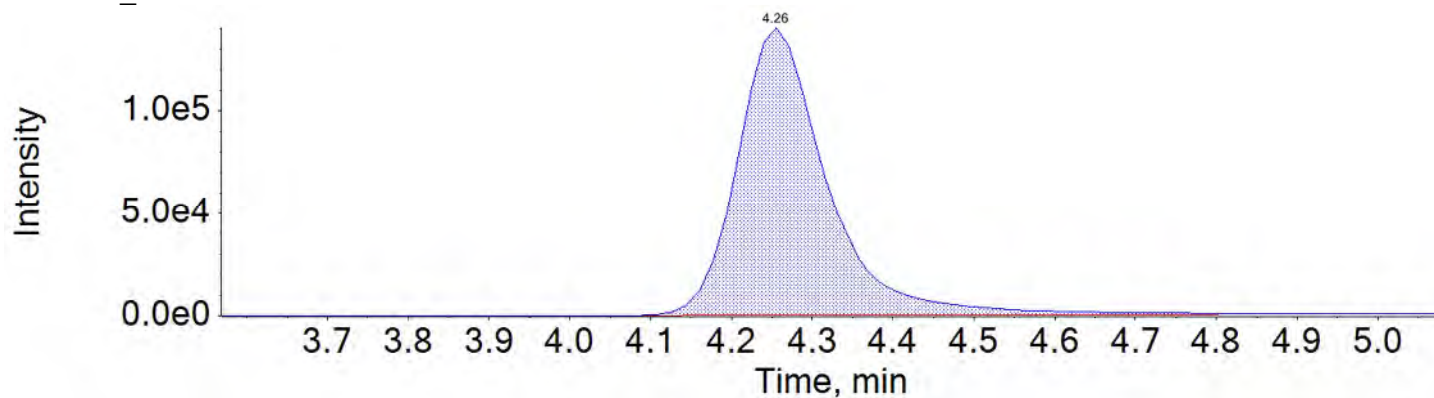
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

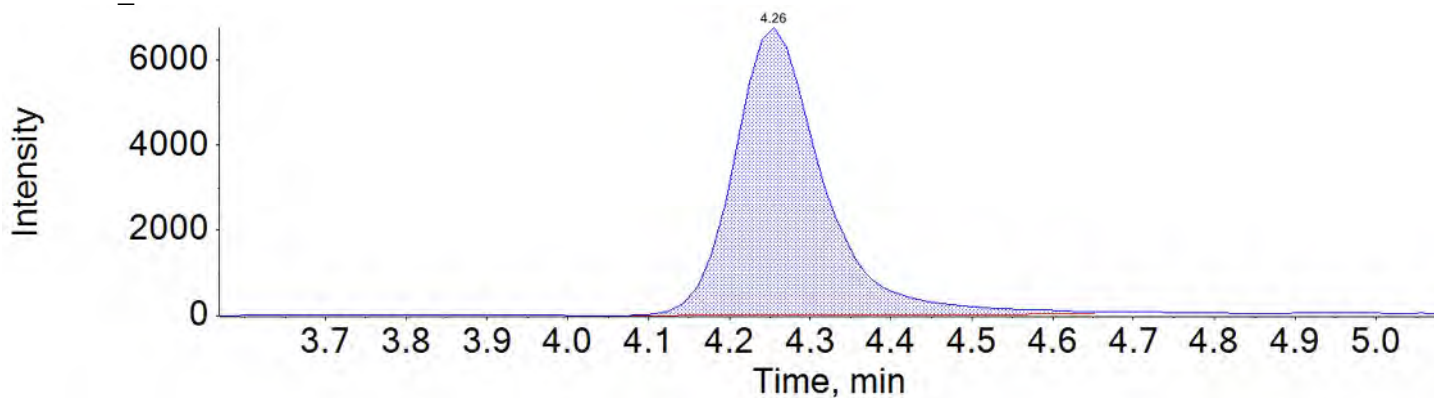


PFTTeDA\_1 713.0 / 669.0

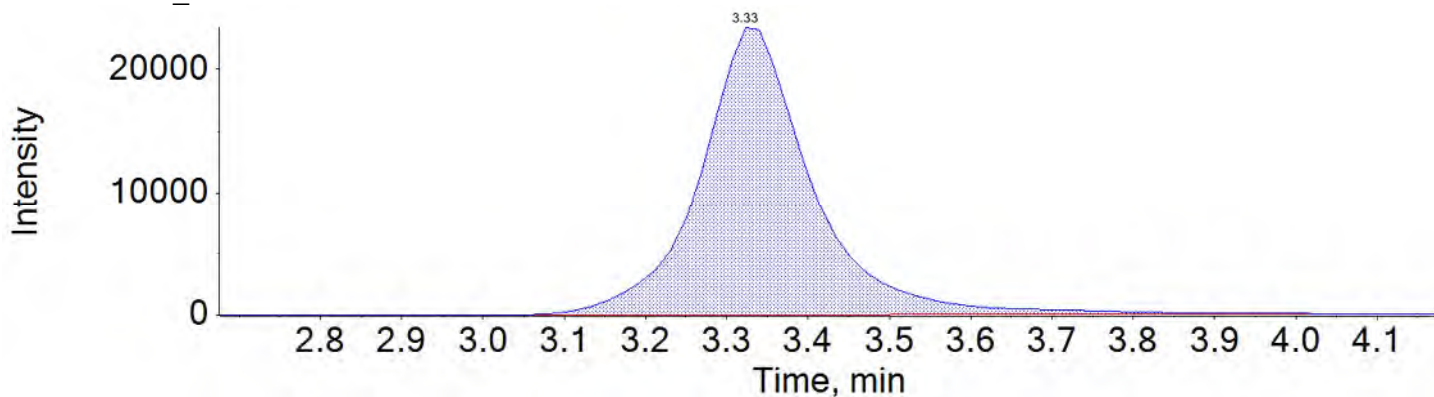




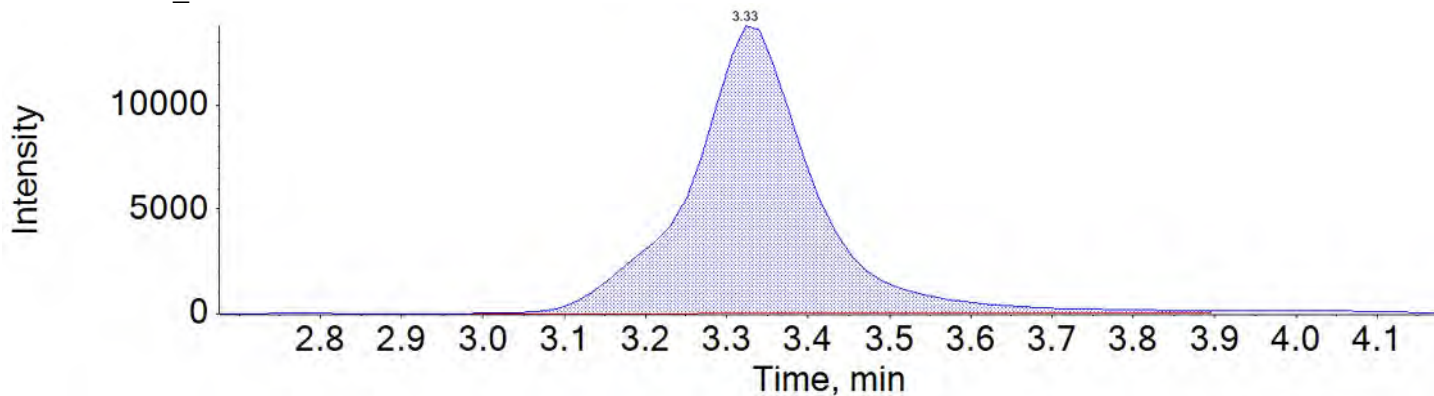
PFTeDA\_2 713.0 / 169.0



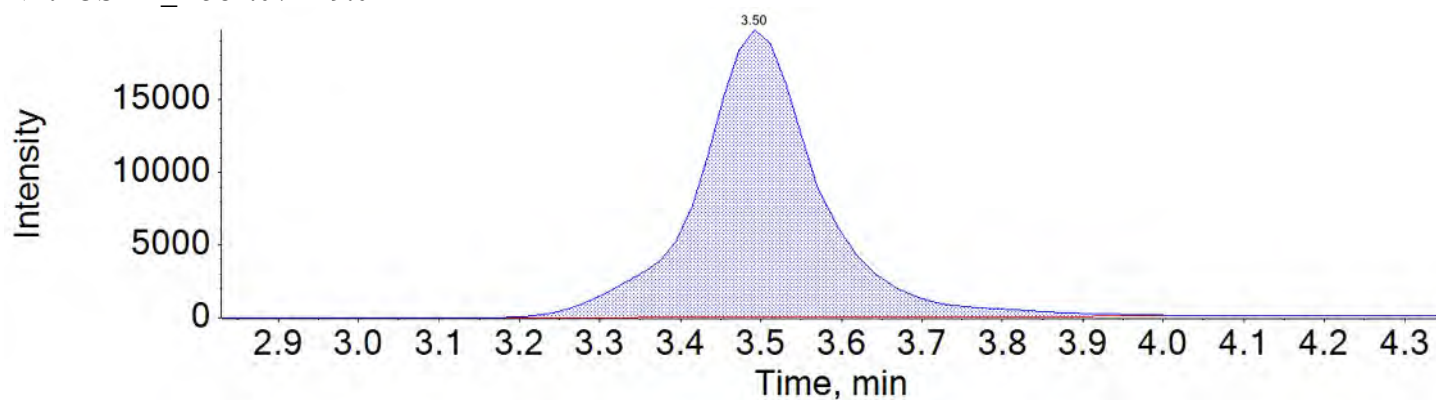
NMeFOSAA\_1 570.0 / 419.0



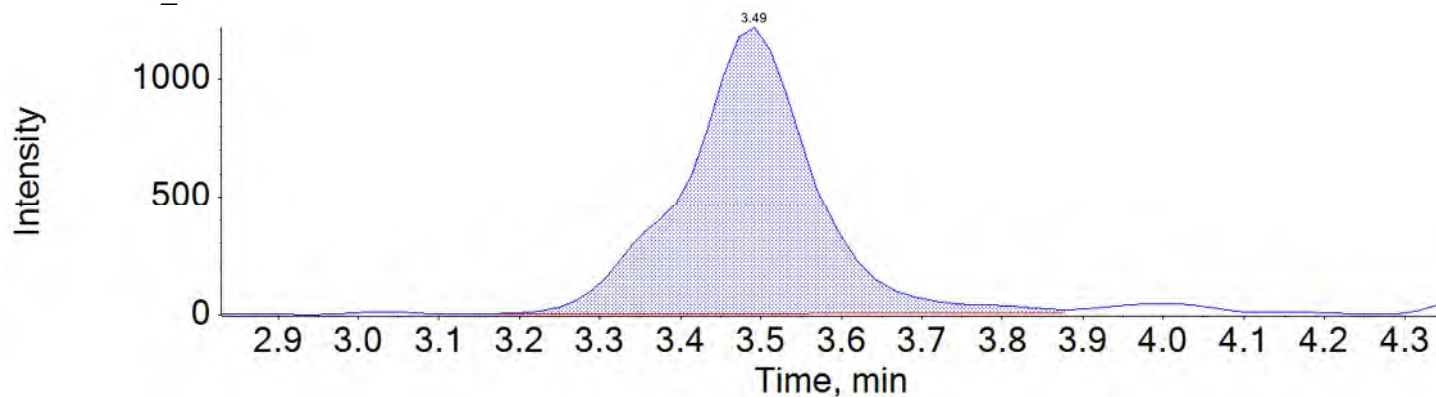
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



NEtFOSAA\_2 584.0 / 483.0

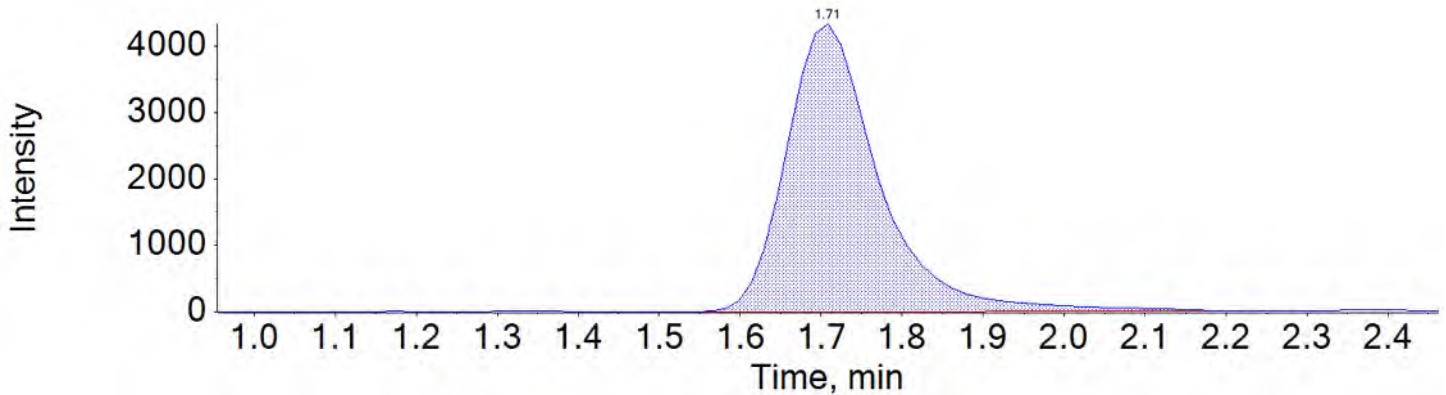




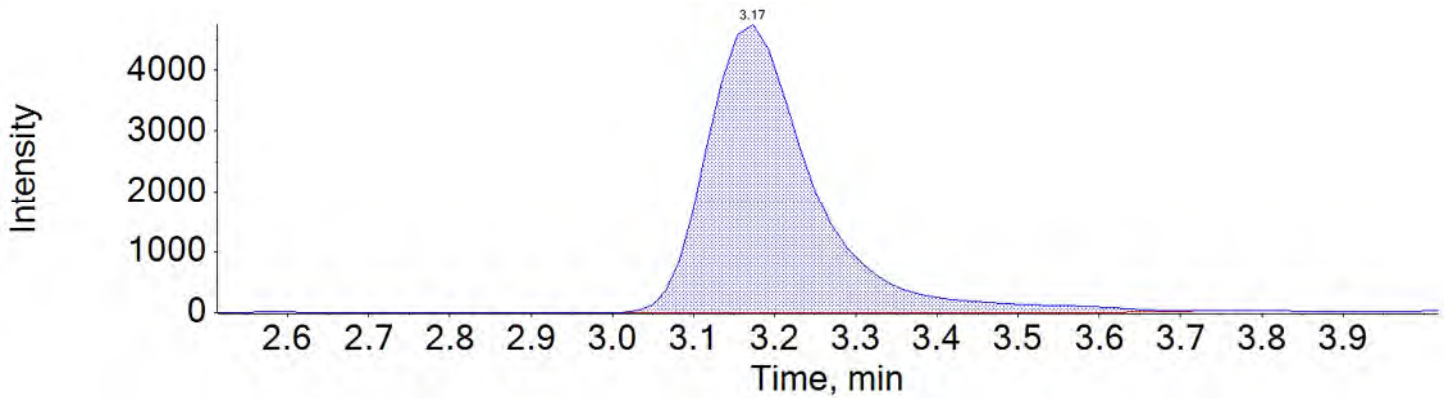
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms

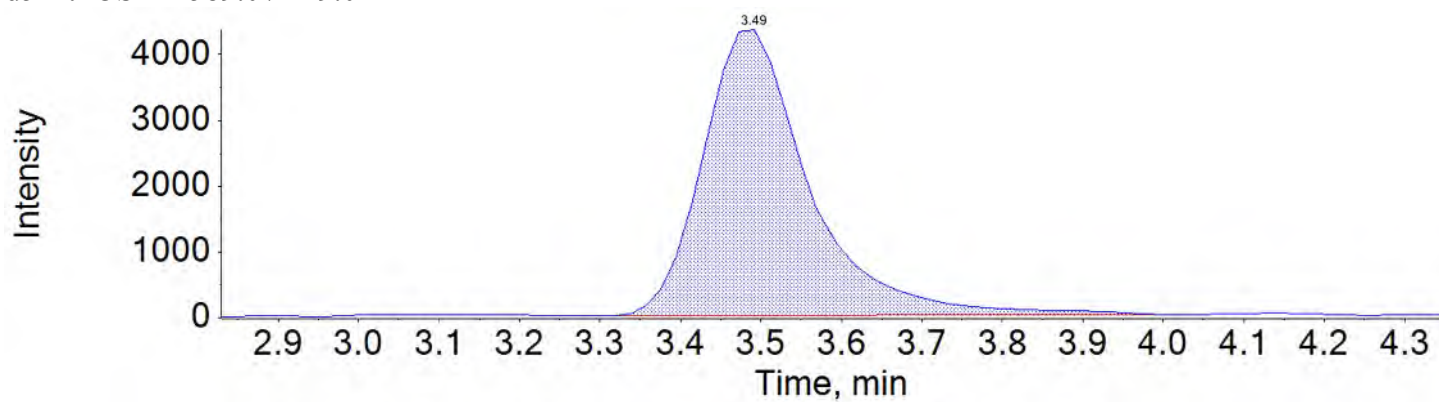
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0



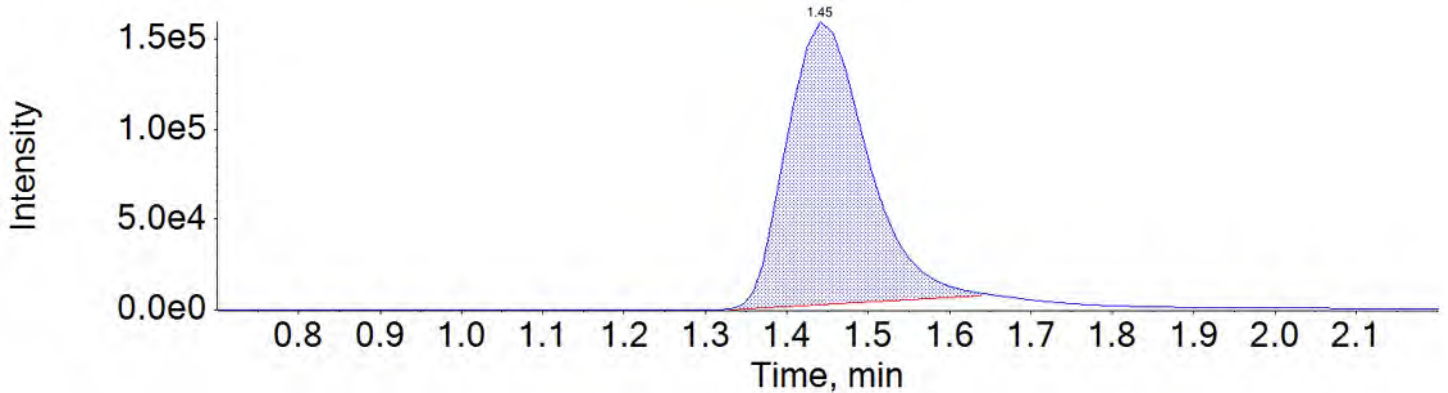
d5-EtFOSAA 589.0 / 419.0



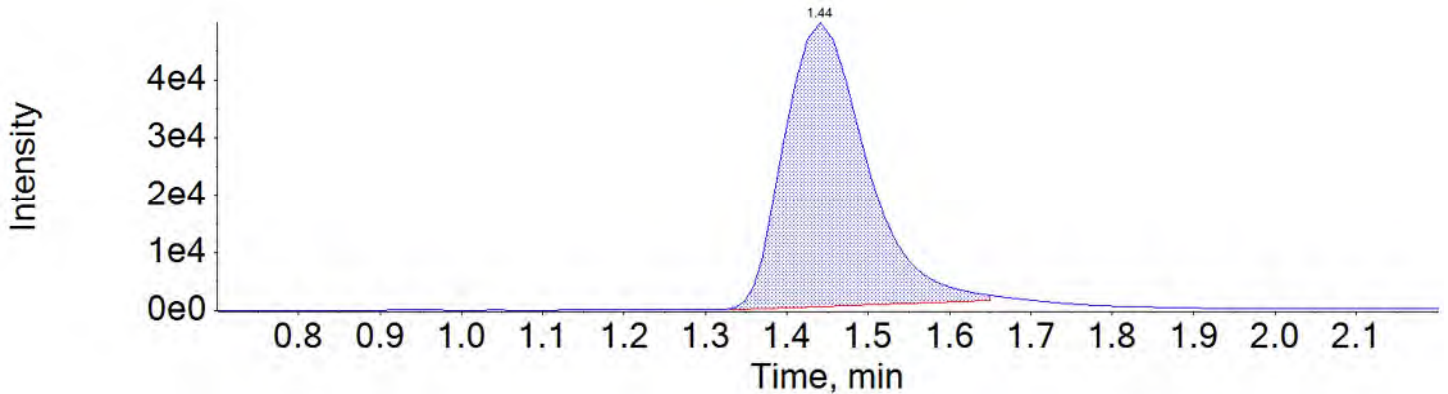
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

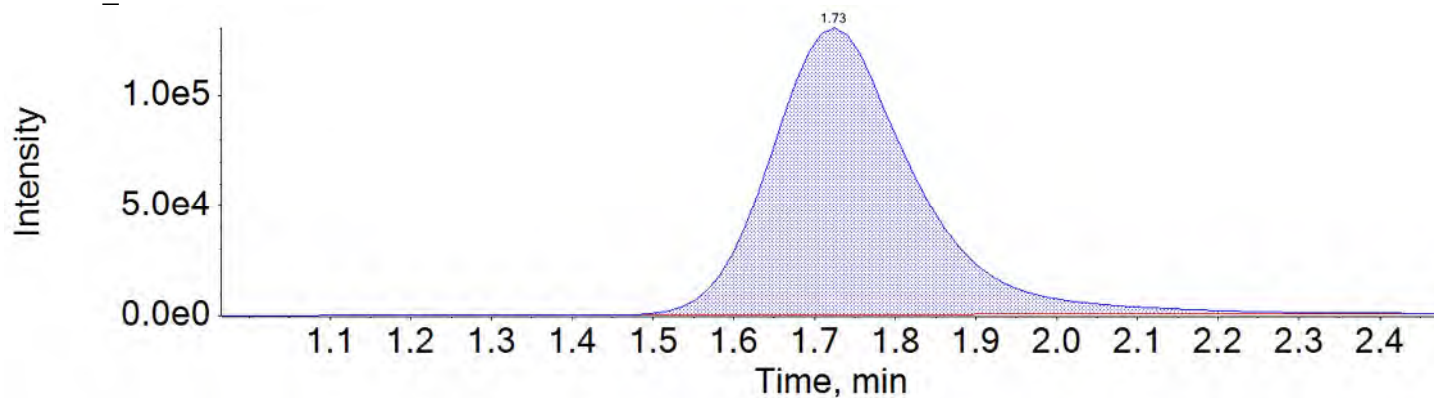
PFBS\_1 298.9 / 80.0



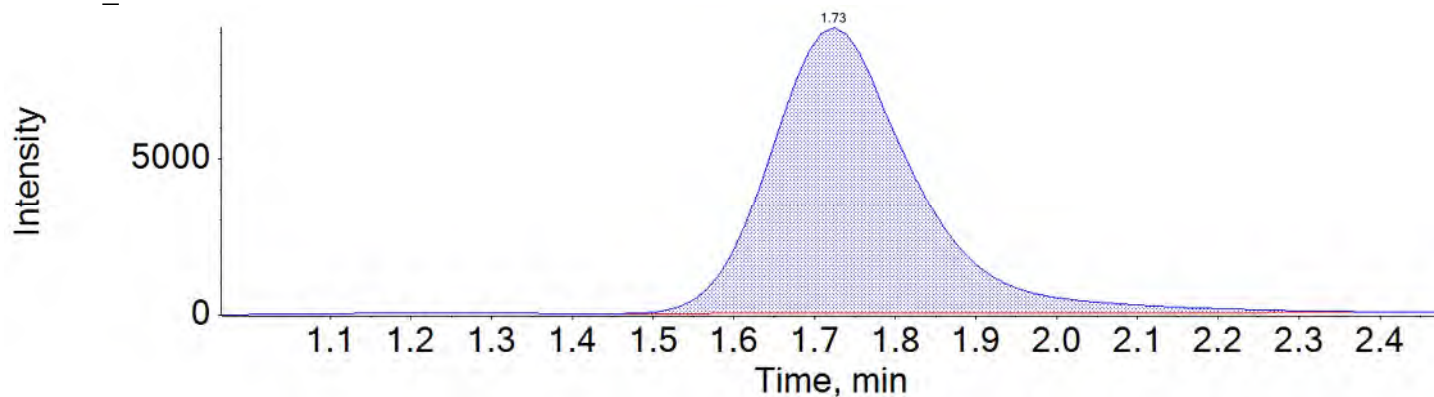
PFBS\_2 298.9 / 99.0



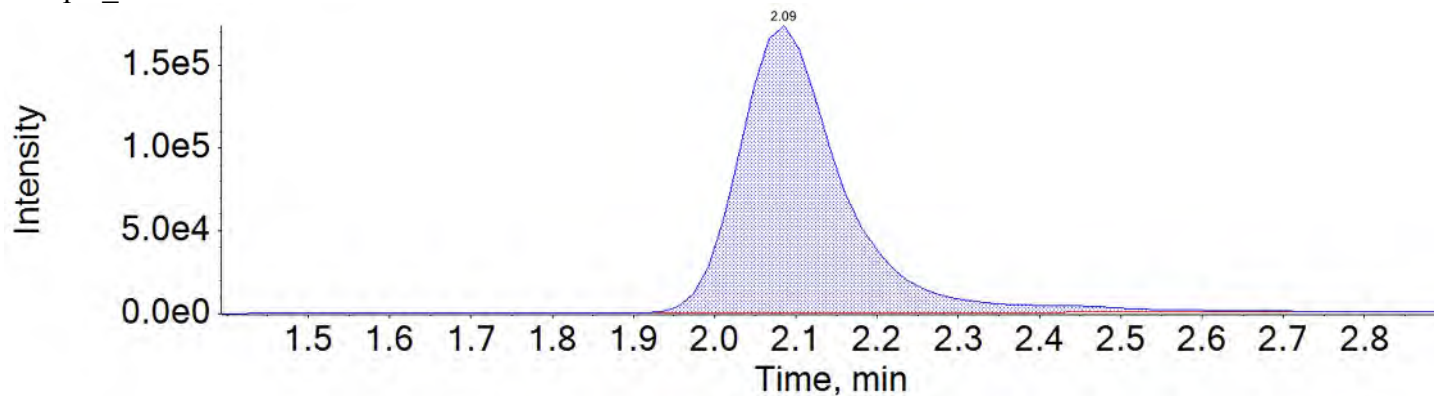
PFHxA\_1 313.0 / 269.0



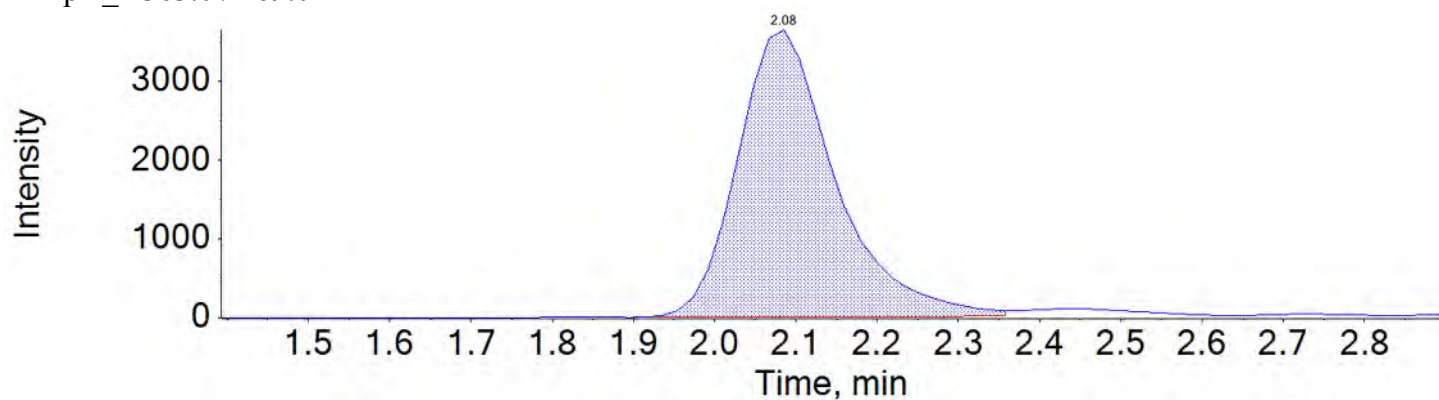
PFHxA\_2 313.0 / 119.0



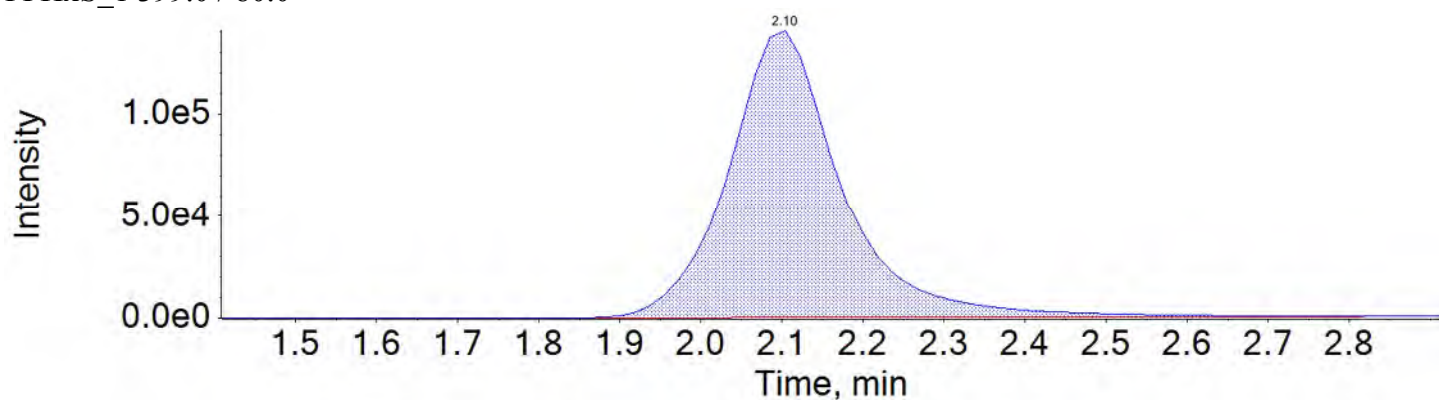
PFHpA\_1 363.0 / 319.0



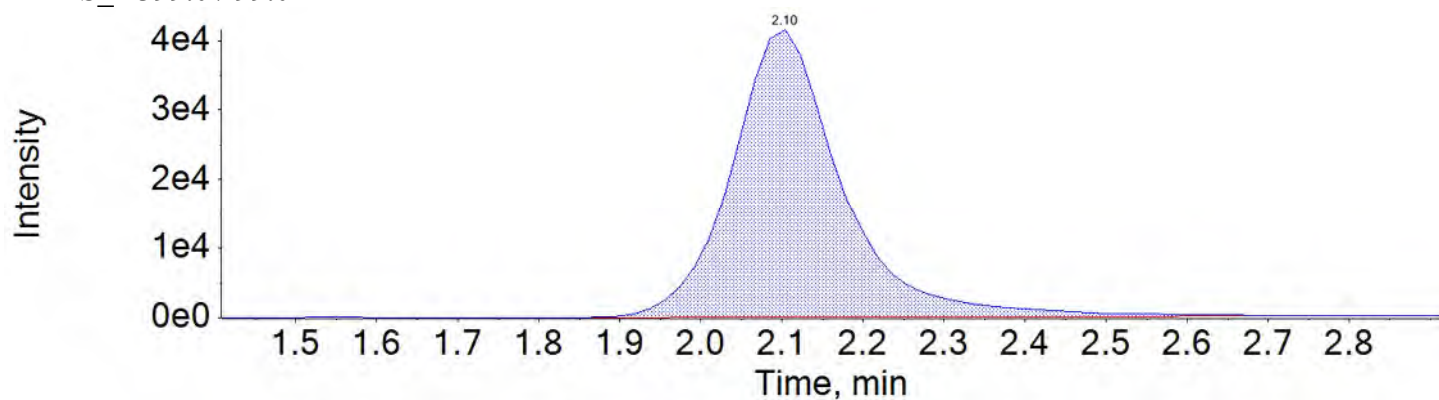
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

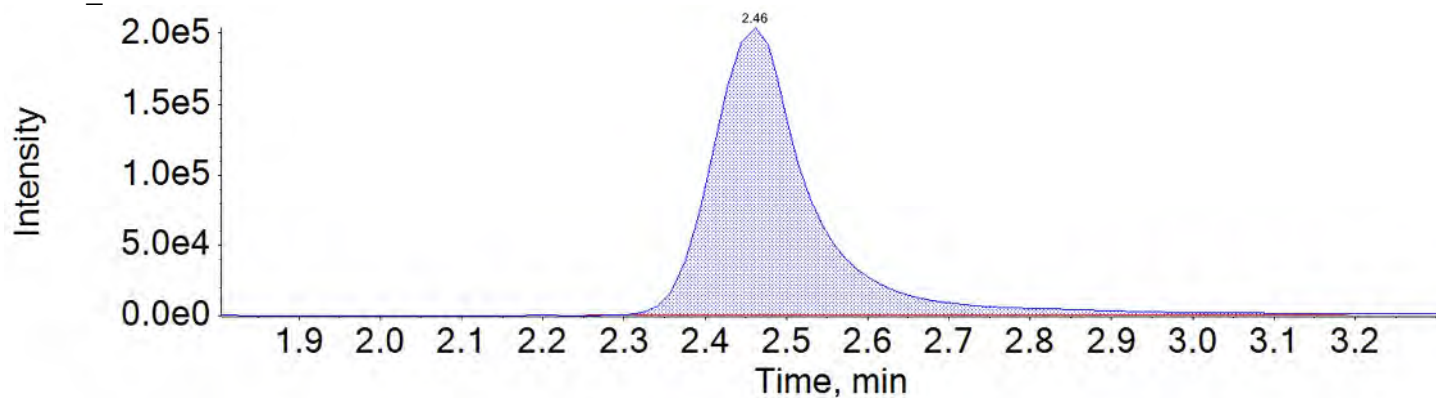


PFHxS\_2 399.0 / 99.0

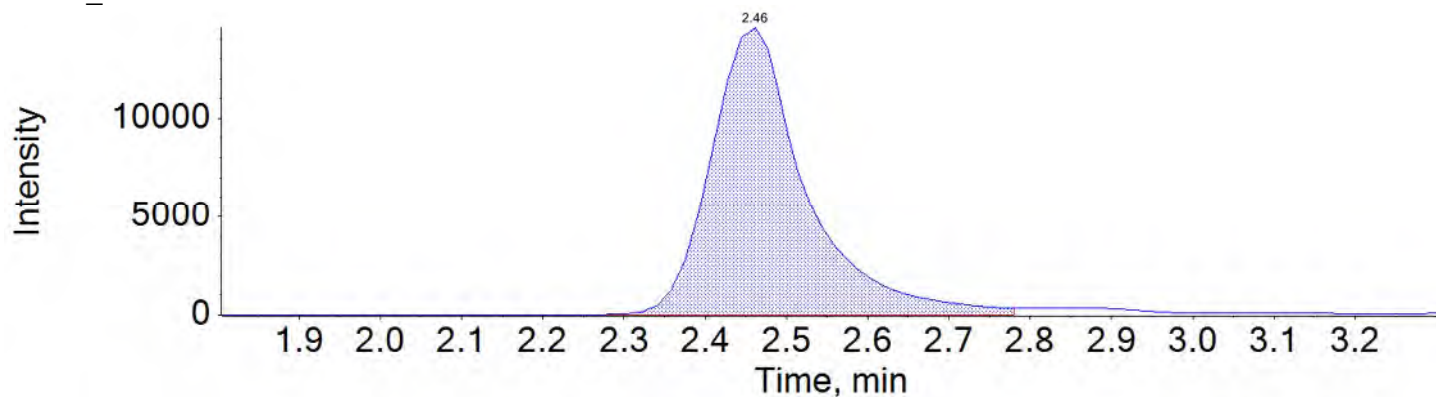




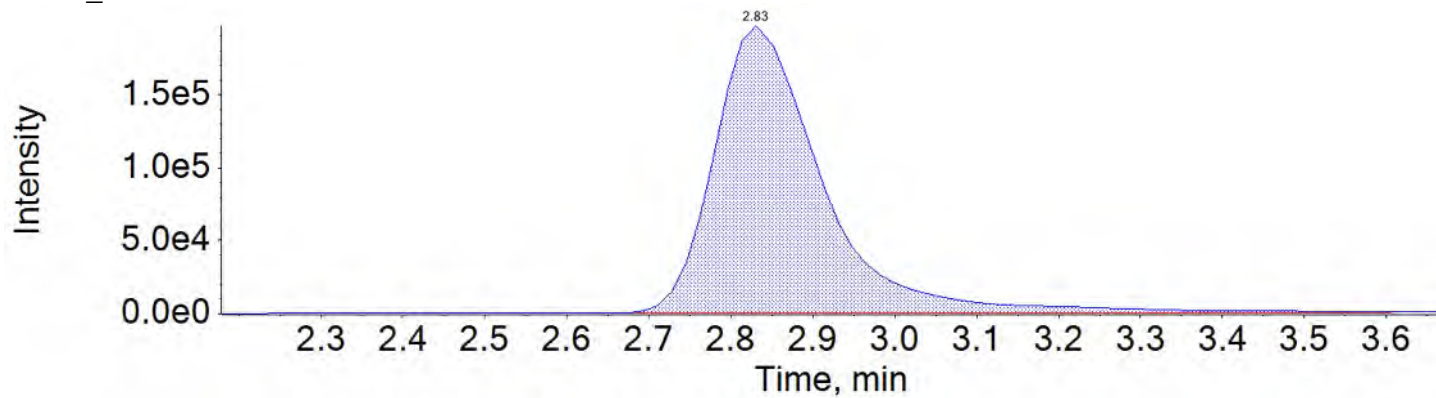
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

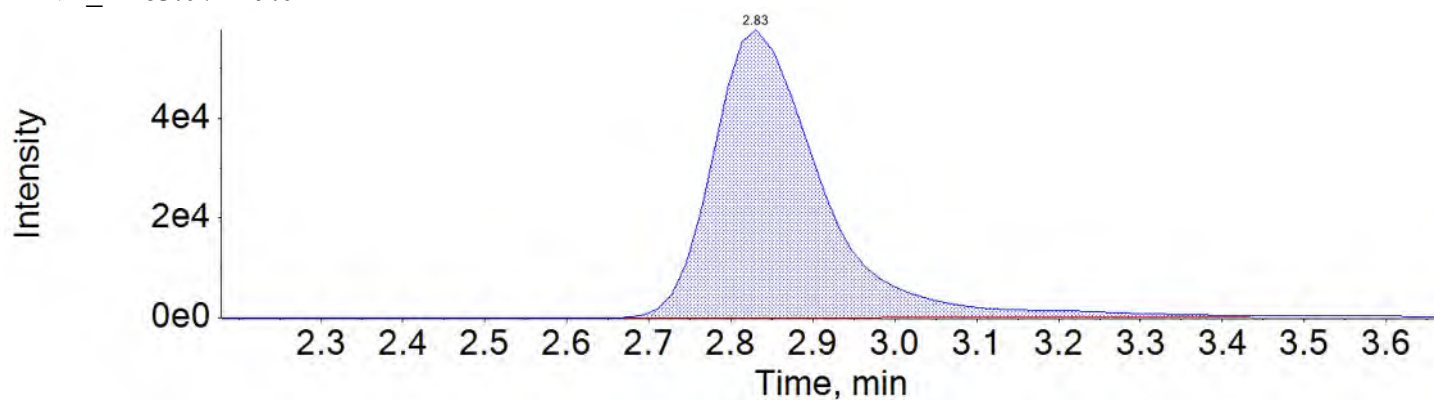


PFNA\_1 463.0 / 419.0

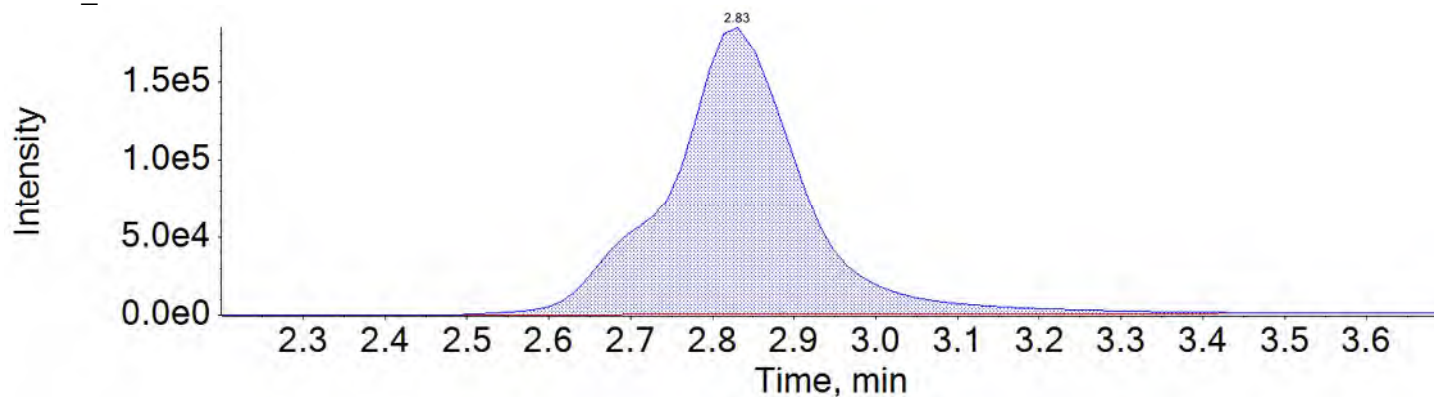




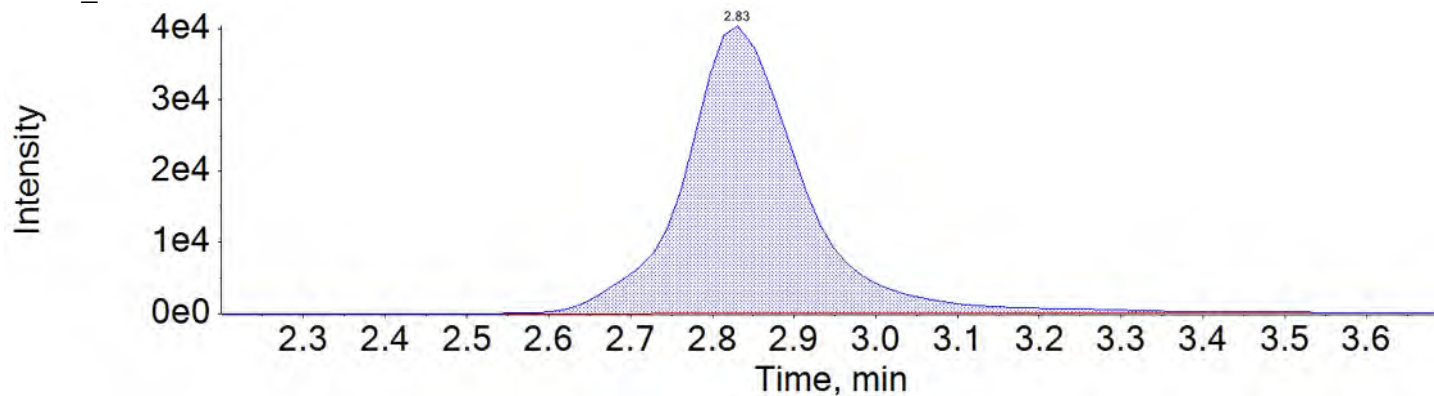
PFNA\_2 463.0 / 219.0



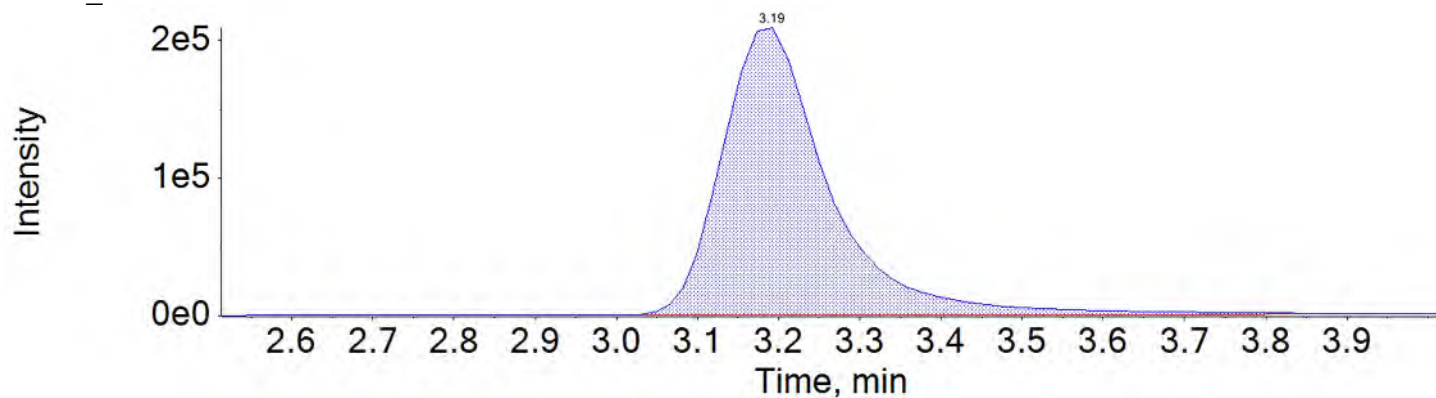
PFOS\_1 499.0 / 80.0



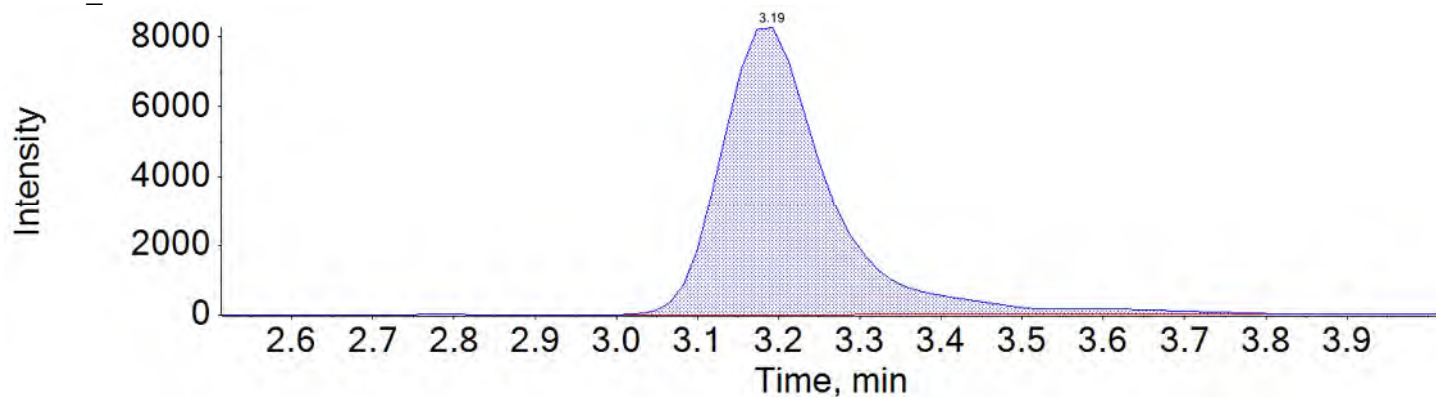
PFOS\_2 499.0 / 99.0



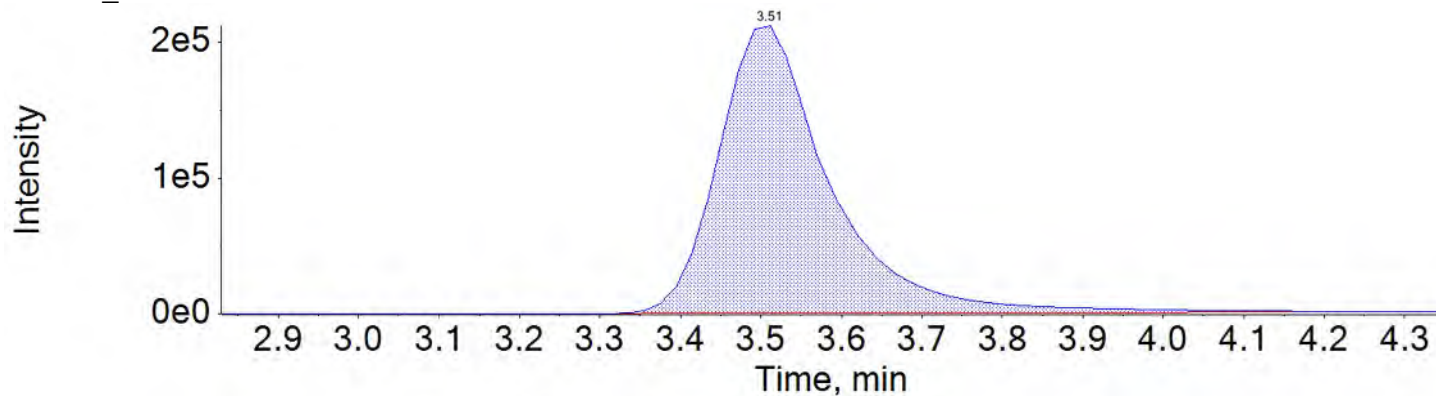
PFDA\_1 513.0 / 469.0



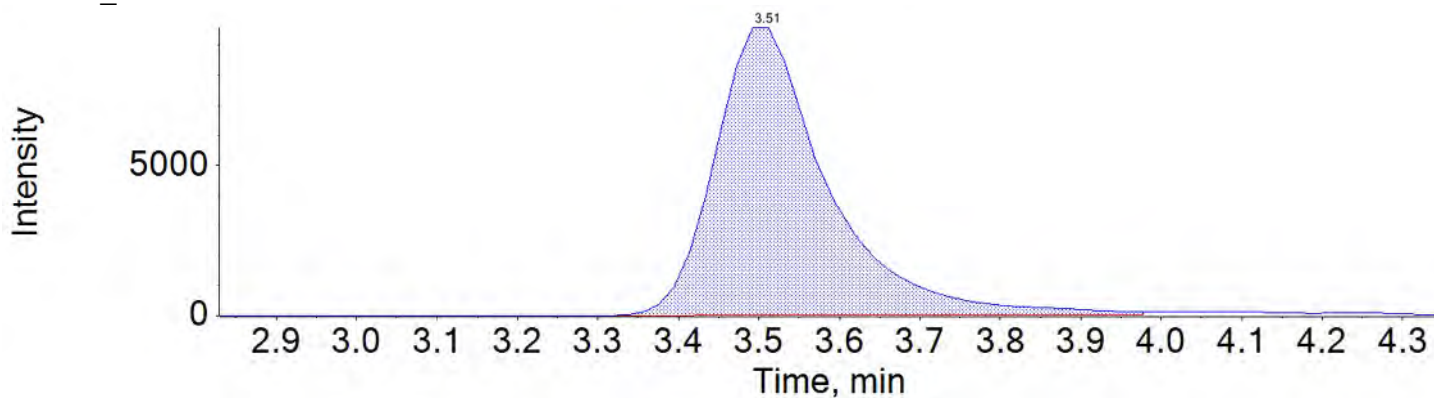
PFDA\_2 513.0 / 219.0



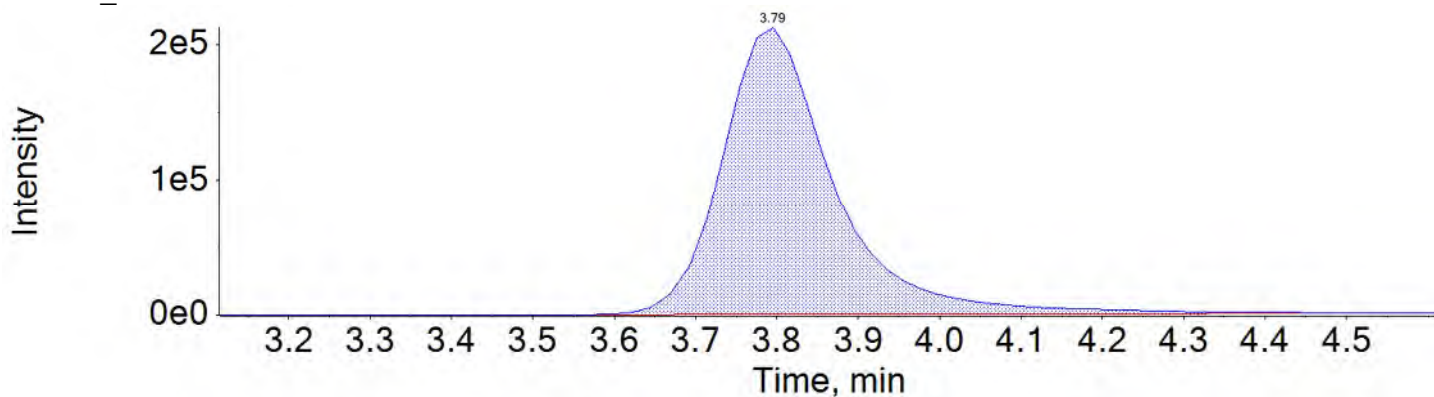
PFUnA\_1 563.0 / 519.0



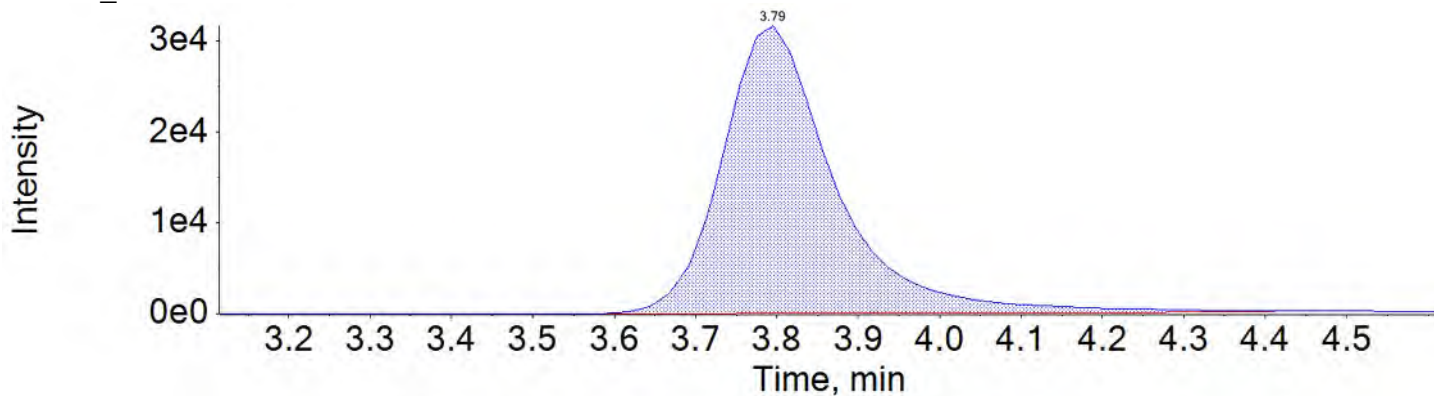
PUnA\_2 563.0 / 269.0



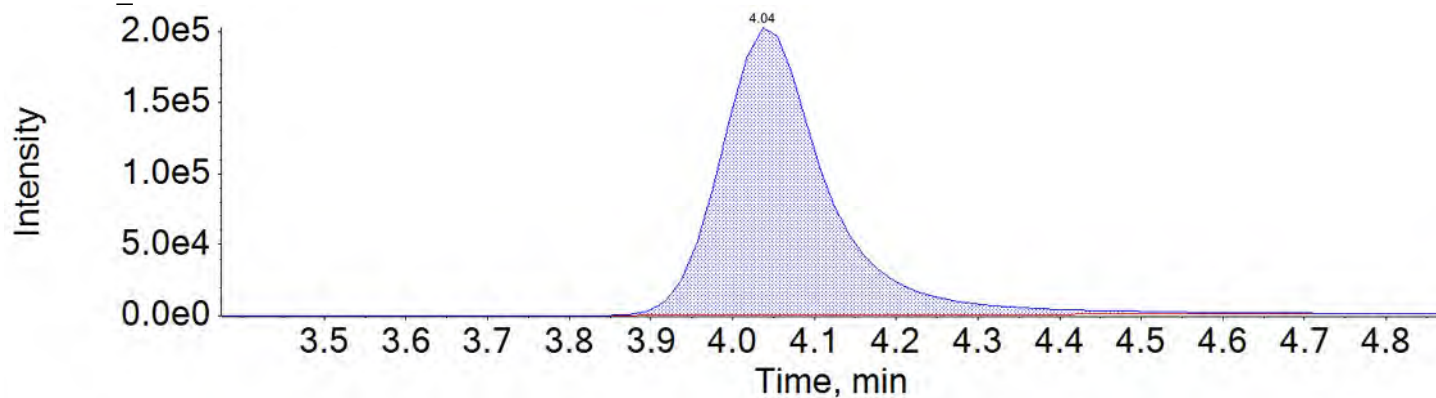
PDoA\_1 613.0 / 569.0



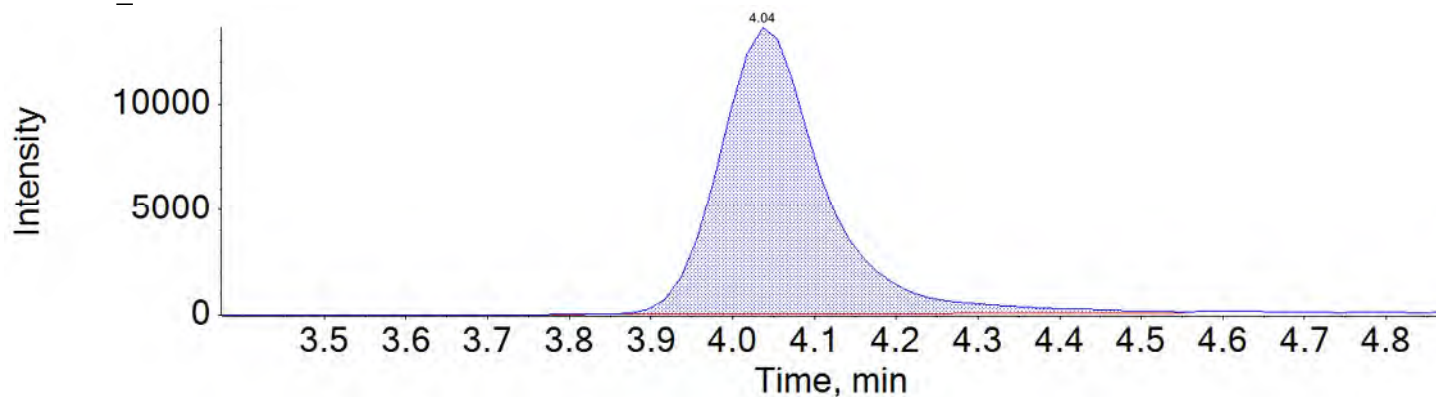
PDoA\_2 613.0 / 319.0



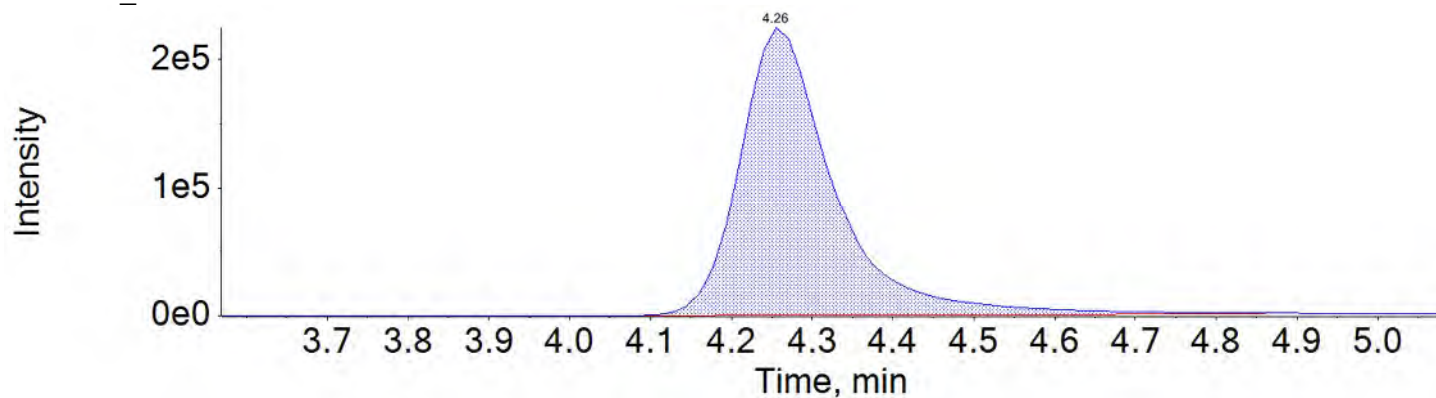
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

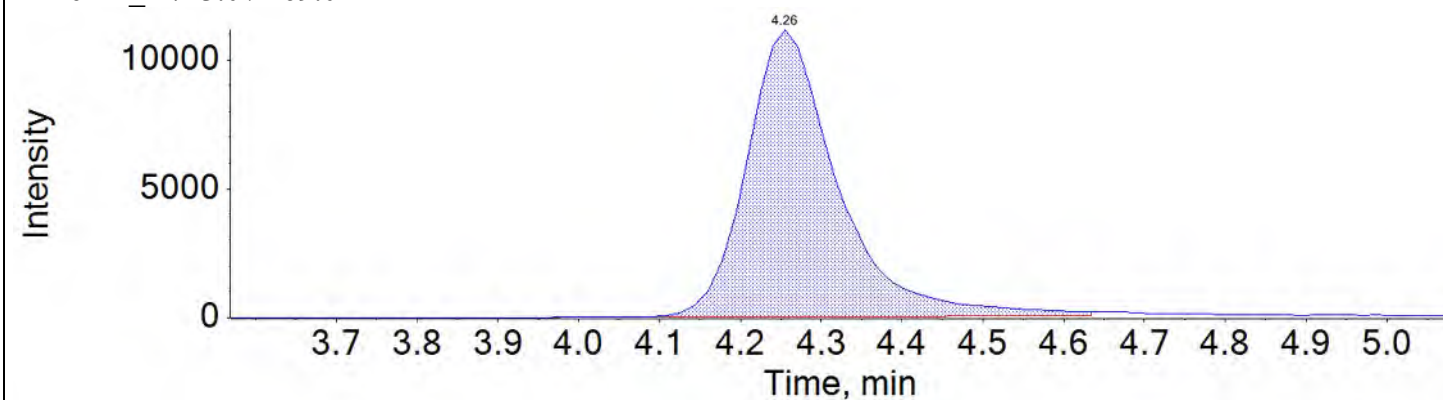


PFTTeDA\_1 713.0 / 669.0

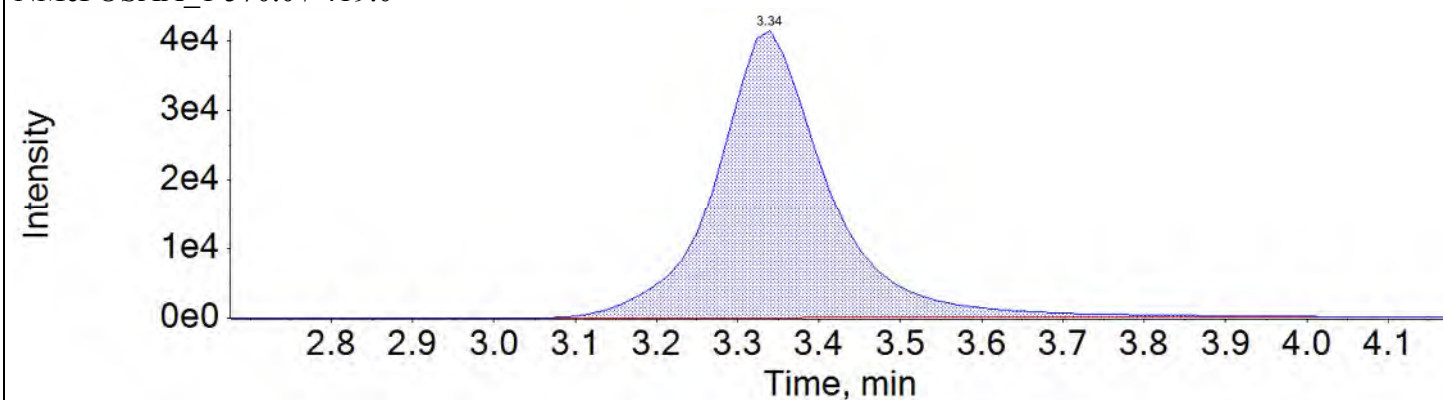




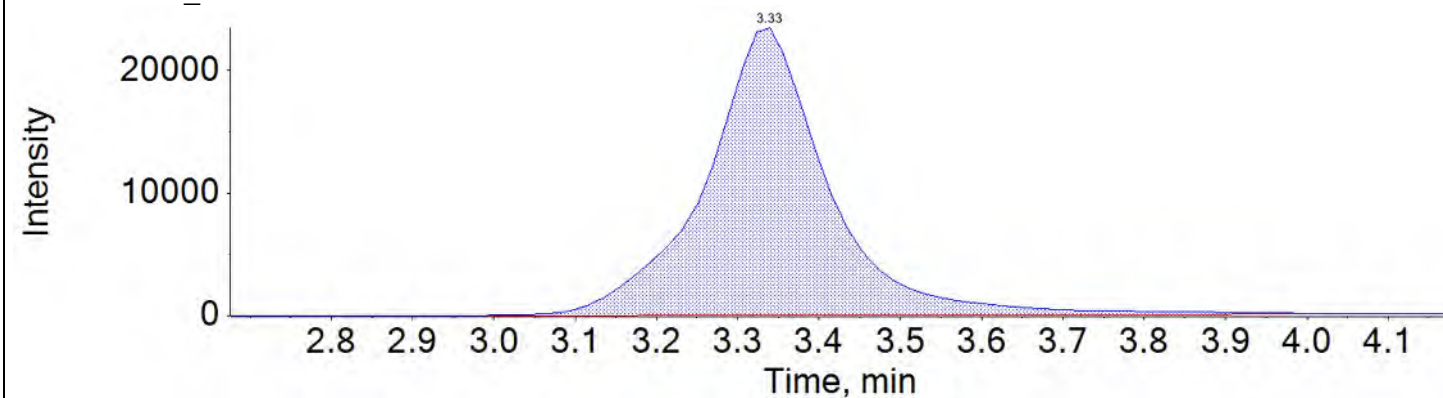
PFTeDA\_2 713.0 / 169.0



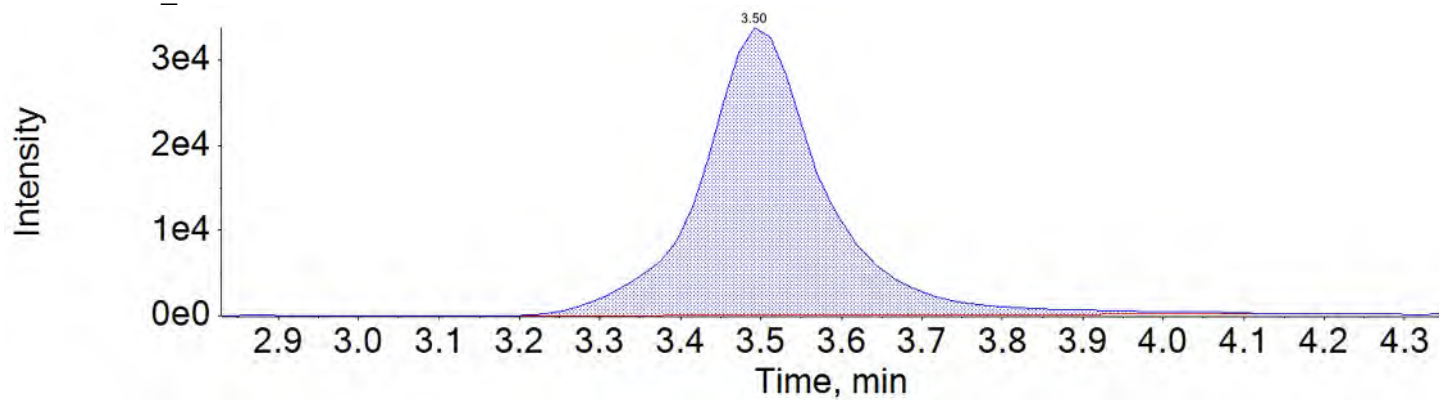
NMeFOSAA\_1 570.0 / 419.0



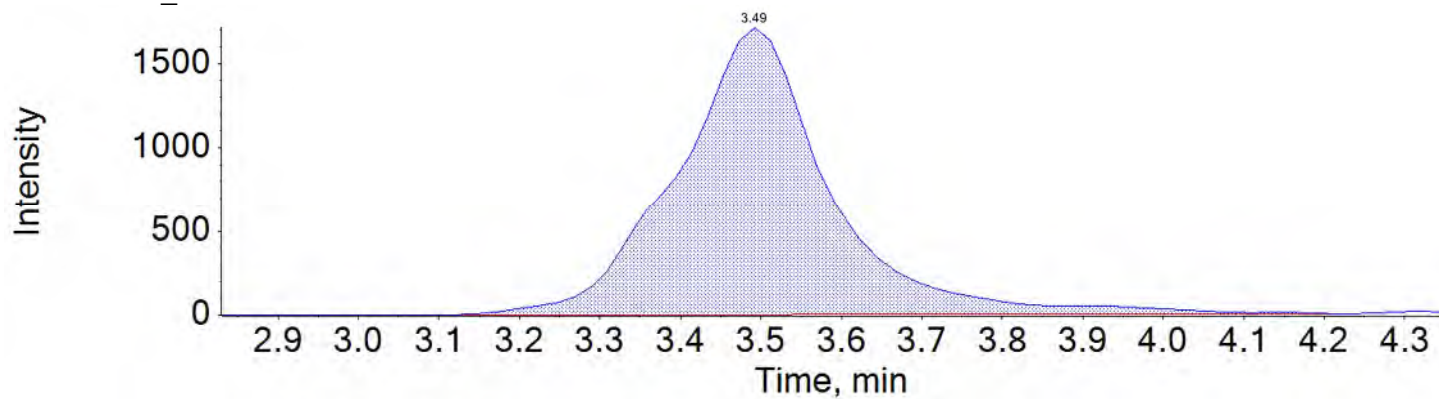
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



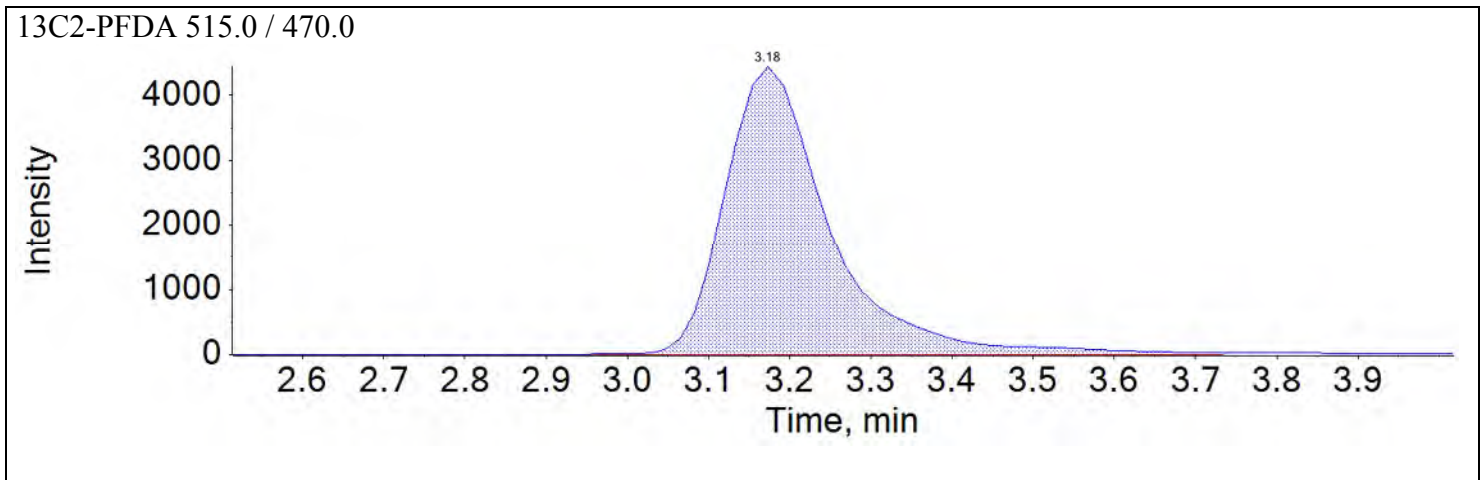
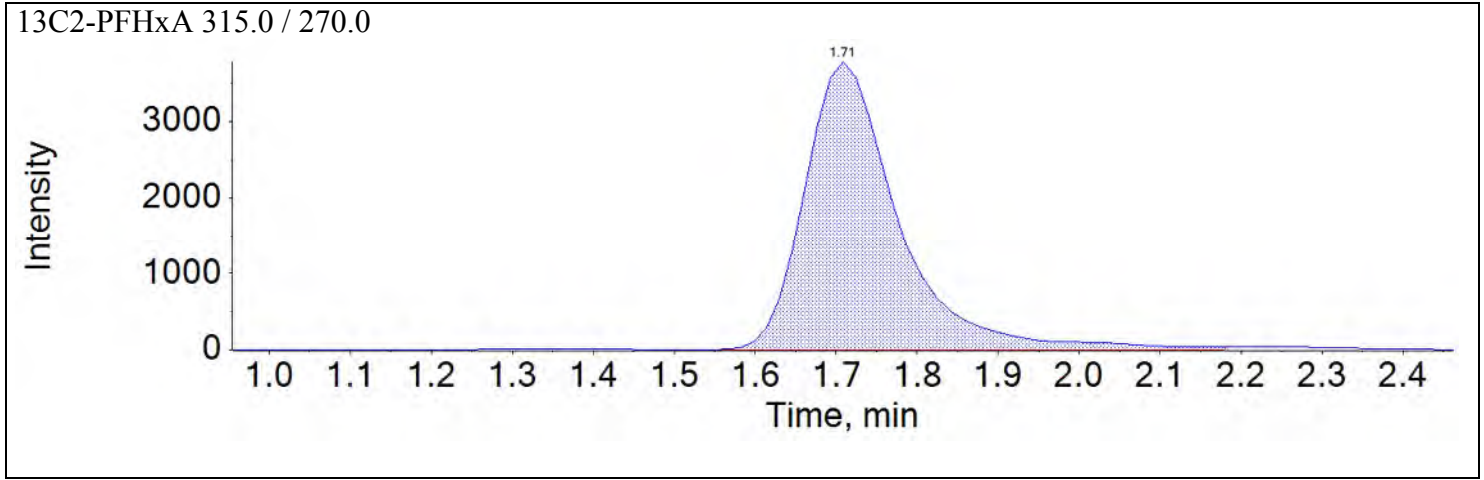
NEtFOSAA\_2 584.0 / 483.0



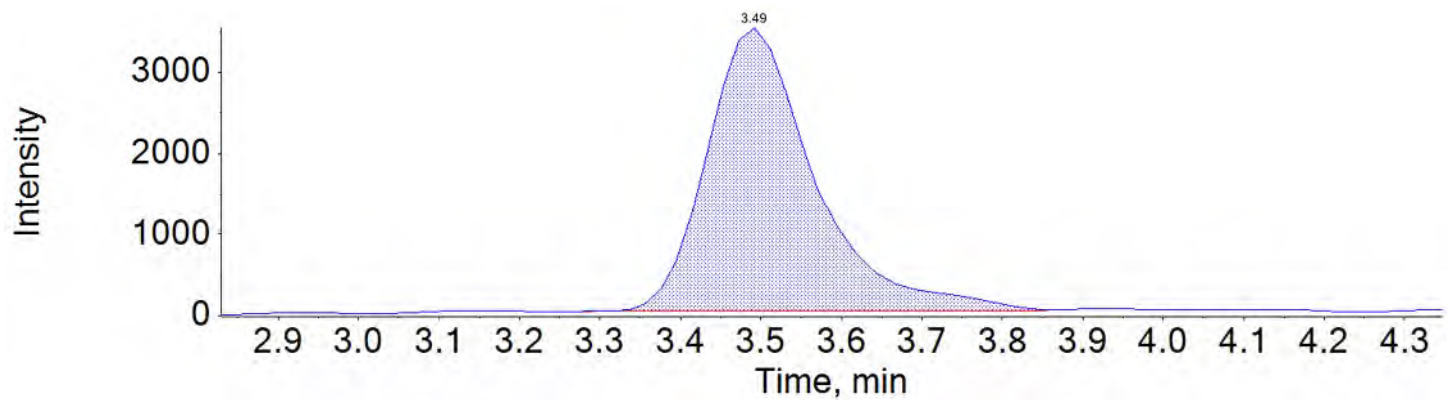


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



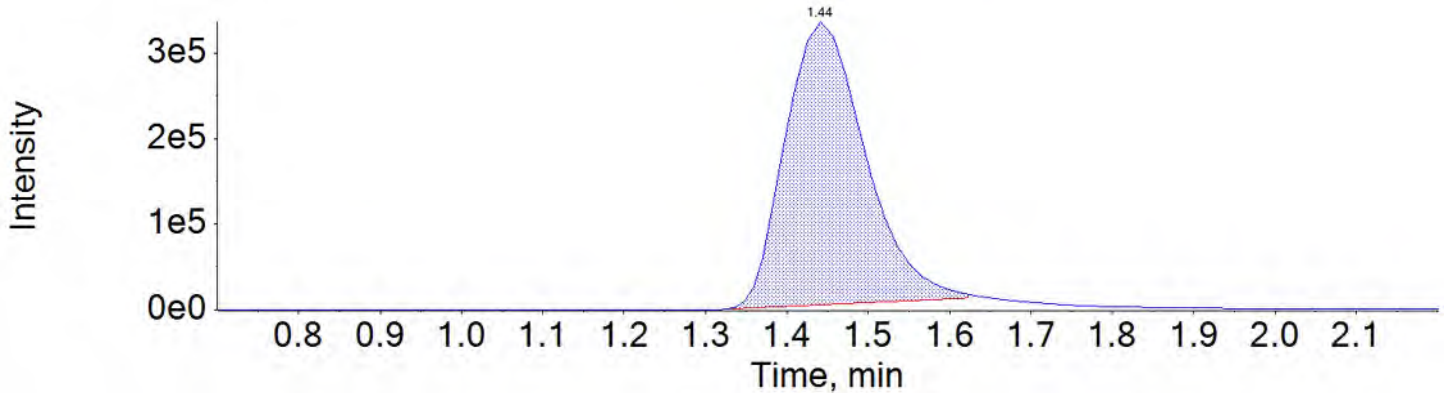
d5-EtFOSAA 589.0 / 419.0



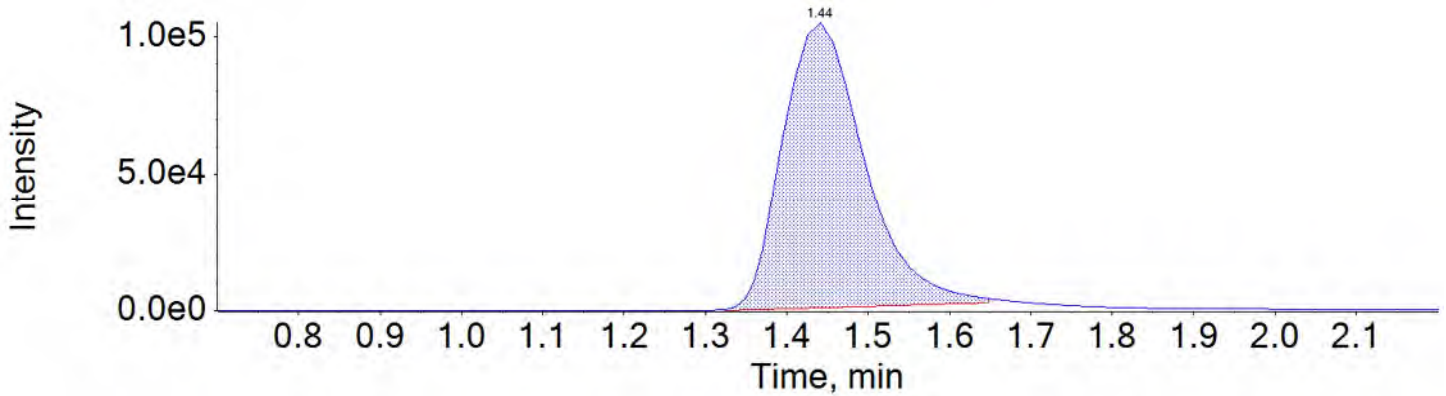
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

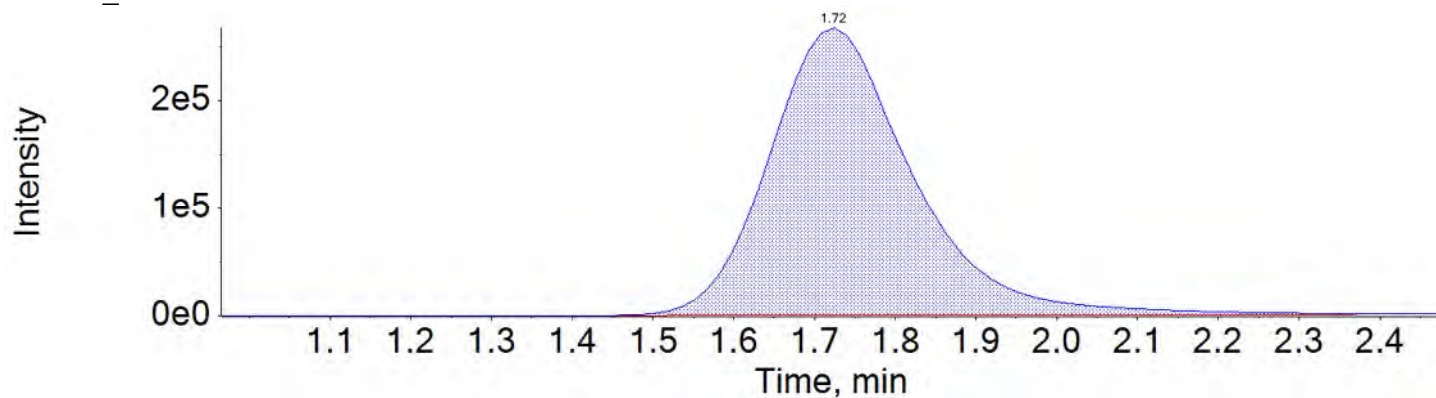
PFBS\_1 298.9 / 80.0



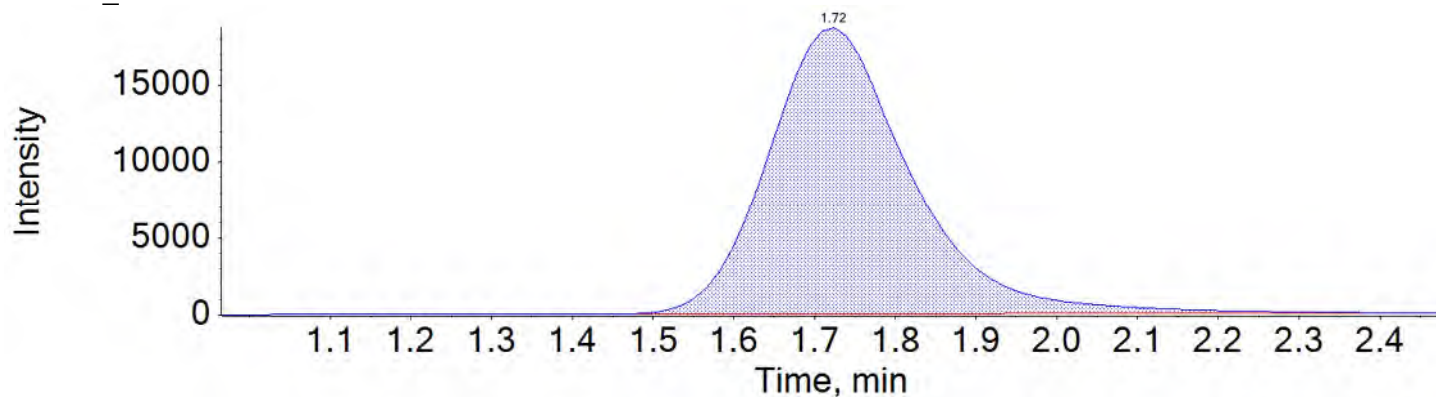
PFBS\_2 298.9 / 99.0



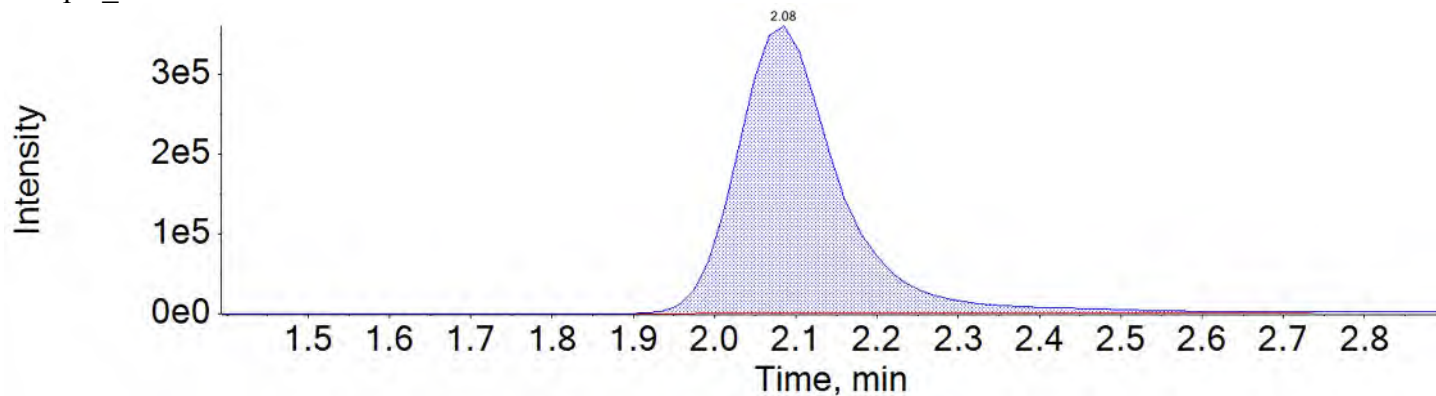
PFHxA\_1 313.0 / 269.0



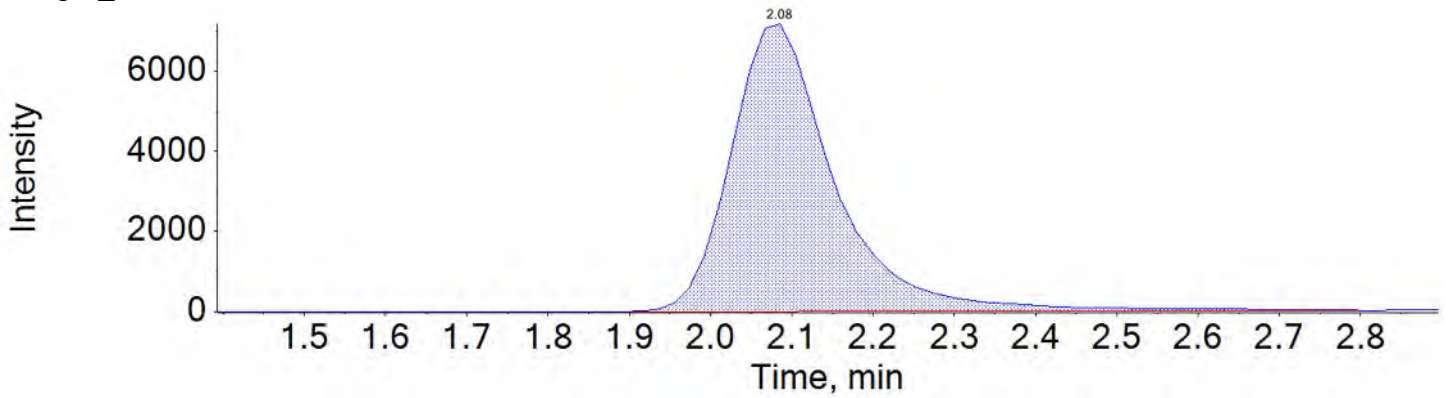
PFHxA\_2 313.0 / 119.0



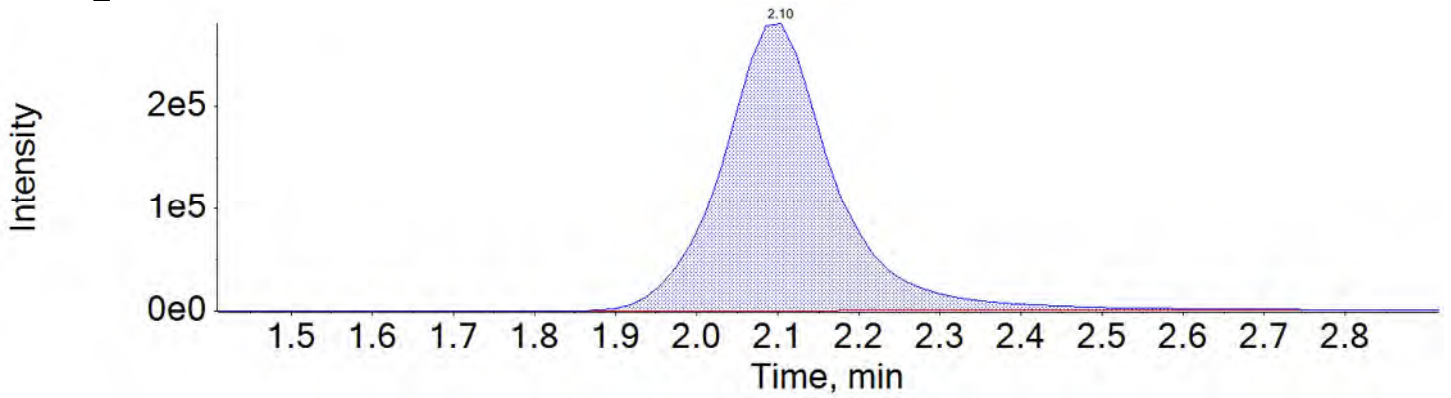
PFHpA\_1 363.0 / 319.0



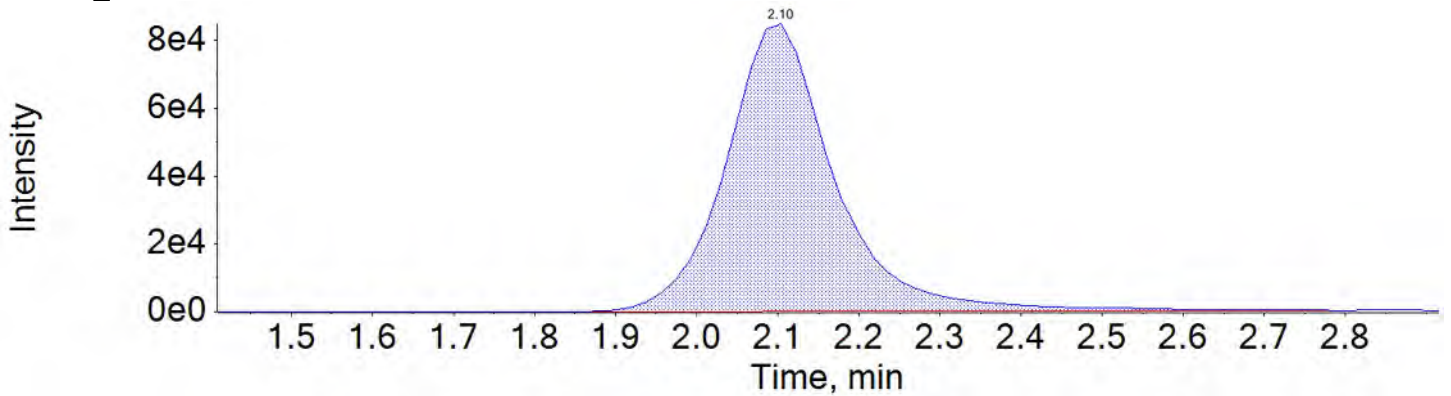
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

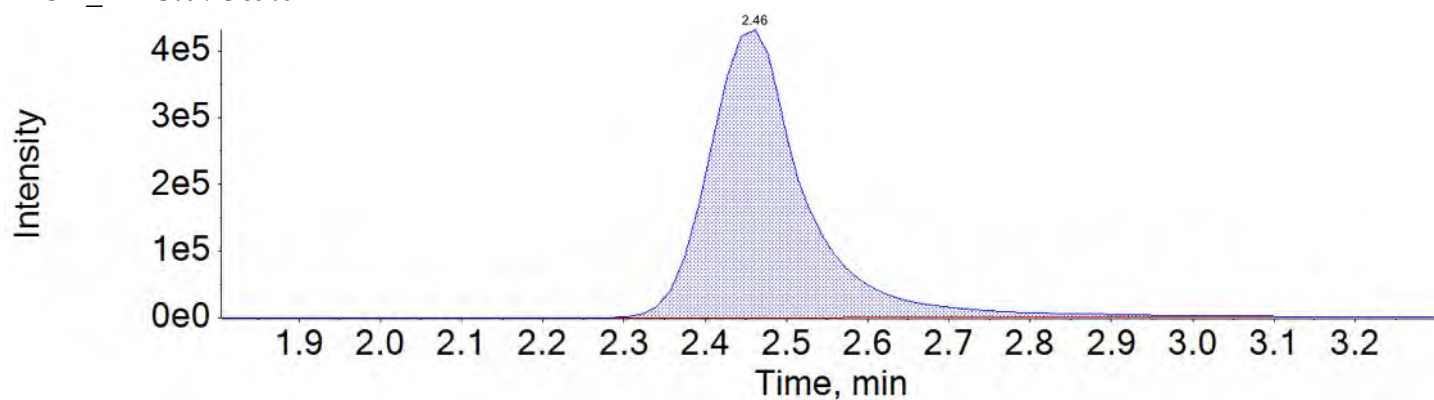


PFHxS\_2 399.0 / 99.0

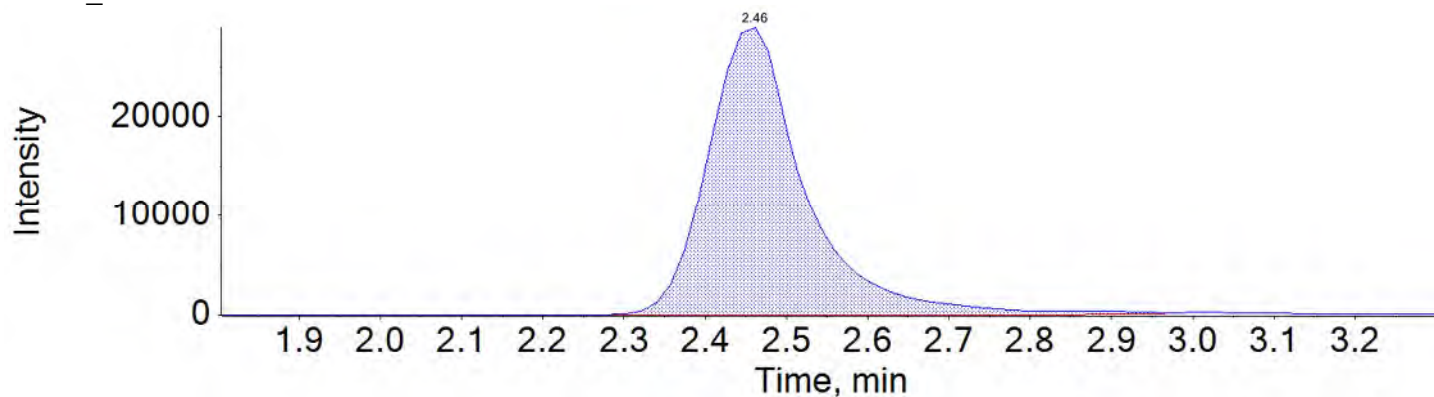




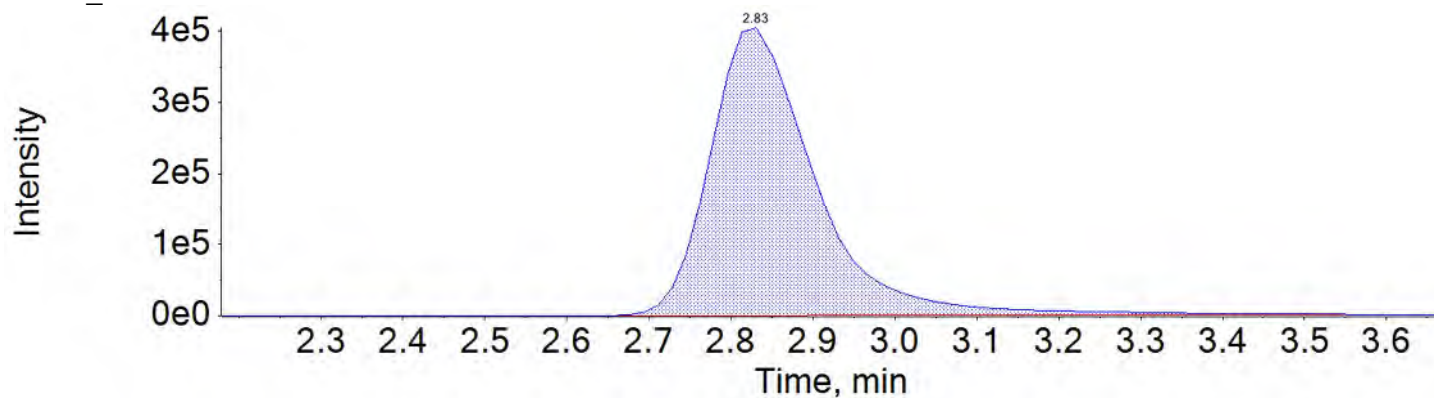
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

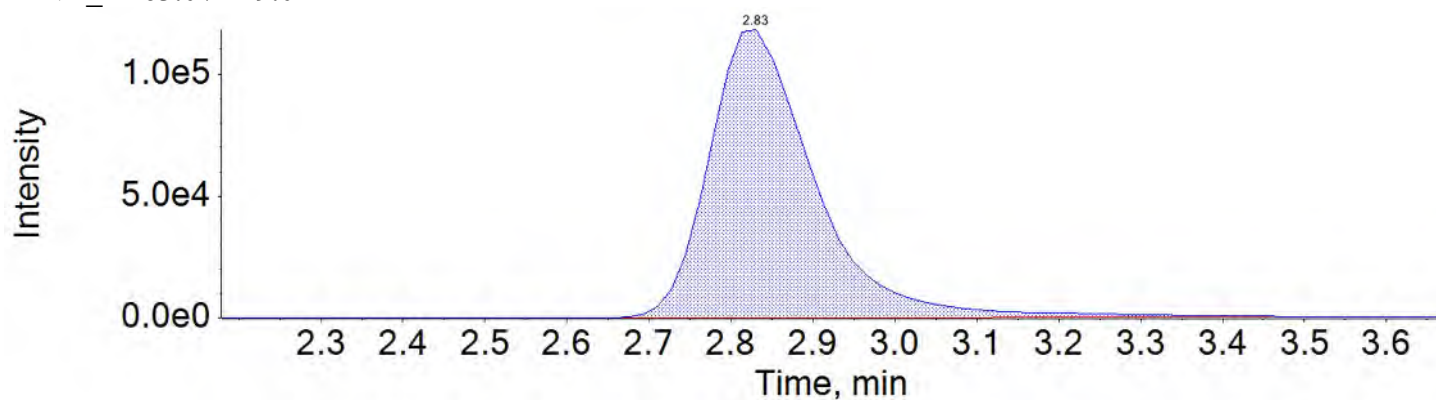


PFNA\_1 463.0 / 419.0

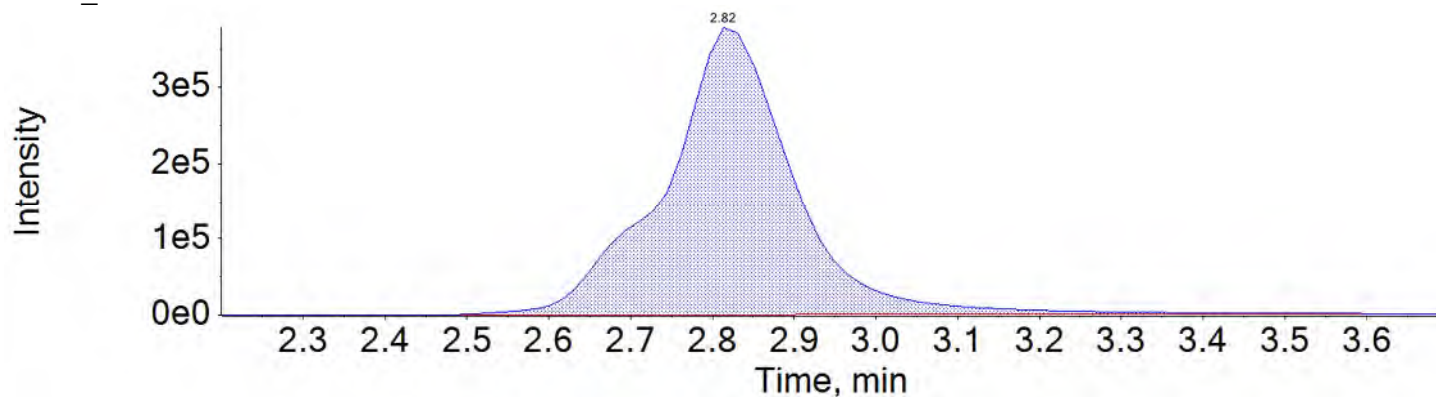




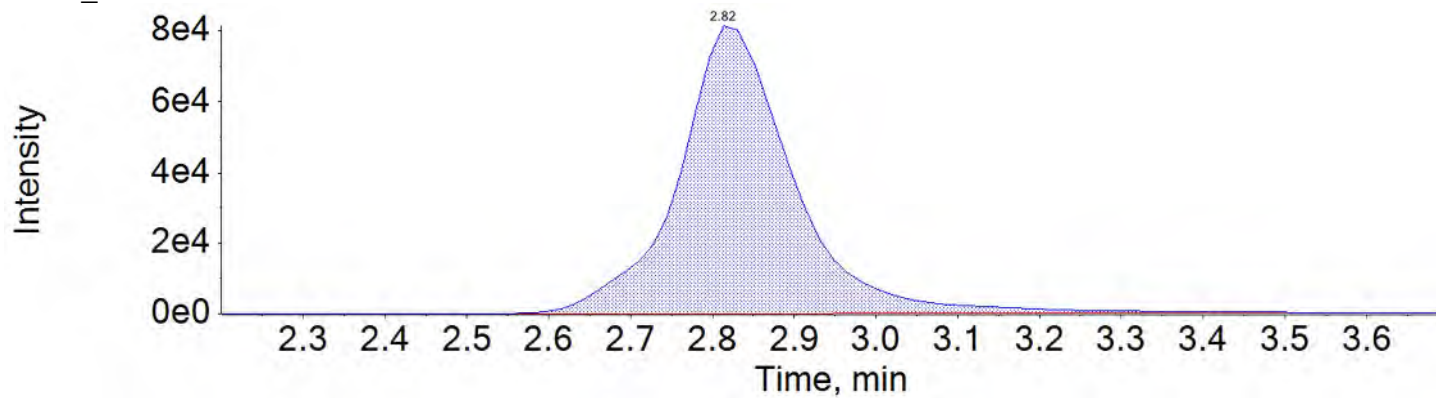
PFNA\_2 463.0 / 219.0



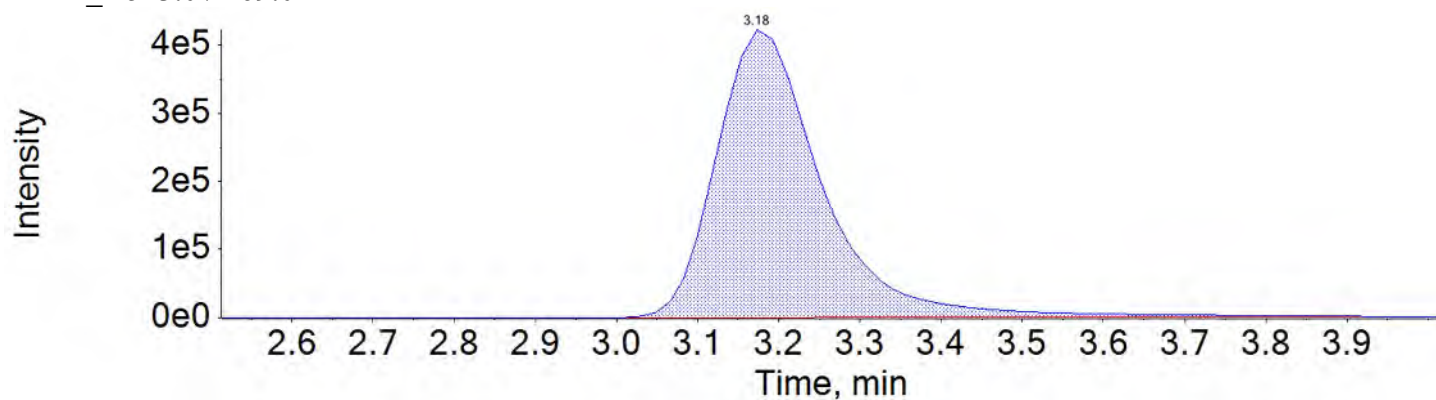
PFOS\_1 499.0 / 80.0



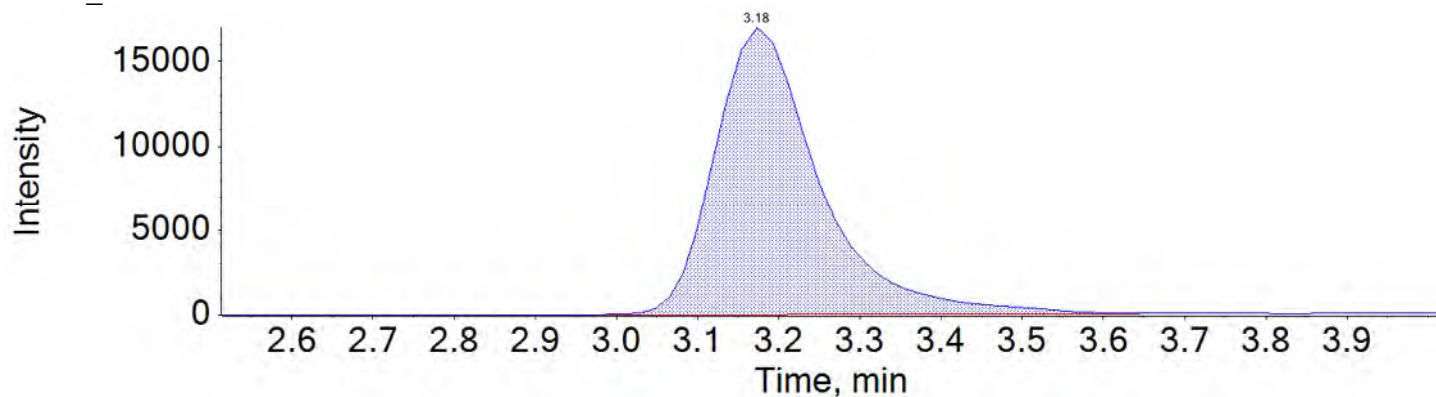
PFOS\_2 499.0 / 99.0



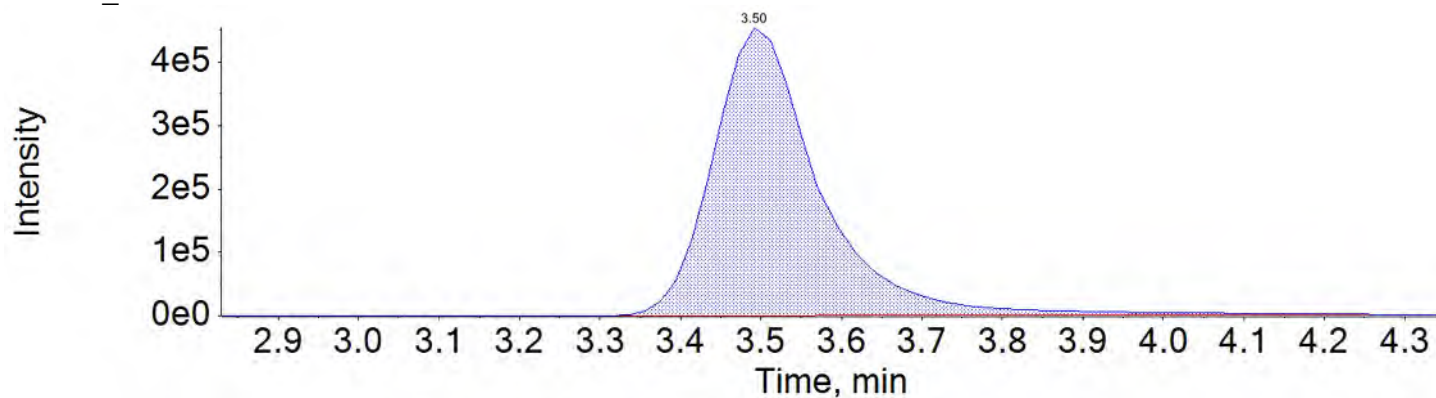
PFDA\_1 513.0 / 469.0



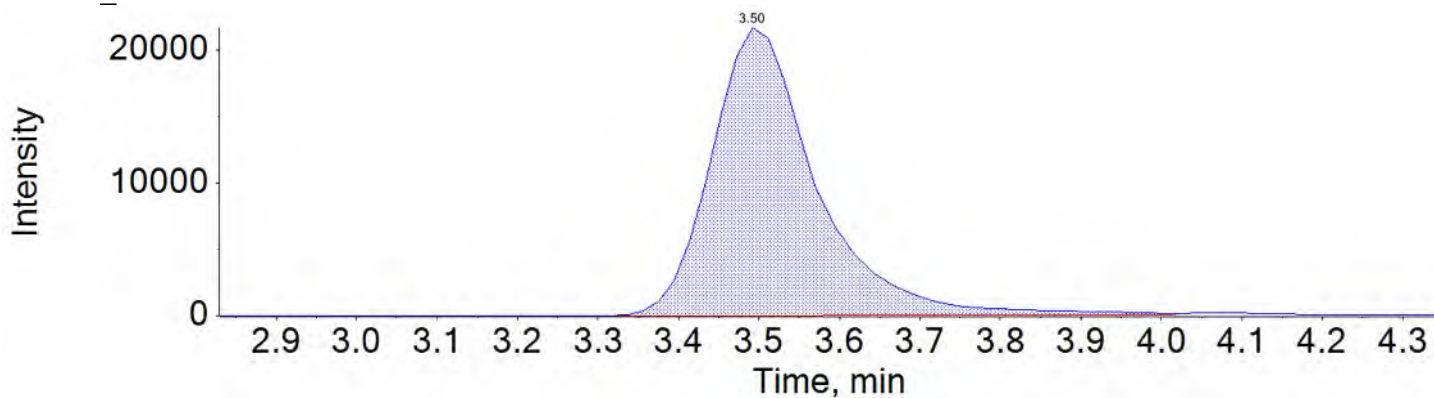
PFDA\_2 513.0 / 219.0



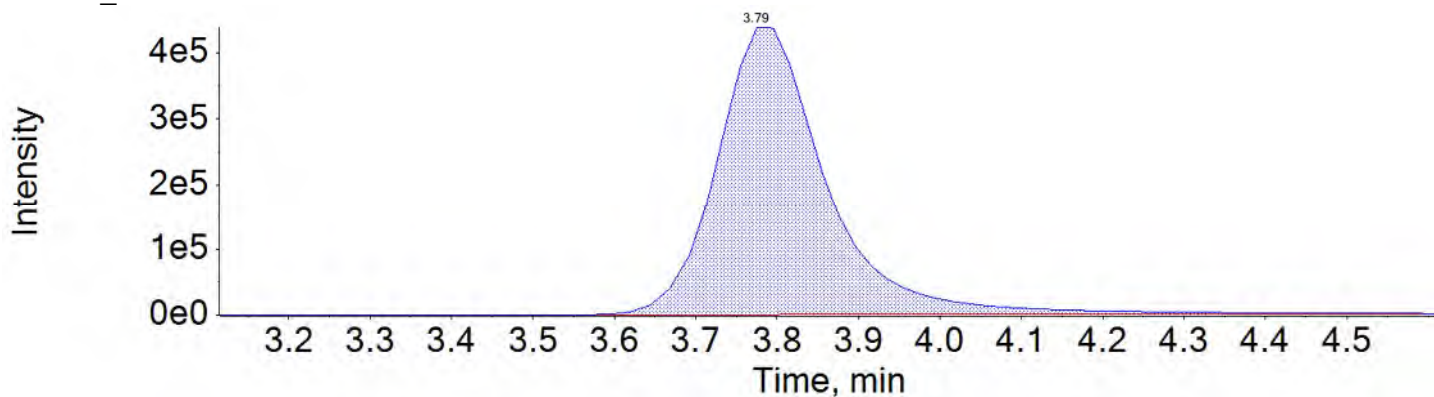
PFUnA\_1 563.0 / 519.0



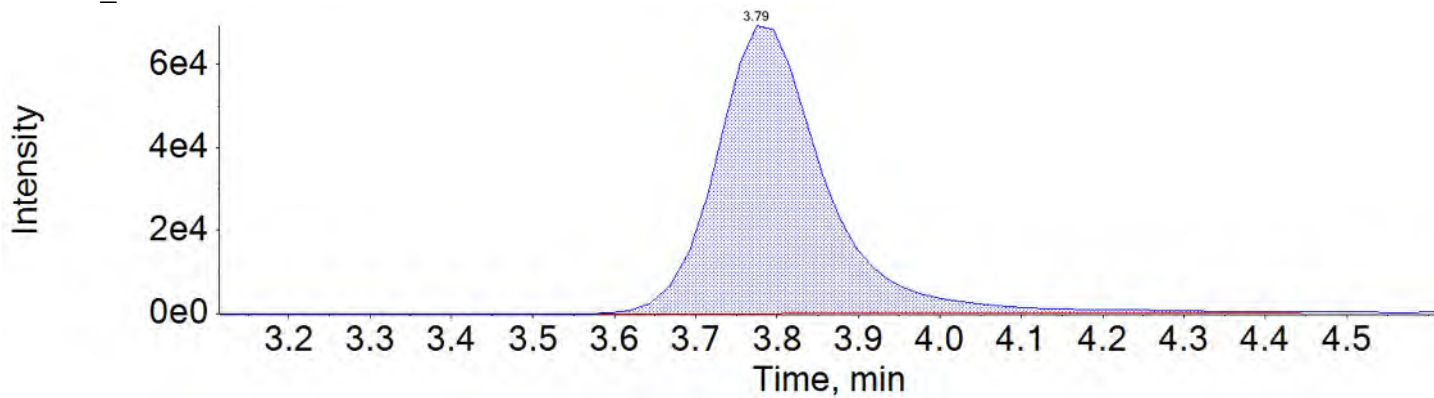
PFUUnA\_2 563.0 / 269.0



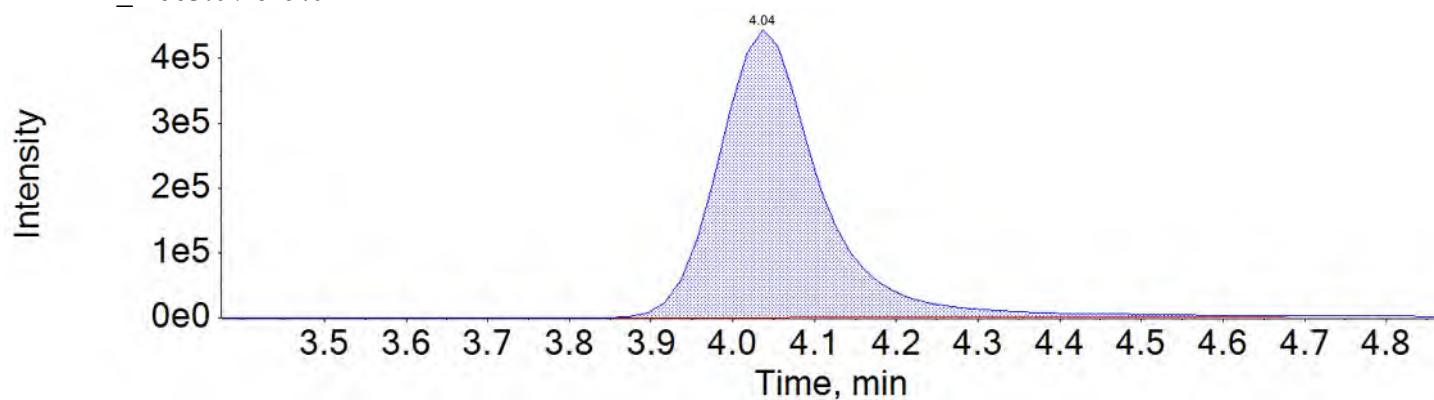
PFDoA\_1 613.0 / 569.0



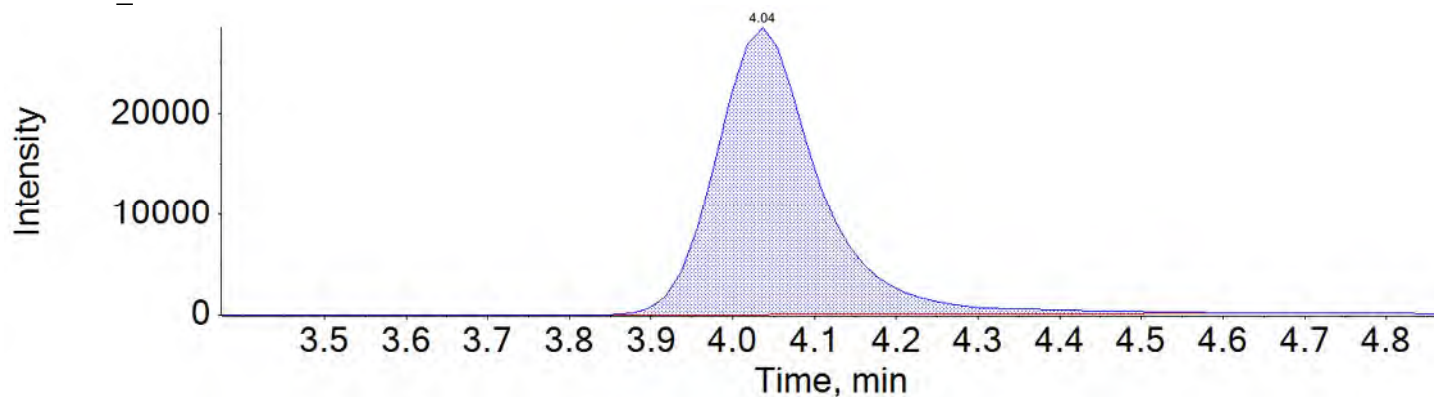
PFDoA\_2 613.0 / 319.0



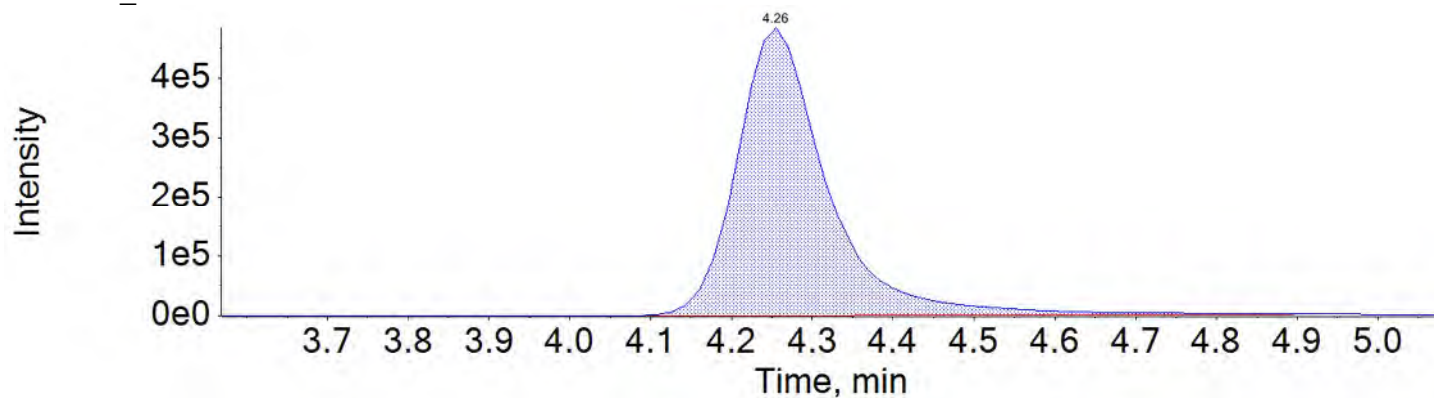
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

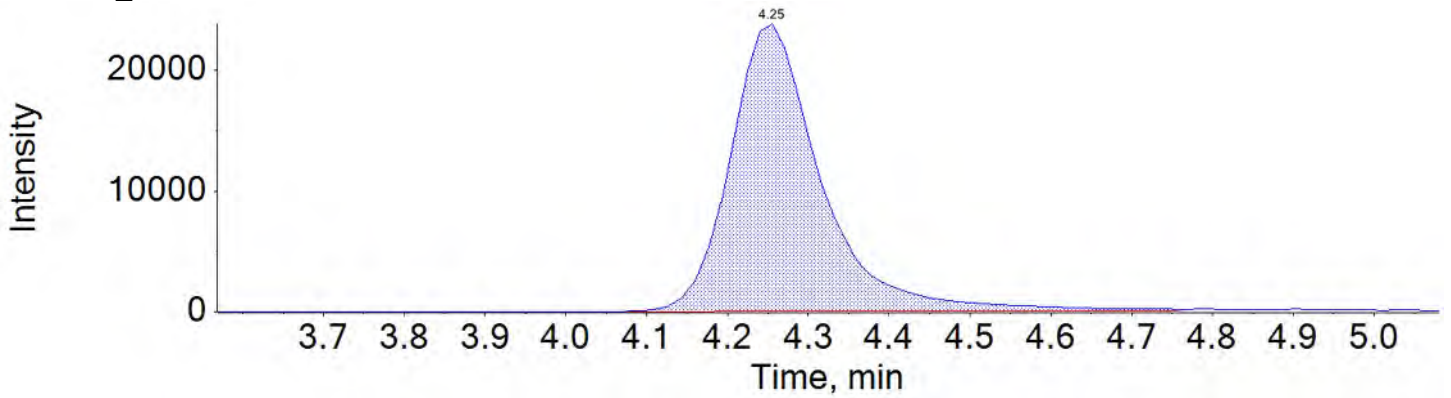


PFTTeDA\_1 713.0 / 669.0

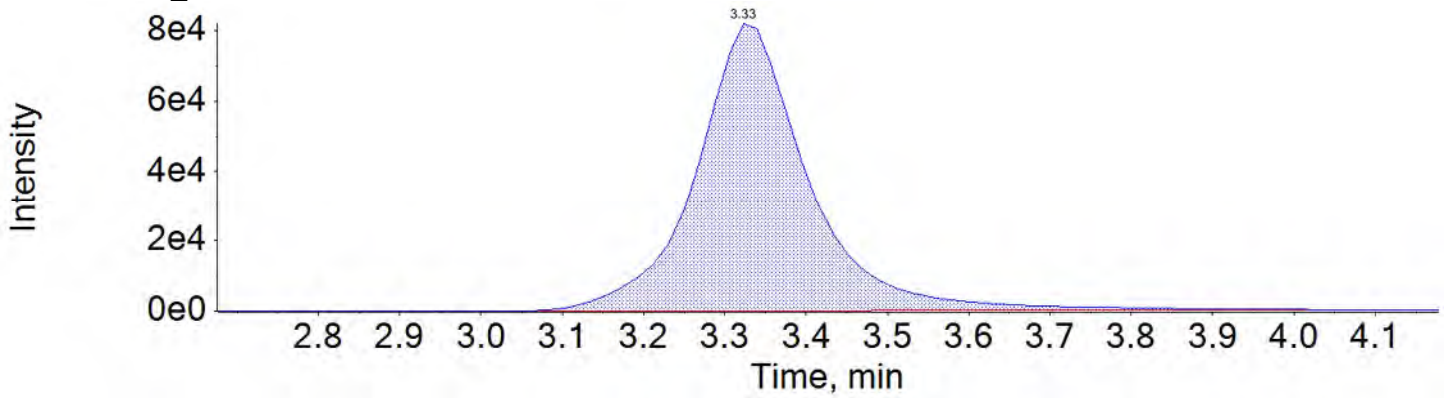




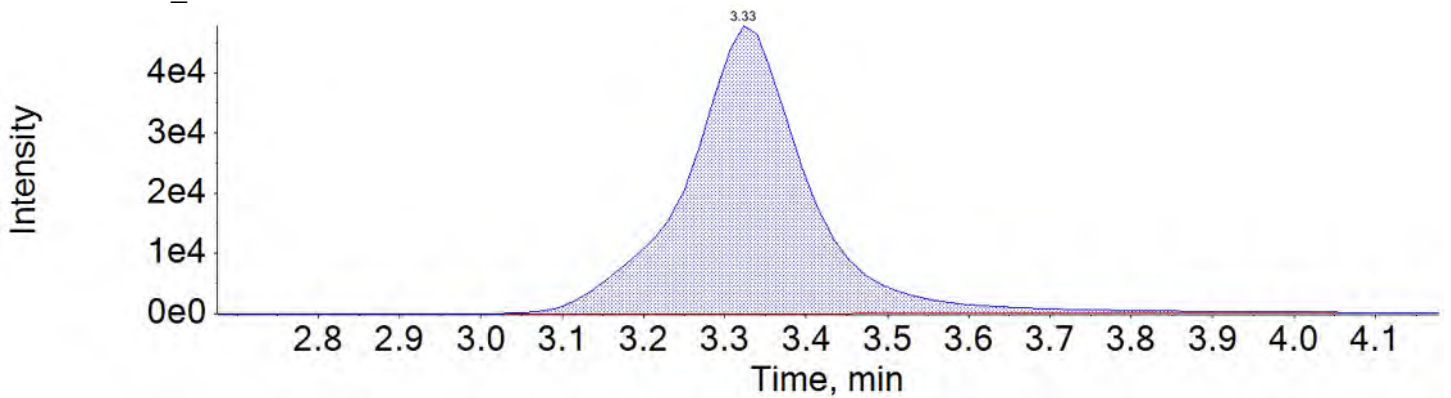
PFTeDA\_2 713.0 / 169.0



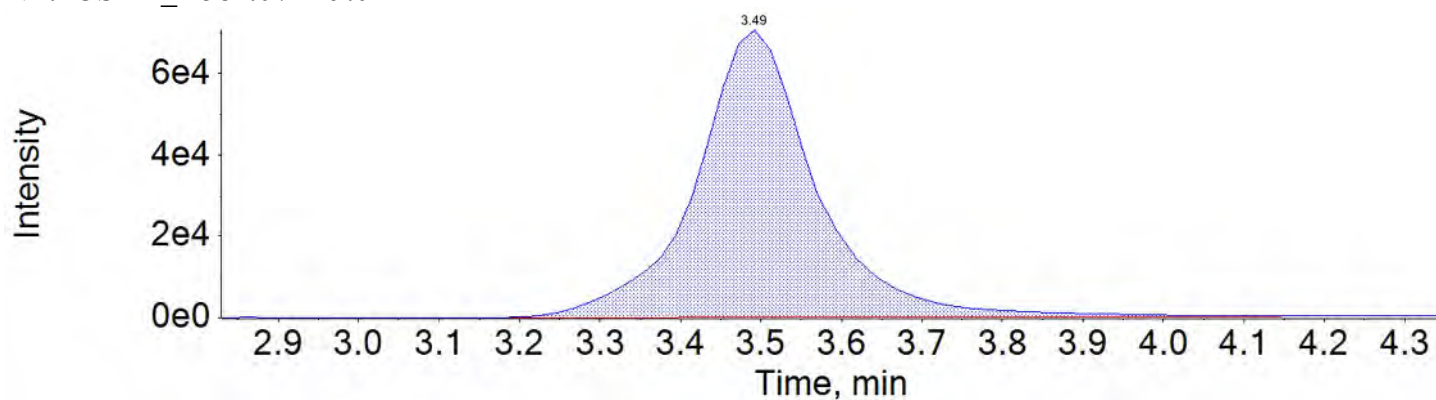
NMeFOSAA\_1 570.0 / 419.0



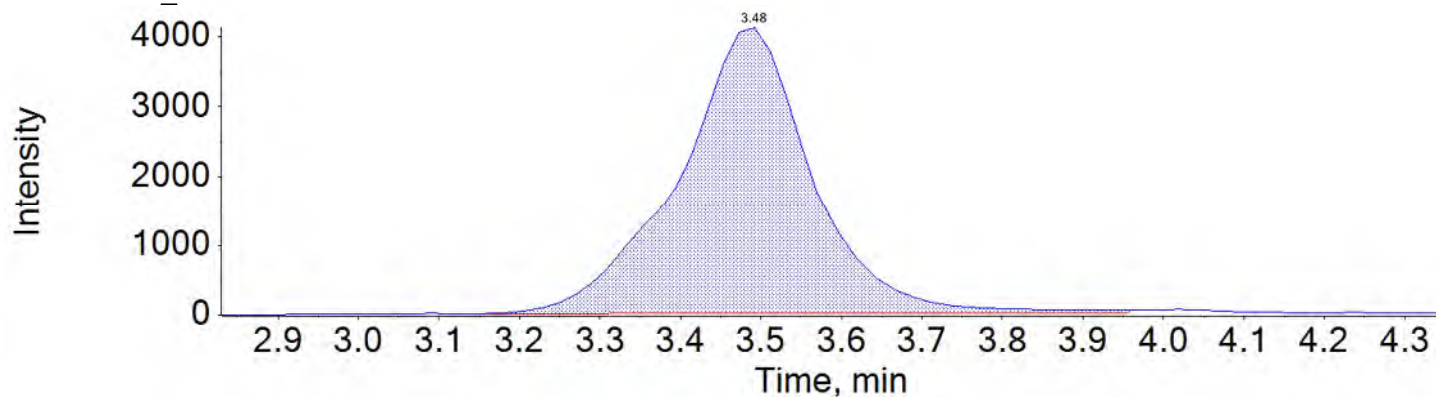
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



NEtFOSAA\_2 584.0 / 483.0

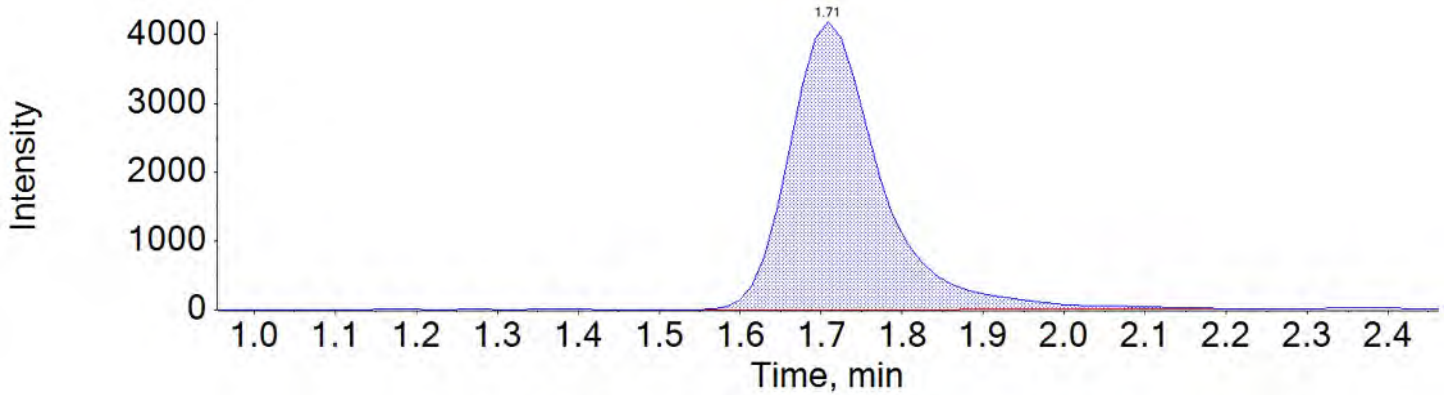




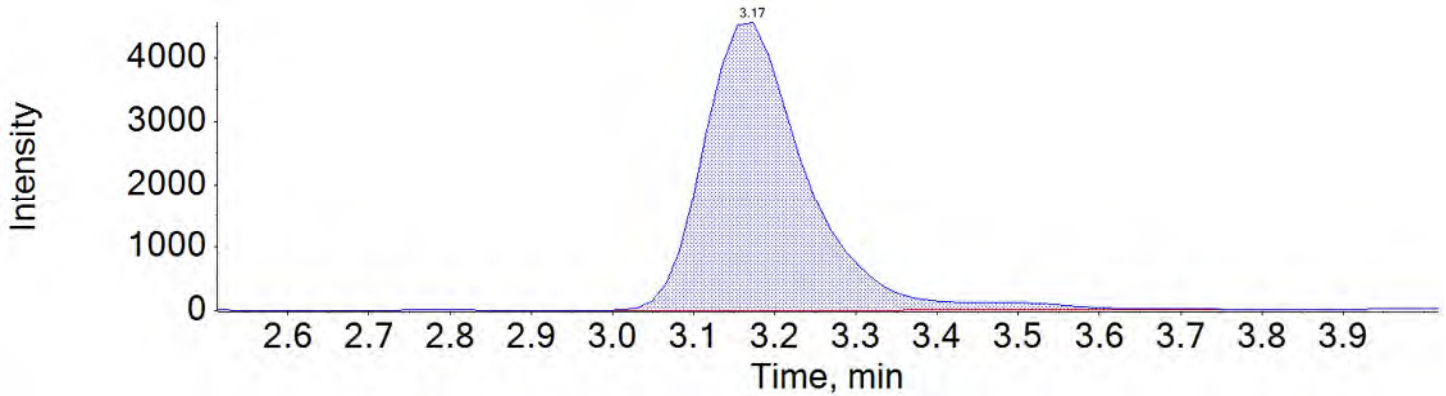
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms

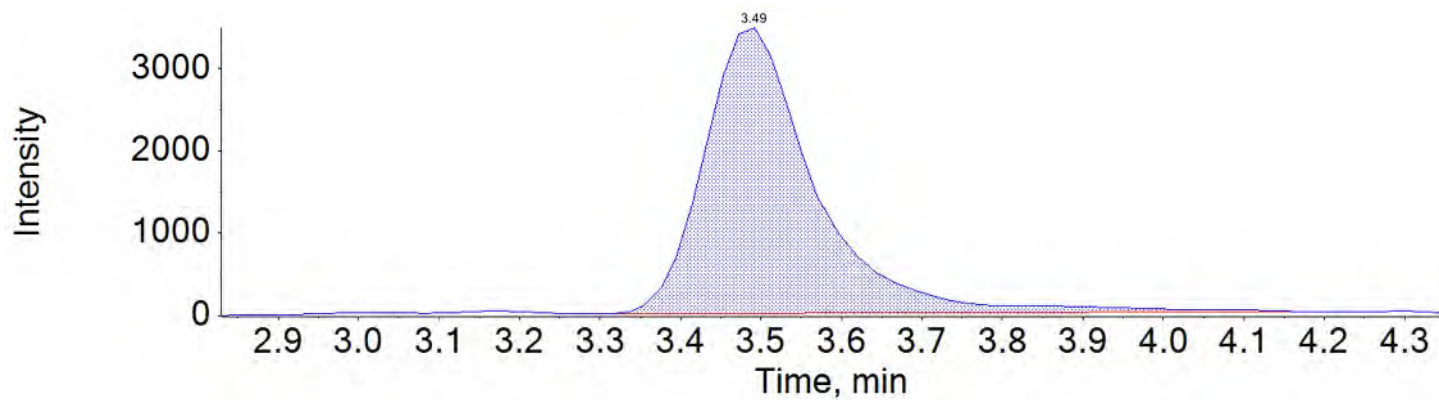
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0

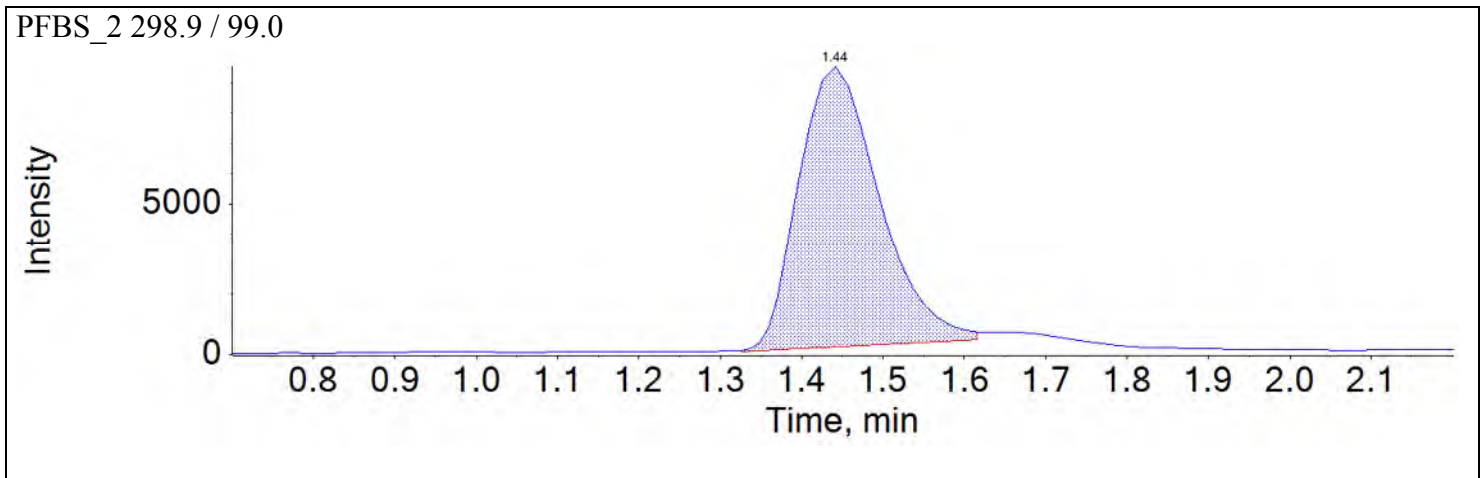
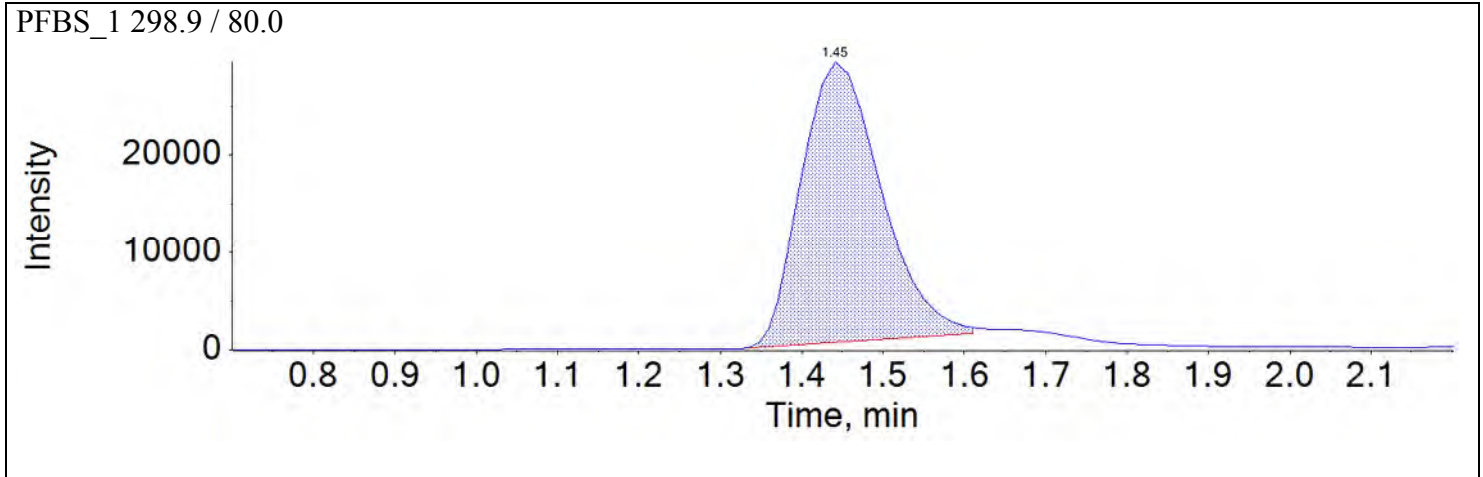


d5-EtFOSAA 589.0 / 419.0

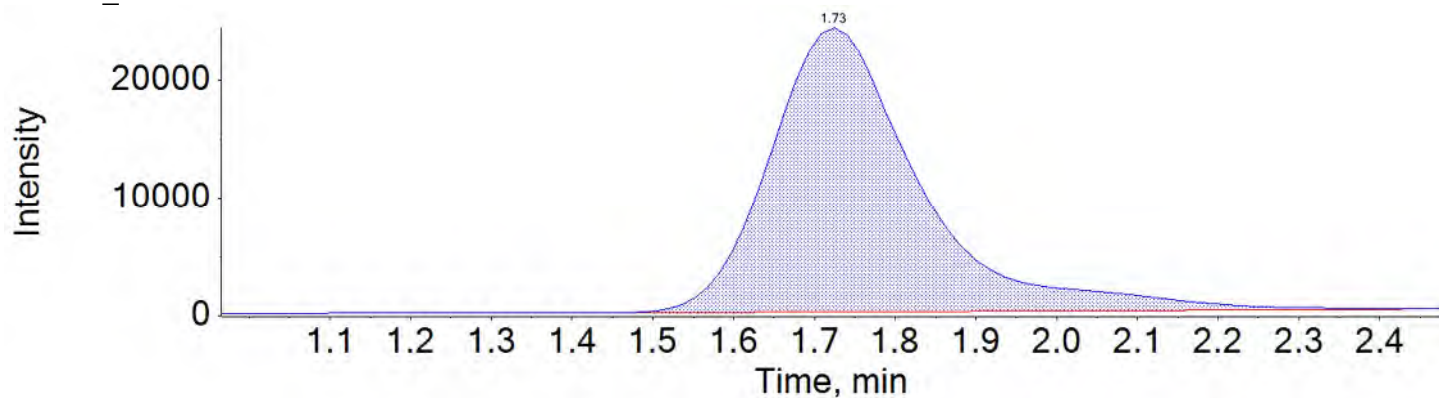


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

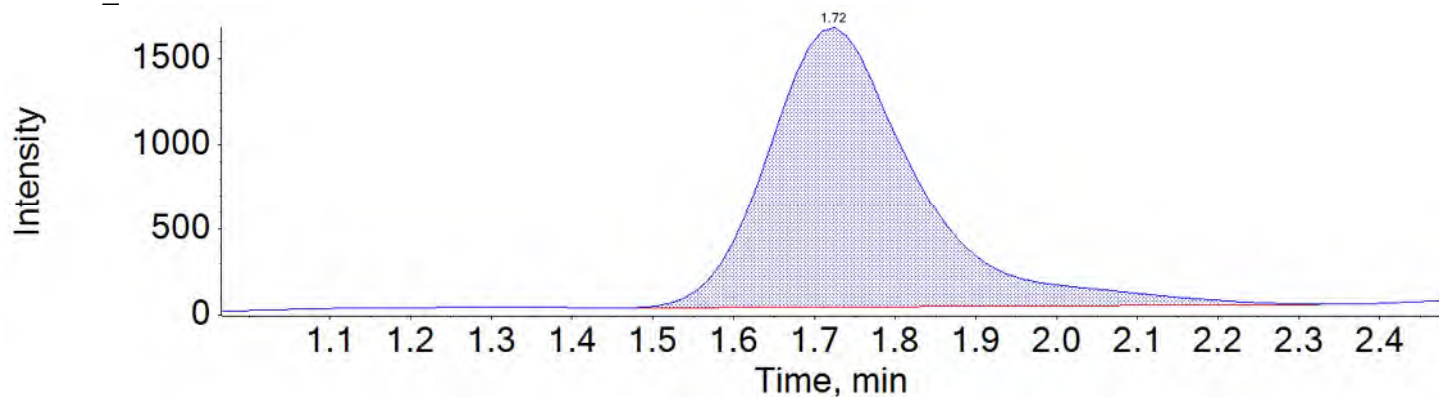
### Chromatograms



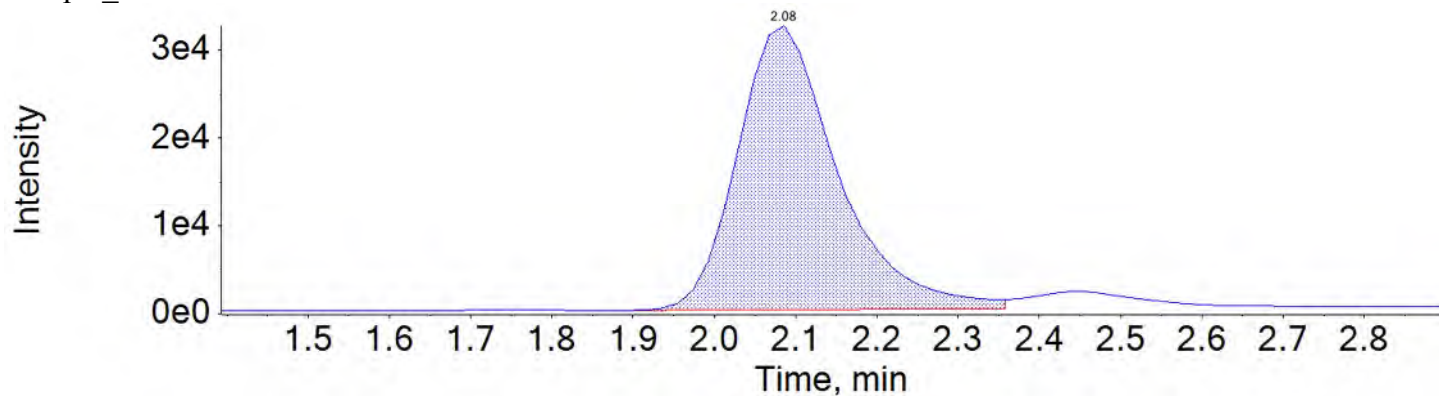
PFHxA\_1 313.0 / 269.0



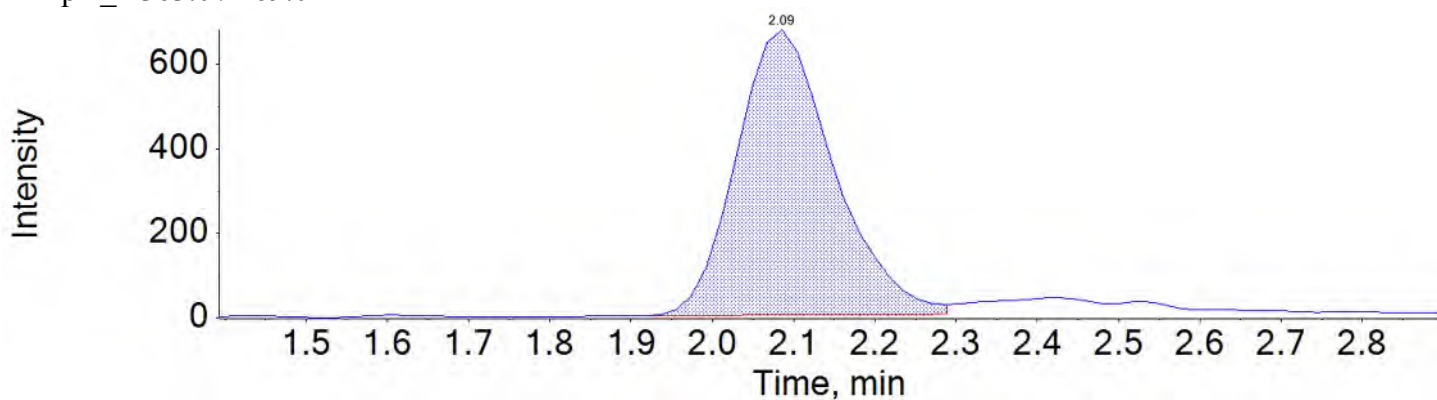
PFHxA\_2 313.0 / 119.0



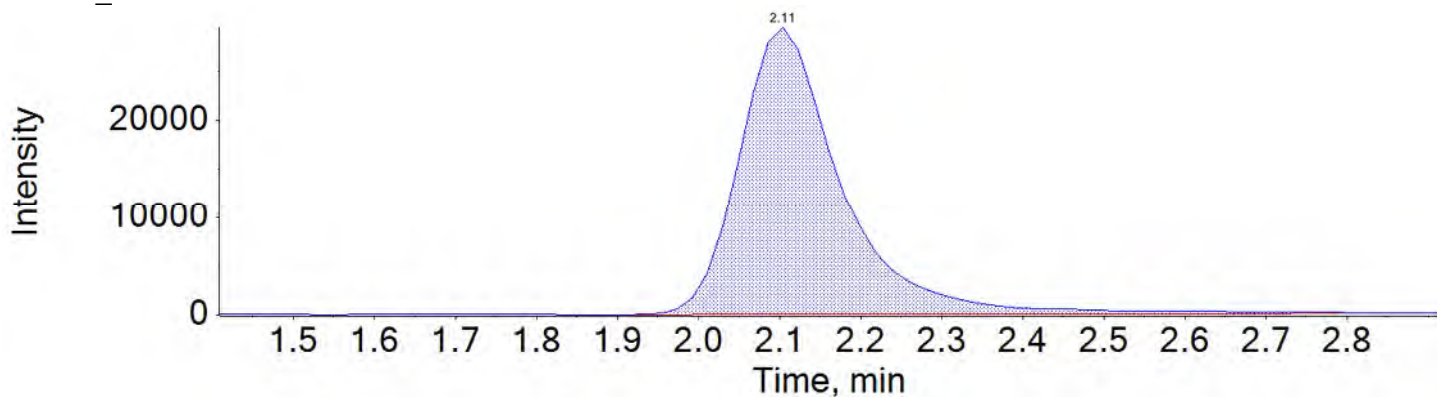
PFHpA\_1 363.0 / 319.0



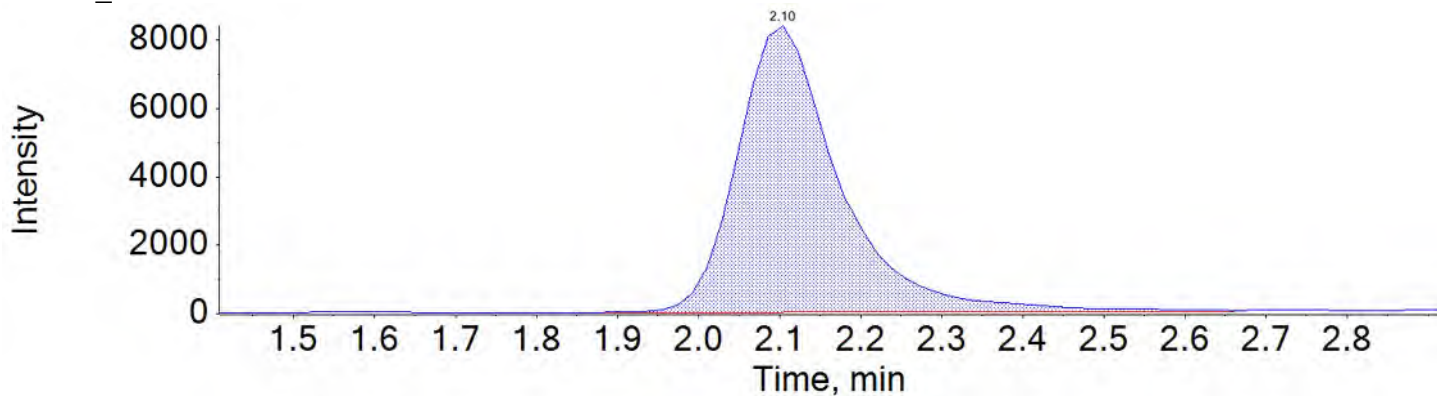
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

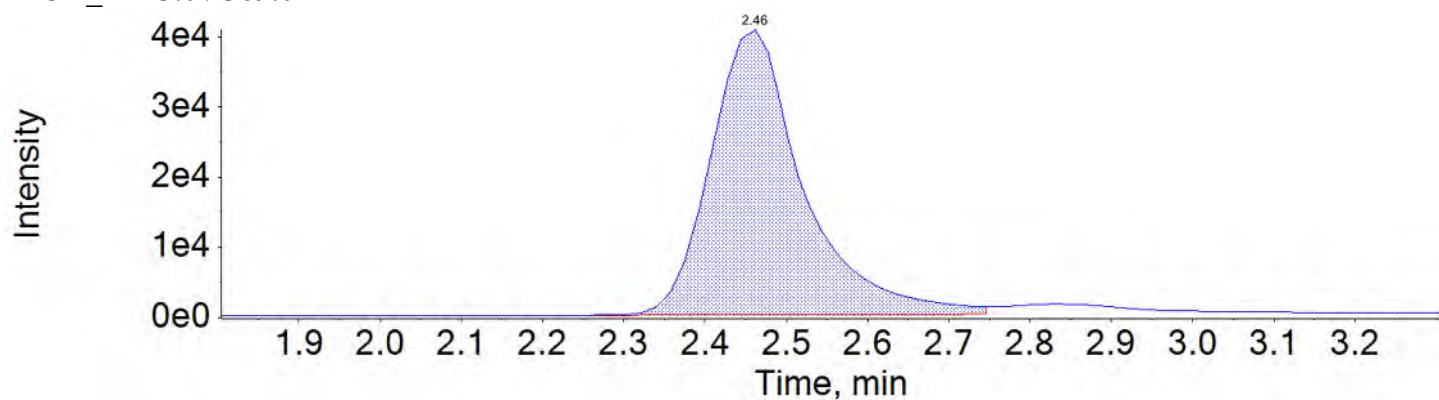


PFHxS\_2 399.0 / 99.0

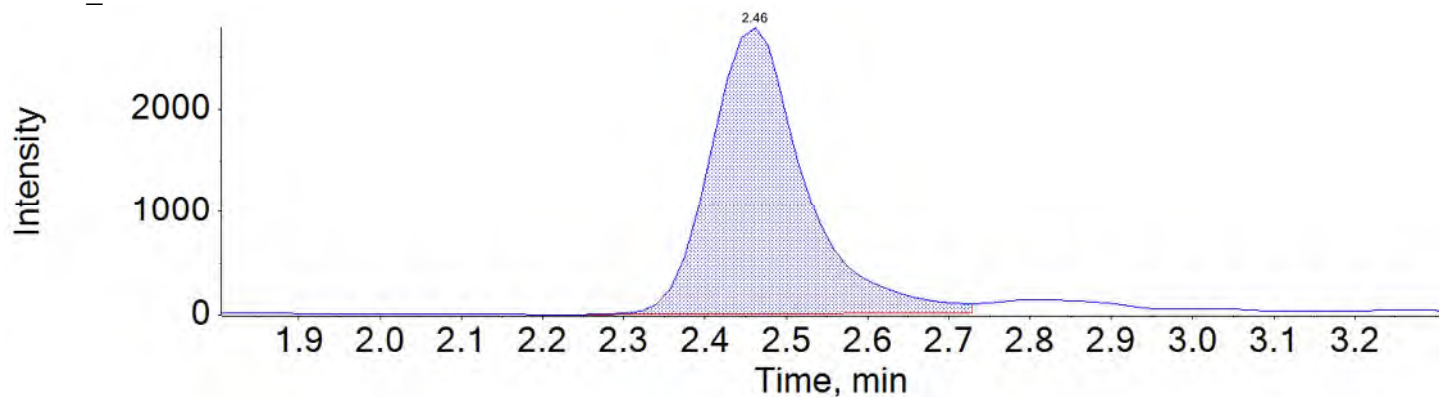




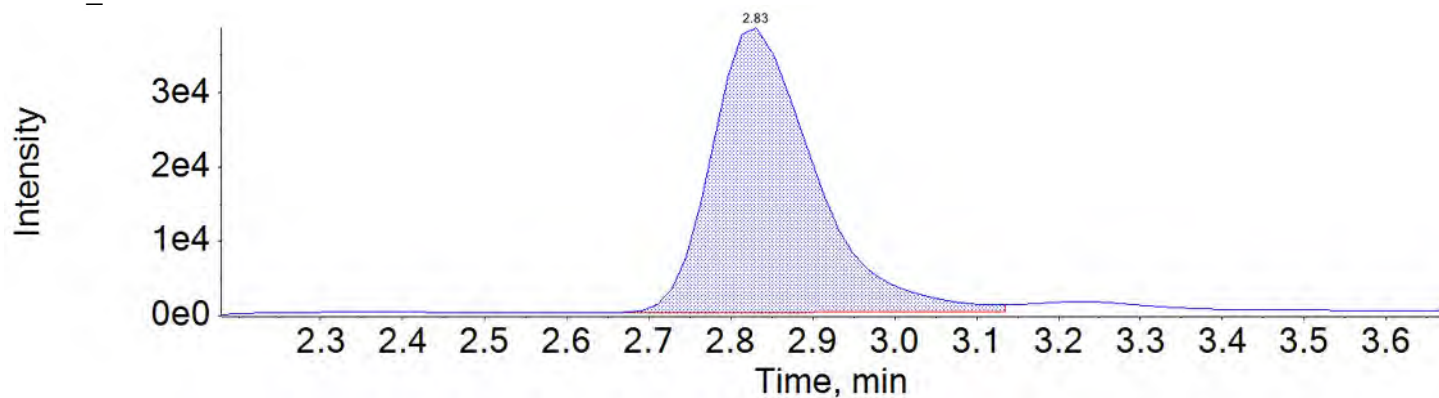
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

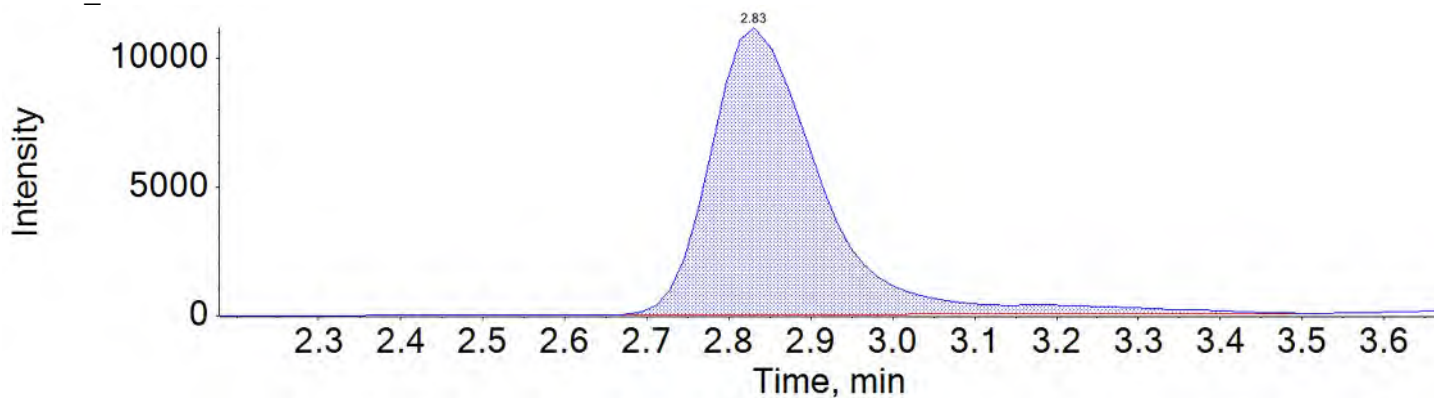


PFNA\_1 463.0 / 419.0

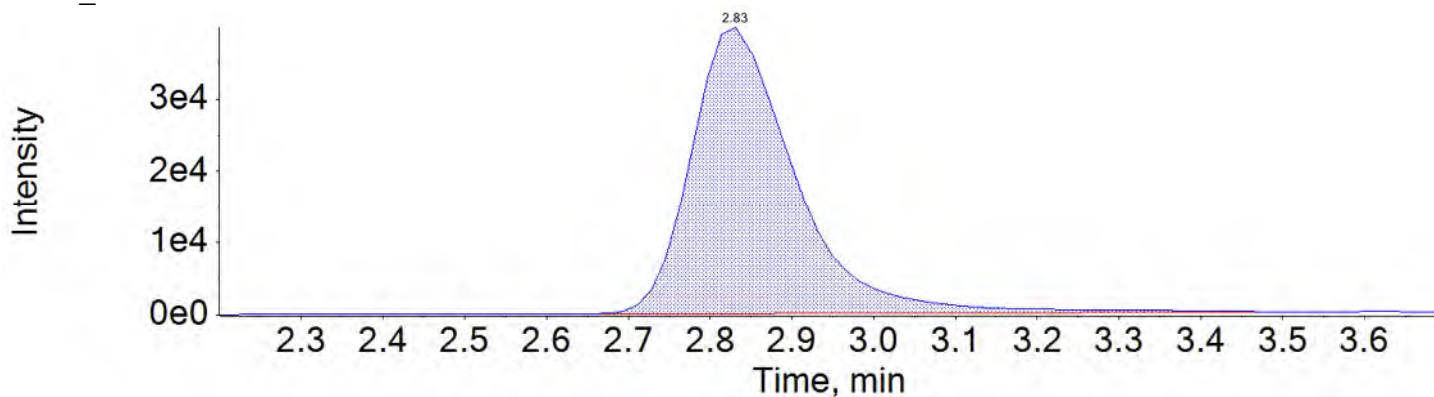




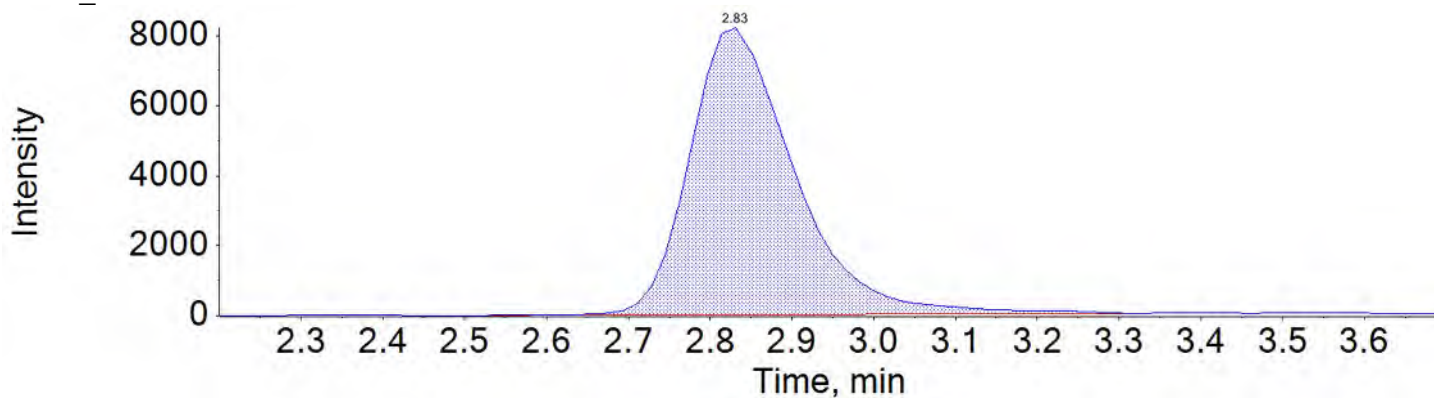
PFNA\_2 463.0 / 219.0



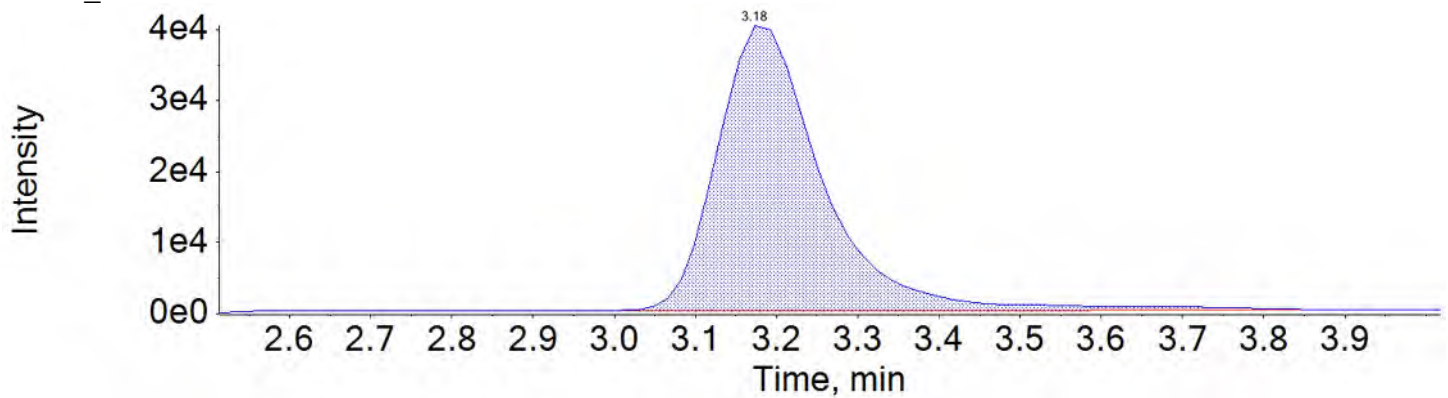
PFOS\_1 499.0 / 80.0



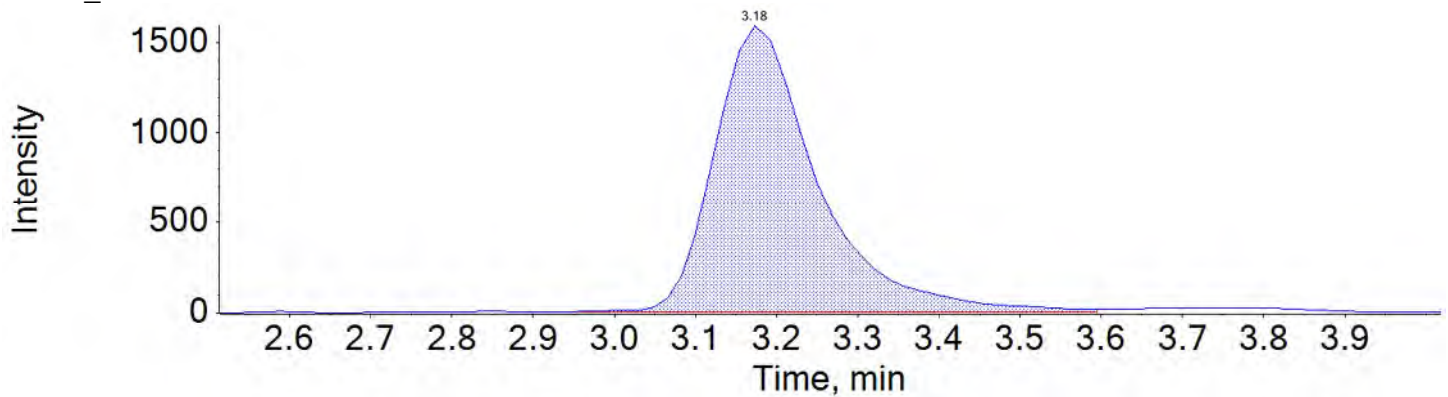
PFOS\_2 499.0 / 99.0



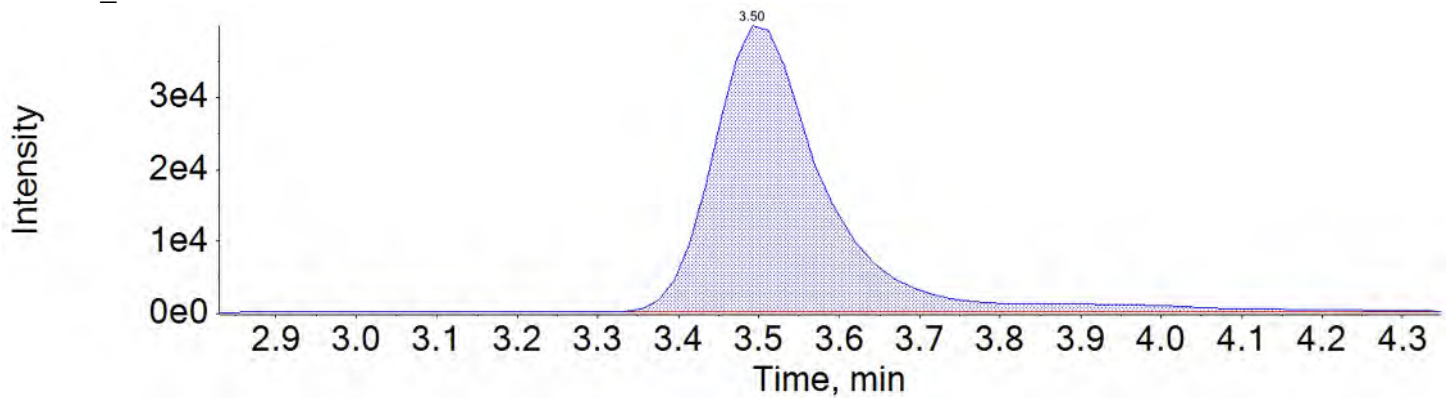
PFDA\_1 513.0 / 469.0



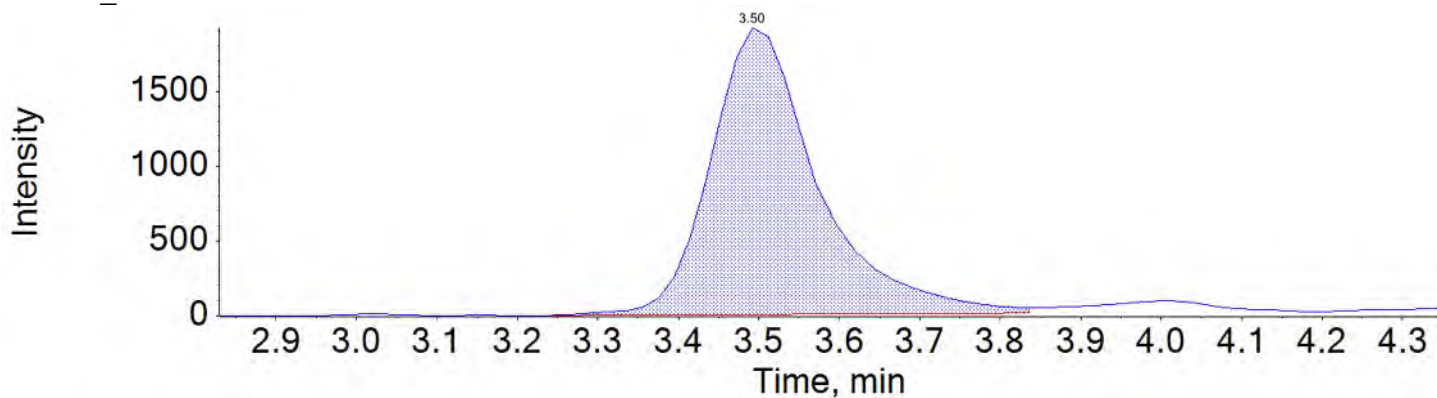
PFDA\_2 513.0 / 219.0



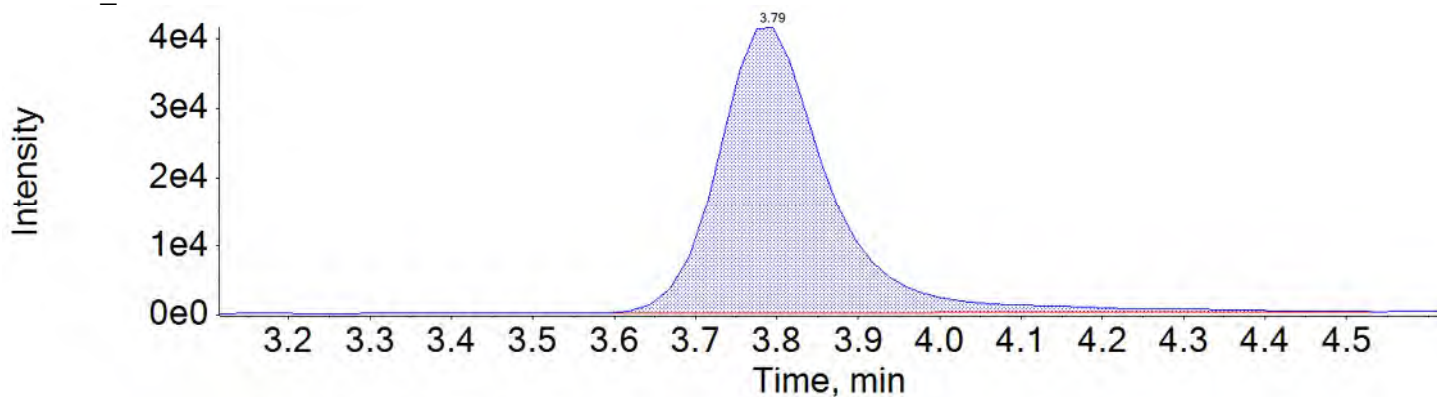
PFUnA\_1 563.0 / 519.0



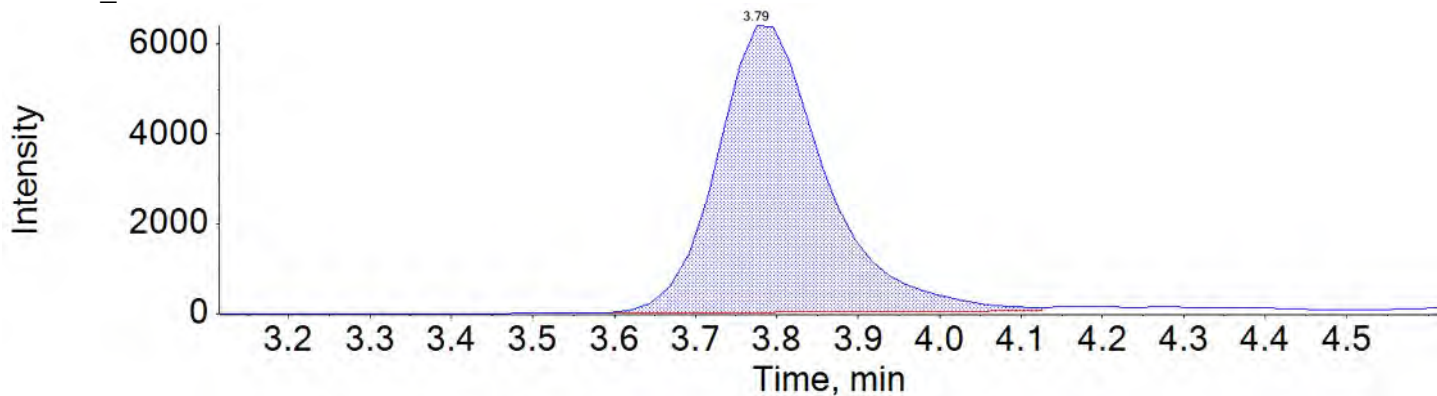
PUnA\_2 563.0 / 269.0



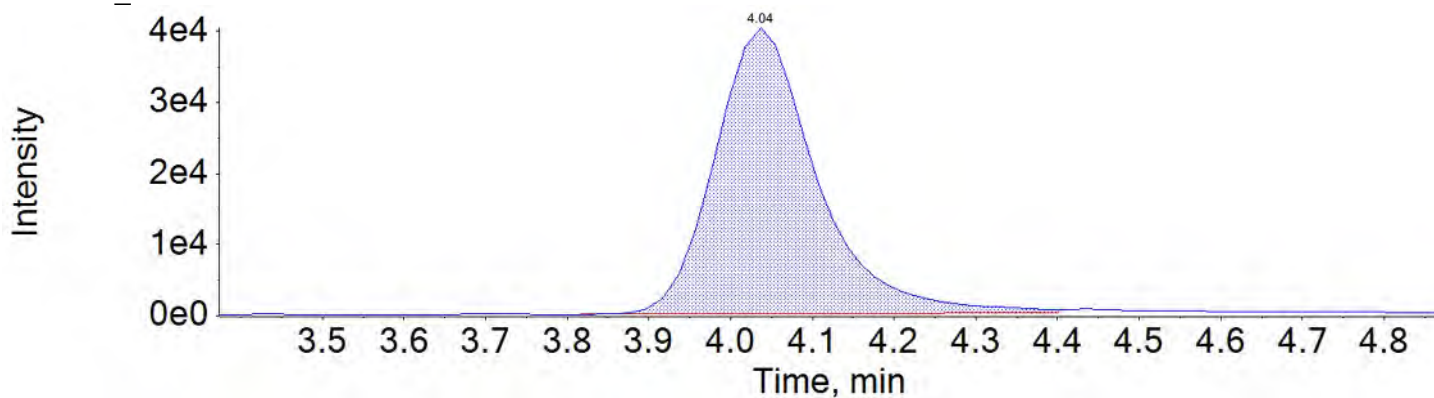
PDoA\_1 613.0 / 569.0



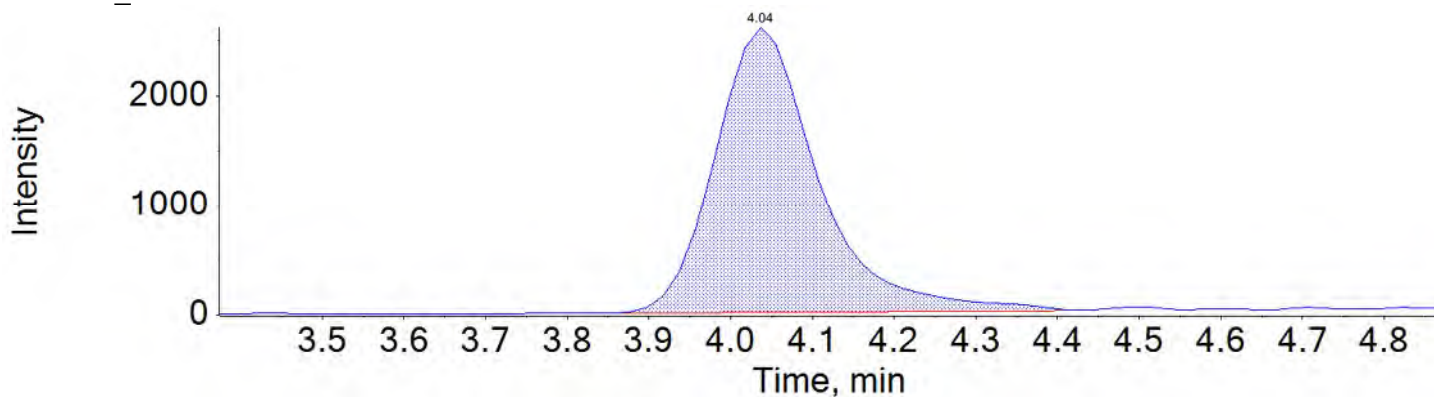
PDoA\_2 613.0 / 319.0



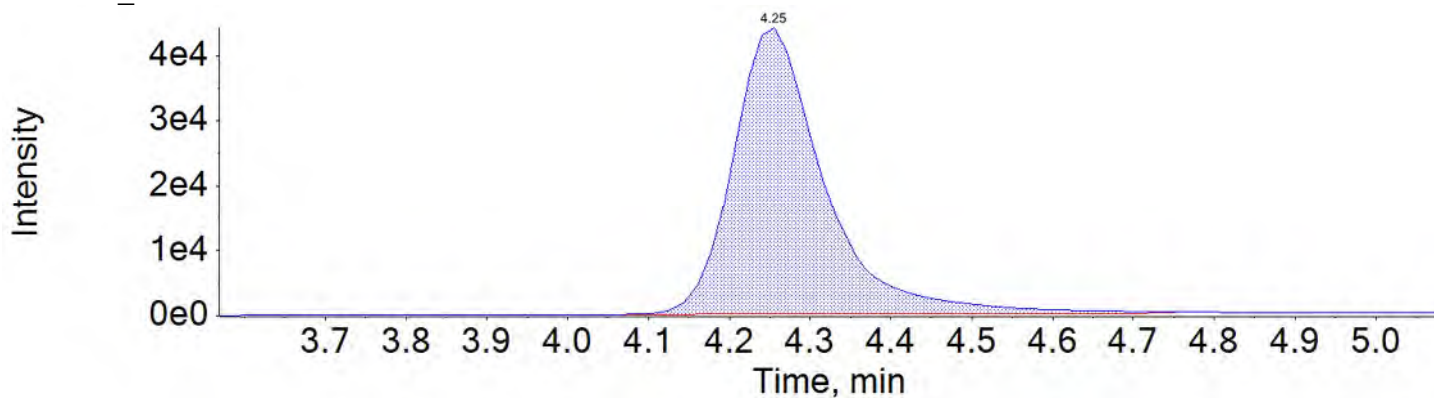
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

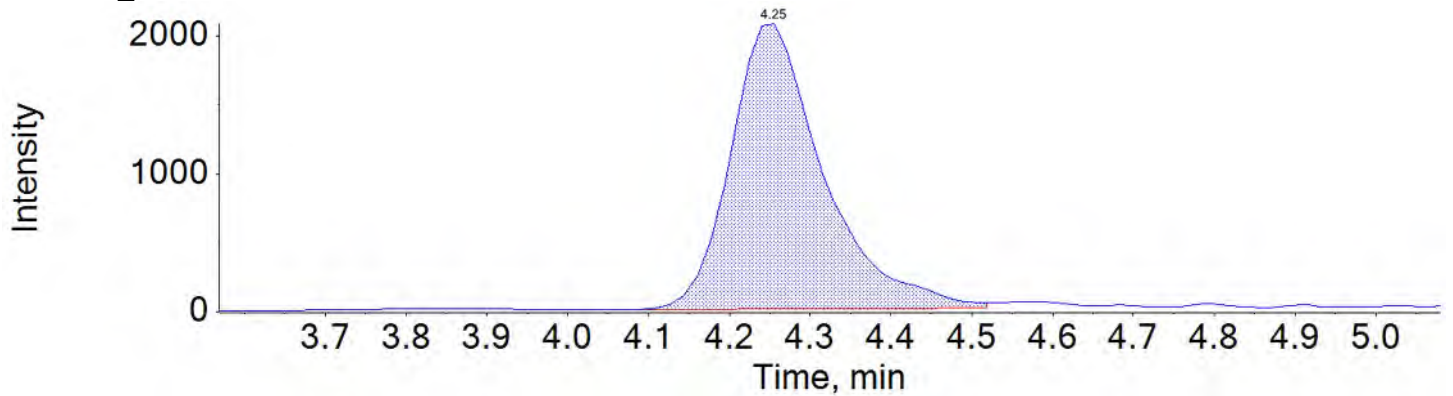


PFTTeDA\_1 713.0 / 669.0

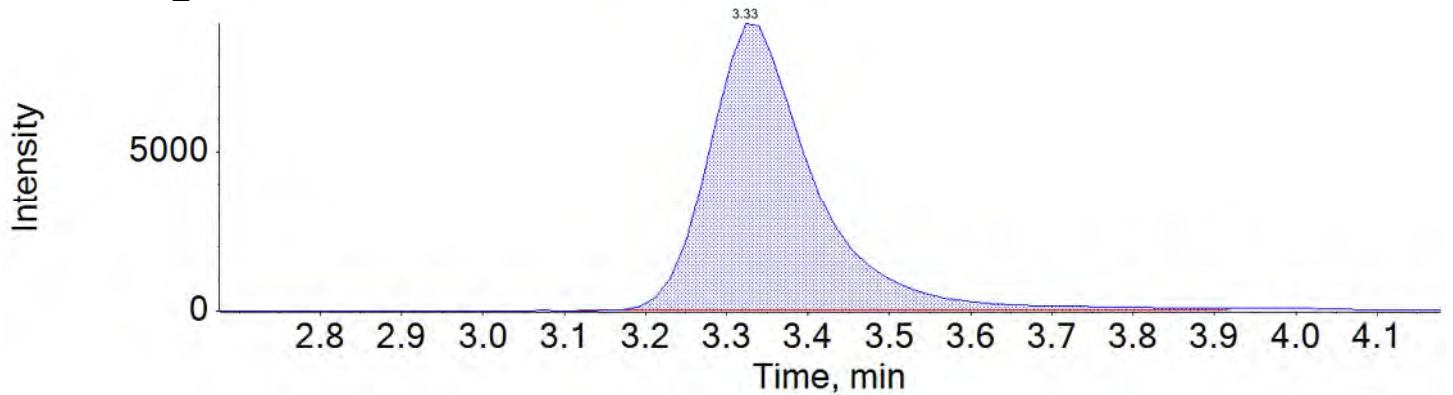




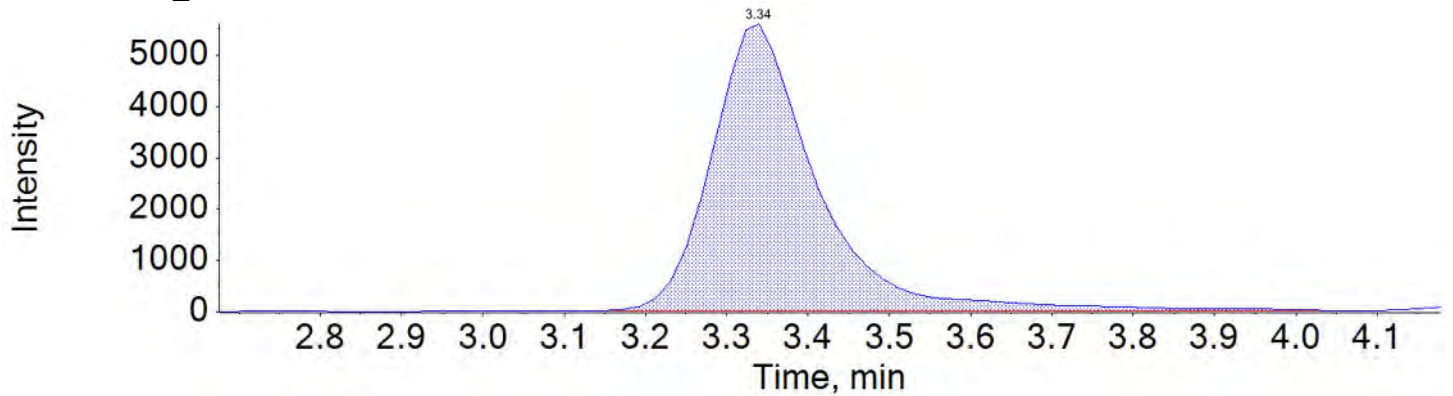
PFTeDA\_2 713.0 / 169.0



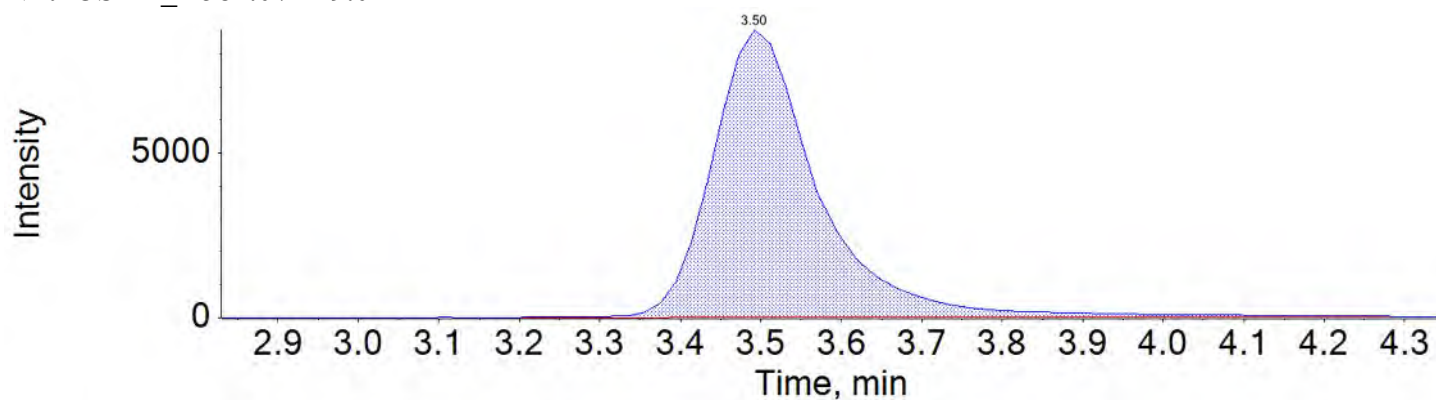
NMeFOSAA\_1 570.0 / 419.0



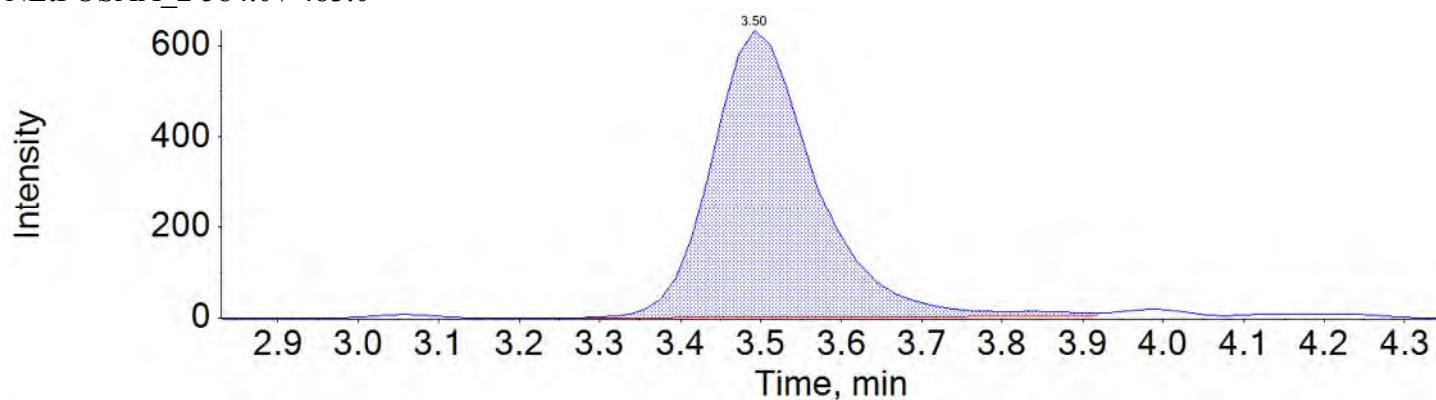
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



NEtFOSAA\_2 584.0 / 483.0

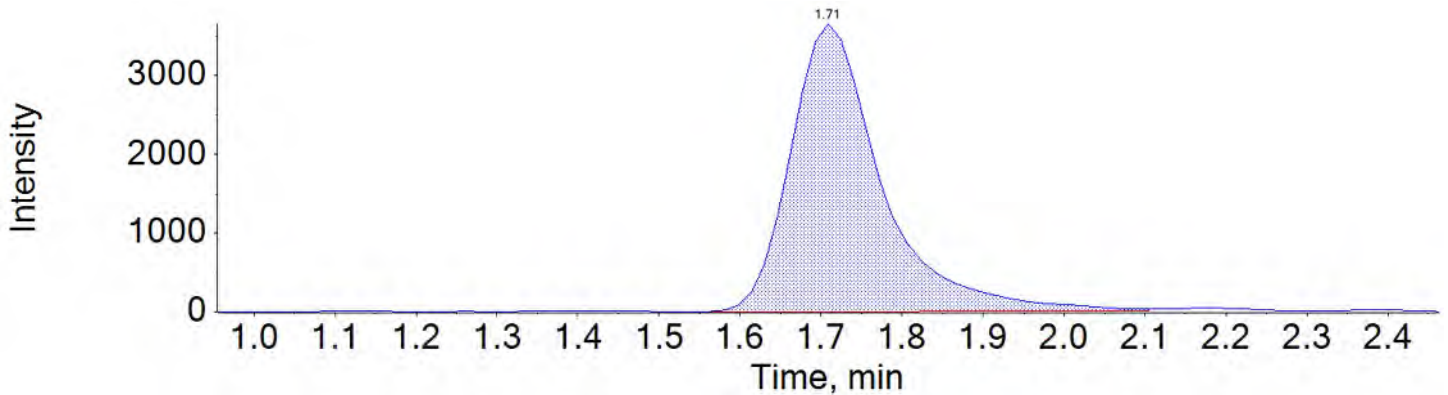




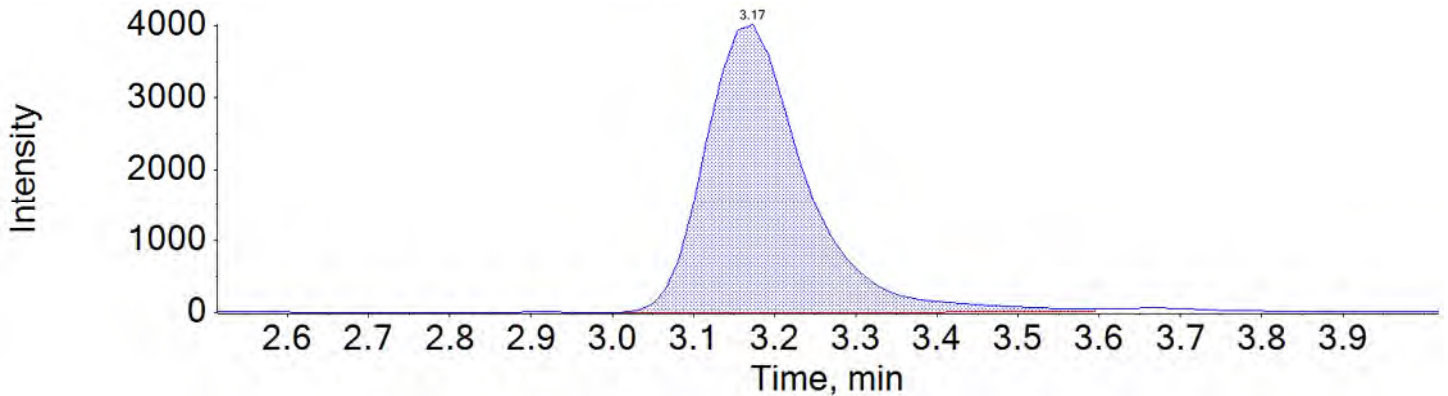
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

### Chromatograms

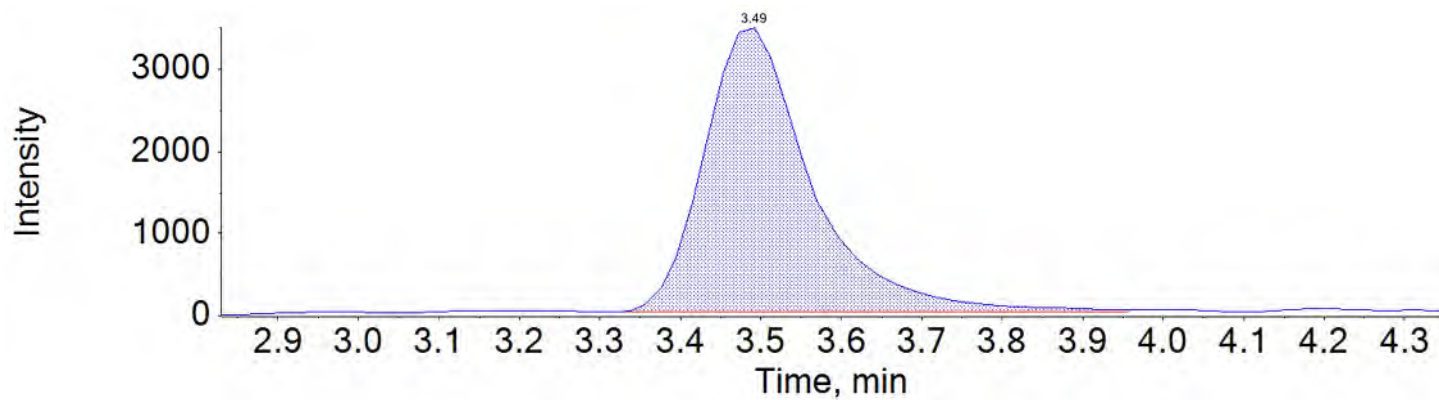
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0



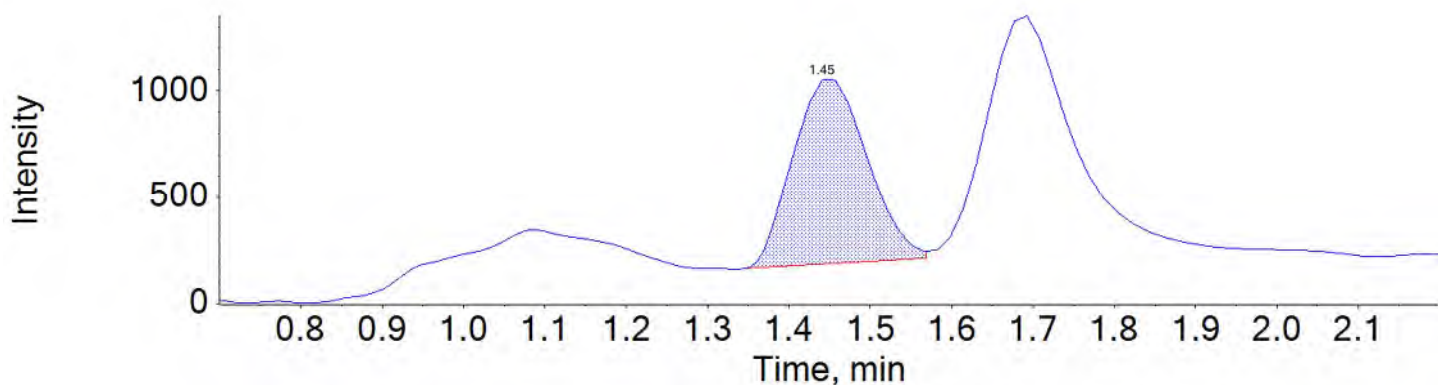
d5-EtFOSAA 589.0 / 419.0



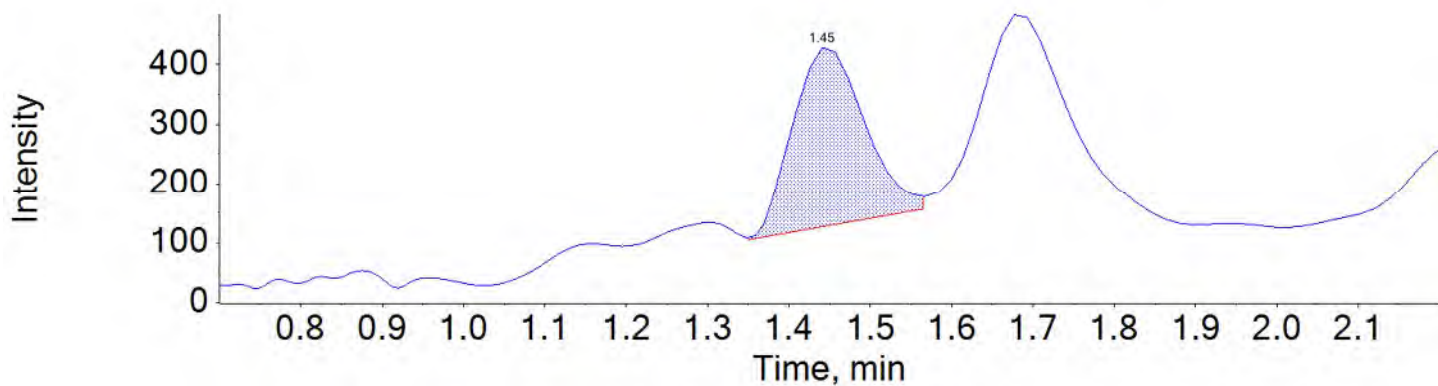
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | CQ753PB-FS(0)       | Injection Vial   | 12           |
| Sample ID          | Procedural Blank    | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:05:20 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

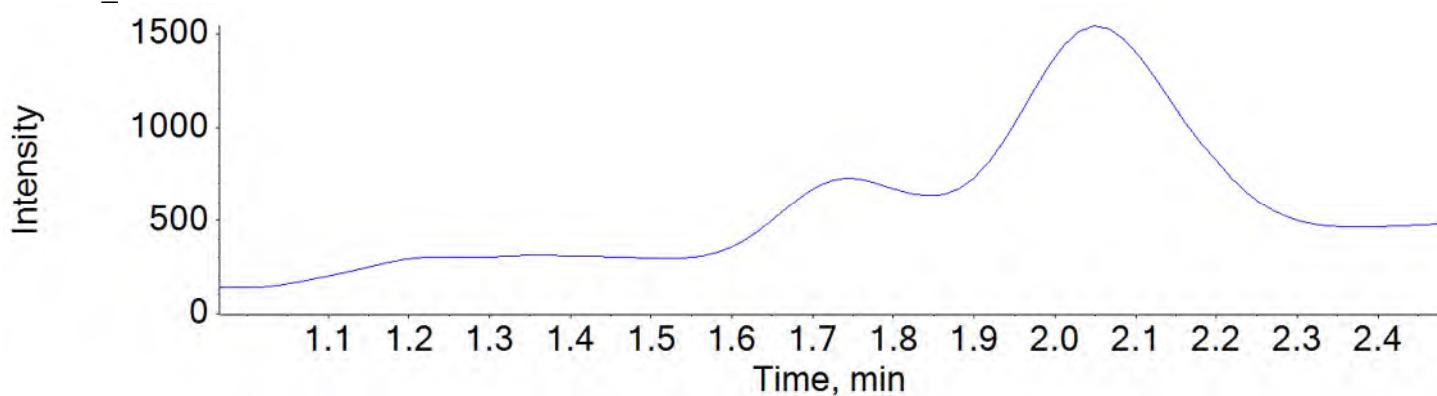
PFBS\_1 298.9 / 80.0



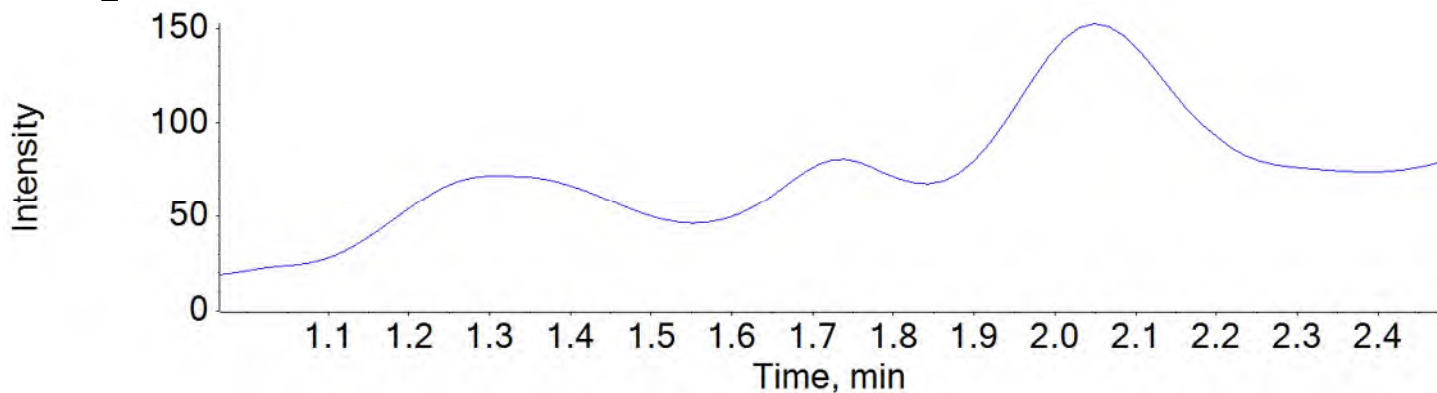
PFBS\_2 298.9 / 99.0



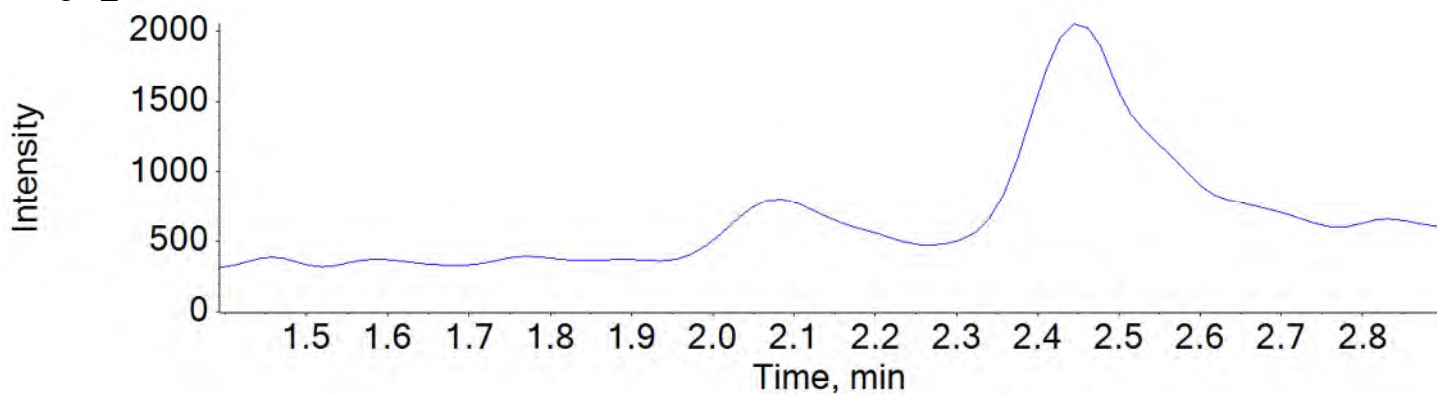
PFHxA\_1 313.0 / 269.0



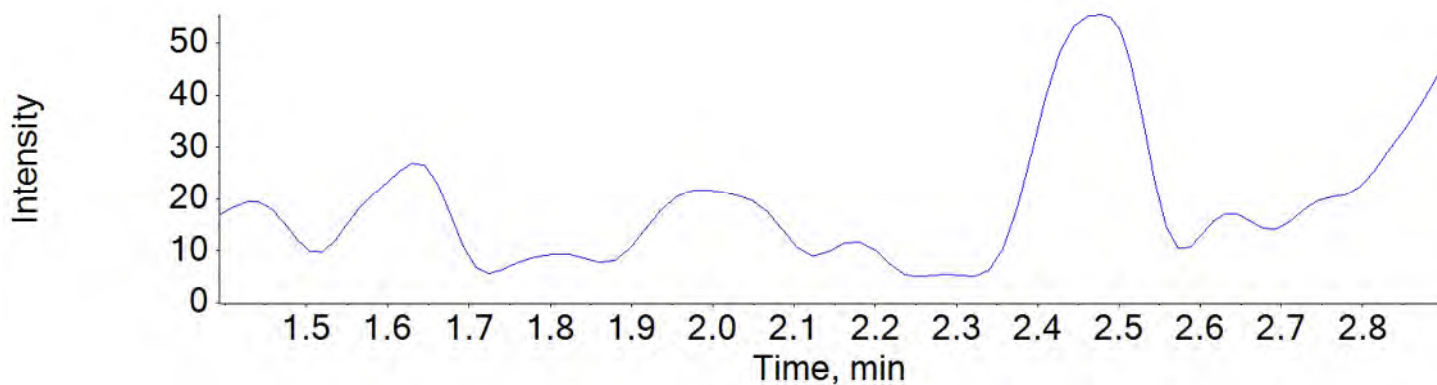
PFHxA\_2 313.0 / 119.0



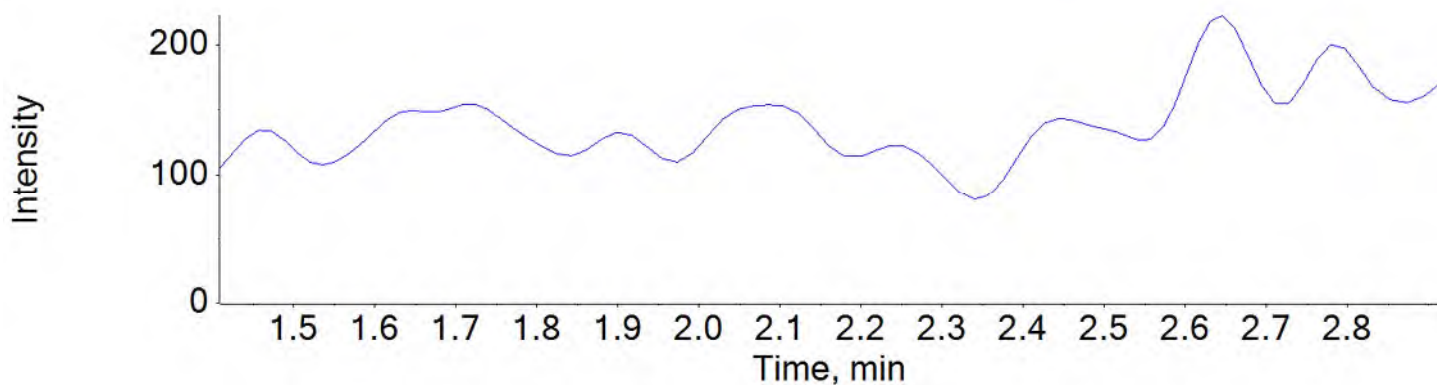
PFHpA\_1 363.0 / 319.0



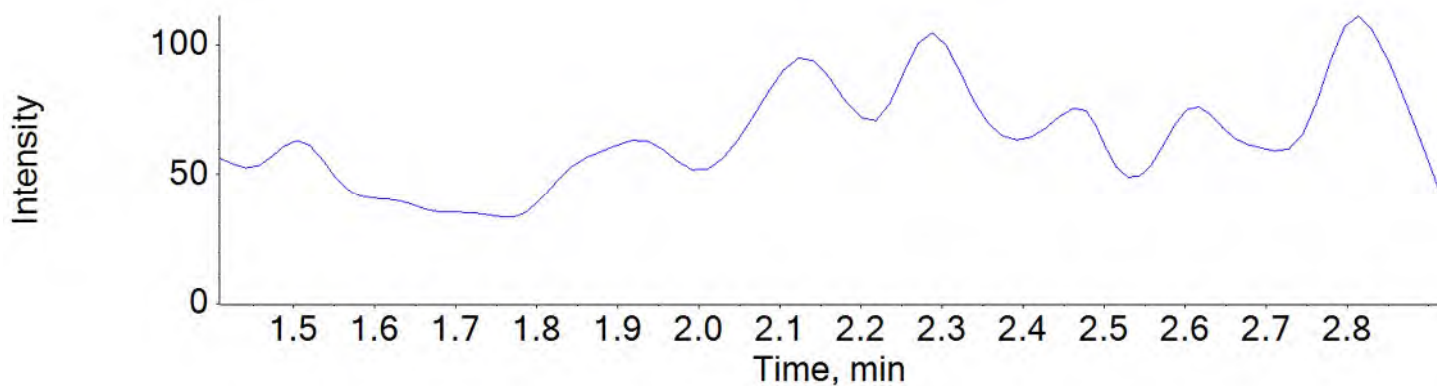
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

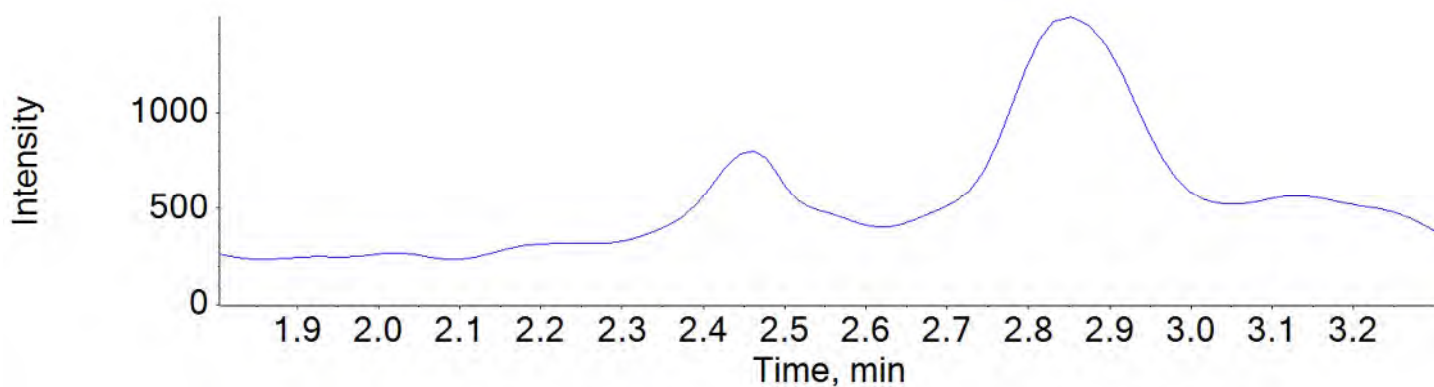


PFHxS\_2 399.0 / 99.0

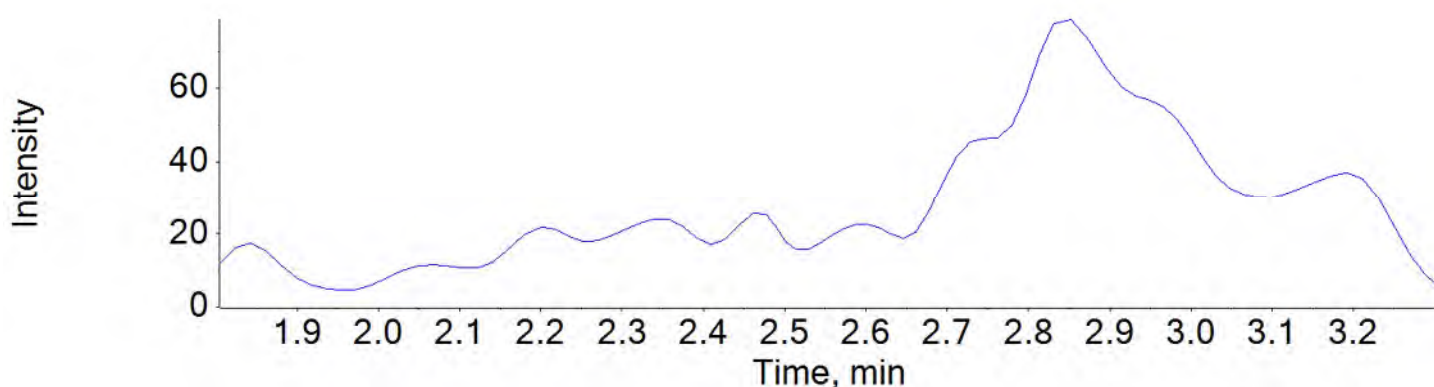




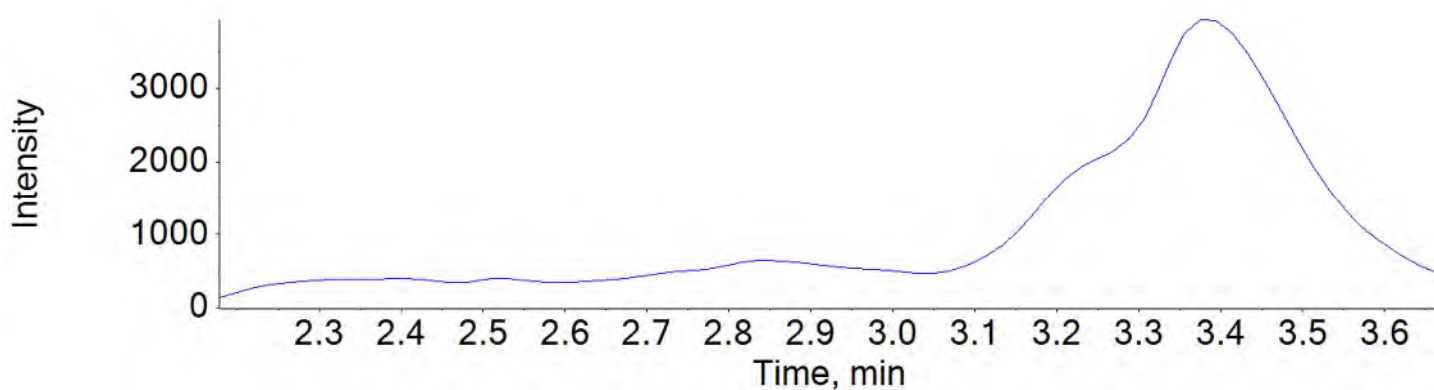
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

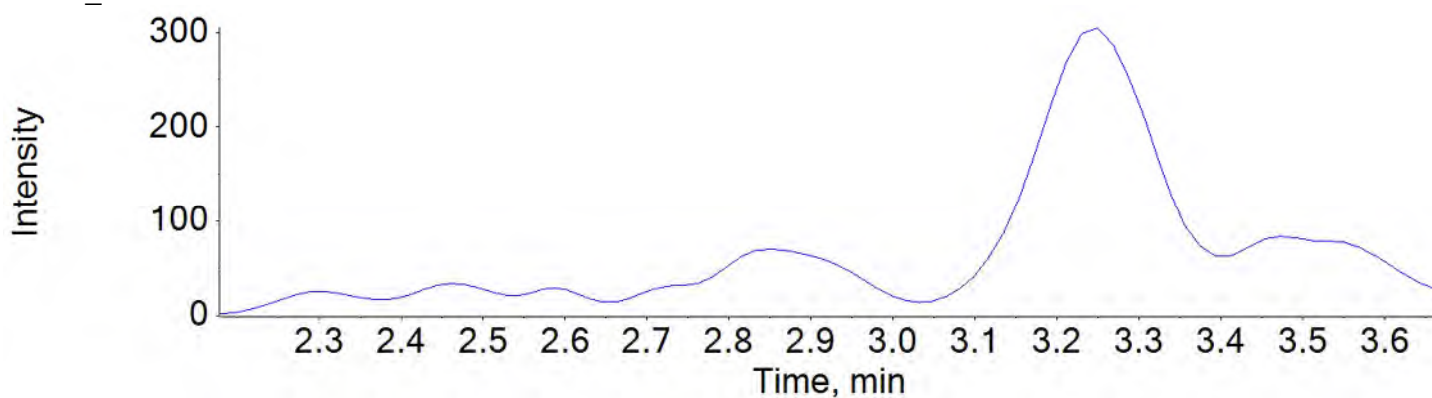


PFNA\_1 463.0 / 419.0

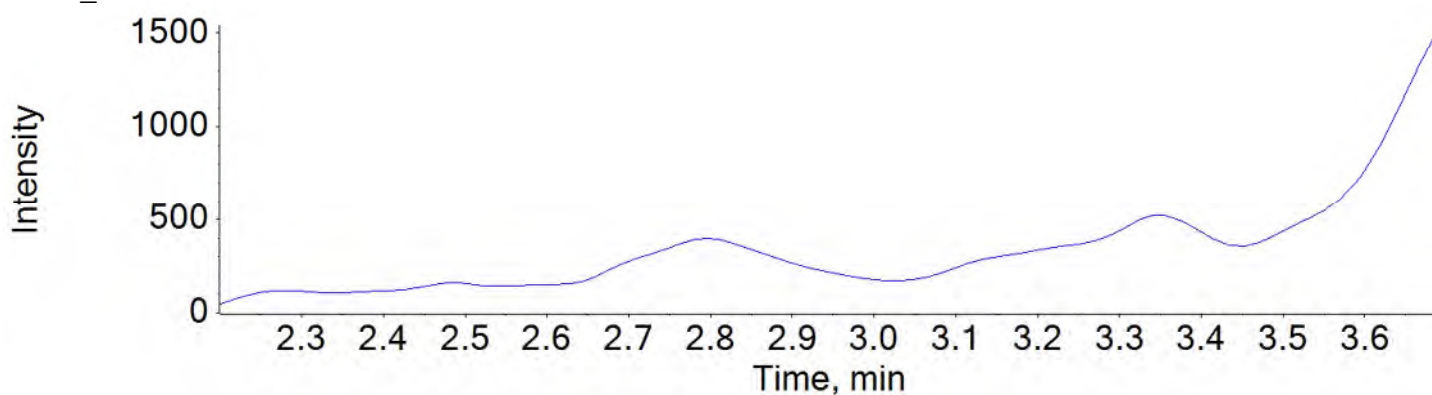




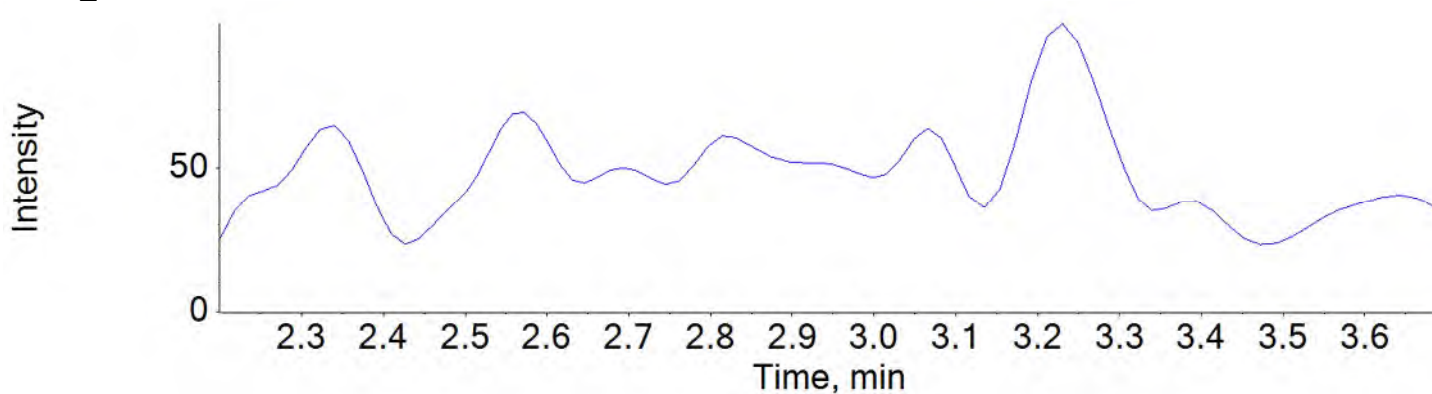
PFNA\_2 463.0 / 219.0



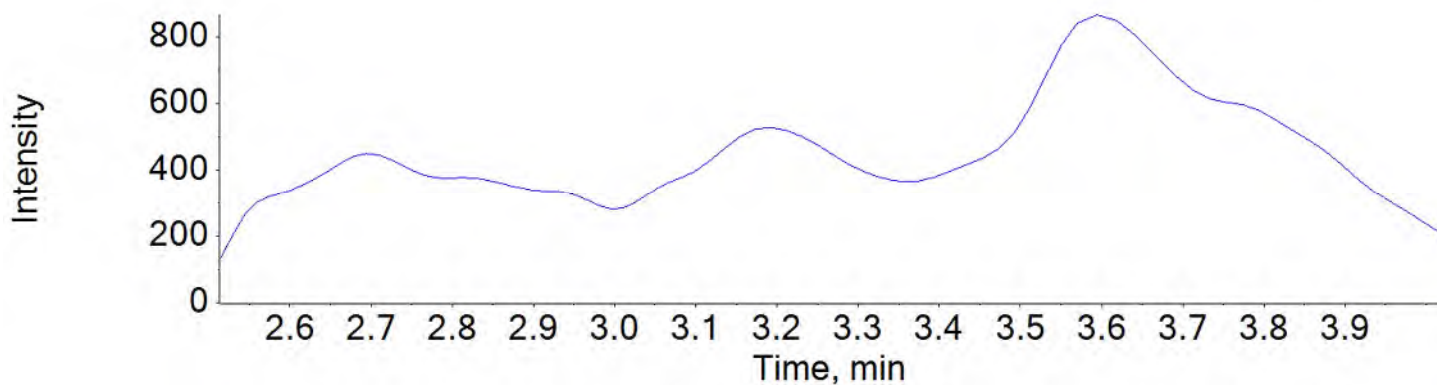
PFOS\_1 499.0 / 80.0



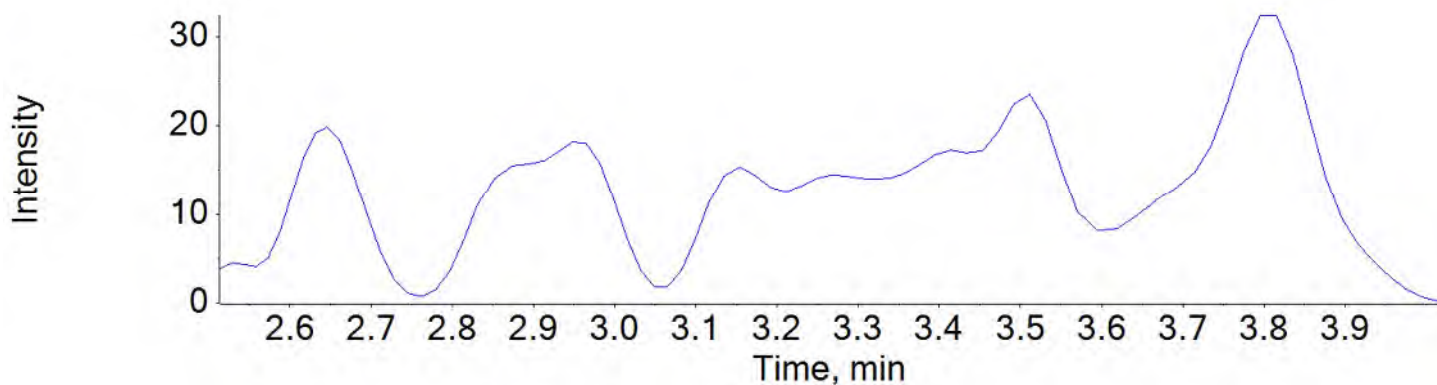
PFOS\_2 499.0 / 99.0



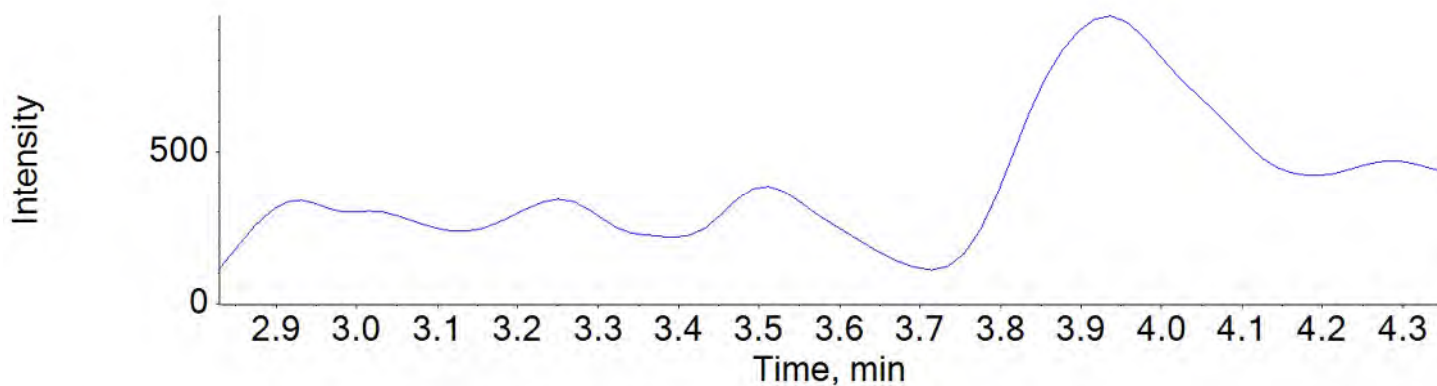
PFDA\_1 513.0 / 469.0



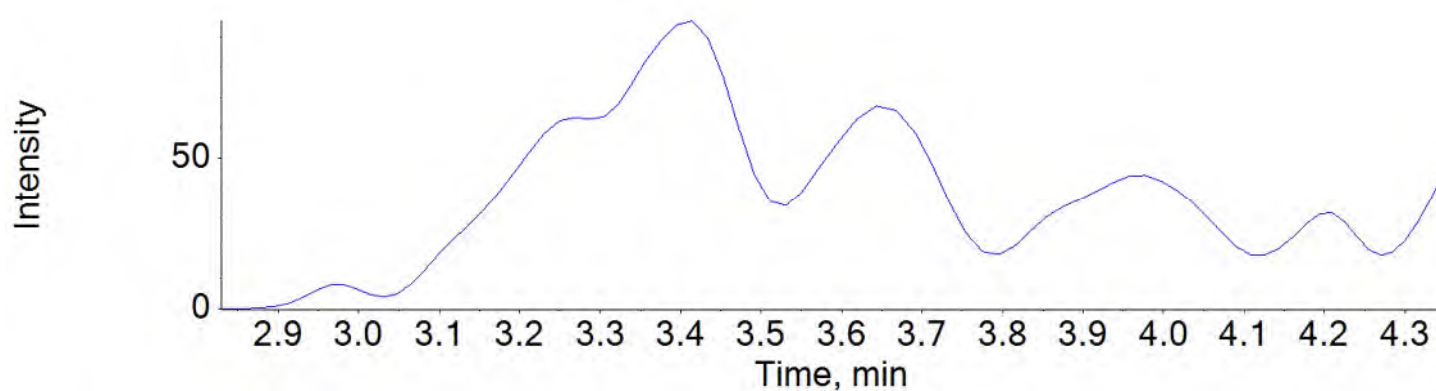
PFDA\_2 513.0 / 219.0



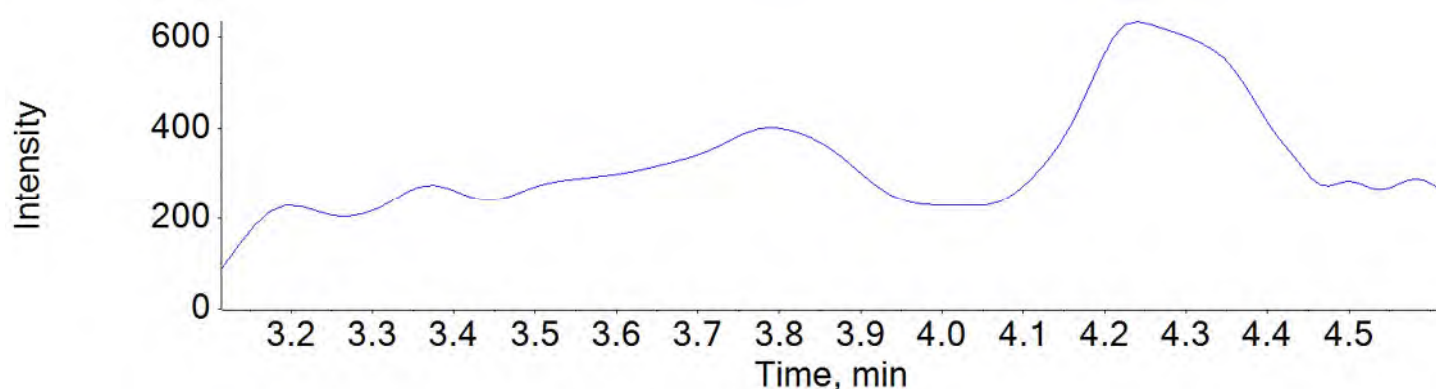
PFUnA\_1 563.0 / 519.0



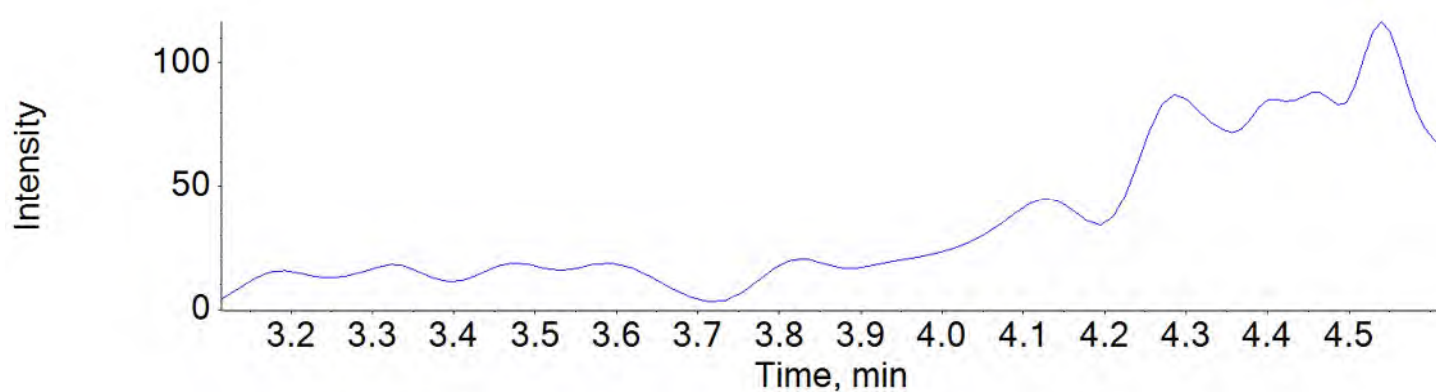
PFUnA\_2 563.0 / 269.0



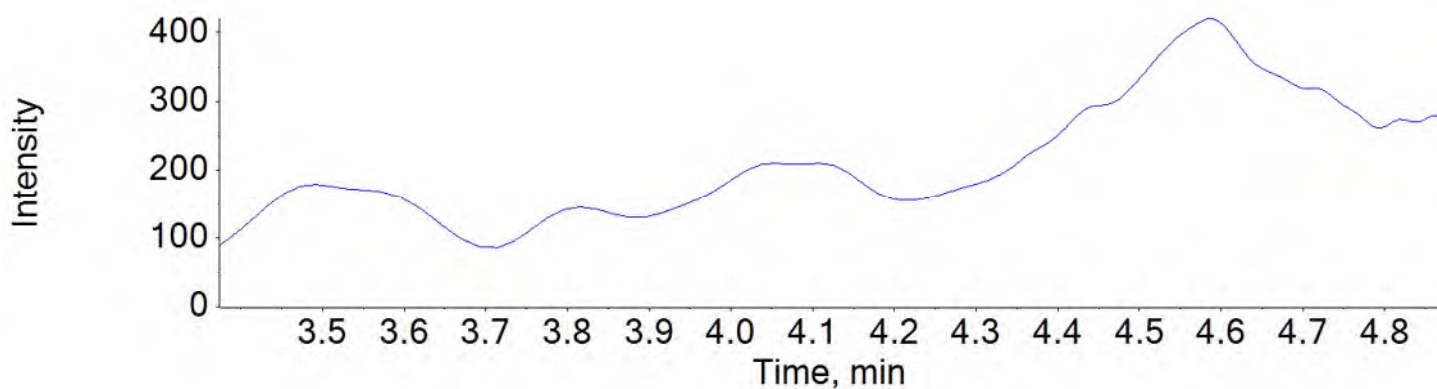
PFDaA\_1 613.0 / 569.0



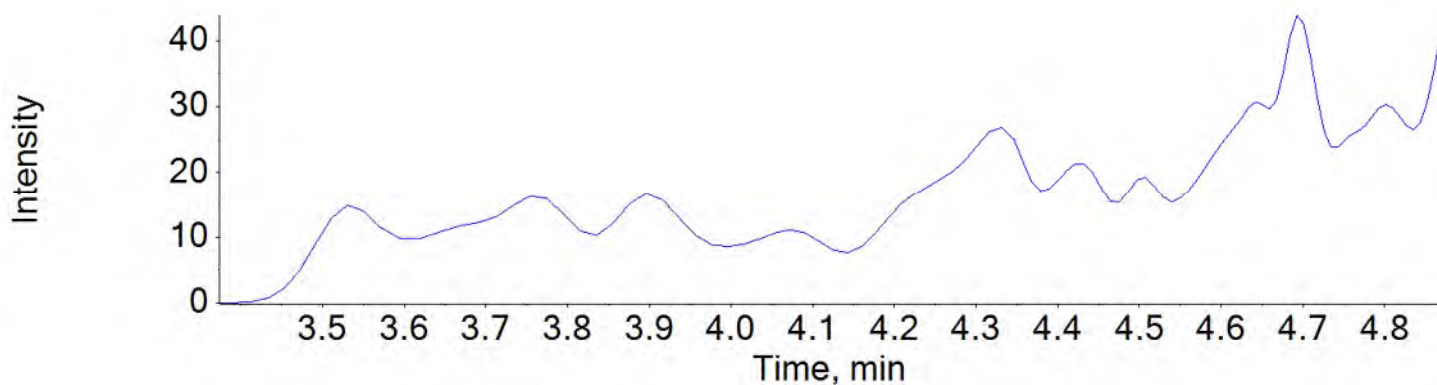
PFDaA\_2 613.0 / 319.0



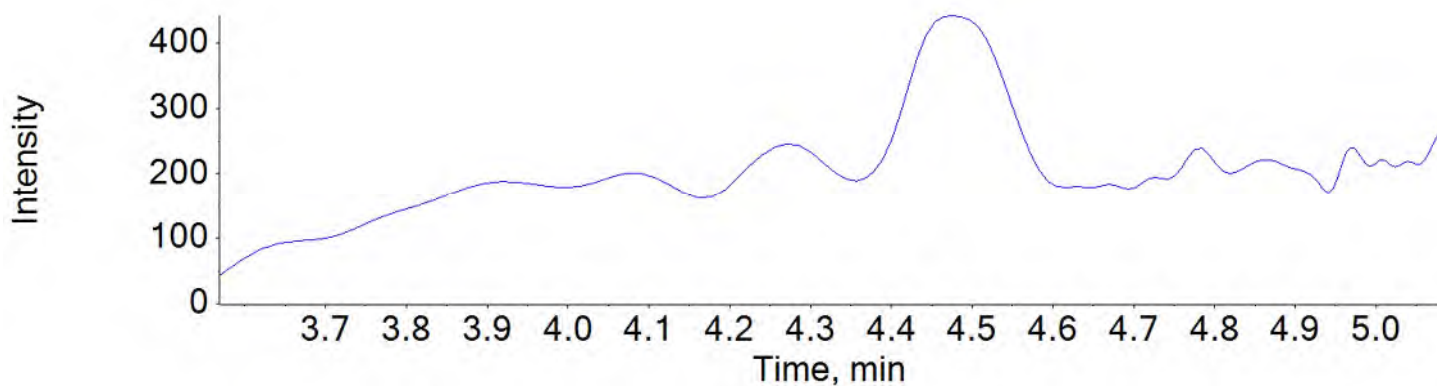
PFTTrDA\_1 663.0 / 619.0



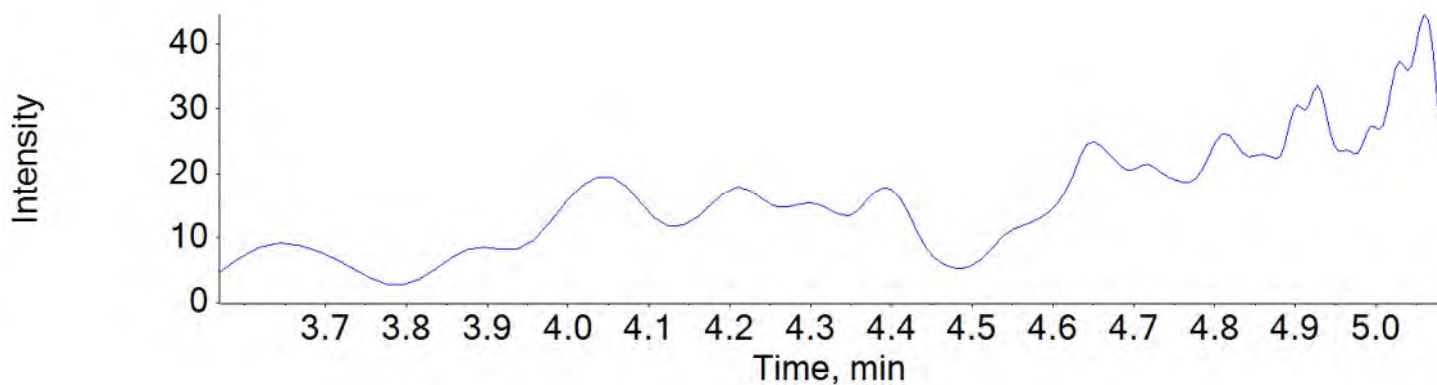
PFTTrDA\_2 663.0 / 169.0



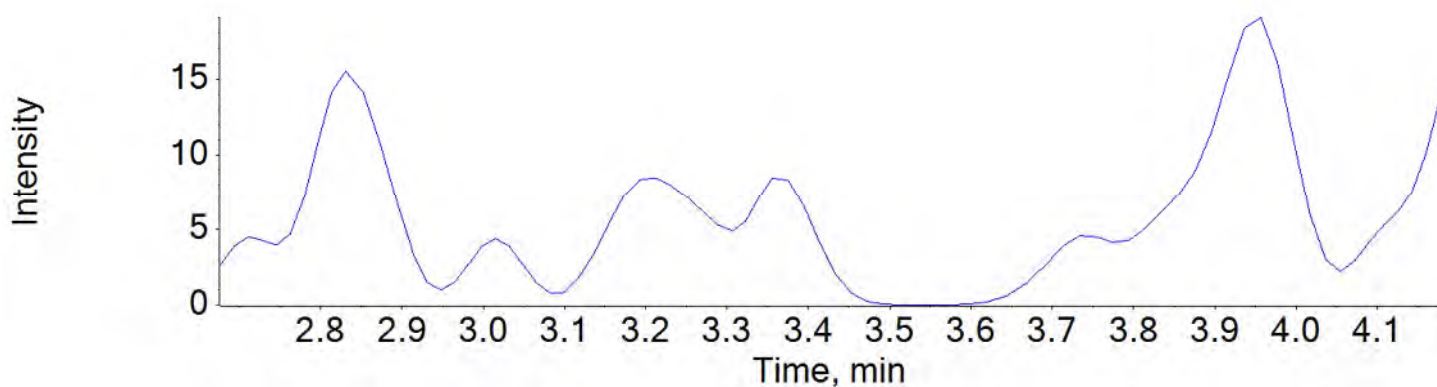
PFTTeDA\_1 713.0 / 669.0



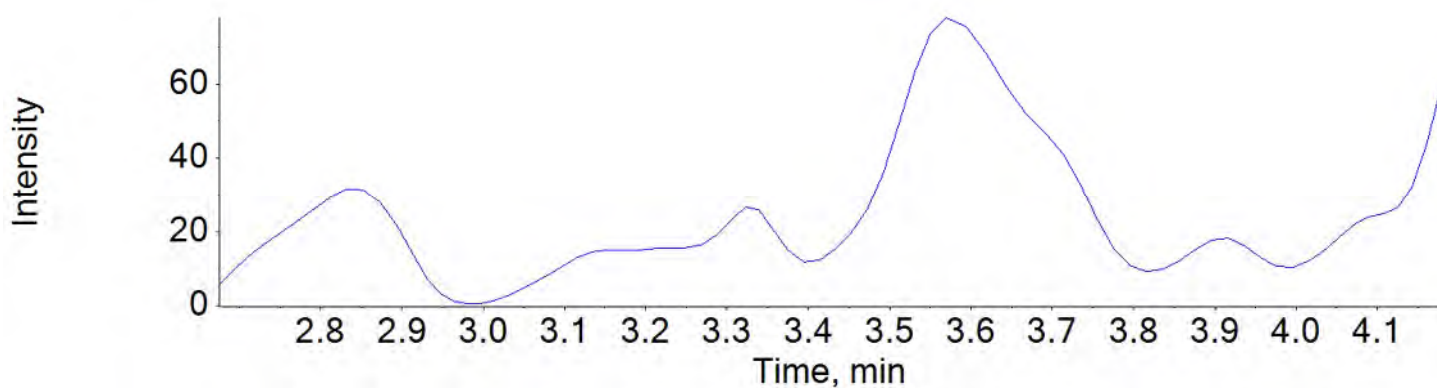
PFTeDA\_2 713.0 / 169.0



NMeFOSAA\_1 570.0 / 419.0

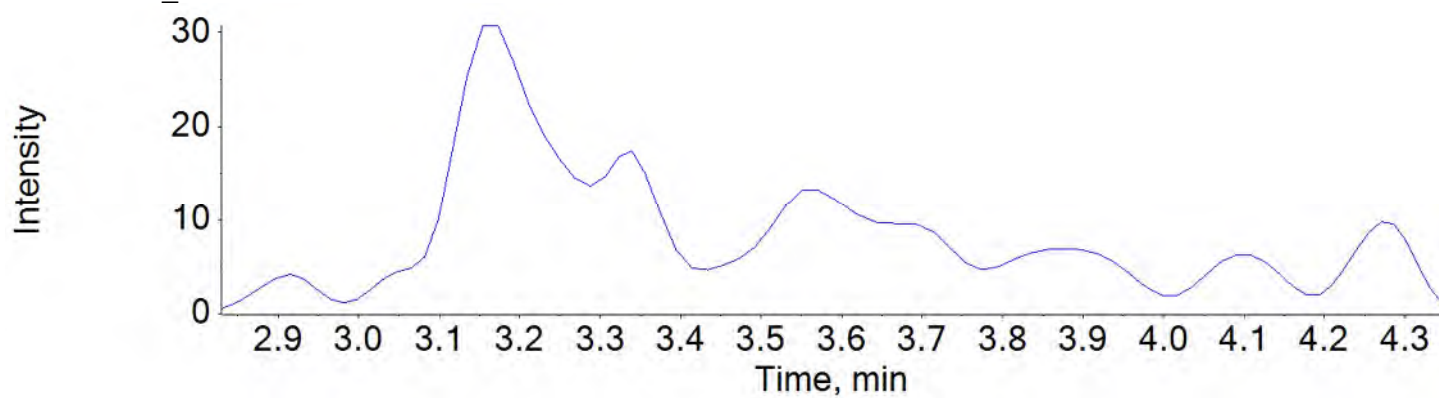


NMeFOSAA\_2 570.0 / 512.0

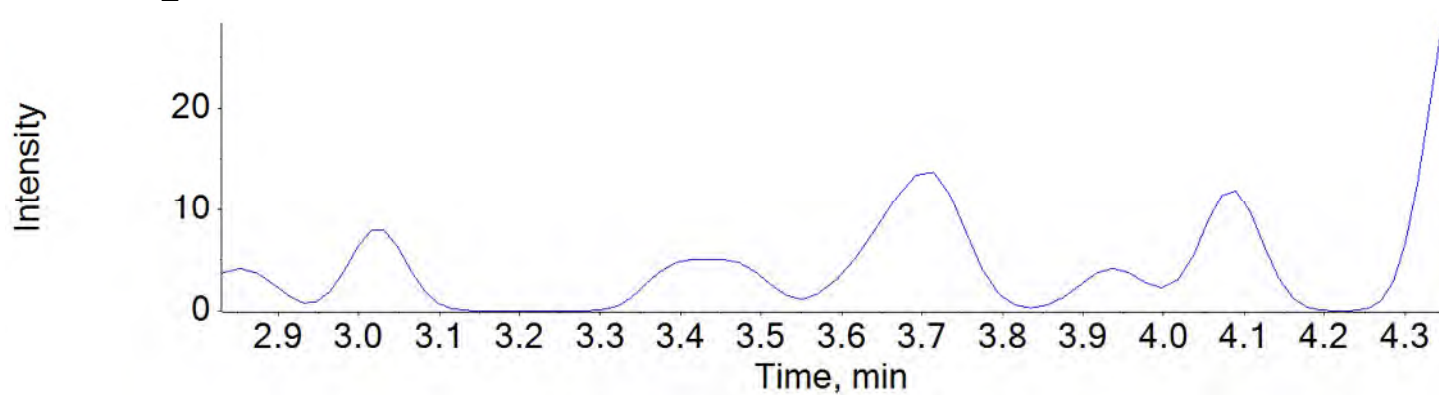




NEtFOSAA\_1 584.0 / 419.0



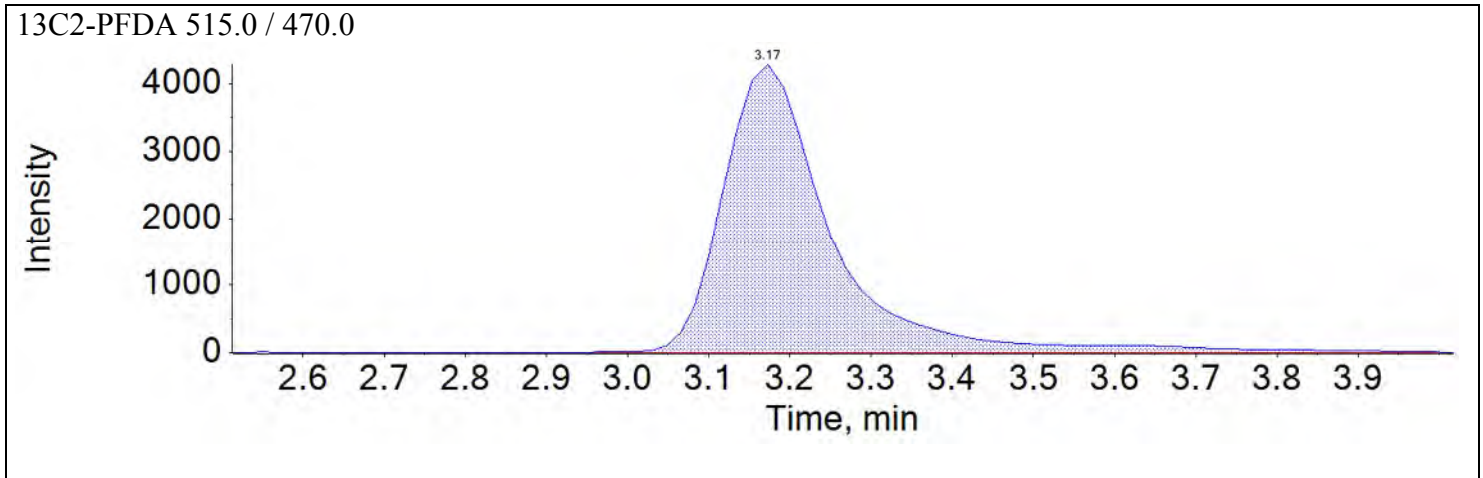
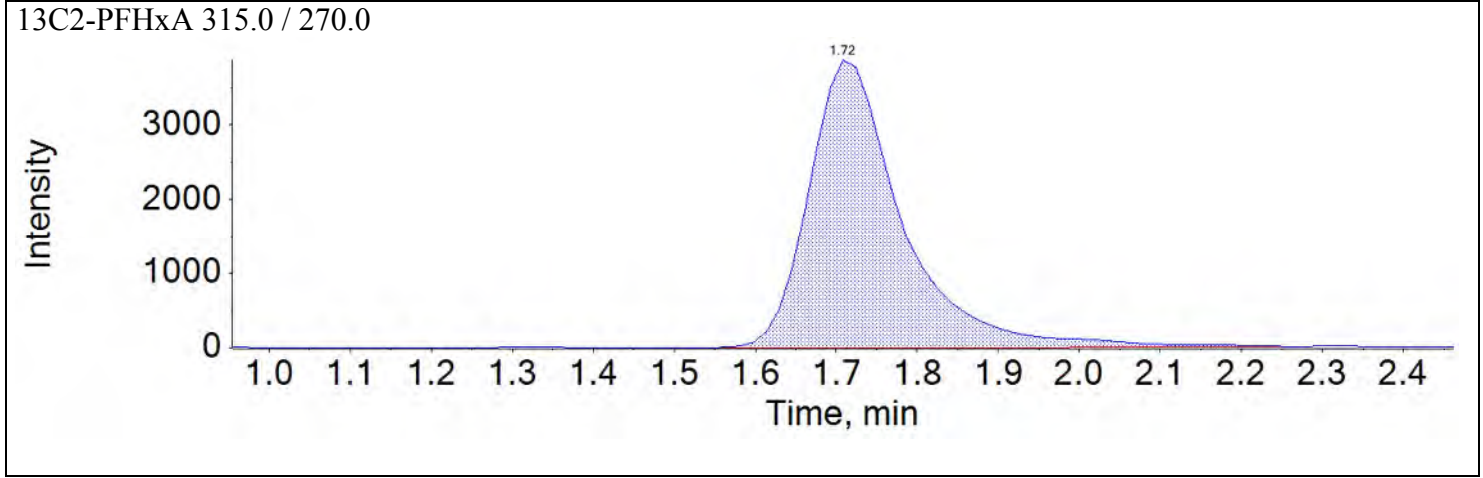
NEtFOSAA\_2 584.0 / 483.0



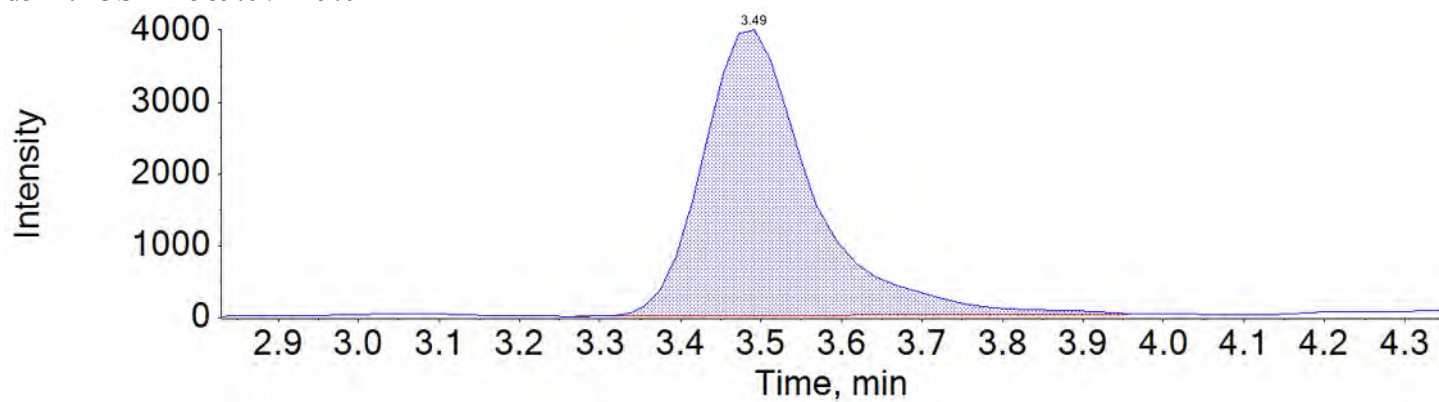


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | CQ753PB-FS(0)       | Injection Vial   | 12           |
| Sample ID          | Procedural Blank    | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:05:20 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



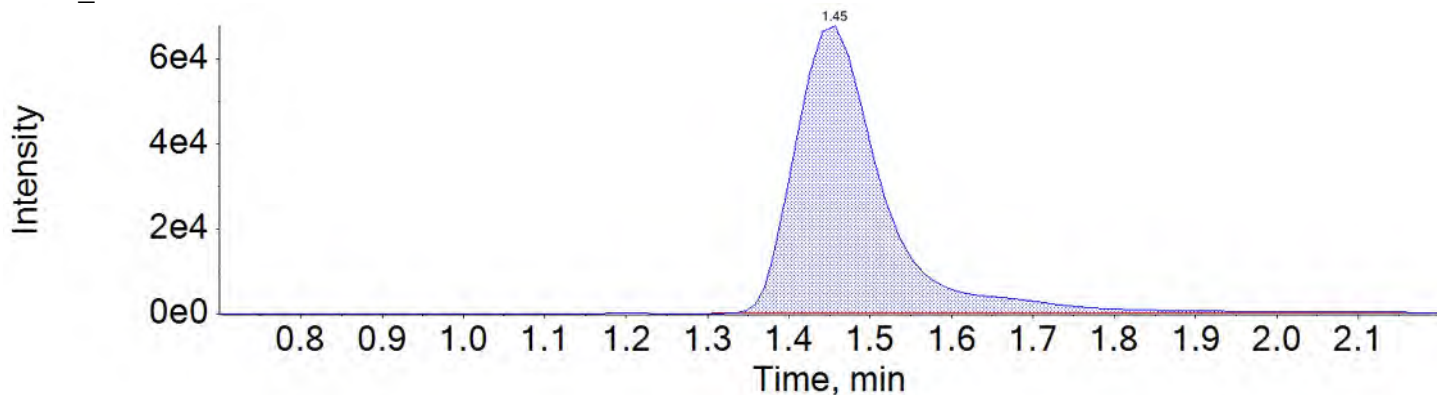
d5-EtFOSAA 589.0 / 419.0



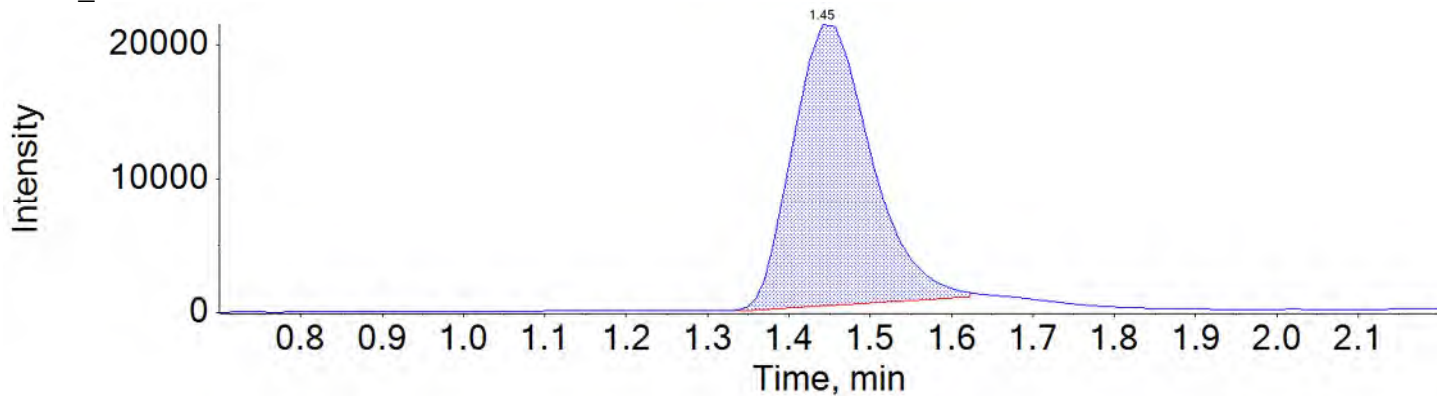
|                    |                           |                  |              |
|--------------------|---------------------------|------------------|--------------|
| Sample Name        | CQ754LCS-FS(0)            | Injection Vial   | 13           |
| Sample ID          | Laboratory Control Sample | Injection Volume | 10.00        |
| Sample Type        | Unknown                   | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:14:15       | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam                | Result Table     | 18-0312_BASE |
| Sample Comment     |                           |                  |              |

## Chromatograms

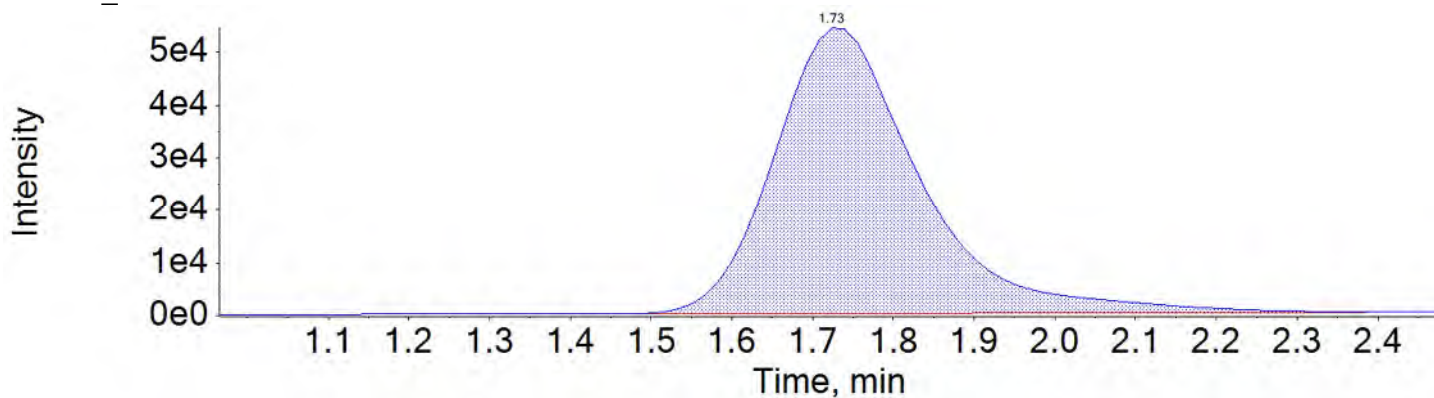
PFBS\_1 298.9 / 80.0



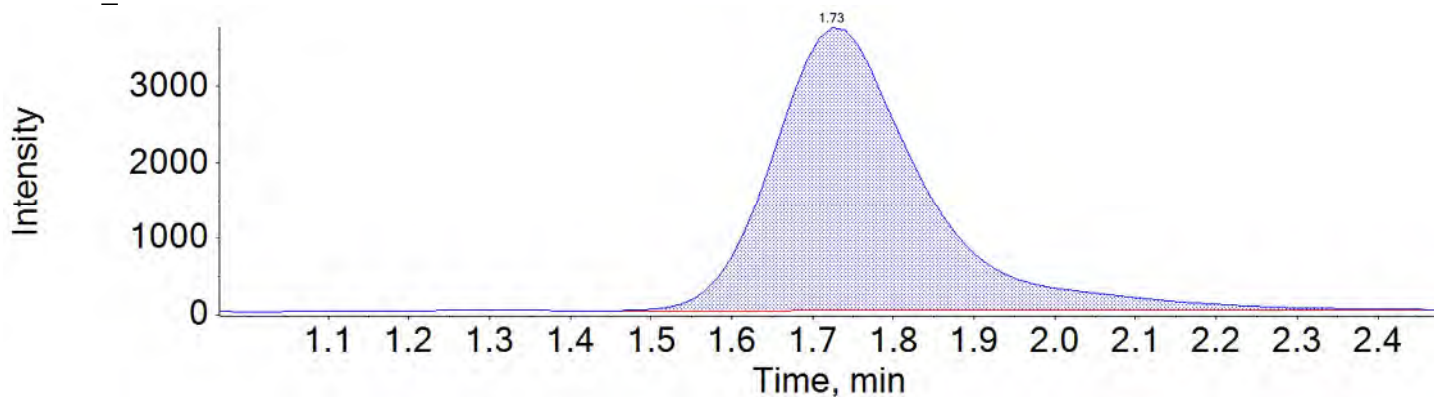
PFBS\_2 298.9 / 99.0



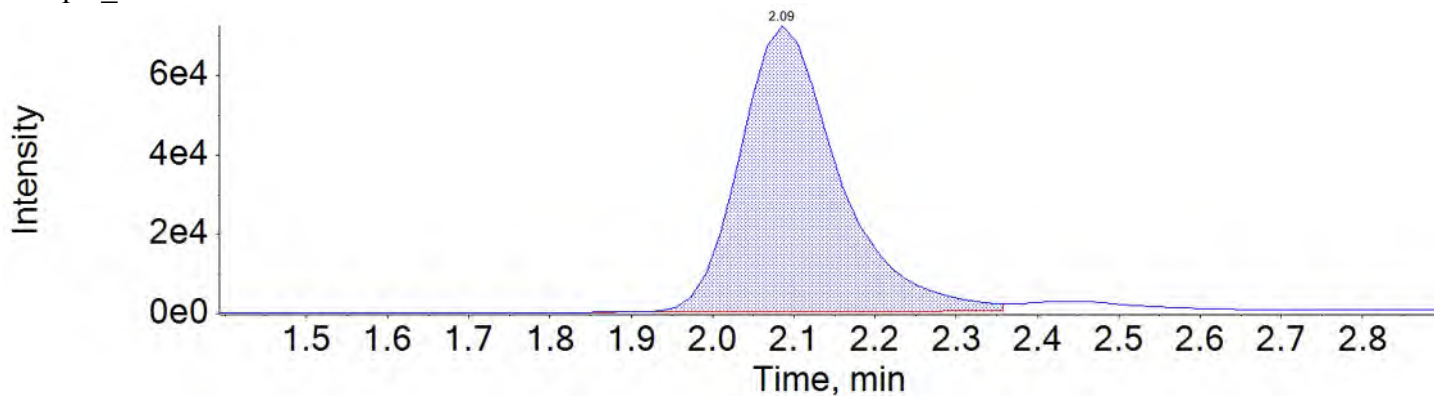
PFHxA\_1 313.0 / 269.0



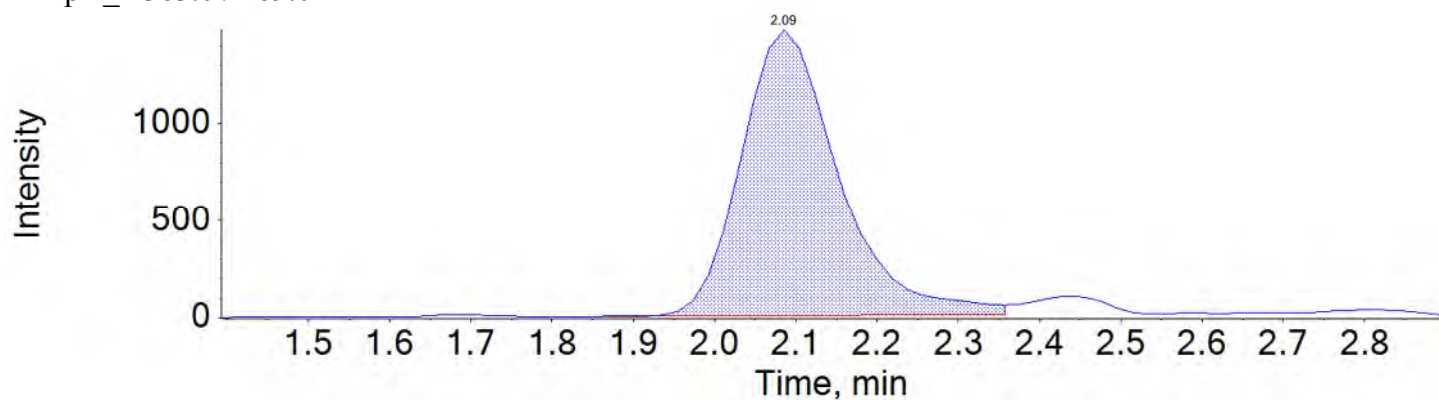
PFHxA\_2 313.0 / 119.0



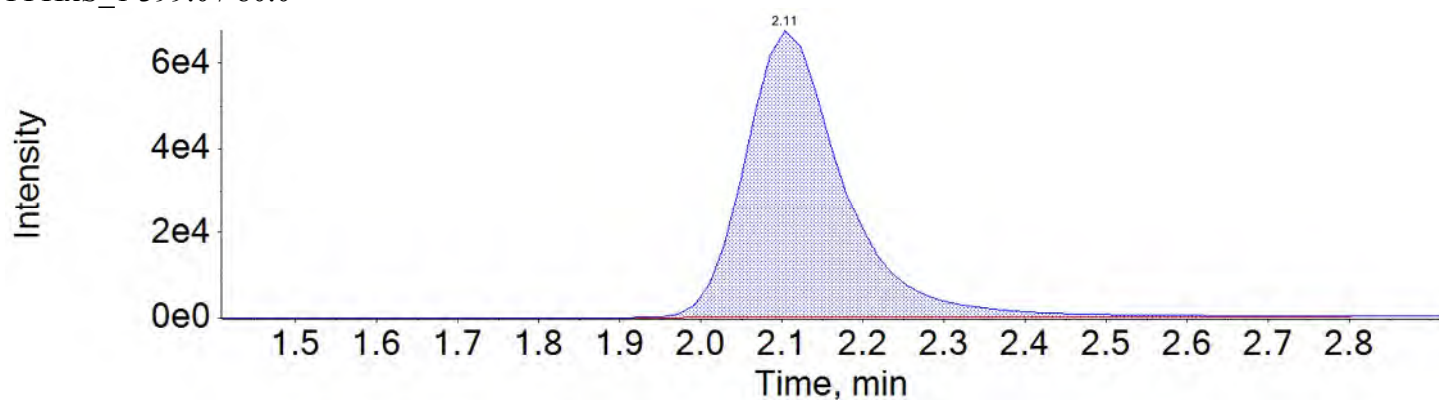
PFHpA\_1 363.0 / 319.0



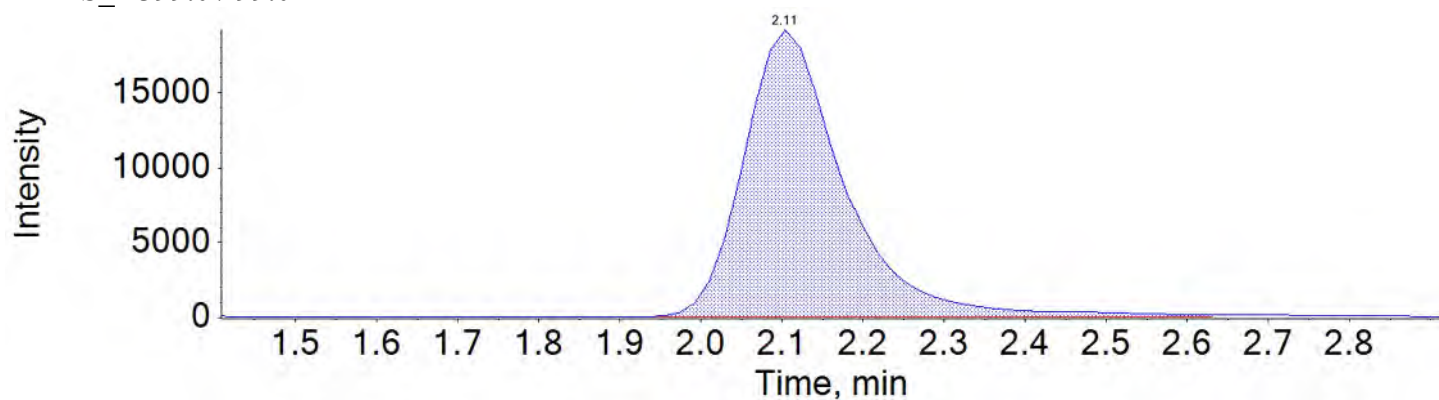
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

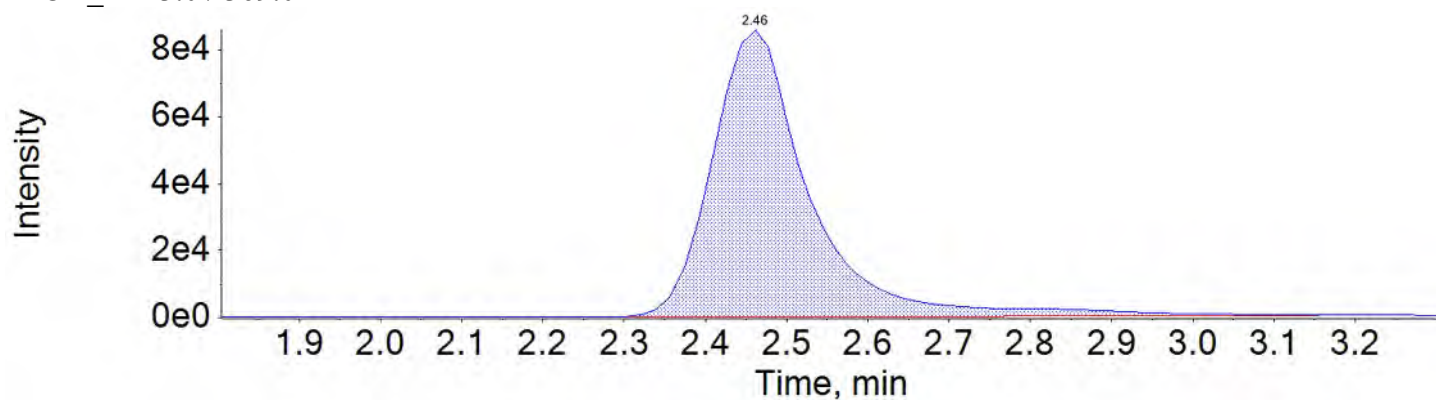


PFHxS\_2 399.0 / 99.0

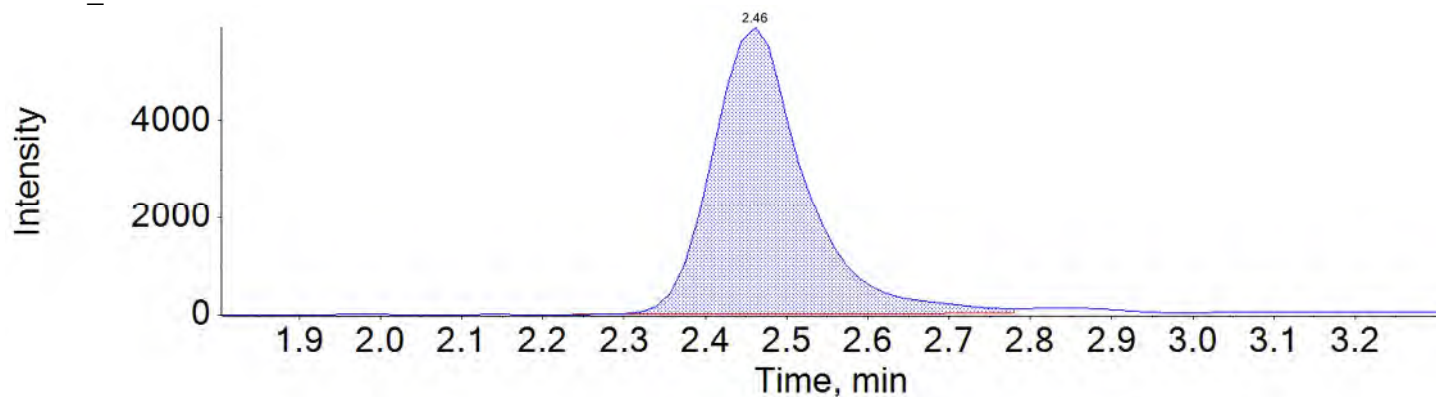




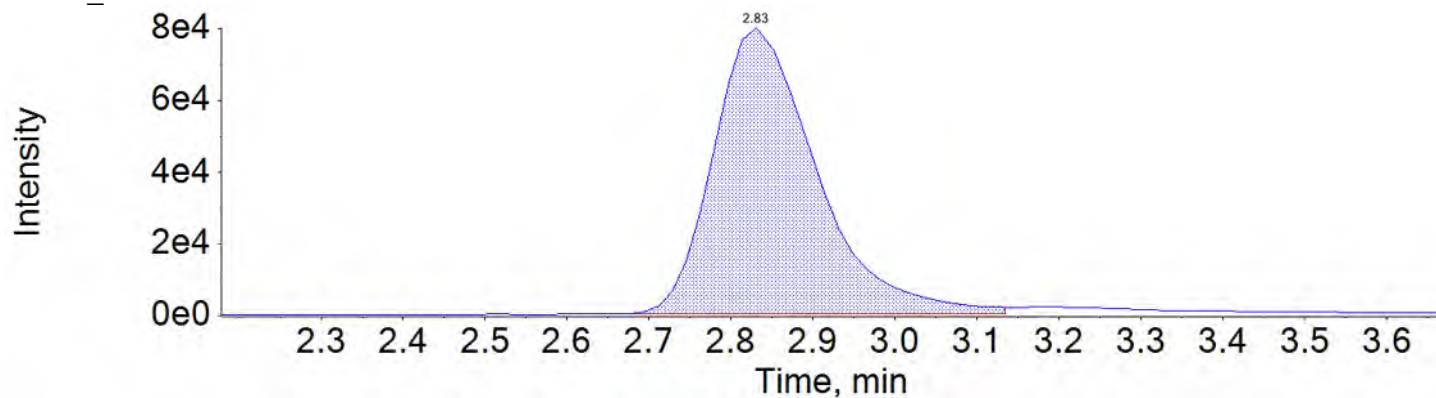
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

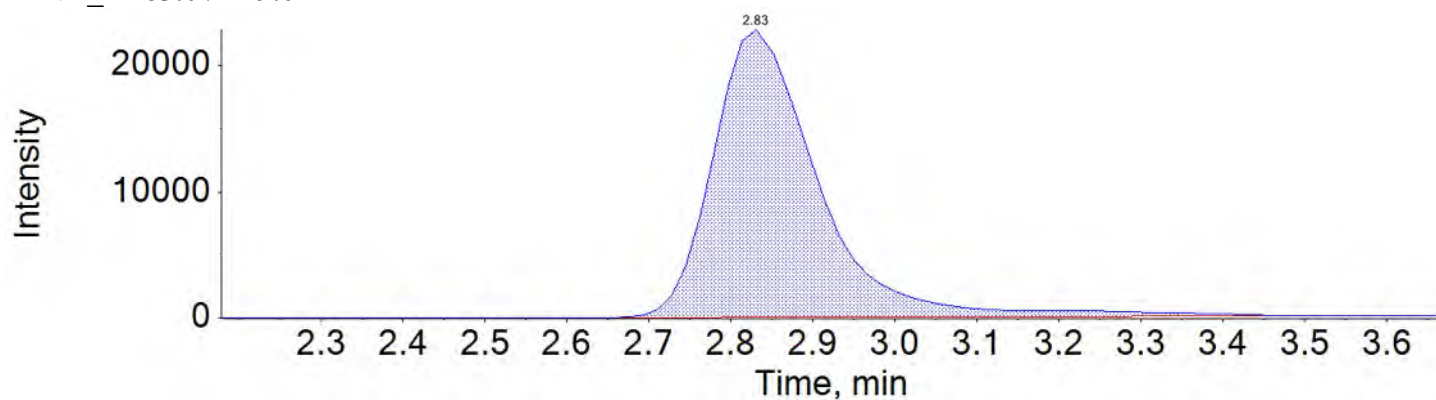


PFNA\_1 463.0 / 419.0

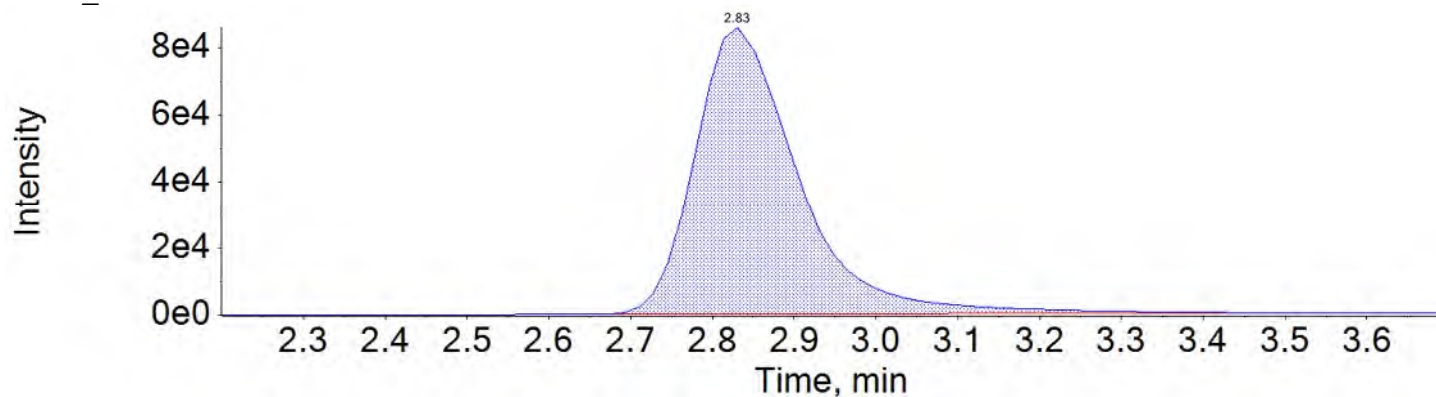




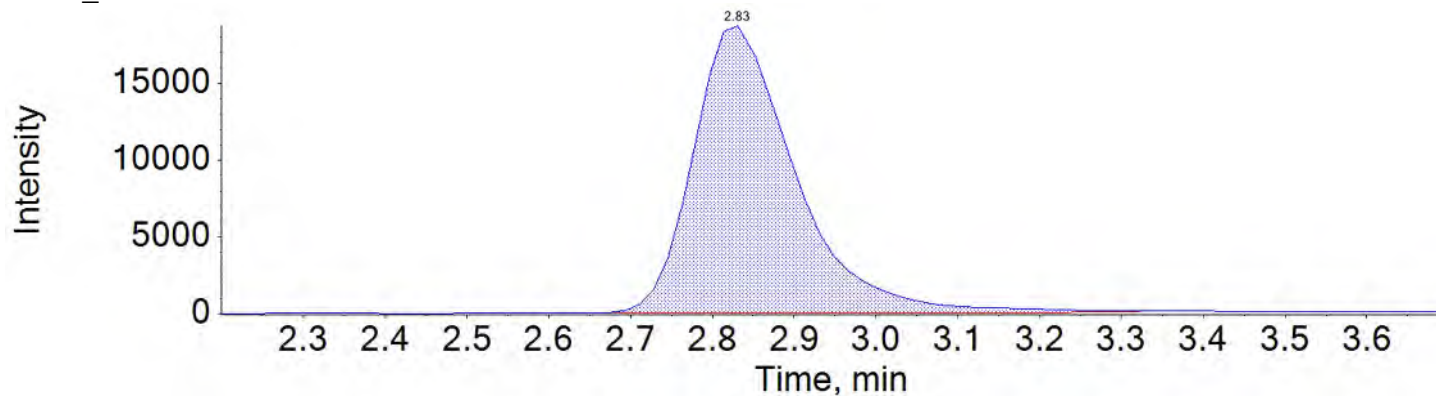
PFNA\_2 463.0 / 219.0



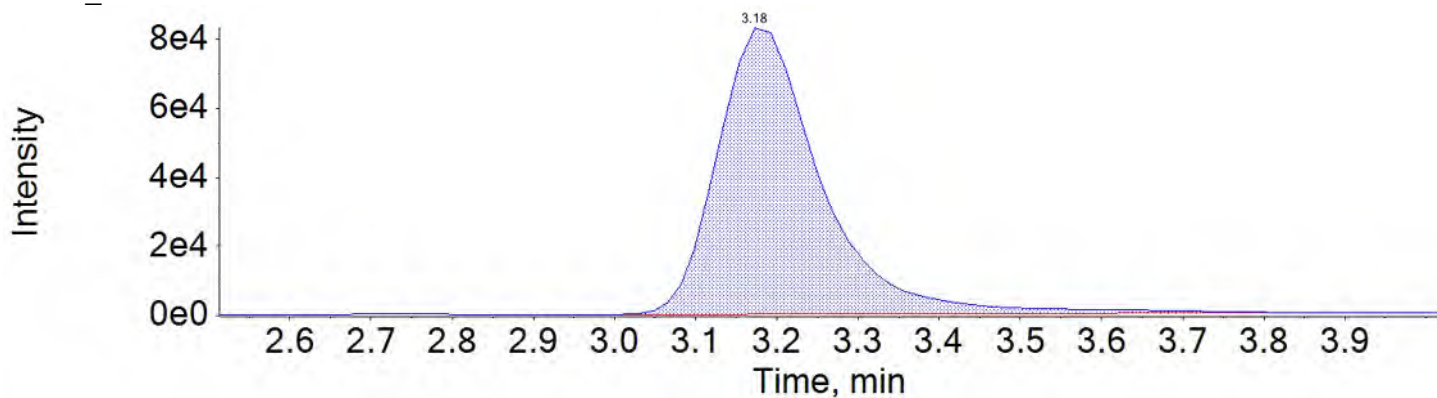
PFOS\_1 499.0 / 80.0



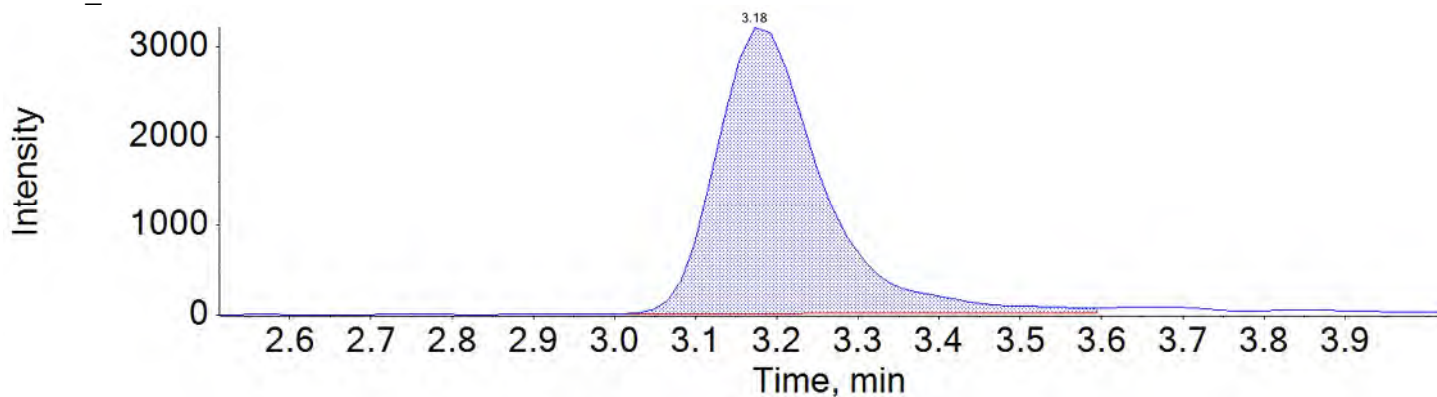
PFOS\_2 499.0 / 99.0



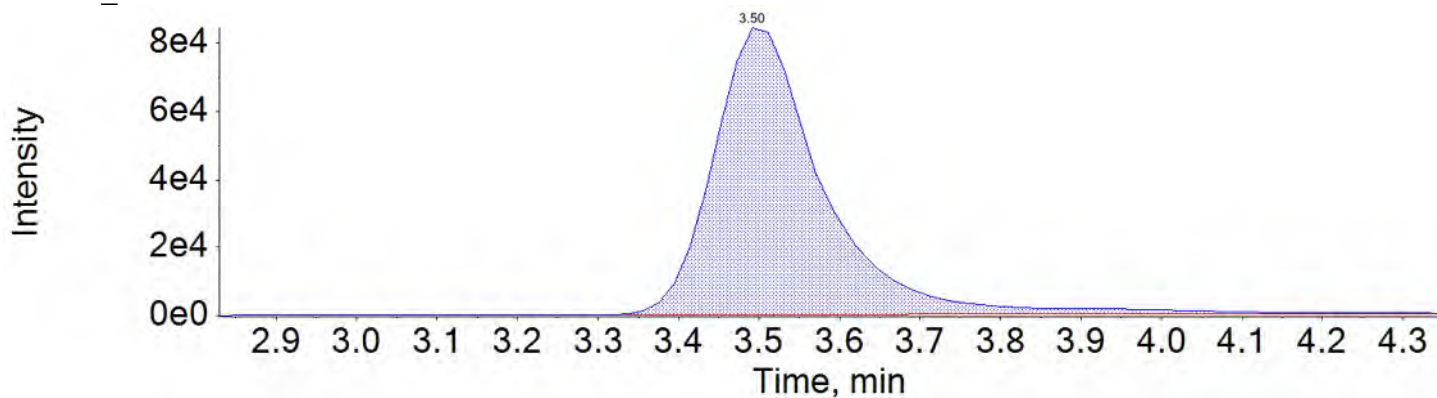
PFDA\_1 513.0 / 469.0



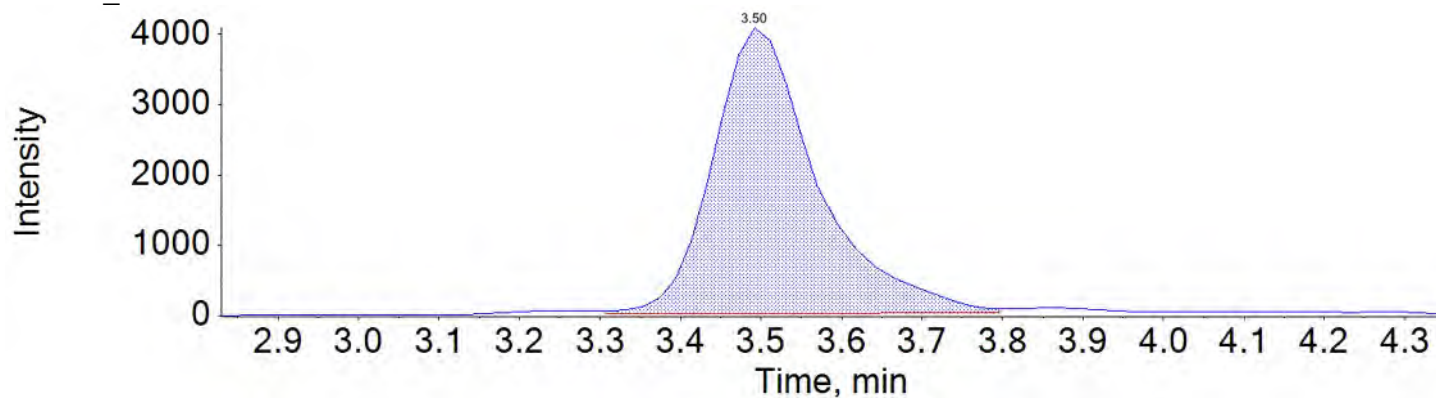
PFDA\_2 513.0 / 219.0



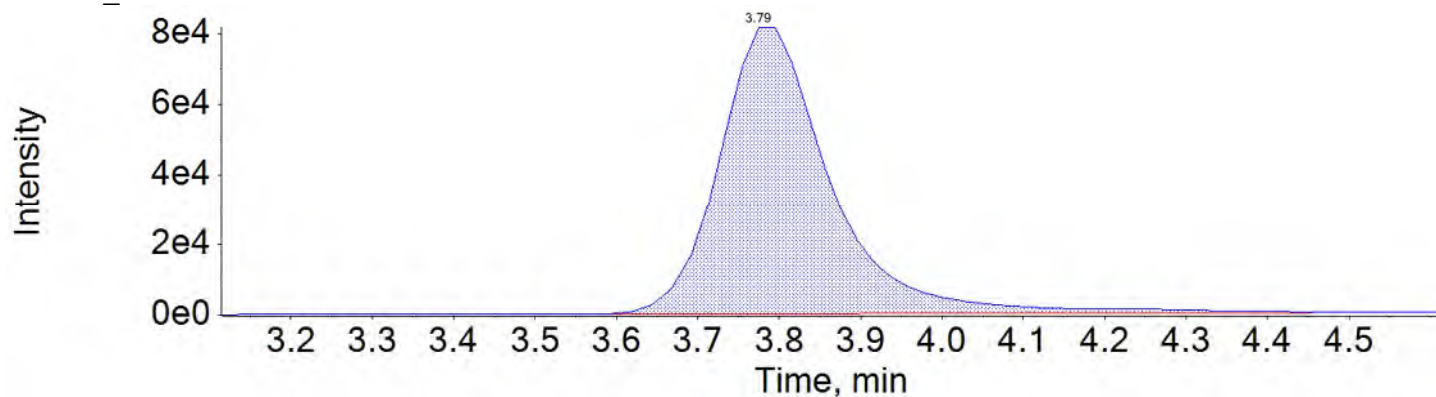
PFUnA\_1 563.0 / 519.0



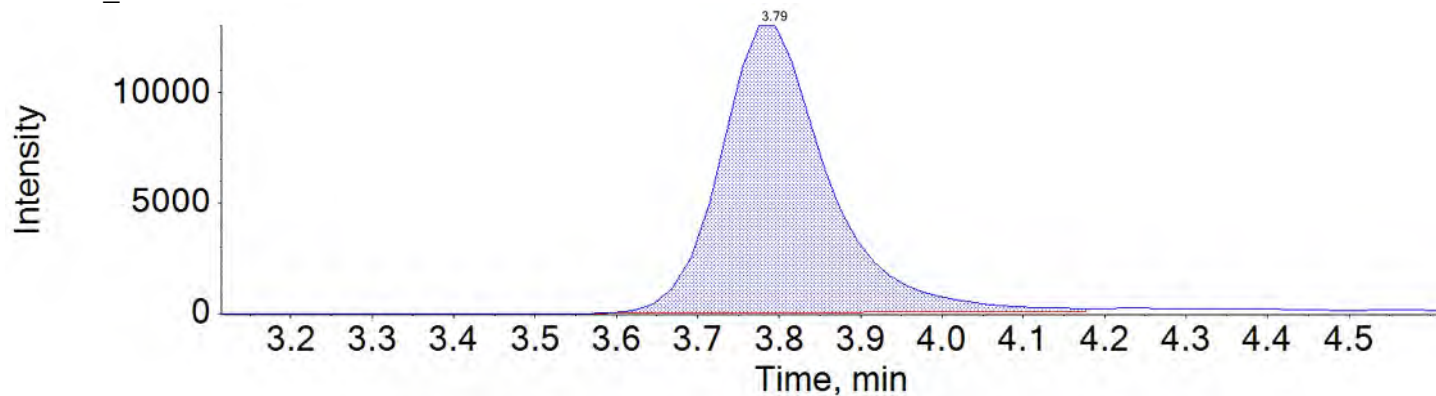
PFUnA\_2 563.0 / 269.0



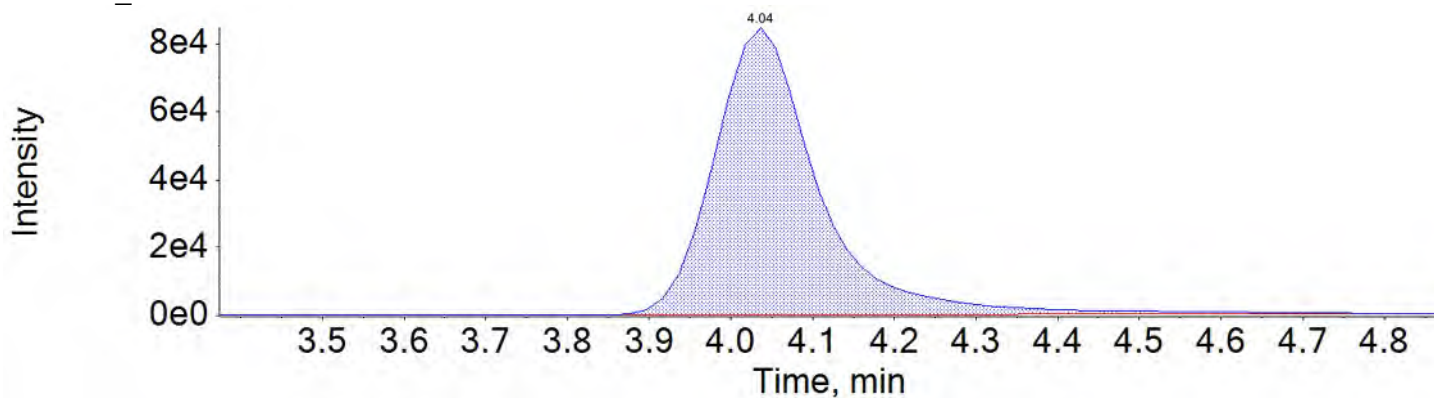
PFDaA\_1 613.0 / 569.0



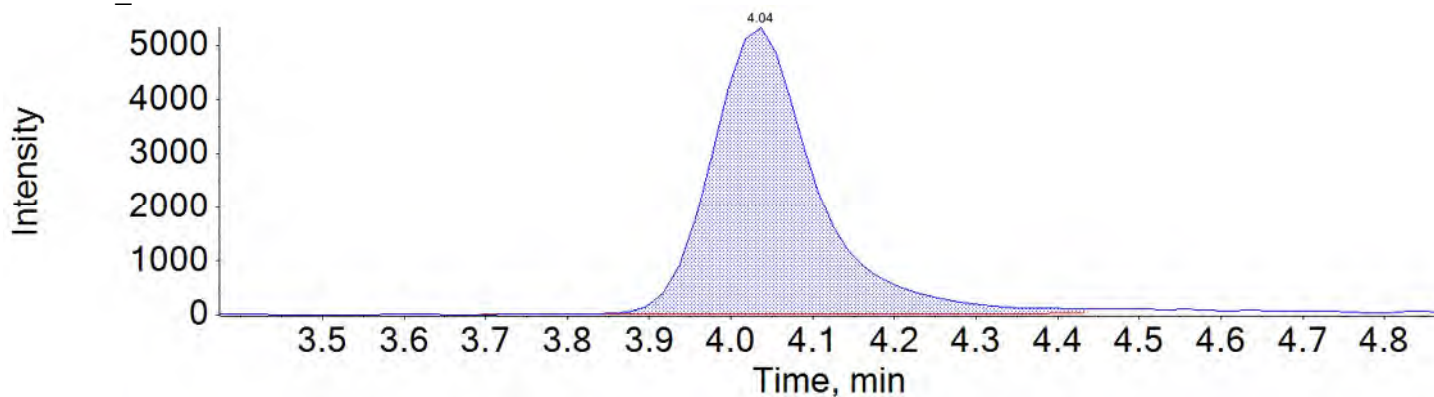
PFDaA\_2 613.0 / 319.0



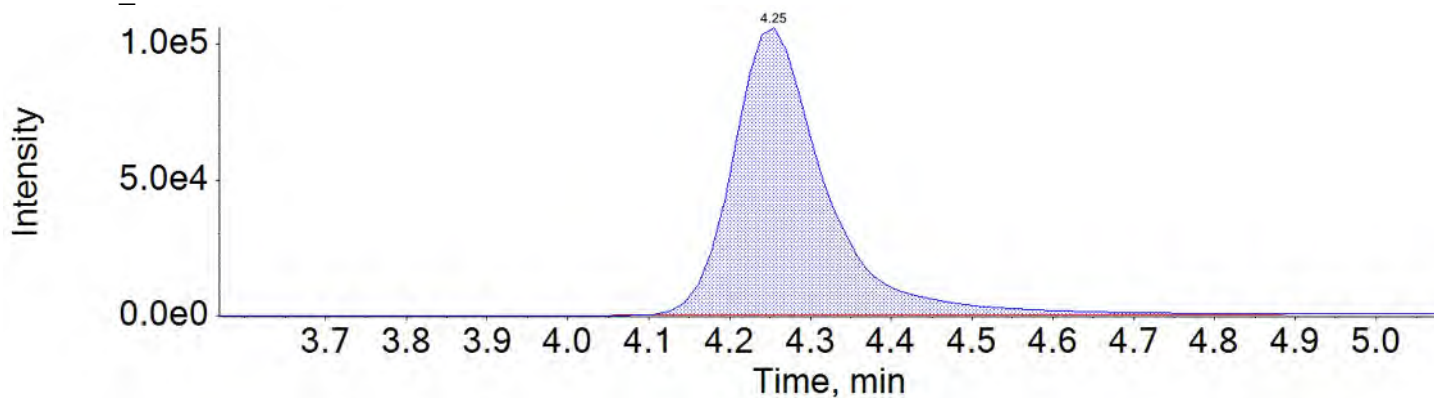
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

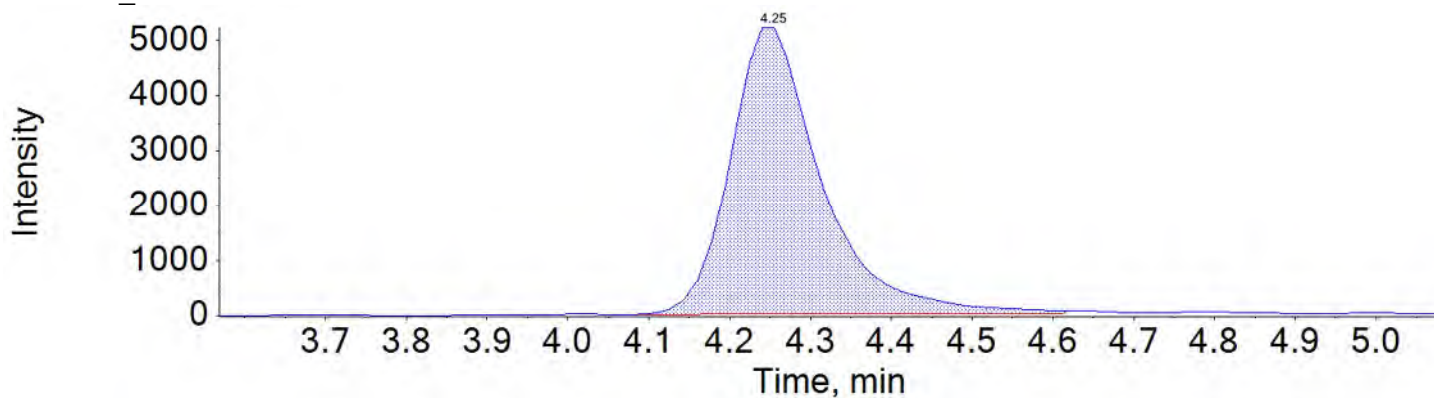


PFTTeDA\_1 713.0 / 669.0

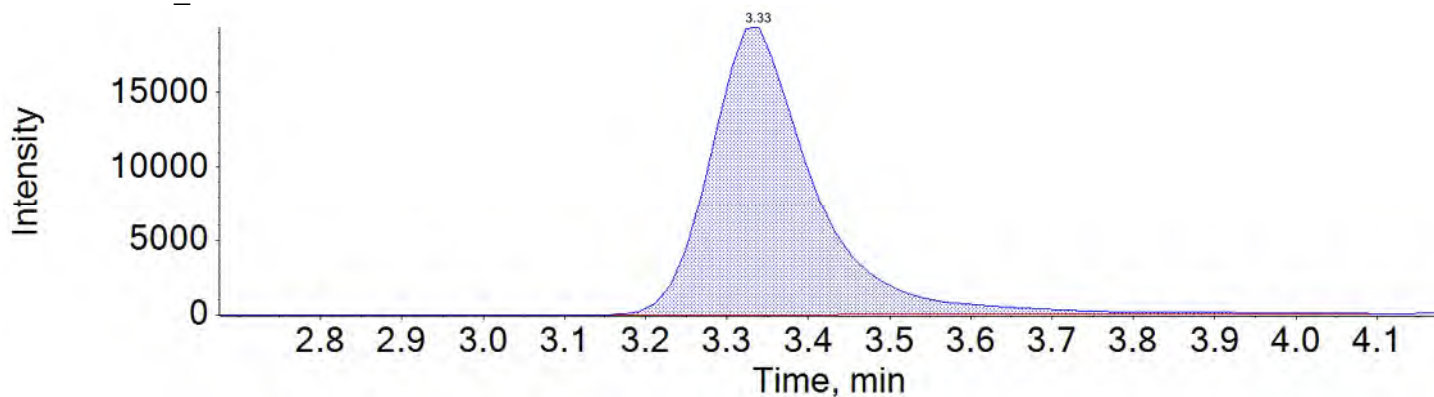




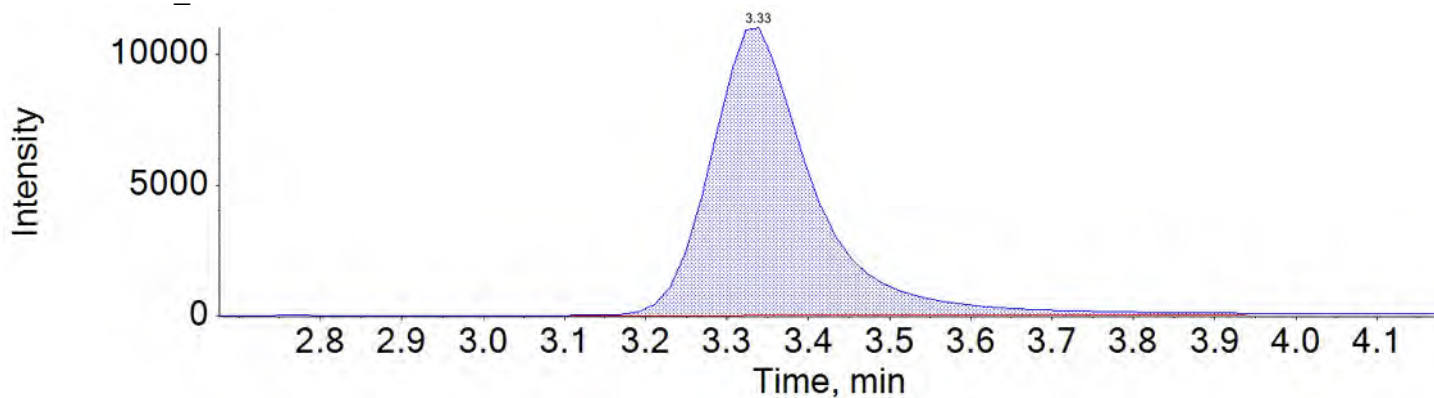
PFTeDA\_2 713.0 / 169.0



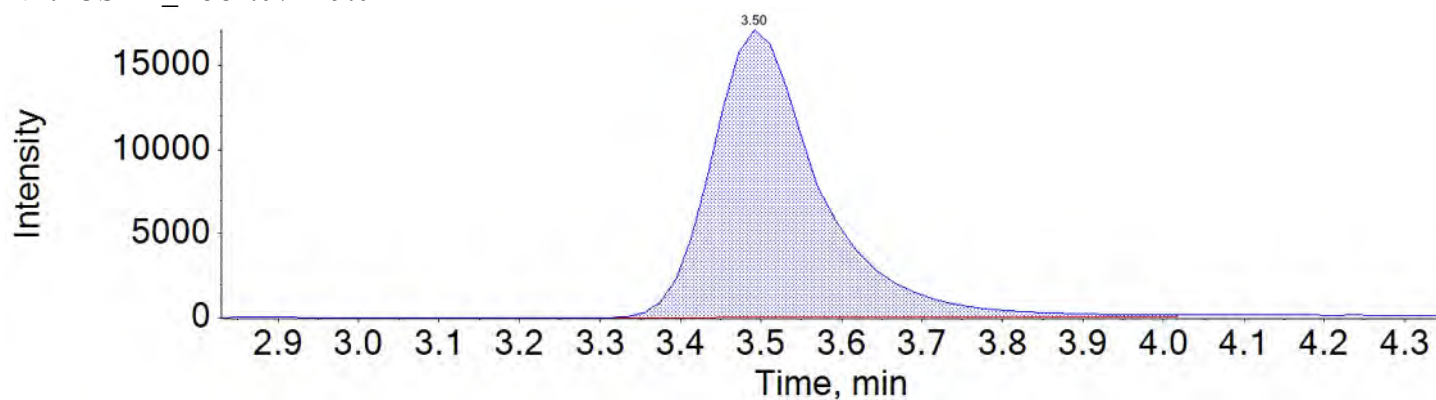
NMeFOSAA\_1 570.0 / 419.0



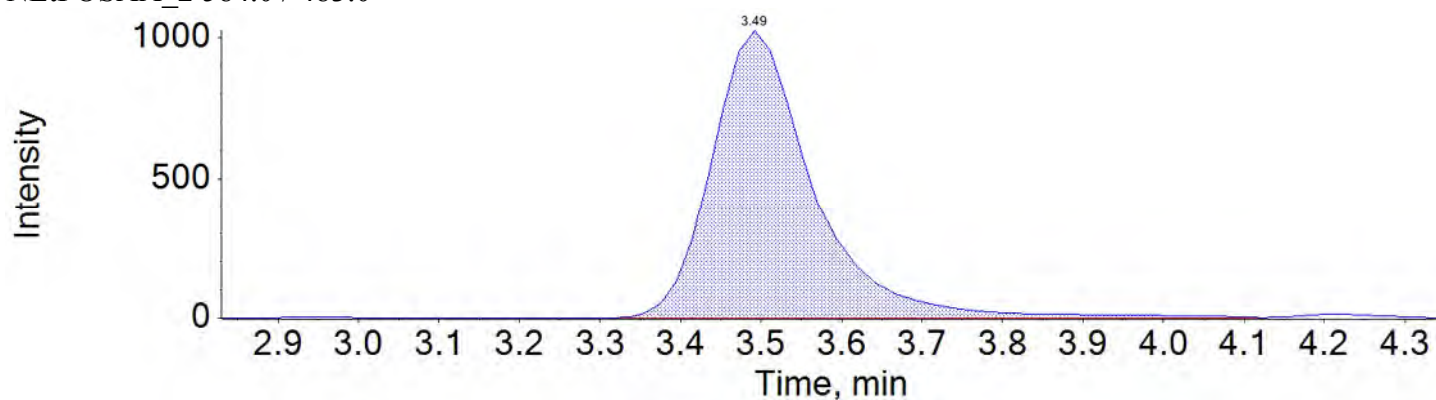
NMeFOSAA\_2 570.0 / 512.0



NetFOSAA\_1 584.0 / 419.0



NetFOSAA\_2 584.0 / 483.0

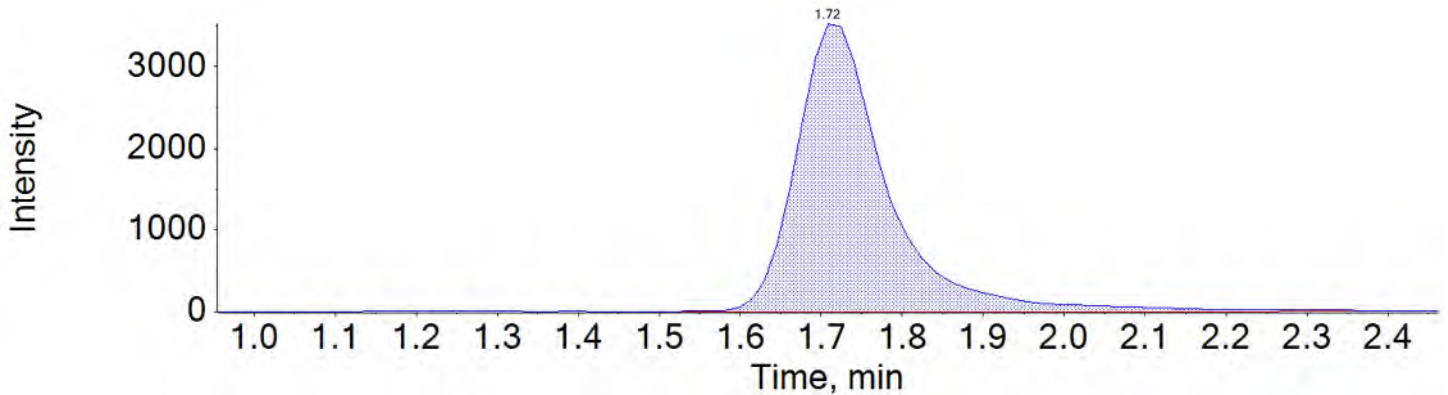




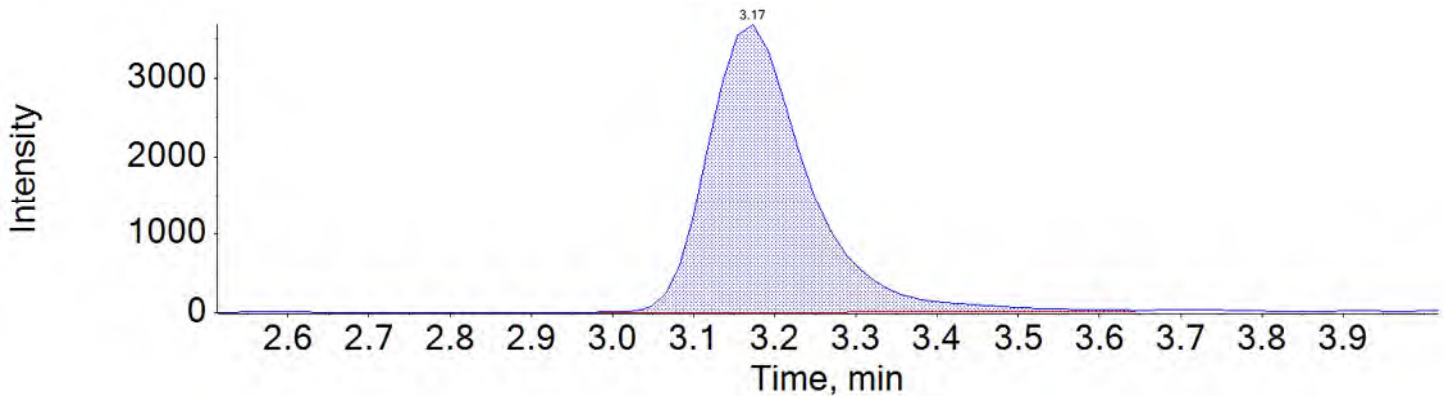
|                    |                           |                  |              |
|--------------------|---------------------------|------------------|--------------|
| Sample Name        | CQ754LCS-FS(0)            | Injection Vial   | 13           |
| Sample ID          | Laboratory Control Sample | Injection Volume | 10.00        |
| Sample Type        | Quality Control           | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:14:15       | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam                | Result Table     | 18-0312_SIS  |
| Sample Comment     |                           |                  |              |

## Chromatograms

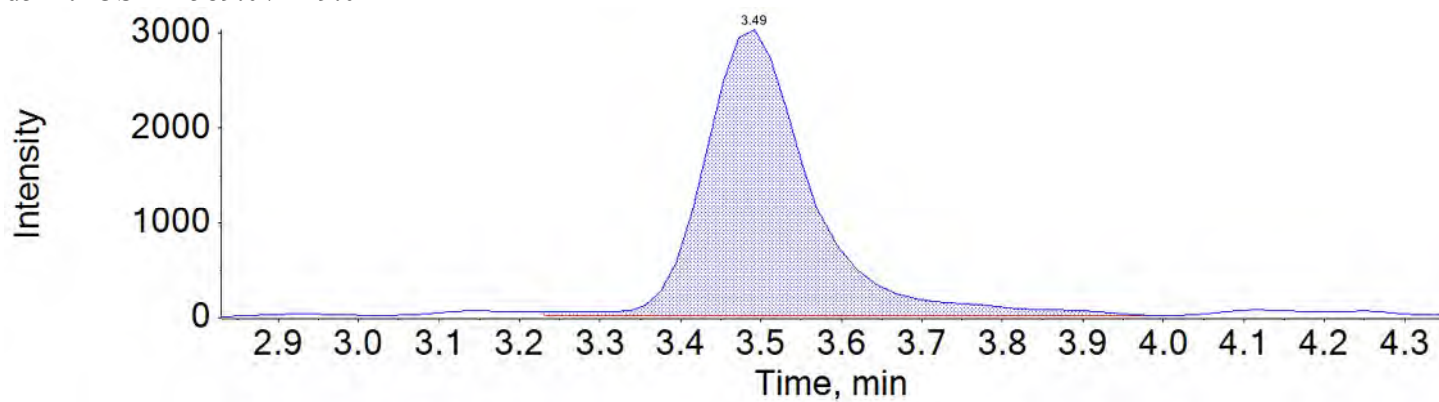
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0



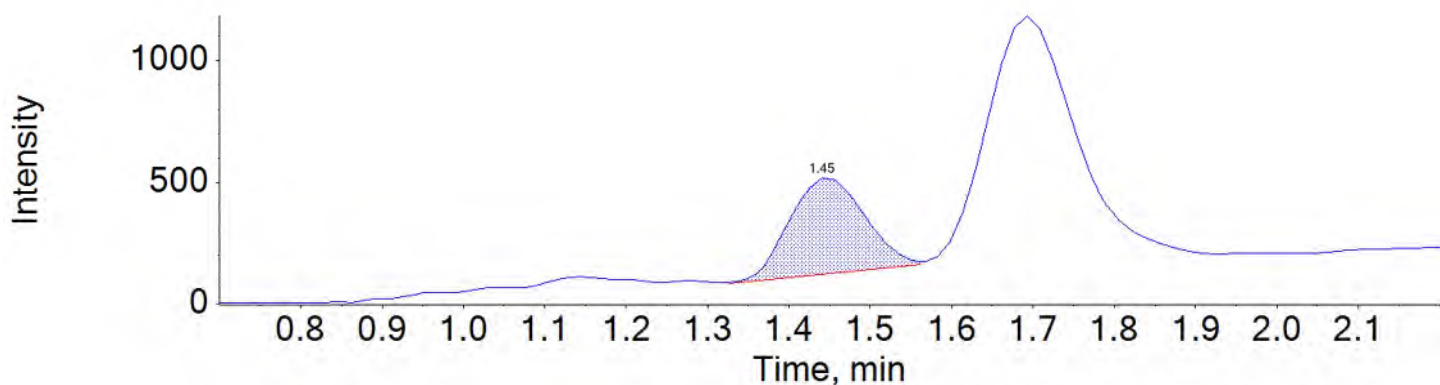
d5-EtFOSAA 589.0 / 419.0



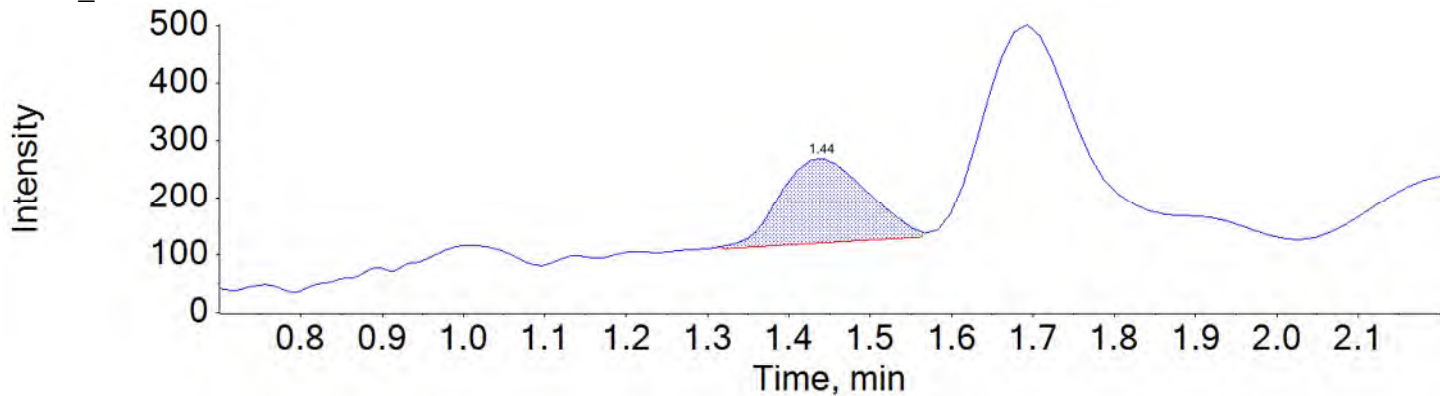
|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5965-FS(0)          | Injection Vial   | 14           |
| Sample ID          | WGNA-043018-FRB-3103 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:23:10  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Chromatograms

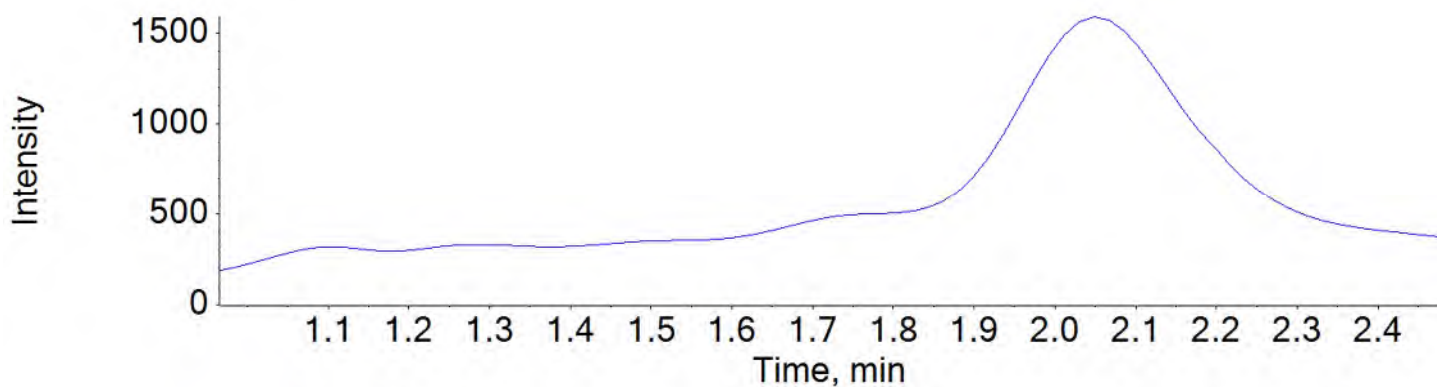
PFBS\_1 298.9 / 80.0



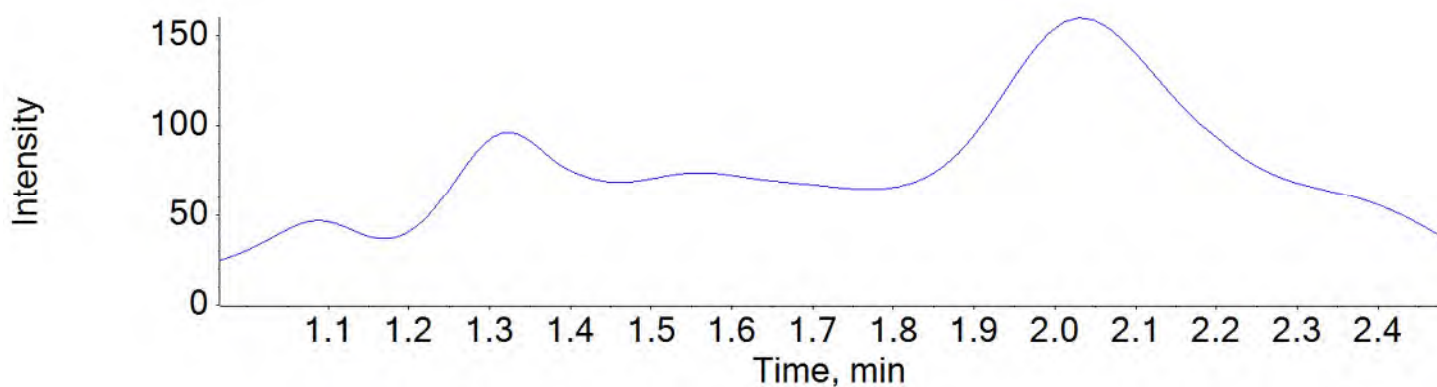
PFBS\_2 298.9 / 99.0



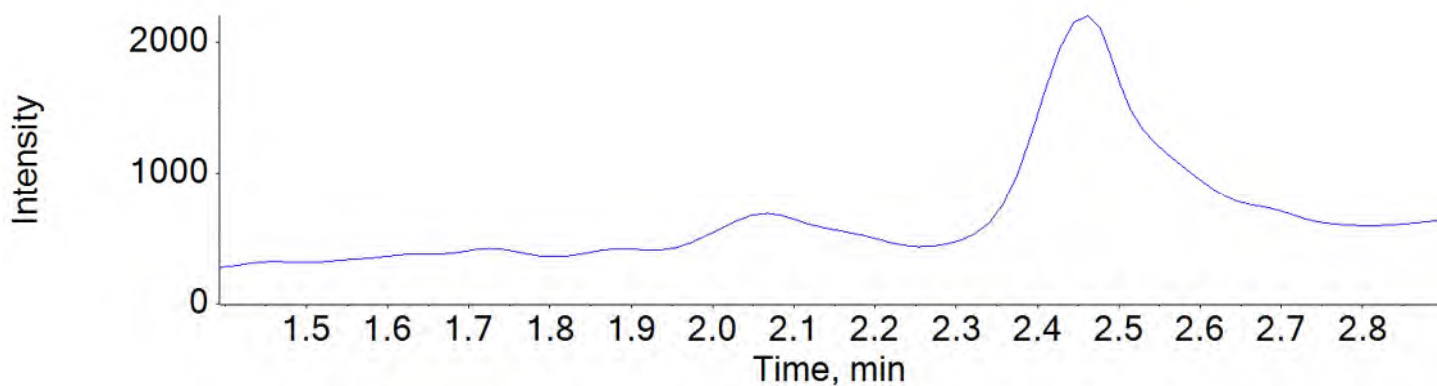
PFHxA\_1 313.0 / 269.0



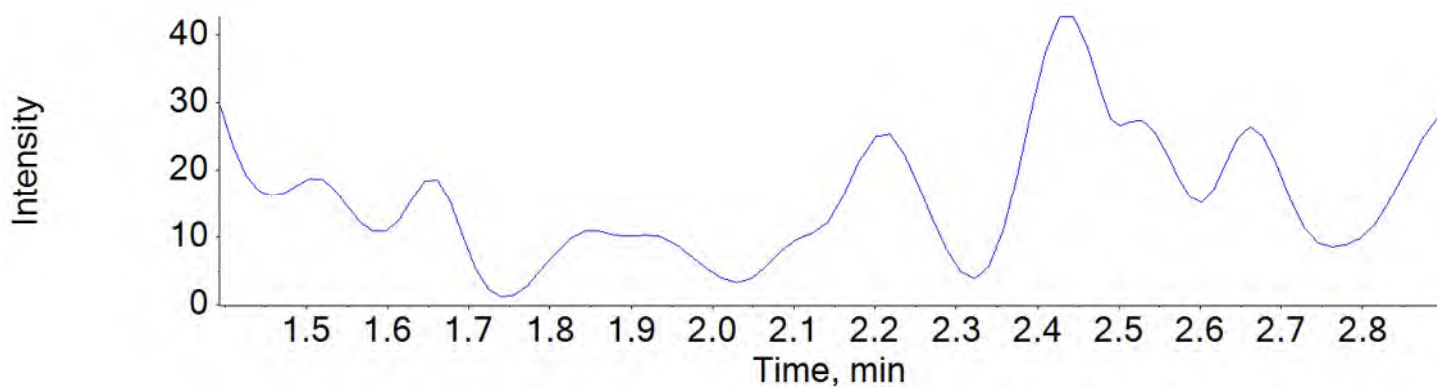
PFHxA\_2 313.0 / 119.0



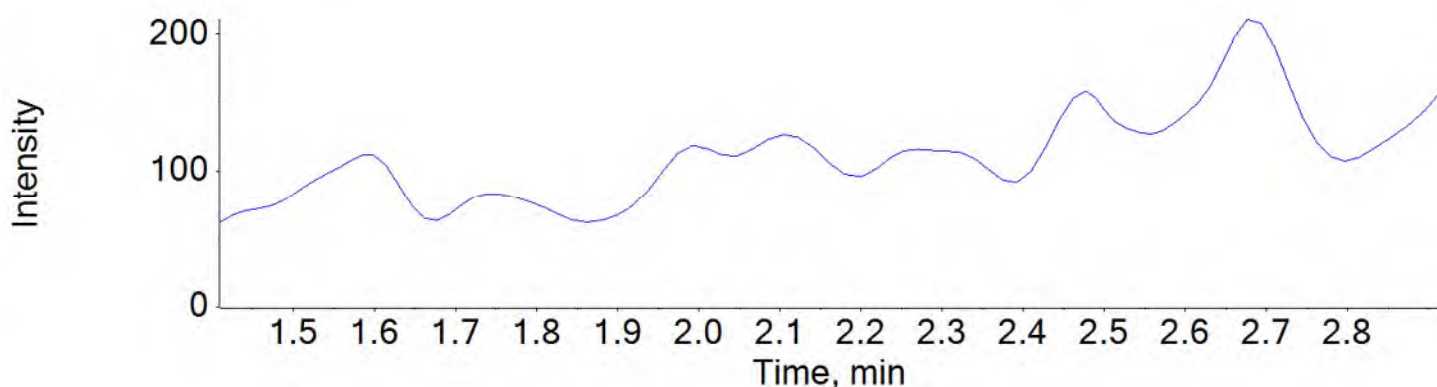
PFHpA\_1 363.0 / 319.0



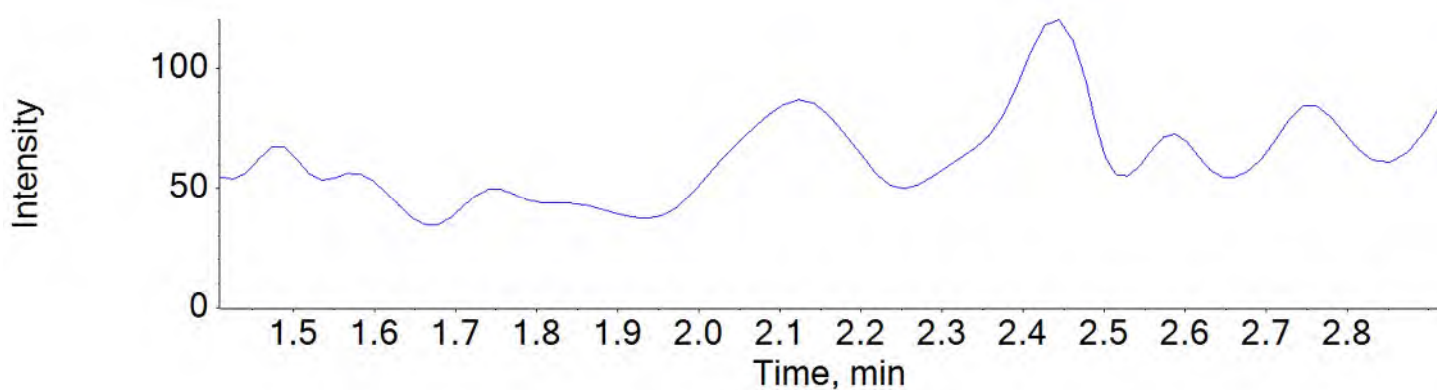
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

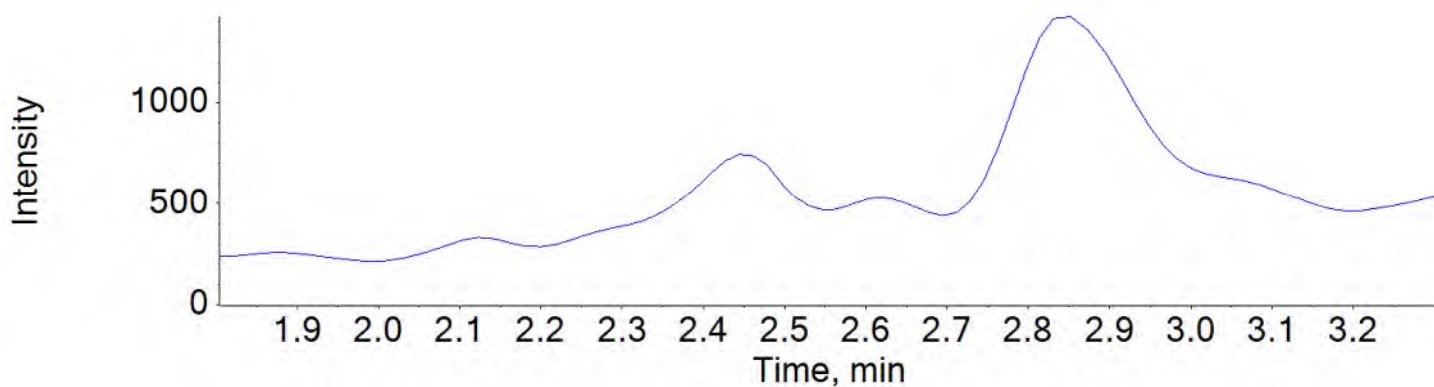


PFHxS\_2 399.0 / 99.0

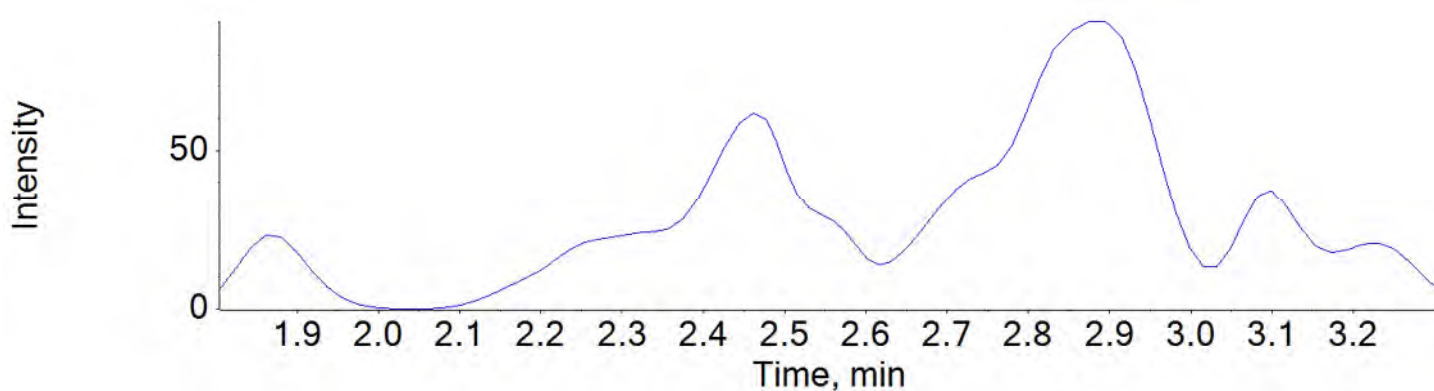




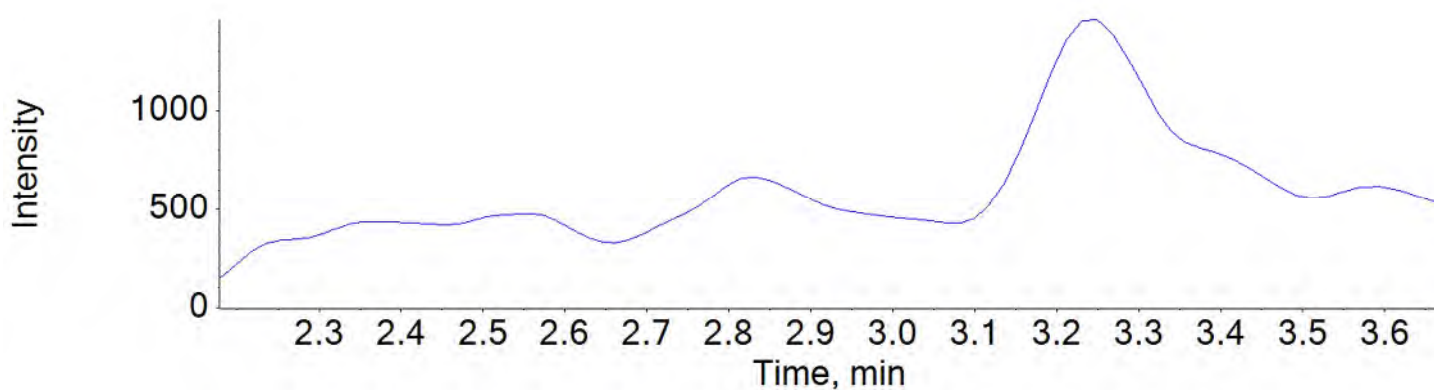
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

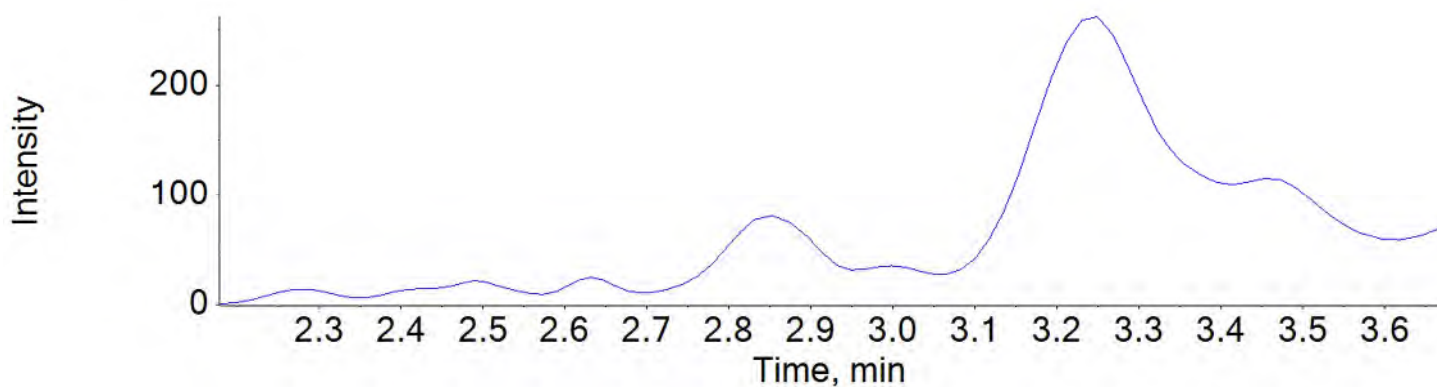


PFNA\_1 463.0 / 419.0

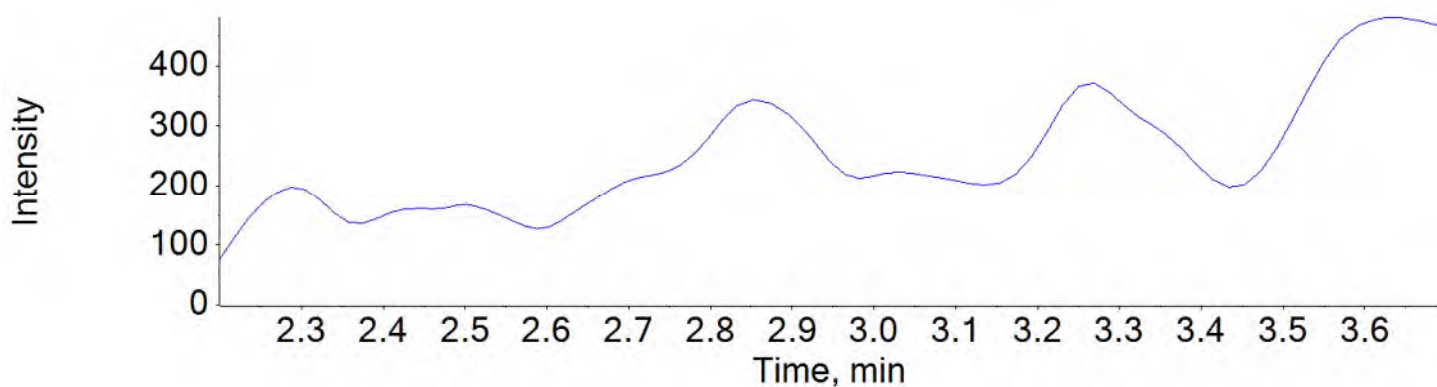




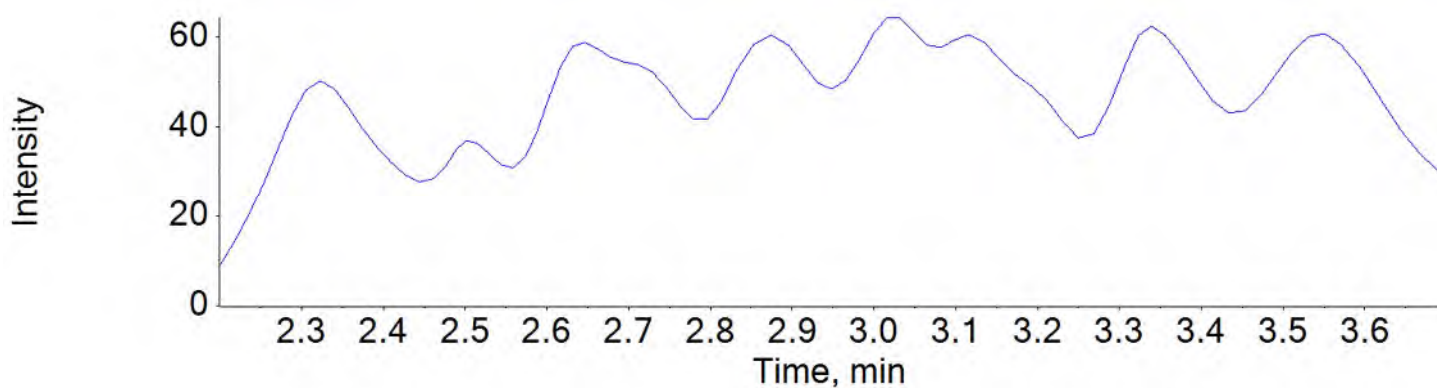
PFNA\_2 463.0 / 219.0



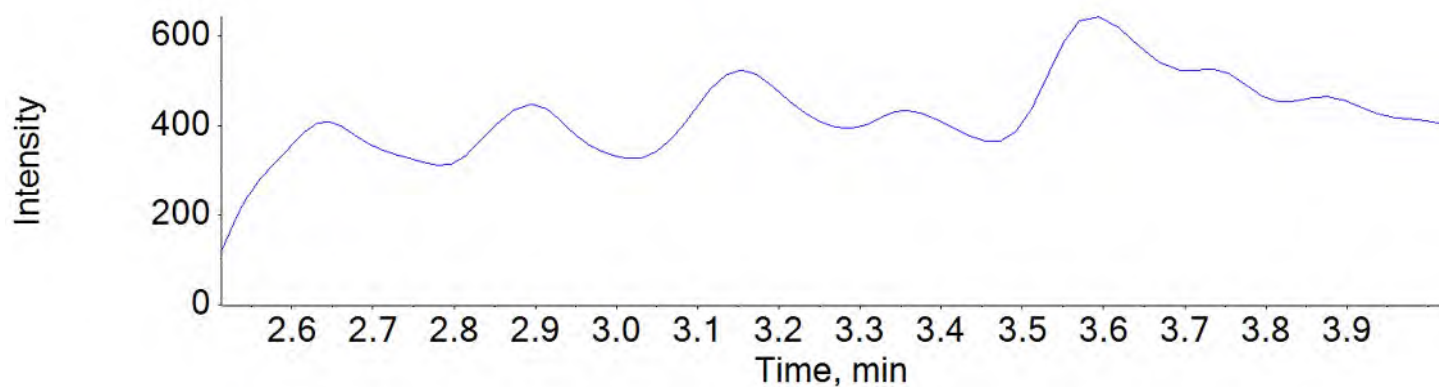
PFOS\_1 499.0 / 80.0



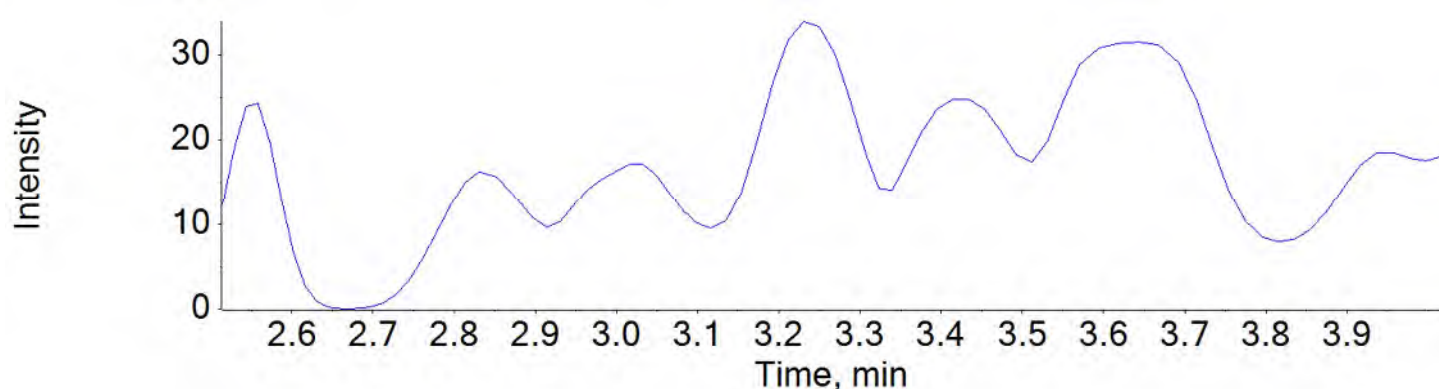
PFOS\_2 499.0 / 99.0



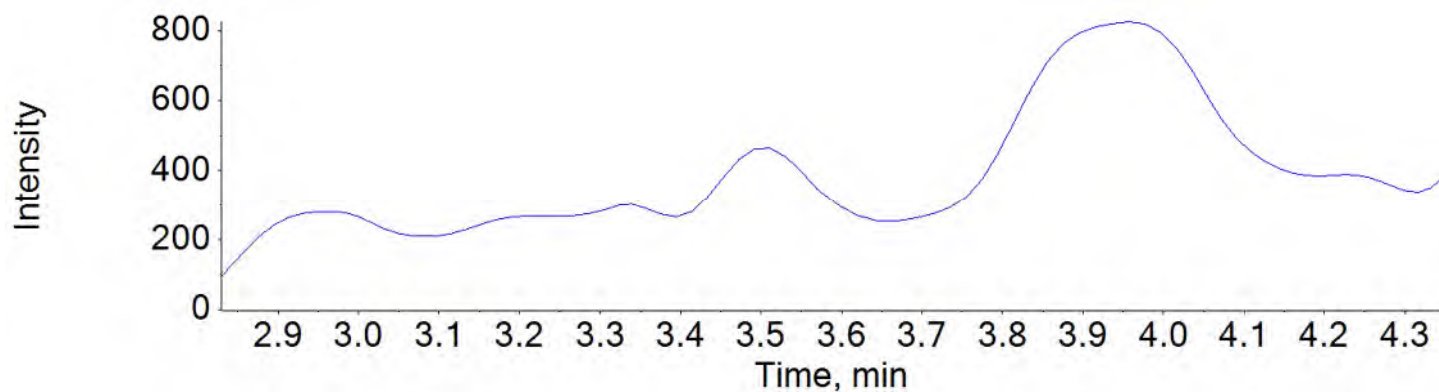
PFDA\_1 513.0 / 469.0



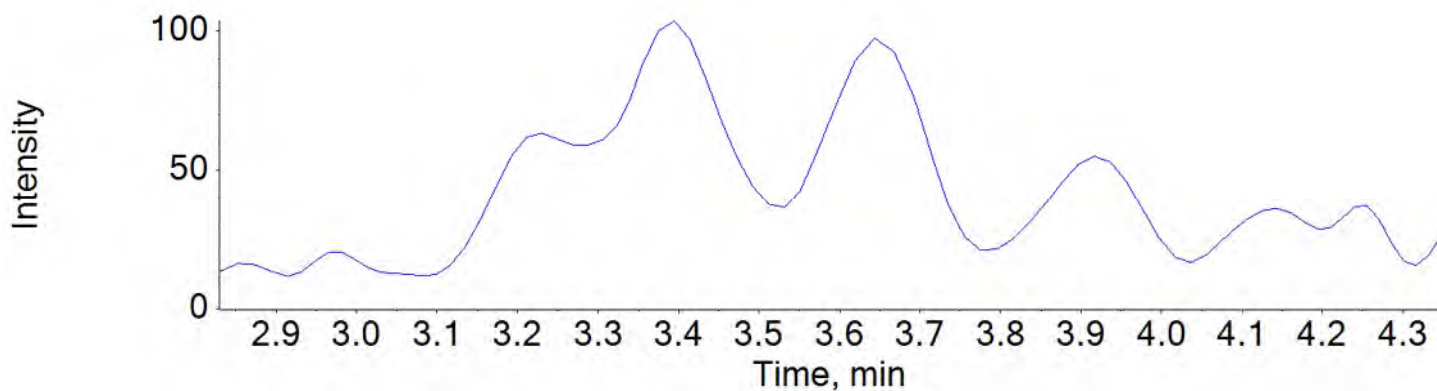
PFDA\_2 513.0 / 219.0



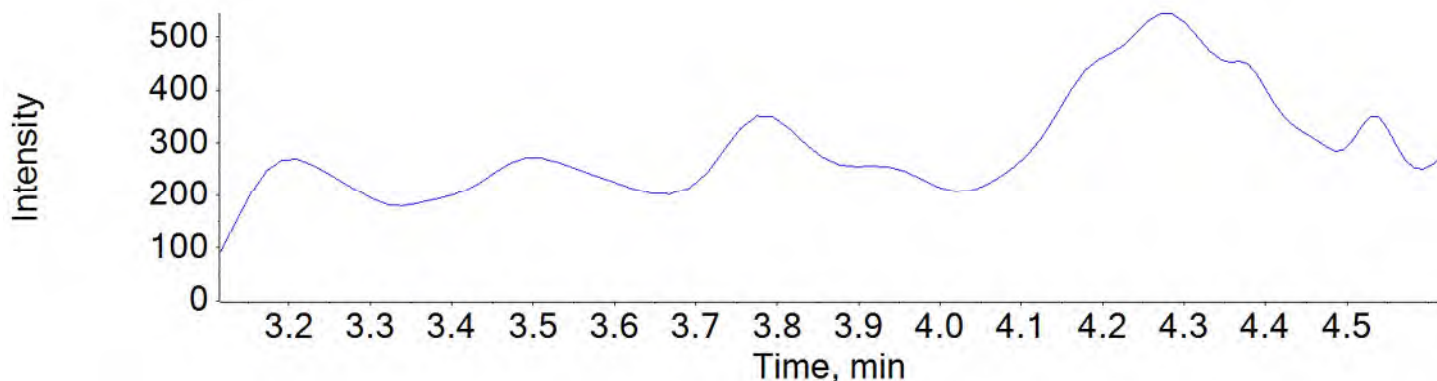
PFUnA\_1 563.0 / 519.0



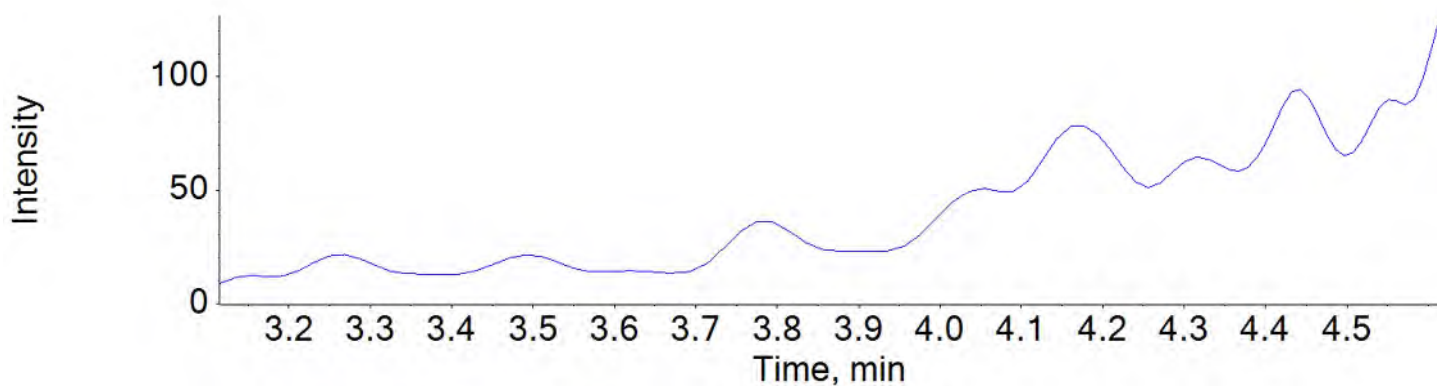
PfUnA\_2 563.0 / 269.0



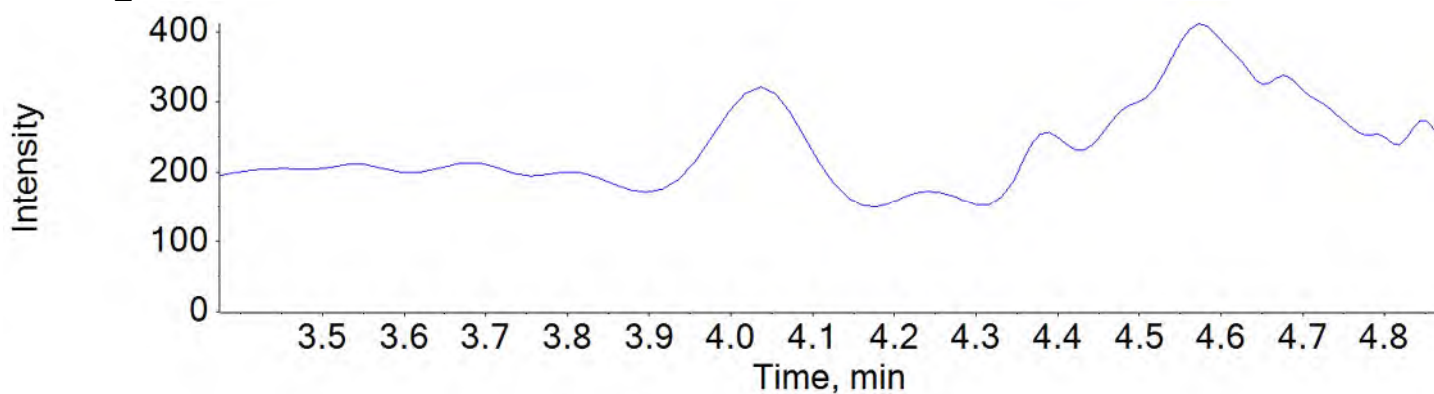
PFDaA\_1 613.0 / 569.0



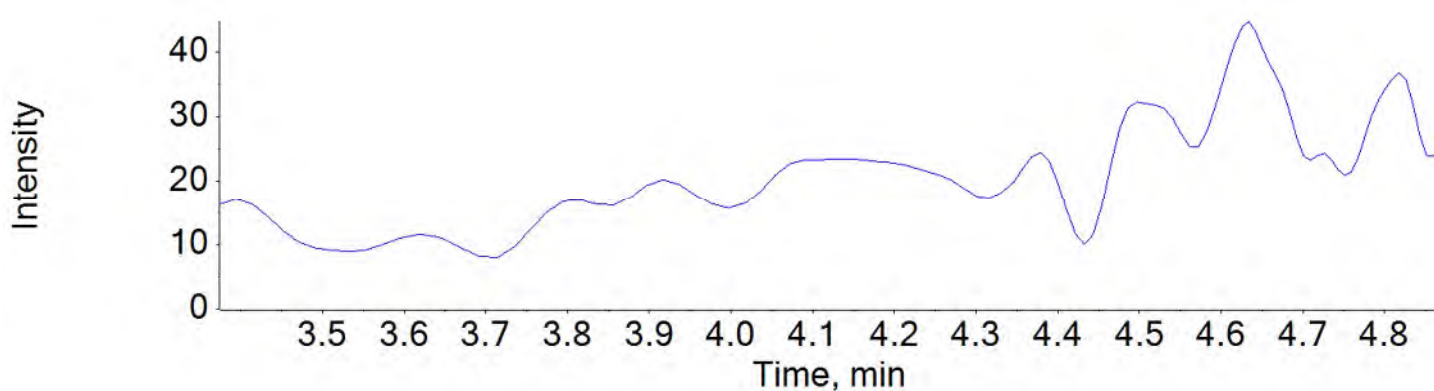
PFDaA\_2 613.0 / 319.0



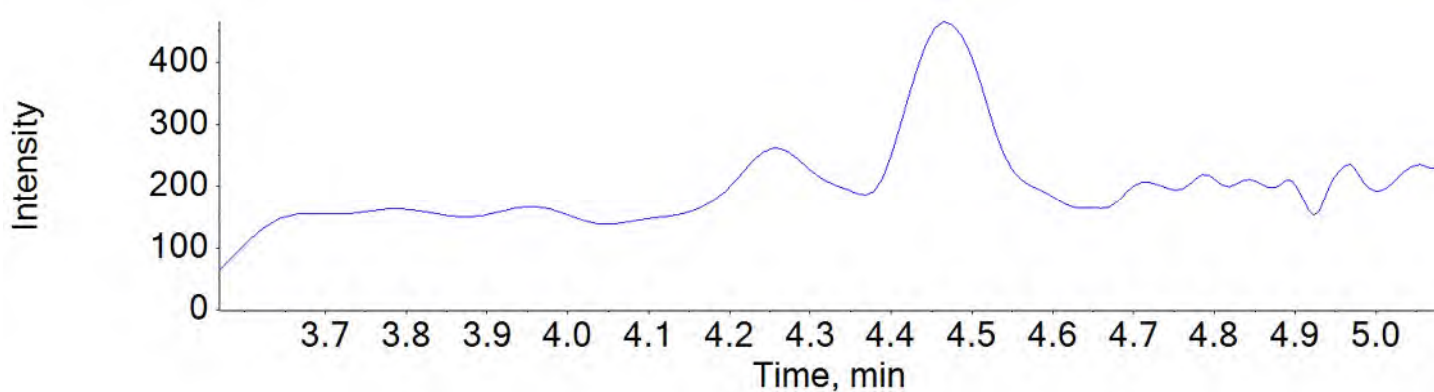
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

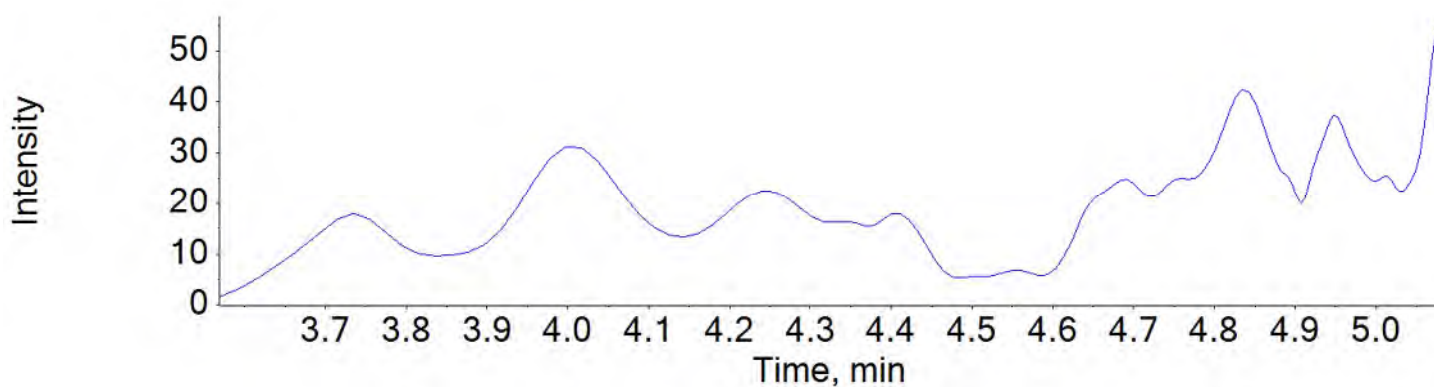


PFTTeDA\_1 713.0 / 669.0

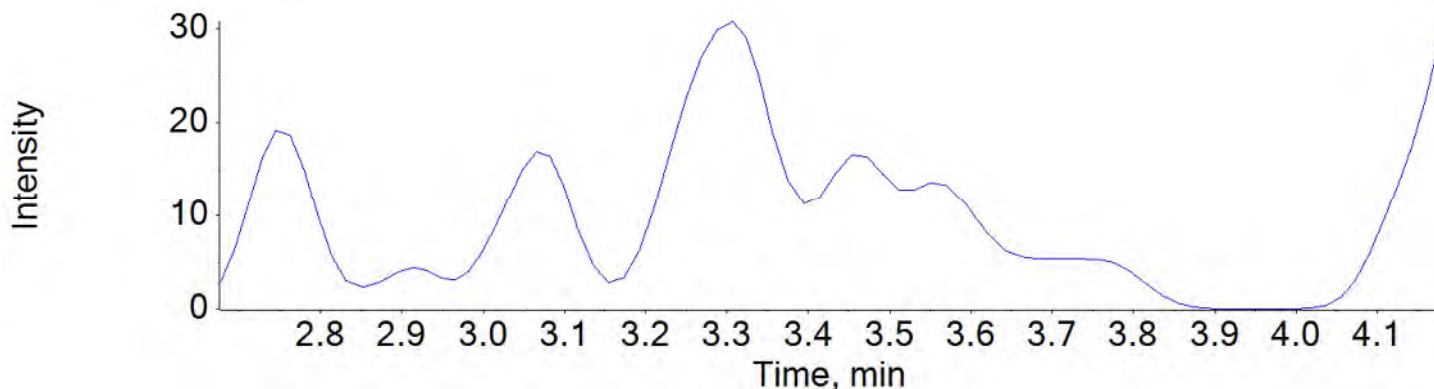




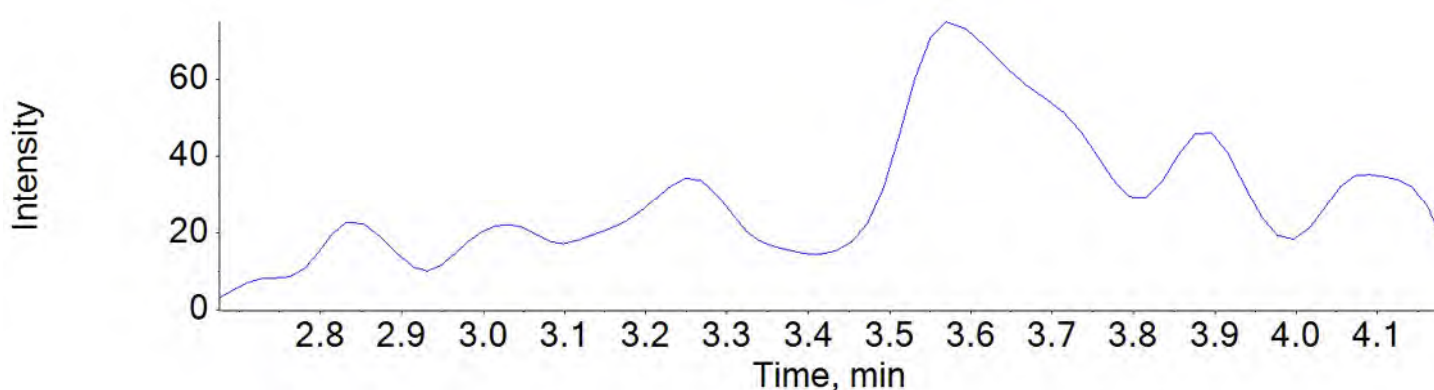
PFTeDA\_2 713.0 / 169.0



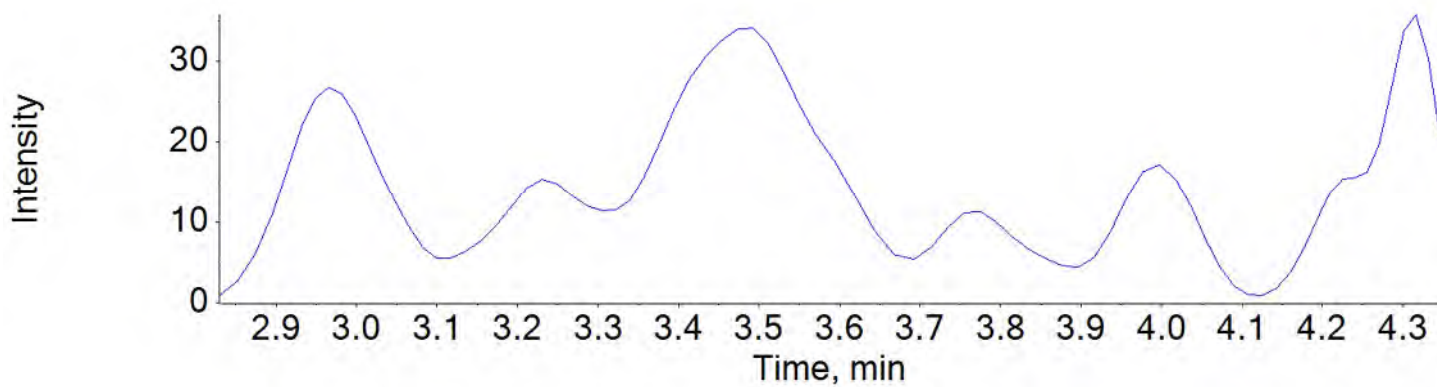
NMeFOSAA\_1 570.0 / 419.0



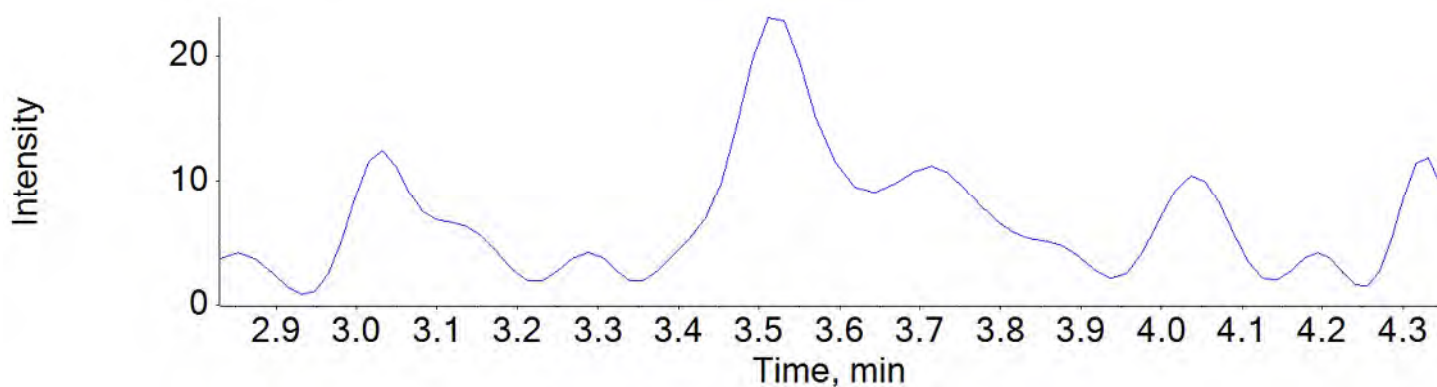
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



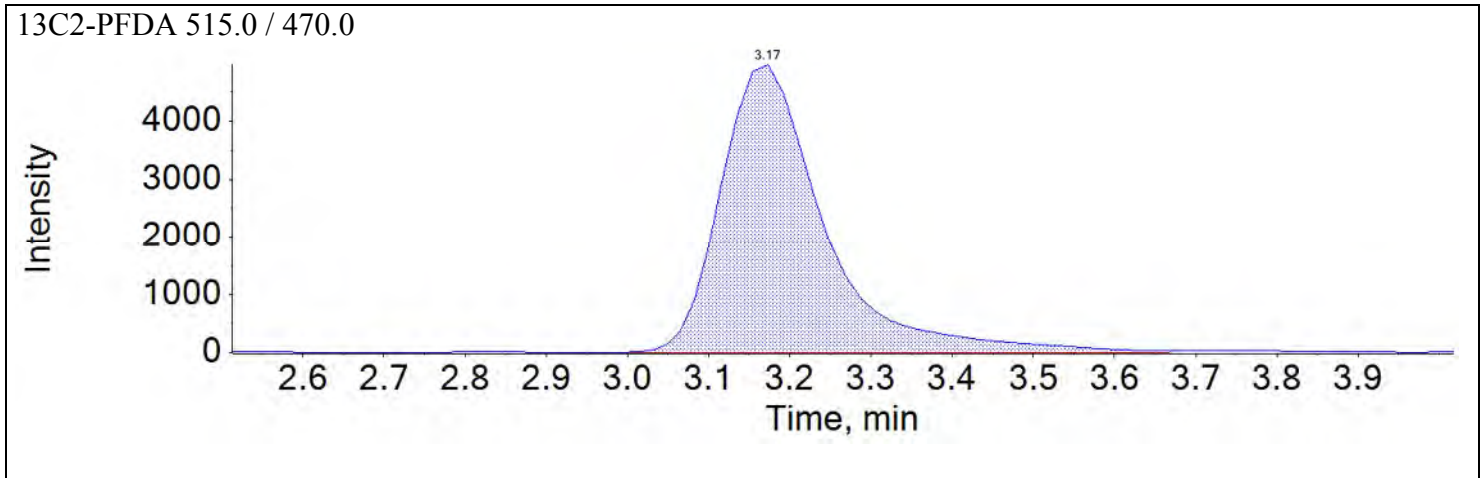
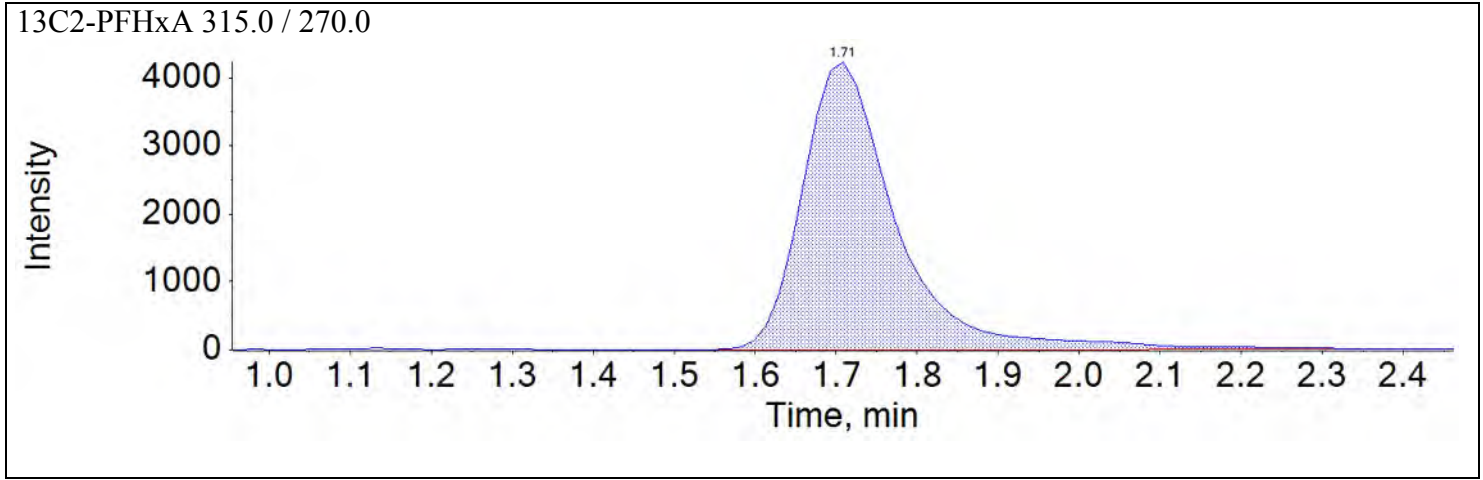
NEtFOSAA\_2 584.0 / 483.0



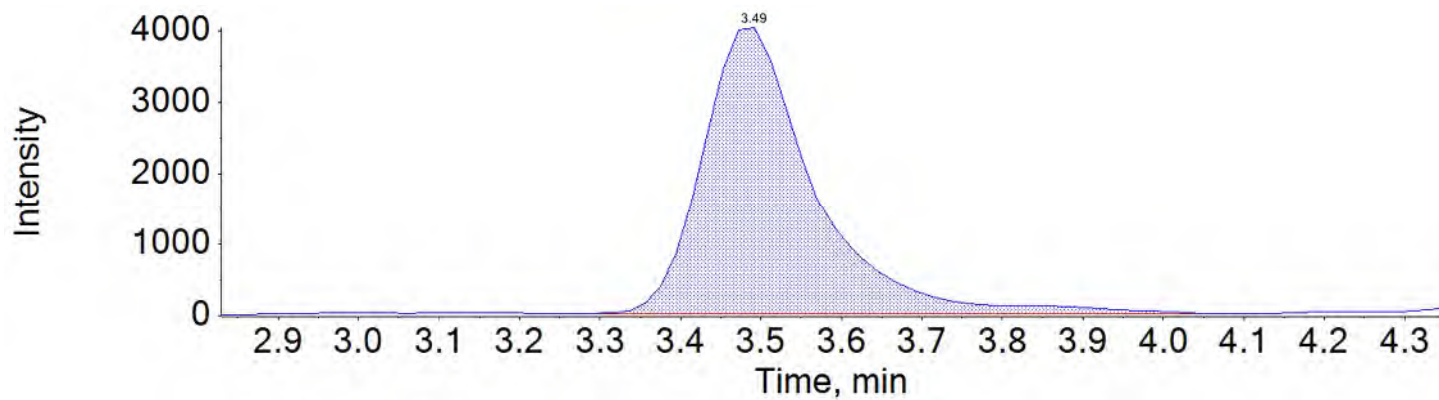


|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5965-FS(0)          | Injection Vial   | 14           |
| Sample ID          | WGNA-043018-FRB-3103 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:23:10  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Chromatograms



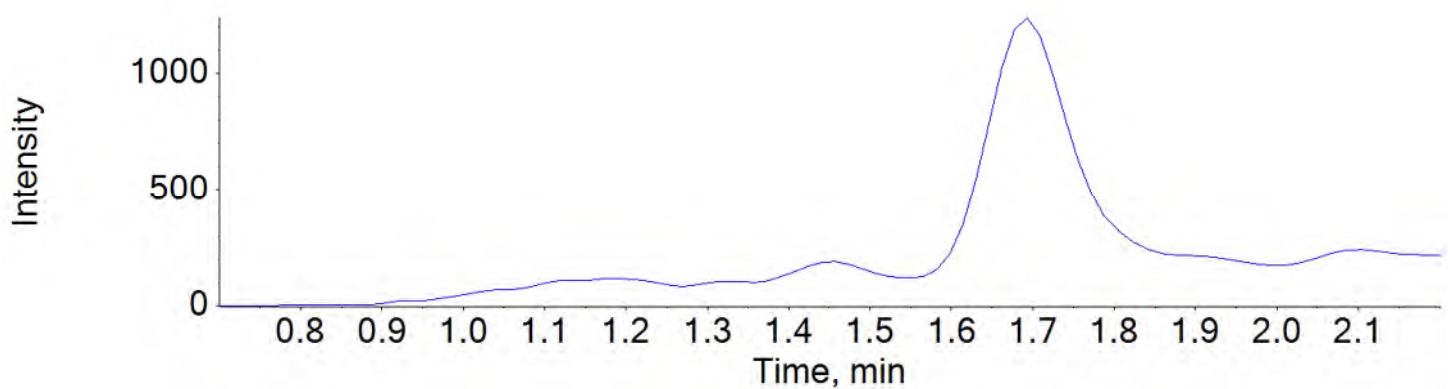
d5-EtFOSAA 589.0 / 419.0



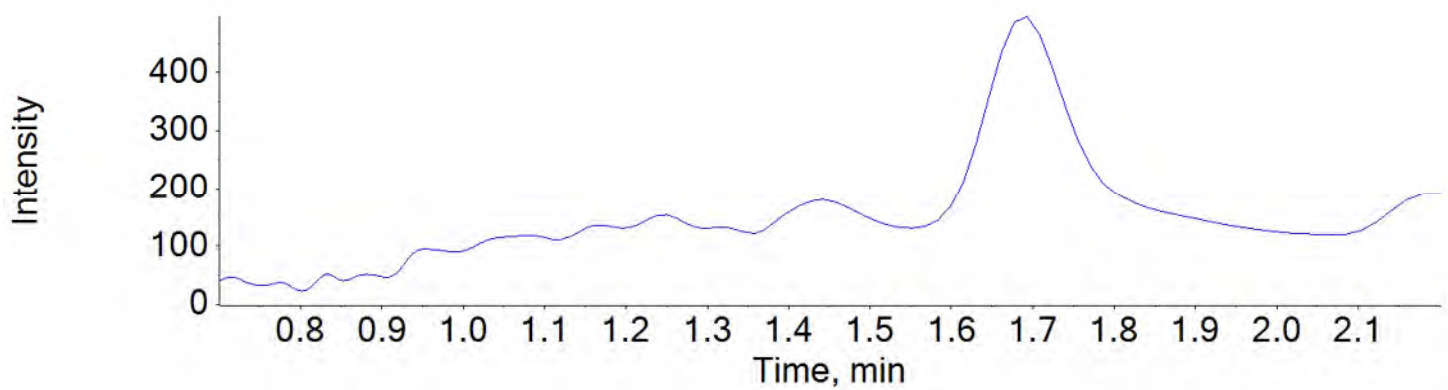
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5967-FS(0)         | Injection Vial   | 15           |
| Sample ID          | NAWC-043018-FRB-207 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:32:06 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

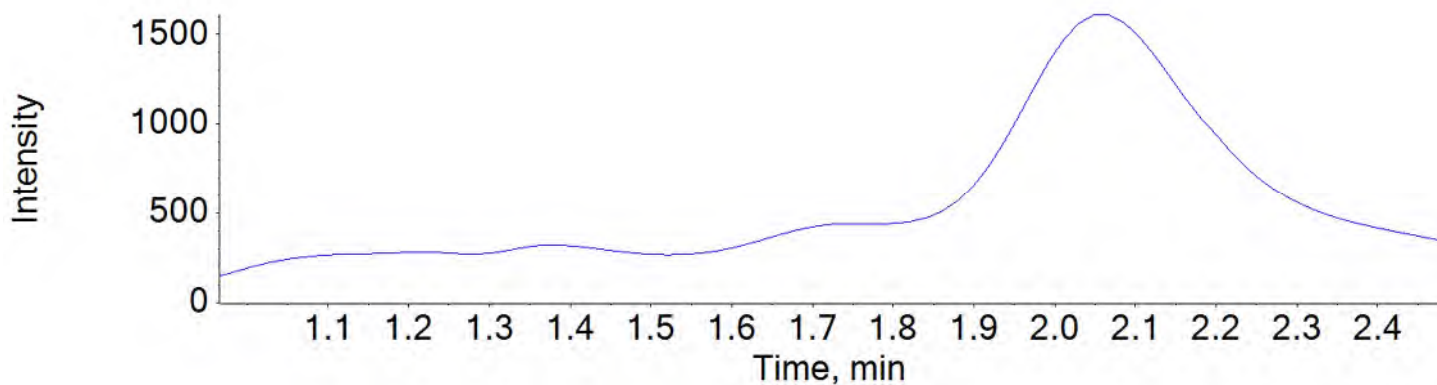
PFBS\_1 298.9 / 80.0



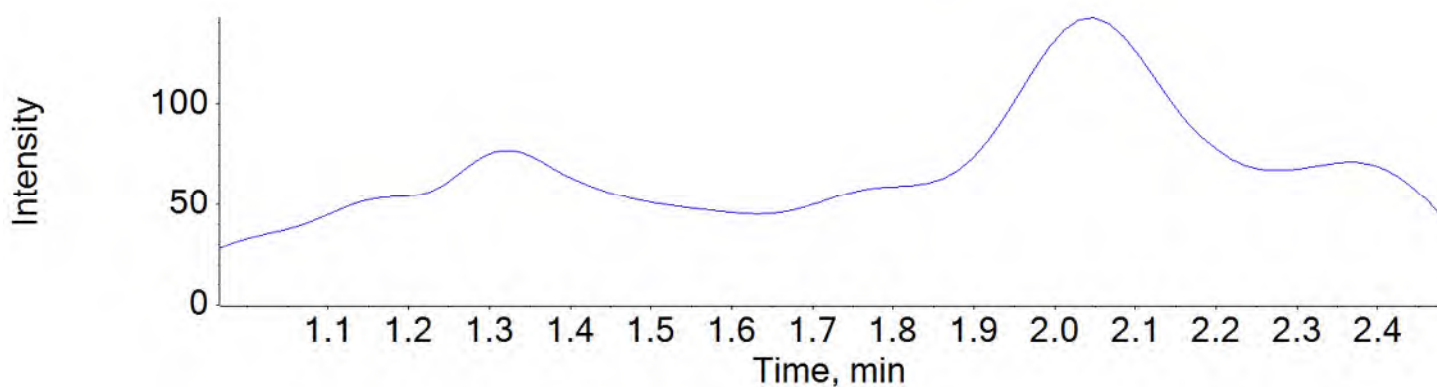
PFBS\_2 298.9 / 99.0



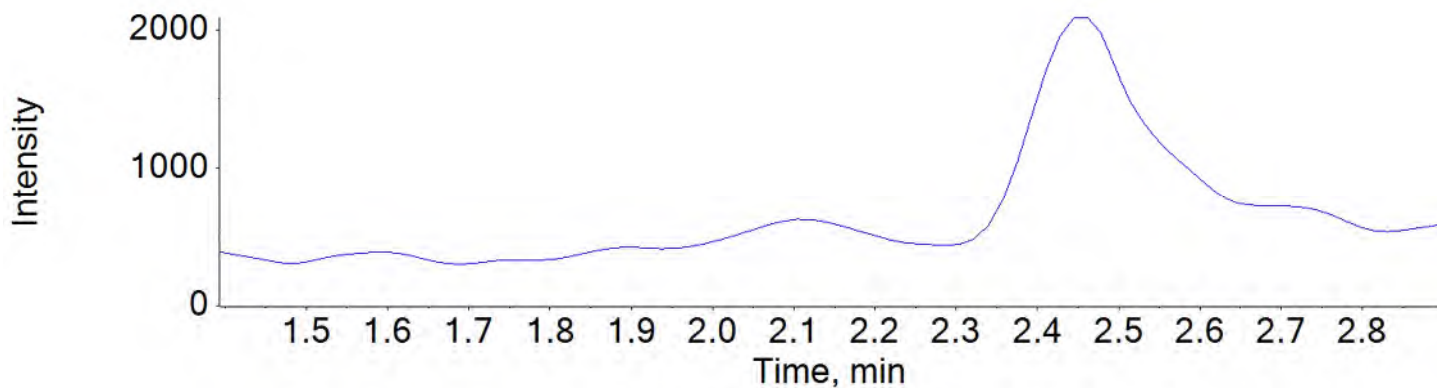
PFHxA\_1 313.0 / 269.0



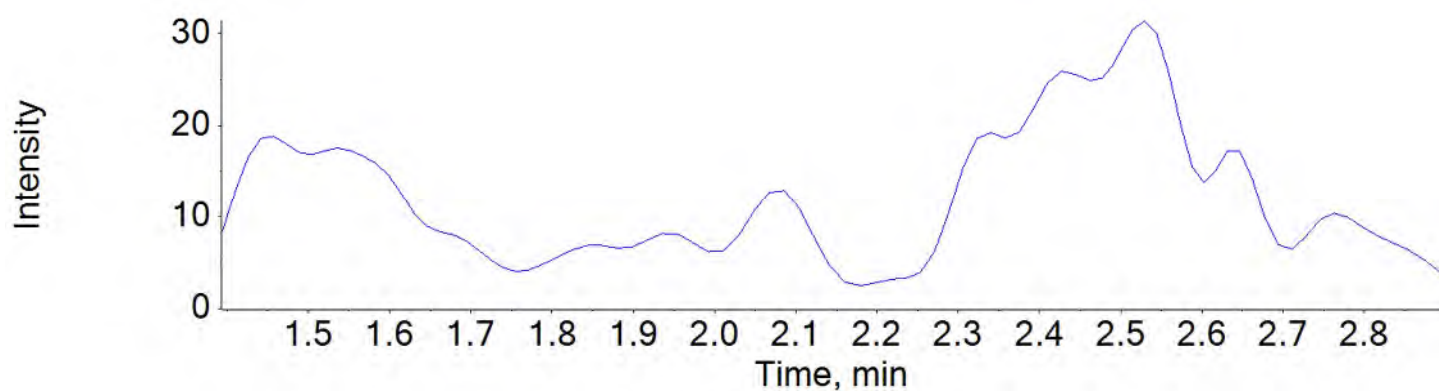
PFHxA\_2 313.0 / 119.0



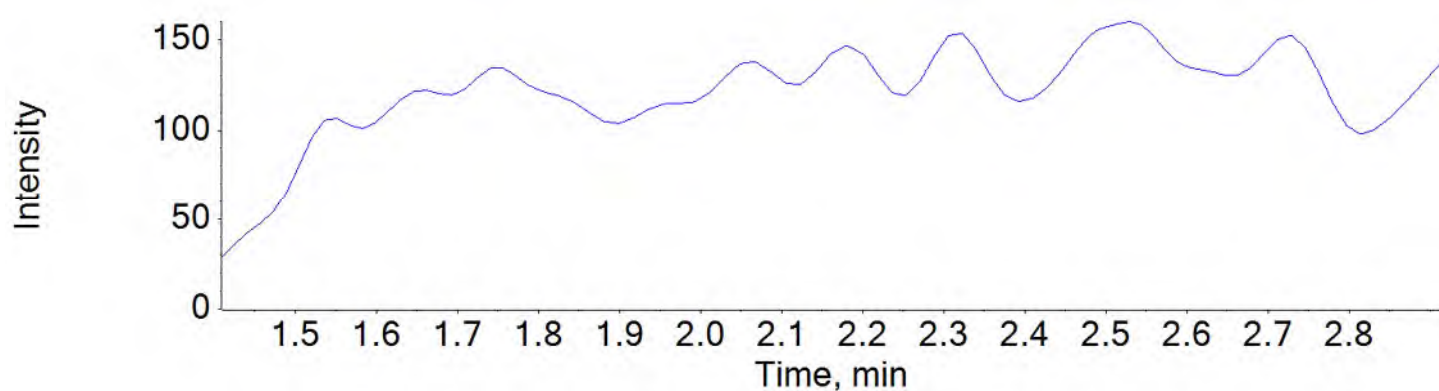
PFHpA\_1 363.0 / 319.0



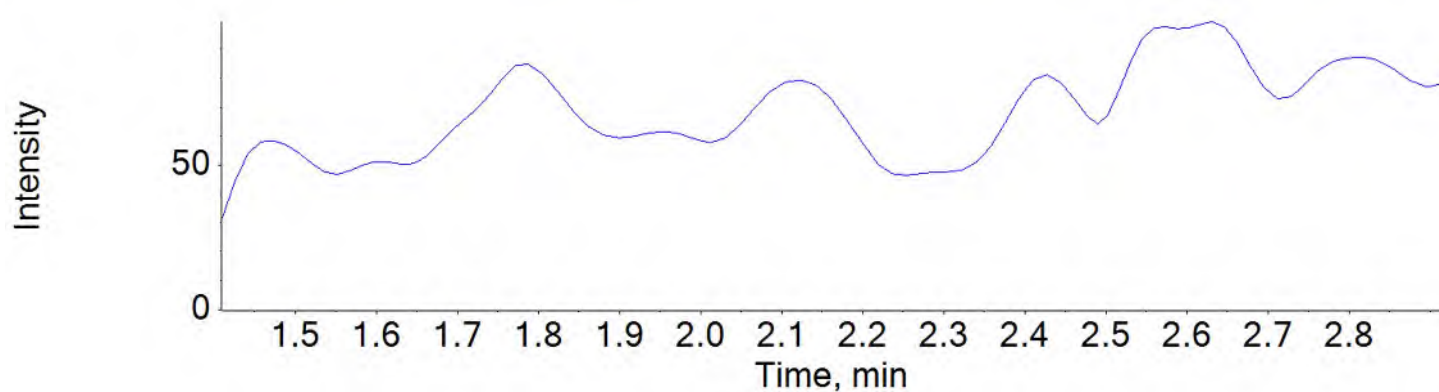
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

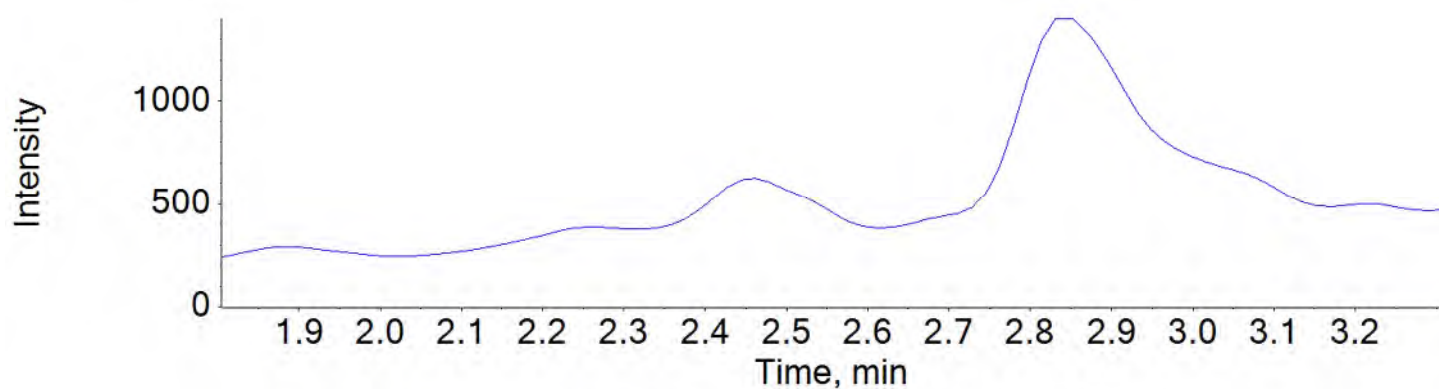


PFHxS\_2 399.0 / 99.0

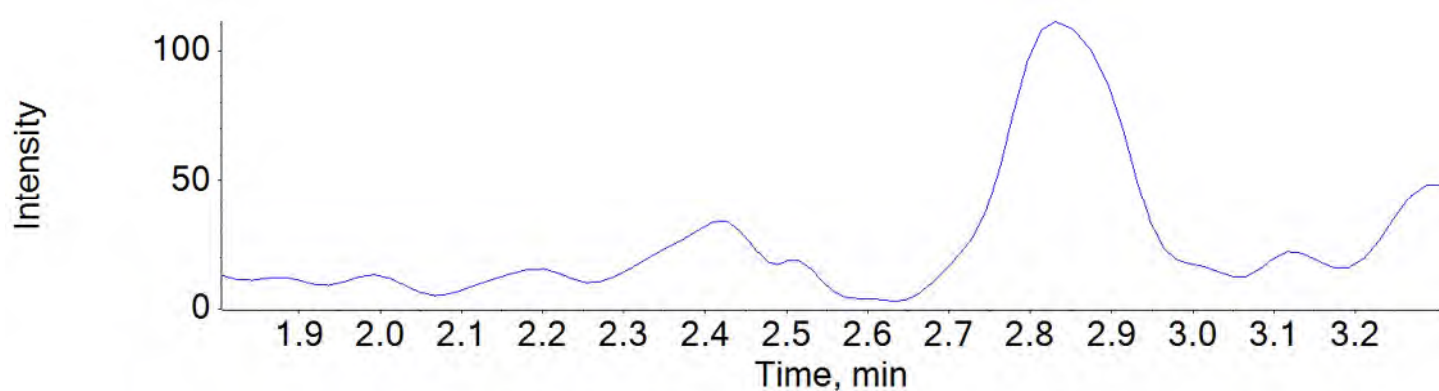




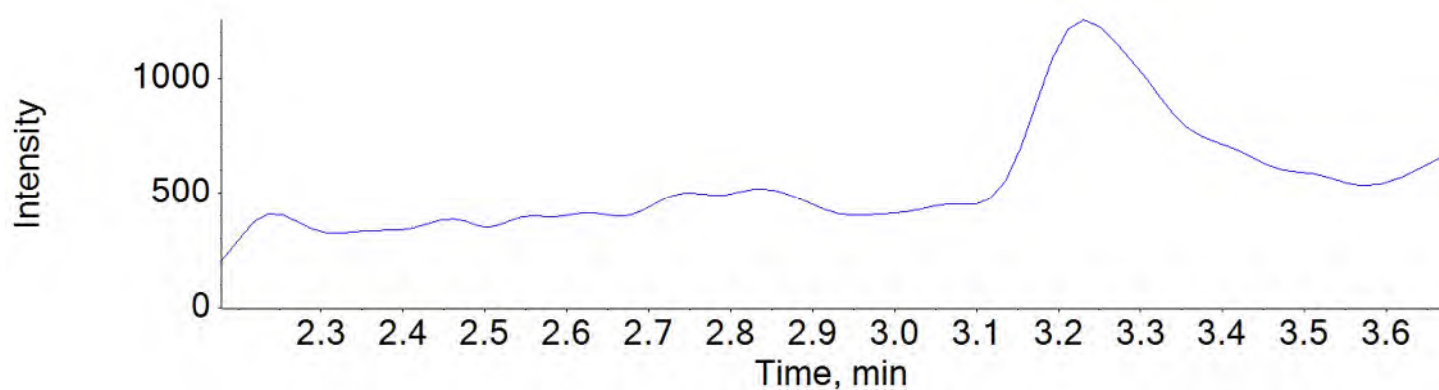
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

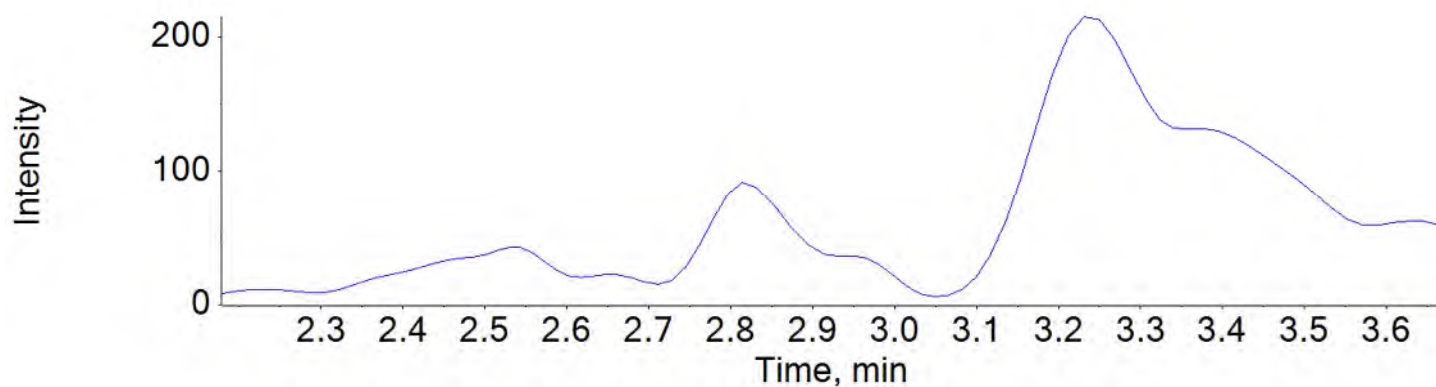


PFNA\_1 463.0 / 419.0

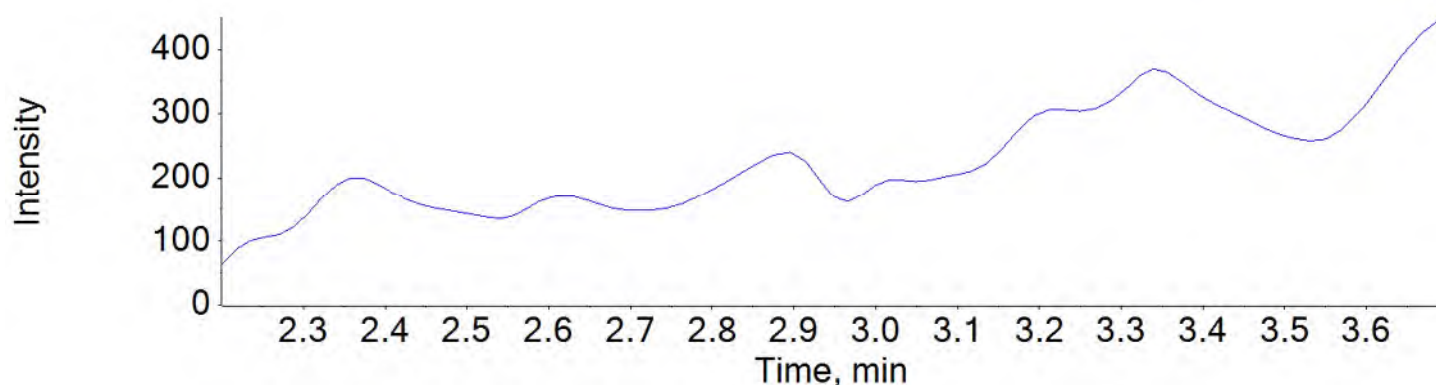




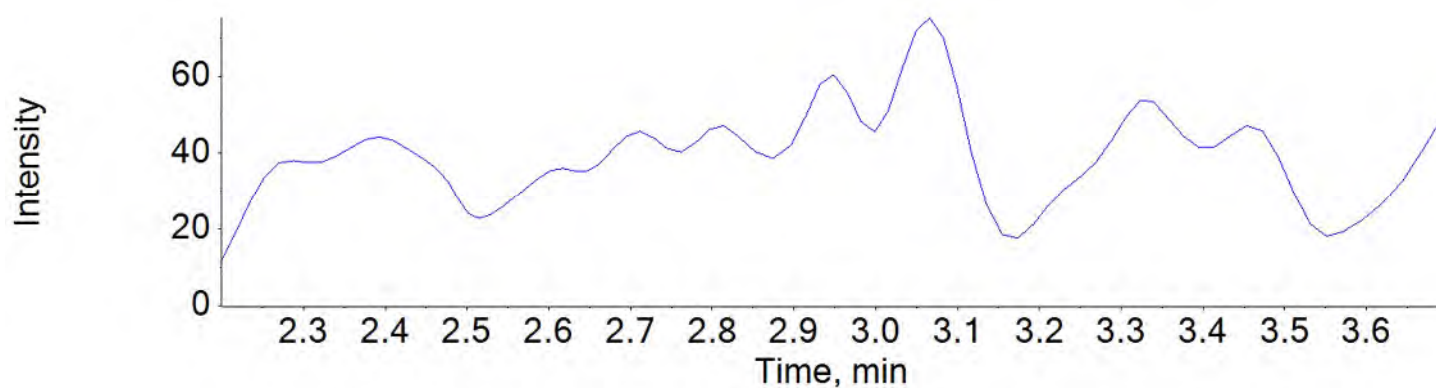
PFNA\_2 463.0 / 219.0



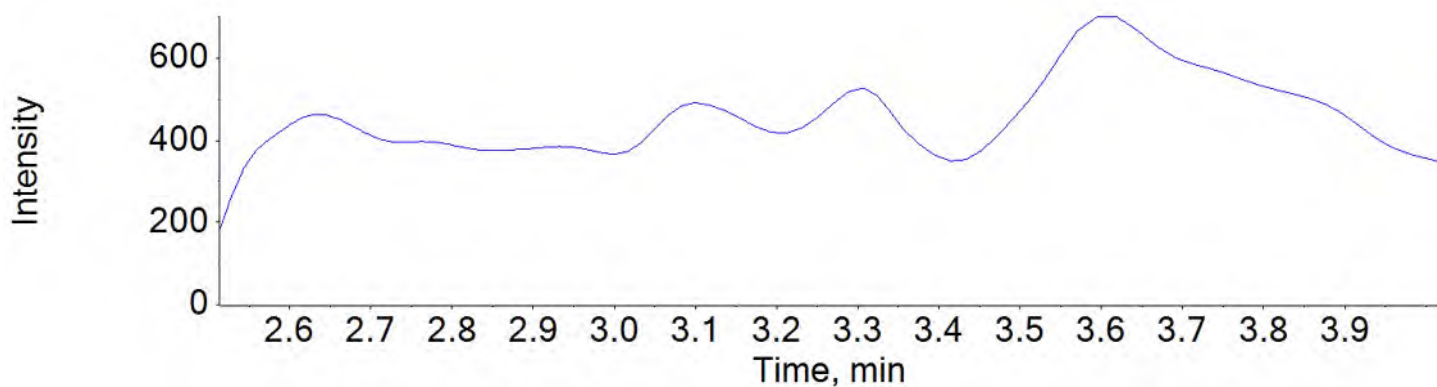
PFOS\_1 499.0 / 80.0



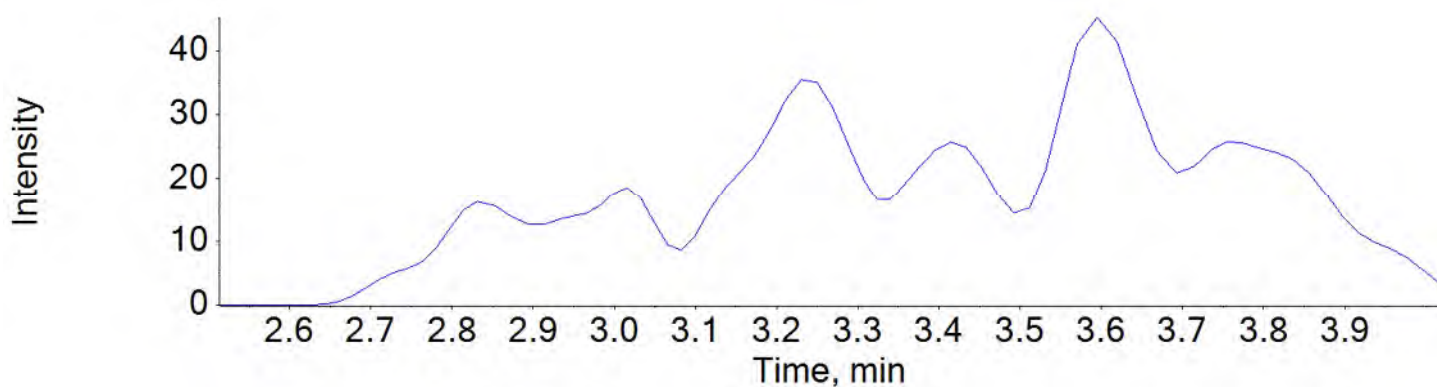
PFOS\_2 499.0 / 99.0



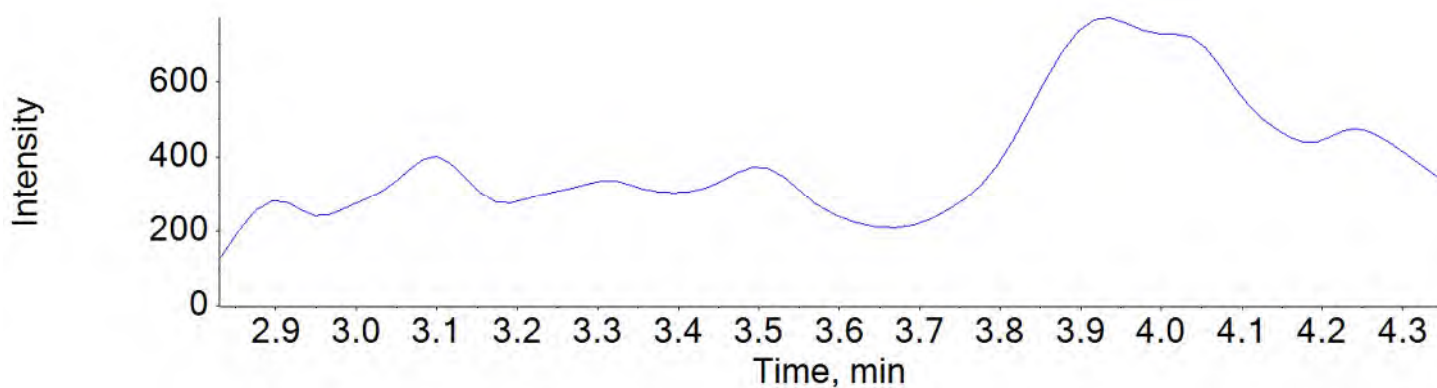
PFDA\_1 513.0 / 469.0



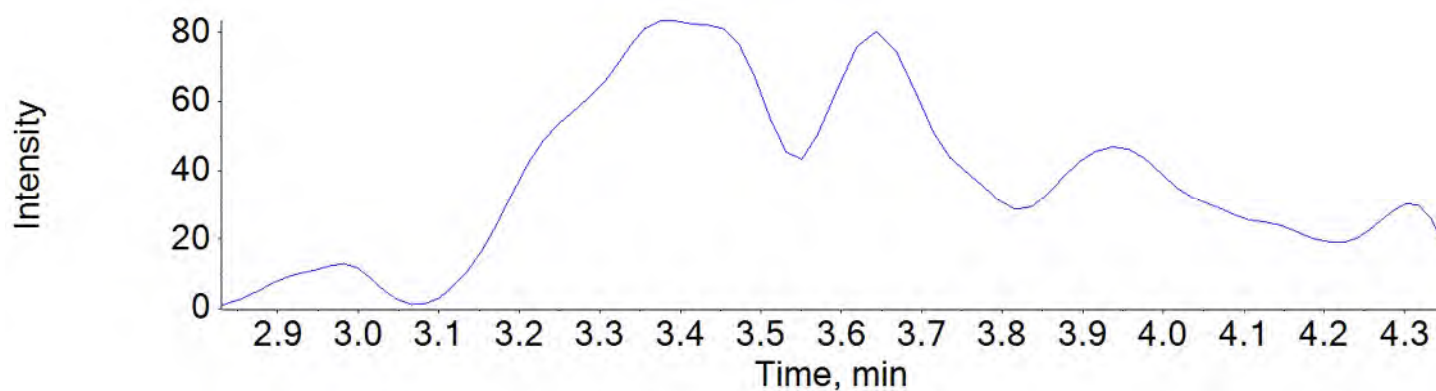
PFDA\_2 513.0 / 219.0



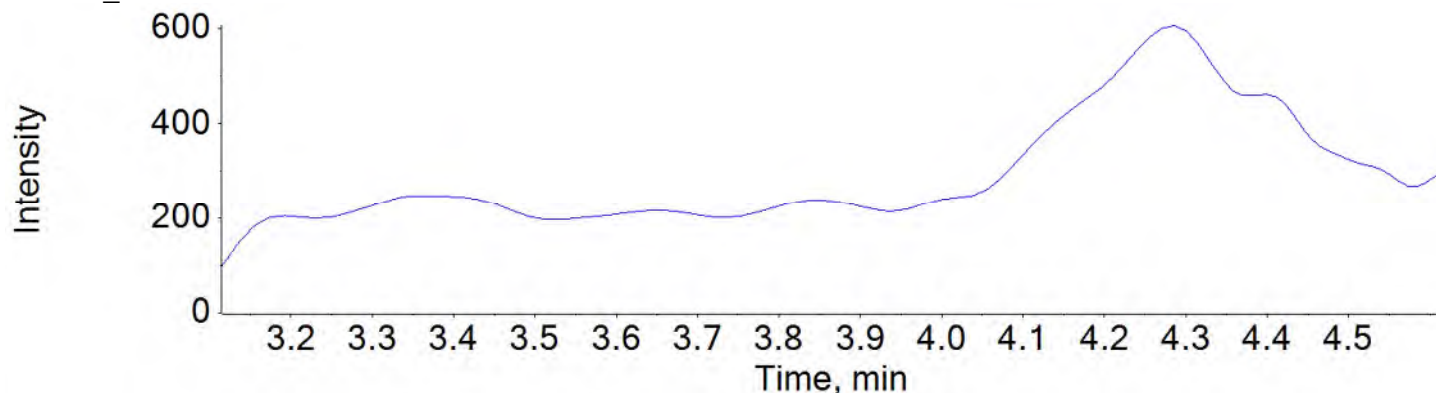
PFUnA\_1 563.0 / 519.0



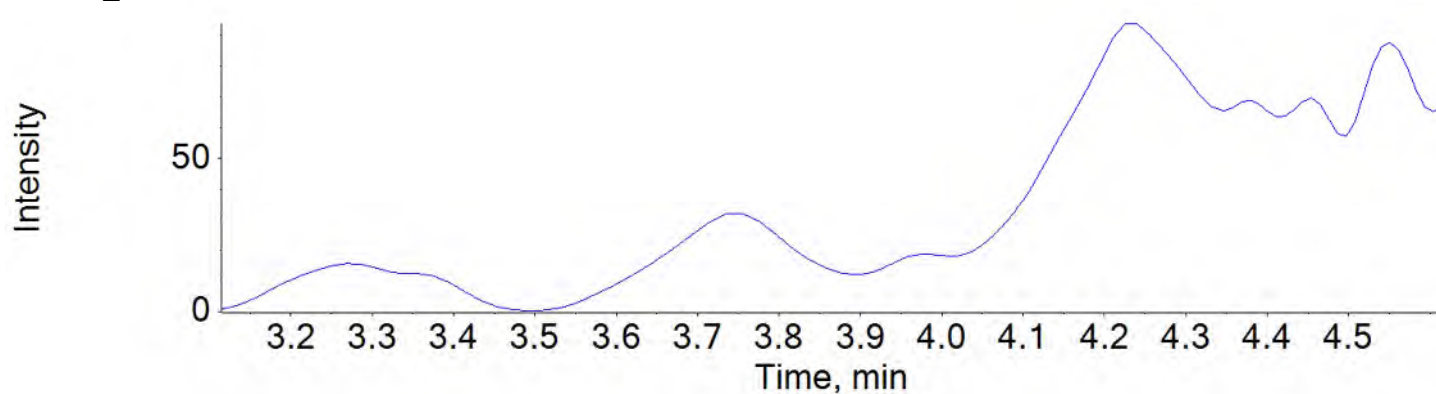
PFUnA\_2 563.0 / 269.0



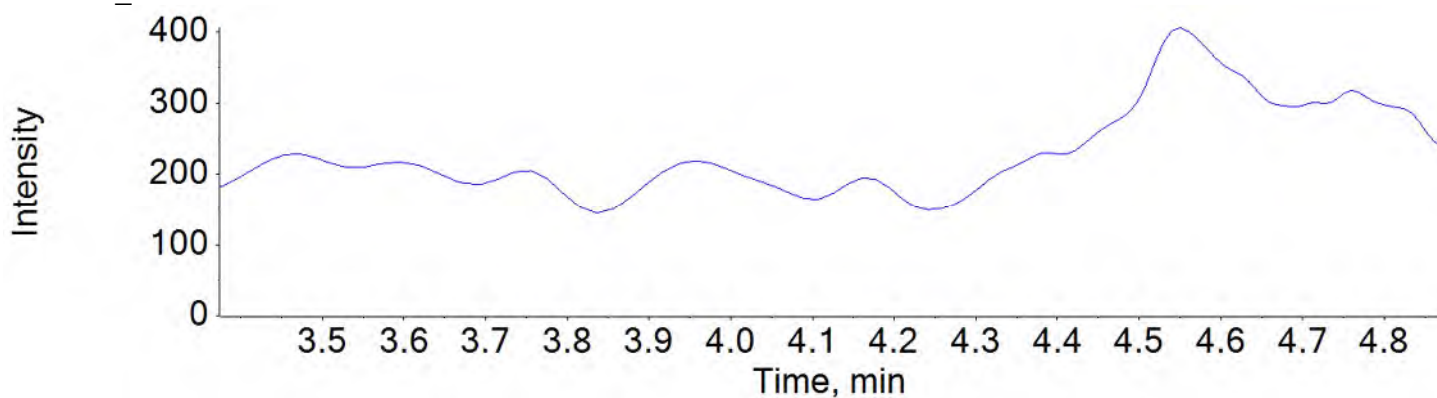
PFDaA\_1 613.0 / 569.0



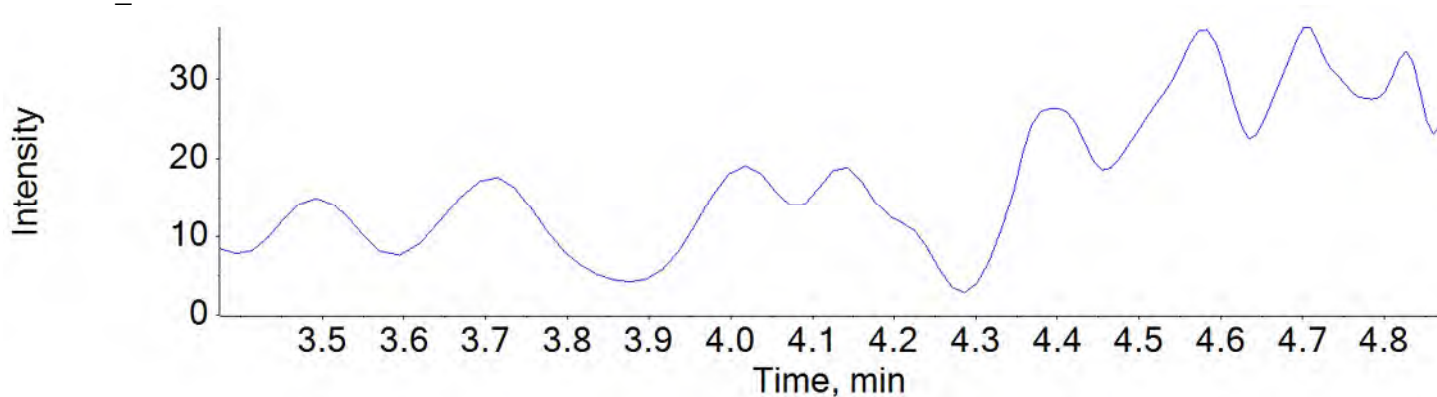
PFDaA\_2 613.0 / 319.0



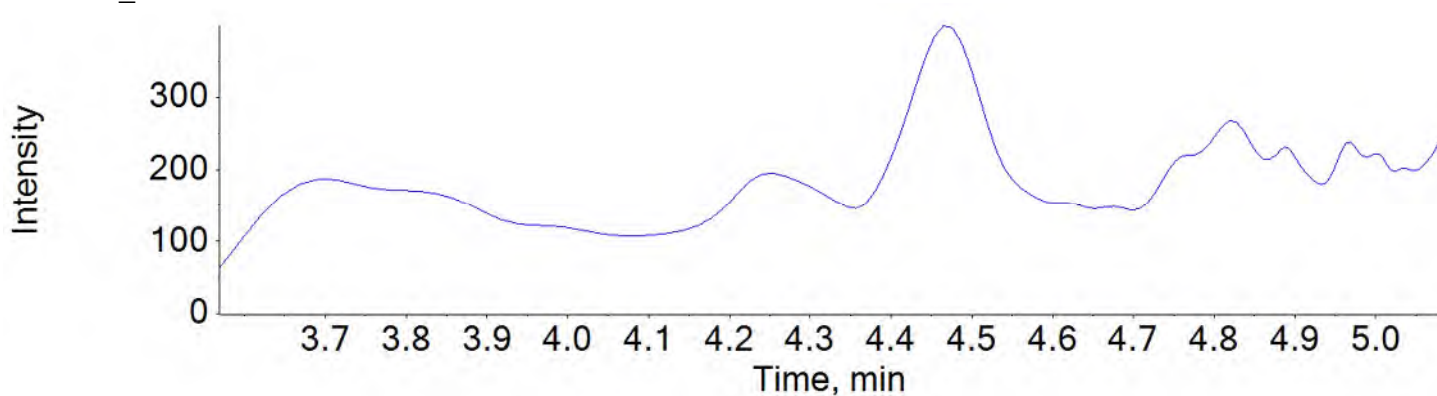
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

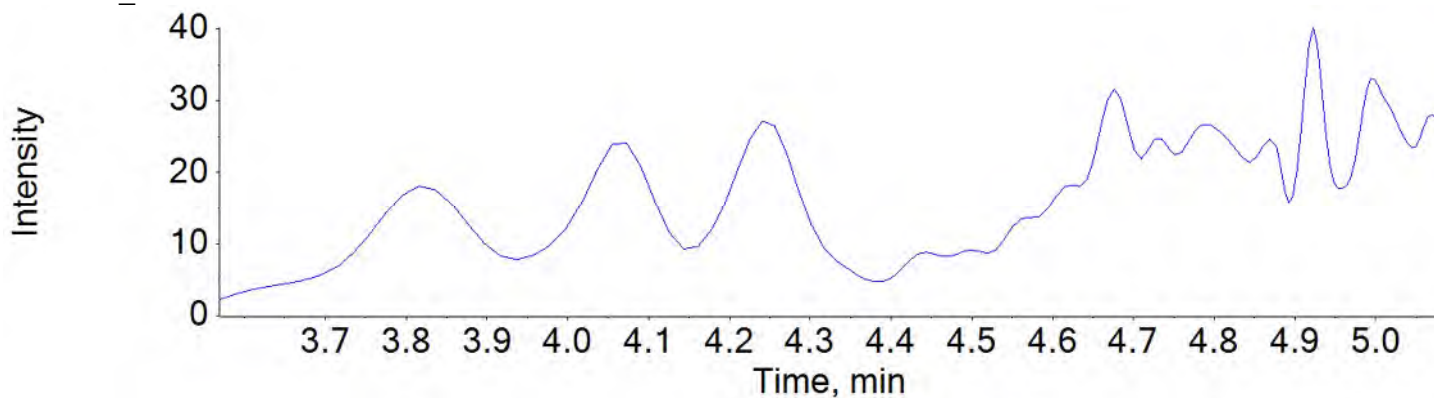


PFTTeDA\_1 713.0 / 669.0

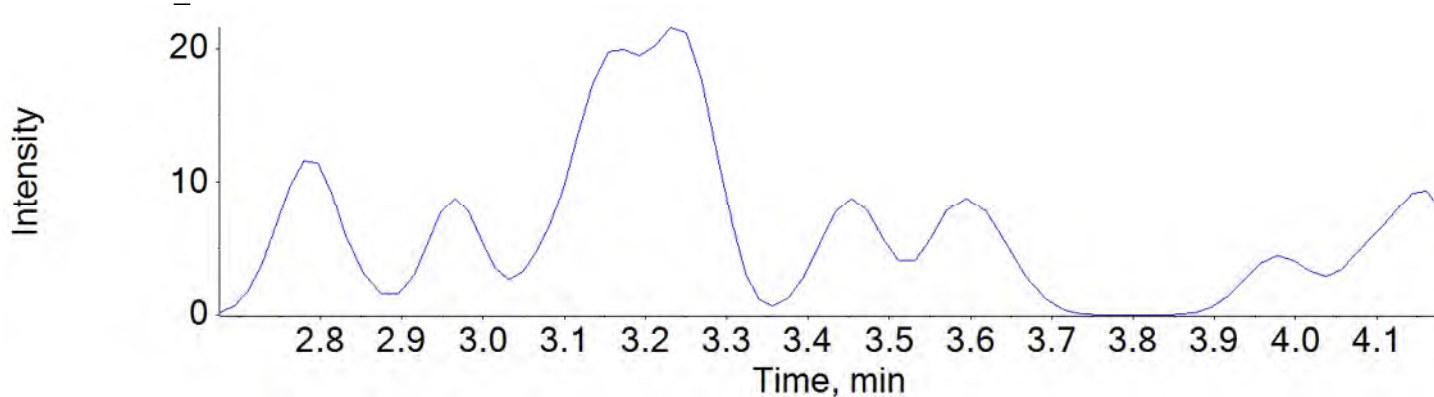




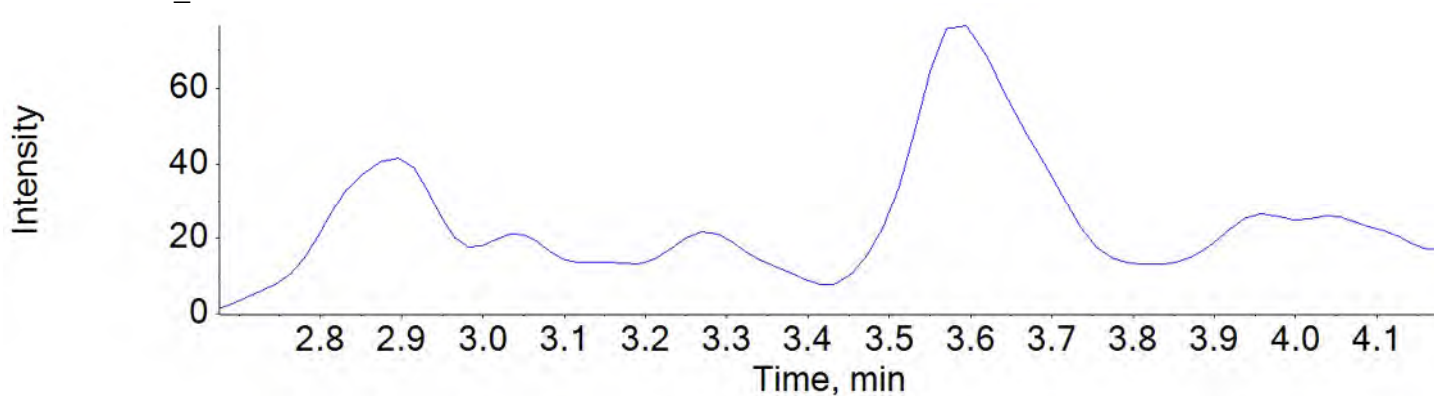
PFTeDA\_2 713.0 / 169.0



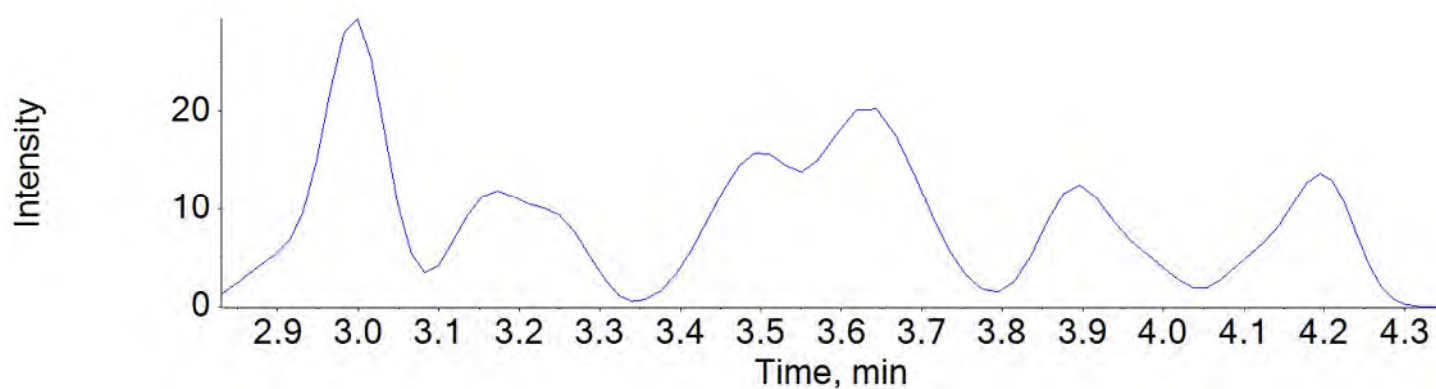
NMeFOSAA\_1 570.0 / 419.0



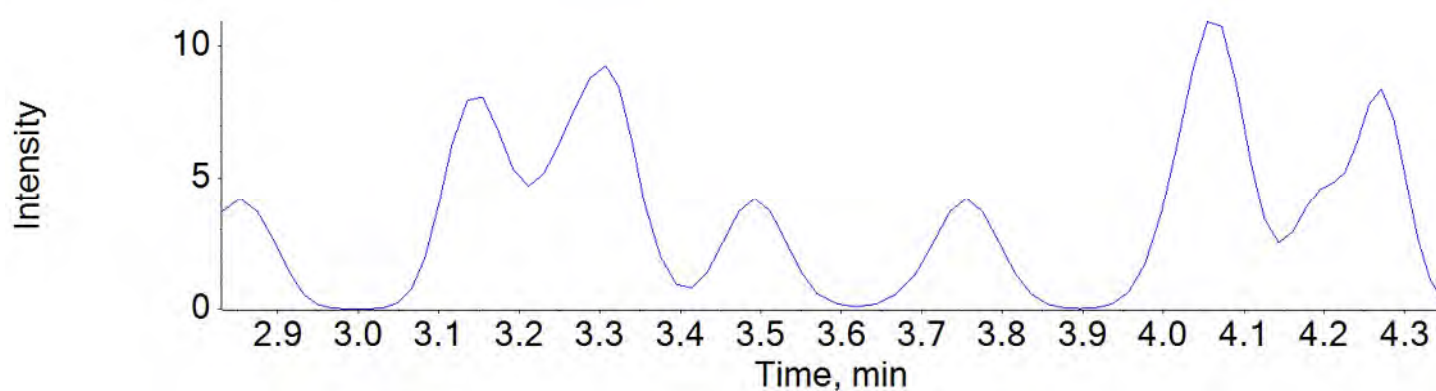
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



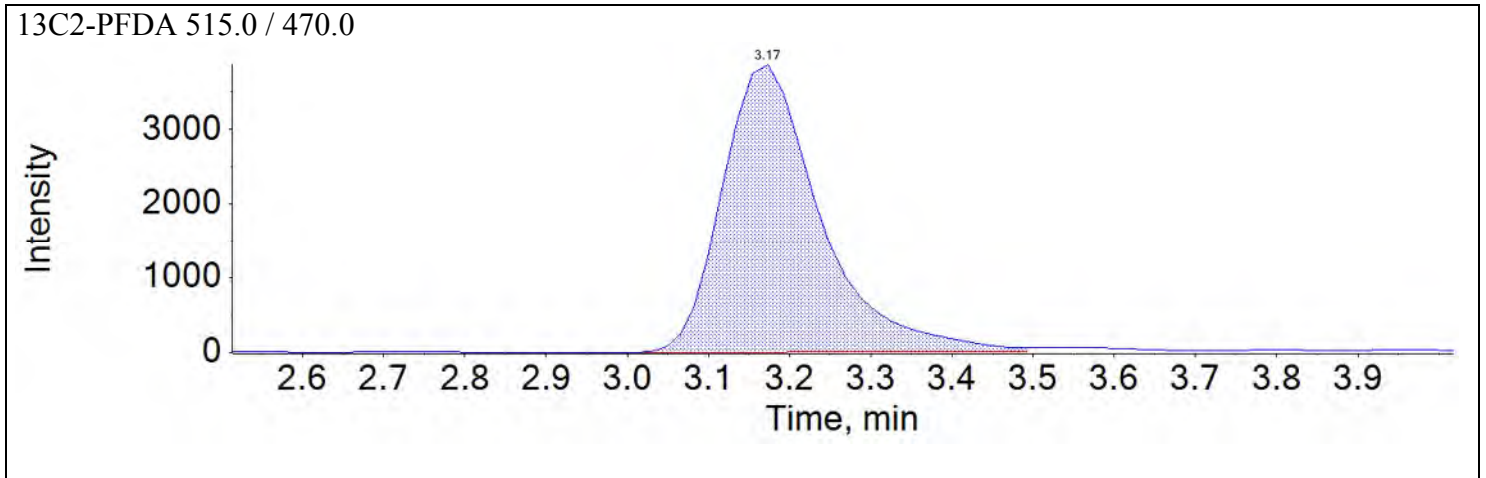
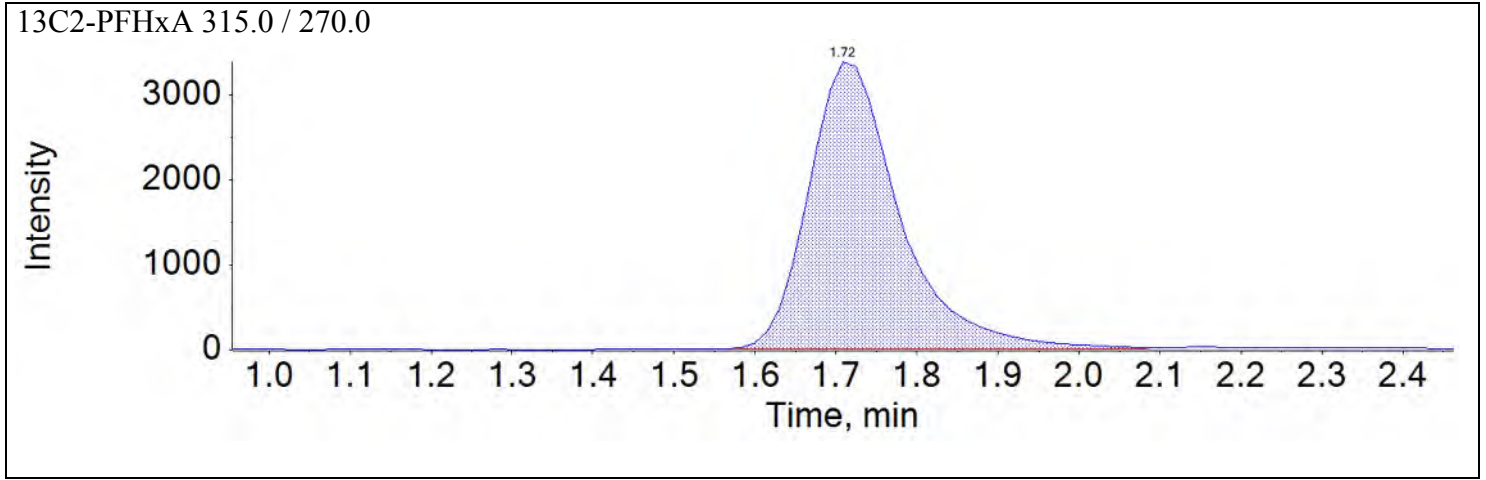
NEtFOSAA\_2 584.0 / 483.0



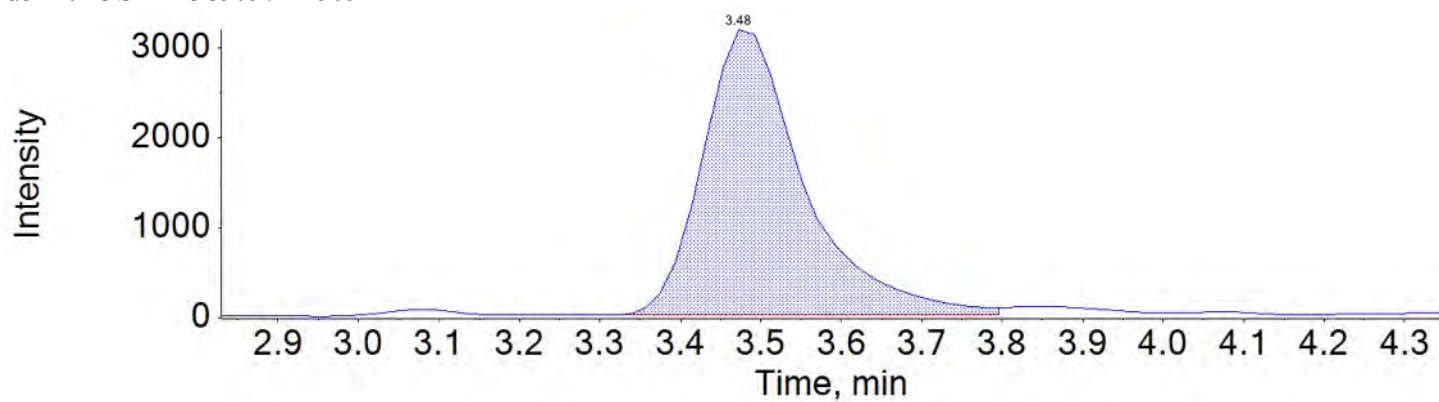


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5967-FS(0)         | Injection Vial   | 15           |
| Sample ID          | NAWC-043018-FRB-207 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:32:06 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

### Chromatograms



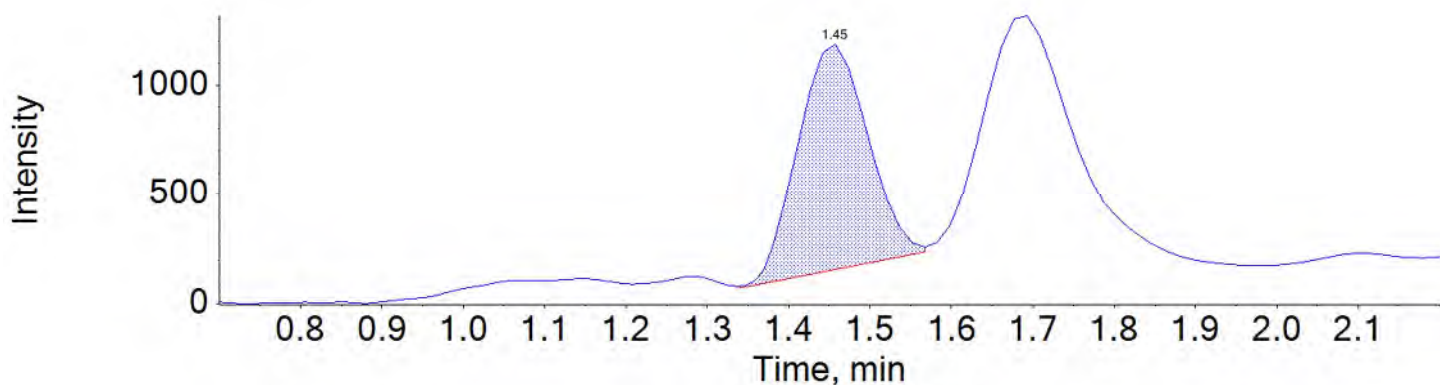
d5-EtFOSAA 589.0 / 419.0



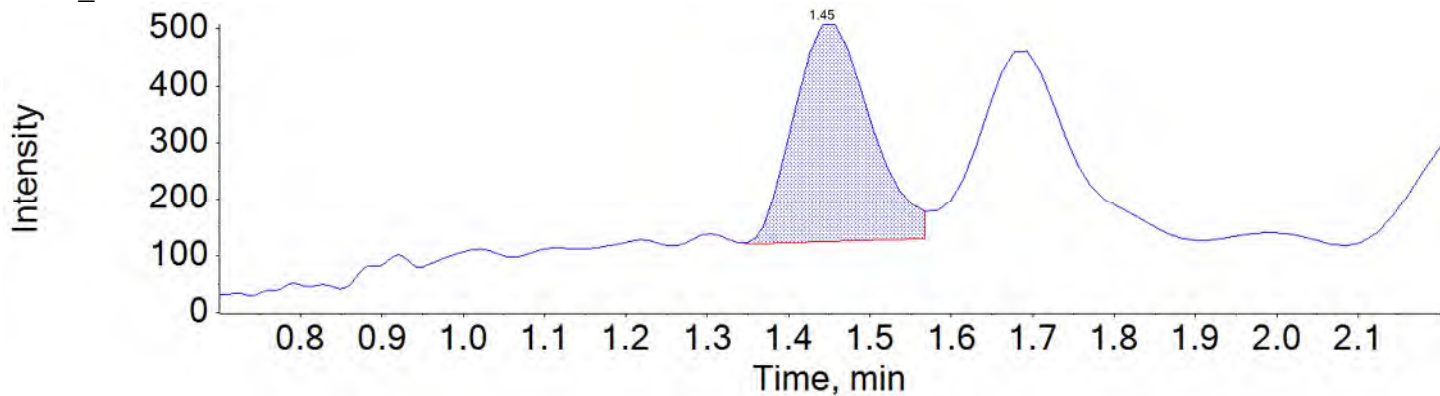
|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5969-FS(0)          | Injection Vial   | 16           |
| Sample ID          | WGNA-043018-FRB-3409 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:41:03  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Chromatograms

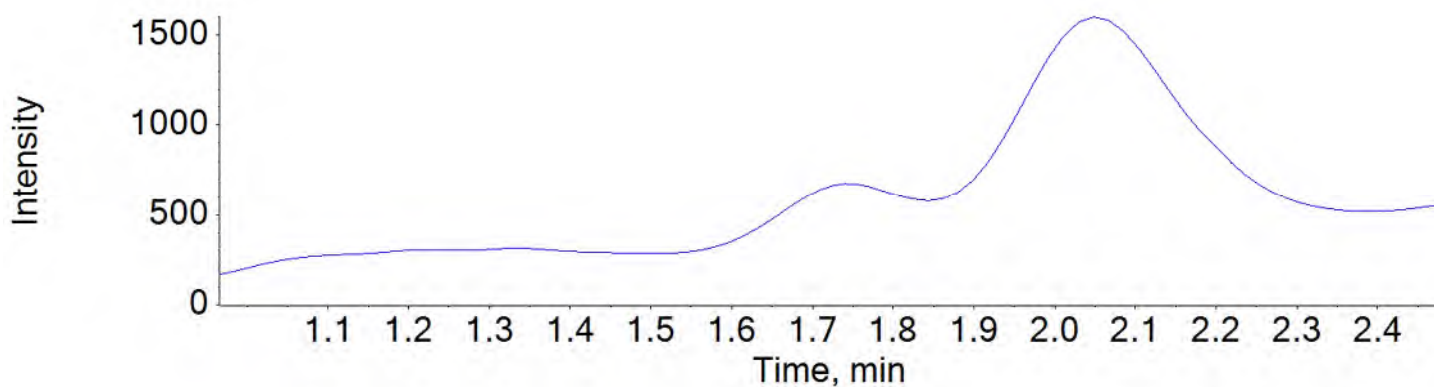
PFBS\_1 298.9 / 80.0



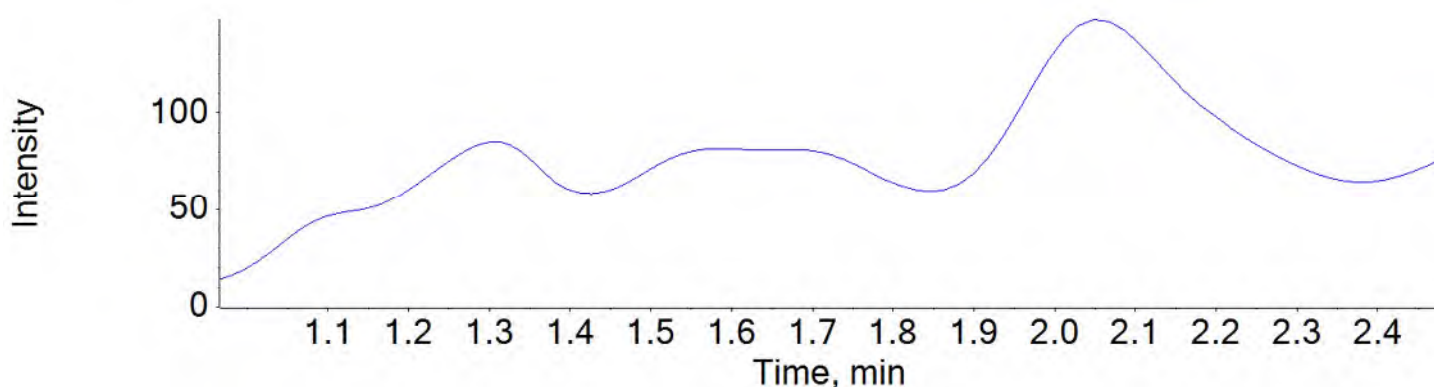
PFBS\_2 298.9 / 99.0



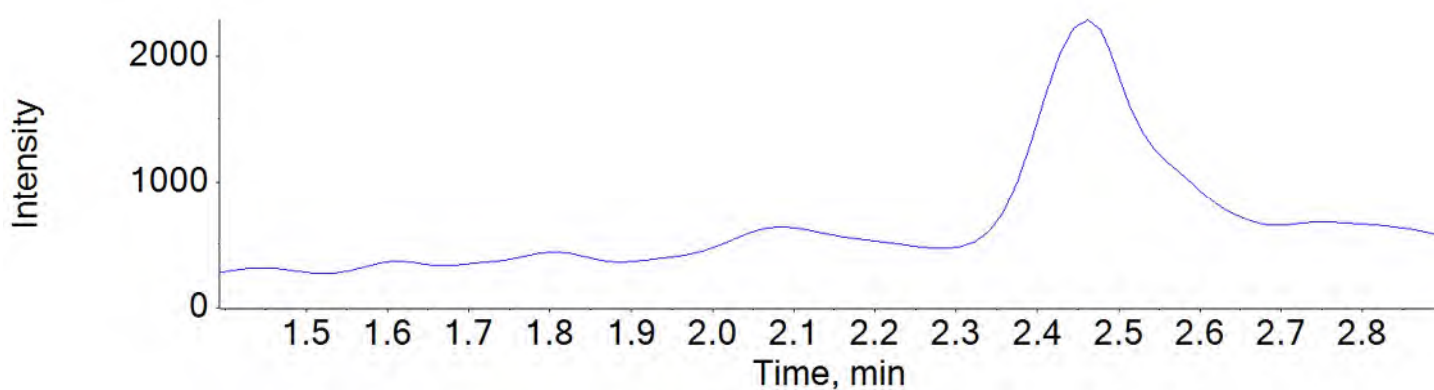
PFHxA\_1 313.0 / 269.0



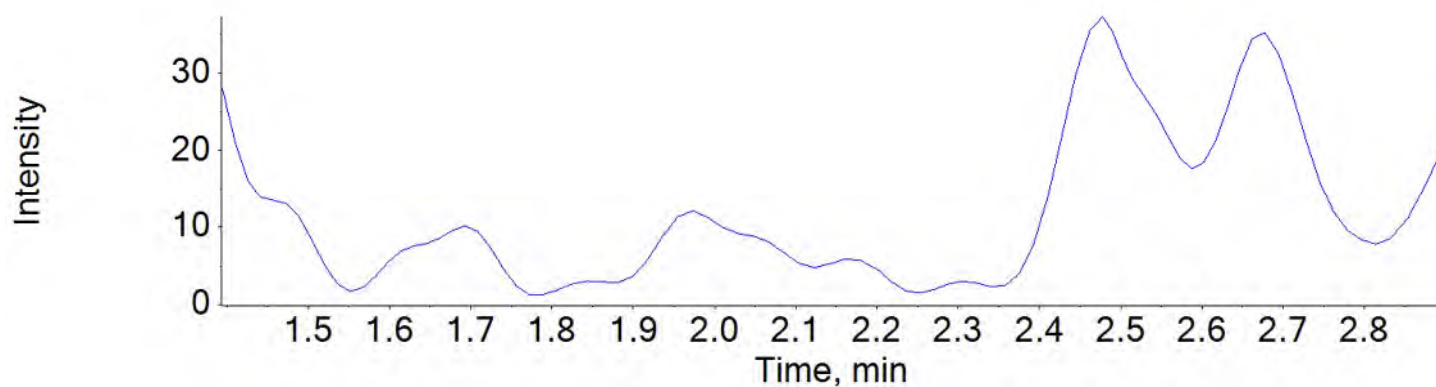
PFHxA\_2 313.0 / 119.0



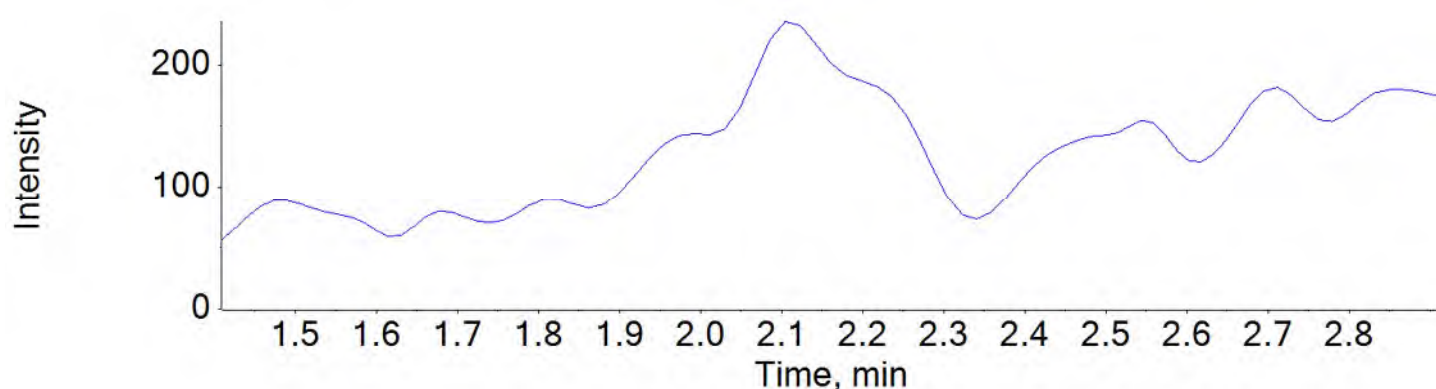
PFHpA\_1 363.0 / 319.0



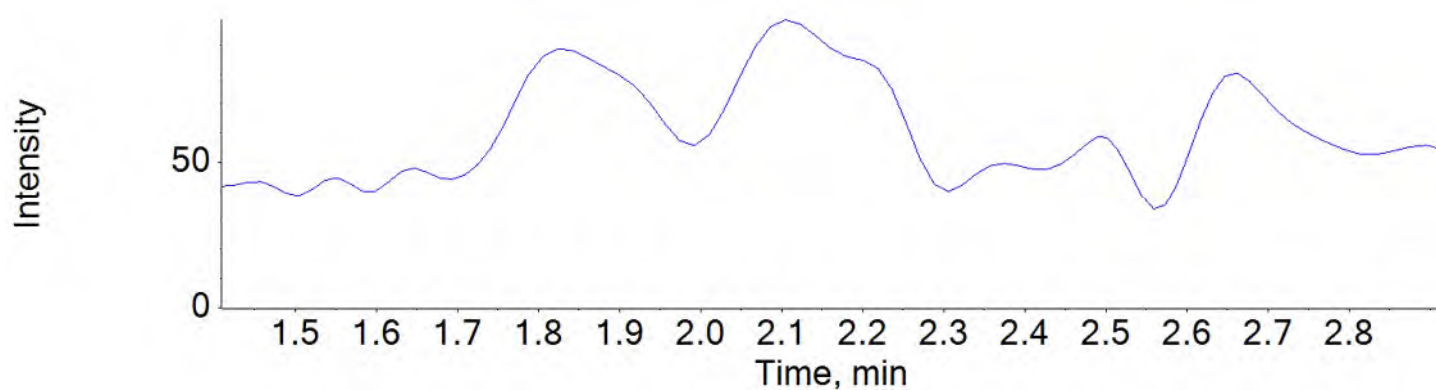
PFHpA\_2 363.0 / 169.0



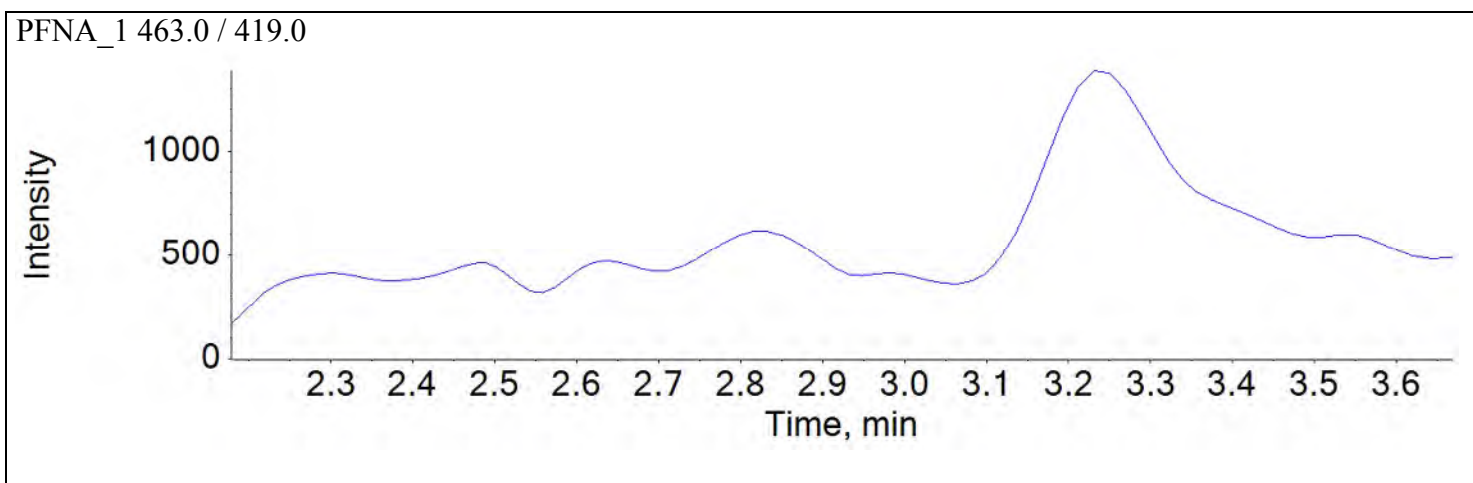
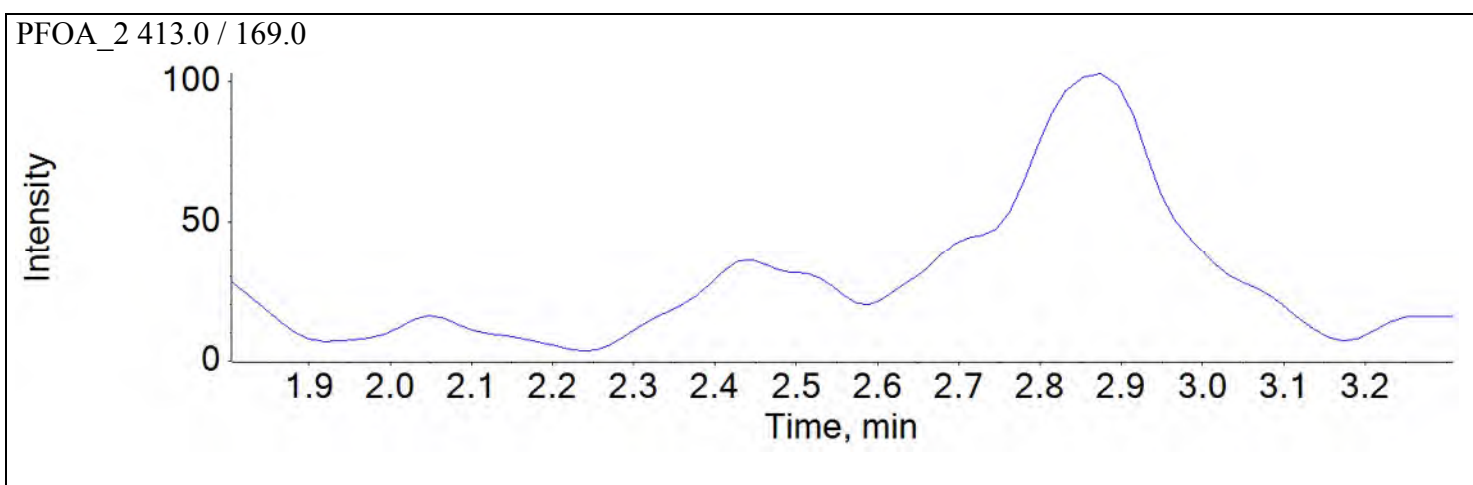
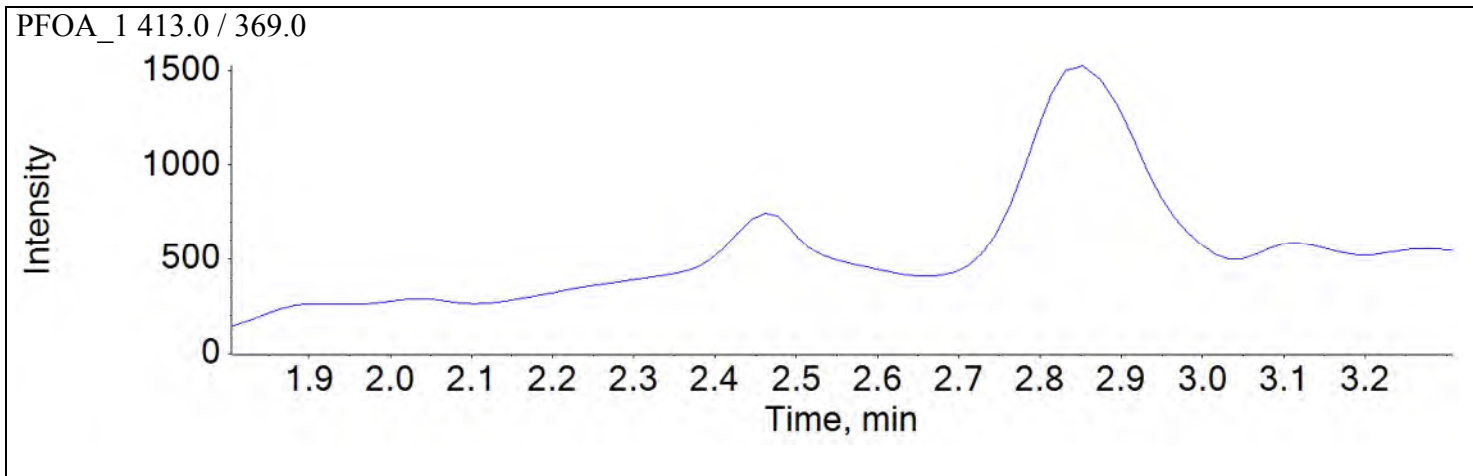
PFHxS\_1 399.0 / 80.0



PFHxS\_2 399.0 / 99.0

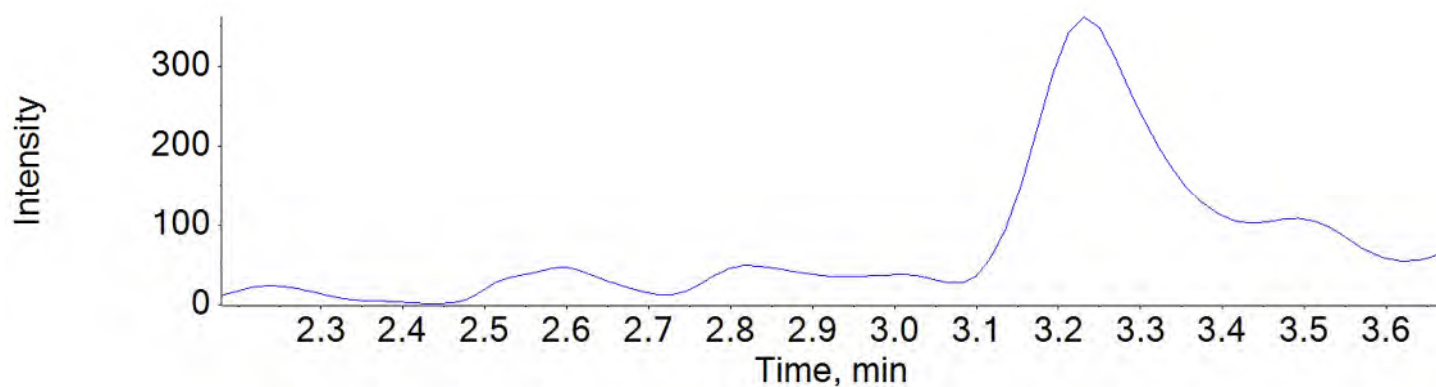




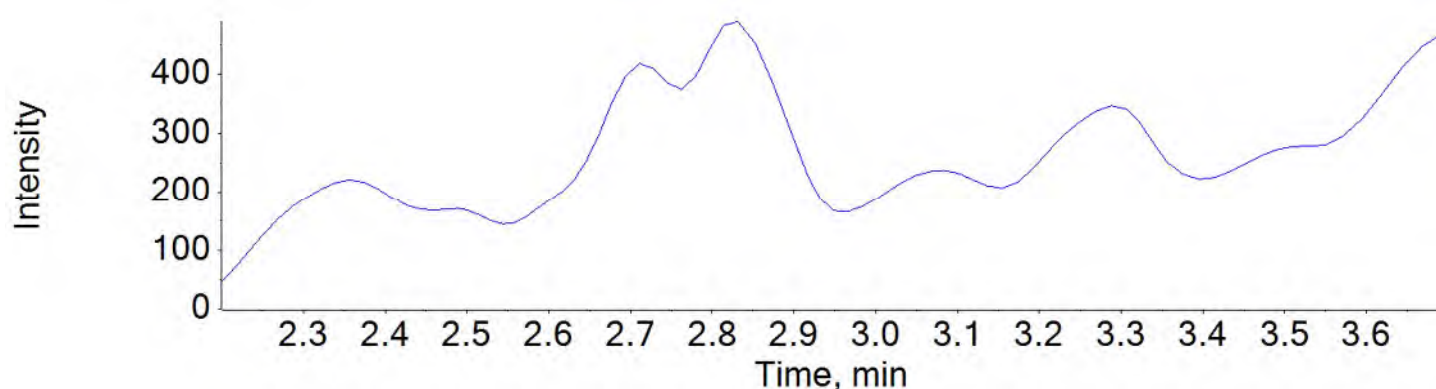




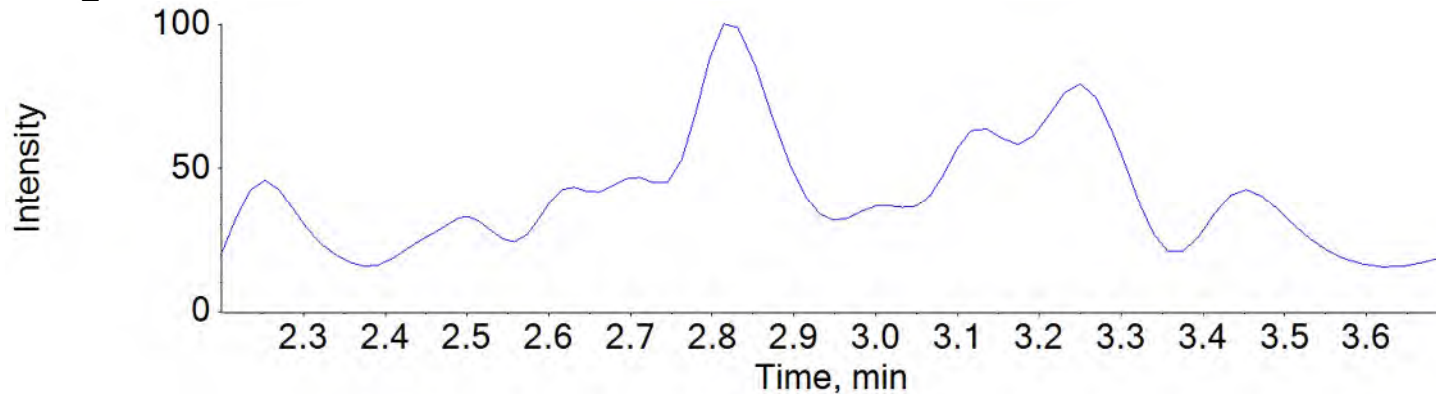
PFNA\_2 463.0 / 219.0



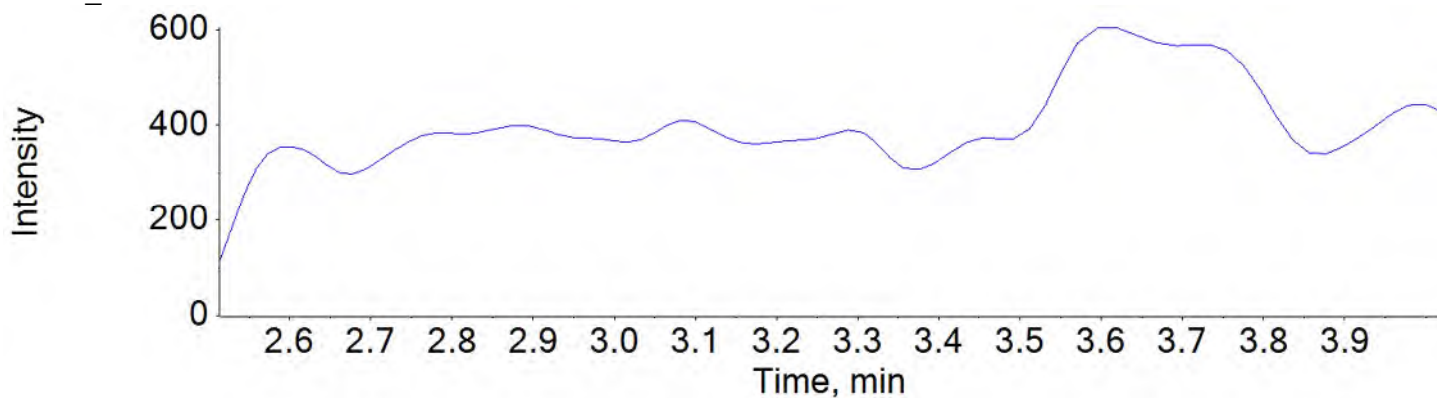
PFOS\_1 499.0 / 80.0



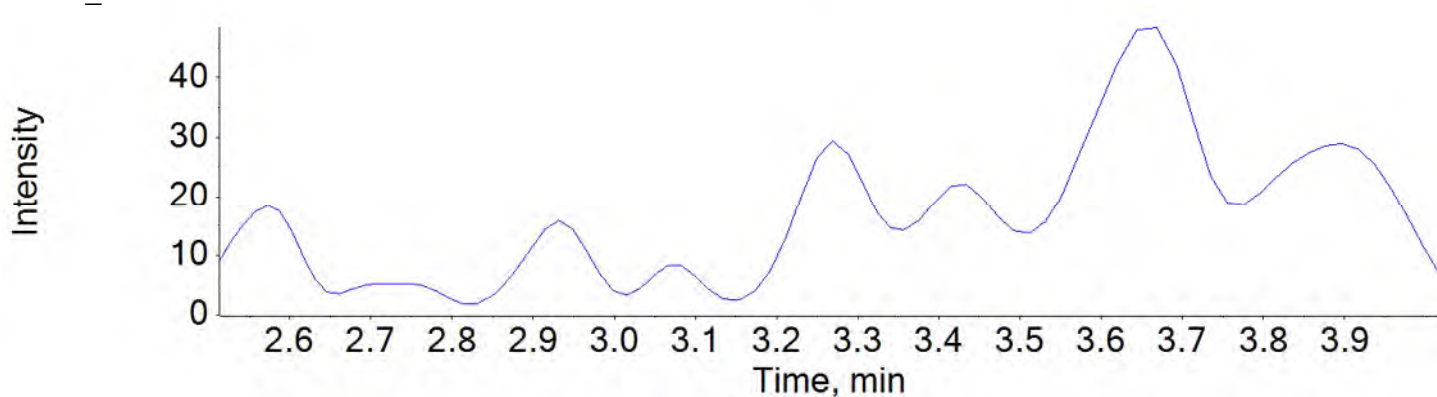
PFOS\_2 499.0 / 99.0



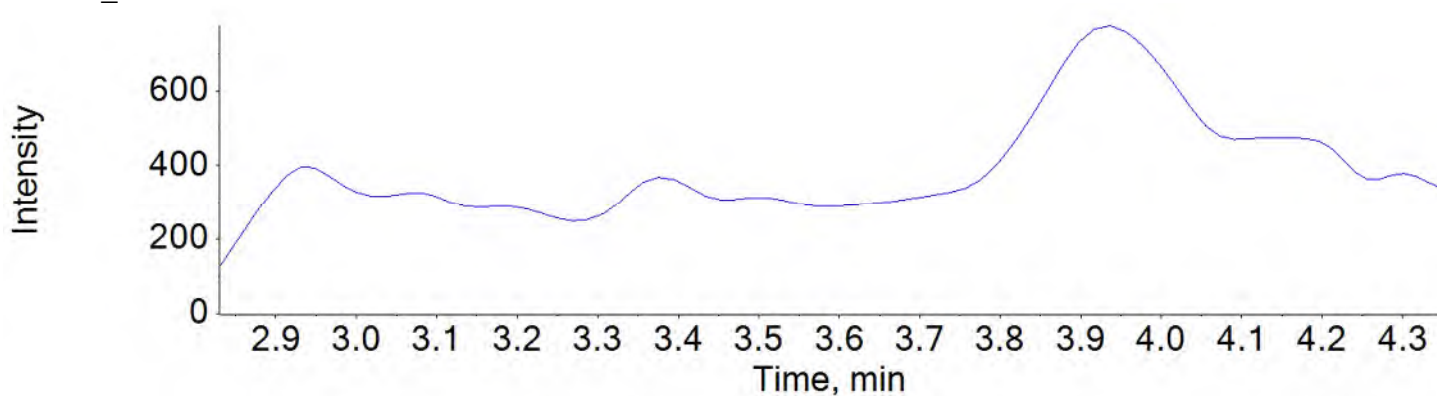
PFDA\_1 513.0 / 469.0



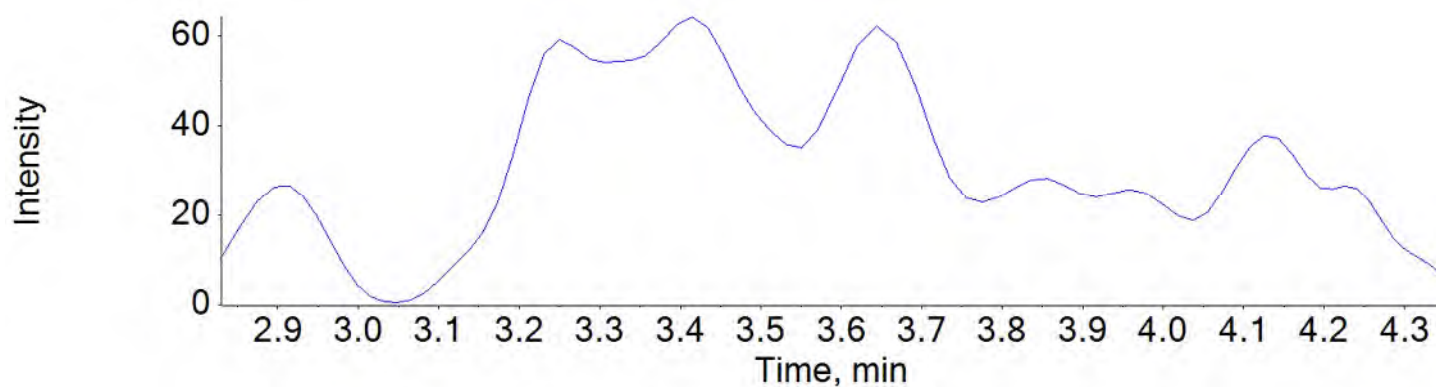
PFDA\_2 513.0 / 219.0



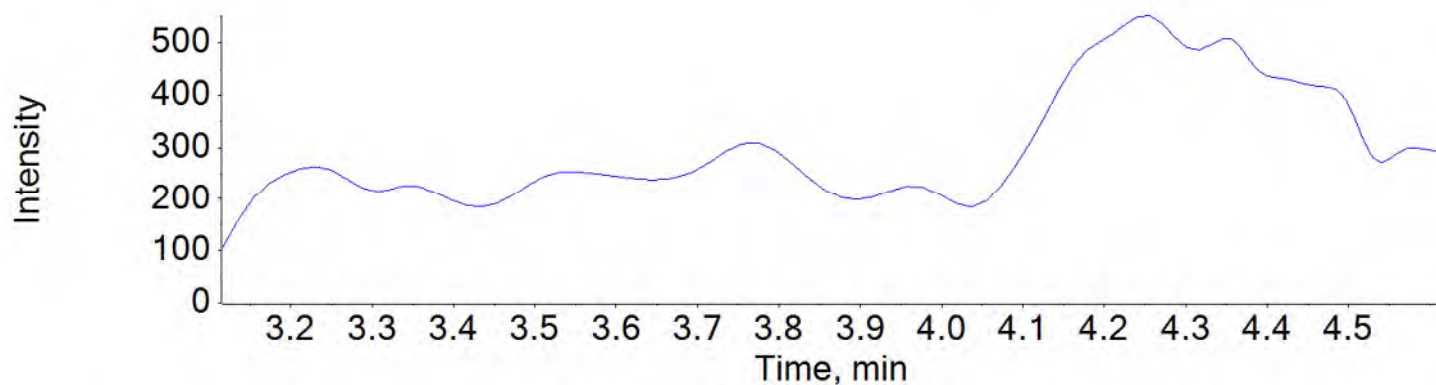
PFUnA\_1 563.0 / 519.0



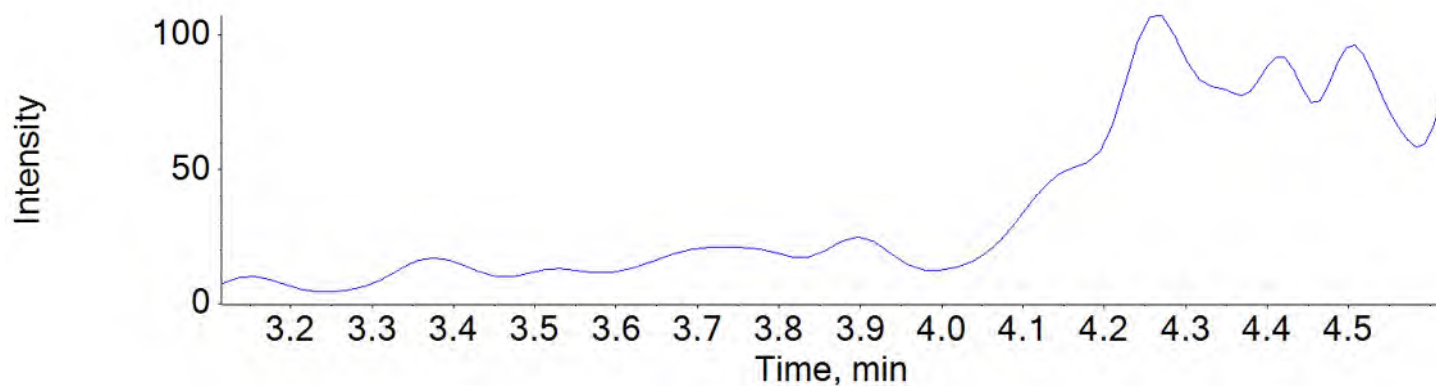
PFUnA\_2 563.0 / 269.0



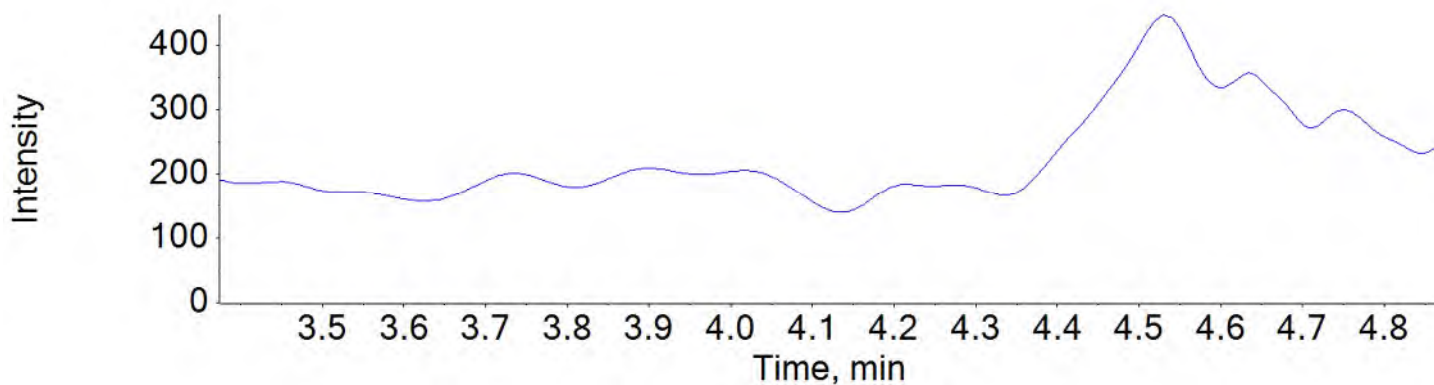
PFDaA\_1 613.0 / 569.0



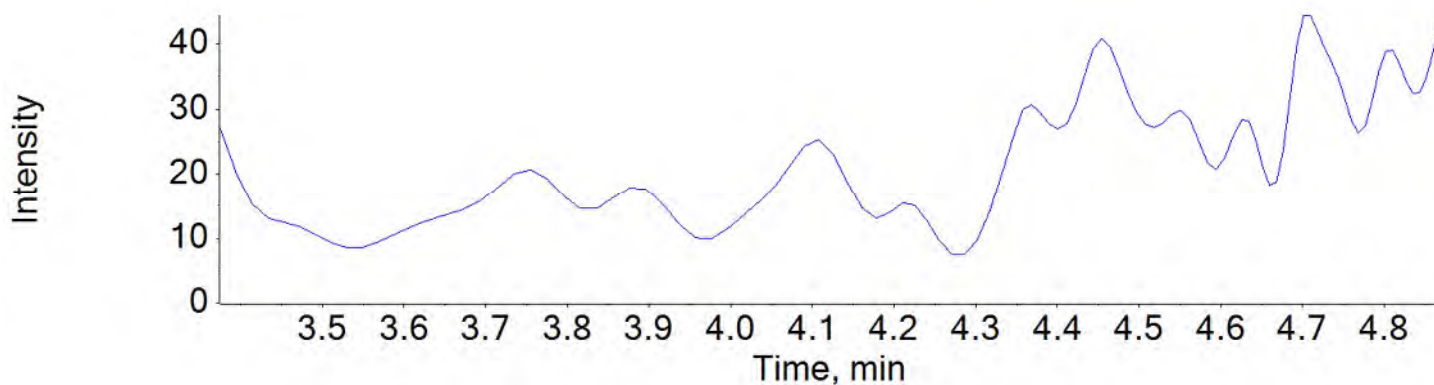
PFDaA\_2 613.0 / 319.0



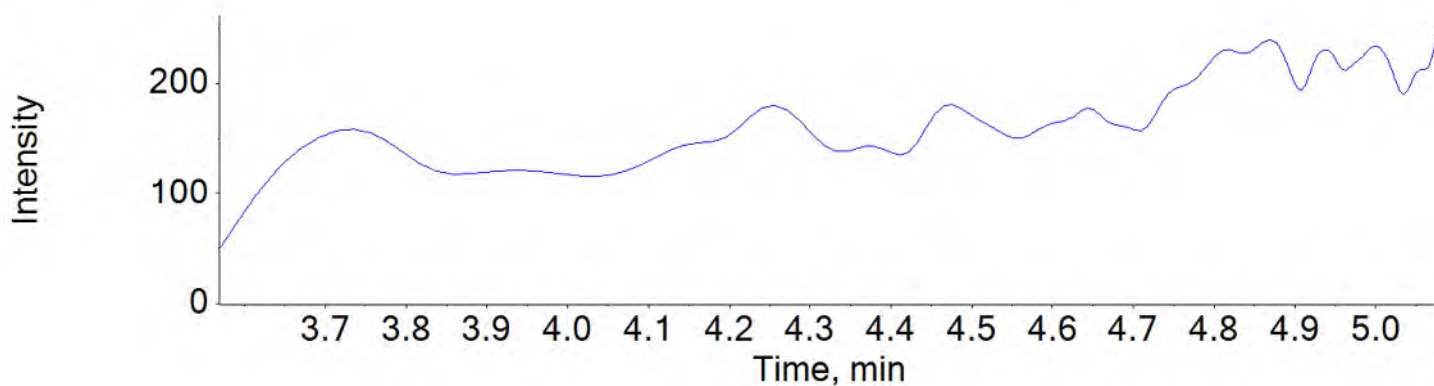
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

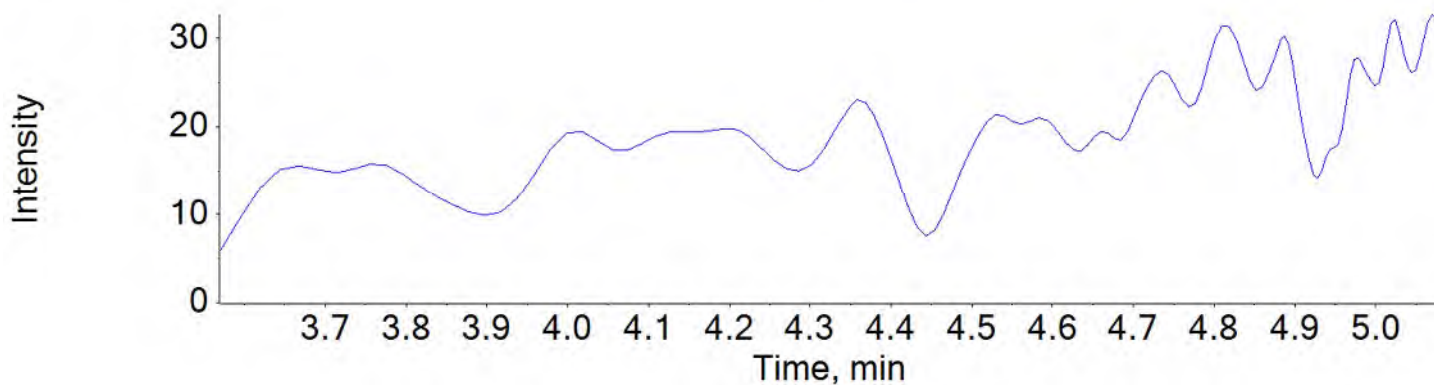


PFTTeDA\_1 713.0 / 669.0

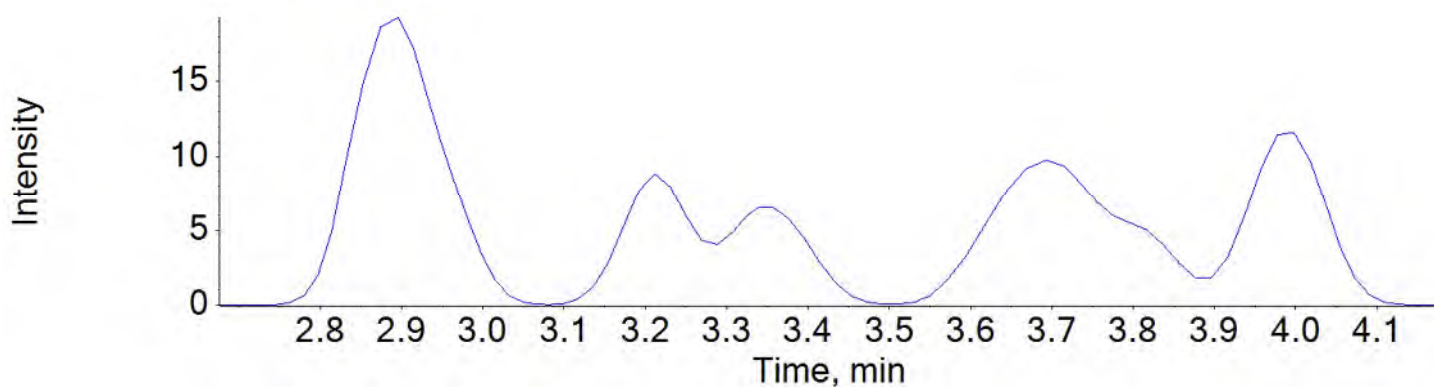




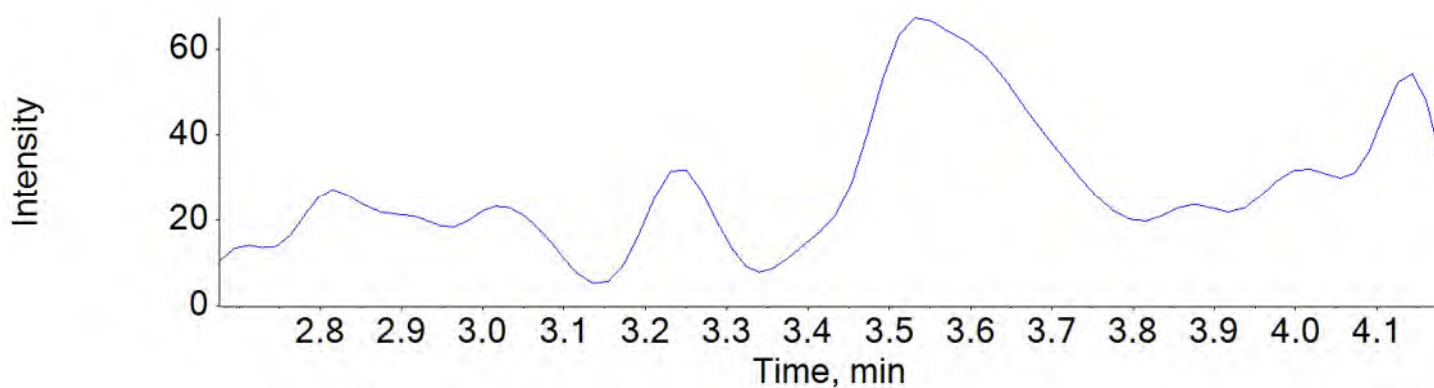
PFTeDA\_2 713.0 / 169.0



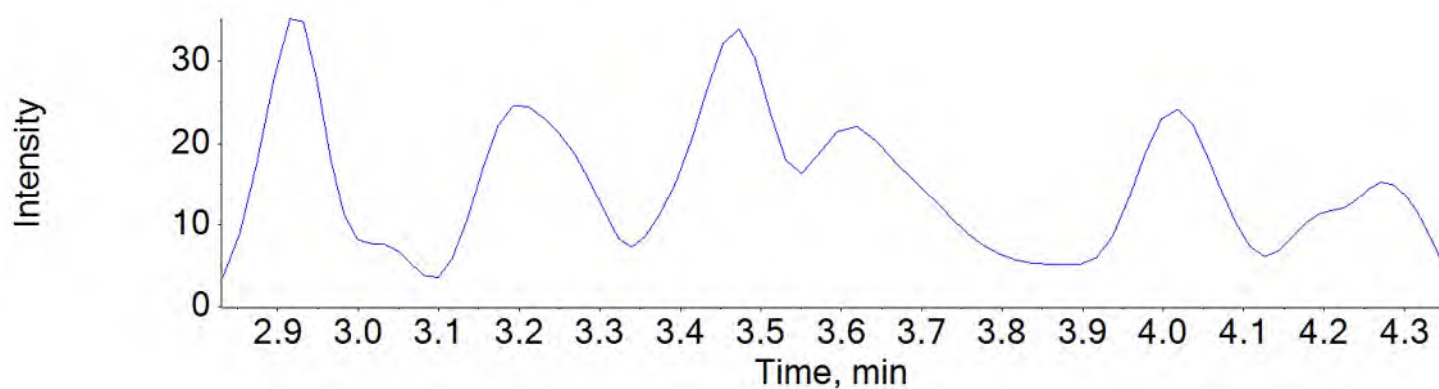
NMeFOSAA\_1 570.0 / 419.0



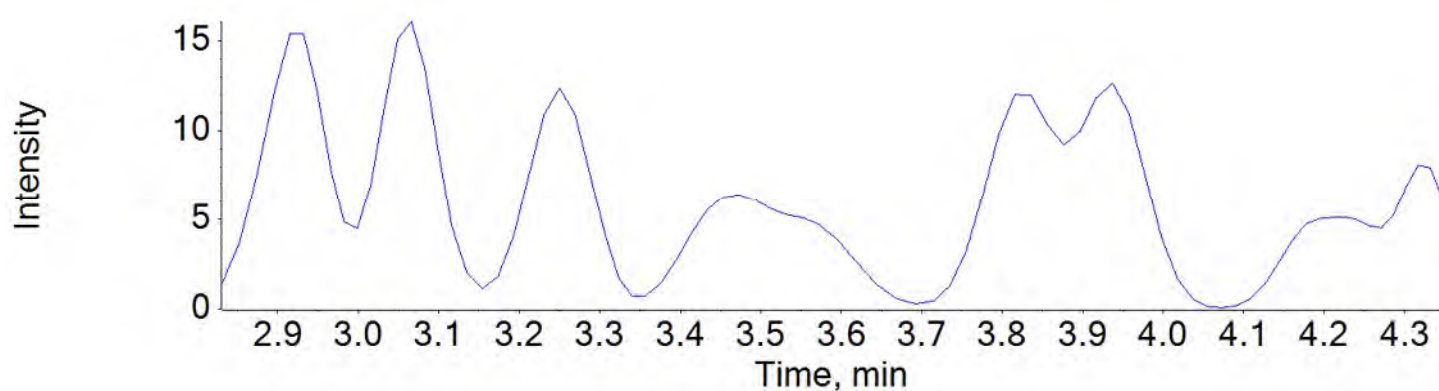
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



NEtFOSAA\_2 584.0 / 483.0

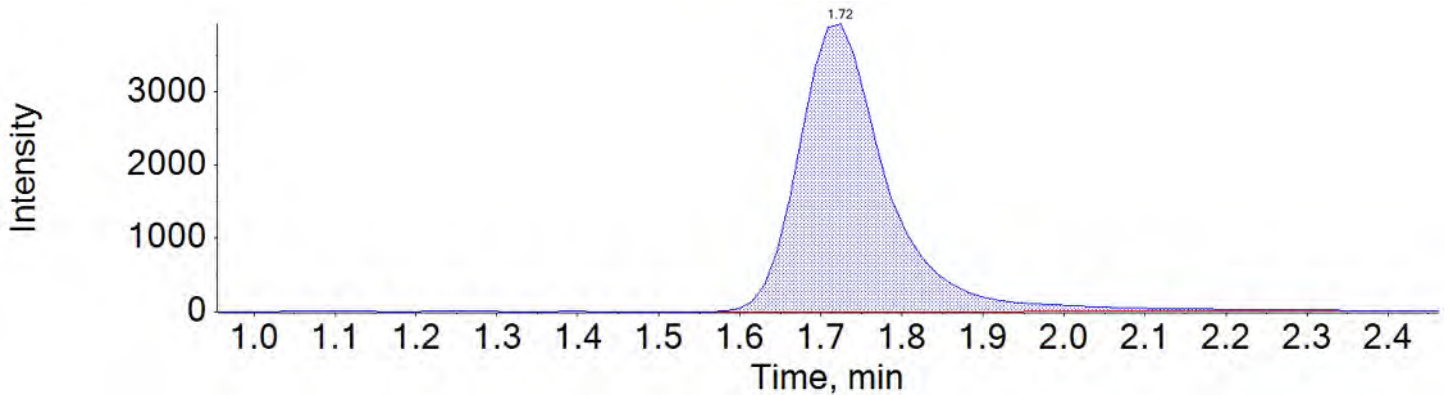




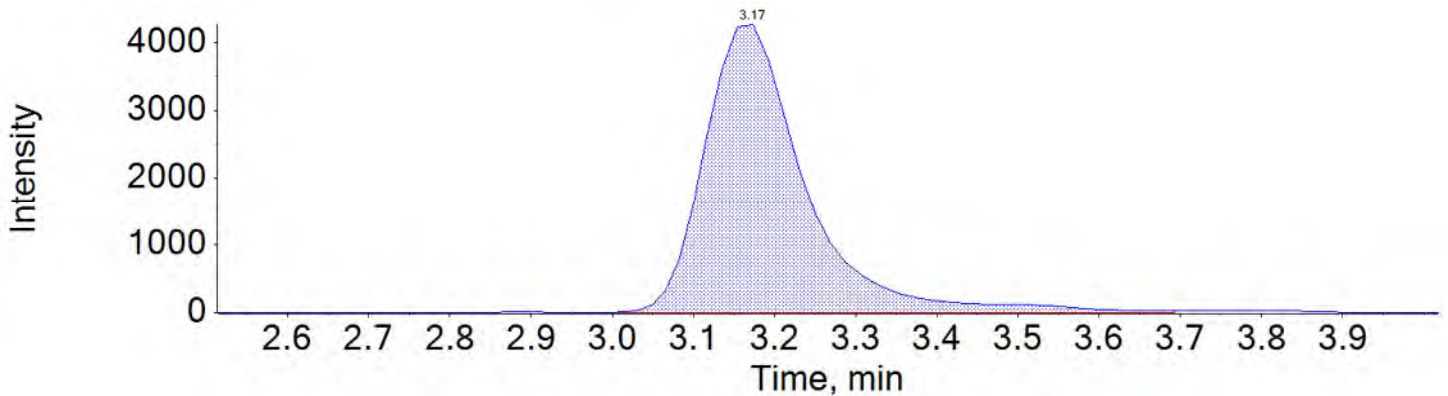
|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5969-FS(0)          | Injection Vial   | 16           |
| Sample ID          | WGNA-043018-FRB-3409 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:41:03  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Chromatograms

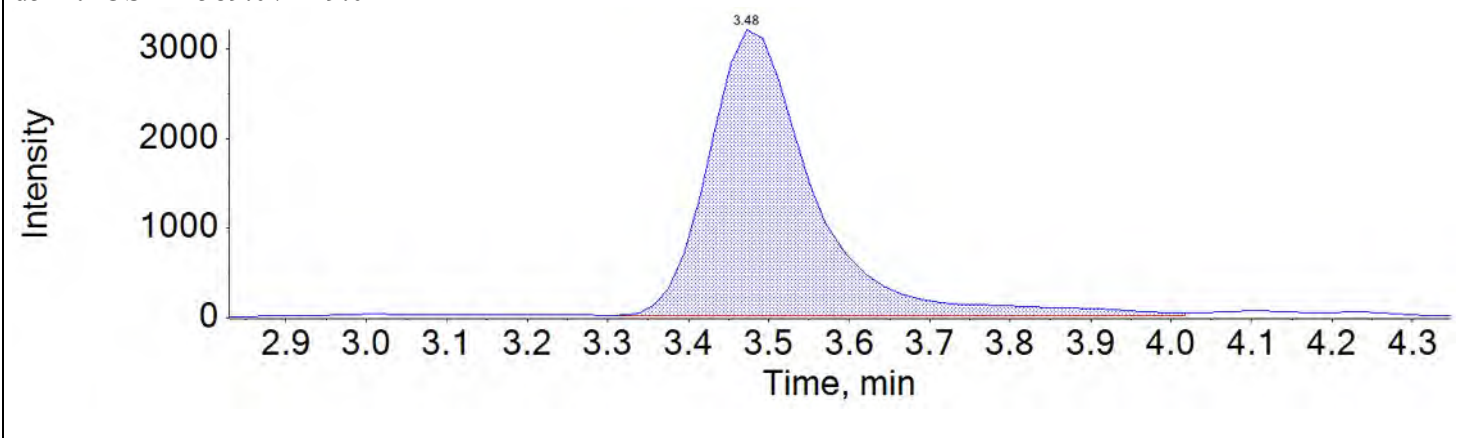
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0



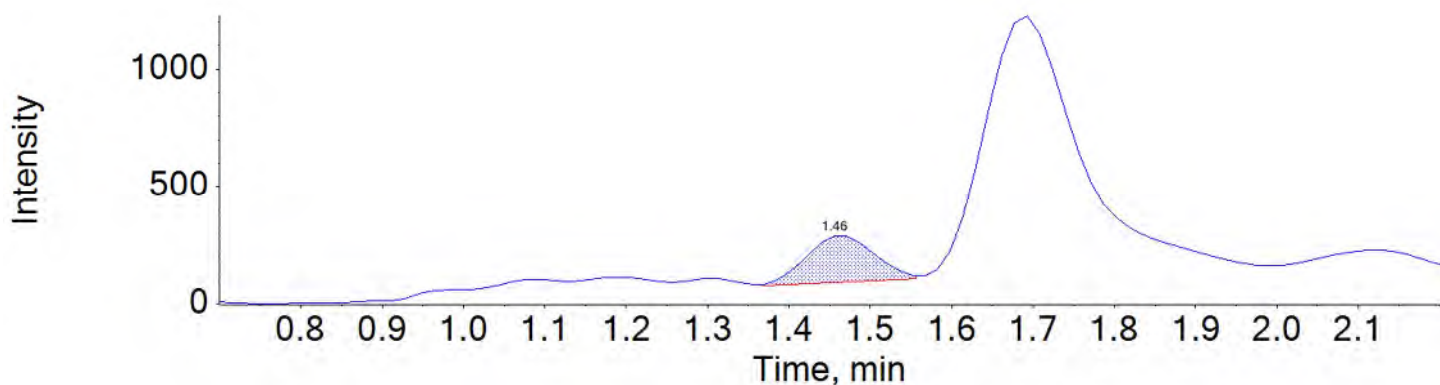
d5-EtFOSAA 589.0 / 419.0



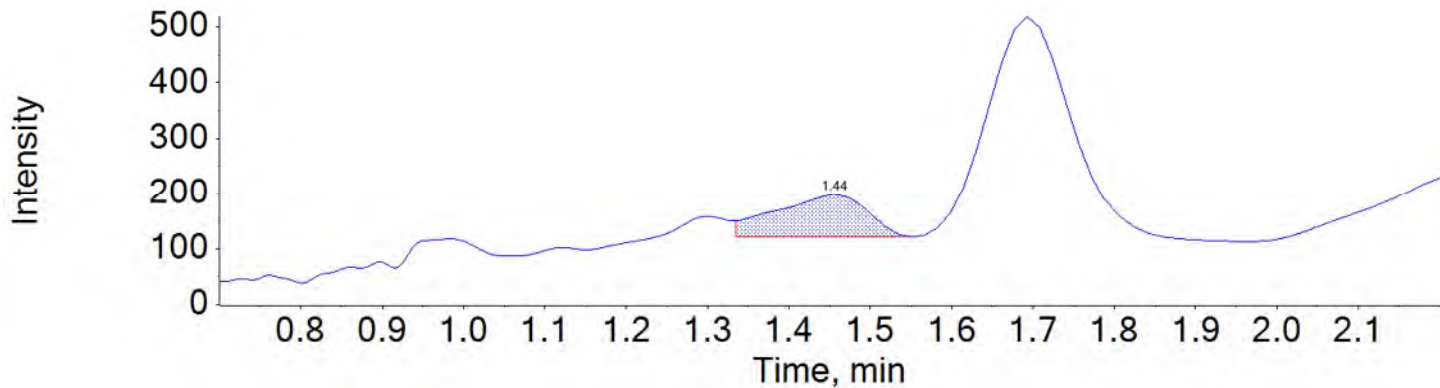
|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5971-FS(0)          | Injection Vial   | 17           |
| Sample ID          | WGNA-050118-FRB-3385 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:49:59  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

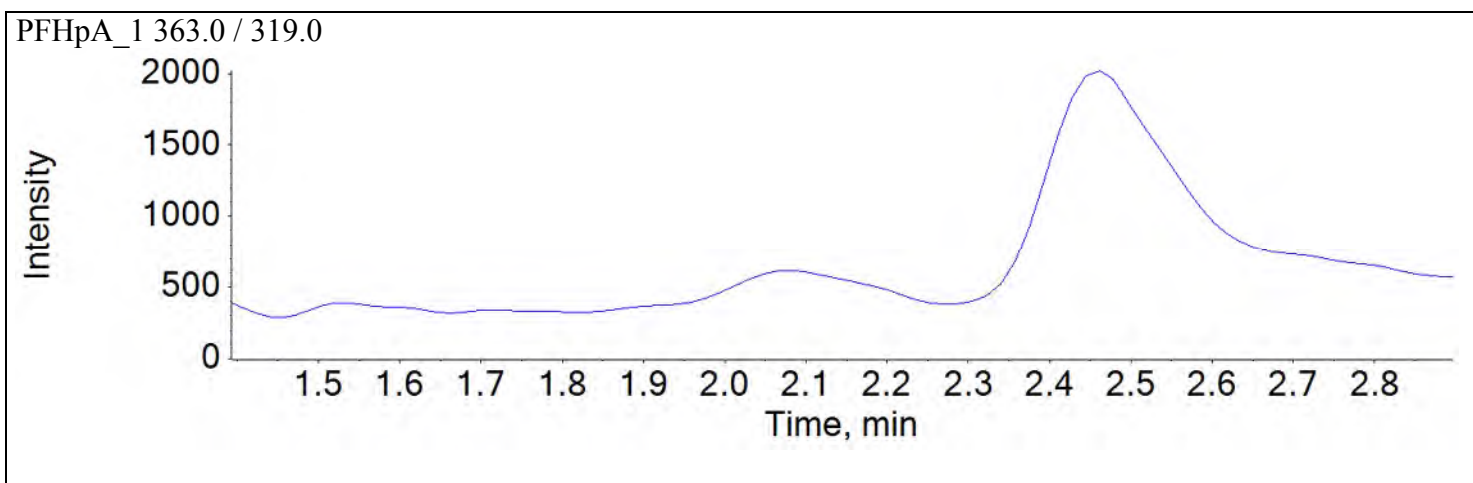
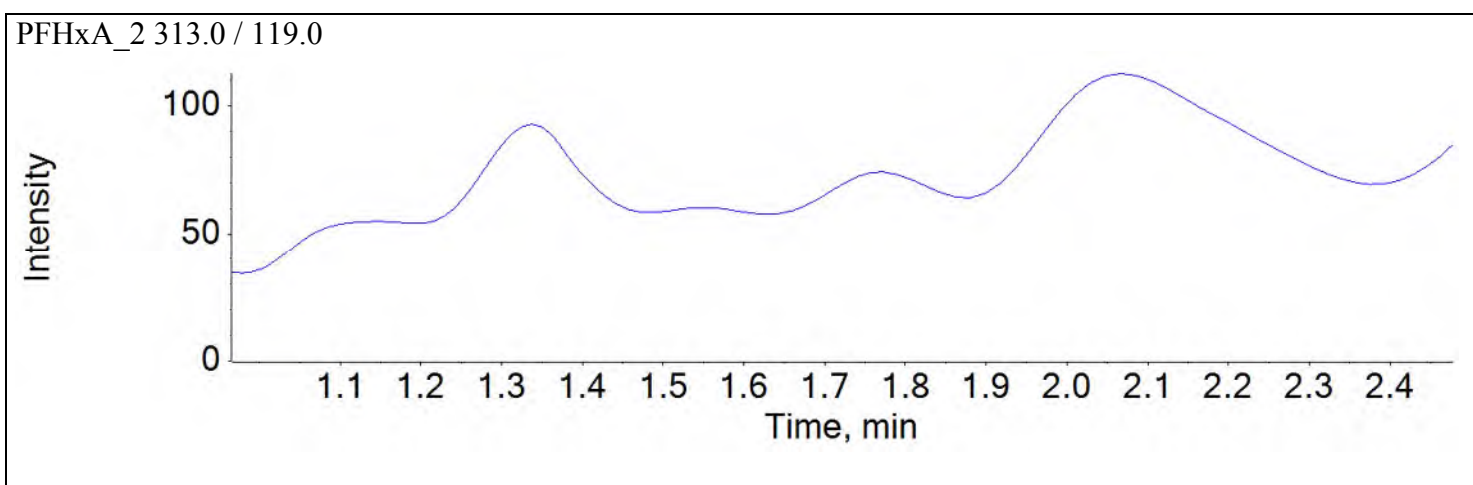
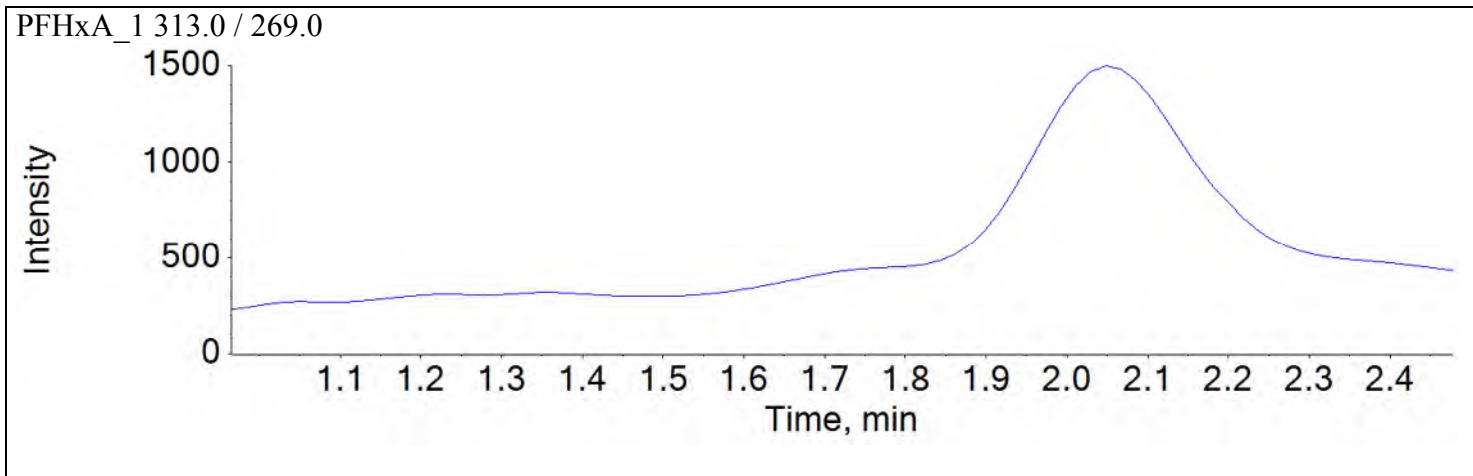
## Chromatograms

PFBS\_1 298.9 / 80.0

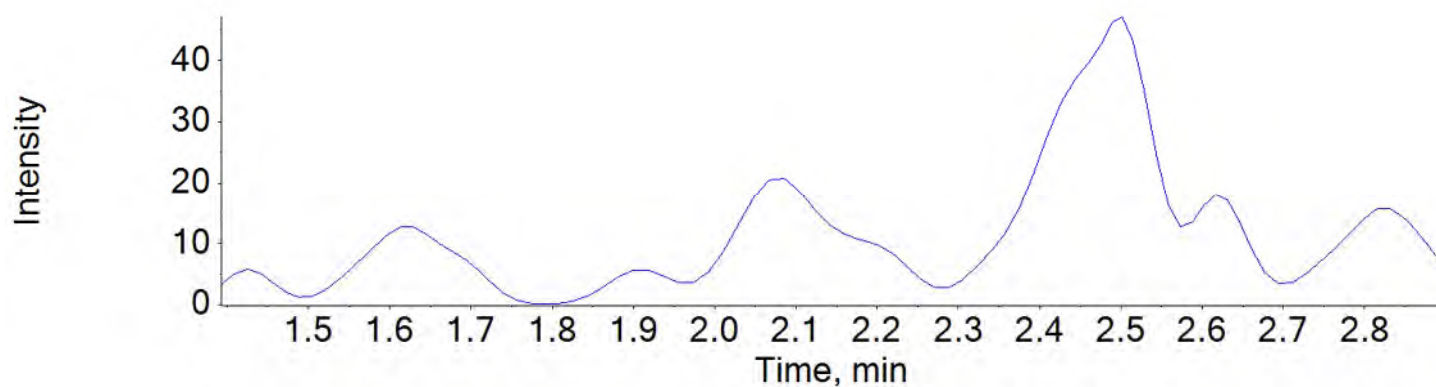


PFBS\_2 298.9 / 99.0

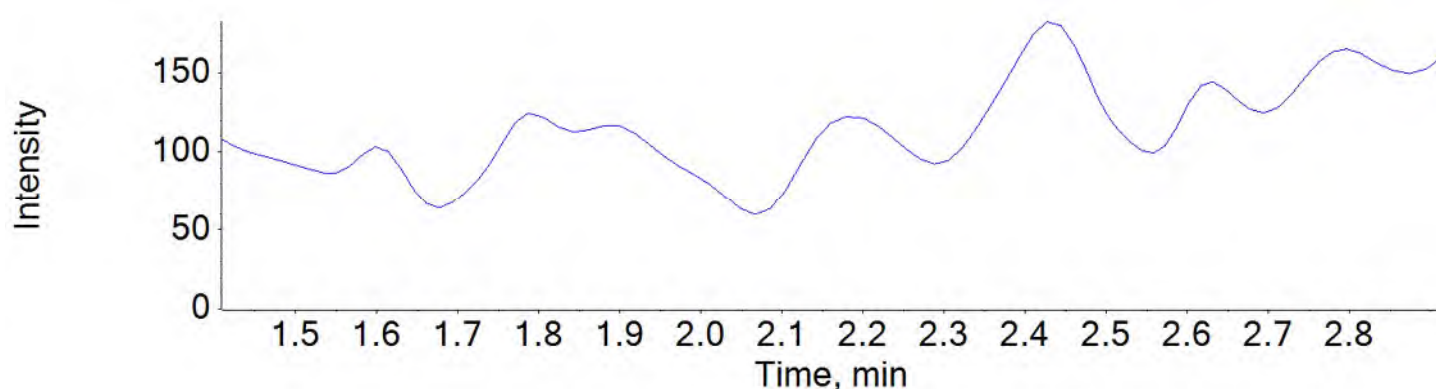




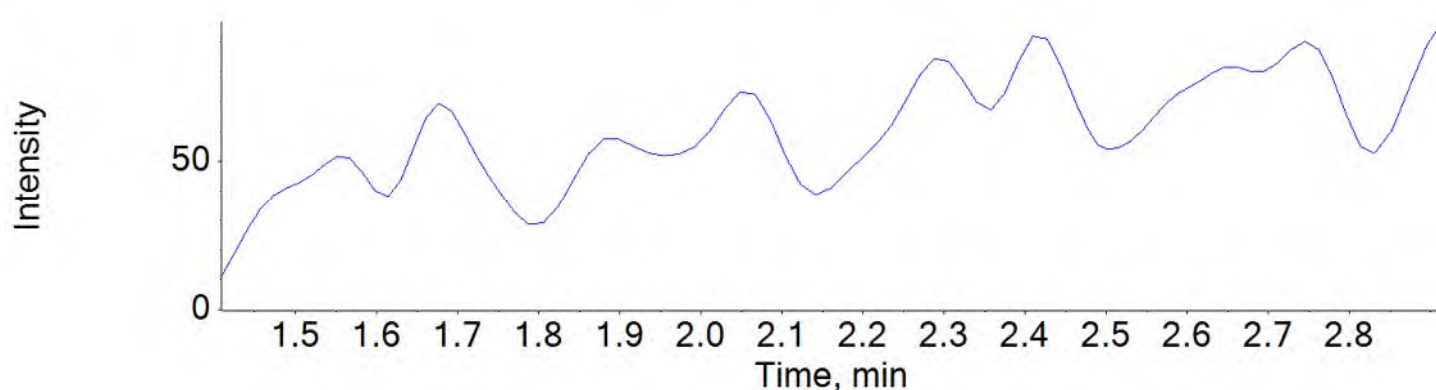
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

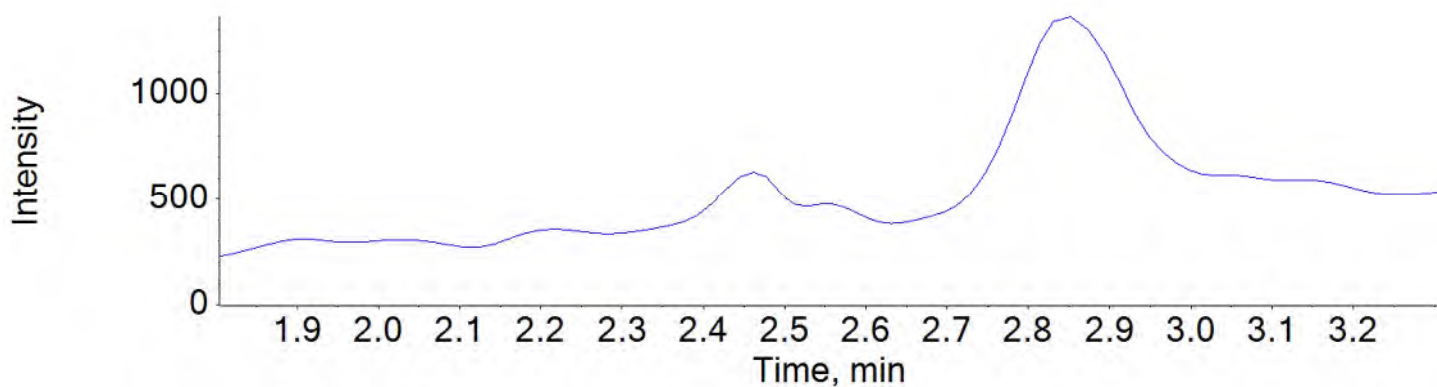


PFHxS\_2 399.0 / 99.0

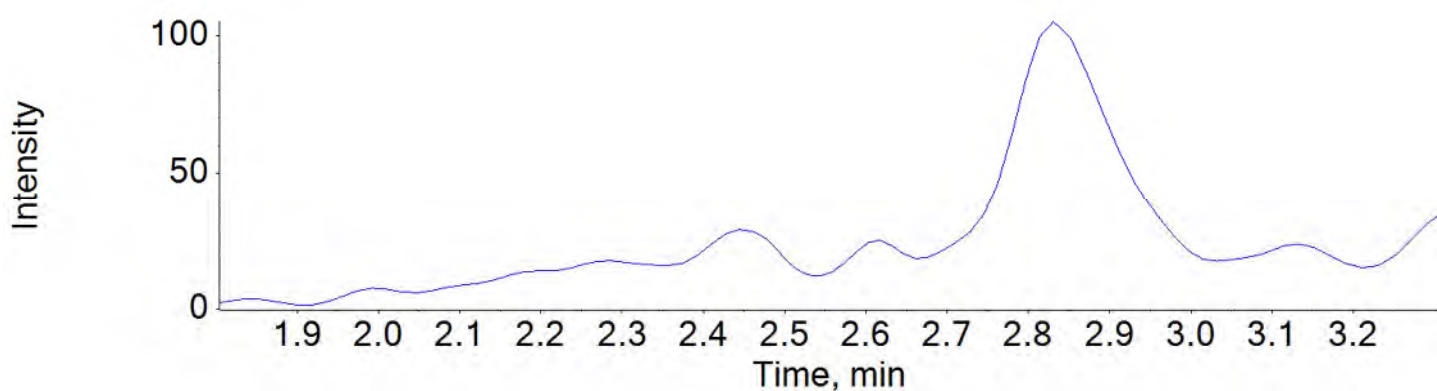




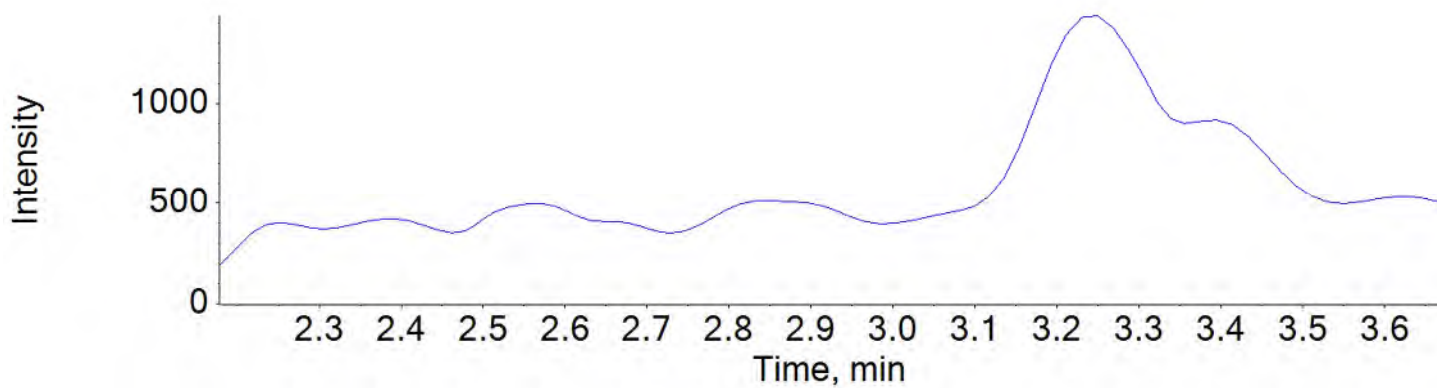
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

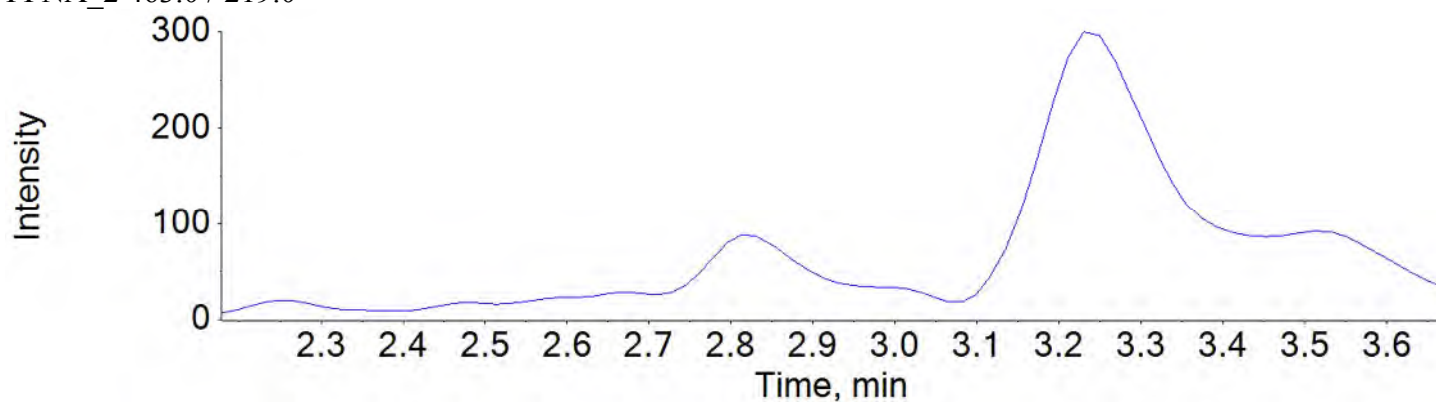


PFNA\_1 463.0 / 419.0

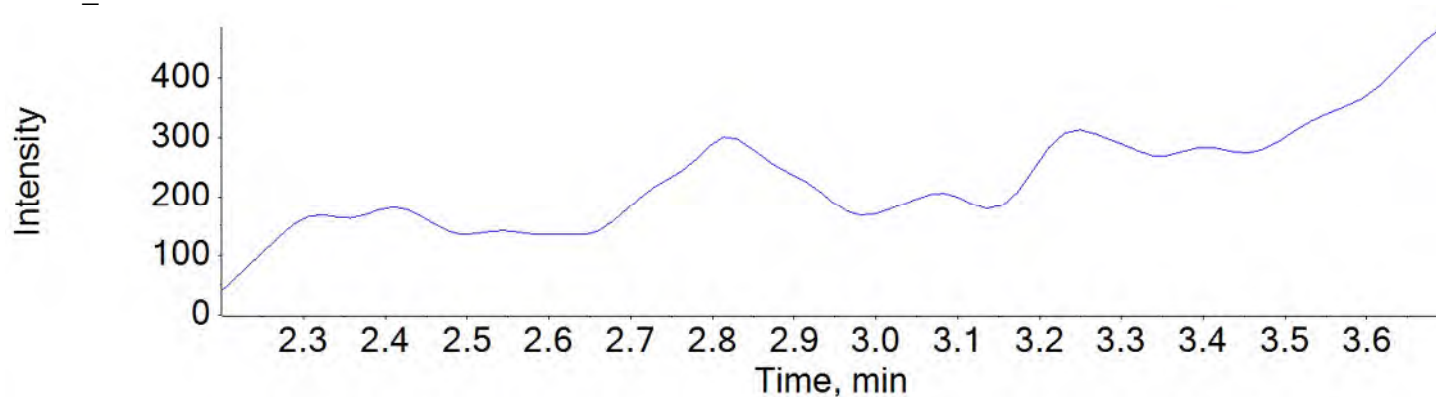




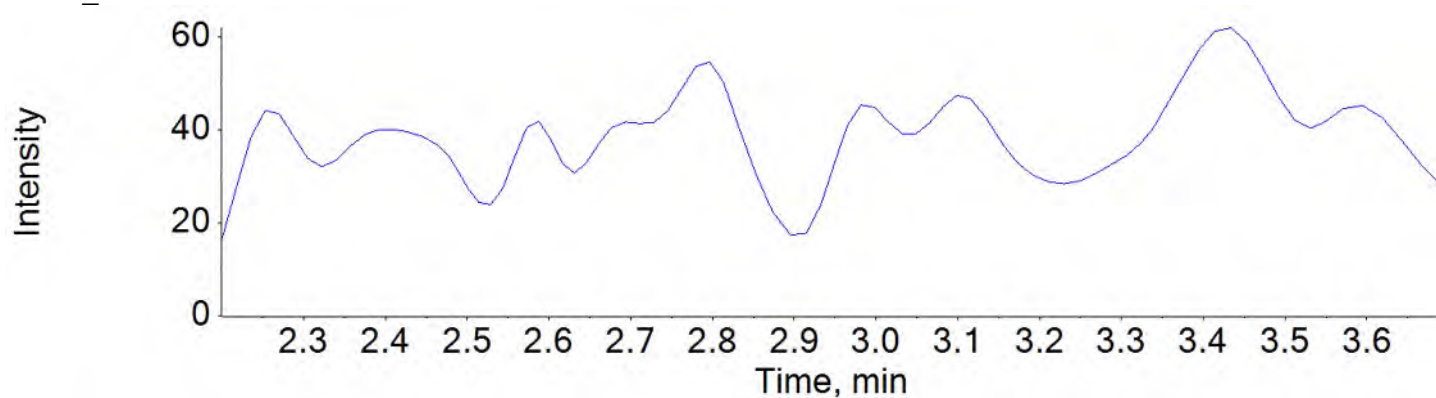
PFNA\_2 463.0 / 219.0



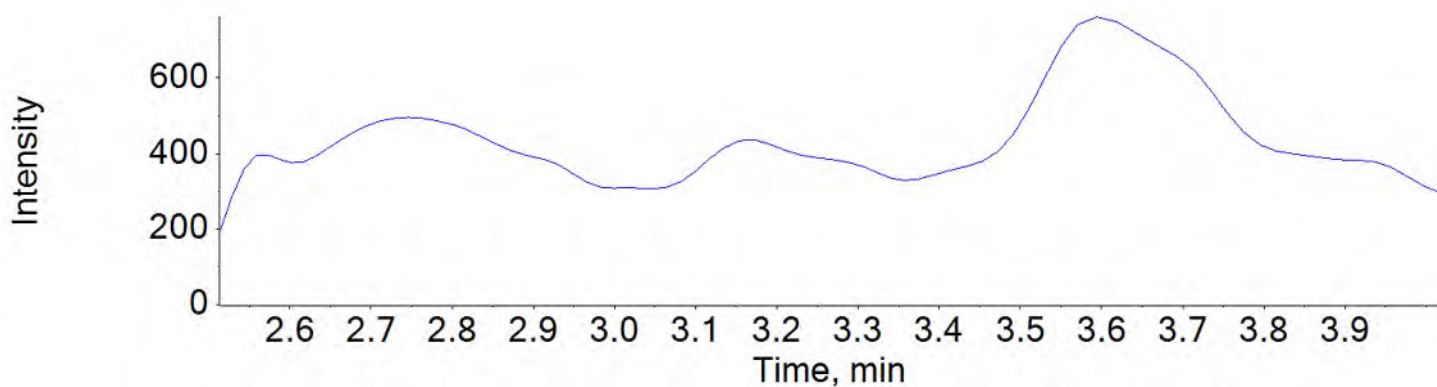
PFOS\_1 499.0 / 80.0



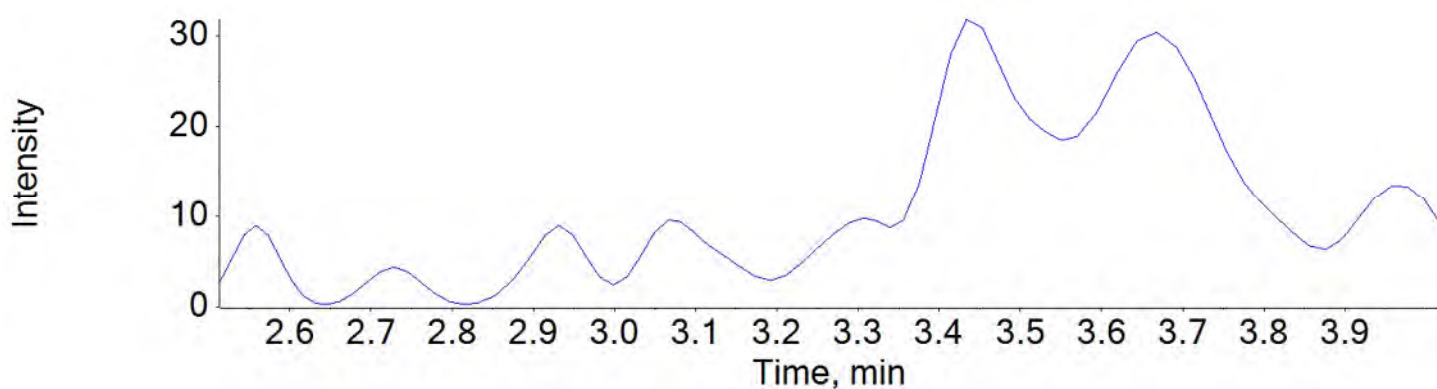
PFOS\_2 499.0 / 99.0



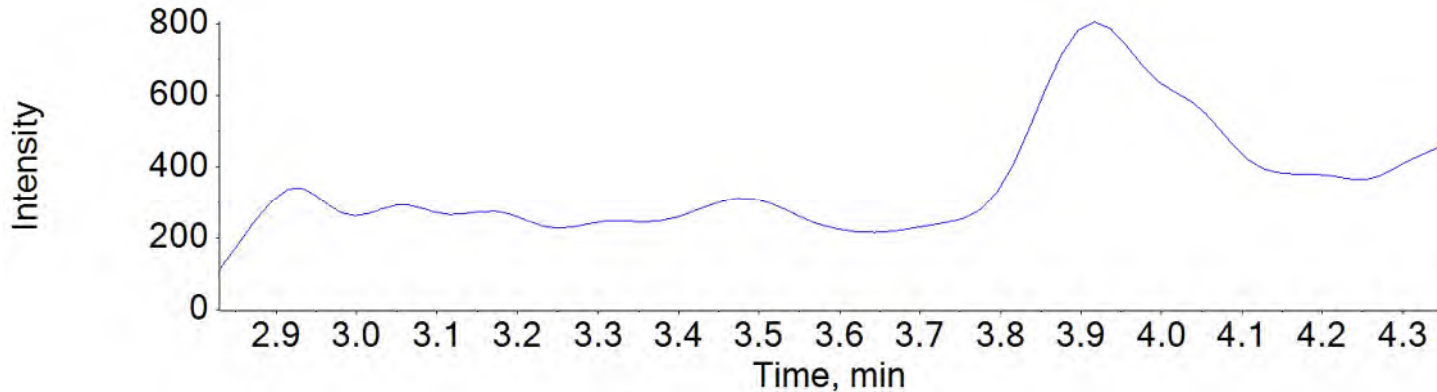
PFDA\_1 513.0 / 469.0



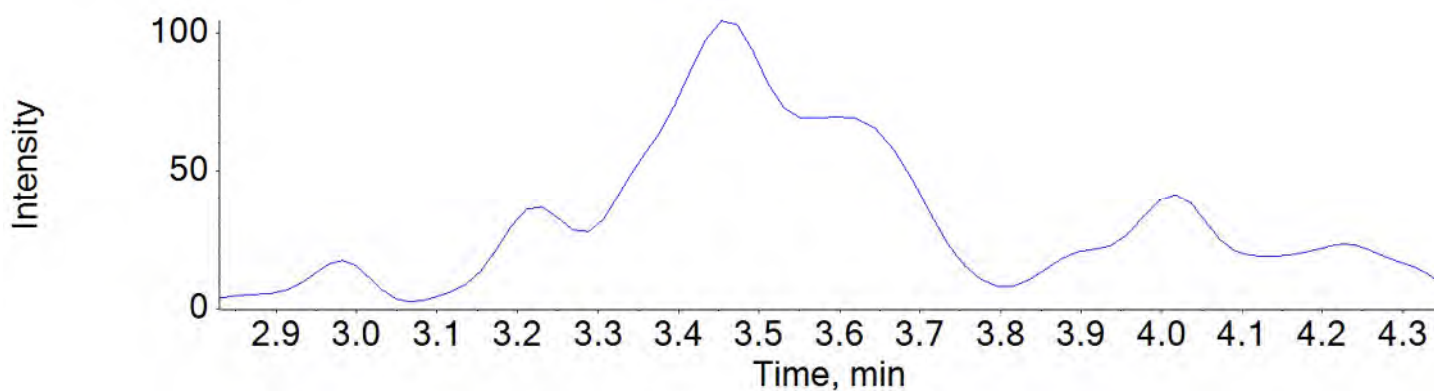
PFDA\_2 513.0 / 219.0



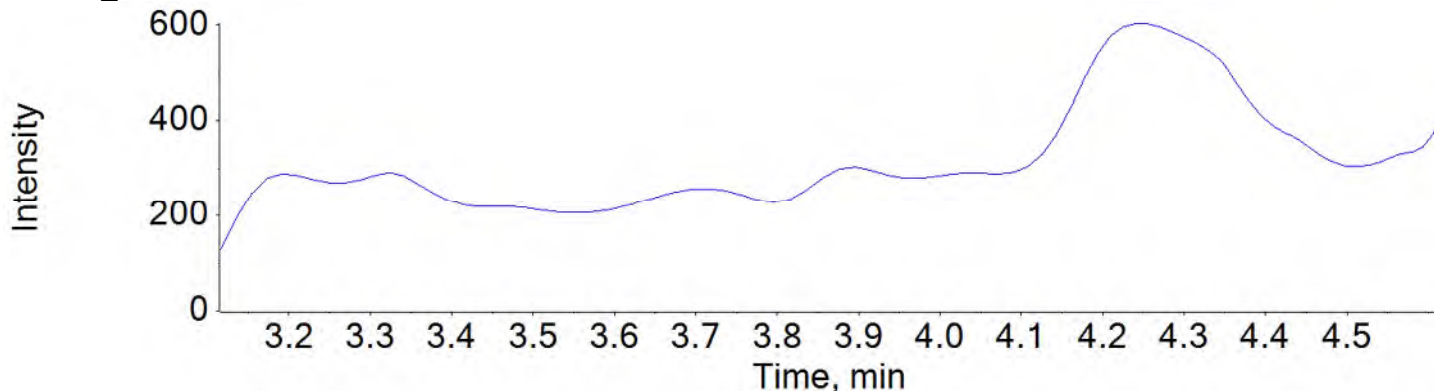
PFUnA\_1 563.0 / 519.0



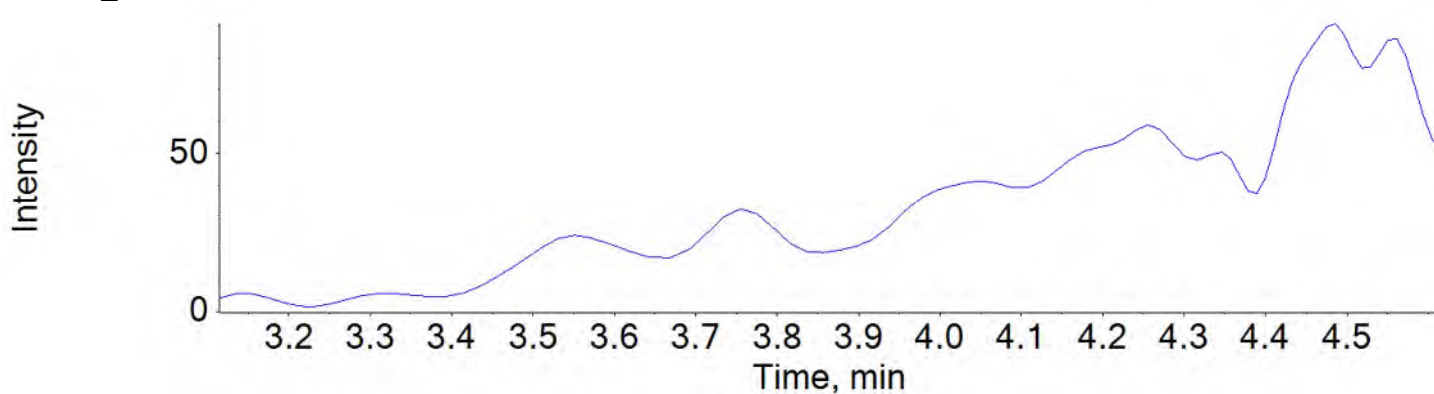
PFUnA\_2 563.0 / 269.0



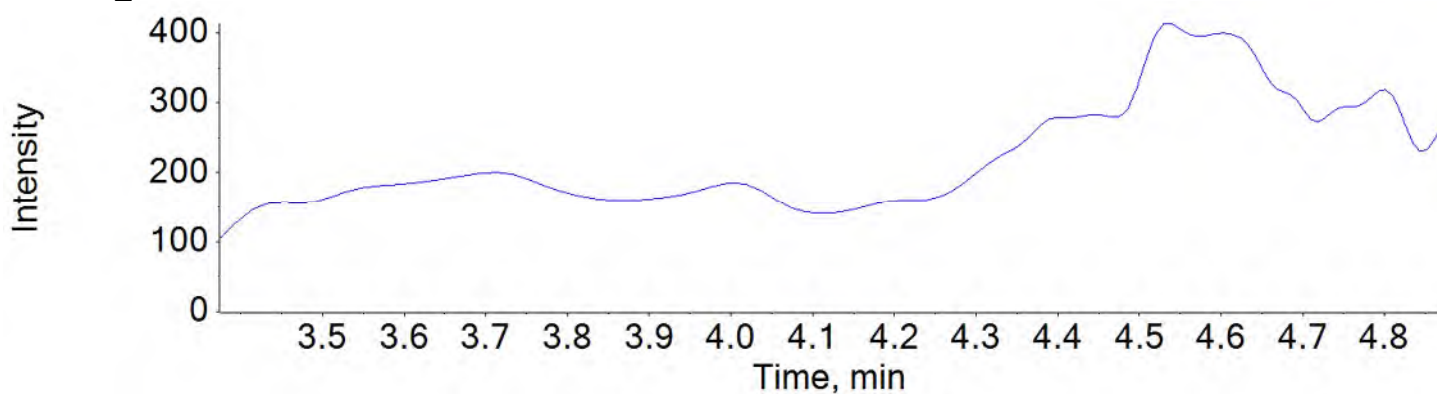
PFDaA\_1 613.0 / 569.0



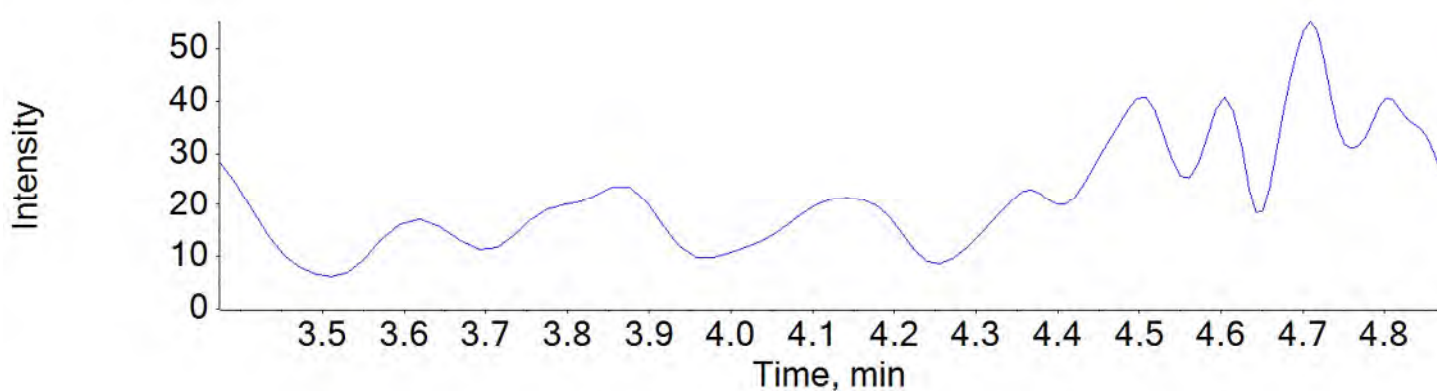
PFDaA\_2 613.0 / 319.0



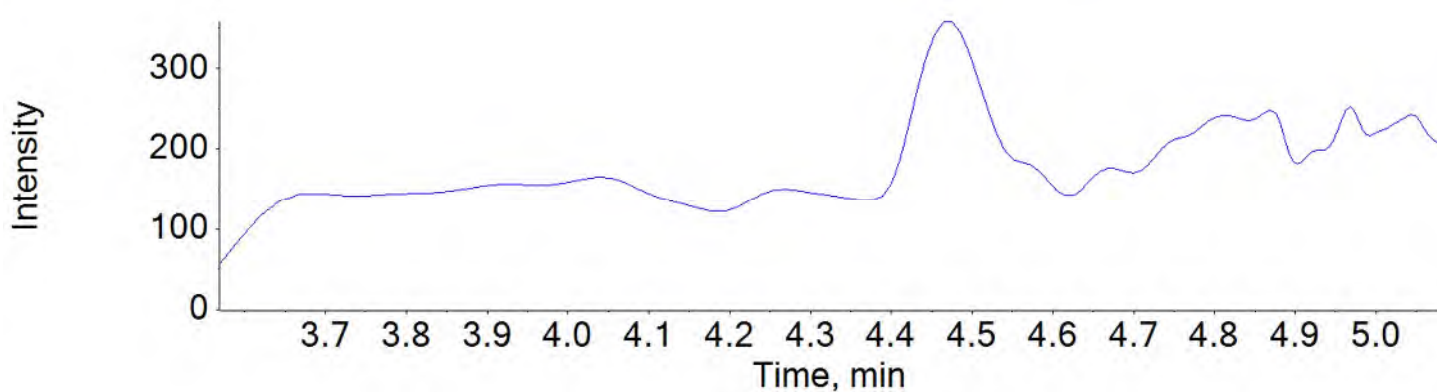
PFTTrDA\_1 663.0 / 619.0



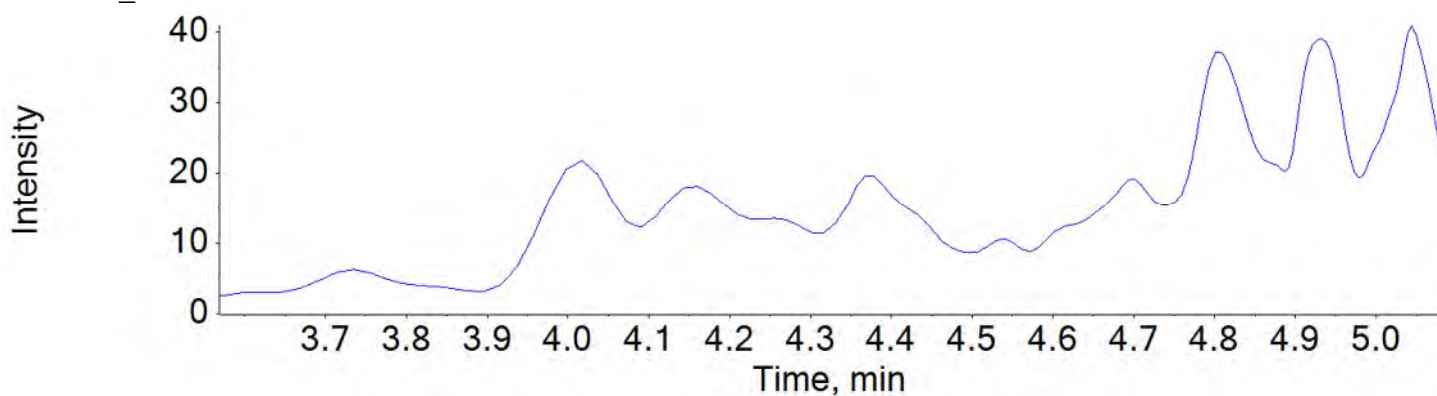
PFTTrDA\_2 663.0 / 169.0



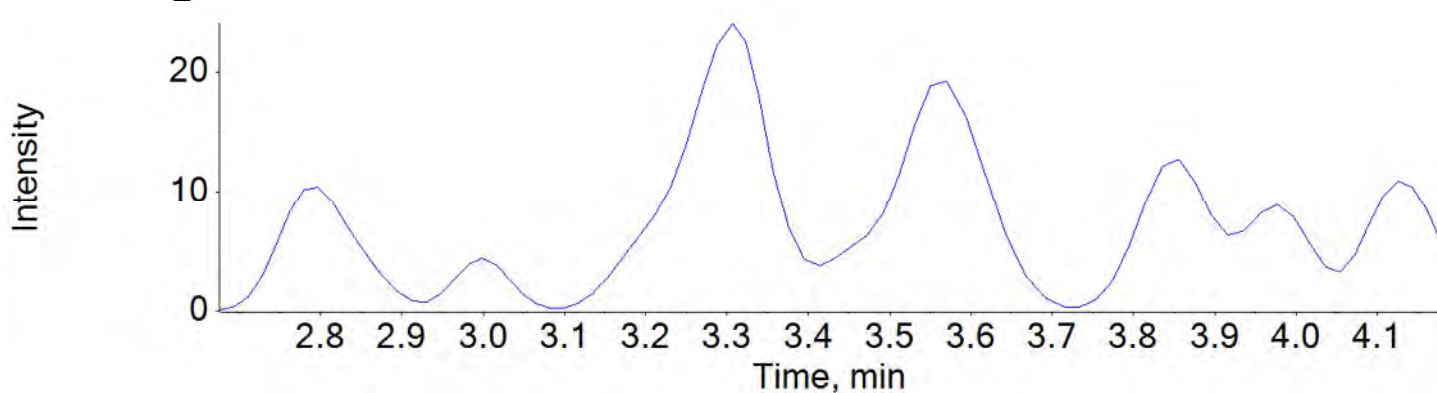
PFTTeDA\_1 713.0 / 669.0



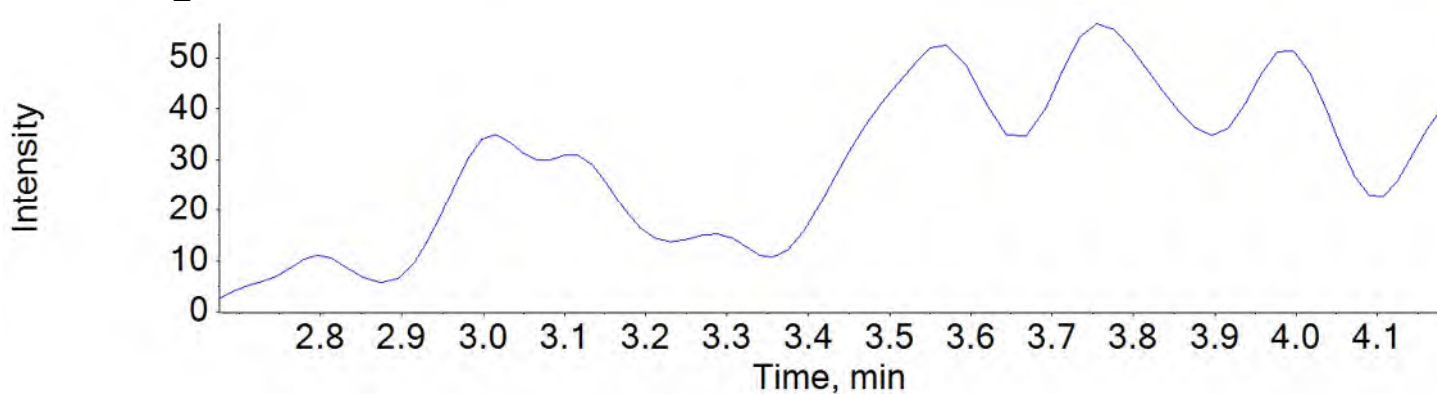
PFTeDA\_2 713.0 / 169.0



NMeFOSAA\_1 570.0 / 419.0

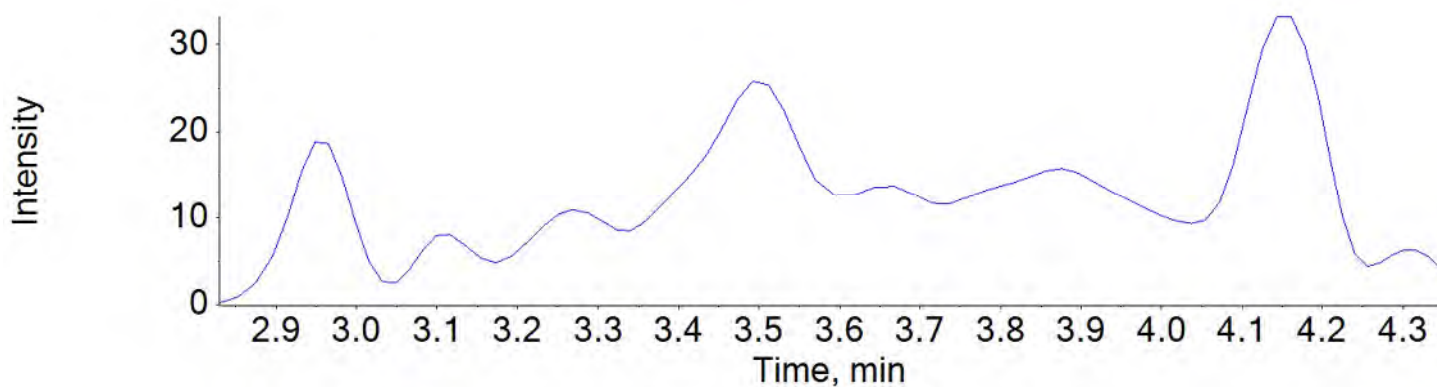


NMeFOSAA\_2 570.0 / 512.0

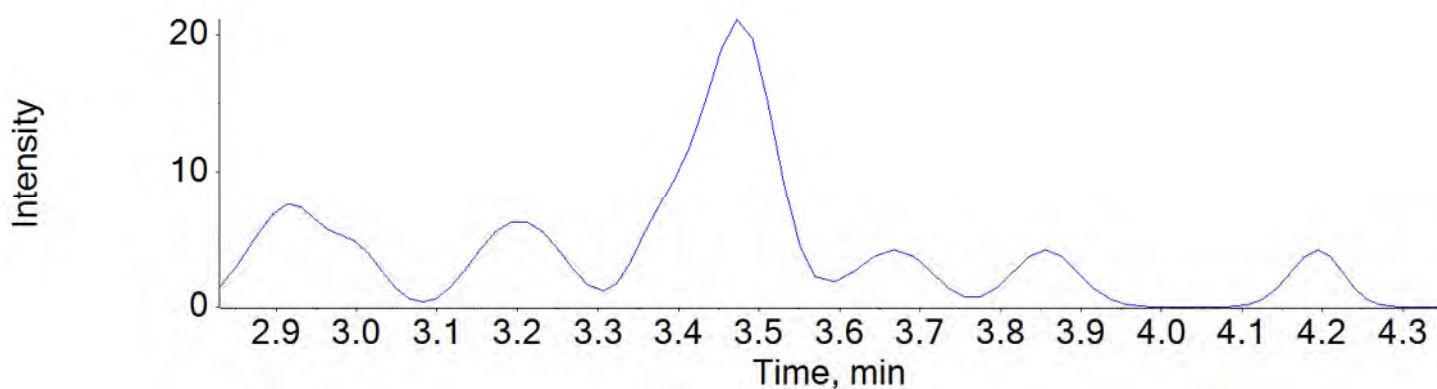




NEtFOSAA\_1 584.0 / 419.0



NEtFOSAA\_2 584.0 / 483.0

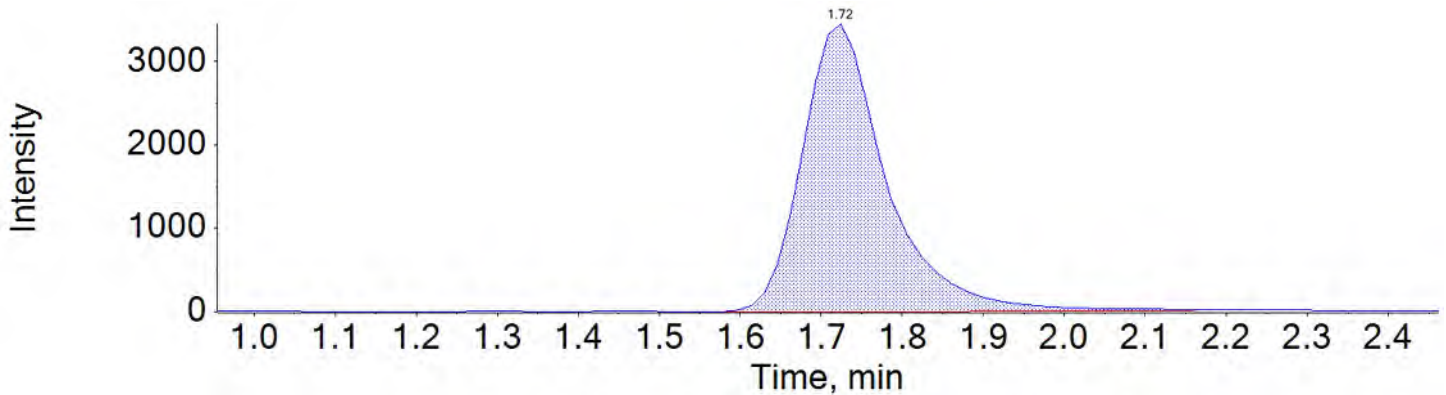




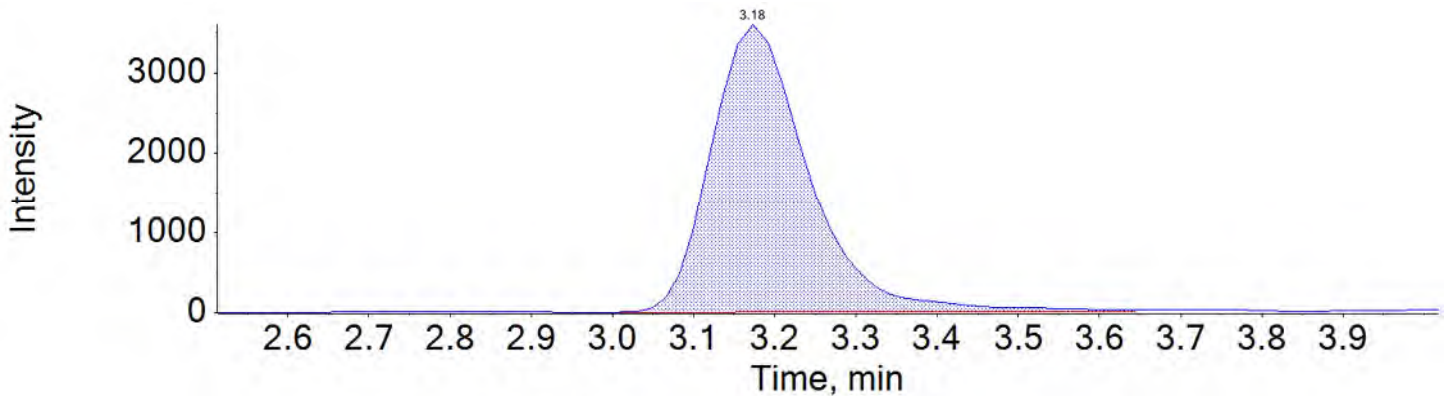
|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5971-FS(0)          | Injection Vial   | 17           |
| Sample ID          | WGNA-050118-FRB-3385 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:49:59  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Chromatograms

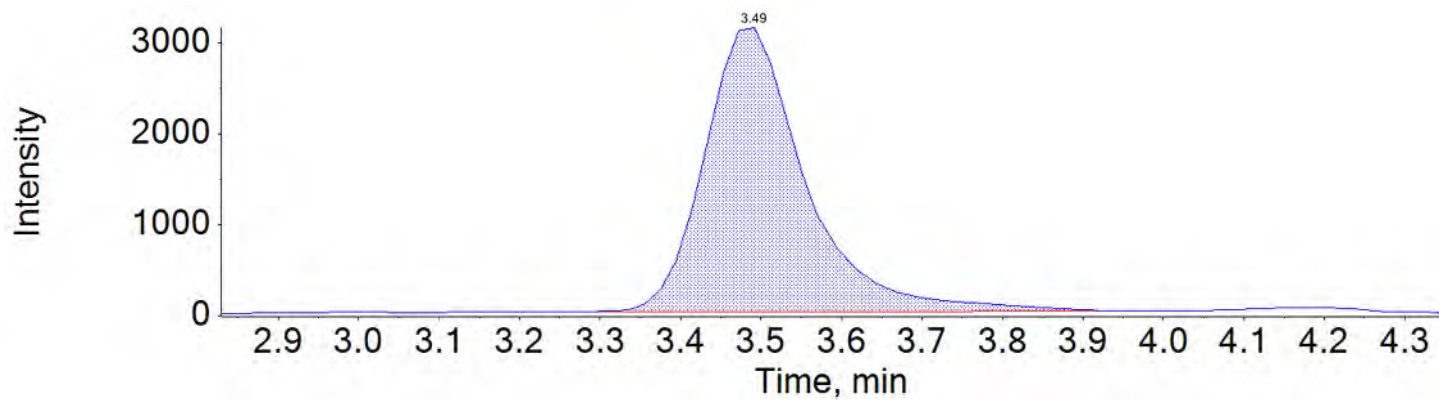
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0



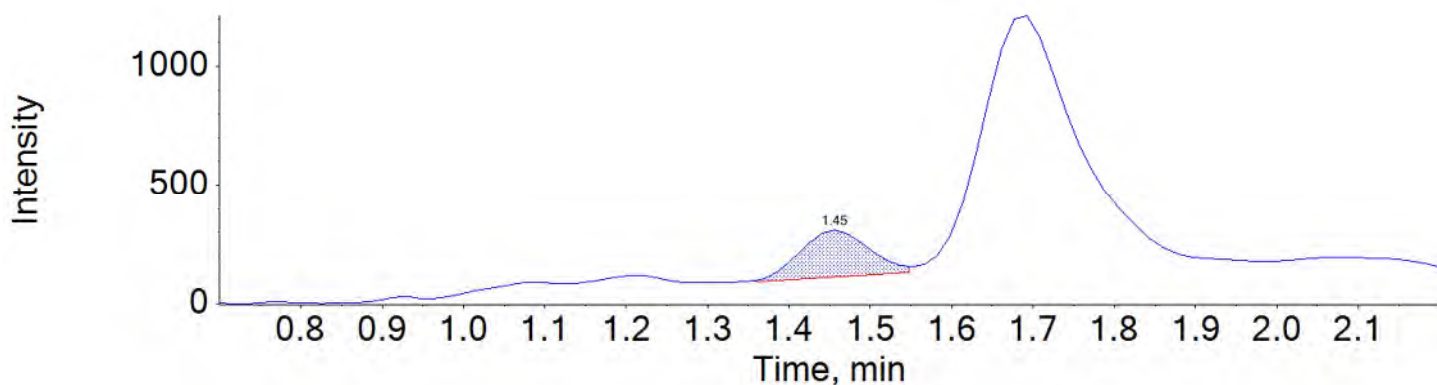
d5-EtFOSAA 589.0 / 419.0



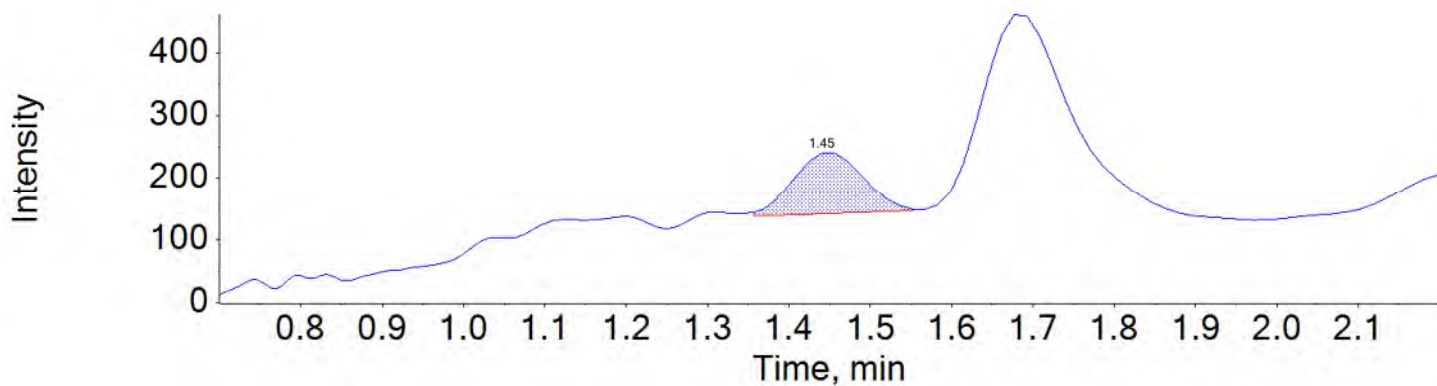
|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5973-FS(0)          | Injection Vial   | 18           |
| Sample ID          | WGNA-050118-FRB-3178 | Injection Volume | 10.00        |
| Sample Type        | Unknown              | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:58:53  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

### Chromatograms

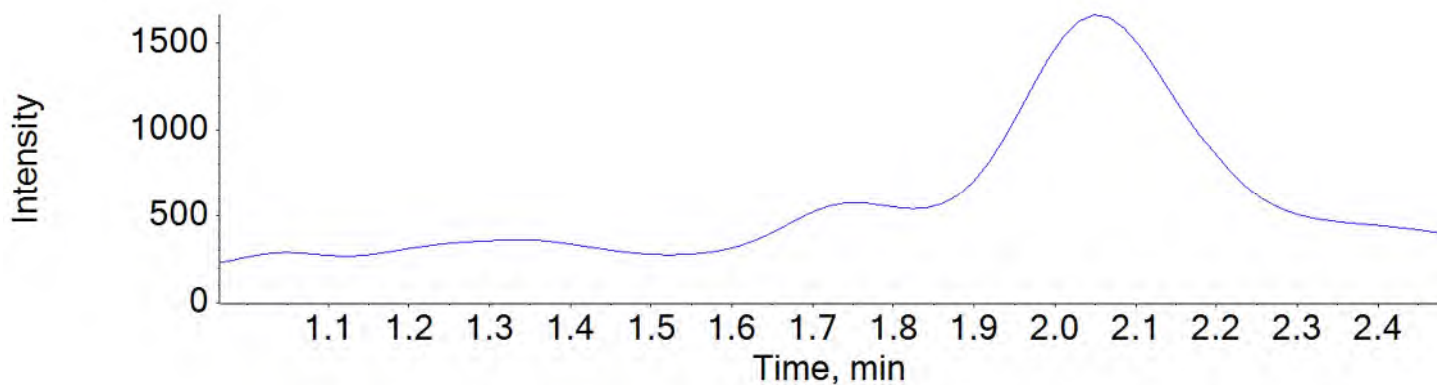
PFBS\_1 298.9 / 80.0



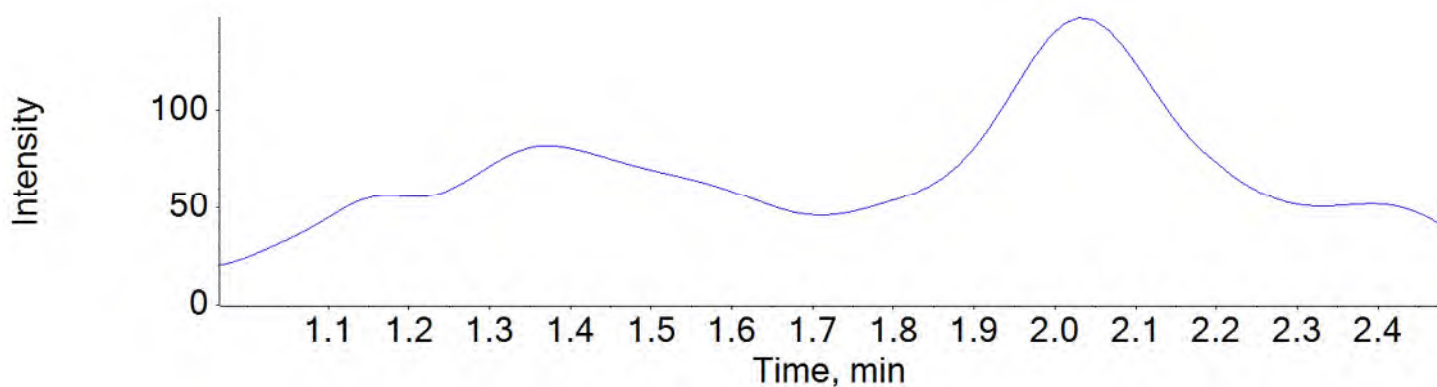
PFBS\_2 298.9 / 99.0



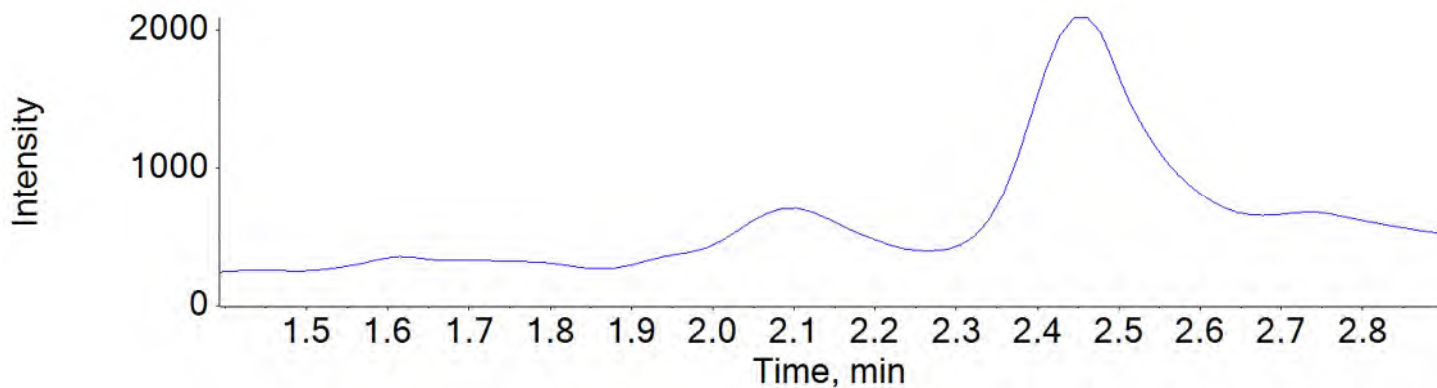
PFHxA\_1 313.0 / 269.0



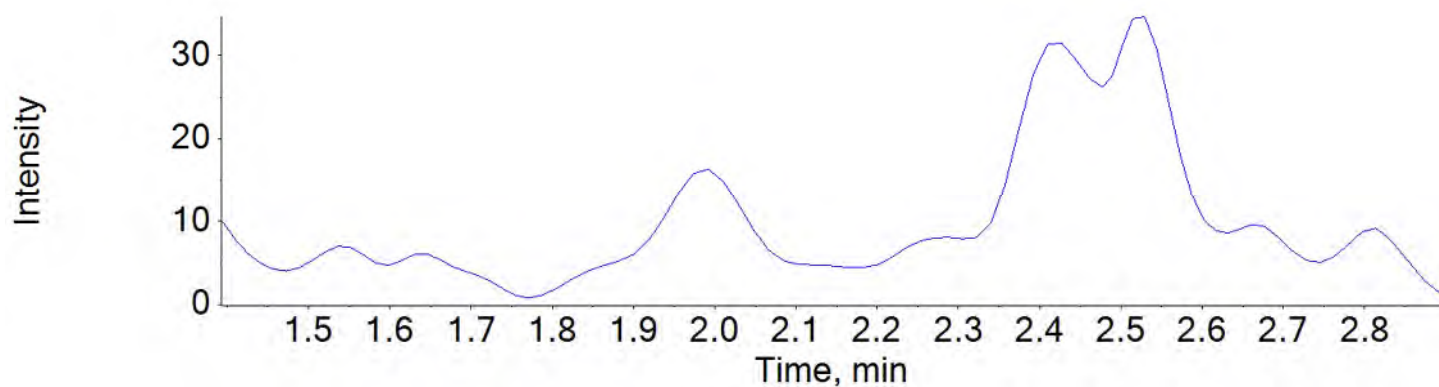
PFHxA\_2 313.0 / 119.0



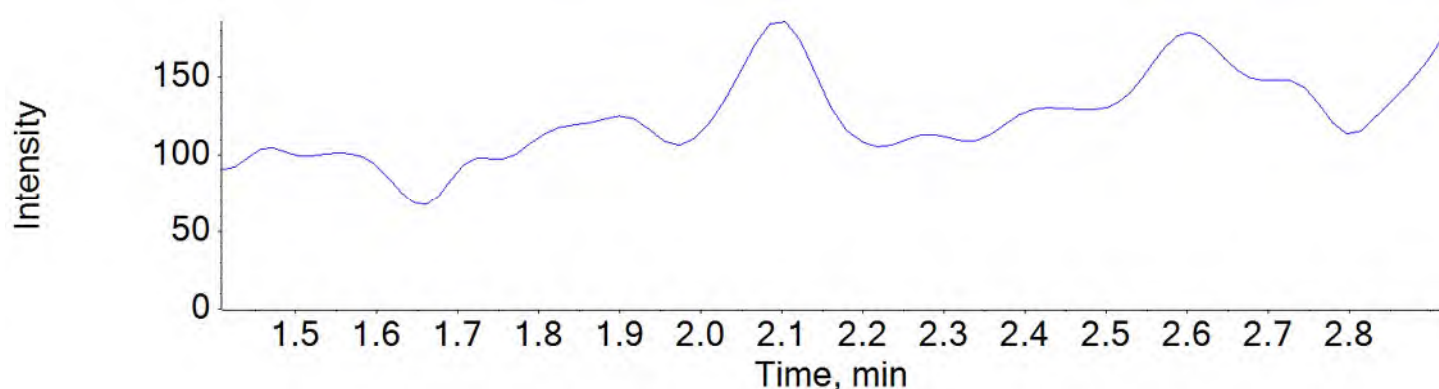
PFHpA\_1 363.0 / 319.0



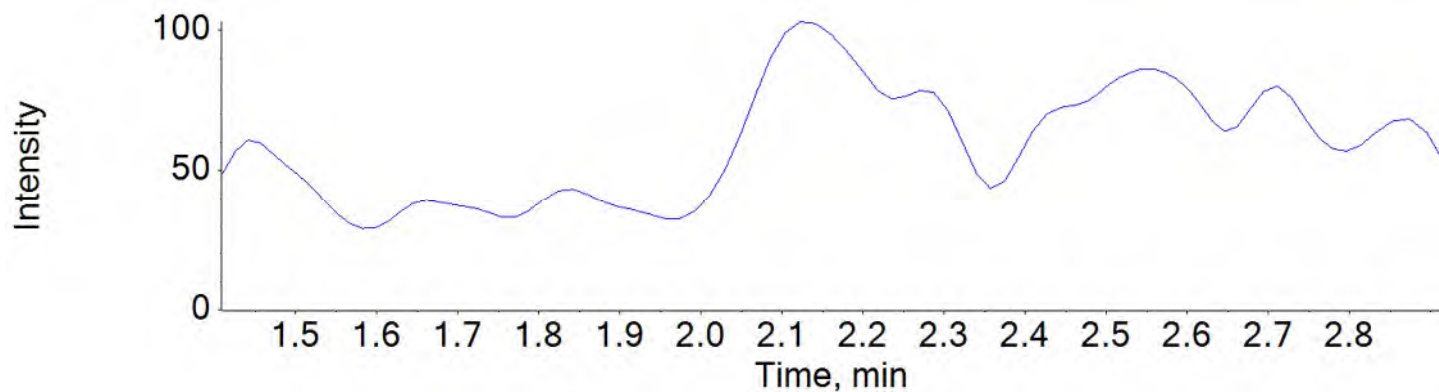
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

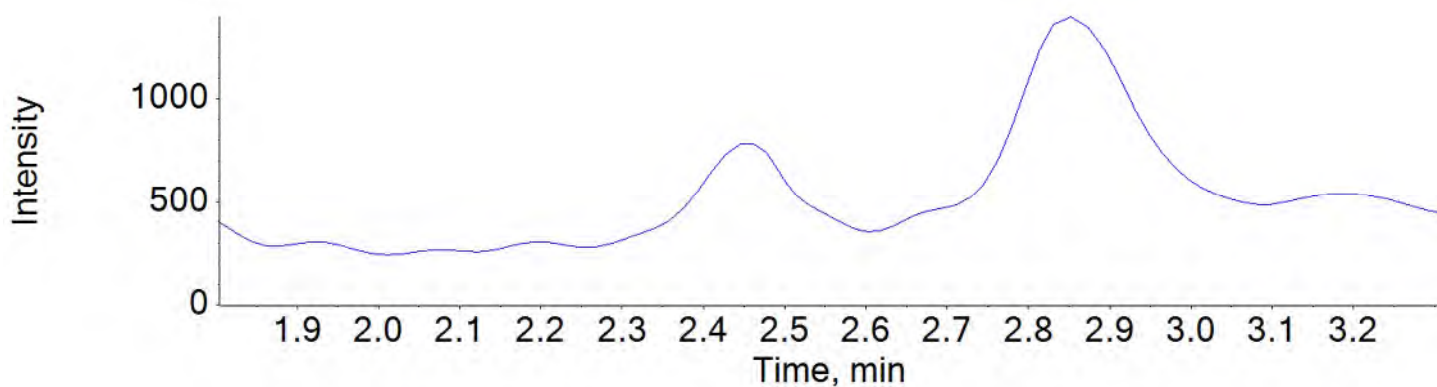


PFHxS\_2 399.0 / 99.0

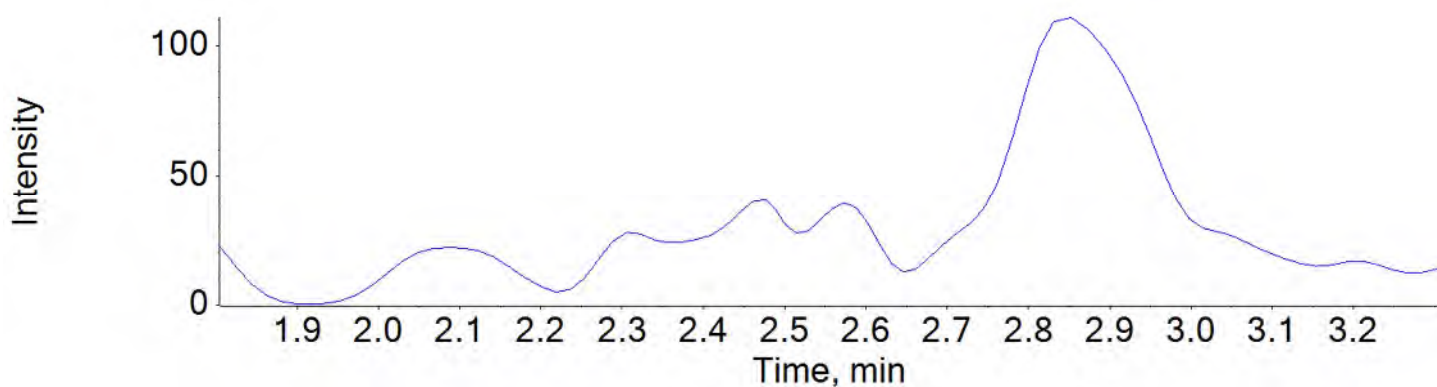




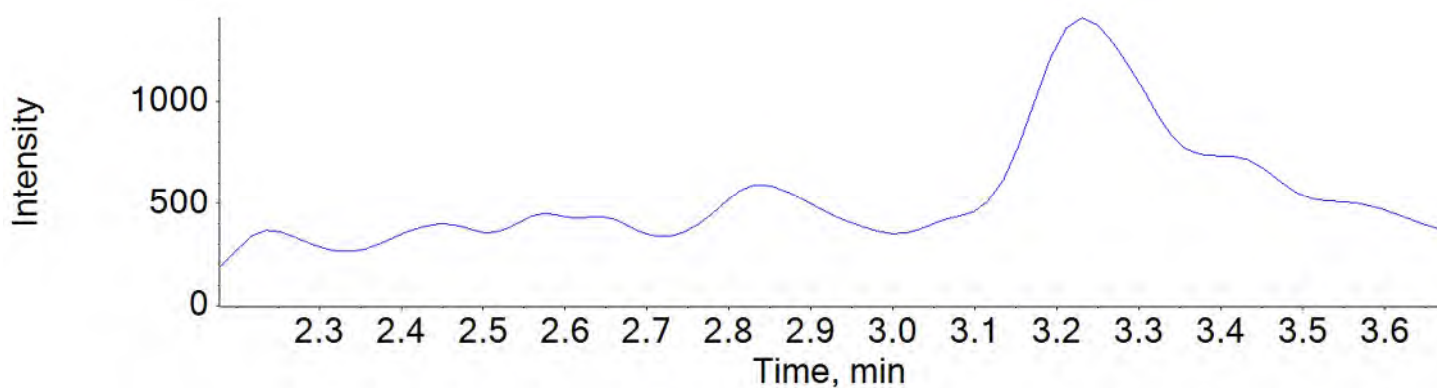
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

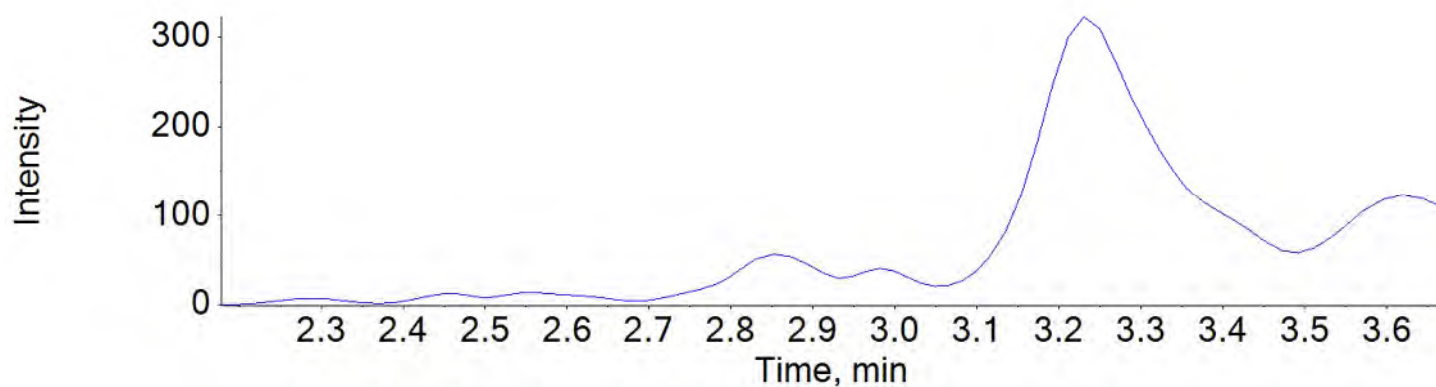


PFNA\_1 463.0 / 419.0

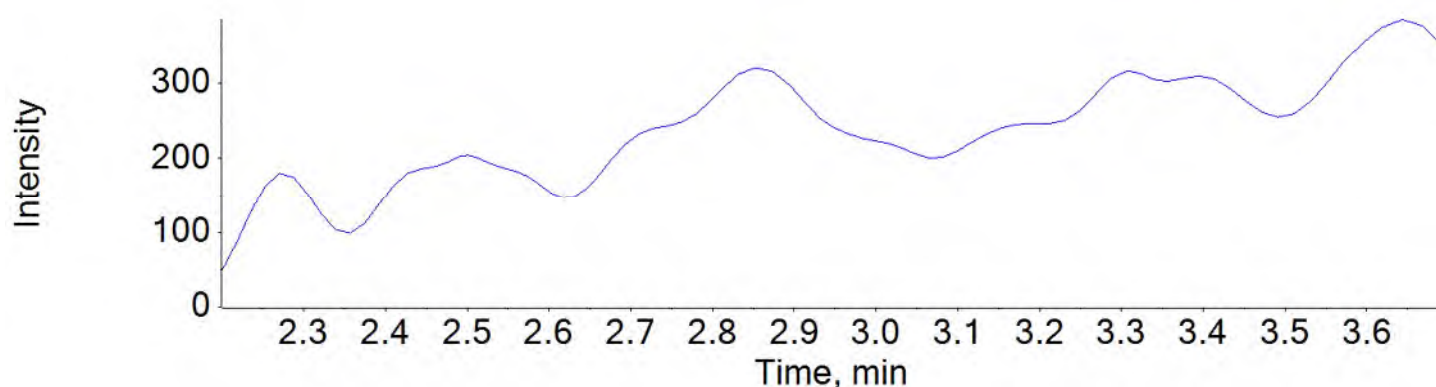




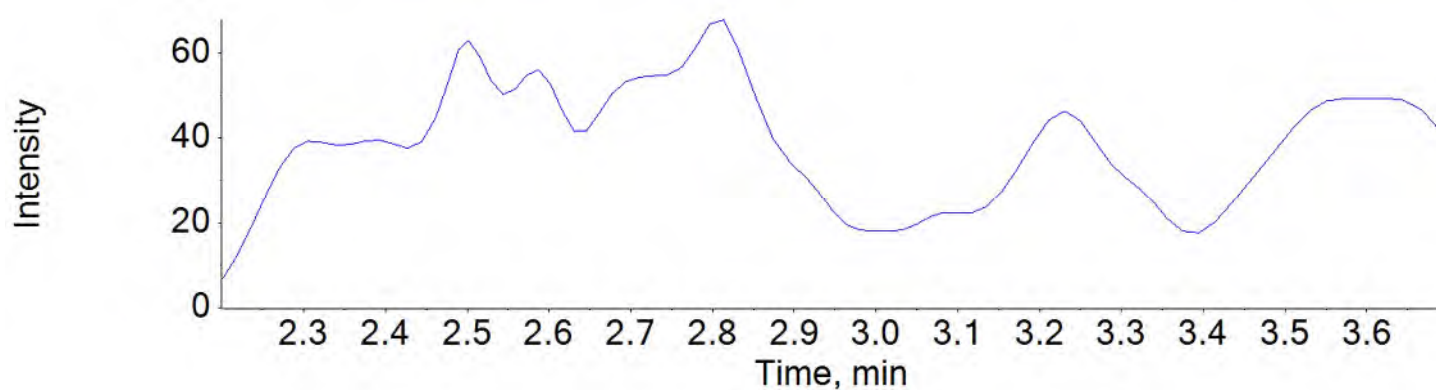
PFNA\_2 463.0 / 219.0



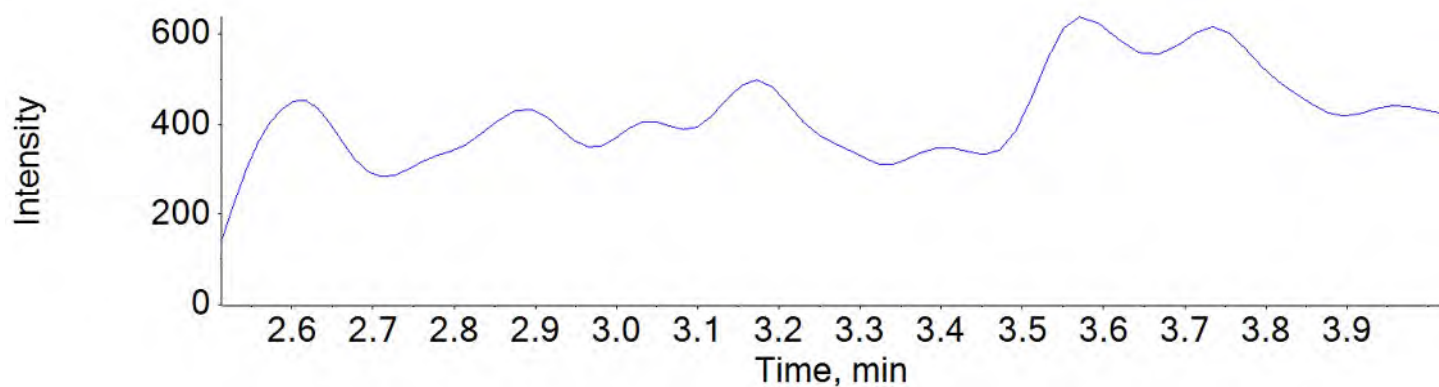
PFOS\_1 499.0 / 80.0



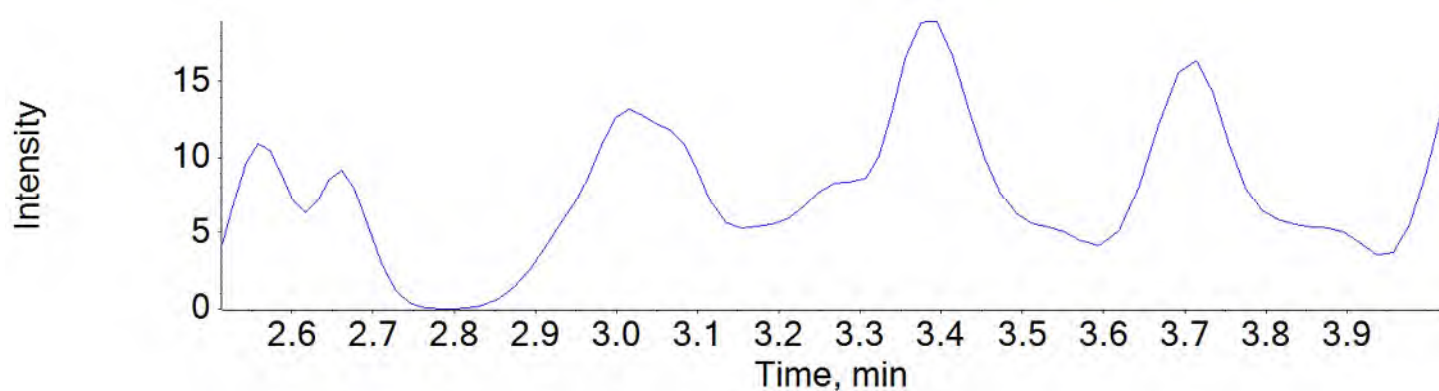
PFOS\_2 499.0 / 99.0



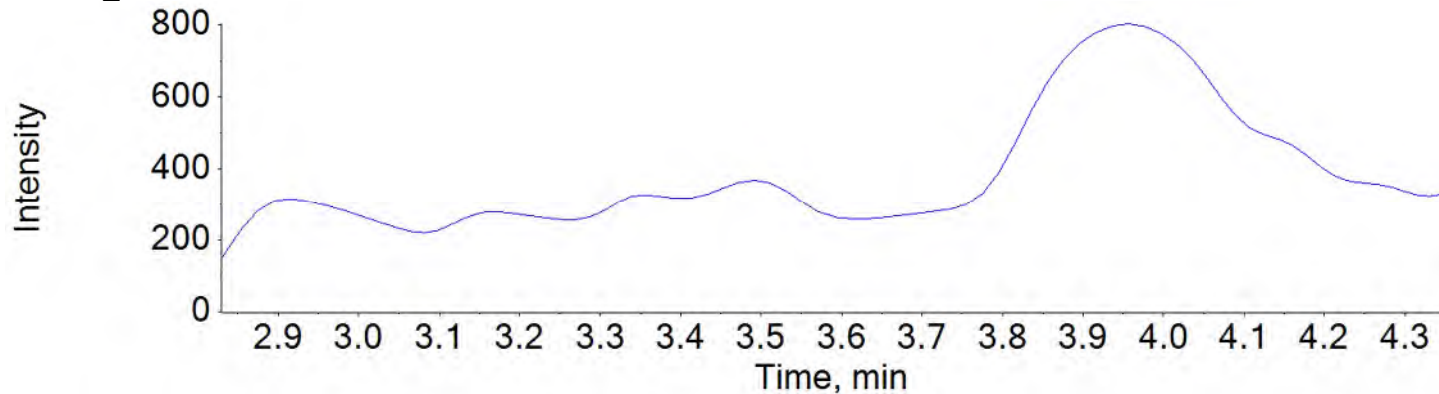
PFDA\_1 513.0 / 469.0



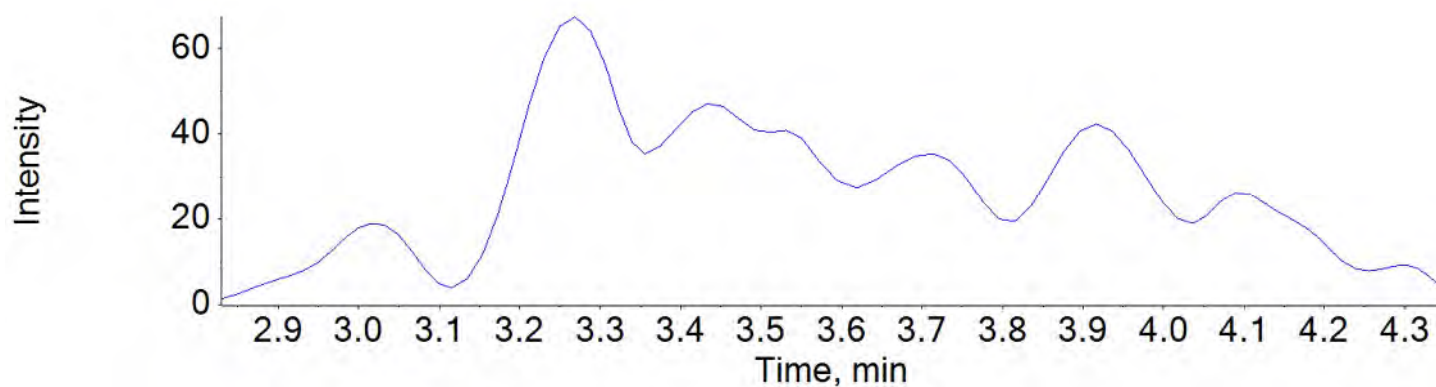
PFDA\_2 513.0 / 219.0



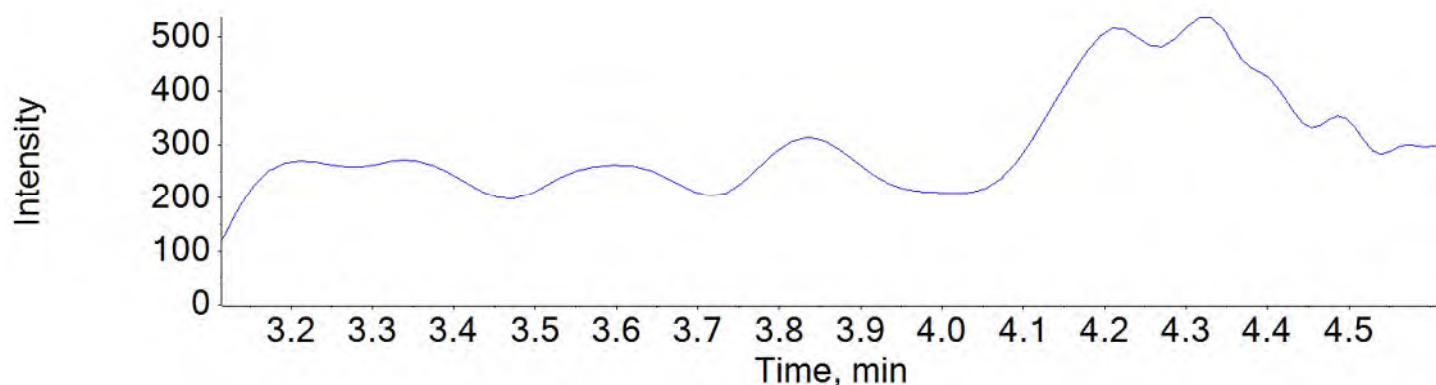
PFUnA\_1 563.0 / 519.0



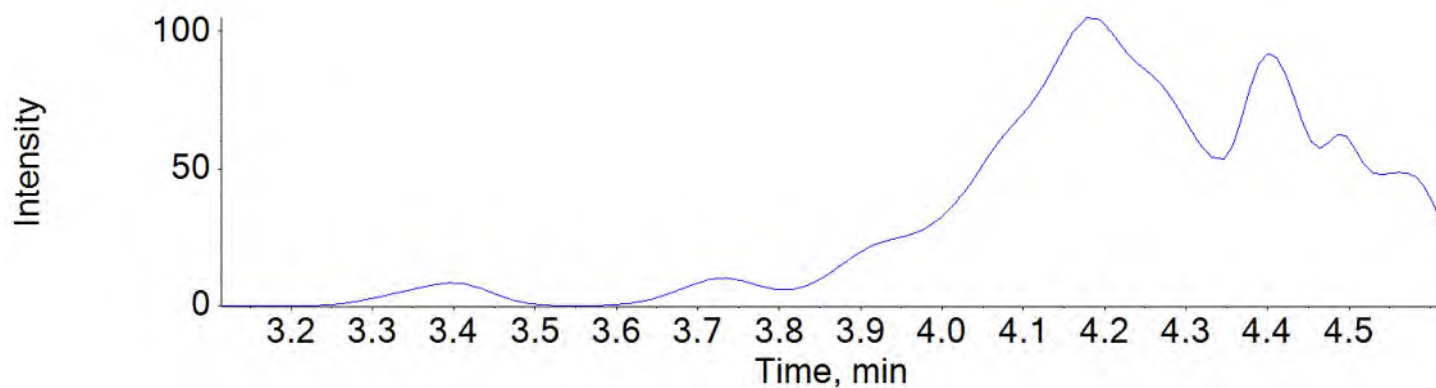
PFUnA\_2 563.0 / 269.0



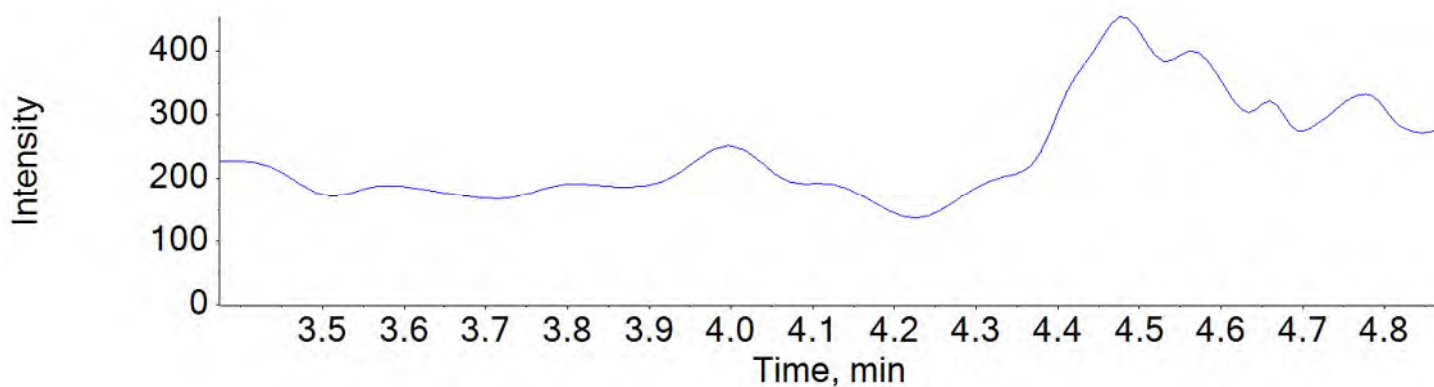
PFDaA\_1 613.0 / 569.0



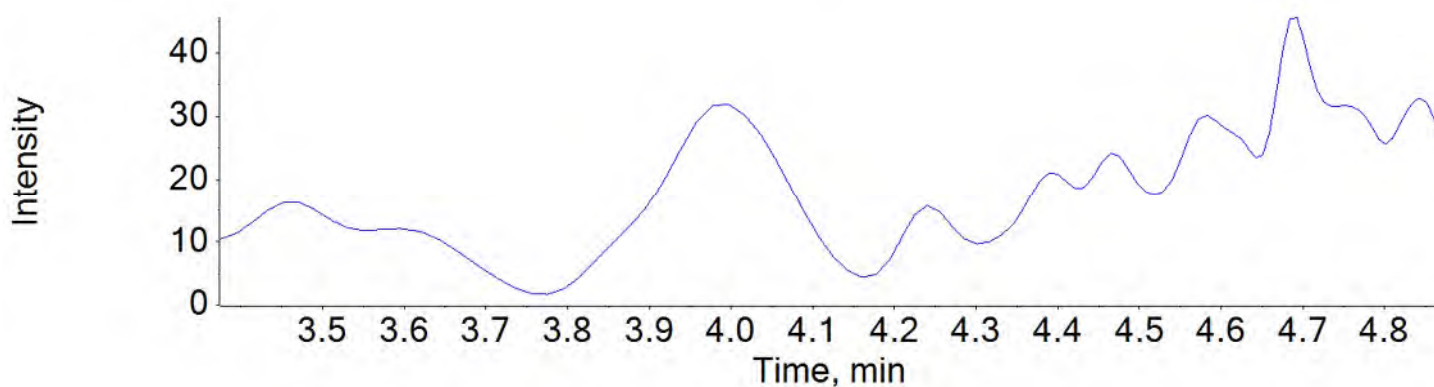
PFDaA\_2 613.0 / 319.0



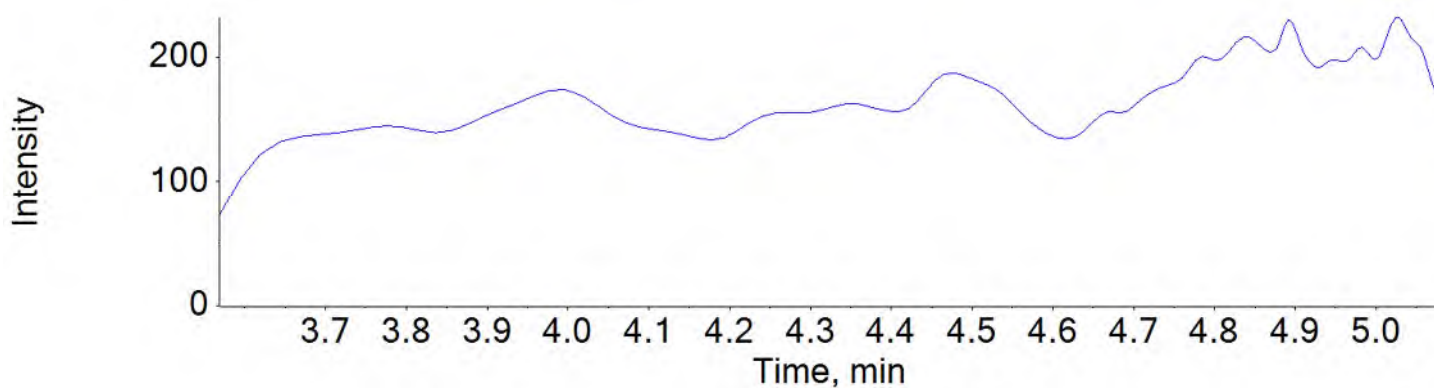
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

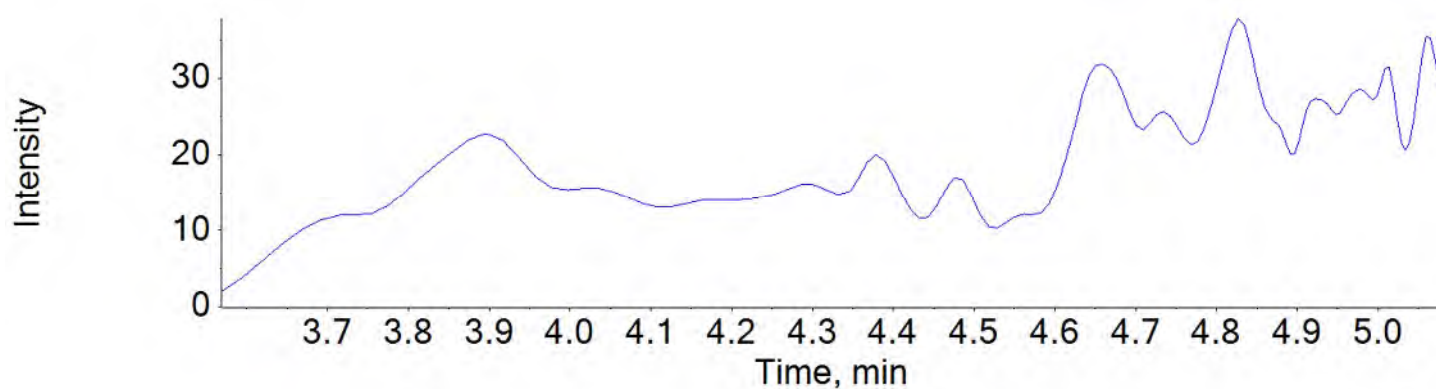


PFTeDA\_1 713.0 / 669.0

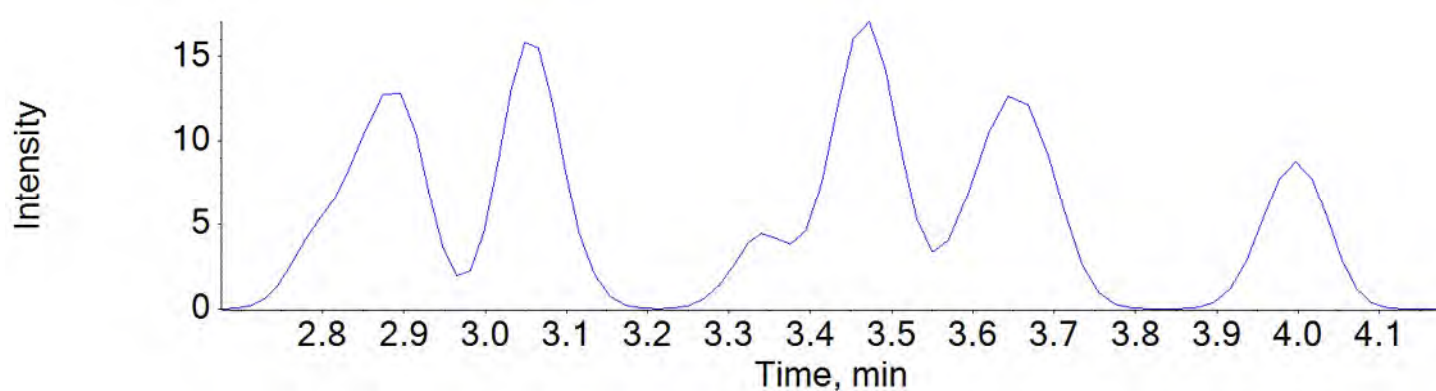




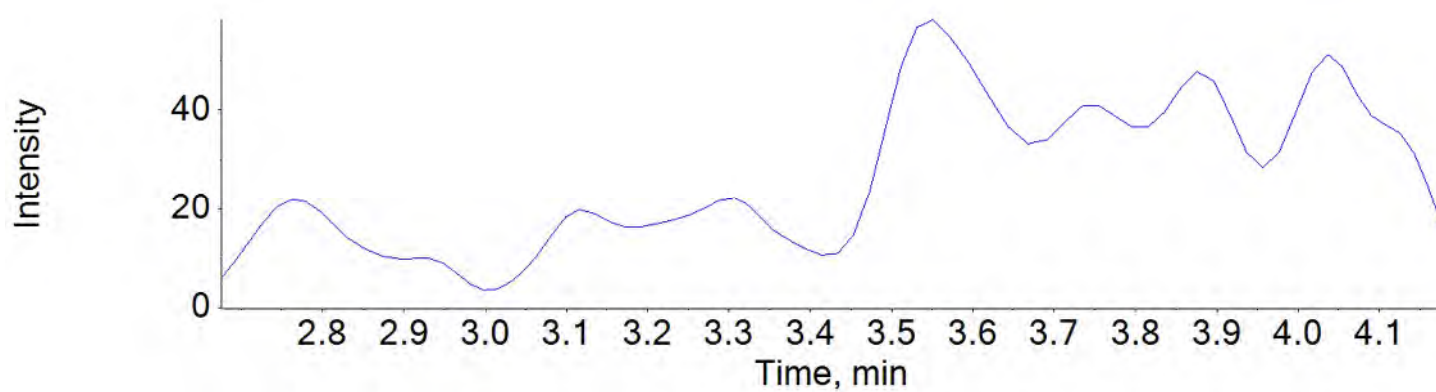
PFTeDA\_2 713.0 / 169.0



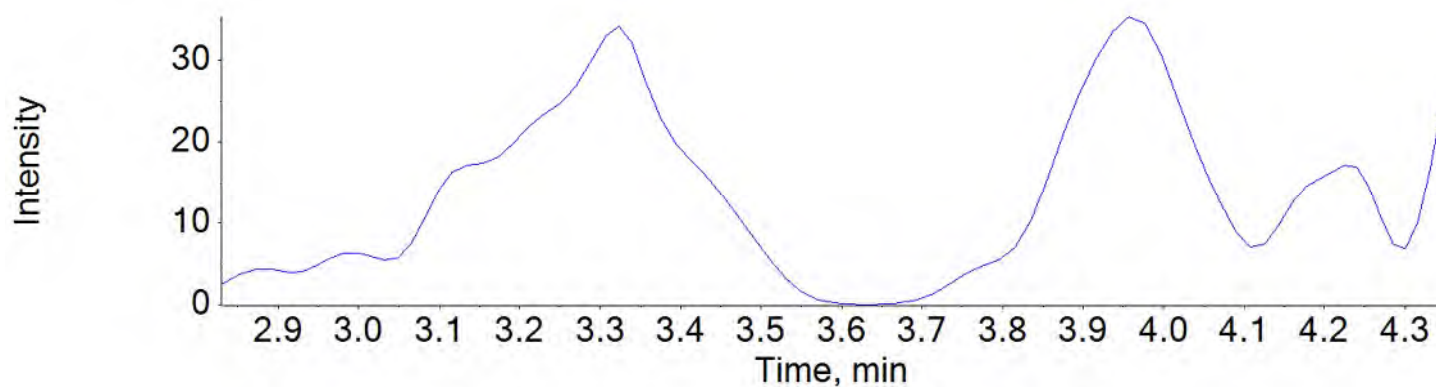
NMeFOSAA\_1 570.0 / 419.0



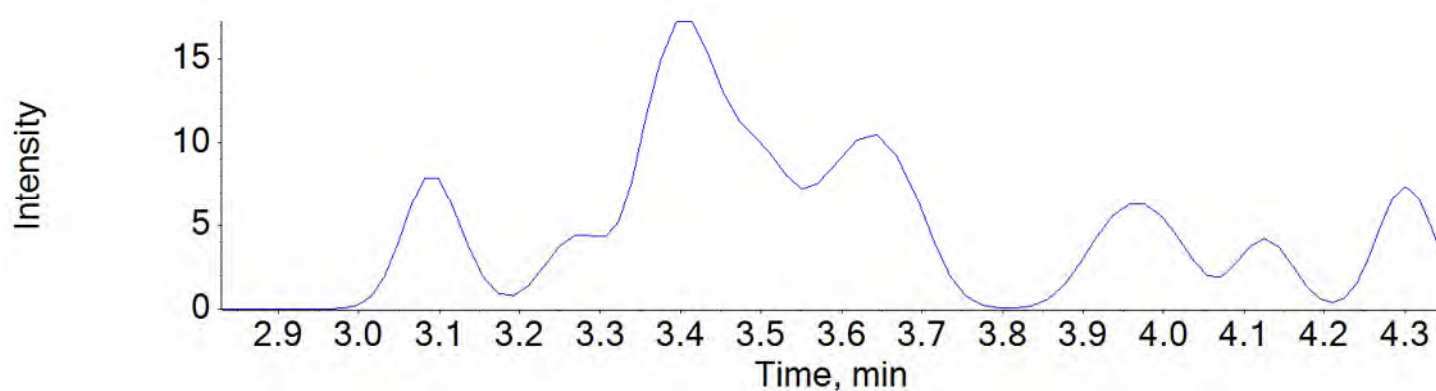
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



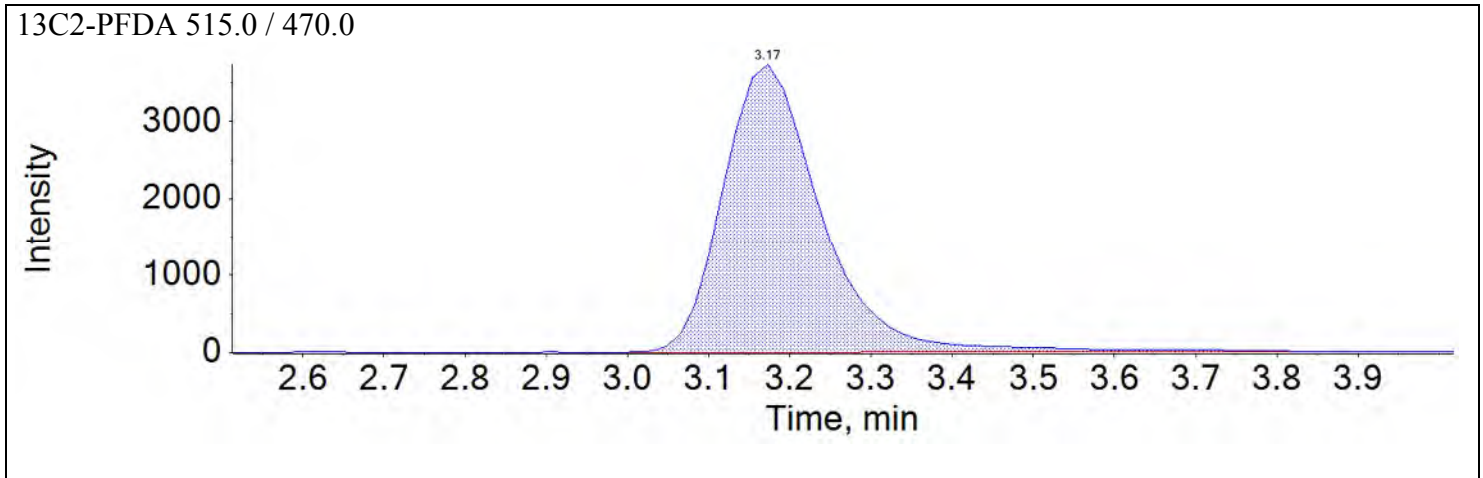
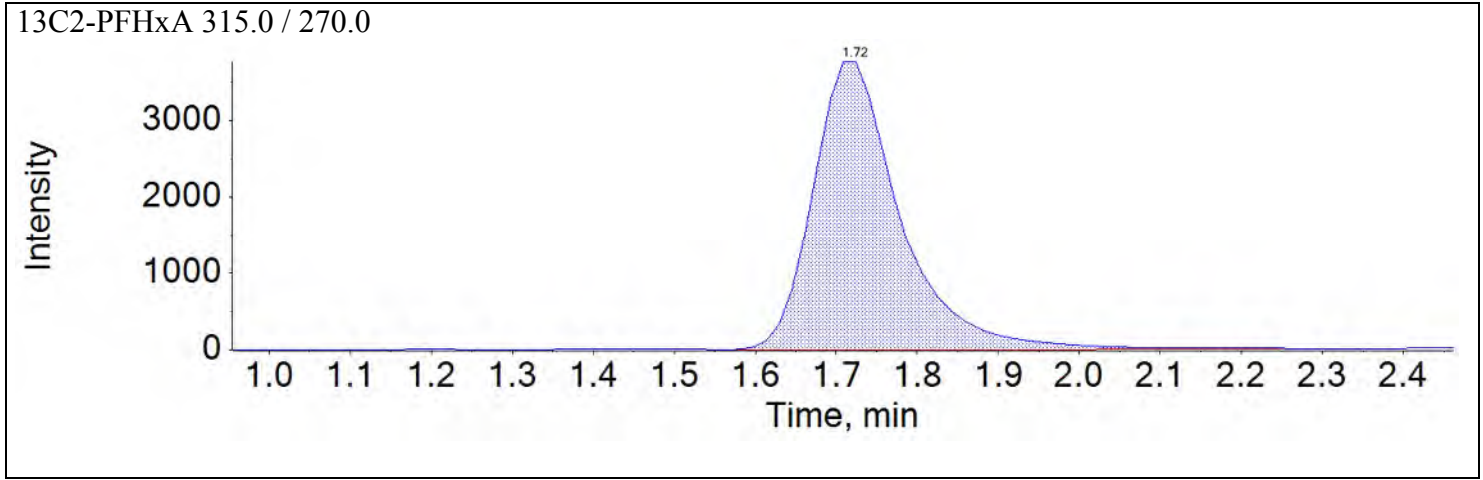
NEtFOSAA\_2 584.0 / 483.0



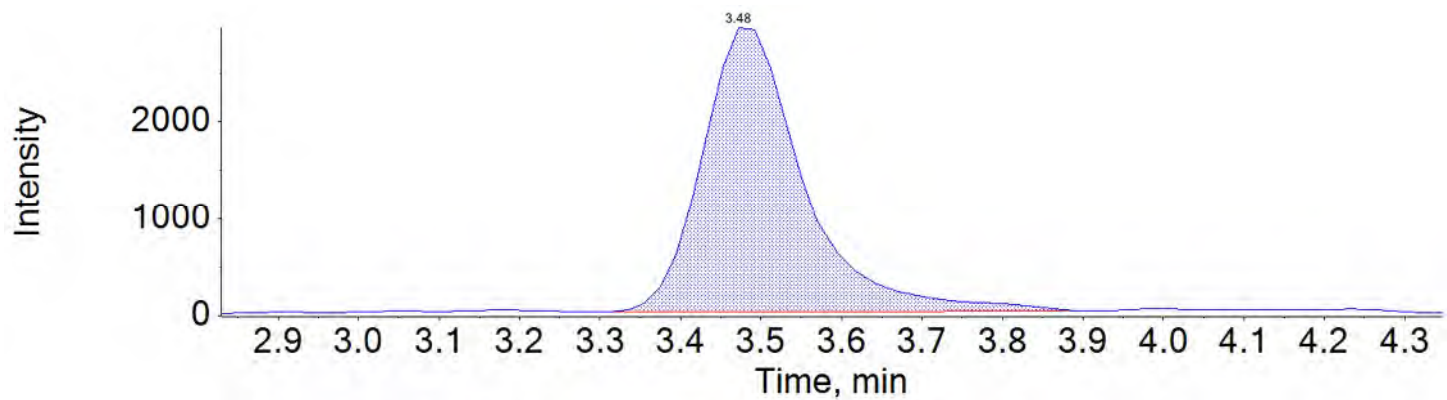


|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | J5973-FS(0)          | Injection Vial   | 18           |
| Sample ID          | WGNA-050118-FRB-3178 | Injection Volume | 10.00        |
| Sample Type        | Quality Control      | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T18:58:53  | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Chromatograms



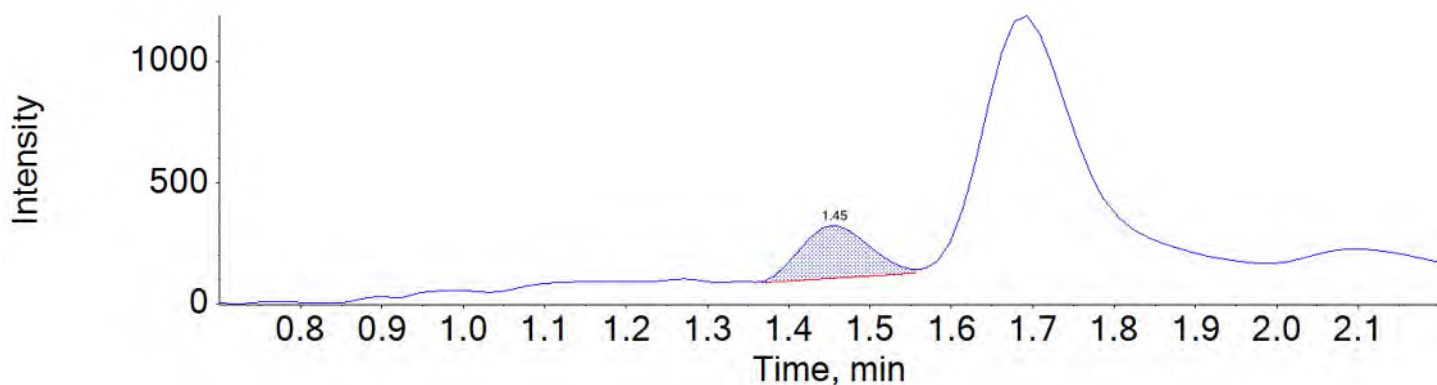
d5-EtFOSAA 589.0 / 419.0



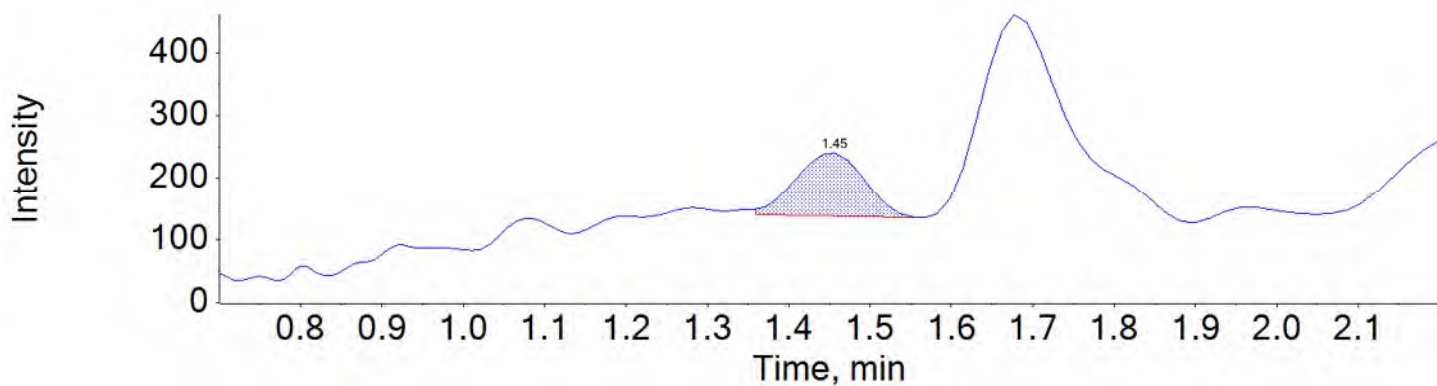
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5975-FS(0)         | Injection Vial   | 19           |
| Sample ID          | NAWC-050118-FRB-304 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:07:47 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

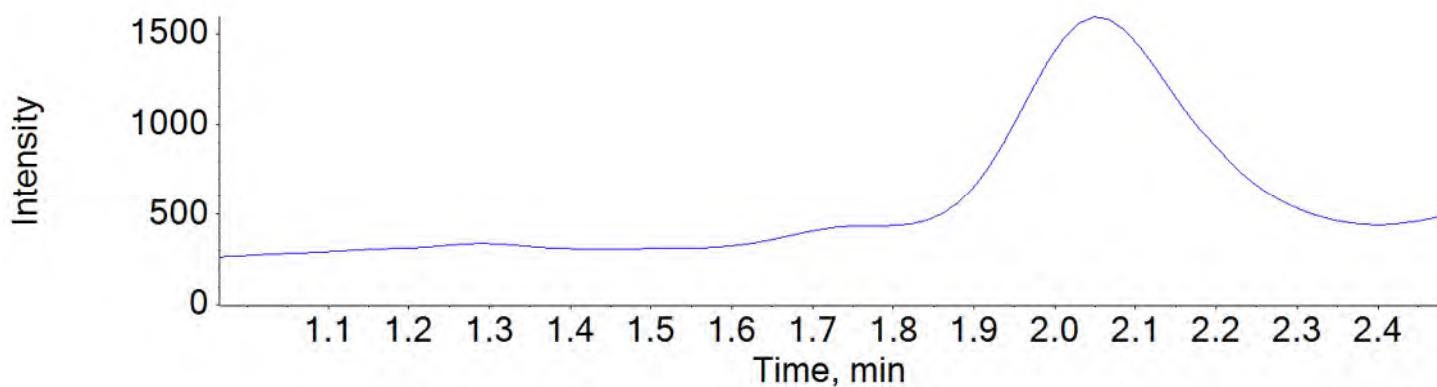
PFBS\_1 298.9 / 80.0



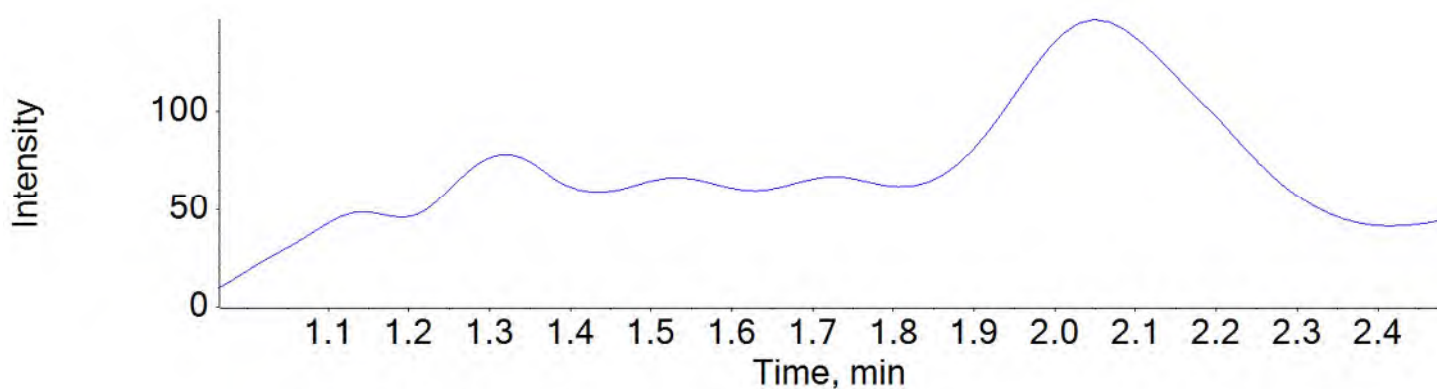
PFBS\_2 298.9 / 99.0



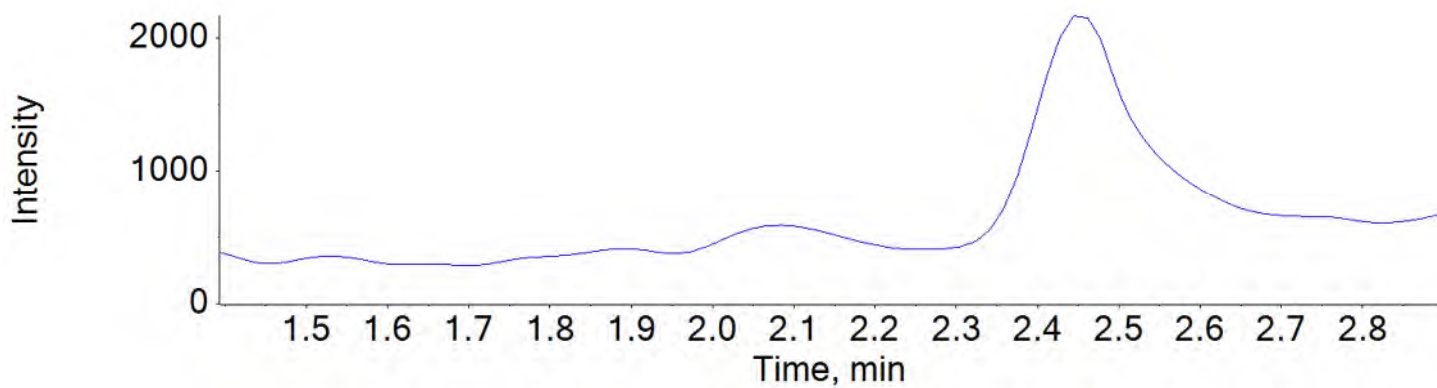
PFHxA\_1 313.0 / 269.0



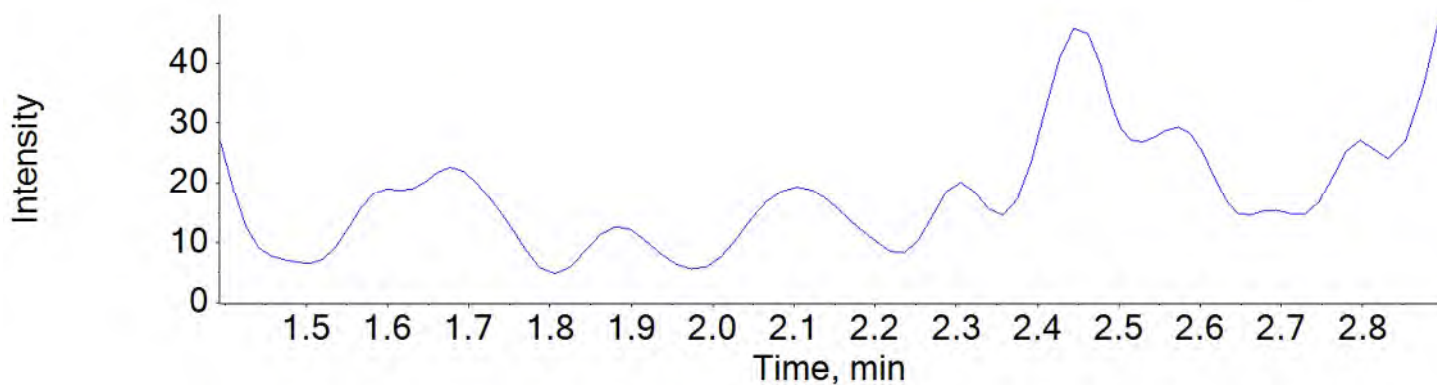
PFHxA\_2 313.0 / 119.0



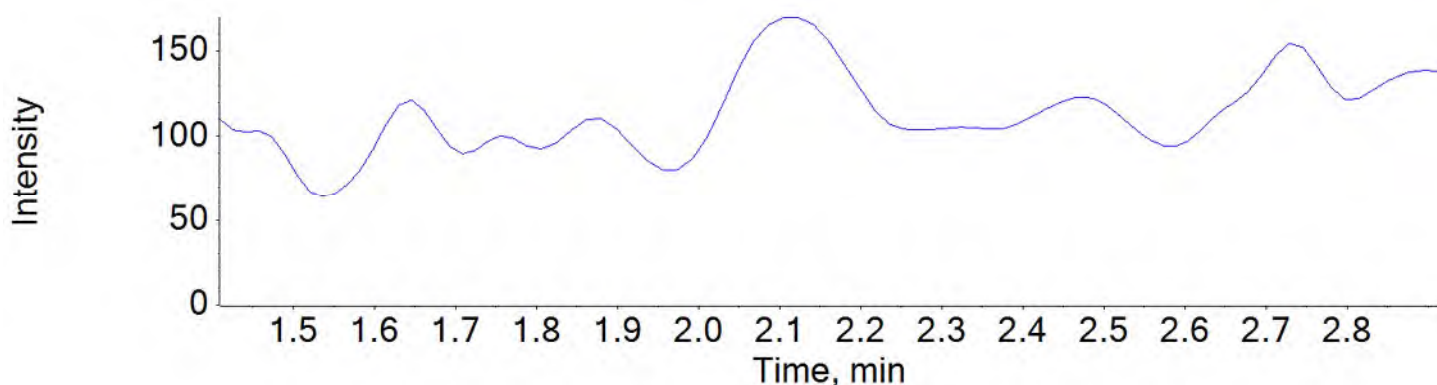
PFHpA\_1 363.0 / 319.0



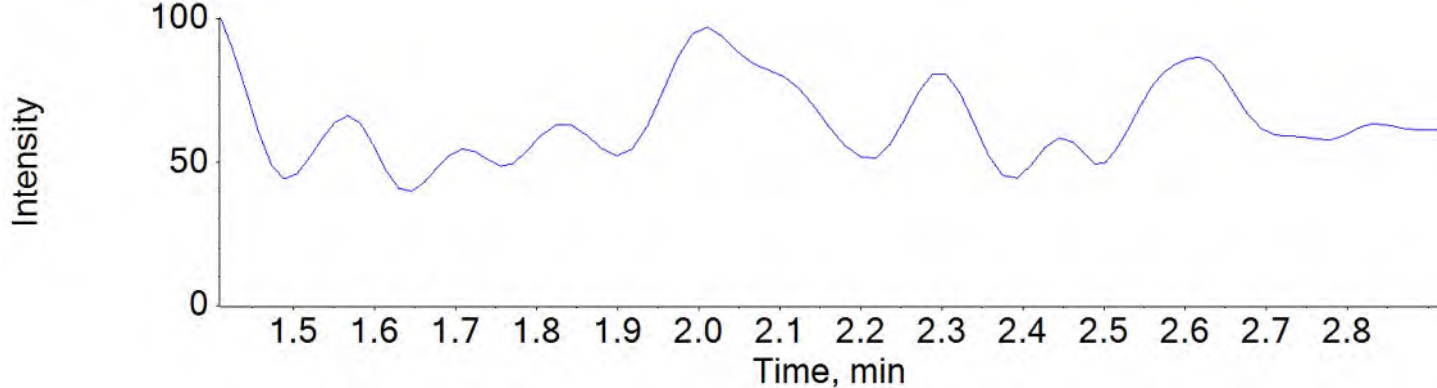
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

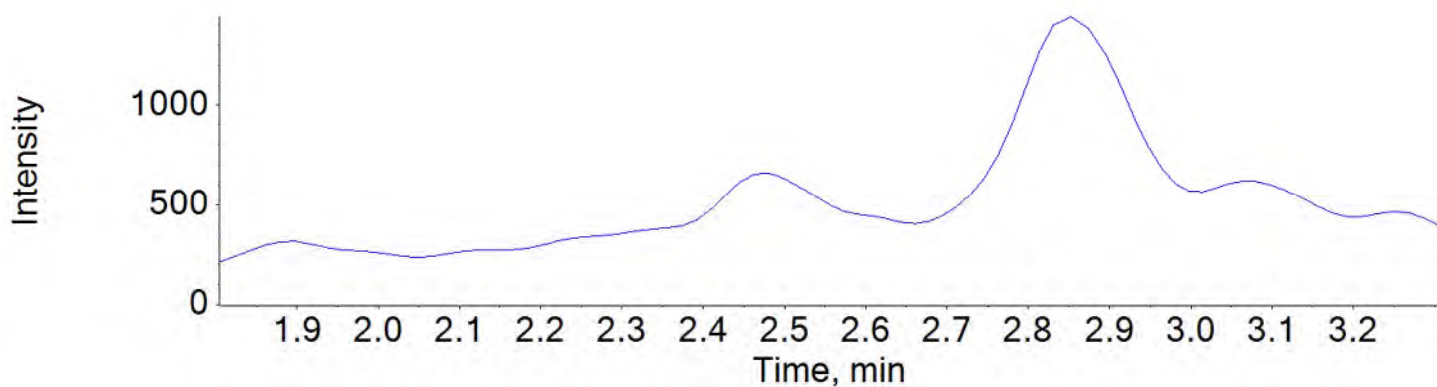


PFHxS\_2 399.0 / 99.0

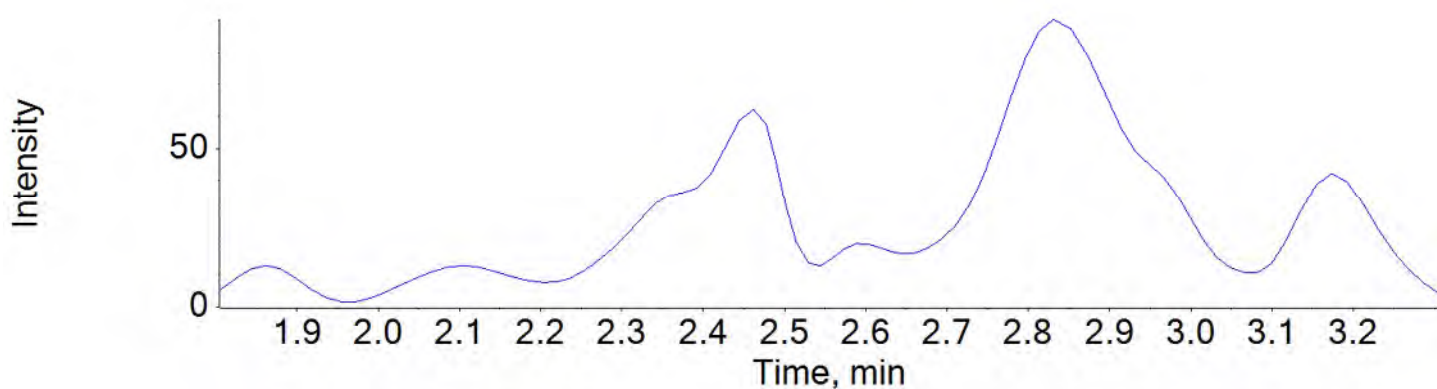




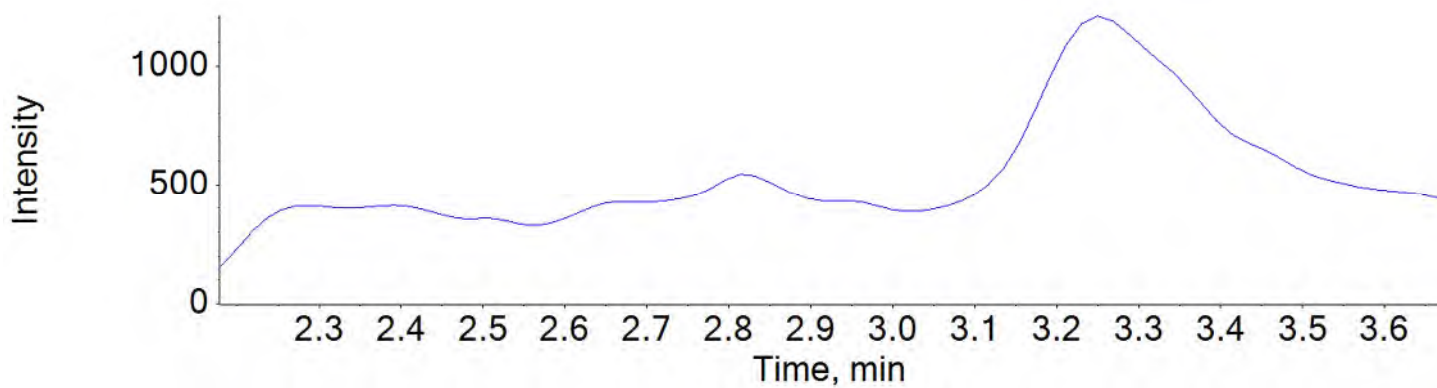
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

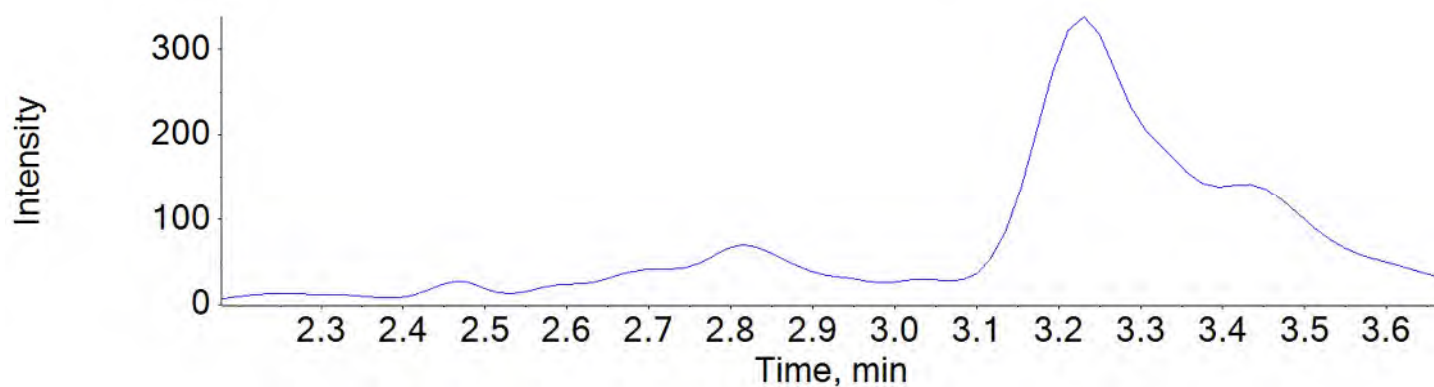


PFNA\_1 463.0 / 419.0

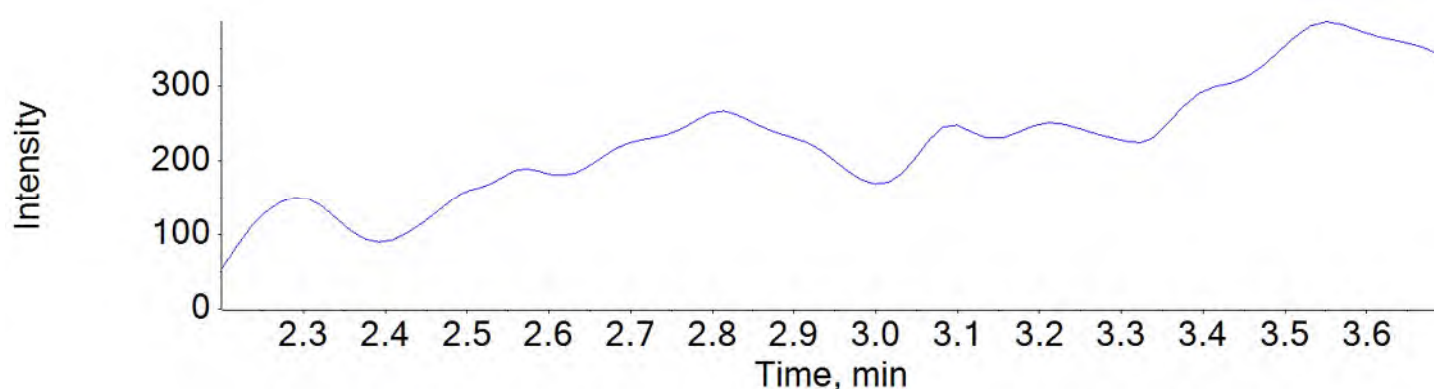




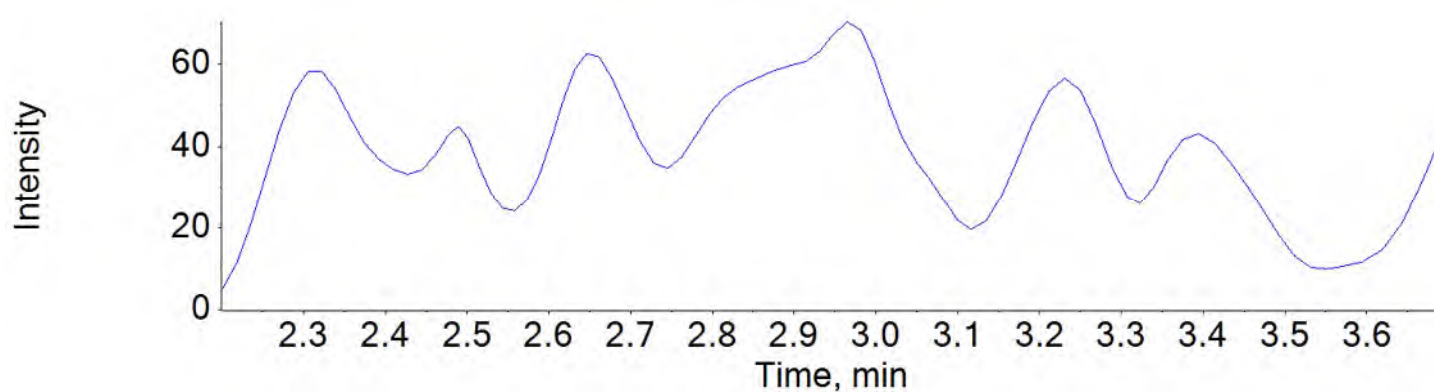
PFNA\_2 463.0 / 219.0



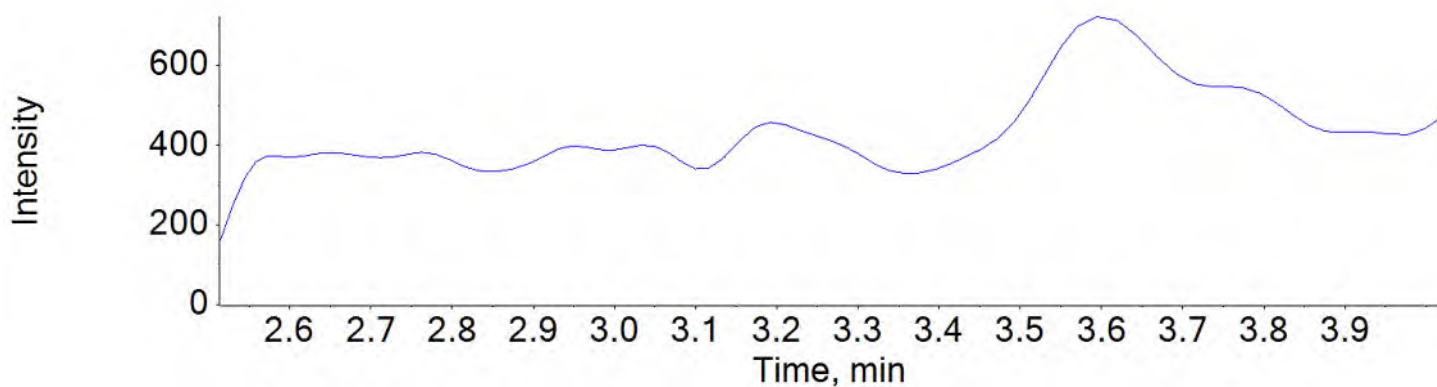
PFOS\_1 499.0 / 80.0



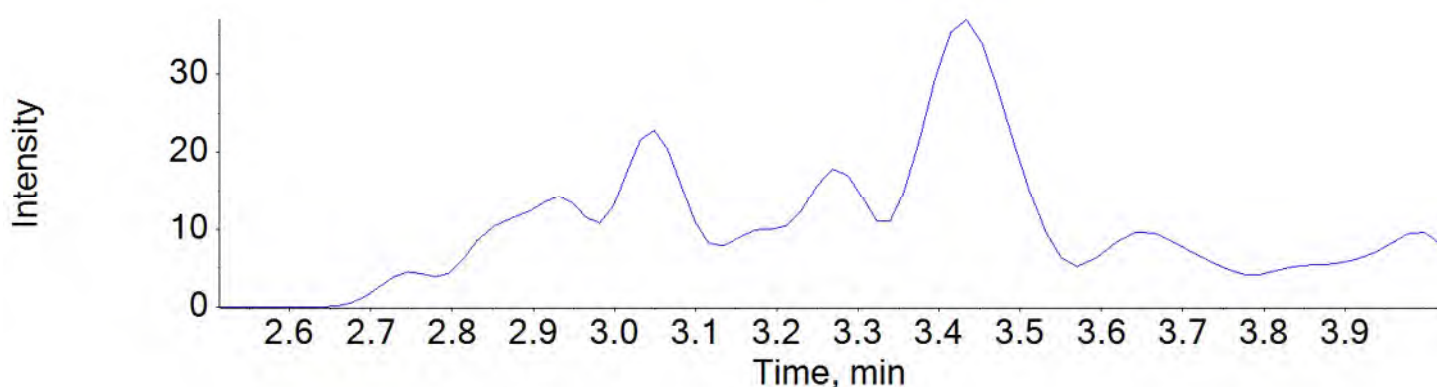
PFOS\_2 499.0 / 99.0



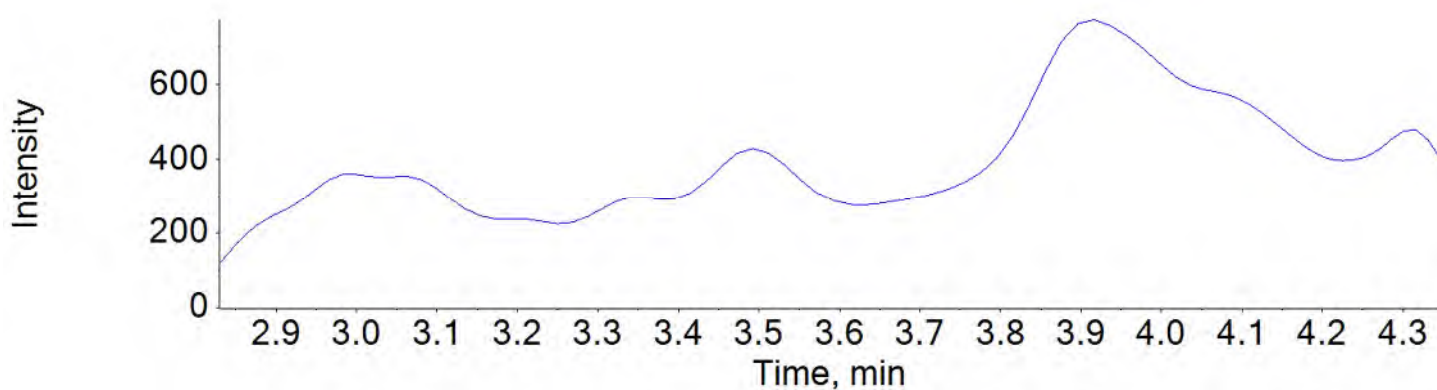
PFDA\_1 513.0 / 469.0



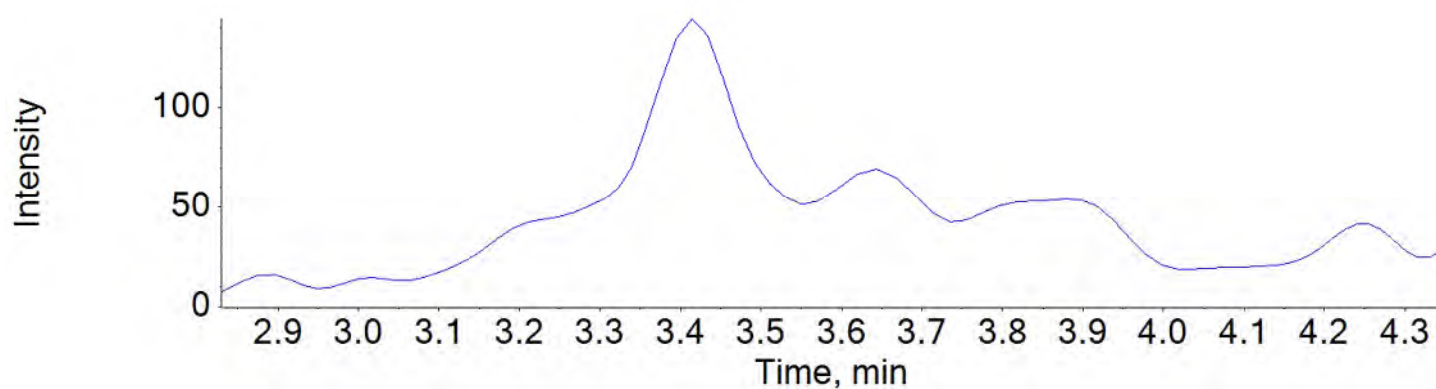
PFDA\_2 513.0 / 219.0



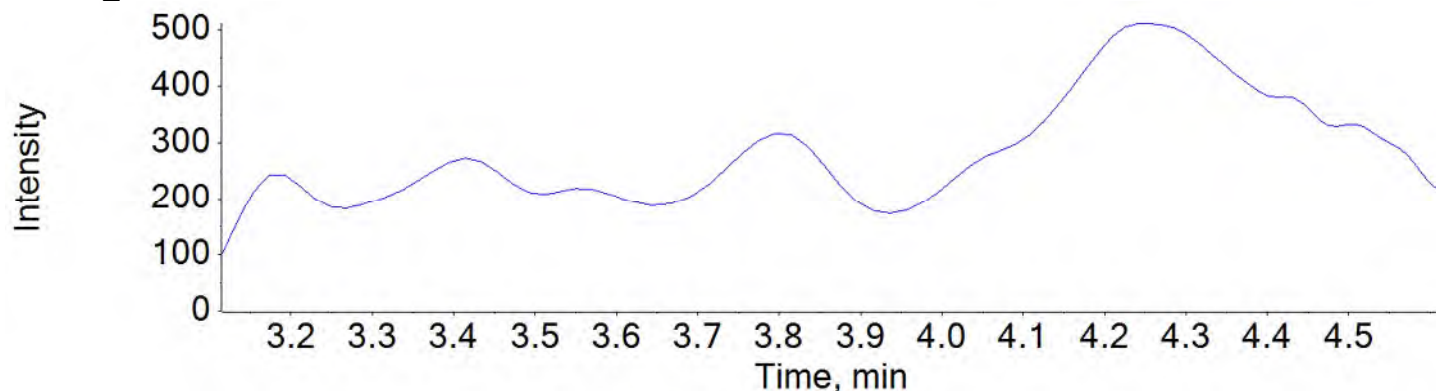
PFUnA\_1 563.0 / 519.0



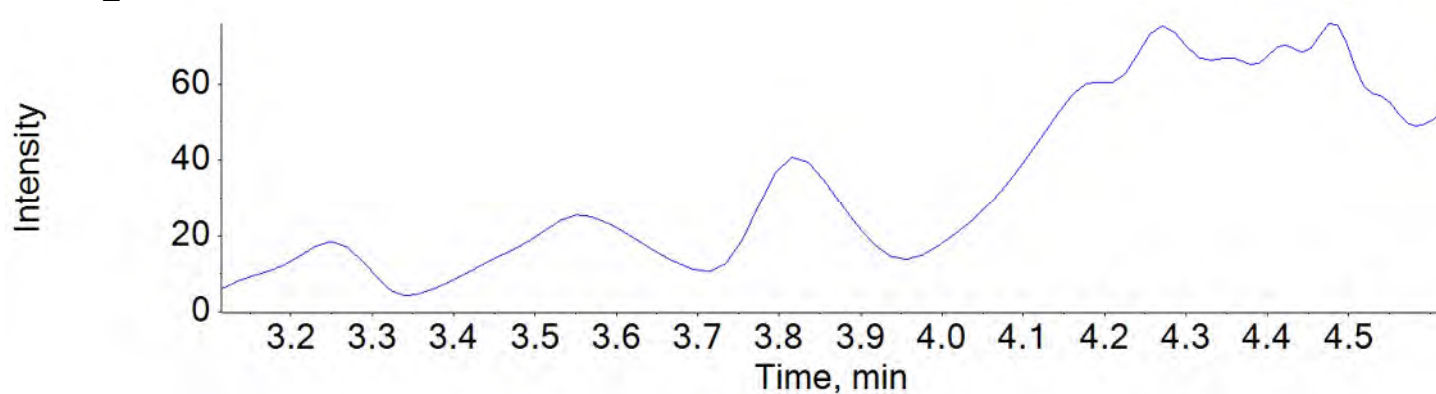
PFUnA\_2 563.0 / 269.0



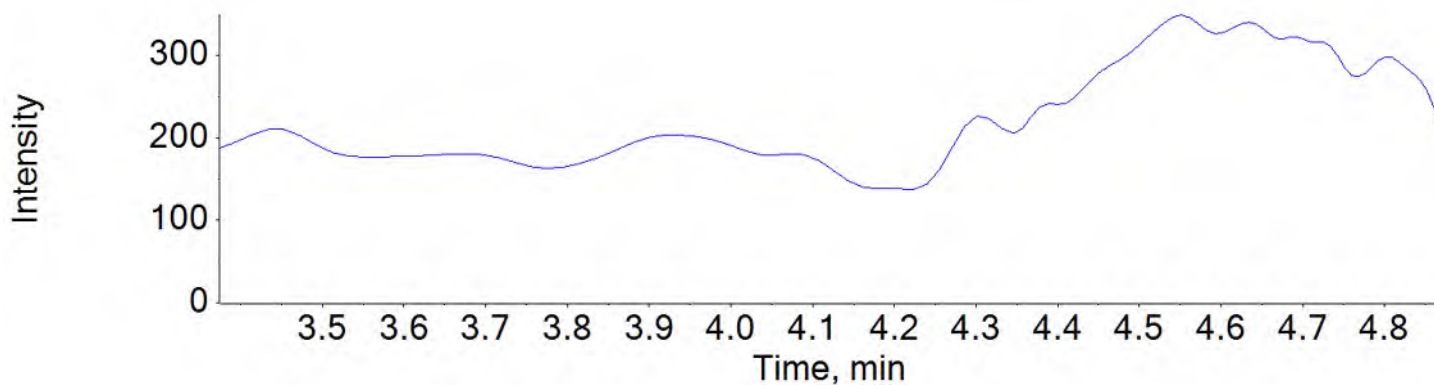
PFDaA\_1 613.0 / 569.0



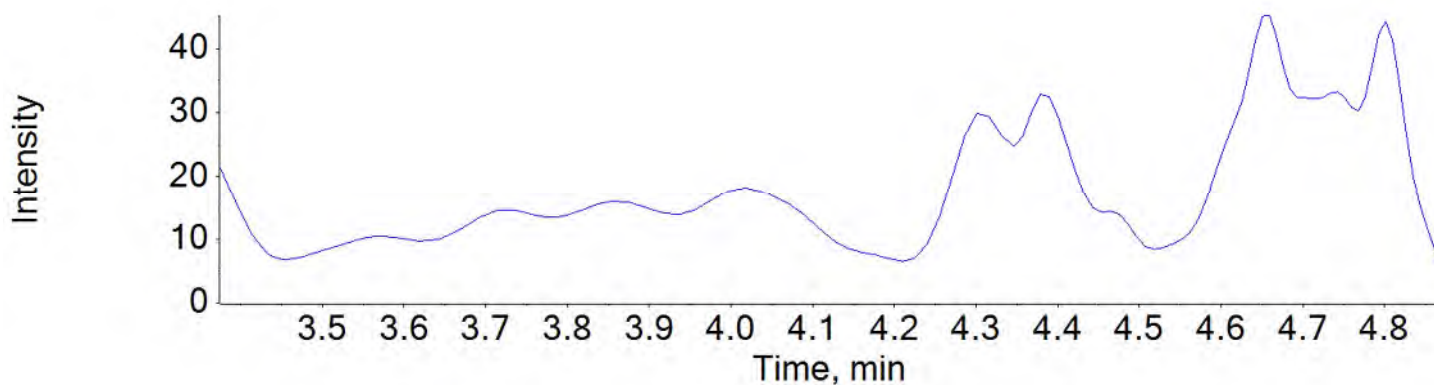
PFDaA\_2 613.0 / 319.0



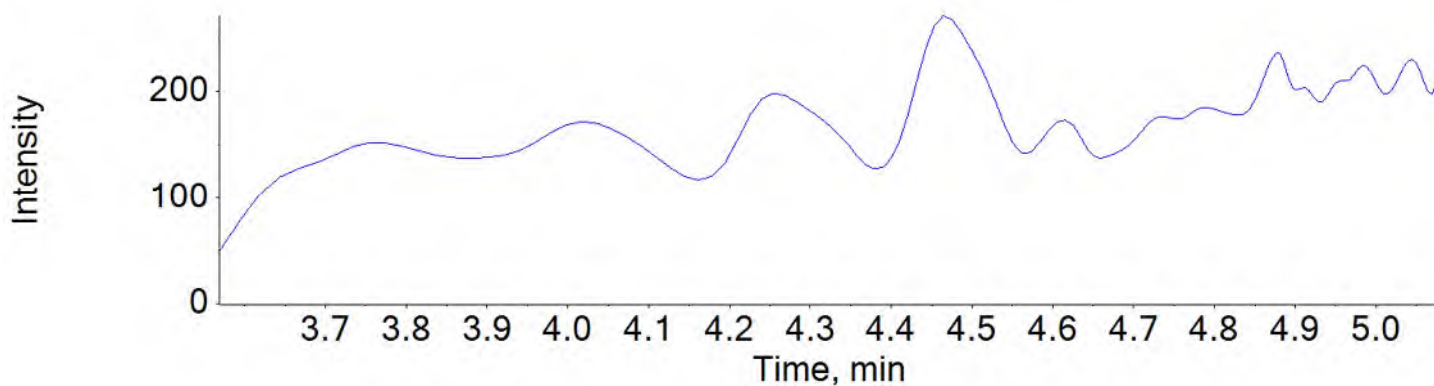
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

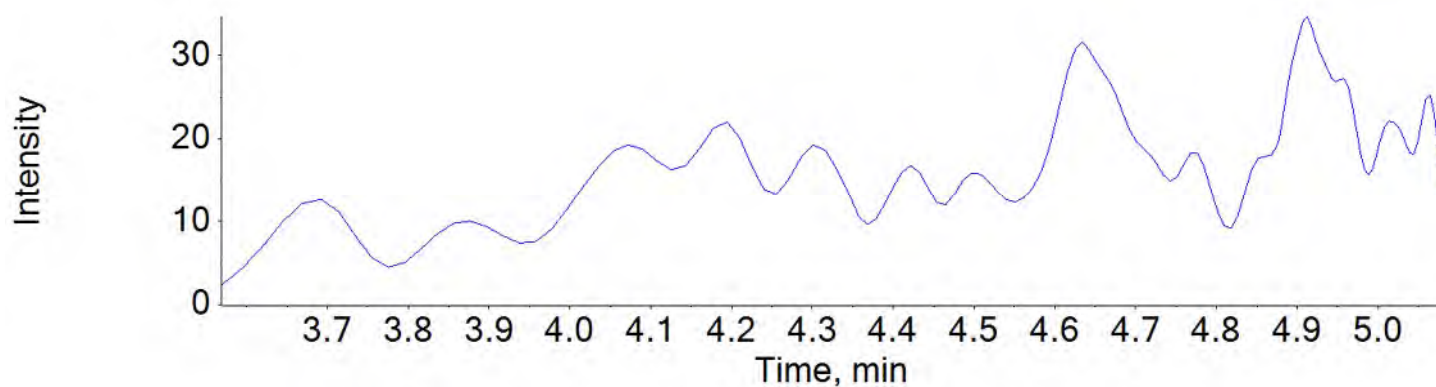


PFTTeDA\_1 713.0 / 669.0

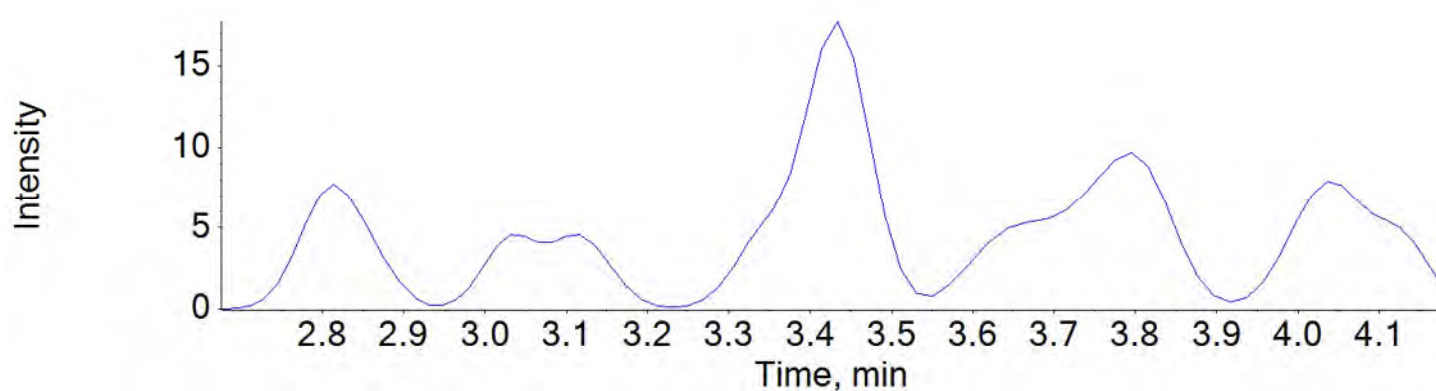




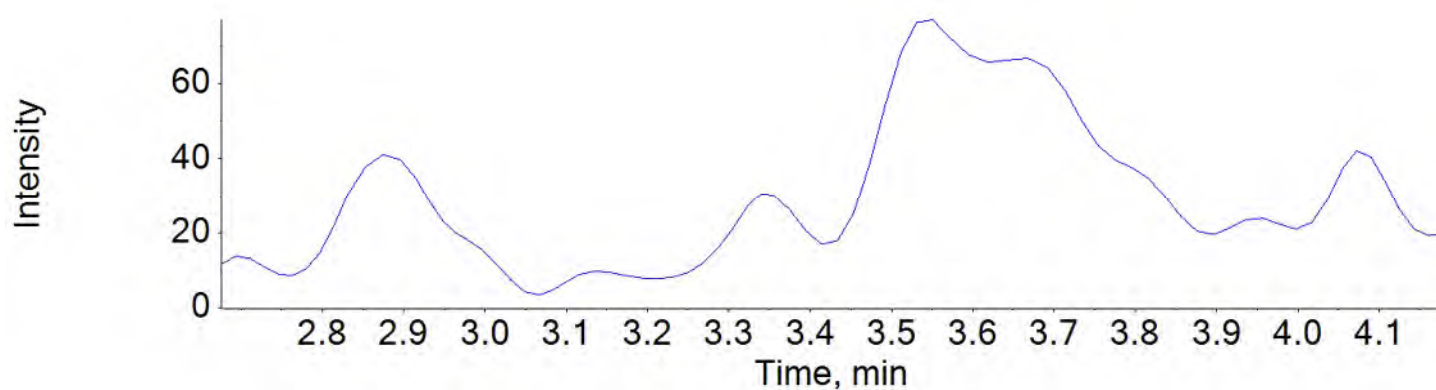
PFTeDA\_2 713.0 / 169.0



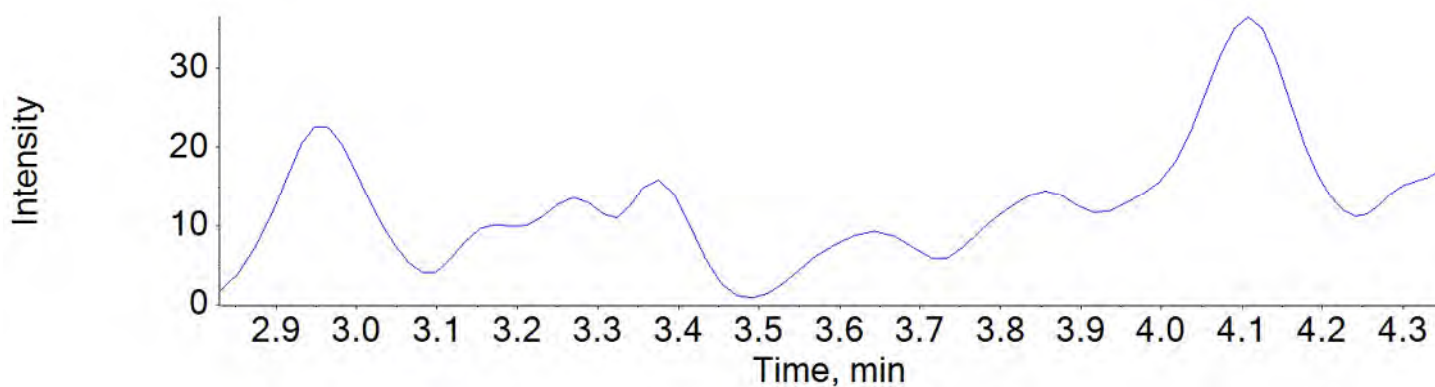
NMeFOSAA\_1 570.0 / 419.0



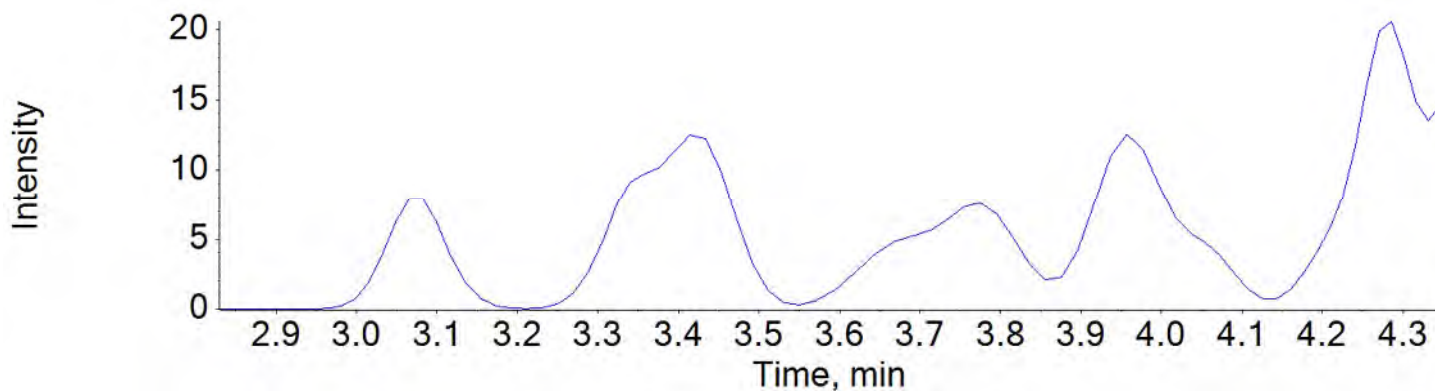
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



NEtFOSAA\_2 584.0 / 483.0

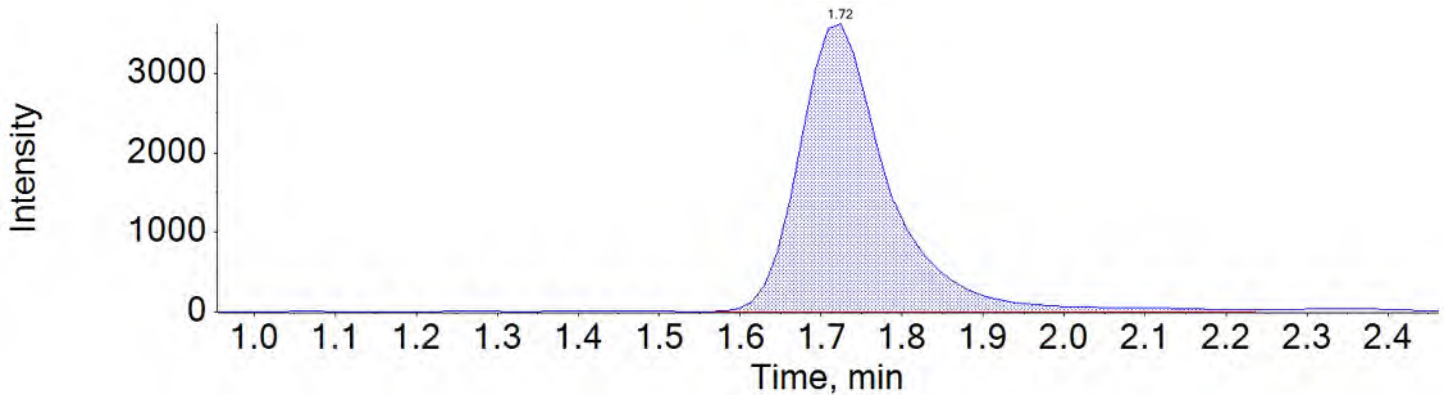




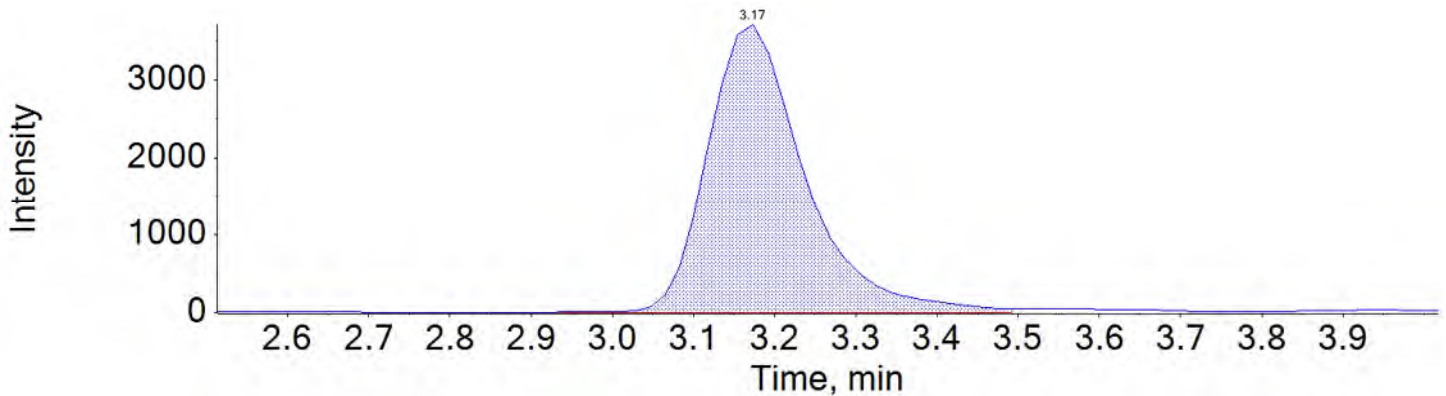
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5975-FS(0)         | Injection Vial   | 19           |
| Sample ID          | NAWC-050118-FRB-304 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:07:47 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms

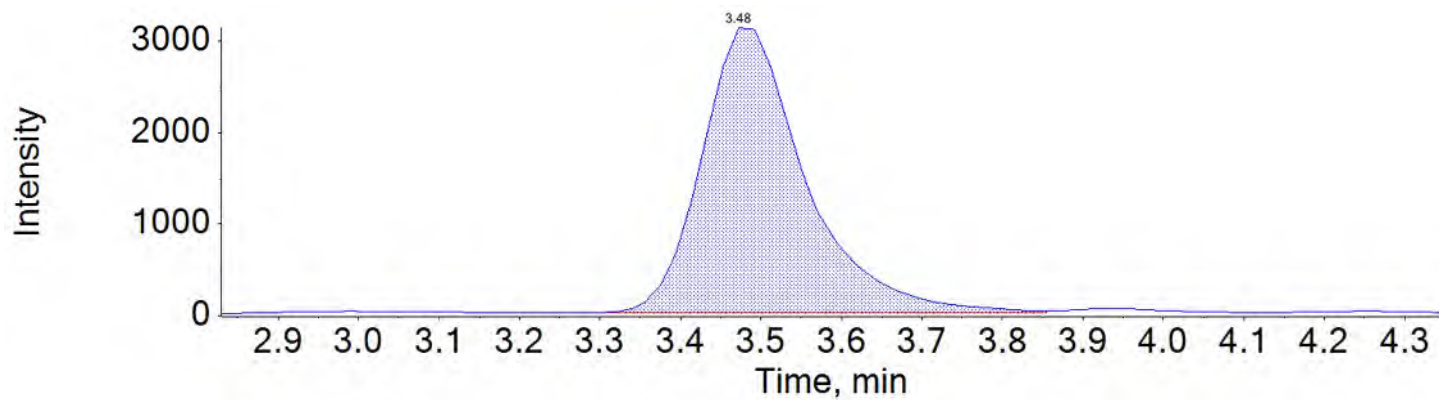
13C2-PFHxA 315.0 / 270.0



13C2-PFDA 515.0 / 470.0



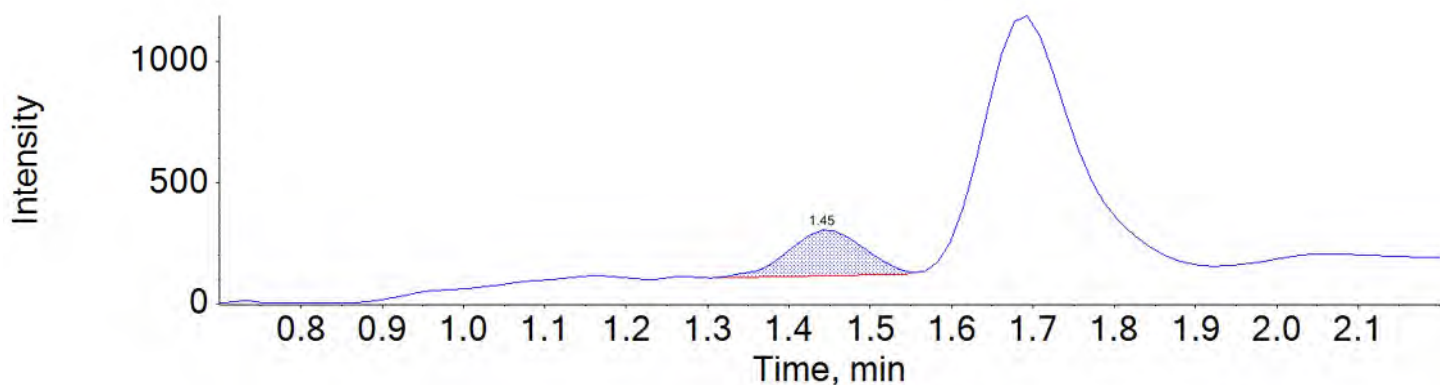
d5-EtFOSAA 589.0 / 419.0



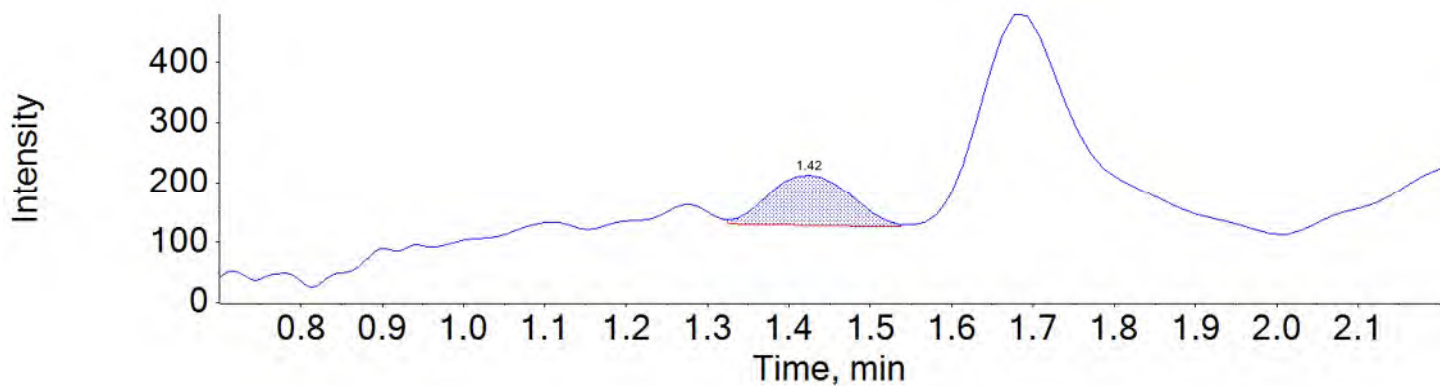
|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5977-FS(0)         | Injection Vial   | 20           |
| Sample ID          | NAWC-050118-FRB-098 | Injection Volume | 10.00        |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:16:43 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Chromatograms

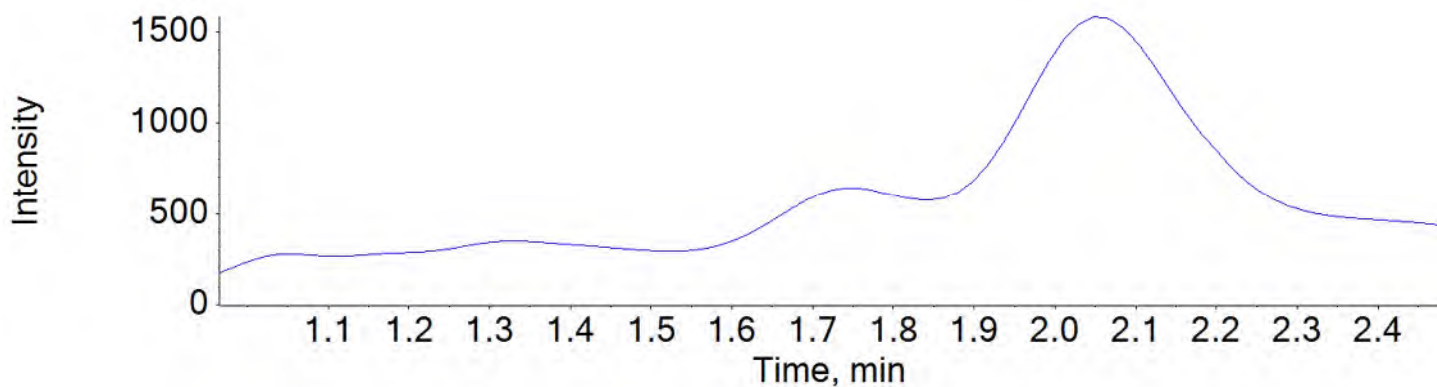
PFBS\_1 298.9 / 80.0



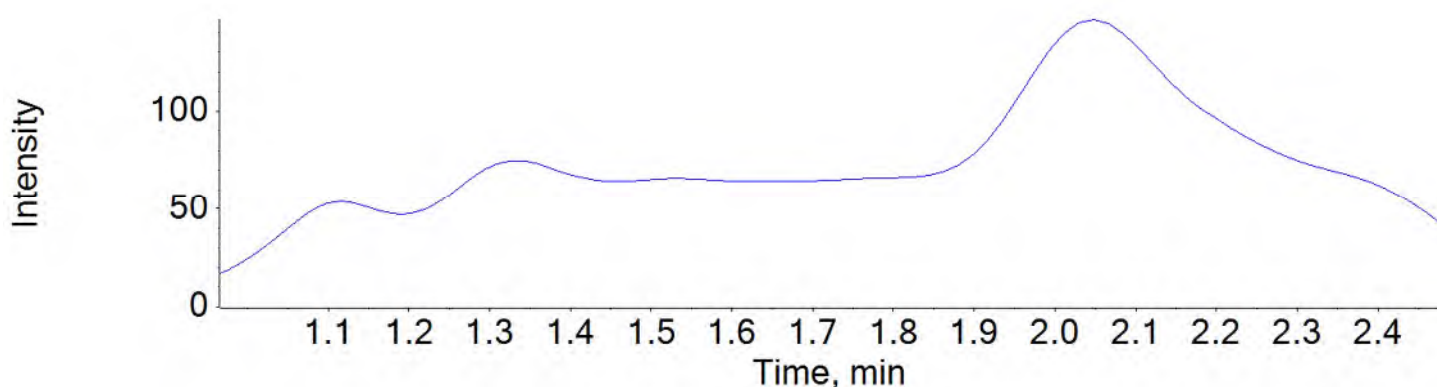
PFBS\_2 298.9 / 99.0



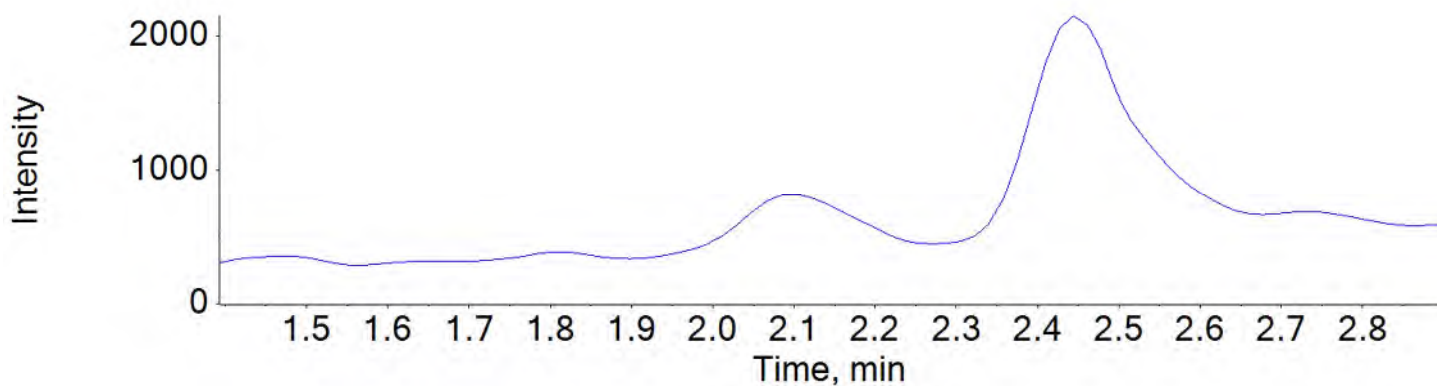
PFHxA\_1 313.0 / 269.0



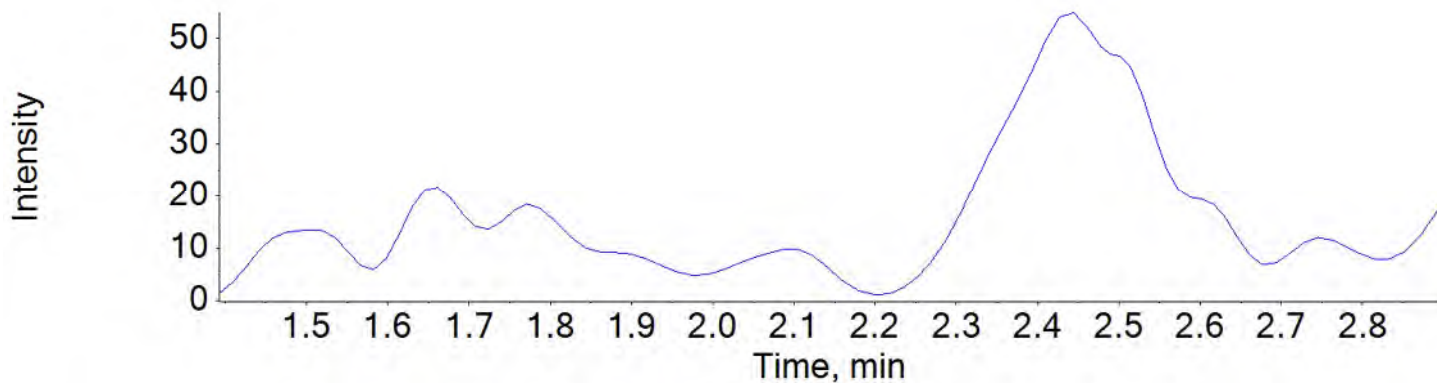
PFHxA\_2 313.0 / 119.0



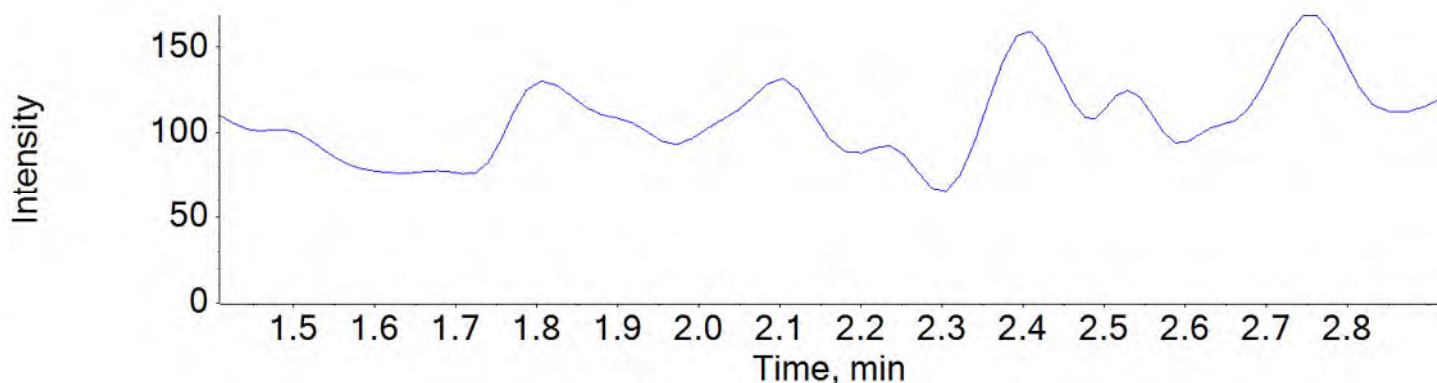
PFHpA\_1 363.0 / 319.0



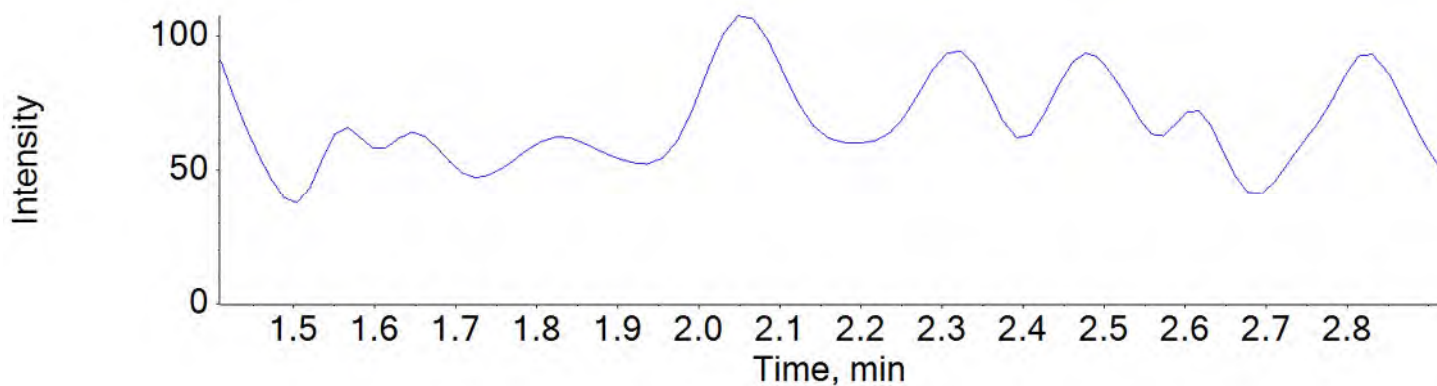
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

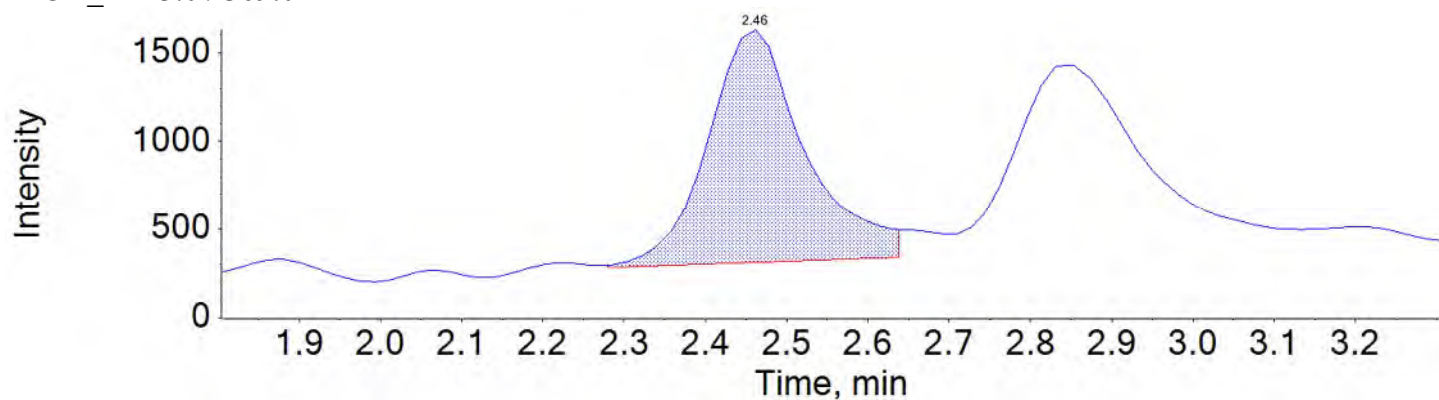


PFHxS\_2 399.0 / 99.0

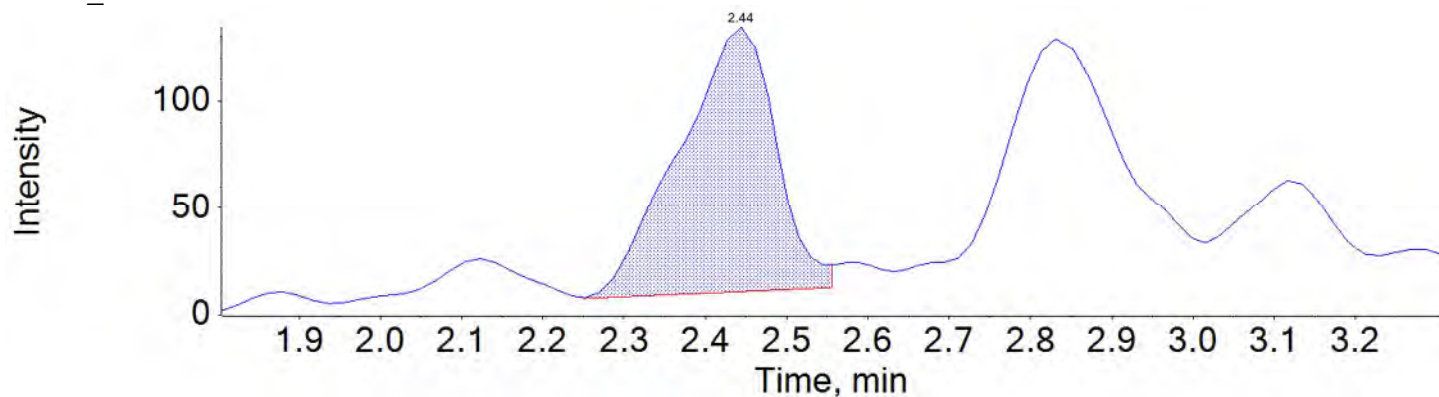




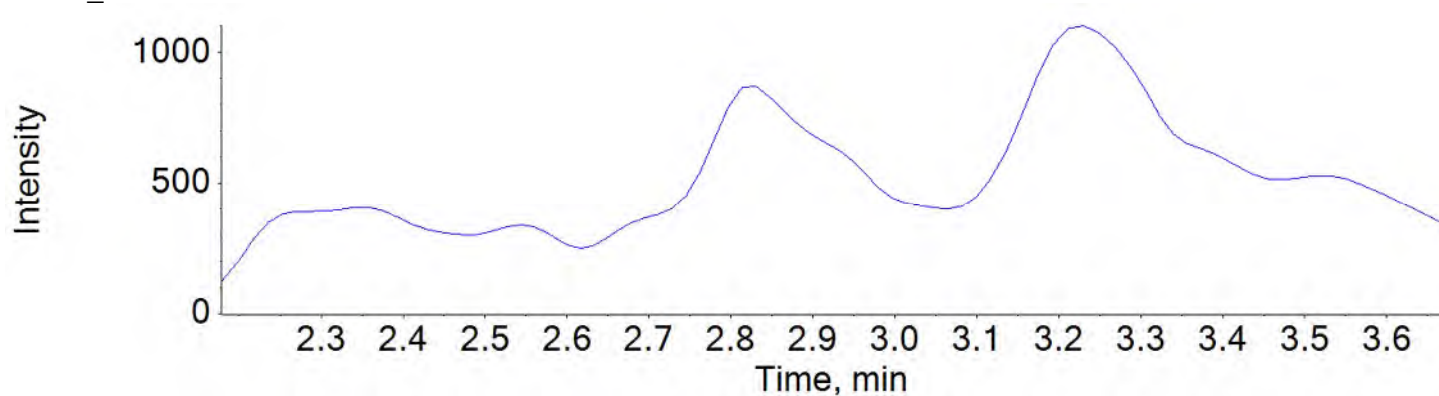
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

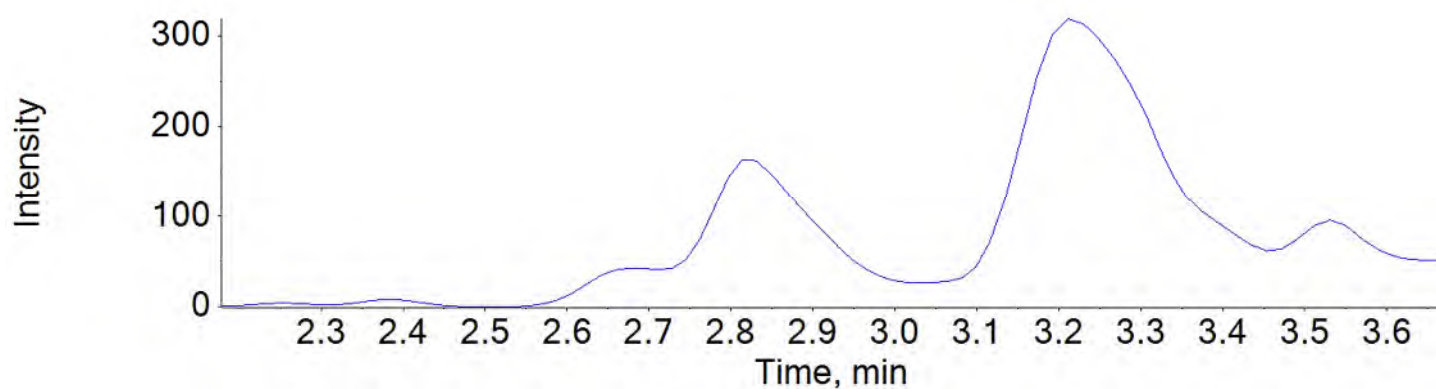


PFNA\_1 463.0 / 419.0

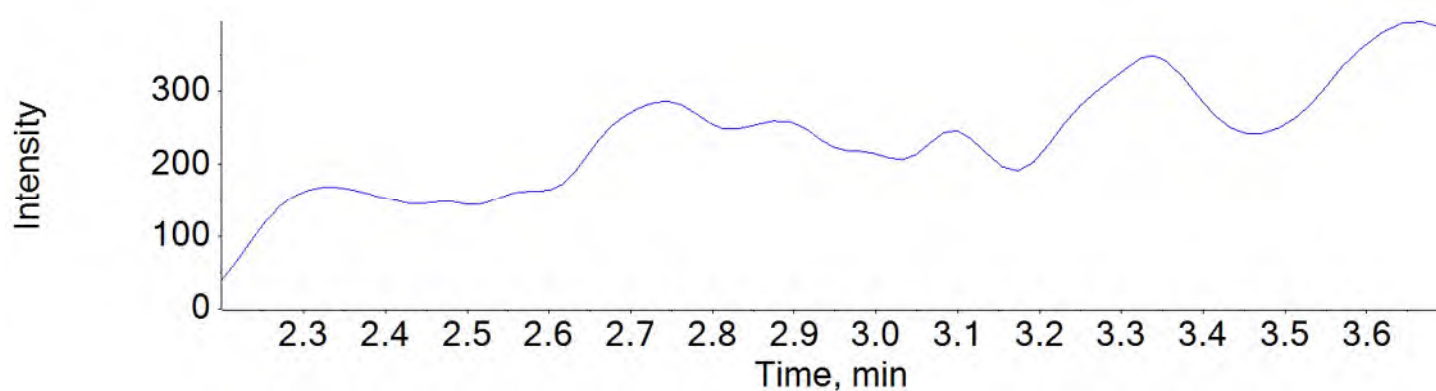




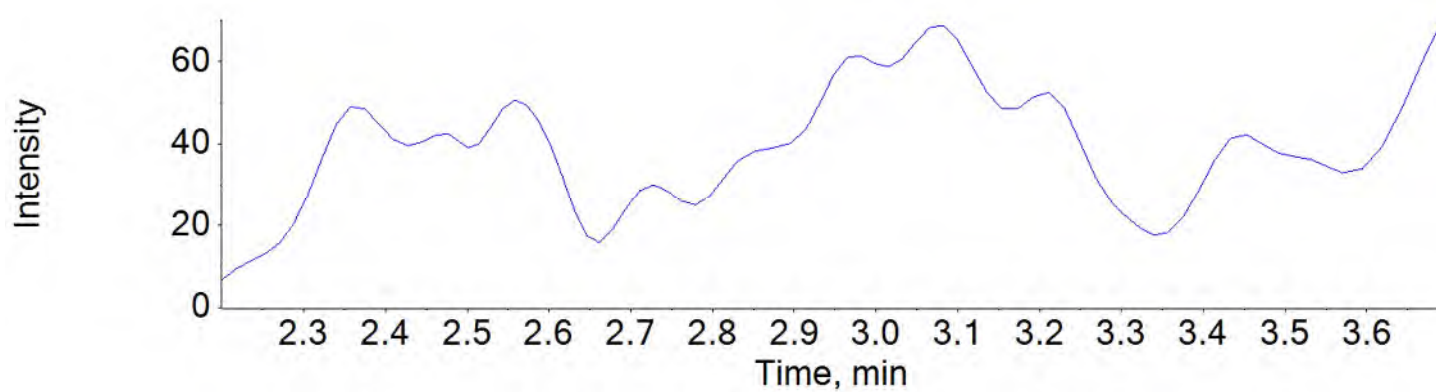
PFNA\_2 463.0 / 219.0



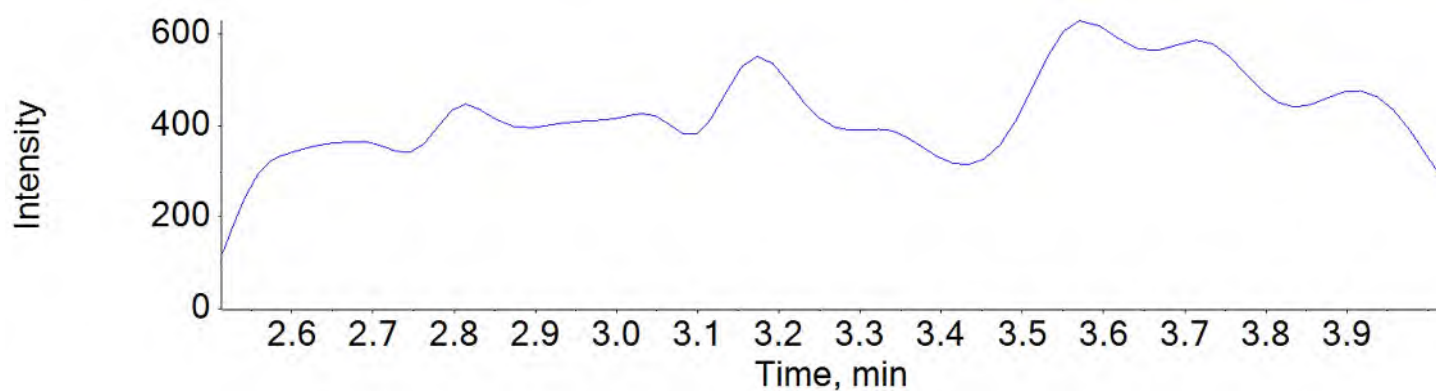
PFOS\_1 499.0 / 80.0



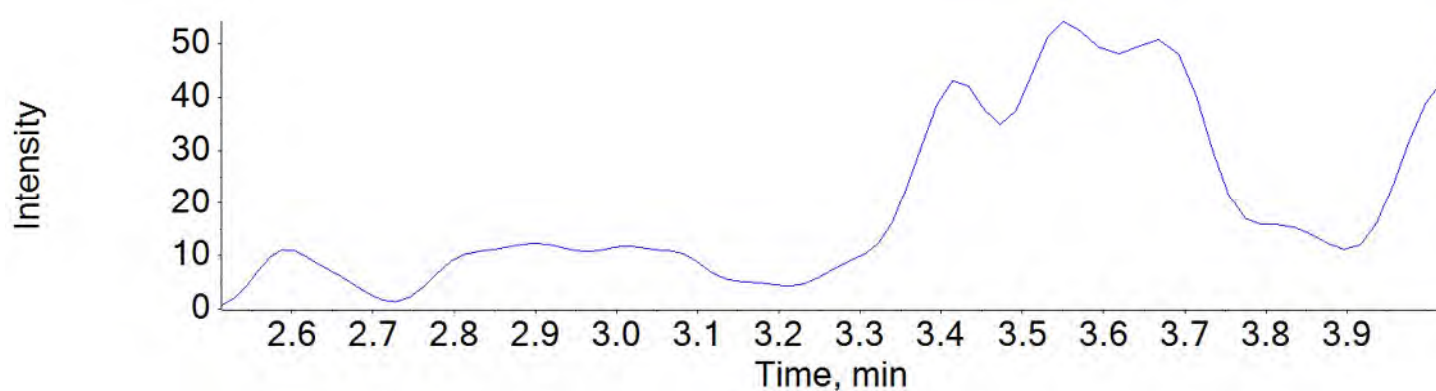
PFOS\_2 499.0 / 99.0



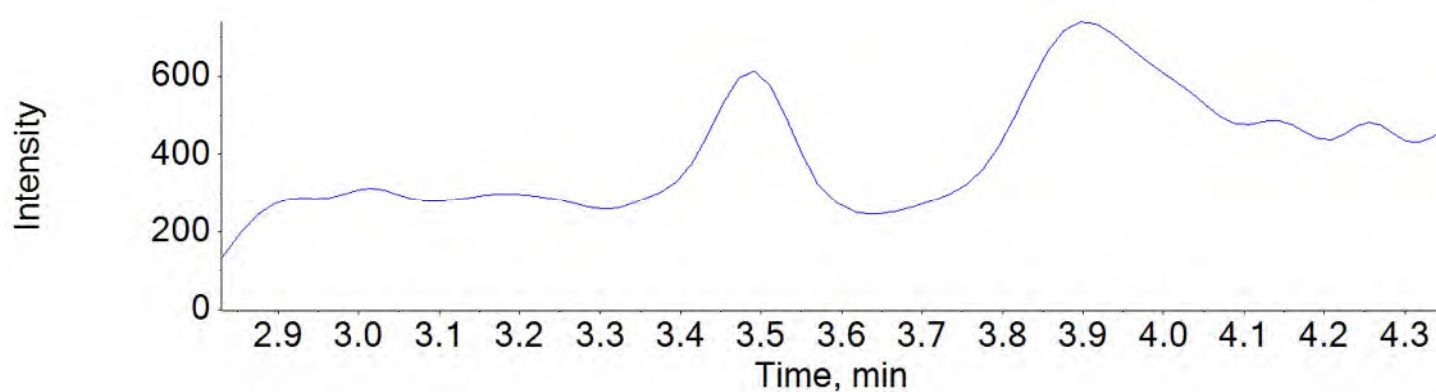
PFDA\_1 513.0 / 469.0



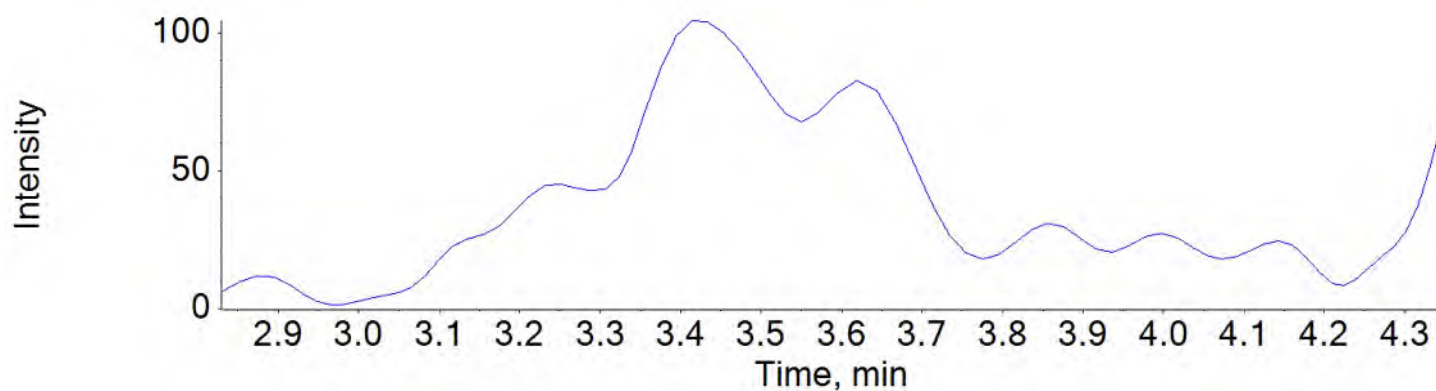
PFDA\_2 513.0 / 219.0



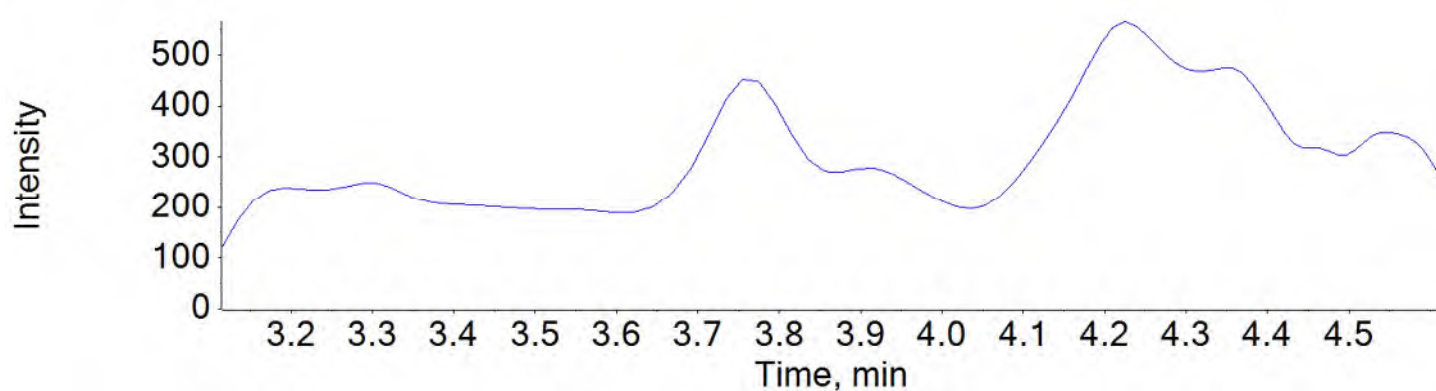
PFUnA\_1 563.0 / 519.0



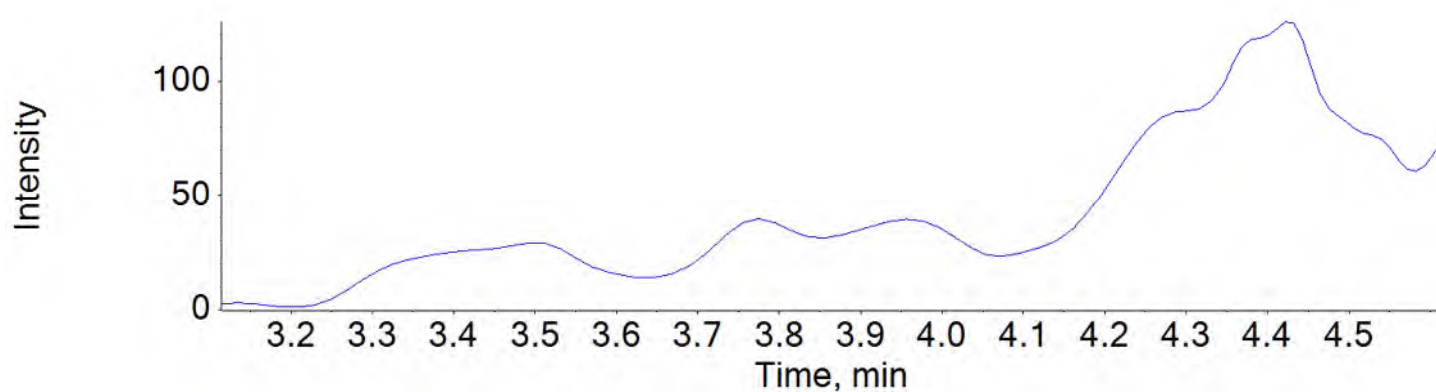
PFUnA\_2 563.0 / 269.0



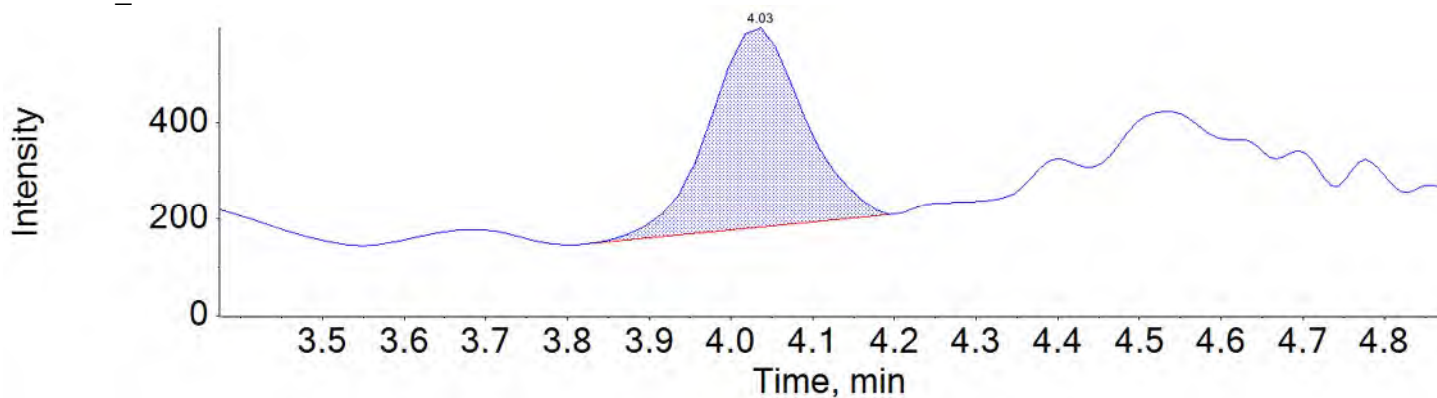
PFDaA\_1 613.0 / 569.0



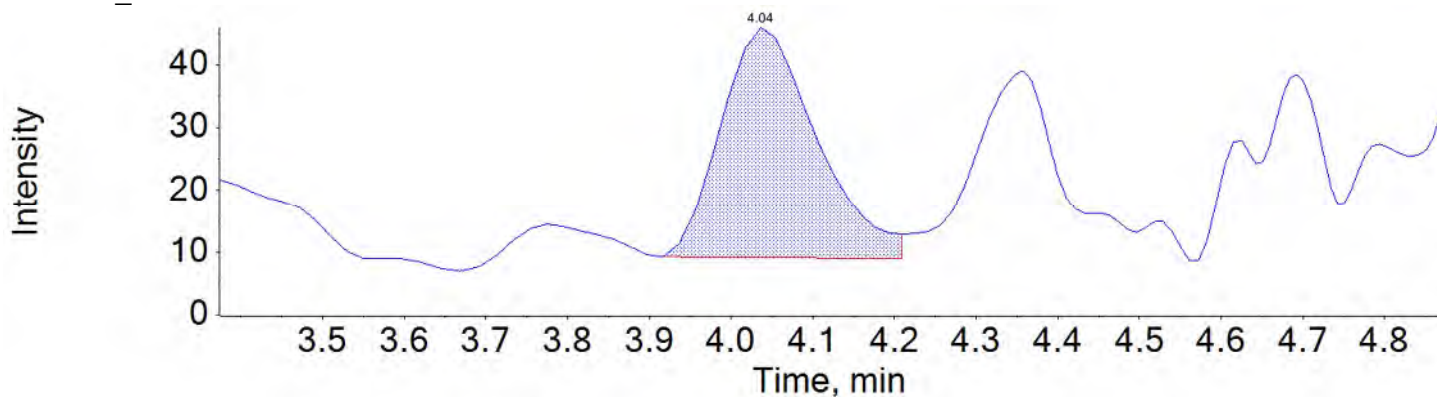
PFDaA\_2 613.0 / 319.0



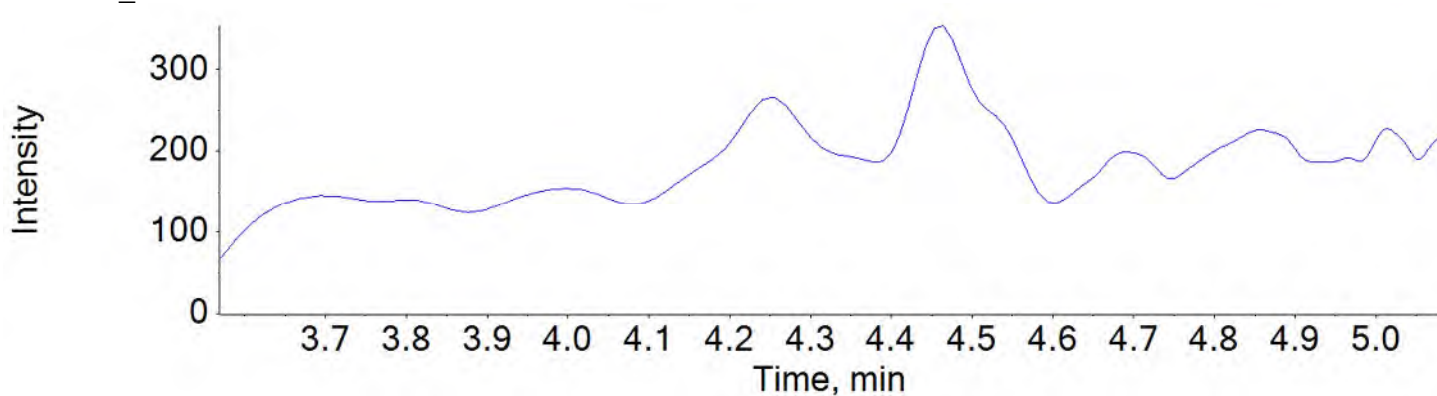
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

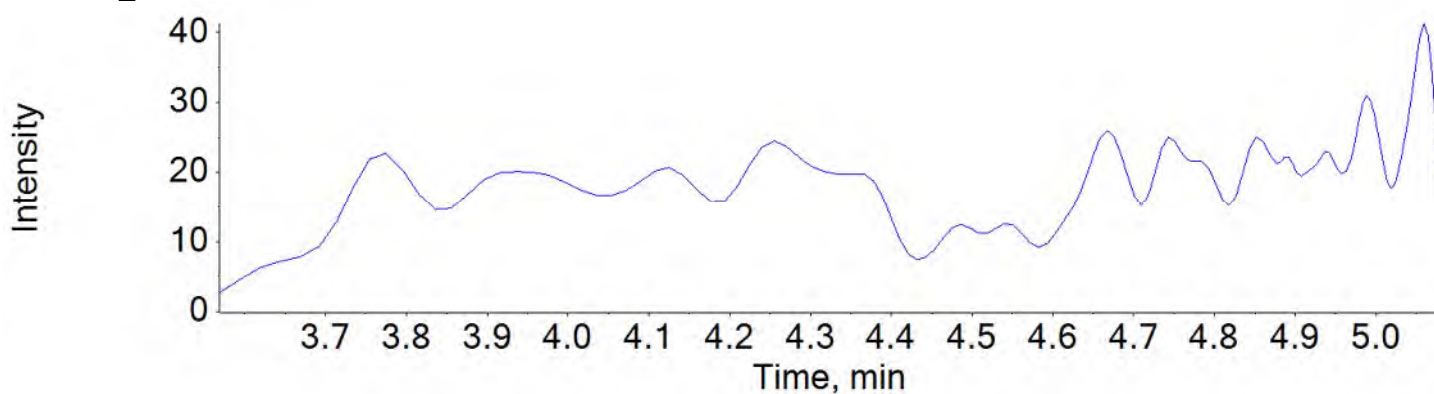


PFTTeDA\_1 713.0 / 669.0

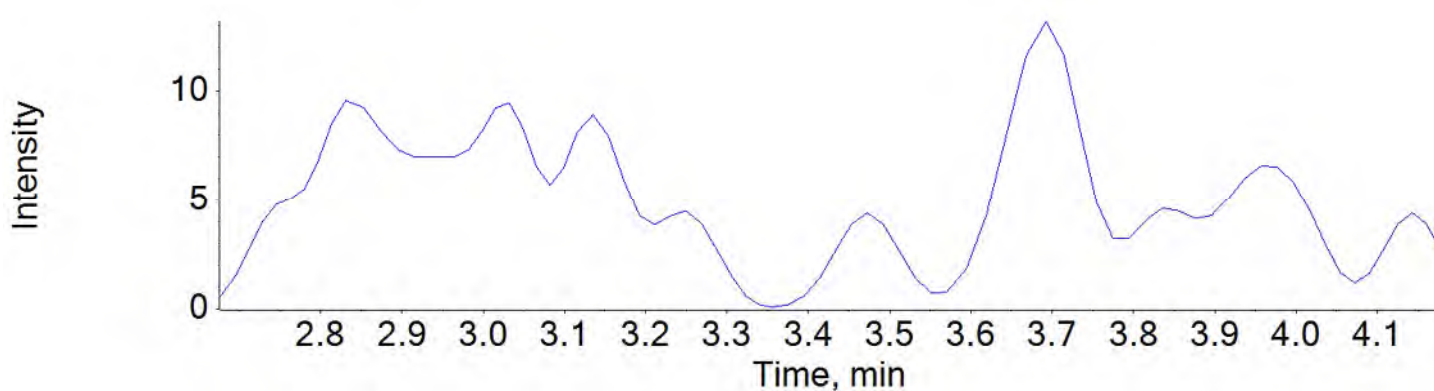




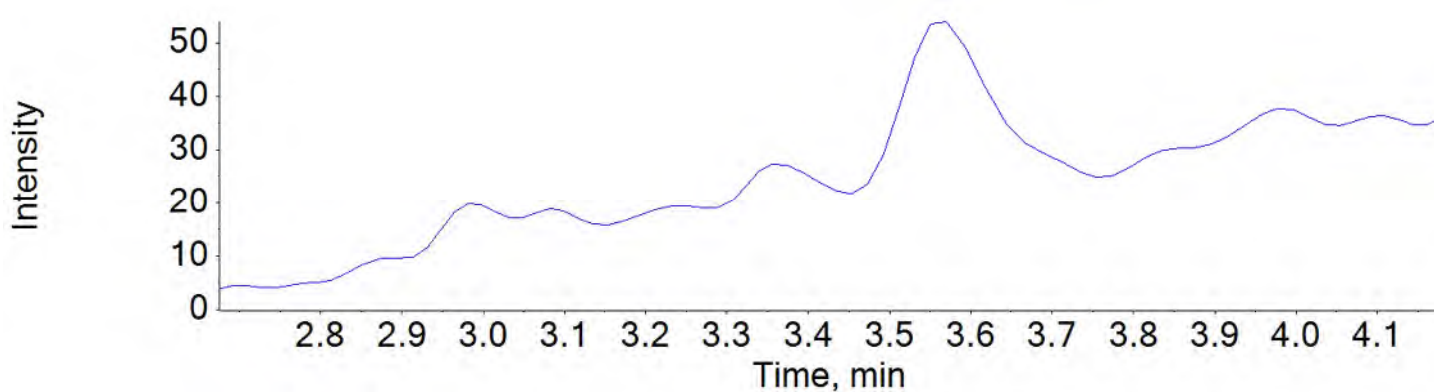
PFTeDA\_2 713.0 / 169.0



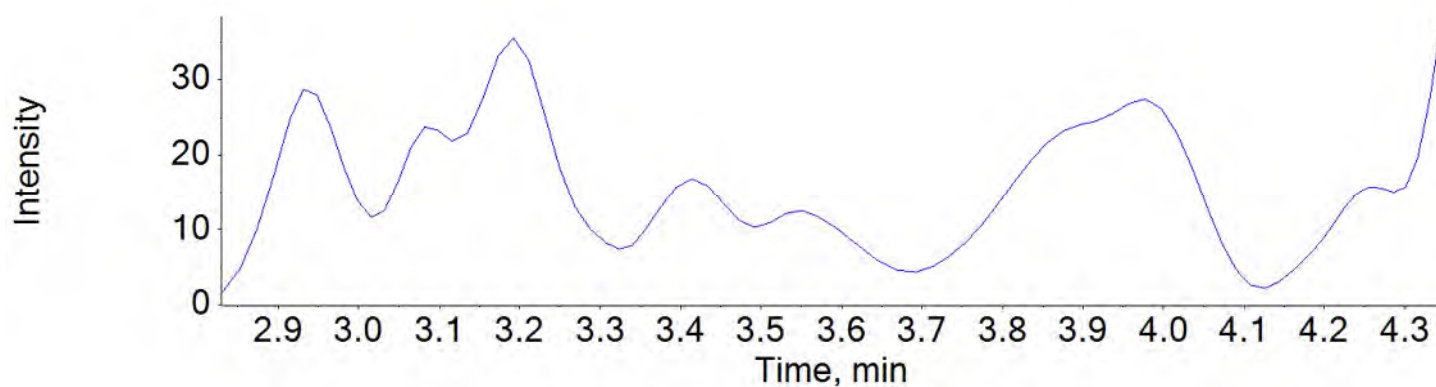
NMeFOSAA\_1 570.0 / 419.0



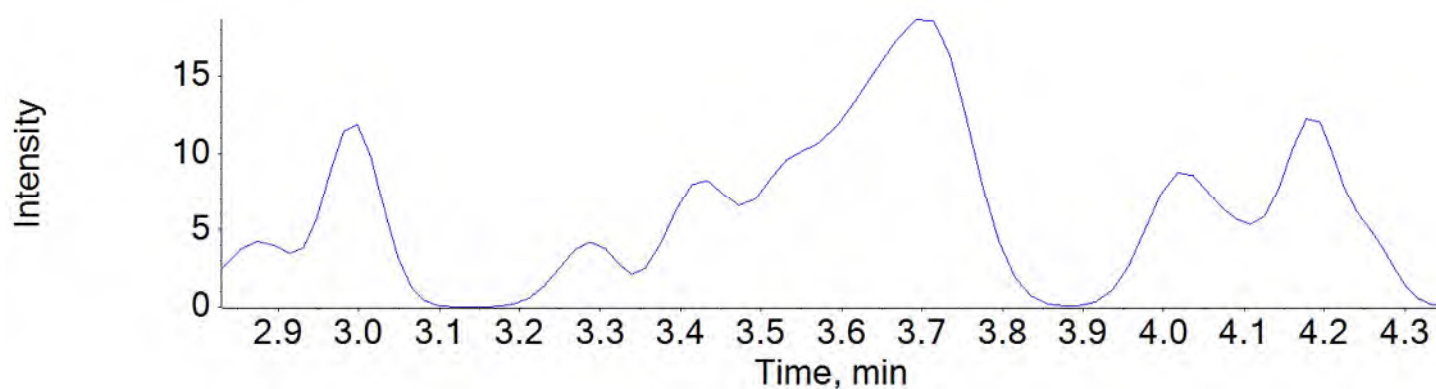
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



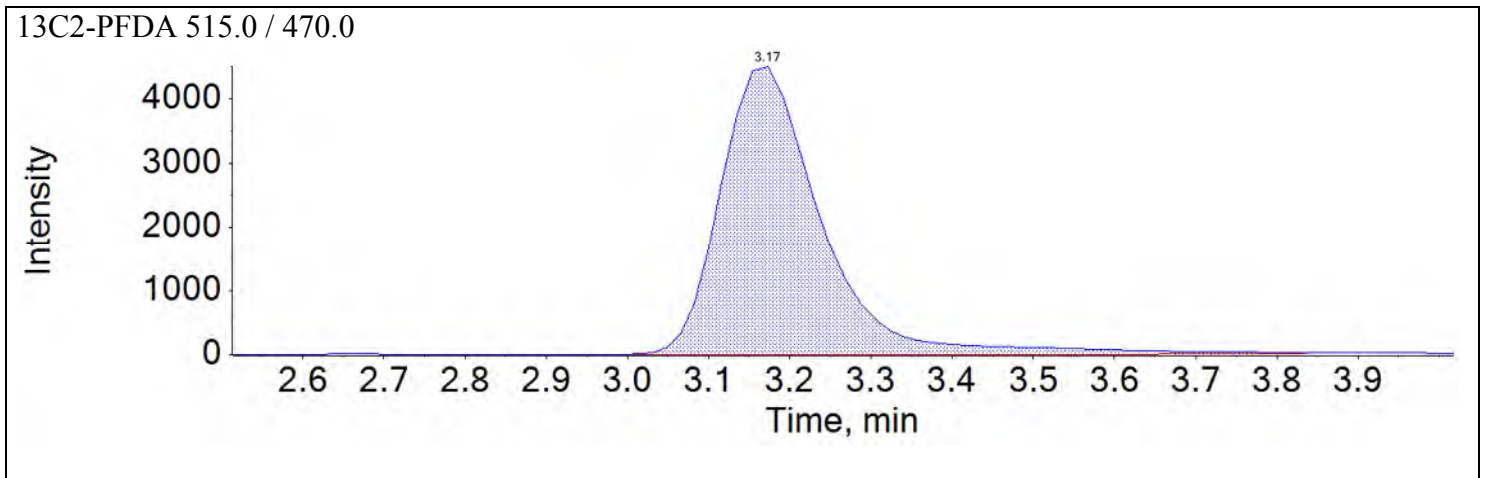
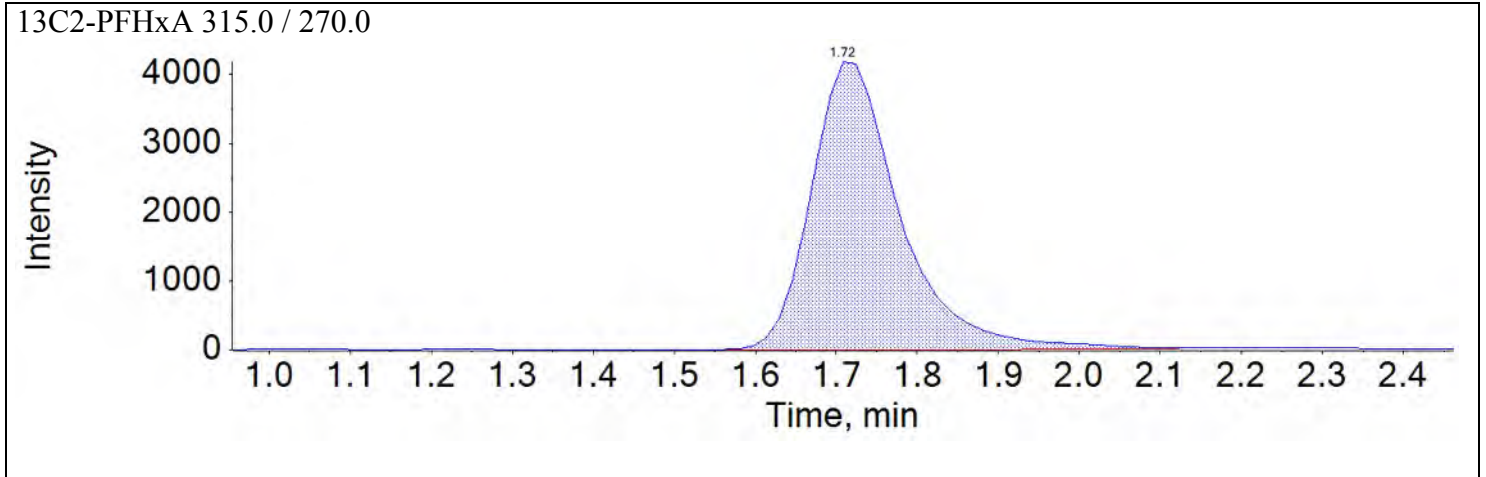
NEtFOSAA\_2 584.0 / 483.0



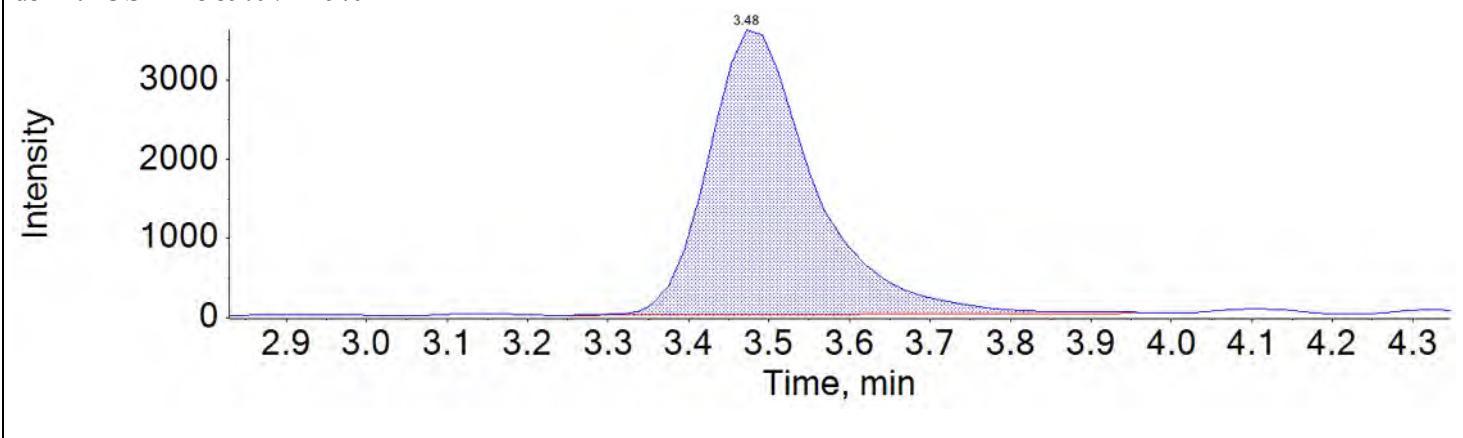


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | J5977-FS(0)         | Injection Vial   | 20           |
| Sample ID          |                     | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:16:43 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

### Chromatograms

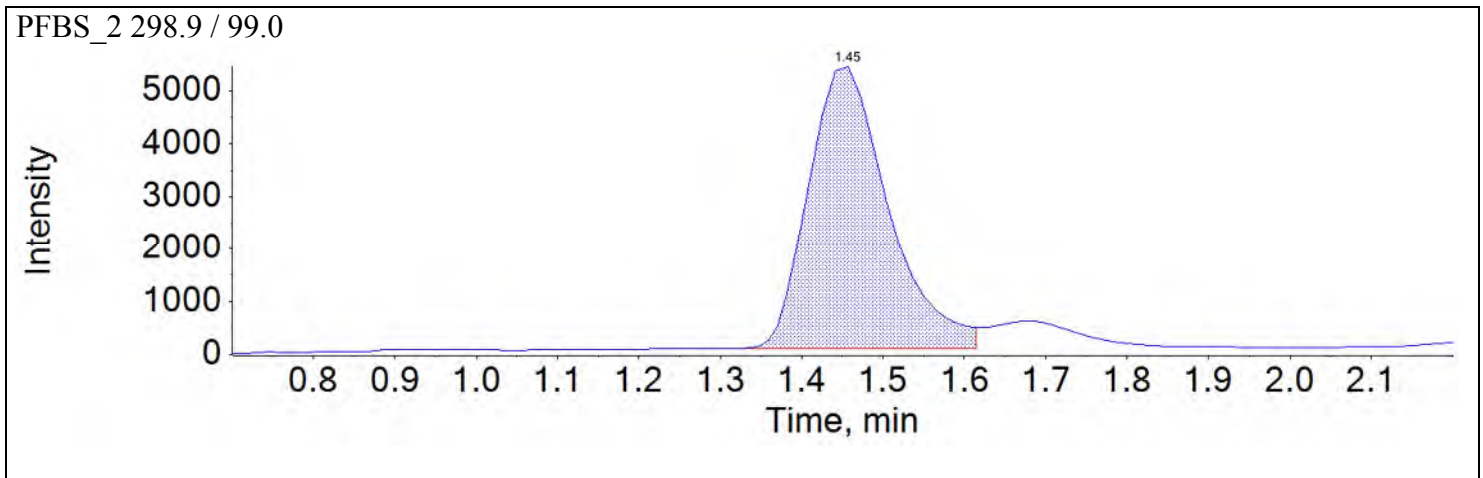
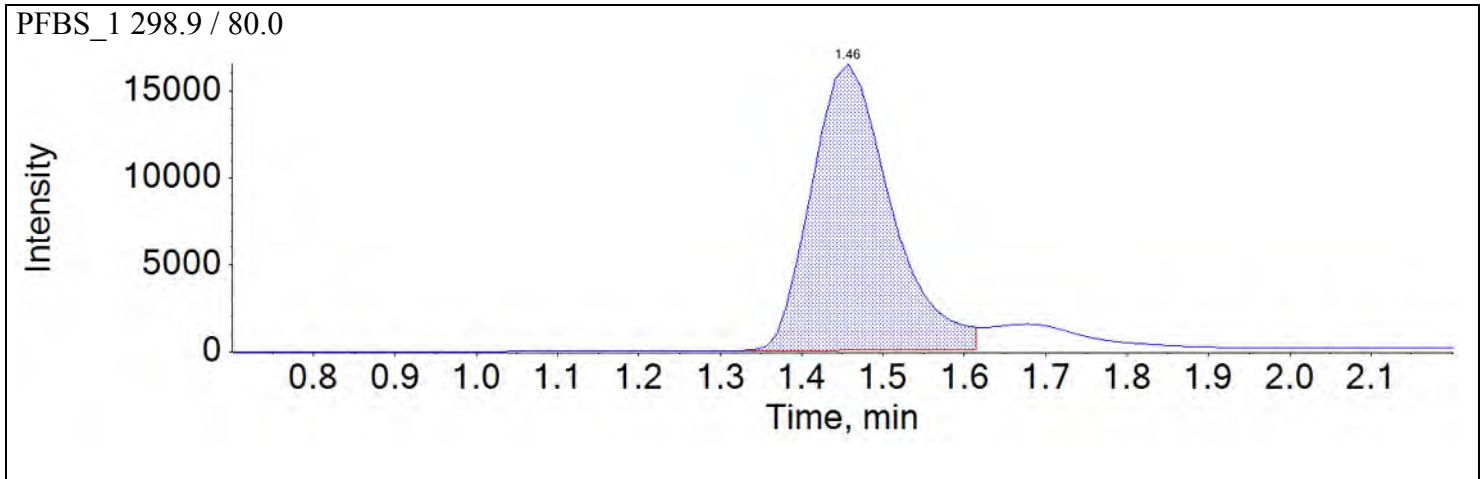


d5-EtFOSAA 589.0 / 419.0

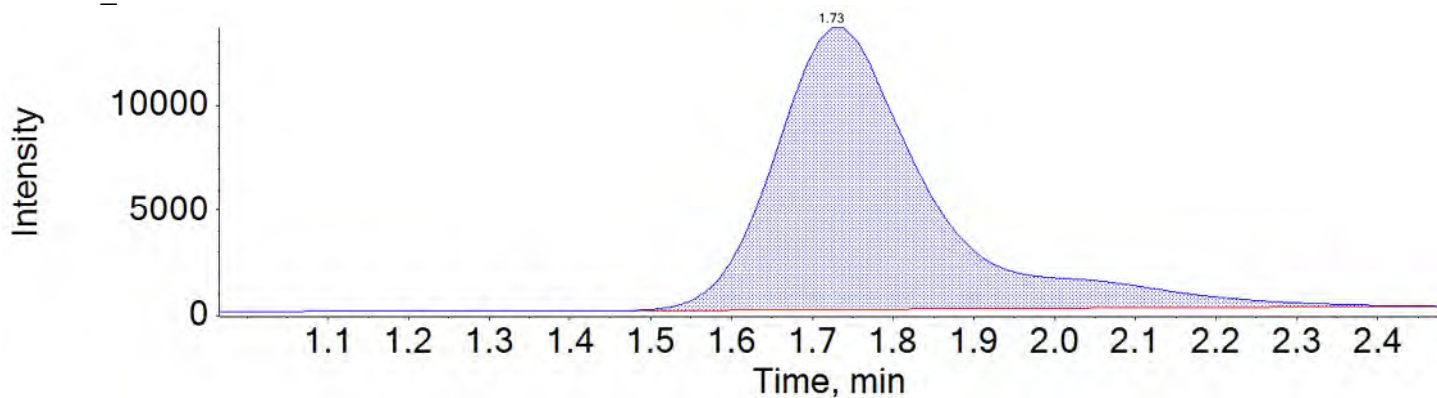


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

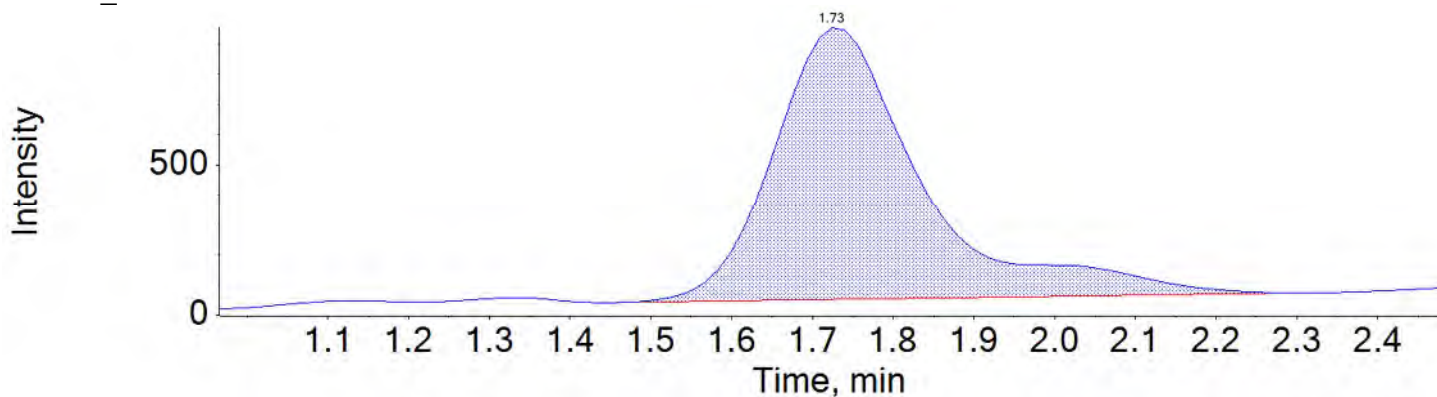
## Chromatograms



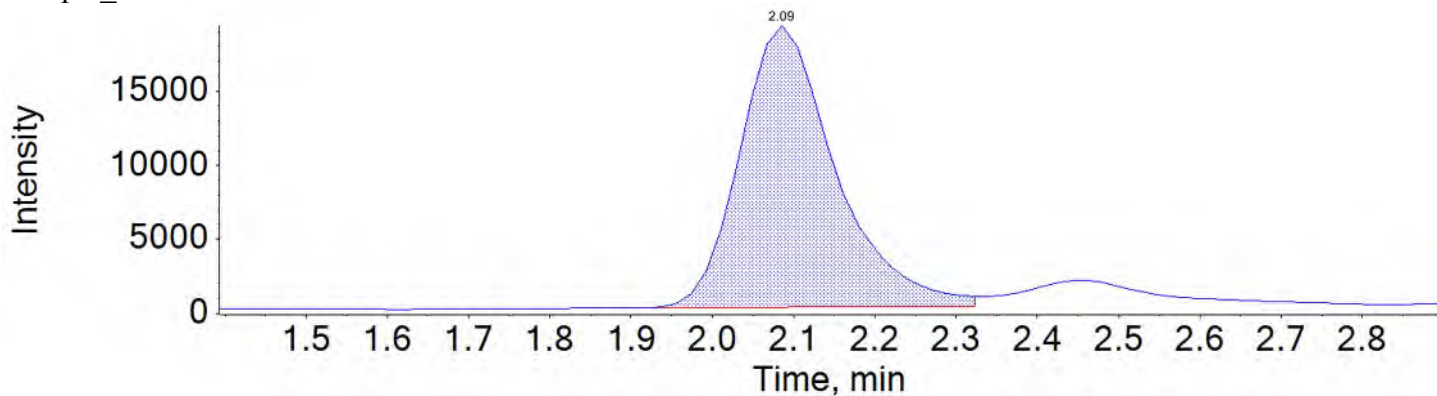
PFHxA\_1 313.0 / 269.0



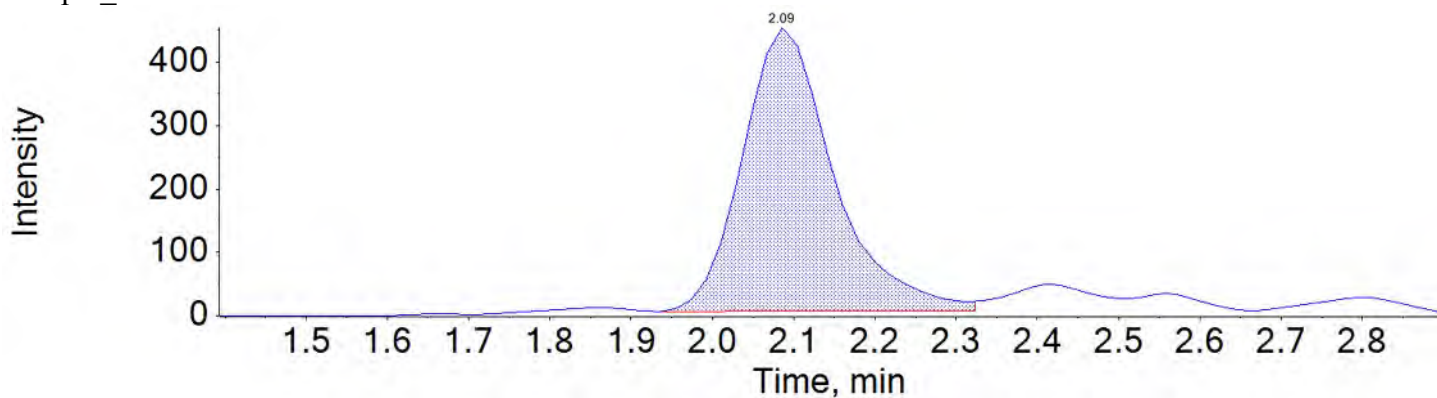
PFHxA\_2 313.0 / 119.0



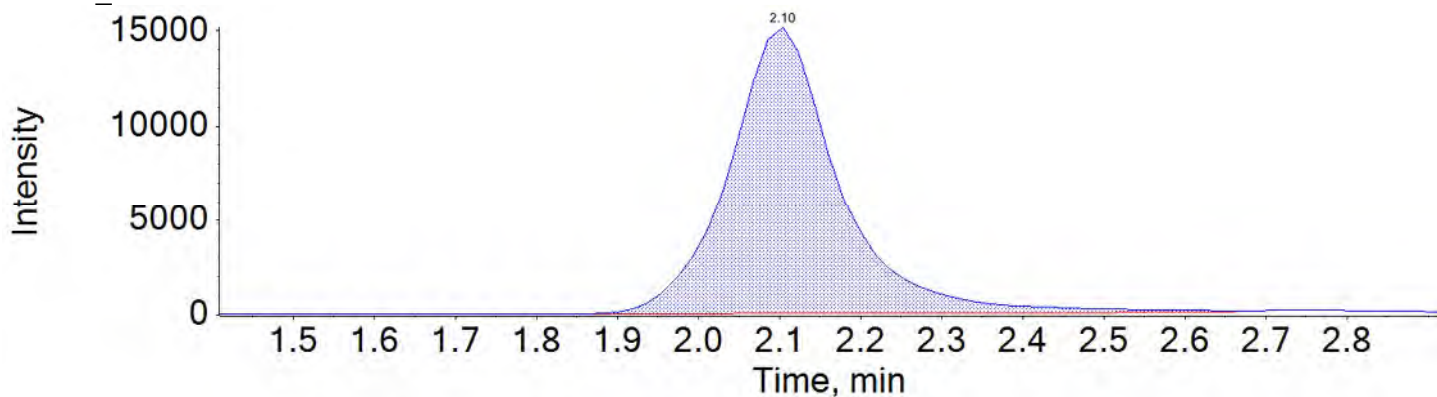
PFHpA\_1 363.0 / 319.0



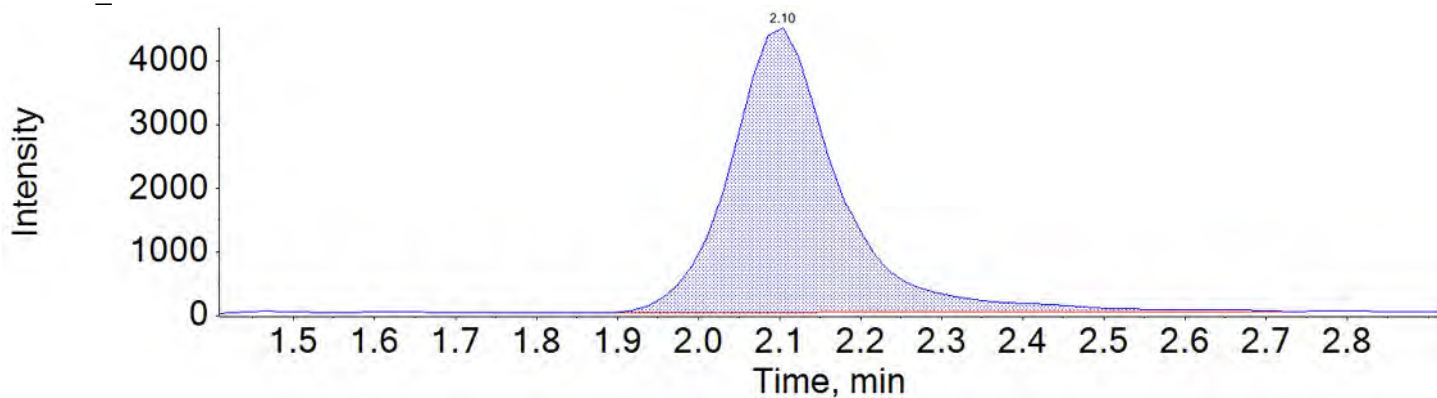
PFHpA\_2 363.0 / 169.0



PFHxS\_1 399.0 / 80.0

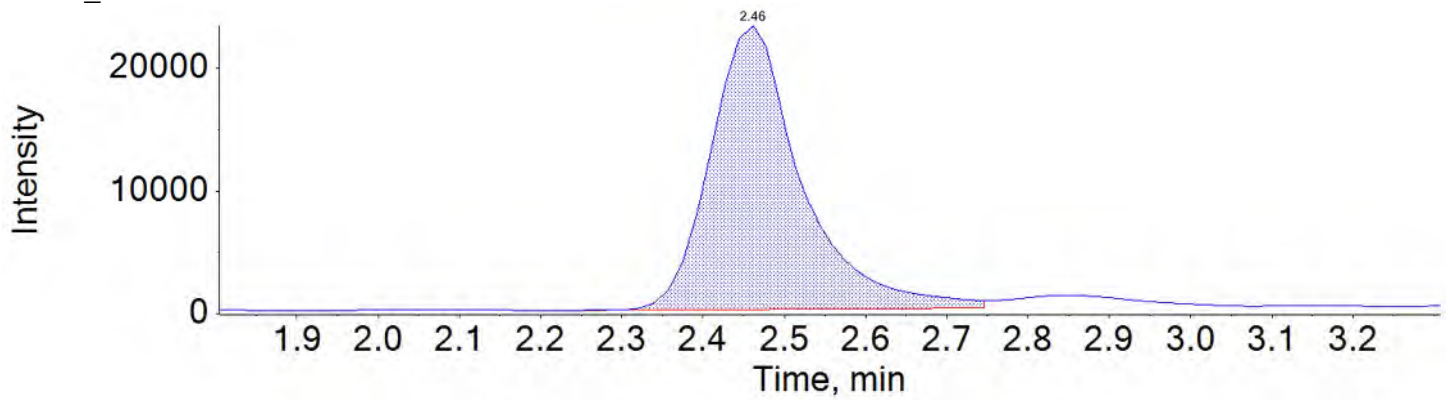


PFHxS\_2 399.0 / 99.0

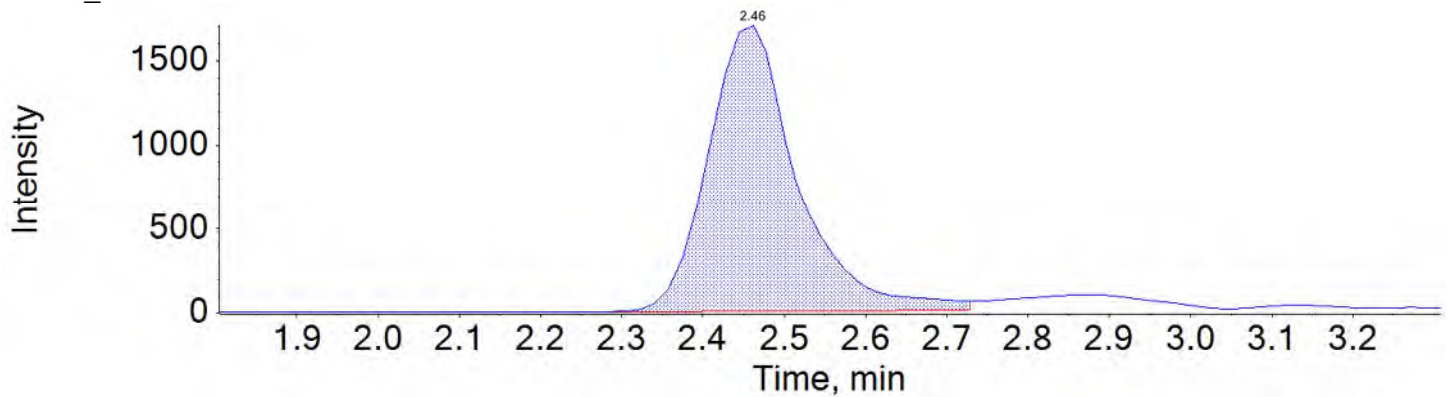




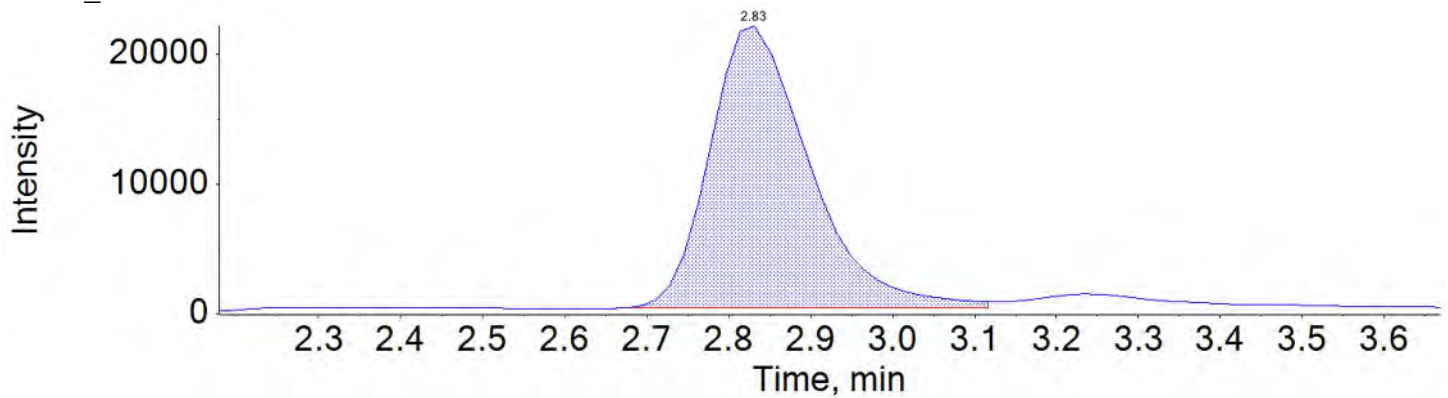
PFOA\_1 413.0 / 369.0



PFOA\_2 413.0 / 169.0

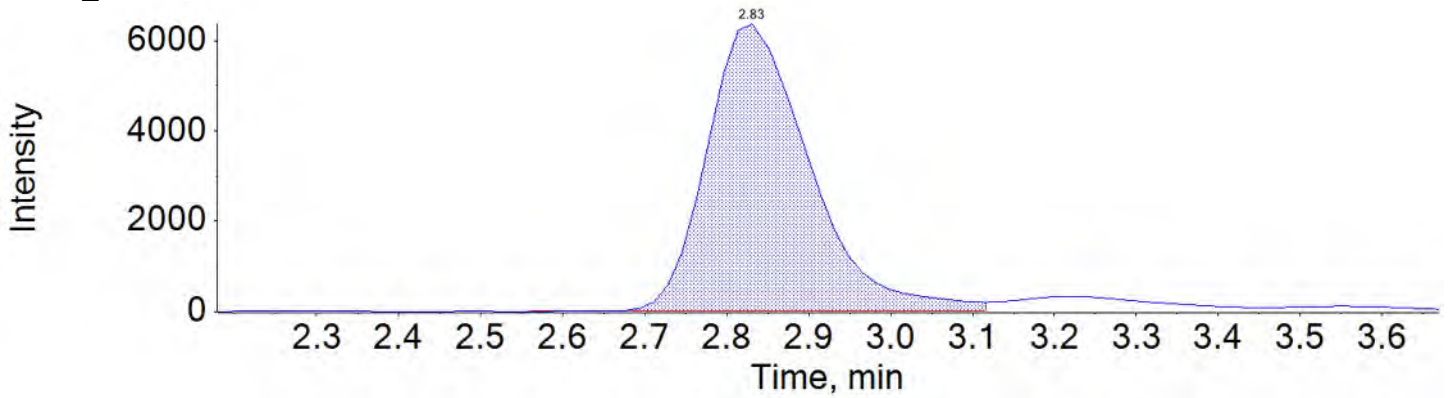


PFNA\_1 463.0 / 419.0

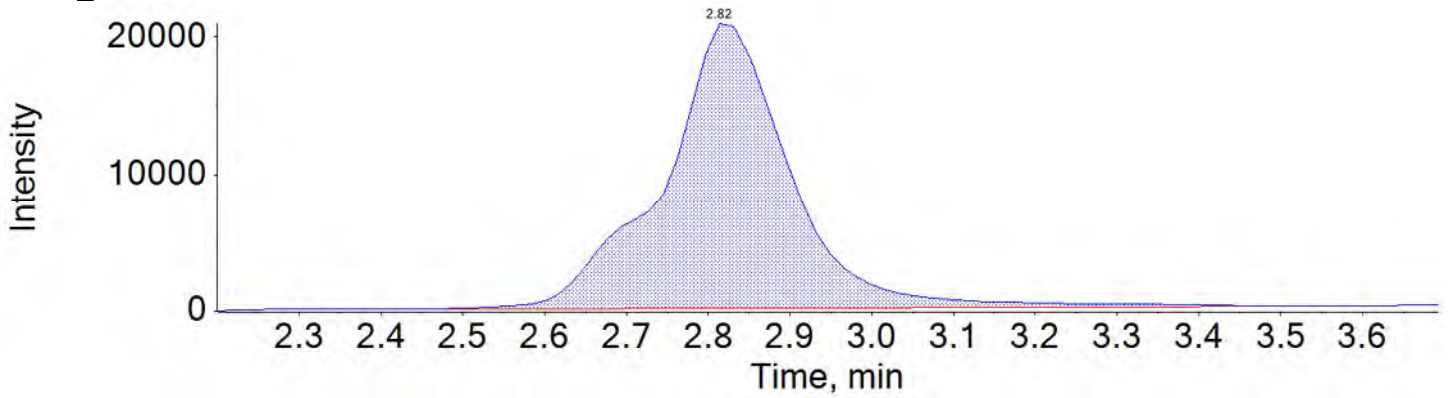




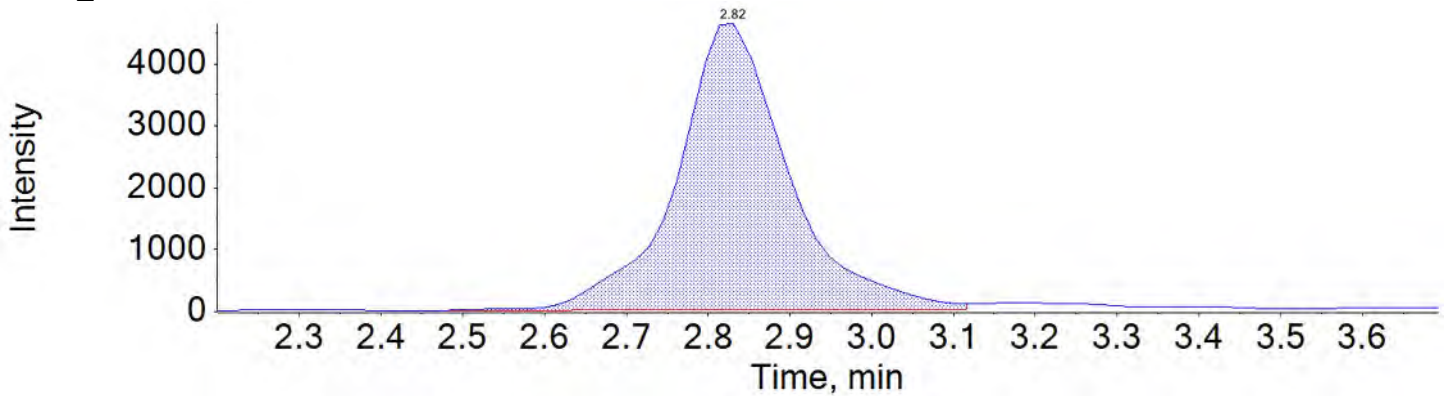
PFNA\_2 463.0 / 219.0



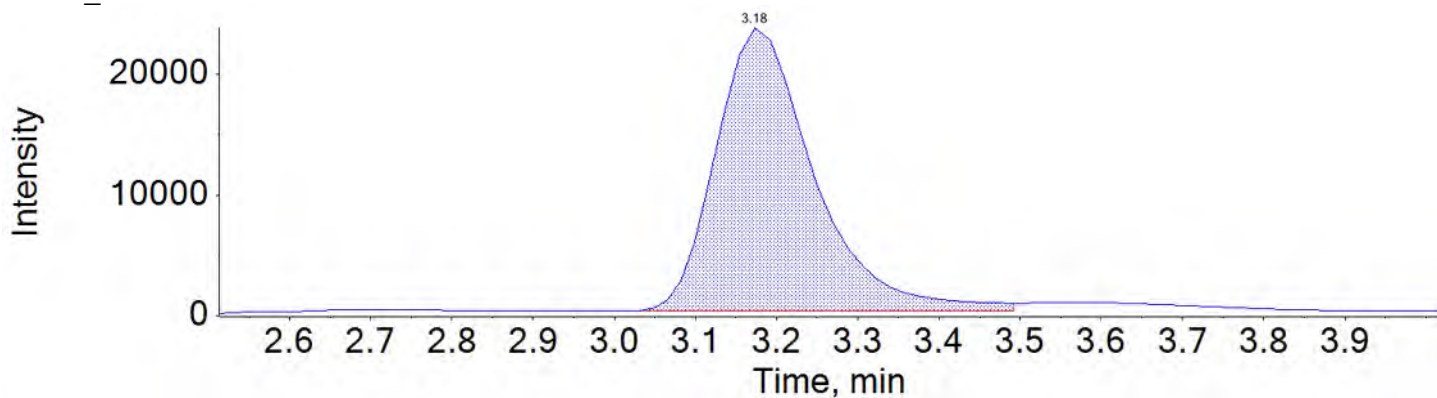
PFOS\_1 499.0 / 80.0



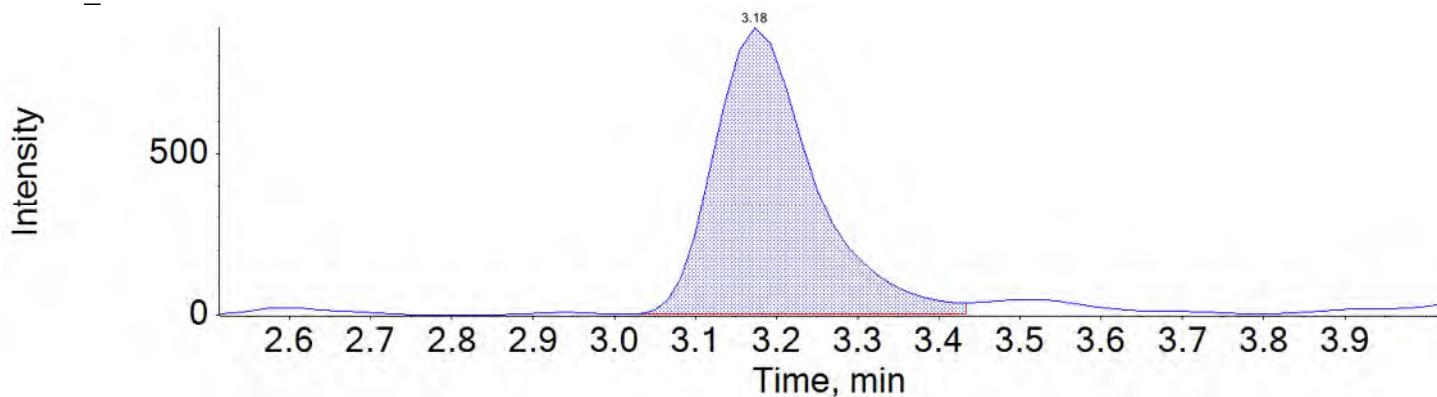
PFOS\_2 499.0 / 99.0



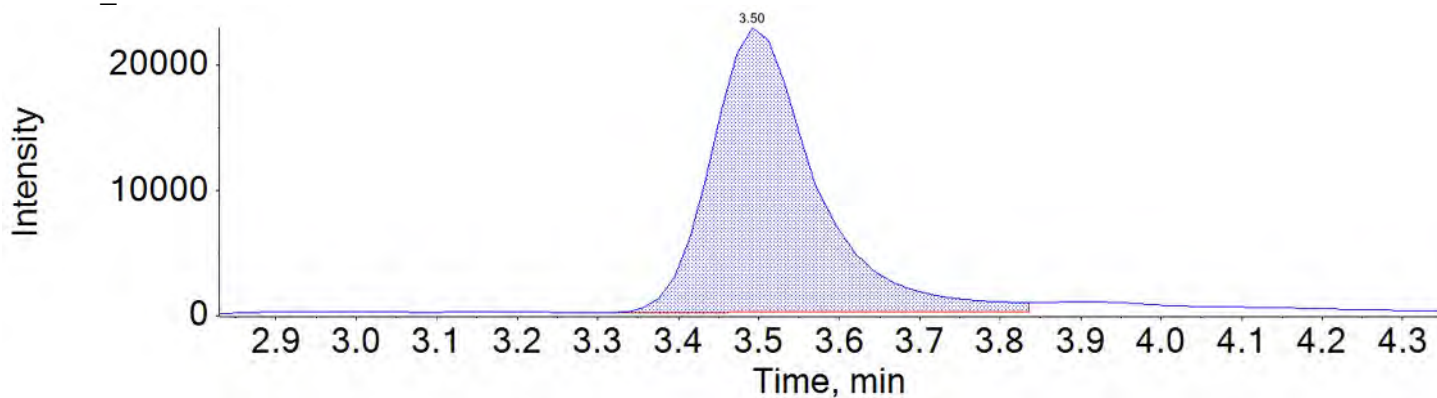
PFDA\_1 513.0 / 469.0



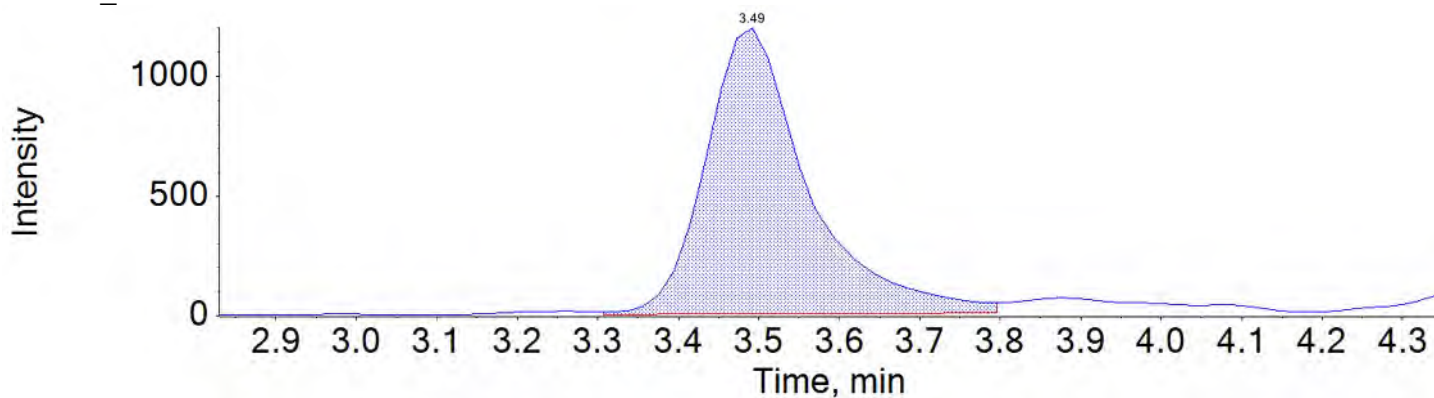
PFDA\_2 513.0 / 219.0



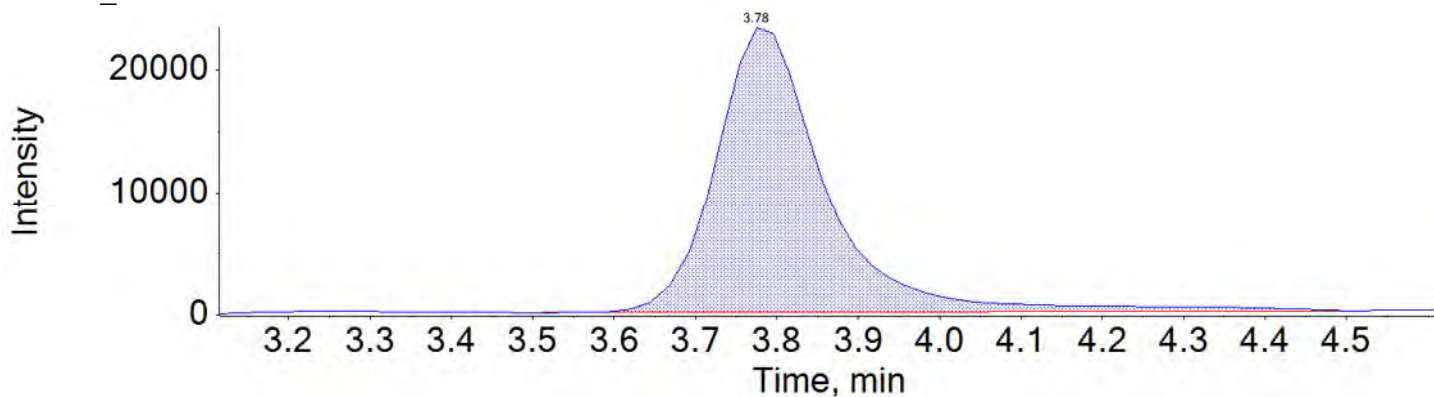
PFUnA\_1 563.0 / 519.0



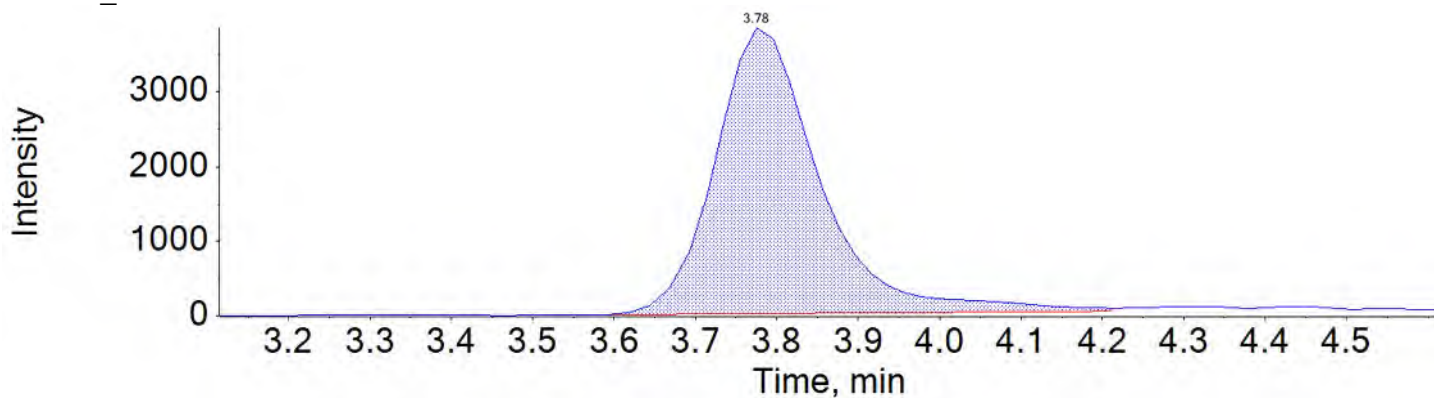
PfUnA\_2 563.0 / 269.0



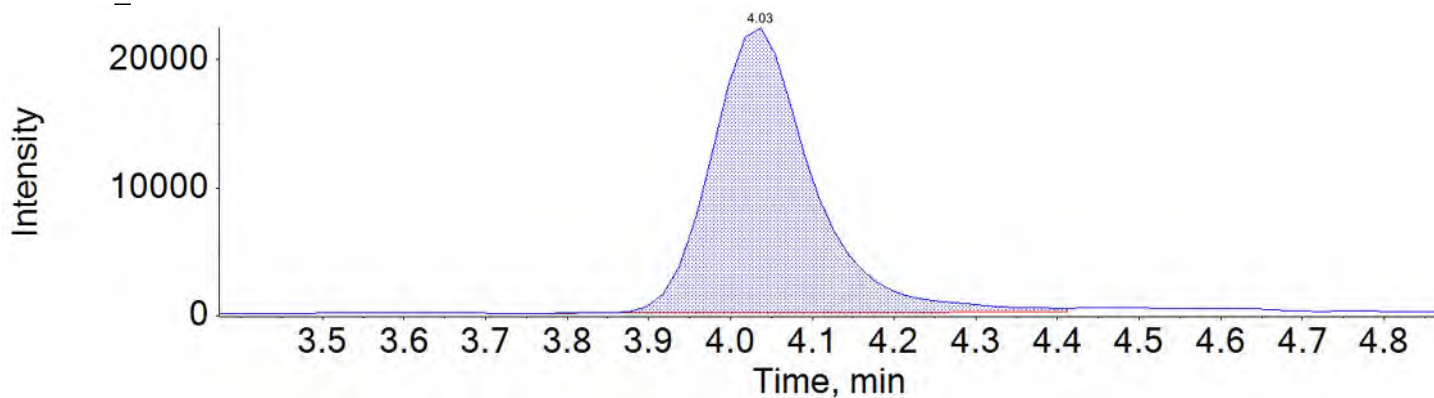
PFDaA\_1 613.0 / 569.0



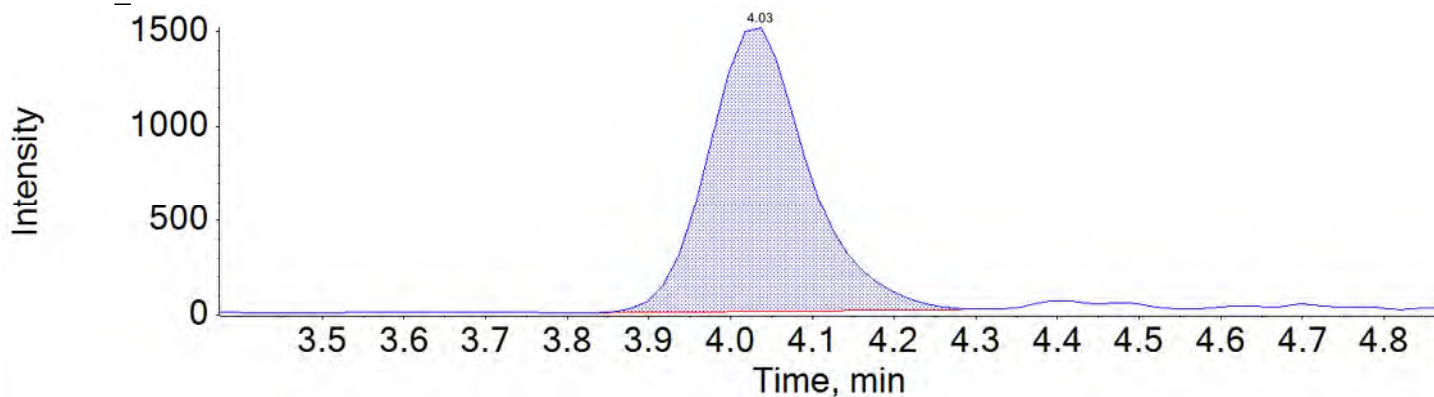
PFDaA\_2 613.0 / 319.0



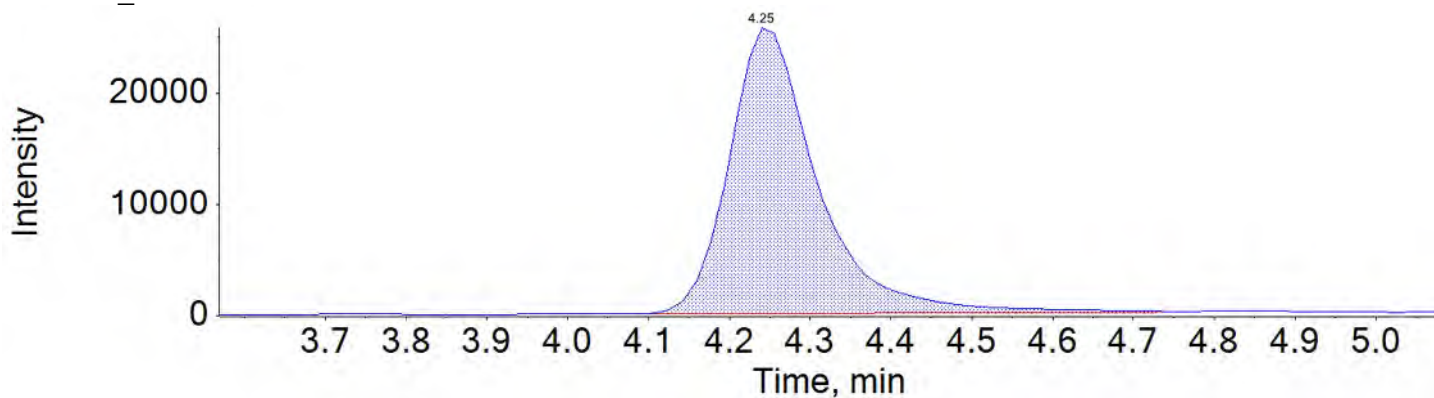
PFTTrDA\_1 663.0 / 619.0



PFTTrDA\_2 663.0 / 169.0

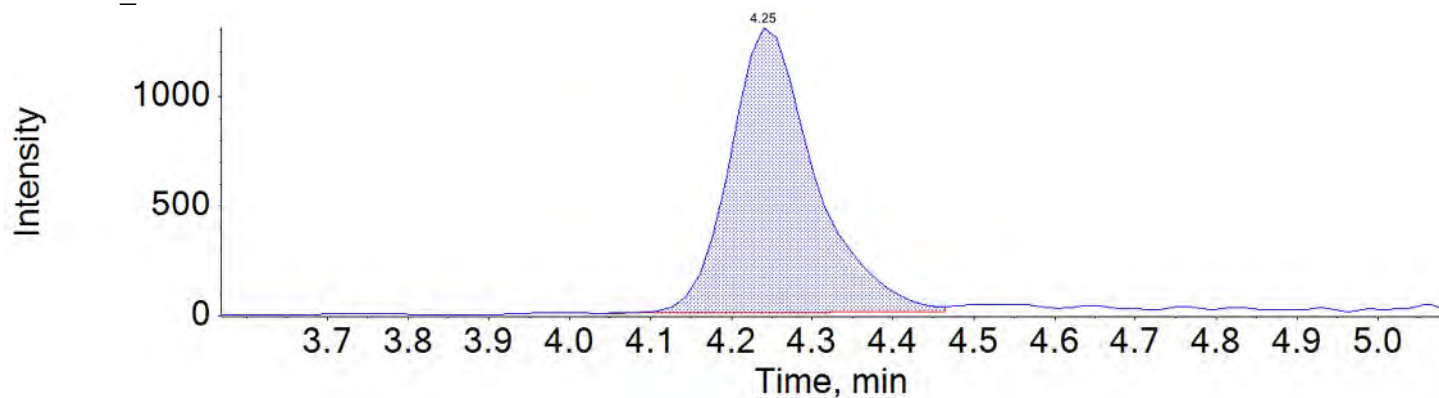


PFTTeDA\_1 713.0 / 669.0

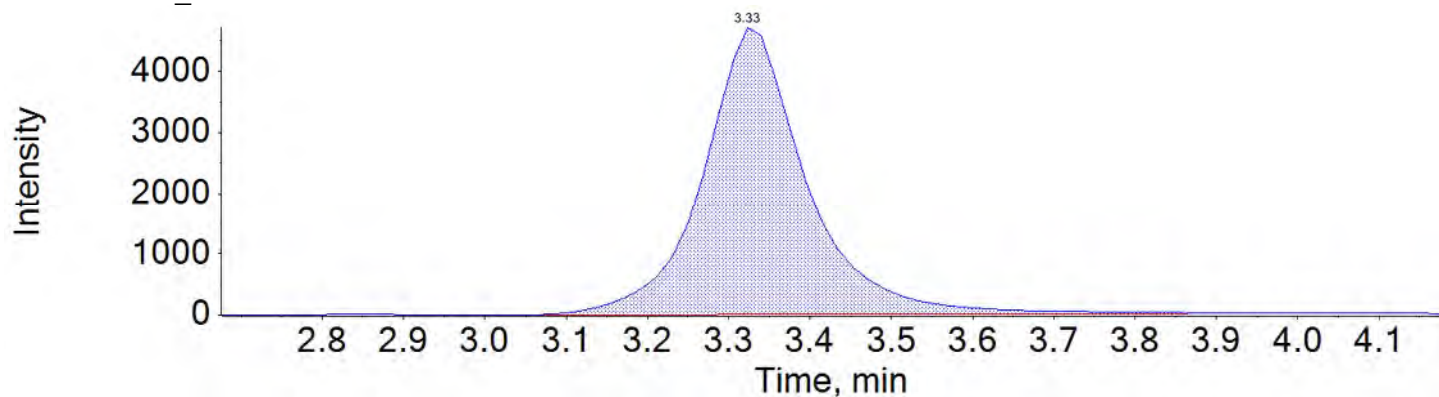




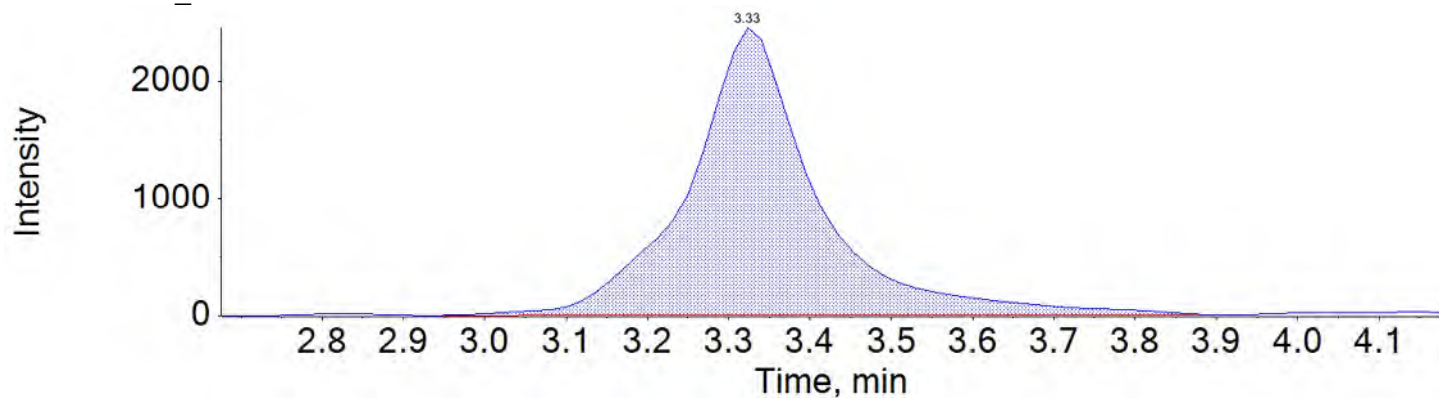
PFTeDA\_2 713.0 / 169.0



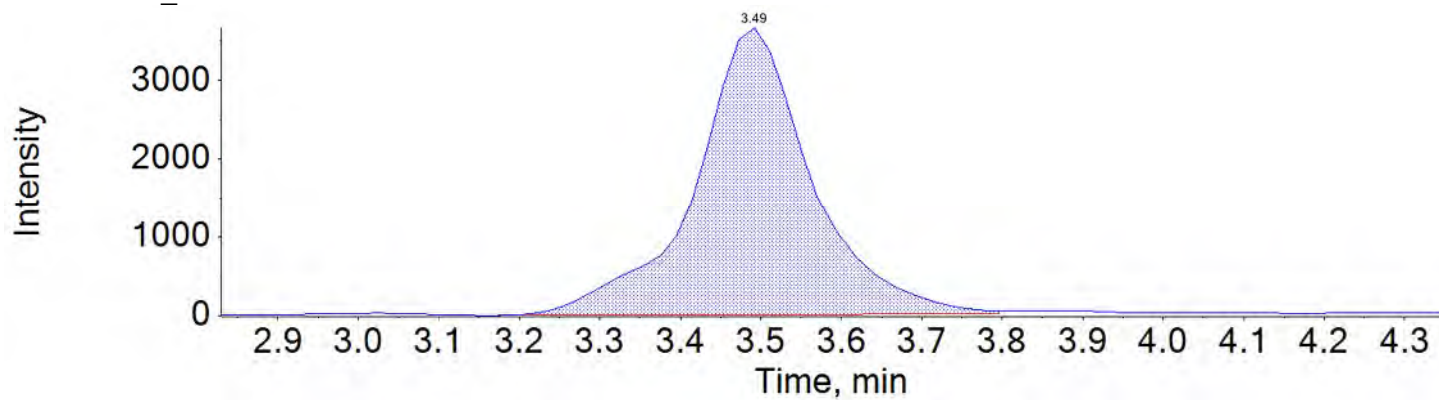
NMeFOSAA\_1 570.0 / 419.0



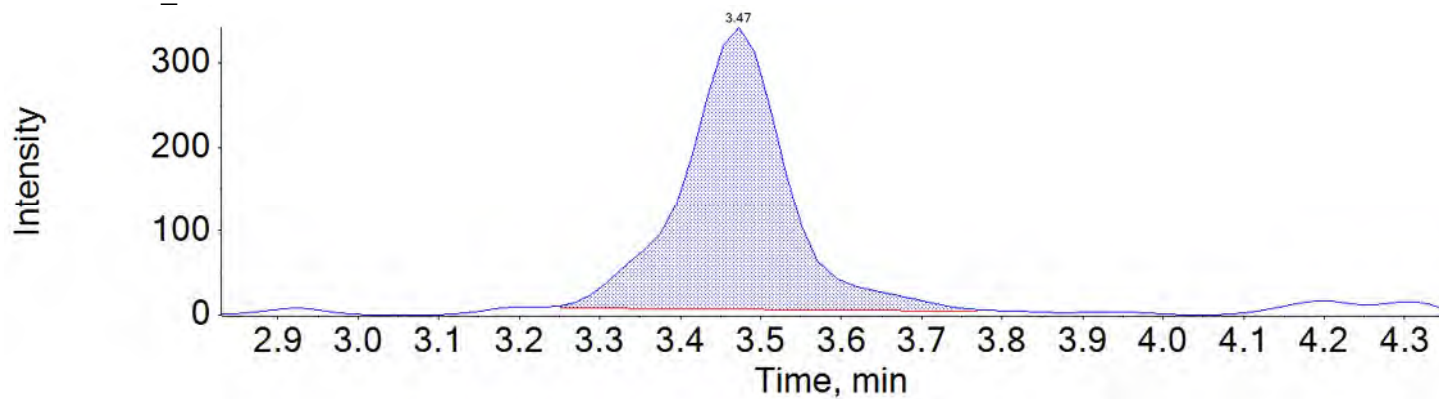
NMeFOSAA\_2 570.0 / 512.0



NEtFOSAA\_1 584.0 / 419.0



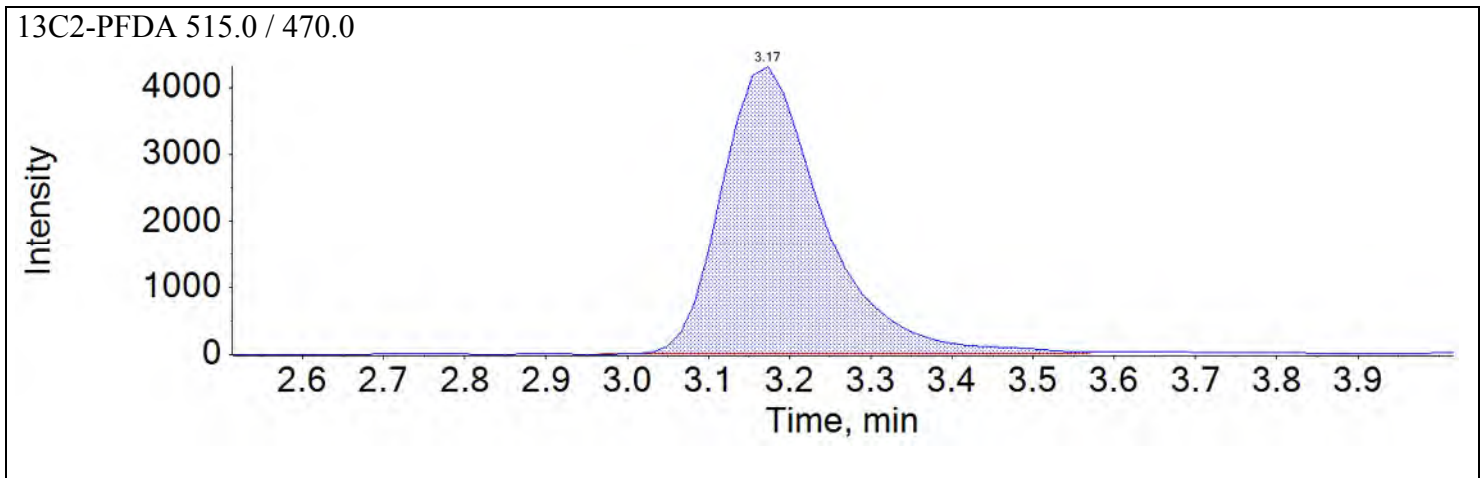
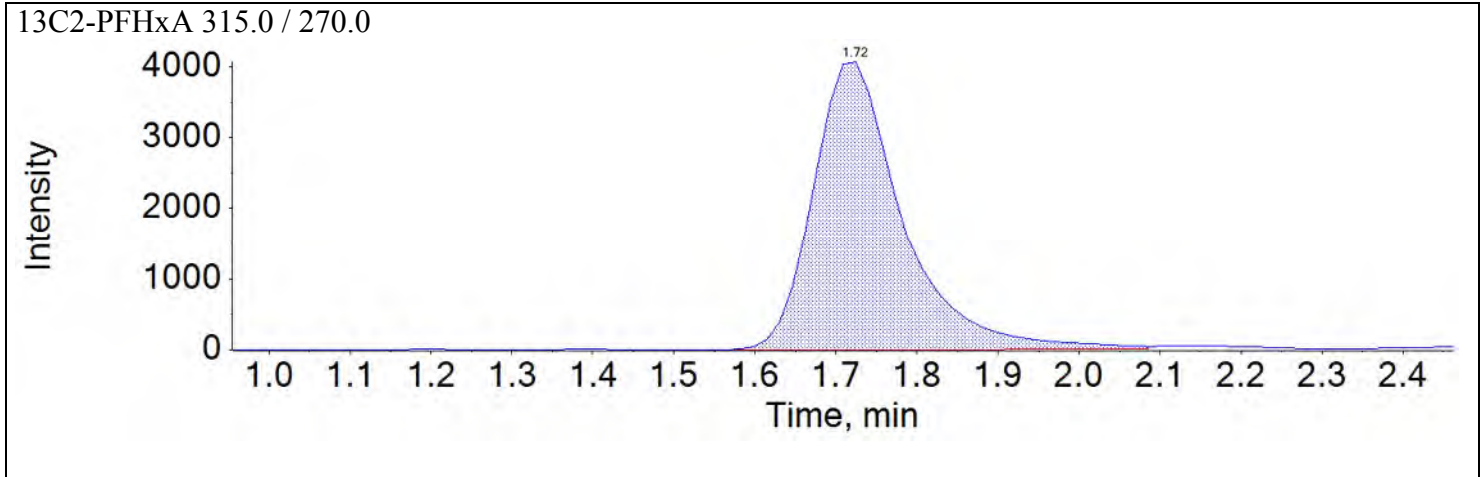
NEtFOSAA\_2 584.0 / 483.0



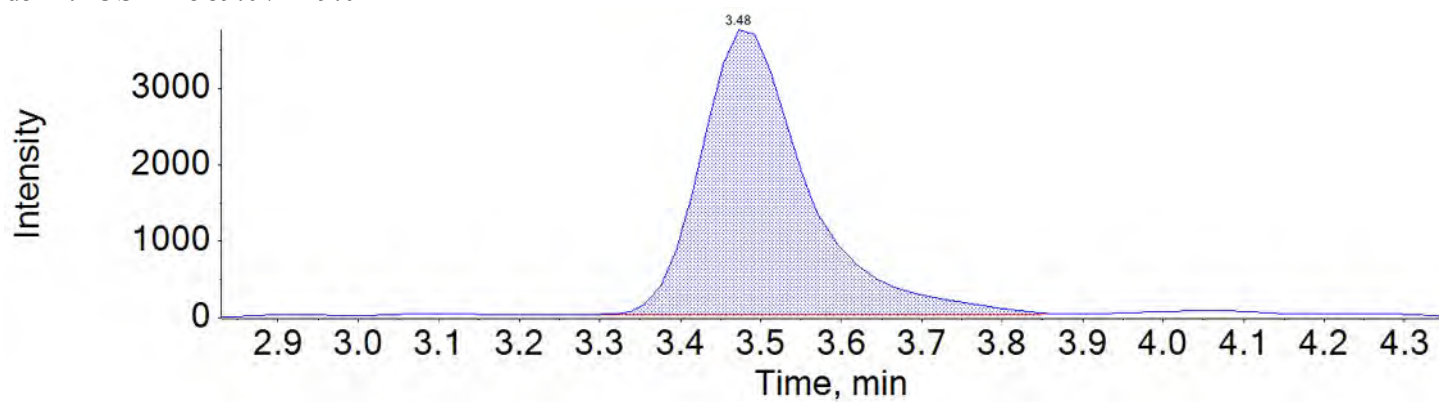


|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Chromatograms



d5-EtFOSAA 589.0 / 419.0



# Unused Data



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-043018-FRB-3103

Battelle ID J5965-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 105

13C5-PFPeA 109

13C5-PFHxA 111



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-043018-FRB-207 |      |      |      |
| Battelle ID                     | J5967-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 04/30/2018          |      |      |      |
| Extraction Date                 | 05/09/2018          |      |      |      |
| Analysis Date                   | 05/14/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.250               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U              | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 104                 |      |      |      |
| 13C5-PFPeA                      | 101                 |      |      |      |
| 13C5-PFHxA                      | 90                  |      |      |      |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

|                                 |                      |      |      |      |
|---------------------------------|----------------------|------|------|------|
| Client ID                       | WGNA-043018-FRB-3409 |      |      |      |
| Battelle ID                     | J5969-FS             |      |      |      |
| Sample Type                     | SA                   |      |      |      |
| Collection Date                 | 04/30/2018           |      |      |      |
| Extraction Date                 | 05/09/2018           |      |      |      |
| Analysis Date                   | 05/14/2018           |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS  |      |      |      |
| % Moisture                      | NA                   |      |      |      |
| Matrix                          | DW                   |      |      |      |
| Sample Size                     | 0.250                |      |      |      |
| Size Unit-Basis                 | L                    |      |      |      |
| Units                           | ng/L                 | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U               | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U               | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U               | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U               | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U               | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U               | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U               | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U               | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                      |      |      |      |
| 13C4-PFBA                       | 104                  |      |      |      |
| 13C5-PFPeA                      | 102                  |      |      |      |
| 13C5-PFHxA                      | 83                   |      |      |      |





Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

|                                 |                      |      |      |      |
|---------------------------------|----------------------|------|------|------|
| Client ID                       | WGNA-050118-FRB-3385 |      |      |      |
| Battelle ID                     | J5971-FS             |      |      |      |
| Sample Type                     | SA                   |      |      |      |
| Collection Date                 | 05/01/2018           |      |      |      |
| Extraction Date                 | 05/09/2018           |      |      |      |
| Analysis Date                   | 05/14/2018           |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS  |      |      |      |
| % Moisture                      | NA                   |      |      |      |
| Matrix                          | DW                   |      |      |      |
| Sample Size                     | 0.250                |      |      |      |
| Size Unit-Basis                 | L                    |      |      |      |
| Units                           | ng/L                 | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U               | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U               | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U               | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U               | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U               | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U               | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U               | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U               | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                      |      |      |      |
| 13C4-PFBA                       | 104                  |      |      |      |
| 13C5-PFPeA                      | 100                  |      |      |      |
| 13C5-PFHxA                      | 97                   |      |      |      |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-FRB-3178

Battelle ID J5973-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 120

13C5-PFPeA 106

13C5-PFHxA 90



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-050118-FRB-304 |      |      |      |
| Battelle ID                     | J5975-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 05/01/2018          |      |      |      |
| Extraction Date                 | 05/09/2018          |      |      |      |
| Analysis Date                   | 05/14/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.250               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U              | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 112                 |      |      |      |
| 13C5-PFPeA                      | 100                 |      |      |      |
| 13C5-PFHxA                      | 109                 |      |      |      |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-050118-FRB-098 |      |      |      |
| Battelle ID                     | J5977-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 05/01/2018          |      |      |      |
| Extraction Date                 | 05/09/2018          |      |      |      |
| Analysis Date                   | 05/14/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.250               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U              | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 106                 |      |      |      |
| 13C5-PFPeA                      | 103                 |      |      |      |
| 13C5-PFHxA                      | 101                 |      |      |      |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

| Client ID             | Procedural Blank    |      |      |      |  |
|-----------------------|---------------------|------|------|------|--|
| Battelle ID           | CQ753PB-FS          |      |      |      |  |
| Sample Type           | PB                  |      |      |      |  |
| Collection Date       | 05/09/2018          |      |      |      |  |
| Extraction Date       | 05/09/2018          |      |      |      |  |
| Analysis Date         | 05/14/2018          |      |      |      |  |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |  |
| % Moisture            | NA                  |      |      |      |  |
| Matrix                | WATER               |      |      |      |  |
| Sample Size           | 0.250               |      |      |      |  |
| Size Unit-Basis       | L                   |      |      |      |  |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |  |
| PFHxA                 | 0.22 U              | 0.22 | 0.50 | 2.50 |  |
| PFHpA                 | 0.34 U              | 0.34 | 1.00 | 2.50 |  |
| PFOA                  | 0.38 U              | 0.38 | 1.00 | 2.50 |  |
| PFNA                  | 0.37 U              | 0.37 | 1.00 | 2.50 |  |
| PFDA                  | 0.39 U              | 0.39 | 1.00 | 2.50 |  |
| PFUnA                 | 0.38 U              | 0.38 | 1.00 | 2.50 |  |
| PFDoA                 | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| PFTTrDA               | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| PFTeDA                | 0.73 U              | 0.73 | 1.50 | 2.50 |  |
| NMeFOSAA              | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| NEtFOSAA              | 0.44 U              | 0.44 | 1.00 | 2.50 |  |
| PFBS                  | 0.21 U              | 0.21 | 0.50 | 2.50 |  |
| PFHxS                 | 0.34 U              | 0.34 | 1.00 | 2.50 |  |
| PFOS                  | 0.30 U              | 0.30 | 1.00 | 2.50 |  |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 115 |
| 13C2-PFDA  | 117 |
| d5-EtFOSAA | 105 |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

| Client ID                       | Laboratory Control Sample |        |          |      |                |       |
|---------------------------------|---------------------------|--------|----------|------|----------------|-------|
| Battelle ID                     | CQ754LCS-FS               |        |          |      |                |       |
| Sample Type                     | LCS                       |        |          |      |                |       |
| Collection Date                 | 05/09/2018                |        |          |      |                |       |
| Extraction Date                 | 05/09/2018                |        |          |      |                |       |
| Analysis Date                   | 05/14/2018                |        |          |      |                |       |
| Analytical Instrument           | Sciex 5500 LC/MS/MS       |        |          |      |                |       |
| % Moisture                      | NA                        |        |          |      |                |       |
| Matrix                          | WATER                     |        |          |      |                |       |
| Sample Size                     | 0.250                     |        |          |      |                |       |
| Size Unit-Basis                 | L                         |        |          |      |                |       |
| Units                           | ng/L                      | Target | Recovery | Qual | Control Limits |       |
|                                 |                           |        |          |      | Lower          | Upper |
| PFHxA                           | 10.43                     | 10.00  | 104      |      | 70             | 130   |
| PFHpA                           | 9.94                      | 10.00  | 99       |      | 70             | 130   |
| PFOA                            | 10.21                     | 10.00  | 102      |      | 70             | 130   |
| PFNA                            | 9.64                      | 10.00  | 96       |      | 70             | 130   |
| PFDA                            | 9.74                      | 10.00  | 97       |      | 70             | 130   |
| PFUnA                           | 9.74                      | 10.00  | 97       |      | 70             | 130   |
| PFDoA                           | 9.50                      | 10.00  | 95       |      | 70             | 130   |
| PFTTrDA                         | 9.88                      | 10.00  | 99       |      | 70             | 130   |
| PFTeDA                          | 11.29                     | 10.00  | 113      |      | 70             | 130   |
| NMeFOSAA                        | 11.25                     | 10.00  | 113      |      | 70             | 130   |
| NEtFOSAA                        | 11.32                     | 10.00  | 113      |      | 70             | 130   |
| PFBS                            | 10.15                     | 8.85   | 115      |      | 70             | 130   |
| PFHxS                           | 9.51                      | 9.45   | 101      |      | 70             | 130   |
| PFOS                            | 8.34                      | 9.55   | 87       |      | 70             | 130   |
| <b>Surrogate Recoveries (%)</b> |                           |        |          |      |                |       |
| 13C4-PFBA                       | 109                       |        |          |      |                |       |
| 13C5-PFPeA                      | 99                        |        |          |      |                |       |
| 13C5-PFHxA                      | 100                       |        |          |      |                |       |





## Glossary of Data Qualifiers

Flag:      Application:

---

|    |                                                                                                                            |
|----|----------------------------------------------------------------------------------------------------------------------------|
| B  | Analyte found in the sample at a concentration <10x the level found in the procedural blank                                |
| D  | Dilution Run. Initial run outside the initial calibration range of the instrument                                          |
| E  | Estimate, result is greater than the highest concentration level in the calibration                                        |
| H  | Surrogate diluted out. Used when surrogate recovery is affected by excessive dilution of the sample extract.               |
| J  | Analyte detected below the Limit of Quantitation (LOQ)                                                                     |
| ME | Significant Matrix Interference - Estimated value.                                                                         |
| MI | Significant Matrix Interference - value could not be determined.                                                           |
| n  | Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO), but meets secondary criteria |
| N  | Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)                               |
| NA | Not Applicable                                                                                                             |
| T  | Holding Time (HT) exceeded                                                                                                 |
| U  | Analyte not detected or detected below the Method detection limit (MDL) value, MDL reported                                |

|               |             |              |               |            |              |              |             |              |              |              |              |           |
|---------------|-------------|--------------|---------------|------------|--------------|--------------|-------------|--------------|--------------|--------------|--------------|-----------|
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "307-24-4"   | "PFHxA"      | ".500000"   |              |              |              |              |           |
| "ng/L"        | "U"         | ".220000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | ".500000"    | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "375-85-9"   | "PFHpA"      | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".340000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "335-67-1"   | "PFOA"       | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".380000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "375-95-1"   | "PFNA"       | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".370000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "335-76-2"   | "PFDA"       | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".390000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "2058-94-8"  | "PFUnA"      | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".380000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "307-55-1"   | "PFDaA"      | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".420000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "72629-94-8" | "PFTTrDA"    | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".420000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "376-06-7"   | "PFTeDA"     | "1.500000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".730000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.500000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "2355-31-9"  | "NMeFOSAA"   |             |              |              |              |              |           |
| "1.000000"    | "ng/L"      | "U"          | ".420000"     | "MDL"      | ""           | "T"          | ""          | ""           | "2.500000"   | "LOQ"        | "YES"        |           |
| "-99.000000"  | ""          | ".250000"    | ".000500"     | "1.000000" | ""           |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "2991-50-6"  | "NEtFOSAA"   | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".440000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "375-73-5"   | "PFBS"       | ".500000"   | "ng/L"       |              |              |              |           |
| "U"           | ".210000"   | "MDL"        | ""            | "T"        | ""           | ""           | "2.500000"  | "LOQ"        | "YES"        | "-99.000000" | ""           | ".250000" |
| ".000500"     | ".500000"   | ""           |               |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "1763-23-1"  | "PFOS"       | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".300000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "355-46-4"   | "PFHxS"      | "1.000000"  |              |              |              |              |           |
| "ng/L"        | "U"         | ".340000"    | "MDL"         | ""         | "T"          | ""           | ""          | "2.500000"   | "LOQ"        | "YES"        | "-99.000000" | ""        |
| ".250000"     | ".000500"   | "1.000000"   | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "BDO-2106"   | "13C2-PFHxA" | ".460000"   |              |              |              |              |           |
| "ng/L"        | ""          | "-99.000000" | "NA"          | ""         | "SIS"        | "115.00"     | ""          | "-99.000000" | "NA"         | "YES"        | ".400000"    | ""        |
| ".250000"     | ".000500"   | ".500000"    | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "BDO-2110"   | "13C2-PFDA"  | ".470000"   |              |              |              |              |           |
| "ng/L"        | ""          | "-99.000000" | "NA"          | ""         | "SIS"        | "117.00"     | ""          | "-99.000000" | "NA"         | "YES"        | ".400000"    | ""        |
| ".250000"     | ".000500"   | ".500000"    | ""            |            |              |              |             |              |              |              |              |           |
| "CQ753PB-FS"  | "SOP 5-369" | "Initial"    | "CQ753PB-FS"  | "BNO"      | "BDO-1839"   | "d5-EtFOSAA" |             |              |              |              |              |           |
| "1.670000"    | "ng/L"      | ""           | "-99.000000"  | "NA"       | ""           | "SIS"        | "105.00"    | ""           | "-99.000000" | "NA"         | "YES"        |           |
| "1.600000"    | ""          | ".250000"    | ".000500"     | ".500000"  | ""           |              |             |              |              |              |              |           |
| "CQ754LCS-FS" | "SOP 5-369" | "Initial"    | "CQ754LCS-FS" | "BNO"      | "307-24-4"   | "PFHxA"      | "10.430000" |              |              |              |              |           |
| "ng/L"        | ""          | ".220000"    | "MDL"         | ""         | "T"          | "104.00"     | ""          | "2.500000"   | "LOQ"        | "YES"        | "10.000000"  | ""        |





|                        |             |              |            |                |              |              |              |    |  |
|------------------------|-------------|--------------|------------|----------------|--------------|--------------|--------------|----|--|
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "375-95-1"   | "PFNA"       | "1.000000"   |    |  |
| "ng/L" "U"             | "370000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "335-76-2"   | "PFDA"       | "1.000000"   |    |  |
| "ng/L" "U"             | "390000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "2058-94-8"  | "PFUnA"      | "1.000000"   |    |  |
| "ng/L" "U"             | "380000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "307-55-1"   | "PFDaA"      | "1.000000"   |    |  |
| "ng/L" "U"             | "420000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "72629-94-8" | "PFTTrDA"    |              |    |  |
| "1.000000"             | "ng/L" "U"  | "420000"     | "MDL" ""   | "T" ""         | ""           | "2.500000"   | "LOQ" "YES"  |    |  |
| "-99.000000"           | ""          | "250000"     | "000500"   | "1.000000"     | ""           |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "376-06-7"   | "PFTeDA"     |              |    |  |
| "1.500000"             | "ng/L" "U"  | "730000"     | "MDL" ""   | "T" ""         | ""           | "2.500000"   | "LOQ" "YES"  |    |  |
| "-99.000000"           | ""          | "250000"     | "000500"   | "1.500000"     | ""           |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "2355-31-9"  | "NMeFOSAA"   |              |    |  |
| "1.000000"             | "ng/L" "U"  | "420000"     | "MDL" ""   | "T" ""         | ""           | "2.500000"   | "LOQ" "YES"  |    |  |
| "-99.000000"           | ""          | "250000"     | "000500"   | "1.000000"     | ""           |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "2991-50-6"  | "NEtFOSAA"   |              |    |  |
| "1.000000"             | "ng/L" "U"  | "440000"     | "MDL" ""   | "T" ""         | ""           | "2.500000"   | "LOQ" "YES"  |    |  |
| "-99.000000"           | ""          | "250000"     | "000500"   | "1.000000"     | ""           |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "375-73-5"   | "PFBS"       | ".500000"    |    |  |
| "ng/L" "U"             | "210000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | ".500000"    | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "1763-23-1"  | "PFOS"       | "1.000000"   |    |  |
| "ng/L" "U"             | "300000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "355-46-4"   | "PFHxA"      | "1.000000"   |    |  |
| "ng/L" "U"             | "340000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "BDO-2106"   | "13C2-PFHxA" |              |    |  |
| "420000"               | "ng/L" ""   | "-99.000000" | "NA" ""    | "SIS" "104.00" | ""           | "-99.000000" | "NA" "YES"   |    |  |
| "400000"               | ""          | "250000"     | "000500"   | ".500000"      | ""           |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "BDO-2110"   | "13C2-PFDA"  |              |    |  |
| "410000"               | "ng/L" ""   | "-99.000000" | "NA" ""    | "SIS" "101.00" | ""           | "-99.000000" | "NA" "YES"   |    |  |
| "400000"               | ""          | "250000"     | "000500"   | ".500000"      | ""           |              |              |    |  |
| "NAWC-043018-FRB-207"  | "SOP 5-369" | "Initial"    | "J5967-FS" | "BNO"          | "BDO-1839"   | "d5-EtFOSAA" |              |    |  |
| "1.440000"             | "ng/L" ""   | "-99.000000" | "NA" ""    | "SIS" "90.00"  | ""           | "-99.000000" | "NA" "YES"   |    |  |
| "1.600000"             | ""          | "250000"     | "000500"   | ".500000"      | ""           |              |              |    |  |
| "WGNA-043018-FRB-3409" | "SOP 5-369" | "Initial"    | "J5969-FS" | "BNO"          | "307-24-4"   | "PFHxA"      | ".500000"    |    |  |
| "ng/L" "U"             | "220000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | ".500000"    | ""         |                |              |              |              |    |  |
| "WGNA-043018-FRB-3409" | "SOP 5-369" | "Initial"    | "J5969-FS" | "BNO"          | "375-85-9"   | "PFHpA"      | "1.000000"   |    |  |
| "ng/L" "U"             | "340000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "WGNA-043018-FRB-3409" | "SOP 5-369" | "Initial"    | "J5969-FS" | "BNO"          | "335-67-1"   | "PFOA"       | "1.000000"   |    |  |
| "ng/L" "U"             | "380000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |
| "250000"               | "000500"    | "1.000000"   | ""         |                |              |              |              |    |  |
| "WGNA-043018-FRB-3409" | "SOP 5-369" | "Initial"    | "J5969-FS" | "BNO"          | "375-95-1"   | "PFNA"       | "1.000000"   |    |  |
| "ng/L" "U"             | "370000"    | "MDL" ""     | "T" ""     | ""             | "2.500000"   | "LOQ" "YES"  | "-99.000000" | "" |  |







|                        |             |              |              |            |              |              |            |              |              |
|------------------------|-------------|--------------|--------------|------------|--------------|--------------|------------|--------------|--------------|
| "250000"               | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "307-55-1"   | "PFD0A"      | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".420000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| "250000"               | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "72629-94-8" | "PFTTrDA"    |            |              |              |
| "1.000000"             | "ng/L"      | "U"          | ".420000"    | "MDL"      | ""           | "T"          | ""         | "2.500000"   | "LOQ"        |
| "-99.000000"           | ""          | ".250000"    | ".000500"    | "1.000000" | ""           |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "376-06-7"   | "PFTeDA"     |            |              |              |
| "1.500000"             | "ng/L"      | "U"          | ".730000"    | "MDL"      | ""           | "T"          | ""         | "2.500000"   | "LOQ"        |
| "-99.000000"           | ""          | ".250000"    | ".000500"    | "1.500000" | ""           |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "2355-31-9"  | "NMeFOSAA"   |            |              |              |
| "1.000000"             | "ng/L"      | "U"          | ".420000"    | "MDL"      | ""           | "T"          | ""         | "2.500000"   | "LOQ"        |
| "-99.000000"           | ""          | ".250000"    | ".000500"    | "1.000000" | ""           |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "2991-50-6"  | "NEtFOSAA"   |            |              |              |
| "1.000000"             | "ng/L"      | "U"          | ".440000"    | "MDL"      | ""           | "T"          | ""         | "2.500000"   | "LOQ"        |
| "-99.000000"           | ""          | ".250000"    | ".000500"    | "1.000000" | ""           |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "375-73-5"   | "PFBS"       | ".500000"  |              |              |
| "ng/L"                 | "U"         | ".210000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| "250000"               | "000500"    | ".500000"    | ""           |            |              |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "1763-23-1"  | "PFOS"       | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".300000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "355-46-4"   | "PFHxS"      | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".340000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "BDO-2106"   | "13C2-PFHxA" |            |              |              |
| ".480000"              | "ng/L"      | ""           | "-99.000000" | "NA"       | ""           | "SIS"        | "120.00"   | ""           | "-99.000000" |
| ".400000"              | ""          | ".250000"    | ".000500"    | ".500000"  | ""           |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "BDO-2110"   | "13C2-PFDA"  | ".420000"  |              |              |
| "ng/L"                 | ""          | "-99.000000" | "NA"         | ""         | "SIS"        | "106.00"     | ""         | "-99.000000" | "NA"         |
| ""                     | ".250000"   | ".000500"    | ".500000"    | ""         |              |              |            |              |              |
| "WGNA-050118-FRB-3178" | "SOP 5-369" | "Initial"    | "J5973-FS"   | "BNO"      | "BDO-1839"   | "d5-EtFOSAA" |            |              |              |
| "1.440000"             | "ng/L"      | ""           | "-99.000000" | "NA"       | ""           | "SIS"        | "90.00"    | ""           | "-99.000000" |
| "1.600000"             | ""          | ".250000"    | ".000500"    | ".500000"  | ""           |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "307-24-4"   | "PFHxA"      | ".500000"  |              |              |
| "ng/L"                 | "U"         | ".220000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | ".500000"    | ""           |            |              |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "375-85-9"   | "PFHpA"      | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".340000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "335-67-1"   | "PFOA"       | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".380000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "375-95-1"   | "PFNA"       | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".370000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "335-76-2"   | "PFDA"       | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".390000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "2058-94-8"  | "PFUnA"      | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".380000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |
| ".250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |              |              |
| "NAWC-050118-FRB-304"  | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "307-55-1"   | "PFD0A"      | "1.000000" |              |              |
| "ng/L"                 | "U"         | ".420000"    | "MDL"        | ""         | "T"          | ""           | "2.500000" | "LOQ"        | "YES"        |

|                       |             |              |              |            |              |              |            |                         |                         |
|-----------------------|-------------|--------------|--------------|------------|--------------|--------------|------------|-------------------------|-------------------------|
| "250000"              | "000500"    | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "72629-94-8" | "PFTTrDA"    |            |                         |                         |
| "1.000000"            | "ng/L"      | "U"          | ".420000"    | "MDL"      | ""           | "T"          | ""         | ""                      | "2.500000" "LOQ" "YES"  |
| "-99.000000"          | ""          | ".250000"    | ".000500"    | "1.000000" | ""           |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "376-06-7"   | "PFTeDA"     |            |                         |                         |
| "1.500000"            | "ng/L"      | "U"          | ".730000"    | "MDL"      | ""           | "T"          | ""         | ""                      | "2.500000" "LOQ" "YES"  |
| "-99.000000"          | ""          | ".250000"    | ".000500"    | "1.500000" | ""           |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "2355-31-9"  | "NMeFOSAA"   |            |                         |                         |
| "1.000000"            | "ng/L"      | "U"          | ".420000"    | "MDL"      | ""           | "T"          | ""         | ""                      | "2.500000" "LOQ" "YES"  |
| "-99.000000"          | ""          | ".250000"    | ".000500"    | "1.000000" | ""           |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "2991-50-6"  | "NEtFOSAA"   |            |                         |                         |
| "1.000000"            | "ng/L"      | "U"          | ".440000"    | "MDL"      | ""           | "T"          | ""         | ""                      | "2.500000" "LOQ" "YES"  |
| "-99.000000"          | ""          | ".250000"    | ".000500"    | "1.000000" | ""           |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "375-73-5"   | "PFBS"       | ".500000"  |                         |                         |
| "ng/L"                | "U"         | ".210000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | ".500000"    | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "1763-23-1"  | "PFOS"       | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".300000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "355-46-4"   | "PFHxS"      | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".340000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "BDO-2106"   | "13C2-PFHxA" |            |                         |                         |
| ".450000"             | "ng/L"      | ""           | "-99.000000" | "NA"       | ""           | "SIS"        | "112.00"   | ""                      | "-99.000000" "NA" "YES" |
| ".400000"             | ""          | ".250000"    | ".000500"    | ".500000"  | ""           |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "BDO-2110"   | "13C2-PFDA"  | ".400000"  |                         |                         |
| "ng/L"                | ""          | "-99.000000" | "NA"         | ""         | "SIS"        | "100.00"     | ""         | "-99.000000" "NA" "YES" | ".400000"               |
| ""                    | ".250000"   | ".000500"    | ".500000"    | ""         |              |              |            |                         |                         |
| "NAWC-050118-FRB-304" | "SOP 5-369" | "Initial"    | "J5975-FS"   | "BNO"      | "BDO-1839"   | "d5-EtFOSAA" |            |                         |                         |
| "1.740000"            | "ng/L"      | ""           | "-99.000000" | "NA"       | ""           | "SIS"        | "109.00"   | ""                      | "-99.000000" "NA" "YES" |
| "1.600000"            | ""          | ".250000"    | ".000500"    | ".500000"  | ""           |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "307-24-4"   | "PFHxA"      | ".500000"  |                         |                         |
| "ng/L"                | "U"         | ".220000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | ".500000"    | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "375-85-9"   | "PFHpA"      | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".340000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "335-67-1"   | "PFOA"       | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".380000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "375-95-1"   | "PFNA"       | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".370000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "335-76-2"   | "PFDA"       | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".390000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "2058-94-8"  | "PFUnA"      | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".380000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "307-55-1"   | "PFDaA"      | "1.000000" |                         |                         |
| "ng/L"                | "U"         | ".420000"    | "MDL"        | ""         | "T"          | ""           | ""         | "2.500000" "LOQ" "YES"  | "-99.000000" ""         |
| ".250000"             | ".000500"   | "1.000000"   | ""           |            |              |              |            |                         |                         |
| "NAWC-050118-FRB-098" | "SOP 5-369" | "Initial"    | "J5977-FS"   | "BNO"      | "72629-94-8" | "PFTTrDA"    |            |                         |                         |
| "1.000000"            | "ng/L"      | "U"          | ".420000"    | "MDL"      | ""           | "T"          | ""         | ""                      | "2.500000" "LOQ" "YES"  |

file:///C:/.../Desktop/Tetra%20Tech/MID%20ATLANTIC/WILLOW GROVE NAS/18-0312/3 EDD%20WILLOW%20SDG%2018-0312.txt[6/9/2019 7:52:41 AM]

"05/14/2018 18:58""BNO" "COA" "NA" "T" "1.000" "NA" "NA" "" "100.000000" "18-0312"  
"18-0312" "DP-18-0111" "DP-18-0111" "18-0312" "05/02/2018 11:30""07/13/2018 14:26""  
"112G08005-WE04" "WE04 NAS Willow Grove" "NAWC-050118-FRB-304" "05/01/2018 10:05""DW"  
"J5975-FS" "NM" "SHP-180502-02" "1.700000" "SOP 5-369" "Gen Prep" "Initial" "05/09/2018 14:42"  
"05/14/2018 19:07""BNO" "COA" "NA" "T" "1.000" "NA" "NA" "" "100.000000" "18-0312"  
"18-0312" "DP-18-0111" "DP-18-0111" "18-0312" "05/02/2018 11:30""07/13/2018 14:26""  
"112G08005-WE04" "WE04 NAS Willow Grove" "NAWC-050118-FRB-098" "05/01/2018 10:35""DW"  
"J5977-FS" "NM" "SHP-180502-02" "1.700000" "SOP 5-369" "Gen Prep" "Initial" "05/09/2018 14:42"  
"05/14/2018 19:16""BNO" "COA" "NA" "T" "1.000" "NA" "NA" "" "100.000000" "18-0312"  
"18-0312" "DP-18-0111" "DP-18-0111" "18-0312" "05/02/2018 11:30""07/13/2018 14:26""



## INTERNAL CORRESPONDENCE

**TO:** A. FREBOWITZ **DATE:** JUNE 13, 2018

**FROM:** TERRI L. SOLOMON **COPIES:** DV FILE

**SUBJECT:** ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)  
NAS JRB WILLOW GROVE  
SAMPLE DELIVERY GROUPS (SDGs) 18-0299, 18-0312

|                      |                             |                      |
|----------------------|-----------------------------|----------------------|
| SAMPLES:             | SDG 18-0299                 |                      |
|                      | 7/Drinking Water            |                      |
|                      | NAWC-043018-RW-207          | NAWC-050118-RW-098   |
|                      | NAWC-050118-RW-304          | WGNA-043018-RW-3103  |
|                      | WGNA-043018-RW-3409         | WGNA-050118-RW-3178  |
|                      | WGNA-050118-RW-3385         |                      |
|                      | SDG 18-0312                 |                      |
|                      | 7/Field Reagent Blank (FRB) |                      |
|                      | NAWC-043018-FRB-207         | NAWC-050118-FRB-098  |
|                      | NAWC-050118-FRB-304         | WGNA-043018-FRB-3103 |
| WGNA-043018-FRB-3409 | WGNA-050118-FRB-3178        |                      |
| WGNA-050118-FRB-3385 |                             |                      |

## Overview

The sample sets for NAS JRB Willow Grove, SDGs 18-0299 and 18-0312, consisted of seven (7) drinking water samples and seven (7) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluorooctane sulfonic acid (PFOS) n-ethylperfluorooctane sulfonamidoacetate (NMeFOSA), n-methylperfluorooctane sulfonamidoacetate (NMeFOSA), perfluorodecanoic acid (PFDA), perfluorododecanoic acid (PFDoA), perfluorohexanoic acid (PFHxA), perfluorotetradecanoic acid (PFTeDA), perfluorotridecanoic acid (PFTrDA) and perfluoroundecanoic acid (PFUnA) . No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech on April 30 and May 1, 2018 and analyzed by Battelle Norwell Operations. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, tune check, instrument sensitivity check, initial/continuing calibrations, ion transition check, laboratory method/FRBs, surrogate spike recoveries (extracted internal standard recoveries), laboratory control sample results, matrix spike / matrix spike duplicate recoveries, injected internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

**Major**

None.

### Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).



TO: A. FREBOWITZ  
SDGS: 18-0299; 18-0312

PAGE 2

### **Notes**

The laboratory uses a primary transition for the quantitation of each analyte and a secondary transition for confirmation.

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

| <b><u>Sample</u></b> | <b><u>Associated FRB</u></b> |
|----------------------|------------------------------|
| NAWC-043018-RW-207   | NAWC-043018-FRB-207          |
| NAWC-050118-RW-098   | NAWC-043018-FRB-207          |
| NAWC-050118-RW-304   | NAWC-043018-FRB-207          |
| WGNA-043018-RW-3103  | WGNA-043018-FRB-3103         |
| WGNA-043018-RW-3409  | WGNA-043018-FRB-3103         |
| WGNA-050118-RW-3178  | WGNA-043018-FRB-3103         |
| WGNA-050118-RW-3385  | WGNA-043018-FRB-3103         |

Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

### **Executive Summary**

**Laboratory Performance:** None.

**Other Factors Affecting Data Quality:** Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories version 5.1" (2017) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



---

Tetra Tech, Inc.  
Terri L. Solomon  
Chemist/Data Validator



---

Tetra Tech, Inc.  
Joseph A. Samchuck  
Data Validation Manager

Attachments:

Appendix A – Qualified Analytical Results

Appendix B – Results as Reported by the Laboratory

Appendix C – Support Documentation

### **Data Qualifier Definitions**

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

|           |                                                                                                                                                                                                                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>U</b>  | The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted method detection limit for sample and method.                                                                                                                                                     |
| <b>J</b>  | The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit). |
| <b>J+</b> | The result is an estimated quantity, but the result may be biased high.                                                                                                                                                                                                                                            |
| <b>J-</b> | The result is an estimated quantity, but the result may be biased low.                                                                                                                                                                                                                                             |
| <b>UJ</b> | The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.                                                                                                                                                                                |
| <b>R</b>  | The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.                                                                                                                                      |
| <b>UR</b> | The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.                                                                                                                                   |

## **Appendix A**

### Qualified Analytical Results

**Qualifier Codes:**

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's  $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ( $< 2 \times$  IDL for inorganics and  $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors  $>40\%$  for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient  $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids  $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

|                                                                                                   |            |                    |     |      |                    |     |      |                    |     |      |                     |     |      |
|---------------------------------------------------------------------------------------------------|------------|--------------------|-----|------|--------------------|-----|------|--------------------|-----|------|---------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 18-0299</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-043018-RW-207 |     |      | NAWC-050118-RW-098 |     |      | NAWC-050118-RW-304 |     |      | WGNA-043018-RW-3103 |     |      |
|                                                                                                   | LAB_ID     | J5966-FS           |     |      | J5976-FS           |     |      | J5974-FS           |     |      | J5964-FS            |     |      |
|                                                                                                   | SAMP_DATE  | 4/30/2018          |     |      | 5/1/2018           |     |      | 5/1/2018           |     |      | 4/30/2018           |     |      |
|                                                                                                   | QC_TYPE    | NM                 |     |      | NM                 |     |      | NM                 |     |      | NM                  |     |      |
|                                                                                                   | UNITS      | NG/L               |     |      | NG/L               |     |      | NG/L               |     |      | NG/L                |     |      |
|                                                                                                   | PCT_SOLIDS | 0.0                |     |      | 0.0                |     |      | 0.0                |     |      | 0.0                 |     |      |
|                                                                                                   | DUP_OF     |                    |     |      |                    |     |      |                    |     |      |                     |     |      |
| PARAMETER                                                                                         |            | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD | RESULT             | VQL | QLCD | RESULT              | VQL | QLCD |
| N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)                                                 |            | 1                  | U   |      | 1                  | U   |      | 1                  | U   |      | 1                   | U   |      |
| N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)                                                |            | 1                  | U   |      | 1                  | U   |      | 1                  | U   |      | 1                   | U   |      |
| PENTADEC AFLUOROOCTANOIC ACID (PFOA)                                                              |            | 5.37               |     |      | 8.62               |     |      | 12.99              |     |      | 8.38                |     |      |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                               |            | 1.69               | J   | P    | 4.45               |     |      | 6.75               |     |      | 3.91                |     |      |
| PERFLUORODECANOIC ACID (PFDA)                                                                     |            | 1                  | U   |      | 1                  | U   |      | 1                  | U   |      | 1                   | U   |      |
| PERFLUORODODECANOIC ACID (PFDOA)                                                                  |            | 1                  | U   |      | 1                  | U   |      | 1                  | U   |      | 1                   | U   |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                   |            | 2.1                | J   | P    | 3                  |     |      | 4.2                |     |      | 2.32                | J   | P    |
| PERFLUOROHEXANESULFONIC ACID (PFHXS)                                                              |            | 0.94               | J   | P    | 3.49               |     |      | 6.71               |     |      | 4.94                |     |      |
| PERFLUOROHEXANOIC ACID (PFHXA)                                                                    |            | 3.75               |     |      | 5.84               |     |      | 7.94               |     |      | 3.96                |     |      |
| PERFLUORONONANOIC ACID (PFNA)                                                                     |            | 0.71               | J   | P    | 1.13               | J   | P    | 1.57               | J   | P    | 2.24                | J   | P    |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                               |            | 3.08               |     |      | 6.53               |     |      | 13.58              |     |      | 7.27                |     |      |
| PERFLUOROTETRADECANOIC ACID (PFTEA)                                                               |            | 1.5                | U   |      | 1.5                | U   |      | 1.5                | U   |      | 1.5                 | U   |      |
| PERFLUOROTRIDECANOIC ACID (PFTRIA)                                                                |            | 1                  | U   |      | 1                  | U   |      | 1                  | U   |      | 1                   | U   |      |
| PERFLUOROUNDECANOIC ACID (PFUNA)                                                                  |            | 1                  | U   |      | 1                  | U   |      | 1                  | U   |      | 1                   | U   |      |

|                                                                                                   |            |                     |     |      |                     |     |      |                     |     |      |
|---------------------------------------------------------------------------------------------------|------------|---------------------|-----|------|---------------------|-----|------|---------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 18-0299</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | WGNA-043018-RW-3409 |     |      | WGNA-050118-RW-3178 |     |      | WGNA-050118-RW-3385 |     |      |
|                                                                                                   | LAB_ID     | J5968-FS            |     |      | J5972-FS            |     |      | J5970-FS            |     |      |
|                                                                                                   | SAMP_DATE  | 4/30/2018           |     |      | 5/1/2018            |     |      | 5/1/2018            |     |      |
|                                                                                                   | QC_TYPE    | NM                  |     |      | NM                  |     |      | NM                  |     |      |
|                                                                                                   | UNITS      | NG/L                |     |      | NG/L                |     |      | NG/L                |     |      |
|                                                                                                   | PCT_SOLIDS | 0.0                 |     |      | 0.0                 |     |      | 0.0                 |     |      |
|                                                                                                   | DUP_OF     |                     |     |      |                     |     |      |                     |     |      |
| PARAMETER                                                                                         |            | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD |
| N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)                                                 |            | 1                   | U   |      | 1                   | U   |      | 1                   | U   |      |
| N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)                                                |            | 1                   | U   |      | 1                   | U   |      | 1                   | U   |      |
| PENTADEC AFLUOROOCTANOIC ACID (PFOA)                                                              |            | 11.71               |     |      | 7.78                |     |      | 14.69               |     |      |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                               |            | 7.62                |     |      | 4.74                |     |      | 2.53                |     |      |
| PERFLUORODECANOIC ACID (PFDA)                                                                     |            | 1                   | U   |      | 1                   | U   |      | 0.41                | J   | P    |
| PERFLUORODODECANOIC ACID (PFDOA)                                                                  |            | 1                   | U   |      | 1                   | U   |      | 1                   | U   |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                   |            | 4.27                |     |      | 2.25                | J   | P    | 4.4                 |     |      |
| PERFLUOROHEXANESULFONIC ACID (PFHXS)                                                              |            | 6.35                |     |      | 6.86                |     |      | 3.12                |     |      |
| PERFLUOROHEXANOIC ACID (PFHXA)                                                                    |            | 7.68                |     |      | 3.9                 |     |      | 5.68                |     |      |
| PERFLUORONONANOIC ACID (PFNA)                                                                     |            | 1.68                | J   | P    | 0.87                | J   | P    | 1.49                | J   | P    |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                               |            | 14.68               |     |      | 13.71               |     |      | 14.77               |     |      |
| PERFLUOROTETRADECANOIC ACID (PFTEA)                                                               |            | 1.5                 | U   |      | 1.5                 | U   |      | 1.5                 | U   |      |
| PERFLUOROTRIDECANOIC ACID (PFTRIA)                                                                |            | 1                   | U   |      | 1                   | U   |      | 1                   | U   |      |
| PERFLUOROUNDECANOIC ACID (PFUNA)                                                                  |            | 1                   | U   |      | 1                   | U   |      | 1                   | U   |      |



|                                                                                                   |            |                     |     |      |                     |     |      |                     |     |      |                      |     |      |
|---------------------------------------------------------------------------------------------------|------------|---------------------|-----|------|---------------------|-----|------|---------------------|-----|------|----------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 18-0312</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | NAWC-043018-FRB-207 |     |      | NAWC-050118-FRB-098 |     |      | NAWC-050118-FRB-304 |     |      | WGNA-043018-FRB-3103 |     |      |
|                                                                                                   | LAB_ID     | J5967-FS            |     |      | J5977-FS            |     |      | J5975-FS            |     |      | J5965-FS             |     |      |
|                                                                                                   | SAMP_DATE  | 4/30/2018           |     |      | 5/1/2018            |     |      | 5/1/2018            |     |      | 4/30/2018            |     |      |
|                                                                                                   | QC_TYPE    | NM                  |     |      | NM                  |     |      | NM                  |     |      | NM                   |     |      |
|                                                                                                   | UNITS      | NG/L                |     |      | NG/L                |     |      | NG/L                |     |      | NG/L                 |     |      |
|                                                                                                   | PCT_SOLIDS | 0.0                 |     |      | 0.0                 |     |      | 0.0                 |     |      | 0.0                  |     |      |
|                                                                                                   | DUP_OF     |                     |     |      |                     |     |      |                     |     |      |                      |     |      |
| PARAMETER                                                                                         |            | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD | RESULT              | VQL | QLCD | RESULT               | VQL | QLCD |
| N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)                                                 |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)                                                |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PENTADEC AFLUOROOCTANOIC ACID (PFOA)                                                              |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                               |            | 0.5 U               |     |      | 0.5 U               |     |      | 0.5 U               |     |      | 0.5 U                |     |      |
| PERFLUORODECANOIC ACID (PFDA)                                                                     |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUORODODECANOIC ACID (PFDOA)                                                                  |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                   |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROHEXANESULFONIC ACID (PFHXS)                                                              |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROHEXANOIC ACID (PFHXA)                                                                    |            | 0.5 U               |     |      | 0.5 U               |     |      | 0.5 U               |     |      | 0.5 U                |     |      |
| PERFLUORONONANOIC ACID (PFNA)                                                                     |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                               |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROTETRADECANOIC ACID (PFTEA)                                                               |            | 1.5 U               |     |      | 1.5 U               |     |      | 1.5 U               |     |      | 1.5 U                |     |      |
| PERFLUOROTRIDECANOIC ACID (PFTRIA)                                                                |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |
| PERFLUOROUNDECANOIC ACID (PFUNA)                                                                  |            | 1 U                 |     |      | 1 U                 |     |      | 1 U                 |     |      | 1 U                  |     |      |

|                                                                                                   |            |                      |     |      |                      |     |      |                      |     |      |
|---------------------------------------------------------------------------------------------------|------------|----------------------|-----|------|----------------------|-----|------|----------------------|-----|------|
| <b>PROJ_NO: 08005-WE04</b><br><b>SDG: 18-0312</b><br><b>FRACTION: PFAS</b><br><b>MEDIA: WATER</b> | NSAMPLE    | WGNA-043018-FRB-3409 |     |      | WGNA-050118-FRB-3178 |     |      | WGNA-050118-FRB-3385 |     |      |
|                                                                                                   | LAB_ID     | J5969-FS             |     |      | J5973-FS             |     |      | J5971-FS             |     |      |
|                                                                                                   | SAMP_DATE  | 4/30/2018            |     |      | 5/1/2018             |     |      | 5/1/2018             |     |      |
|                                                                                                   | QC_TYPE    | NM                   |     |      | NM                   |     |      | NM                   |     |      |
|                                                                                                   | UNITS      | NG/L                 |     |      | NG/L                 |     |      | NG/L                 |     |      |
|                                                                                                   | PCT_SOLIDS | 0.0                  |     |      | 0.0                  |     |      | 0.0                  |     |      |
|                                                                                                   | DUP_OF     |                      |     |      |                      |     |      |                      |     |      |
| PARAMETER                                                                                         |            | RESULT               | VQL | QLCD | RESULT               | VQL | QLCD | RESULT               | VQL | QLCD |
| N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)                                                 |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)                                                |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PENTADEC AFLUOROOCTANOIC ACID (PFOA)                                                              |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROBUTANESULFONIC ACID (PFBS)                                                               |            | 0.5 U                |     |      | 0.5 U                |     |      | 0.5 U                |     |      |
| PERFLUORODECANOIC ACID (PFDA)                                                                     |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUORODODECANOIC ACID (PFDOA)                                                                  |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROHEPTANOIC ACID (PFHPA)                                                                   |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROHEXANESULFONIC ACID (PFHXS)                                                              |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROHEXANOIC ACID (PFHXA)                                                                    |            | 0.5 U                |     |      | 0.5 U                |     |      | 0.5 U                |     |      |
| PERFLUORONONANOIC ACID (PFNA)                                                                     |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROOCTANESULFONIC ACID (PFOS)                                                               |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROTETRADECANOIC ACID (PFTEA)                                                               |            | 1.5 U                |     |      | 1.5 U                |     |      | 1.5 U                |     |      |
| PERFLUOROTRIDECANOIC ACID (PFTRIA)                                                                |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |
| PERFLUOROUNDECANOIC ACID (PFUNA)                                                                  |            | 1 U                  |     |      | 1 U                  |     |      | 1 U                  |     |      |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-043018-FRB-3103

Battelle ID J5965-FS  
 Sample Type SA  
 Collection Date 04/30/2018  
 Extraction Date 05/09/2018  
 Analysis Date 05/14/2018  
 Analytical Instrument Sciex 5500 LC/MS/MS  
 % Moisture NA  
 Matrix DW  
 Sample Size 0.250  
 Size Unit-Basis L  
 Units ng/L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 105  
 13C5-PFPeA 109  
 13C5-PFHxA 111

*Denise L. Schumitz*  
 05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-043018-FRB-207

Battelle ID J5967-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 104

13C5-PFPeA 101

13C5-PFHxA 90

  
05/30/2018



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-043018-FRB-3409

Battelle ID J5969-FS  
 Sample Type SA  
 Collection Date 04/30/2018  
 Extraction Date 05/09/2018  
 Analysis Date 05/14/2018  
 Analytical Instrument Sciex 5500 LC/MS/MS  
 % Moisture NA  
 Matrix DW  
 Sample Size 0.250  
 Size Unit-Basis L  
 Units ng/L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 104  
 13C5-PFPeA 102  
 13C5-PFHxA 83

*Wendy L. Schumitz*  
 05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-FRB-3385

Battelle ID J5971-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 104

13C5-PFPeA 100

13C5-PFHxA 97

*Denise L. Schumitz*  
05/30/2018





Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-FRB-3178

Battelle ID J5973-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 120

13C5-PFPeA 106

13C5-PFHxA 90

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-050118-FRB-304

Battelle ID J5975-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 112

13C5-PFPeA 100

13C5-PFHxA 109

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-050118-FRB-098

Battelle ID J5977-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 106

13C5-PFPeA 103

13C5-PFHxA 101

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-043018-RW-3103

Battelle ID J5964-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.265

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 3.96   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 2.32 J | 0.34 | 1.00 | 2.50 |
| PFOA     | 8.38   | 0.38 | 1.00 | 2.50 |
| PFNA     | 2.24 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 3.91   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 4.94   | 0.34 | 1.00 | 2.50 |
| PFOS     | 7.27   | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 122

13C5-PFPeA 104

13C5-PFHxA 93

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-043018-RW-207

Battelle ID J5966-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.265

Size Unit-Basis L

Units ng/L

MDL

LOD

LOQ

PFHxA 3.75 0.22 0.50 2.50

PFHpA 2.10 J 0.34 1.00 2.50

PFOA 5.37 0.38 1.00 2.50

PFNA 0.71 J 0.37 1.00 2.50

PFDA 0.39 U 0.39 1.00 2.50

PFUnA 0.38 U 0.38 1.00 2.50

PFDoA 0.42 U 0.42 1.00 2.50

PFTTrDA 0.42 U 0.42 1.00 2.50

PFTeDA 0.73 U 0.73 1.50 2.50

NMeFOSAA 0.42 U 0.42 1.00 2.50

NEtFOSAA 0.44 U 0.44 1.00 2.50

PFBS 1.69 J 0.21 0.50 2.50

PFHxS 0.94 J 0.34 1.00 2.50

PFOS 3.08 0.30 1.00 2.50

**Surrogate Recoveries (%)**

13C4-PFBA 111

13C5-PFPeA 94

13C5-PFHxA 89

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-043018-RW-3409

Battelle ID J5968-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.275

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 7.68   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 4.27   | 0.34 | 1.00 | 2.50 |
| PFOA     | 11.71  | 0.38 | 1.00 | 2.50 |
| PFNA     | 1.68 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 7.62   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 6.35   | 0.34 | 1.00 | 2.50 |
| PFOS     | 14.68  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 125

13C5-PFPeA 97

13C5-PFHxA 100

  
05/30/2018





Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-RW-3385

Battelle ID J5970-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.280

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 5.68   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 4.40   | 0.34 | 1.00 | 2.50 |
| PFOA     | 14.69  | 0.38 | 1.00 | 2.50 |
| PFNA     | 1.49 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.41 J | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 2.53   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 3.12   | 0.34 | 1.00 | 2.50 |
| PFOS     | 14.77  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 118

13C5-PFPeA 97

13C5-PFHxA 89

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-RW-3178

Battelle ID J5972-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.285

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 3.90   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 2.25 J | 0.34 | 1.00 | 2.50 |
| PFOA     | 7.78   | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.87 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 4.74   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 6.86   | 0.34 | 1.00 | 2.50 |
| PFOS     | 13.71  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 124

13C5-PFPeA 98

13C5-PFHxA 91

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-050118-RW-304

Battelle ID J5974-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.275

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 7.94   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 4.20   | 0.34 | 1.00 | 2.50 |
| PFOA     | 12.99  | 0.38 | 1.00 | 2.50 |
| PFNA     | 1.57 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 6.75   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 6.71   | 0.34 | 1.00 | 2.50 |
| PFOS     | 13.58  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 114

13C5-PFPeA 88

13C5-PFHxA 90

  
05/30/2018



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-050118-RW-098

Battelle ID J5976-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.280

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 5.84   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 3.00   | 0.34 | 1.00 | 2.50 |
| PFOA     | 8.62   | 0.38 | 1.00 | 2.50 |
| PFNA     | 1.13 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 4.45   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 3.49   | 0.34 | 1.00 | 2.50 |
| PFOS     | 6.53   | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 124

13C5-PFPeA 103

13C5-PFHxA 93

  
05/30/2018

## **Appendix B**

Results as Reported by the Laboratory



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

|                                 |                      |      |      |      |
|---------------------------------|----------------------|------|------|------|
| Client ID                       | WGNA-043018-FRB-3103 |      |      |      |
| Battelle ID                     | J5965-FS             |      |      |      |
| Sample Type                     | SA                   |      |      |      |
| Collection Date                 | 04/30/2018           |      |      |      |
| Extraction Date                 | 05/09/2018           |      |      |      |
| Analysis Date                   | 05/14/2018           |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS  |      |      |      |
| % Moisture                      | NA                   |      |      |      |
| Matrix                          | DW                   |      |      |      |
| Sample Size                     | 0.250                |      |      |      |
| Size Unit-Basis                 | L                    |      |      |      |
| Units                           | ng/L                 | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U               | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U               | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U               | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U               | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U               | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U               | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U               | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U               | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                      |      |      |      |
| 13C4-PFBA                       | 105                  |      |      |      |
| 13C5-PFPeA                      | 109                  |      |      |      |
| 13C5-PFHxA                      | 111                  |      |      |      |





Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-043018-FRB-207

Battelle ID J5967-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 104

13C5-PFPeA 101

13C5-PFHxA 90



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-043018-FRB-3409

Battelle ID J5969-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 104

13C5-PFPeA 102

13C5-PFHxA 83



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                      |      |      |      |
|---------------------------------|----------------------|------|------|------|
| Client ID                       | WGNA-050118-FRB-3385 |      |      |      |
| Battelle ID                     | J5971-FS             |      |      |      |
| Sample Type                     | SA                   |      |      |      |
| Collection Date                 | 05/01/2018           |      |      |      |
| Extraction Date                 | 05/09/2018           |      |      |      |
| Analysis Date                   | 05/14/2018           |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS  |      |      |      |
| % Moisture                      | NA                   |      |      |      |
| Matrix                          | DW                   |      |      |      |
| Sample Size                     | 0.250                |      |      |      |
| Size Unit-Basis                 | L                    |      |      |      |
| Units                           | ng/L                 | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U               | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U               | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U               | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U               | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U               | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U               | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U               | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U               | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U               | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U               | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U               | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                      |      |      |      |
| 13C4-PFBA                       | 104                  |      |      |      |
| 13C5-PFPeA                      | 100                  |      |      |      |
| 13C5-PFHxA                      | 97                   |      |      |      |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-FRB-3178

Battelle ID J5973-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/09/2018

Analysis Date 05/14/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.250

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 0.22 U | 0.22 | 0.50 | 2.50 |
| PFHpA    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOA     | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.37 U | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 0.21 U | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.34 U | 0.34 | 1.00 | 2.50 |
| PFOS     | 0.30 U | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 120

13C5-PFPeA 106

13C5-PFHxA 90



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-050118-FRB-304 |      |      |      |
| Battelle ID                     | J5975-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 05/01/2018          |      |      |      |
| Extraction Date                 | 05/09/2018          |      |      |      |
| Analysis Date                   | 05/14/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.250               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U              | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 112                 |      |      |      |
| 13C5-PFPeA                      | 100                 |      |      |      |
| 13C5-PFHxA                      | 109                 |      |      |      |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-050118-FRB-098 |      |      |      |
| Battelle ID                     | J5977-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 05/01/2018          |      |      |      |
| Extraction Date                 | 05/09/2018          |      |      |      |
| Analysis Date                   | 05/14/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.250               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 0.22 U              | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOA                            | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFNA                            | 0.37 U              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 0.21 U              | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 0.34 U              | 0.34 | 1.00 | 2.50 |
| PFOS                            | 0.30 U              | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 106                 |      |      |      |
| 13C5-PFPeA                      | 103                 |      |      |      |
| 13C5-PFHxA                      | 101                 |      |      |      |





Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-043018-RW-3103

Battelle ID J5964-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.265

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 3.96   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 2.32 J | 0.34 | 1.00 | 2.50 |
| PFOA     | 8.38   | 0.38 | 1.00 | 2.50 |
| PFNA     | 2.24 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 3.91   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 4.94   | 0.34 | 1.00 | 2.50 |
| PFOS     | 7.27   | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 122

13C5-PFPeA 104

13C5-PFHxA 93



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID NAWC-043018-RW-207

Battelle ID J5966-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.265

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 3.75   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 2.10 J | 0.34 | 1.00 | 2.50 |
| PFOA     | 5.37   | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.71 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 1.69 J | 0.21 | 0.50 | 2.50 |
| PFHxS    | 0.94 J | 0.34 | 1.00 | 2.50 |
| PFOS     | 3.08   | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 111

13C5-PFPeA 94

13C5-PFHxA 89



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-043018-RW-3409

Battelle ID J5968-FS

Sample Type SA

Collection Date 04/30/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.275

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 7.68   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 4.27   | 0.34 | 1.00 | 2.50 |
| PFOA     | 11.71  | 0.38 | 1.00 | 2.50 |
| PFNA     | 1.68 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 7.62   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 6.35   | 0.34 | 1.00 | 2.50 |
| PFOS     | 14.68  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 125

13C5-PFPeA 97

13C5-PFHxA 100



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-RW-3385

Battelle ID J5970-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.280

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 5.68   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 4.40   | 0.34 | 1.00 | 2.50 |
| PFOA     | 14.69  | 0.38 | 1.00 | 2.50 |
| PFNA     | 1.49 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.41 J | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 2.53   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 3.12   | 0.34 | 1.00 | 2.50 |
| PFOS     | 14.77  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 118

13C5-PFPeA 97

13C5-PFHxA 89



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

Client ID WGNA-050118-RW-3178

Battelle ID J5972-FS

Sample Type SA

Collection Date 05/01/2018

Extraction Date 05/04/2018

Analysis Date 05/13/2018

Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA

Matrix DW

Sample Size 0.285

Size Unit-Basis L

| Units    | ng/L   | MDL  | LOD  | LOQ  |
|----------|--------|------|------|------|
| PFHxA    | 3.90   | 0.22 | 0.50 | 2.50 |
| PFHpA    | 2.25 J | 0.34 | 1.00 | 2.50 |
| PFOA     | 7.78   | 0.38 | 1.00 | 2.50 |
| PFNA     | 0.87 J | 0.37 | 1.00 | 2.50 |
| PFDA     | 0.39 U | 0.39 | 1.00 | 2.50 |
| PFUnA    | 0.38 U | 0.38 | 1.00 | 2.50 |
| PFDoA    | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTTrDA  | 0.42 U | 0.42 | 1.00 | 2.50 |
| PFTeDA   | 0.73 U | 0.73 | 1.50 | 2.50 |
| NMeFOSAA | 0.42 U | 0.42 | 1.00 | 2.50 |
| NEtFOSAA | 0.44 U | 0.44 | 1.00 | 2.50 |
| PFBS     | 4.74   | 0.21 | 0.50 | 2.50 |
| PFHxS    | 6.86   | 0.34 | 1.00 | 2.50 |
| PFOS     | 13.71  | 0.30 | 1.00 | 2.50 |

**Surrogate Recoveries (%)**

13C4-PFBA 124

13C5-PFPeA 98

13C5-PFHxA 91



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-050118-RW-304  |      |      |      |
| Battelle ID                     | J5974-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 05/01/2018          |      |      |      |
| Extraction Date                 | 05/04/2018          |      |      |      |
| Analysis Date                   | 05/13/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.275               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 7.94                | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 4.20                | 0.34 | 1.00 | 2.50 |
| PFOA                            | 12.99               | 0.38 | 1.00 | 2.50 |
| PFNA                            | 1.57 J              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 6.75                | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 6.71                | 0.34 | 1.00 | 2.50 |
| PFOS                            | 13.58               | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 114                 |      |      |      |
| 13C5-PFPeA                      | 88                  |      |      |      |
| 13C5-PFHxA                      | 90                  |      |      |      |





Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

|                                 |                     |      |      |      |
|---------------------------------|---------------------|------|------|------|
| Client ID                       | NAWC-050118-RW-098  |      |      |      |
| Battelle ID                     | J5976-FS            |      |      |      |
| Sample Type                     | SA                  |      |      |      |
| Collection Date                 | 05/01/2018          |      |      |      |
| Extraction Date                 | 05/04/2018          |      |      |      |
| Analysis Date                   | 05/13/2018          |      |      |      |
| Analytical Instrument           | Sciex 5500 LC/MS/MS |      |      |      |
| % Moisture                      | NA                  |      |      |      |
| Matrix                          | DW                  |      |      |      |
| Sample Size                     | 0.280               |      |      |      |
| Size Unit-Basis                 | L                   |      |      |      |
| Units                           | ng/L                | MDL  | LOD  | LOQ  |
| PFHxA                           | 5.84                | 0.22 | 0.50 | 2.50 |
| PFHpA                           | 3.00                | 0.34 | 1.00 | 2.50 |
| PFOA                            | 8.62                | 0.38 | 1.00 | 2.50 |
| PFNA                            | 1.13 J              | 0.37 | 1.00 | 2.50 |
| PFDA                            | 0.39 U              | 0.39 | 1.00 | 2.50 |
| PFUnA                           | 0.38 U              | 0.38 | 1.00 | 2.50 |
| PFDoA                           | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTTrDA                         | 0.42 U              | 0.42 | 1.00 | 2.50 |
| PFTeDA                          | 0.73 U              | 0.73 | 1.50 | 2.50 |
| NMeFOSAA                        | 0.42 U              | 0.42 | 1.00 | 2.50 |
| NEtFOSAA                        | 0.44 U              | 0.44 | 1.00 | 2.50 |
| PFBS                            | 4.45                | 0.21 | 0.50 | 2.50 |
| PFHxS                           | 3.49                | 0.34 | 1.00 | 2.50 |
| PFOS                            | 6.53                | 0.30 | 1.00 | 2.50 |
| <b>Surrogate Recoveries (%)</b> |                     |      |      |      |
| 13C4-PFBA                       | 124                 |      |      |      |
| 13C5-PFPeA                      | 103                 |      |      |      |
| 13C5-PFHxA                      | 93                  |      |      |      |

## **Appendix C**

Support Documentation



| Battelle<br>The Business of Innovation                                                                                         |  |                                                                                                                                                  |             |                             |        | Chain-of-Custody                         |   |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------|--------|------------------------------------------|---|-------------------|--|--------------------------------------------------------|--|--|--|-------------------|--|--------------|--|--|--|--|--|--|
| Client Contact Information<br><br>Andy Frebowitz<br>234 Mall Boulevard, Suite 260<br>King of Prussia, PA 19406<br>610-382-1170 |  | Project Manager: Jonathan Thorn<br><br>Sampler Information (print name): Mary Kay Bond<br>Phone: 610-382-1169<br>Email: mary.bond@tetrattech.com |             |                             |        | Sampling Site: WE04                      |   |                   |  | Site Information: NAS JRB Willow Grove/NAWC Warminster |  |  |  |                   |  |              |  |  |  |  |  |  |
| Project Name: WE04                                                                                                             |  | Turnaround Time (TAT) Requested: 21 days                                                                                                         |             |                             |        | Preservative<br>Trizma                   |   |                   |  |                                                        |  |  |  |                   |  | COC #        |  |  |  |  |  |  |
| Project No.: 112G08005-WE04                                                                                                    |  | Time Zone: Eastern                                                                                                                               |             |                             |        | Analysis<br>PFAS EPA 537<br>14 analytes  |   |                   |  |                                                        |  |  |  |                   |  | Page# 1 of 1 |  |  |  |  |  |  |
| Sample Identification                                                                                                          |  | Sample Date                                                                                                                                      | Sample Time | Sample Type                 | Matrix | Total # of Cont.                         |   |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| WGNA-050118-RW-3385 JS970                                                                                                      |  | 5/1/2018                                                                                                                                         | 09:10       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| WGNA-050118-FRB-3385 JS971                                                                                                     |  | 5/1/2018                                                                                                                                         | 09:05       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| WGNA-050118-RW-3178 JS972                                                                                                      |  | 5/1/2018                                                                                                                                         | 09:40       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| WGNA-050118-FRB-3178 JS973                                                                                                     |  | 5/1/2018                                                                                                                                         | 09:35       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| NAWC-050118-RW-304 JS974                                                                                                       |  | 5/1/2018                                                                                                                                         | 10:10       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| NAWC-050118-FRB-304 JS975                                                                                                      |  | 5/1/2018                                                                                                                                         | 10:05       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| NAWC-050118-RW-098 JS976                                                                                                       |  | 5/1/2018                                                                                                                                         | 10:40       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| NAWC-050118-FRB-098 JS977                                                                                                      |  | 5/1/2018                                                                                                                                         | 10:35       | G                           | DW     | 2                                        | X |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
|                                                                                                                                |  |                                                                                                                                                  |             |                             |        |                                          |   |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
|                                                                                                                                |  |                                                                                                                                                  |             |                             |        |                                          |   |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
|                                                                                                                                |  |                                                                                                                                                  |             |                             |        |                                          |   |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |
| Receipt Temperature:(°C)                                                                                                       |  | Samples Intact: Yes - No                                                                                                                         |             |                             |        | Samples on Ice: Yes - No                 |   |                   |  |                                                        |  |  |  | Receipt Comments: |  |              |  |  |  |  |  |  |
| Relinquished by (Print/Sign):<br>Mary Kay Bond                                                                                 |  | Company: Tetra Tech                                                                                                                              |             | Date/Time: 05/01/2018 16:00 |        | Received by (Print/Sign):<br>[Signature] |   | Company: Battelle |  | Date/Time: 5/2/18 1130                                 |  |  |  |                   |  |              |  |  |  |  |  |  |
| Relinquished by (Print/Sign):                                                                                                  |  | Company:                                                                                                                                         |             | Date/Time:                  |        | Received by (Print/Sign):                |   | Company:          |  | Date/Time:                                             |  |  |  |                   |  |              |  |  |  |  |  |  |
| Relinquished by (Print/Sign):                                                                                                  |  | Company:                                                                                                                                         |             | Date/Time:                  |        | Received by (Print/Sign):                |   | Company:          |  | Date/Time:                                             |  |  |  |                   |  |              |  |  |  |  |  |  |
| Comments: FedEx Tracking # 7721 2279 0356                                                                                      |  |                                                                                                                                                  |             |                             |        |                                          |   |                   |  |                                                        |  |  |  |                   |  |              |  |  |  |  |  |  |

## QA/QC Summary Batch 18-0312

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| Project:          | CTO-WE04 Naval Air Station Joint Reserve Base Willow Grove |
| Parameters:       | PFAS                                                       |
| Laboratory:       | Battelle, Norwell, MA                                      |
| Matrix:           | DW                                                         |
| Data Set:         | DP-18-0111                                                 |
| Analytical SOP:   | 5-371                                                      |
| Method Reference: | USEPA 537 rev. 1.1, QSM 5.1                                |

### Sample Custody

| Collection Date | Receipt Date | Temp (°C) |
|-----------------|--------------|-----------|
| 4/30/2018       | 5/1/2018     | 1.9       |
| 5/1/2018        | 5/2/2018     | 1.7       |

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Corrective Actions | None                                                         |
| Sample Storage     | The water samples were stored refrigerated until extraction. |
| Related samples    | FRB samples related to field samples reported in SDG 13-0299 |

### METHOD SUMMARIES

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Preparation | Water samples were spiked with surrogates in the original sample container from the field. The water was extracted using a weak ion exchange solid phase extraction (SPE) cartridge and eluted from the SPE with methanol. Extracts were split and concentrated to dryness under nitrogen with a water bath set between 60 °C and 65 °C, reconstituted with 96:4 methanol/water (V/V) and fortified with internal standard. Extracts were transferred for LC-MS/MS analysis.                                                                       |
| Prep comments      | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Analysis           | PFAS were measured by liquid chromatography tandem mass spectrometry (LC-MS/MS) in the multiple reaction monitoring (MRM). An initial calibration consisting of representative target analytes, labelled analogs, and internal standards was analyzed prior to analysis to demonstrate the linear range of analysis. Calibration verification was performed at the beginning and end of 10 injections and at the end of each sequence. Target PFAS were quantified using the isotope dilution method. Samples are reported in ng/L concentrations. |
| Analysis Comments  | Samples analyzed on the Sciex 5500.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Holding Times | Extraction Date(s) | Analysis Date(s) |
|---------------|--------------------|------------------|
|               | 5/9/2018           | 5/14/2018        |

|                       |                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------|
| Procedural Blank (PB) | A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods are free of contamination. |
| ≤ 1/3 the MRL         | No exceedances noted.<br>No comments.                                                                                        |
|                       |                                                                                                                              |

**QA/QC Summary**  
**Batch 18-0312**

|                                                                                                               |                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laboratory Control Spike (LCS)                                                                                | A LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.                                         |
| 70-130% of true value                                                                                         | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No comments.                                                                                                                                                          |
| Surrogates Standard Analytes                                                                                  | Labelled surrogate compounds were added prior to extraction. The recoveries are calculated to measure extraction efficiency.                                          |
| 70-130% of true value                                                                                         | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No Comments.                                                                                                                                                          |
| Internal Standard Analytes                                                                                    | Labelled analog compounds were added prior to analysis.                                                                                                               |
| ICal high and low points RPD $\leq 20\%$ , 50-150% of average area of the ICAL and 70-140% of most recent CCV | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No Comments.                                                                                                                                                          |
| Initial Calibration (ICAL)                                                                                    | The LC-MS/MS was calibrated with multi-level calibration curve for all compounds using linear or quadratic curve fitting.                                             |
| R <sup>2</sup> >0.99                                                                                          | No exceedances noted.                                                                                                                                                 |
| Target and SIS compounds +/- 30% of true value, Low point 50-150% of true value                               | No comments.                                                                                                                                                          |
| Independent Calibration Check (ICC)                                                                           | The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.                       |
| Target and SIS compounds +/- 30% of true value                                                                | No exceedances noted.                                                                                                                                                 |
|                                                                                                               | No comments.                                                                                                                                                          |
| Continuing Calibration Verification (CCV)                                                                     | Continuing calibration standards were run at the beginning and end of 10 injections and at the end of the sequence to ensure that initial calibration is still valid. |
| Target and SIS compounds +/- 30% of true value                                                                | No exceedances noted.                                                                                                                                                 |
| Low point 50-150% of true value                                                                               | No comments.                                                                                                                                                          |





Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project Number: 100117920-WE04  
 Preparation Batch: 18-0312  
 Data Set: DP-18-0111  
 Test Code: Master\_371

| QC Parameter:                                     | Exceed: | Justification: |
|---------------------------------------------------|---------|----------------|
| Procedural Blank                                  | 0       | None           |
| PB Measurement Quality Objective                  | 0       | None           |
| Laboratory Control Sample                         | 0       | None           |
| Matrix Spike / Matrix Spike Duplicate Recovery    | N/A     | None           |
| Matrix Spike / Matrix Spike Duplicate Precision   | 0       | None           |
| Extracted Internal Standard Analytes (Surrogates) | 0       | None           |
| Instrument Calibration                            | 0       | None           |
| Instrument Blank                                  | 0       | None           |
| Independent Calibration Check                     | 0       | None           |
| Continuing Calibration Verification               | 0       | None           |

**It can be done****BATTELLE - NORWELL OPERATIONS  
SAMPLE IDENTIFICATION PAGE****Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| <b>Sample ID</b> | <b>Description</b>        |
|------------------|---------------------------|
| CQ753PB-FS       | Procedural Blank          |
| CQ754LCS-FS      | Laboratory Control Sample |
| J5965-FS         | WGNA-043018-FRB-3103      |
| J5967-FS         | NAWC-043018-FRB-207       |
| J5969-FS         | WGNA-043018-FRB-3409      |
| J5971-FS         | WGNA-050118-FRB-3385      |
| J5973-FS         | WGNA-050118-FRB-3178      |
| J5975-FS         | NAWC-050118-FRB-304       |
| J5977-FS         | NAWC-050118-FRB-098       |

Samples Assigned By:

Stephanie Schultz

Date :

May 9, 2018

Comments:



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

| Client ID             | Procedural Blank    |      |      |      |  |
|-----------------------|---------------------|------|------|------|--|
| Battelle ID           | CQ753PB-FS          |      |      |      |  |
| Sample Type           | PB                  |      |      |      |  |
| Collection Date       | 05/09/2018          |      |      |      |  |
| Extraction Date       | 05/09/2018          |      |      |      |  |
| Analysis Date         | 05/14/2018          |      |      |      |  |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |  |
| % Moisture            | NA                  |      |      |      |  |
| Matrix                | WATER               |      |      |      |  |
| Sample Size           | 0.250               |      |      |      |  |
| Size Unit-Basis       | L                   |      |      |      |  |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |  |
| PFHxA                 | 0.22 U              | 0.22 | 0.50 | 2.50 |  |
| PFHpA                 | 0.34 U              | 0.34 | 1.00 | 2.50 |  |
| PFOA                  | 0.38 U              | 0.38 | 1.00 | 2.50 |  |
| PFNA                  | 0.37 U              | 0.37 | 1.00 | 2.50 |  |
| PFDA                  | 0.39 U              | 0.39 | 1.00 | 2.50 |  |
| PFUnA                 | 0.38 U              | 0.38 | 1.00 | 2.50 |  |
| PFDoA                 | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| PFTTrDA               | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| PFTeDA                | 0.73 U              | 0.73 | 1.50 | 2.50 |  |
| NMeFOSAA              | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| NEtFOSAA              | 0.44 U              | 0.44 | 1.00 | 2.50 |  |
| PFBS                  | 0.21 U              | 0.21 | 0.50 | 2.50 |  |
| PFHxS                 | 0.34 U              | 0.34 | 1.00 | 2.50 |  |
| PFOS                  | 0.30 U              | 0.30 | 1.00 | 2.50 |  |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 115 |
| 13C2-PFDA  | 117 |
| d5-EtFOSAA | 105 |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

| Client ID                       | Laboratory Control Sample |        |          |      |                |       |
|---------------------------------|---------------------------|--------|----------|------|----------------|-------|
| Battelle ID                     | CQ754LCS-FS               |        |          |      |                |       |
| Sample Type                     | LCS                       |        |          |      |                |       |
| Collection Date                 | 05/09/2018                |        |          |      |                |       |
| Extraction Date                 | 05/09/2018                |        |          |      |                |       |
| Analysis Date                   | 05/14/2018                |        |          |      |                |       |
| Analytical Instrument           | Sciex 5500 LC/MS/MS       |        |          |      |                |       |
| % Moisture                      | NA                        |        |          |      |                |       |
| Matrix                          | WATER                     |        |          |      |                |       |
| Sample Size                     | 0.250                     |        |          |      |                |       |
| Size Unit-Basis                 | L                         |        |          |      |                |       |
| Units                           | ng/L                      | Target | Recovery | Qual | Control Limits |       |
|                                 |                           |        |          |      | Lower          | Upper |
| PFHxA                           | 10.43                     | 10.00  | 104      |      | 70             | 130   |
| PFHpA                           | 9.94                      | 10.00  | 99       |      | 70             | 130   |
| PFOA                            | 10.21                     | 10.00  | 102      |      | 70             | 130   |
| PFNA                            | 9.64                      | 10.00  | 96       |      | 70             | 130   |
| PFDA                            | 9.74                      | 10.00  | 97       |      | 70             | 130   |
| PFUnA                           | 9.74                      | 10.00  | 97       |      | 70             | 130   |
| PFDoA                           | 9.50                      | 10.00  | 95       |      | 70             | 130   |
| PFTTrDA                         | 9.88                      | 10.00  | 99       |      | 70             | 130   |
| PFTeDA                          | 11.29                     | 10.00  | 113      |      | 70             | 130   |
| NMeFOSAA                        | 11.25                     | 10.00  | 113      |      | 70             | 130   |
| NEtFOSAA                        | 11.32                     | 10.00  | 113      |      | 70             | 130   |
| PFBS                            | 10.15                     | 8.85   | 115      |      | 70             | 130   |
| PFHxS                           | 9.51                      | 9.45   | 101      |      | 70             | 130   |
| PFOS                            | 8.34                      | 9.55   | 87       |      | 70             | 130   |
| <b>Surrogate Recoveries (%)</b> |                           |        |          |      |                |       |
| 13C4-PFBA                       | 109                       |        |          |      |                |       |
| 13C5-PFPeA                      | 99                        |        |          |      |                |       |
| 13C5-PFHxA                      | 100                       |        |          |      |                |       |

Project Client: Tetra Tech

Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA

Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte   | Area       | RPD (L1/L9) |
|-------------|-----------|---------------|-----------|------------|-------------|
| JV64        | L1        | 5/14/18 16:27 | 13C4-PFOS | 117,641.83 | -           |
| JV65        | L2        | 5/14/18 16:36 | 13C4-PFOS | 128,859.01 | -           |
| JV66        | L3        | 5/14/18 16:45 | 13C4-PFOS | 105,963.04 | -           |
| JV67        | L4        | 5/14/18 16:53 | 13C4-PFOS | 131,015.70 | -           |
| JV68        | L5        | 5/14/18 17:02 | 13C4-PFOS | 118,468.59 | -           |
| JV69        | L6        | 5/14/18 17:11 | 13C4-PFOS | 124,400.13 | -           |
| JV70        | L7        | 5/14/18 17:20 | 13C4-PFOS | 118,733.91 | -           |
| JV71        | L8        | 5/14/18 17:29 | 13C4-PFOS | 101,181.69 | -           |
| JV72        | L9        | 5/14/18 17:38 | 13C4-PFOS | 105,473.33 | 10.9        |

PASS

Average      Lower      Upper  
116,859.69    58,429.85    175,289.54

| Sample Name    | Sample ID                 | Analysis Date | Analyte   | Area       | Lower     | Upper      | Qualifier | CCV Lower | CCV Upper  | Qualifier |
|----------------|---------------------------|---------------|-----------|------------|-----------|------------|-----------|-----------|------------|-----------|
| JV64           | L1                        | 5/14/18 16:27 | 13C4-PFOS | 117,641.83 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV65           | L2                        | 5/14/18 16:36 | 13C4-PFOS | 128,859.01 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV66           | L3                        | 5/14/18 16:45 | 13C4-PFOS | 105,963.04 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV67           | L4                        | 5/14/18 16:53 | 13C4-PFOS | 131,015.70 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV68           | L5                        | 5/14/18 17:02 | 13C4-PFOS | 118,468.59 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV69           | L6                        | 5/14/18 17:11 | 13C4-PFOS | 124,400.13 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV70           | L7                        | 5/14/18 17:20 | 13C4-PFOS | 118,733.91 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV71           | L8                        | 5/14/18 17:29 | 13C4-PFOS | 101,181.69 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV72           | L9                        | 5/14/18 17:38 | 13C4-PFOS | 105,473.33 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV63 ICC       | ICC                       | 5/14/18 17:47 | 13C4-PFOS | 103,611.84 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| CQ753PB-FS(0)  | Procedural Blank          | 5/14/18 18:05 | 13C4-PFOS | 103,853.95 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| CQ754LCS-FS(0) | Laboratory Control Sample | 5/14/18 18:14 | 13C4-PFOS | 84,459.89  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5965-FS(0)    | WGNA-043018-FRB-3103      | 5/14/18 18:23 | 13C4-PFOS | 116,949.30 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5967-FS(0)    | NAWC-043018-FRB-207       | 5/14/18 18:32 | 13C4-PFOS | 94,129.68  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5969-FS(0)    | WGNA-043018-FRB-3409      | 5/14/18 18:41 | 13C4-PFOS | 111,823.48 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5971-FS(0)    | WGNA-050118-FRB-3385      | 5/14/18 18:49 | 13C4-PFOS | 90,706.52  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5973-FS(0)    | WGNA-050118-FRB-3178      | 5/14/18 18:58 | 13C4-PFOS | 94,076.63  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5975-FS(0)    | NAWC-050118-FRB-304       | 5/14/18 19:07 | 13C4-PFOS | 88,279.99  | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| J5977-FS(0)    | NAWC-050118-FRB-098       | 5/14/18 19:16 | 13C4-PFOS | 109,495.96 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |
| JV68 CCV       | CCV                       | 5/14/18 19:25 | 13C4-PFOS | 121,468.05 | 58,429.85 | 175,289.54 |           | 82,928.01 | 165,856.03 |           |

Project Client: Tetra Tech

Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA

Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte   | Area      | RPD (L1/L9) |
|-------------|-----------|---------------|-----------|-----------|-------------|
| JV64        | L1        | 5/14/18 16:27 | 13C2-PFOA | 38,439.74 | -           |
| JV65        | L2        | 5/14/18 16:36 | 13C2-PFOA | 39,205.09 | -           |
| JV66        | L3        | 5/14/18 16:45 | 13C2-PFOA | 34,066.69 | -           |
| JV67        | L4        | 5/14/18 16:53 | 13C2-PFOA | 39,739.37 | -           |
| JV68        | L5        | 5/14/18 17:02 | 13C2-PFOA | 34,175.48 | -           |
| JV69        | L6        | 5/14/18 17:11 | 13C2-PFOA | 38,237.89 | -           |
| JV70        | L7        | 5/14/18 17:20 | 13C2-PFOA | 39,542.23 | -           |
| JV71        | L8        | 5/14/18 17:29 | 13C2-PFOA | 35,226.63 | -           |
| JV72        | L9        | 5/14/18 17:38 | 13C2-PFOA | 38,024.48 | 1.1         |

PASS

Average      Lower      Upper  
 37,406.40    18,703.20    56,109.60

| Sample Name    | Sample ID                 | Analysis Date | Analyte   | Area      | Lower     | Upper     | Qualifier | CCV Lower | CCV Upper | Qualifier |
|----------------|---------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| JV64           | L1                        | 5/14/18 16:27 | 13C2-PFOA | 38,439.74 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV65           | L2                        | 5/14/18 16:36 | 13C2-PFOA | 39,205.09 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV66           | L3                        | 5/14/18 16:45 | 13C2-PFOA | 34,066.69 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV67           | L4                        | 5/14/18 16:53 | 13C2-PFOA | 39,739.37 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV68           | L5                        | 5/14/18 17:02 | 13C2-PFOA | 34,175.48 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV69           | L6                        | 5/14/18 17:11 | 13C2-PFOA | 38,237.89 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV70           | L7                        | 5/14/18 17:20 | 13C2-PFOA | 39,542.23 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV71           | L8                        | 5/14/18 17:29 | 13C2-PFOA | 35,226.63 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV72           | L9                        | 5/14/18 17:38 | 13C2-PFOA | 38,024.48 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV63 ICC       | ICC                       | 5/14/18 17:47 | 13C2-PFOA | 35,637.34 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| CQ753PB-FS(0)  | Procedural Blank          | 5/14/18 18:05 | 13C2-PFOA | 31,105.55 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| CQ754LCS-FS(0) | Laboratory Control Sample | 5/14/18 18:14 | 13C2-PFOA | 29,190.46 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5965-FS(0)    | WGNA-043018-FRB-3103      | 5/14/18 18:23 | 13C2-PFOA | 37,306.55 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5967-FS(0)    | NAWC-043018-FRB-207       | 5/14/18 18:32 | 13C2-PFOA | 29,453.32 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5969-FS(0)    | WGNA-043018-FRB-3409      | 5/14/18 18:41 | 13C2-PFOA | 33,204.68 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5971-FS(0)    | WGNA-050118-FRB-3385      | 5/14/18 18:49 | 13C2-PFOA | 27,675.77 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5973-FS(0)    | WGNA-050118-FRB-3178      | 5/14/18 18:58 | 13C2-PFOA | 27,255.88 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5975-FS(0)    | NAWC-050118-FRB-304       | 5/14/18 19:07 | 13C2-PFOA | 28,391.02 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| J5977-FS(0)    | NAWC-050118-FRB-098       | 5/14/18 19:16 | 13C2-PFOA | 34,760.01 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |
| JV68 CCV       | CCV                       | 5/14/18 19:25 | 13C2-PFOA | 36,497.99 | 18,703.20 | 56,109.60 |           | 23,922.84 | 47,845.67 |           |



Project Client: Tetra Tech  
Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA  
Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte    | Area      | RPD (L1/L9) |
|-------------|-----------|---------------|------------|-----------|-------------|
| JV64        | L1        | 5/14/18 16:27 | d3-MeFOSAA | 36,112.58 | -           |
| JV65        | L2        | 5/14/18 16:36 | d3-MeFOSAA | 36,897.69 | -           |
| JV66        | L3        | 5/14/18 16:45 | d3-MeFOSAA | 30,420.23 | -           |
| JV67        | L4        | 5/14/18 16:53 | d3-MeFOSAA | 35,707.97 | -           |
| JV68        | L5        | 5/14/18 17:02 | d3-MeFOSAA | 33,628.73 | -           |
| JV69        | L6        | 5/14/18 17:11 | d3-MeFOSAA | 34,298.33 | -           |
| JV70        | L7        | 5/14/18 17:20 | d3-MeFOSAA | 36,446.02 | -           |
| JV71        | L8        | 5/14/18 17:29 | d3-MeFOSAA | 31,869.23 | -           |
| JV72        | L9        | 5/14/18 17:38 | d3-MeFOSAA | 35,734.85 | 1.1         |

PASS

Average 34,568.40 Lower 17,284.20 Upper 51,852.60

| Sample Name    | Sample ID                 | Analysis Date | Analyte    | Area      | Lower     | Upper     | Qualifier | CCV Lower | CCV Upper | Qualifier |
|----------------|---------------------------|---------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| JV64           | L1                        | 5/14/18 16:27 | d3-MeFOSAA | 36,112.58 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV65           | L2                        | 5/14/18 16:36 | d3-MeFOSAA | 36,897.69 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV66           | L3                        | 5/14/18 16:45 | d3-MeFOSAA | 30,420.23 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV67           | L4                        | 5/14/18 16:53 | d3-MeFOSAA | 35,707.97 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV68           | L5                        | 5/14/18 17:02 | d3-MeFOSAA | 33,628.73 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV69           | L6                        | 5/14/18 17:11 | d3-MeFOSAA | 34,298.33 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV70           | L7                        | 5/14/18 17:20 | d3-MeFOSAA | 36,446.02 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV71           | L8                        | 5/14/18 17:29 | d3-MeFOSAA | 31,869.23 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV72           | L9                        | 5/14/18 17:38 | d3-MeFOSAA | 35,734.85 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV63 ICC       | ICC                       | 5/14/18 17:47 | d3-MeFOSAA | 32,603.64 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| CQ753PB-FS(0)  | Procedural Blank          | 5/14/18 18:05 | d3-MeFOSAA | 33,816.55 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| CQ754LCS-FS(0) | Laboratory Control Sample | 5/14/18 18:14 | d3-MeFOSAA | 26,148.55 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5965-FS(0)    | WGNA-043018-FRB-3103      | 5/14/18 18:23 | d3-MeFOSAA | 33,389.17 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5967-FS(0)    | NAWC-043018-FRB-207       | 5/14/18 18:32 | d3-MeFOSAA | 29,381.71 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5969-FS(0)    | WGNA-043018-FRB-3409      | 5/14/18 18:41 | d3-MeFOSAA | 32,886.89 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5971-FS(0)    | WGNA-050118-FRB-3385      | 5/14/18 18:49 | d3-MeFOSAA | 26,728.75 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5973-FS(0)    | WGNA-050118-FRB-3178      | 5/14/18 18:58 | d3-MeFOSAA | 26,940.76 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5975-FS(0)    | NAWC-050118-FRB-304       | 5/14/18 19:07 | d3-MeFOSAA | 24,390.83 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| J5977-FS(0)    | NAWC-050118-FRB-098       | 5/14/18 19:16 | d3-MeFOSAA | 30,654.25 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |
| JV68 CCV       | CCV                       | 5/14/18 19:25 | d3-MeFOSAA | 32,203.27 | 17,284.20 | 51,852.60 |           | 23,540.11 | 47,080.22 |           |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | JV70                 | Injection Vial   | 8            |
| Sample ID          | L7                   | Injection Volume | 10.00        |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 5/14/2018 5:20:42 PM | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte | MRM Transition | RT   | Asymmetry Factor | Passing Range |
|---------|----------------|------|------------------|---------------|
| PFBS_1  | 298.9 / 80.0   | 1.44 | 1.50             | 0.8 – 1.5     |
| PFHxA_1 | 313.0 / 269.0  | 1.72 | 1.36             | 0.8 – 1.5     |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | JV70                 | Injection Vial   | 8            |
| Sample ID          | L7                   | Injection Volume | 10.00        |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 5/14/2018 5:20:42 PM | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_BASE |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Spectra Acquisition Rate | Passing Range |
|------------|----------------|------|--------------------------|---------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | 24                       | >10           |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 24                       | >10           |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | 62                       | >10           |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 57                       | >10           |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 28                       | >10           |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | 45                       | >10           |
| PFHxS_1    | 399.0 / 80.0   | 2.09 | 64                       | >10           |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 52                       | >10           |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 62                       | >10           |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 55                       | >10           |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 54                       | >10           |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 51                       | >10           |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 70                       | >10           |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 67                       | >10           |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 51                       | >10           |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 46                       | >10           |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 56                       | >10           |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 29                       | >10           |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 55                       | >10           |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 37                       | >10           |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 62                       | >10           |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 39                       | >10           |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 71                       | >10           |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 48                       | >10           |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 58                       | >10           |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 52                       | >10           |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 47                       | >10           |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | 39                       | >10           |

|                    |                      |                  |              |
|--------------------|----------------------|------------------|--------------|
| Sample Name        | JV70                 | Injection Vial   | 8            |
| Sample ID          | L7                   | Injection Volume | 10.00        |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 5/14/2018 5:20:42 PM | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0312_SIS  |
| Sample Comment     |                      |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Spectra<br>Acquisition Rate | Passing Range |
|------------|----------------|------|-----------------------------|---------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 40                          | >10           |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 39                          | >10           |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 36                          | >10           |

Analytical Transitions for PFAS in drinking water

SOP 5-371 (EPA 537 Version 1.1)

| Analyte                                 | CAS No.    | Type   | Primary Transition | Secondary Transition |
|-----------------------------------------|------------|--------|--------------------|----------------------|
| <b>PFHxA</b>                            | 307-24-4   | Target | 313.0 / 269.0      | 313.0 / 119.0        |
| <b>PFHpA</b>                            | 375-85-9   | Target | 363.0 / 319.0      | 363.0 / 169.0        |
| <b>PFOA</b>                             | 335-67-1   | Target | 413.0 / 369.0      | 413.0 / 169.0        |
| <b>PFNA</b>                             | 375-95-1   | Target | 463.0 / 419.0      | 463.0 / 219.0        |
| <b>PFDA</b>                             | 335-76-2   | Target | 513.0 / 469.0      | 513.0 / 219.0        |
| <b>PFUnA</b>                            | 2058-94-8  | Target | 563.0 / 519.0      | 563.0 / 269.0        |
| <b>PFDoA</b>                            | 307-55-1   | Target | 613.0 / 569.0      | 613.0 / 319.0        |
| <b>PFTTrDA</b>                          | 72629-94-8 | Target | 663.0 / 619.0      | 663.0 / 169.0        |
| <b>PFTeDA</b>                           | 376-06-7   | Target | 713.0 / 669.0      | 713.0 / 169.0        |
| <b>NMeFOSAA</b>                         | 2355-31-9  | Target | 570.0 / 419.0      | 570.0 / 512.0        |
| <b>NEtFOSAA</b>                         | 2991-50-6  | Target | 584.0 / 419.0      | 584.0 / 483.0        |
| <b>PFBS</b>                             | 375-73-5   | Target | 298.9.0 / 80.0     | 298.9.0 / 99.0       |
| <b>PFHxS</b>                            | 355-46-4   | Target | 399.0 / 80.0       | 399.0 / 99.0         |
| <b>PFOS</b>                             | 1763-23-1  | Target | 499.0 / 80.0       | 499.0 / 99.0         |
| <b><sup>13</sup>C<sub>2</sub>-PFHxA</b> | NA         | SIS    | 315.0 / 270.0      | NA                   |
| <b><sup>13</sup>C<sub>2</sub>-PFDA</b>  | NA         | SIS    | 515.0 / 470.0      | NA                   |
| <b>d<sub>5</sub>-EtFOSAA</b>            | NA         | SIS    | 589.0 / 419.0      | NA                   |
| <b><sup>13</sup>C<sub>2</sub>-PFOA</b>  | NA         | IS     | 415.0 / 270.0      | NA                   |
| <b><sup>13</sup>C<sub>4</sub>-PFOS</b>  | NA         | IS     | 503.0 / 80.0       | NA                   |
| <b>d<sub>3</sub>-MeFOSAA</b>            | NA         | IS     | 573.0 / 419.0      | NA                   |

# BATTELLE DETECTION LIMITS FOR PFAS IN DRINKING WATER

Page 48 of 506

Battelle SOP 5-371 (EPA Method 537 Version 1.1)

| Analyte         | CAS No.    | MDL (ng/L) | LOD (ng/L) | LOQ (ng/L) | MRL (ng/L) |
|-----------------|------------|------------|------------|------------|------------|
| <b>PFHxA</b>    | 307-24-4   | 0.22       | 0.5        | 2.5        | 2.5        |
| <b>PFHpA</b>    | 375-85-9   | 0.34       | 1.0        | 2.5        | 2.5        |
| <b>PFOA</b>     | 335-67-1   | 0.38       | 1.0        | 2.5        | 2.5        |
| <b>PFNA</b>     | 375-95-1   | 0.37       | 1.0        | 2.5        | 2.5        |
| <b>PFDA</b>     | 335-76-2   | 0.39       | 1.0        | 2.5        | 2.5        |
| <b>PFUnA</b>    | 2058-94-8  | 0.38       | 1.0        | 2.5        | 2.5        |
| <b>PFDoA</b>    | 307-55-1   | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>PFTTrDA</b>  | 72629-94-8 | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>PFTeDA</b>   | 376-06-7   | 0.73       | 1.5        | 2.5        | 2.5        |
| <b>NMeFOSAA</b> | 2355-31-9  | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>NEtFOSAA</b> | 2991-50-6  | 0.44       | 1.0        | 2.5        | 2.5        |
| <b>PFBS</b>     | 375-73-5   | 0.21       | 0.5        | 2.5        | 2.5        |
| <b>PFHxS</b>    | 3871-99-6  | 0.34       | 1.0        | 2.5        | 2.5        |
| <b>PFOS</b>     | 1763-23-1  | 0.30       | 1.0        | 2.5        | 2.5        |

*Analytes on NELAP and ELAP QSM 5.1 Scope of accreditation*



**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

Mass calibration and tune check

## QTRAP 5500 Preventive Maintenance Checklist

|                              |                             |
|------------------------------|-----------------------------|
| Preventive Maintenance Date: | 22-Feb-2017                 |
| Request ID:                  | 3683                        |
| Company Name:                | Battelle Memorial Institute |
| Instrument ID:               | X60666                      |
| Instrument Model:            | QTRAP 5500                  |
| Instrument Serial Number:    | AU23051004                  |

☒ **PASS**

☐ **FAIL**

**Any failure will lead to an automatic Service Call being open to investigate fault.**

Preventive Maintenance is performed twice every year unless specified in the Service Contract. It is designed to help maintain optimum system performance and to help diagnose any system deficiencies.

Engineer is required the assigned Request ID for this PM otherwise making this job invalid.

**Comments:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Performed By:** Kaustubh Dhayagude **Date:** 22-Feb-2017

**Approved By :** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## PRE PM PPG PERFORMANCE EVALUATION:

- ☒ Consult Customer concerning the unit overall performance.
- ☒ Check Logbook for Services recently performed.
- ☒ Check Vacuum Pressure:

| CAD Settings                                   | Vacuum Reading<br>( x 10 <sup>-5</sup> Torr) | Acceptance Criteria               |
|------------------------------------------------|----------------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> CAD 0      | 0.5                                          | 0.4 to 1.1 x10 <sup>-5</sup> Torr |
| <input checked="" type="checkbox"/> CAD Low    | 1.9                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD Medium | 2.4                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD High   | 3.4                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD 12     | 3.4                                          | 2.4 to 4.5 x10 <sup>-5</sup> Torr |

- ☒ Check for Front end contamination symptoms. Run Q1 POS PPG using PPG 2e-7for a few minutes and check for any TIC signal degradation or huge sensitivity drop where the sensitivity result can't pass specification
  - ☒ No degradation or Sensitivity drop
- ☒ Check for Q3 contamination symptoms. Run Q3 POS PPG using PPG 2e-7for a few minutes and check for any TIC signal degradation or huge sensitivity drop where the sensitivity result can't pass specification
  - ☒ No degradation or Sensitivity drop

**Pre PM PPG Test:** Perform each of the following tests. Optimize ion source position only. The specifications listed for these Pre PM tests are guidelines only, not required to be met.

- ☒ Perform Q1 POS using POS PPG 2e-7M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q1 Intensity |           | Q1 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q1 175.133 | 1.64 e6      | Read Only | 0.8095         | Read Only   |
| Q1 500.380 | 2.40 e7      | Read Only | 0.8592         | Read Only   |
| Q1 906.673 | 2.86 e7      | Read Only | 0.9633         | Read Only   |

- ☒ Perform Q3 POS using POS PPG 2e-7M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q3 Intensity |           | Q3 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q3 175.133 | 1.26 e6      | Read Only | 0.6252         | Read Only   |
| Q3 500.380 | 2.19 e7      | Read Only | 0.7275         | Read Only   |
| Q3 906.673 | 3.02 e7      | Read Only | 0.7662         | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

☒ Perform MSMS POS in Product Ion scan with 609.3 parent and record daughter 195.1 using Reserpine 0.167 pmol/ul at the scan rate of 10 Da/s for 10 MCA. Calculate transmission efficiency comparing Q1POS 609 intensity. Transmission Efficiency: : 19.51% (Read Only)

| Mass        | MSMS Intensity |           | MSMS Width Value | Width Specs |
|-------------|----------------|-----------|------------------|-------------|
|             | Value          | Spec      |                  |             |
| Q1 609.3    | 7.43 e7        | Read Only | 0.9981           | Read Only   |
| MS/MS 195.1 | 1.45 e7        | Read Only | 0.6582           | Read Only   |

☒ Perform Q1 NEG using NEG PPG 3e-5M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q1 Intensity |           | Q1 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q1 933.636 | 1.43 e7      | Read Only | 0.7330         | Read Only   |

☒ Perform Q3 NEG using NEG PPG 3e-5M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q3 Intensity |           | Q3 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q3 933.636 | 2.22 e7      | Read Only | 0.8138         | Read Only   |

☒ Perform Product Ion scan using NEG PPG 3e-5M. Record 10 mca.

| Mass    | Scan Rate | MCA | MSMS Intensity |           | MSMS Width Value | Width Specs |
|---------|-----------|-----|----------------|-----------|------------------|-------------|
|         |           |     | Value          | Spec      |                  |             |
| MSMS 45 | 10        | 10  | 3.35 e6        | Read Only | 0.6495           | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## PREVENTIVE MAINTENANCE CHECKLIST:

- ☒ Check Cooling Fans for Turbo Pumps while MS is ON.
- ☒ Check QJet and QPS tuning voltage for reference.
- ☐ Record AC input Voltage while MS is OFF: \_\_\_\_\_ (200-240VAC).  
If Out-of-Range, notify customer.
- ☒ Clean Interface
  - ☒ Curtain Plate
  - ☒ Orifice Plate
  - ☒ QJet
  - ☒ Q0 Rods.
- ☒ Replace Roughing Pump Oil.
- ☒ Inspect Oil Exhaust Filter, if Applicable. ☐ N/A
- ☒ Clean and inspect built-in divert valve if used. ☐ N/A
- ☒ Check Multiplier Voltage, optimize if necessary.
- ☒ Replace four Air Filters at the bottom of the mass spectrometer.
- ☒ Pump down overnight if possible. ☐ N/A
- ☒ Perform Maintenance on Turbo V source.
- ☒ Replace Electrode, if necessary. ☐ N/A
- ☒ Check Turbo heaters resistances.
- ☒ Check if Temperature is reached at 500C with TIS Probe installed.
- ☐ Check if Temperature is reached at 500C with APCI Probe installed. ☒ N/A

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## POST PM PPG PERFORMANCE TESTS:

- ☒ Set-up Sample for Infusion.
- ☒ Check spray and adjust sprayer's position of the TIS source.
- ☒ Check Vacuum Pressure:

| CAD Settings                                   | Vacuum Reading<br>( x 10 <sup>-5</sup> Torr) | Acceptance Criteria               |
|------------------------------------------------|----------------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> CAD 0      | 0.8                                          | 0.4 to 1.1 x10 <sup>-5</sup> Torr |
| <input checked="" type="checkbox"/> CAD Low    | 2.1                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD Medium | 2.6                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD High   | 3.7                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD 12     | 3.7                                          | 2.4 to 4.5 x10 <sup>-5</sup> Torr |

- ☒ Perform Q1 POS using POS PPG 2e-7M. Mass calibrate to less than 0.1 amu.

| Mass                              | Q1 Intensity |                    | Q1 Width Value | Width Specs |
|-----------------------------------|--------------|--------------------|----------------|-------------|
|                                   | Value        | Spec               |                |             |
| Scan Rate 10 Da/s Record 10 mca   |              |                    |                |             |
| Q1 175.133                        | 5.94 e6      | ≥1.2 <sup>e6</sup> | 0.6933         | 0.6 to 0.8  |
| Q1 500.380                        | 2.25 e7      | ≥9.0 <sup>e6</sup> | 0.7444         | 0.6 to 0.8  |
| Q1 906.673                        | 2.74 e7      | ≥1.4 <sup>e7</sup> | 0.7347         | 0.6 to 0.8  |
| Scan Rate 1000 Da/s Record 50 mca |              |                    |                |             |
| Q1 906.673                        | 1.33 e8      | ≥6.8 <sup>e7</sup> | 0.7656         | 0.6 to 0.8  |

- ☒ Perform Q3 POS using POS PPG 2e-7M. Mass calibrate to less than 0.1 amu.

| Mass                              | Q3 Intensity |                    | Q3 Width Value | Width Specs |
|-----------------------------------|--------------|--------------------|----------------|-------------|
|                                   | Value        | Spec               |                |             |
| Scan Rate 10 Da/s Record 10 mca   |              |                    |                |             |
| Q3 175.133                        | 4.54 e6      | ≥1.2 <sup>e6</sup> | 0.6390         | 0.6 to 0.8  |
| Q3 500.380                        | 2.13 e7      | ≥9.0 <sup>e6</sup> | 0.7008         | 0.6 to 0.8  |
| Q3 906.673                        | 3.04 e7      | ≥1.4 <sup>e7</sup> | 0.7683         | 0.6 to 0.8  |
| Scan Rate 1000 Da/s Record 50 mca |              |                    |                |             |
| Q3 906.673                        | 1.51 e8      | ≥6.8 <sup>e7</sup> | 0.7118         | 0.6 to 0.8  |

- ☒ Perform "Product of 609.3" POS and record product ion 195.1 using Reserpine 0.167pmol/uL. Record 10 mca. Calculate Transmission efficiency comparing Q1POS 609 intensity.

Transmission Efficiency: 16.93% (≥ 10.0%)

| Mass        | MSMS Intensity |      | Width<br>Value | Width Specs |
|-------------|----------------|------|----------------|-------------|
|             | Value          | Spec |                |             |
| Q1 609.3    | 5.74 e7        | N/A  | 0.7667         | Read Only   |
| MS/MS 195.1 | 9.72 e6        | N/A  | 0.6751         | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

☒ Perform Q1 NEG using NEG PPG 3e-5M. Mass calibrate to less than 0.1 amu.

| Mass       | Scan Rate | Mca | Q1 Intensity |               | Q1 Width Value | Width Specs |
|------------|-----------|-----|--------------|---------------|----------------|-------------|
|            |           |     | Value        | Spec          |                |             |
| Q1 933.636 | 10        | 10  | 1.31 e7      | $\geq 1.0^e7$ | 0.6895         | 0.6 to 0.8  |
| Q1 933.636 | 1000      | 50  | 6.32 e7      | $\geq 4.0^e7$ | 0.6740         | 0.6 to 0.8  |

☒ Perform Q3 NEG using NEG PPG 3e-5M. Mass calibrate to less than 0.1 amu.

| Mass       | Scan Rate | Mca | Q3 Intensity |               | Q3 Width Value | Width Specs |
|------------|-----------|-----|--------------|---------------|----------------|-------------|
|            |           |     | Value        | Spec          |                |             |
| Q3 933.636 | 10        | 10  | 1.70 e7      | $\geq 8.0^e6$ | 0.7665         | 0.6 to 0.8  |
| Q3 933.636 | 1000      | 50  | 7.41 e7      | $\geq 4.0^e7$ | 0.7292         | 0.6 to 0.8  |

☒ Perform Product Ion scan using NEG PPG 3e-5M.

| Mass    | Scan Rate | Mca | MSMS Intensity |           | MSMS Width Value | Width Specs |
|---------|-----------|-----|----------------|-----------|------------------|-------------|
|         |           |     | Value          | Spec      |                  |             |
| MSMS 45 | 10        | 10  | 3.33 e6        | Read Only | 0.6387           | Read Only   |

☒ Perform ER POS 118.087 and 922.01 using ESI Tuning Mix 1:100 in ES Tuning Dilution Solvent. Apply suggested Scan Rate and Record number of MCA. Mass calibrate to less than 0.1 amu.

| Mass                           | Fill Time (ms) | ER Intensity |         | ER Width Value | Width Specs |
|--------------------------------|----------------|--------------|---------|----------------|-------------|
|                                |                | Value        | Spec    |                |             |
| ScanRate : 1000 Da/s ; 50 Mca  |                |              |         |                |             |
| ER 118.087                     | 0.05           | 8.08 e6      | ≥7.2 e6 | 0.1302         | <0.35       |
| ER 922.010                     | 0.05           | 3.89 e7      | ≥2.8 e6 | 0.2603         | <0.35       |
| ScanRate : 10000 Da/s ; 50 Mca |                |              |         |                |             |
| ER 118.087                     | 0.05           | 2.55 e7      | ≥2.4 e7 | 0.3740         | <0.65       |
| ER 922.010                     | 0.05           | 2.37 e8      | ≥6.8 e7 | 0.5407         | <0.65       |

☒ Perform ER NEG 431.982 and 601.978 using ESI Tuning Mix 1:100 in ES Tuning Dilution Solvent. Apply suggested Scan Rate and Record number of MCA. Mass calibrate to less than 0.1 amu.

| Mass                           | Fill Time<br>(ms) | ER Intensity |                    | ER Width<br>Value | Width Specs |
|--------------------------------|-------------------|--------------|--------------------|-------------------|-------------|
|                                |                   | Value        | Spec               |                   |             |
| ScanRate : 1000 Da/s ; 50 Mca  |                   |              |                    |                   |             |
| ER 431.982                     | 0.05              | 1.05 e8      | ≥4.4 <sup>e7</sup> | 0.1840            | <0.35       |
| ER 601.978                     | 0.05              | 7.74 e7      | ≥5.6 <sup>e7</sup> | 0.1849            | <0.35       |
| ScanRate : 10000 Da/s ; 50 Mca |                   |              |                    |                   |             |
| ER 431.982                     | 0.05              | 3.43 e8      | ≥1.2 <sup>e8</sup> | 0.4382            | <0.65       |
| ER 601.978                     | 0.05              | 2.55 e8      | ≥1.6 <sup>e8</sup> | 0.6205            | <0.65       |



**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

- ☒ Perform EPI POS 397.2 using Reserpine 0.167pmol/uL. Record 20 mca.

| Mass      | Scan Rate<br>(Da/s) | Q0 Trapping OFF |         | Q0 Trapping ON |         |
|-----------|---------------------|-----------------|---------|----------------|---------|
|           |                     | Intensity       | Spec    | Intensity      | Spec    |
| EPI 397.2 | 10000               | > 3.5 e6        | ≥2.0 e6 | > 4.0 e7       | ≥6.4 e6 |

- ☒ Perform MS3 POS full scan Fragmentation ON & OFF using Reserpine 0.167pmol/uL. Record 20 mca.

| Mass                                                                    | Scan Rate<br>(Da/s) | Fragamentation OFF |                     | Fragmentation ON |                        |
|-------------------------------------------------------------------------|---------------------|--------------------|---------------------|------------------|------------------------|
|                                                                         |                     | Intensity          | Spec                | Intensity        | Spec                   |
| MS3 397.2                                                               | 1000                | 3.2 e7             | Contains only 397.2 | N/A              | N/A                    |
| <input type="checkbox"/> 236 OR <input checked="" type="checkbox"/> 365 | 1000                | 1.19 e8            | Fragment Intensity  | > 4.4 e6         | ≥1.6x 10 <sup>e6</sup> |

## REVIEW:

- ☒ Attach all spectrums printouts to this procedure.
- ☒ If any parameter setting access modes were changed during the PM, ensure they are returned to their normal access mode and that their offsets are adjusted to match optimized values from the post-PM acquisition files.
- ☐ Empty tuning cache folder, if necessary. ☒ N/A
- ☒ Update Service Work Order status
- ☒ Fill and replace PM Label.

## END OF PREVENTIVE MAINTENANCE CHECKLIST

## Document history:

06 OCT 2016: Appendix ZEFPM003-2L: Removed requirements to fit Manufacturer's testing criteria.



It can be done

## BATTELLE - NORWELL OPERATIONS LIQUID SAMPLE ID FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | Description               | Volume (mL) | Bottles | *  | Date<br>Initials |
|-------------|---------------------------|-------------|---------|----|------------------|
| CQ753PB-FS  | Procedural Blank          | 250.0       | NA      | -- | 05/09/18 SAS     |
| CQ754LCS-FS | Laboratory Control Sample | 250.0       | NA      | -- | 05/09/18 SAS     |
| J5965-FS    | WGNA-043018-FRB-3103      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5967-FS    | NAWC-043018-FRB-207       | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5969-FS    | WGNA-043018-FRB-3409      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5971-FS    | WGNA-050118-FRB-3385      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5973-FS    | WGNA-050118-FRB-3178      | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5975-FS    | NAWC-050118-FRB-304       | 250.0       | 1       | C  | 05/09/18 SAS     |
| J5977-FS    | NAWC-050118-FRB-098       | 250.0       | 1       | C  | 05/09/18 SAS     |

**Comments:**

| Sample ID:  | Comments:                                  |
|-------------|--------------------------------------------|
| CQ753PB-FS  | 1.23g Trizma(170526-01) weighed on BAL-009 |
| CQ754LCS-FS | 1.24g Trizma(170526-01) weighed on BAL-009 |

Samples Assigned By

Stephanie Schultz

Date :

May 9, 2018

\* - "C" = Sample is Consumed



It can be done

## BATTELLE - NORWELL OPERATIONS SURROGATE SPIKE FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | Standard ID | Type   | Vial No. | Vol Added (uL) | Date Spiked/<br>Spiked By | Witn'd By | Comment |
|-------------|-------------|--------|----------|----------------|---------------------------|-----------|---------|
| CQ753PB-FS  | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| CQ754LCS-FS | JV41        | LCS/MS | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| CQ754LCS-FS | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5965-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5967-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5969-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5971-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5973-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5975-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |
| J5977-FS    | JV60        | SIS    | 1        | 50             | 05/09/18 SAS              | JCT       | NA      |

Syringes/Pipettes Used:

| Std ID | Type    | Syr/Pip   |
|--------|---------|-----------|
| JV41   | Pipette | I0793912B |
| JV60   | Pipette | I0793912B |



It can be done

## BATTELLE - NORWELL OPERATIONS SAMPLE EXTRACTION FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0312****WE04 PFAS Analysis****DW**

| Sample ID   | 1st<br>Extraction | 2nd<br>Extraction | 3rd<br>Extraction | Conc.<br>ID | Turbo<br>°C | Turbo<br>PSI | KD<br>°C | Comment |
|-------------|-------------------|-------------------|-------------------|-------------|-------------|--------------|----------|---------|
| CQ753PB-FS  | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| CQ754LCS-FS | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5965-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5967-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5969-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5971-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5973-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5975-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5977-FS    | 05/09/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |

**Solvents/Reagent Preparations:**

| Name                  | ID          | Expires  | Lot No    | Procedure             | Comments |
|-----------------------|-------------|----------|-----------|-----------------------|----------|
| Pre-packed SPE Column | RP-180509-2 | 05/09/18 | S214-0071 | Pre-packed SPE Column |          |

**Solvents/Reagents:**

| Name                        | Lot No | Comments |
|-----------------------------|--------|----------|
| Methanol (HPLC) (180227-02) | 178212 |          |

## Sequence Report

Created with Analyst Reporter  
Printed: 16/05/2018 6:10:32 PM

| Vial | Laboratory Sample ID | Client Sample ID          | Acquisition Date     | Acquisition Method | Data File    |
|------|----------------------|---------------------------|----------------------|--------------------|--------------|
| 1    | MeOH                 |                           | 5/14/2018 4:18:10 PM | 5-0371.dam         | 18-0313.wiff |
| 2    | JV64                 | L1                        | 5/14/2018 4:27:07 PM | 5-0371.dam         | 18-0313.wiff |
| 3    | JV65                 | L2                        | 5/14/2018 4:36:03 PM | 5-0371.dam         | 18-0313.wiff |
| 4    | JV66                 | L3                        | 5/14/2018 4:45:01 PM | 5-0371.dam         | 18-0313.wiff |
| 5    | JV67                 | L4                        | 5/14/2018 4:53:56 PM | 5-0371.dam         | 18-0313.wiff |
| 6    | JV68                 | L5                        | 5/14/2018 5:02:52 PM | 5-0371.dam         | 18-0313.wiff |
| 7    | JV69                 | L6                        | 5/14/2018 5:11:47 PM | 5-0371.dam         | 18-0313.wiff |
| 8    | JV70                 | L7                        | 5/14/2018 5:20:42 PM | 5-0371.dam         | 18-0313.wiff |
| 9    | JV71                 | L8                        | 5/14/2018 5:29:36 PM | 5-0371.dam         | 18-0313.wiff |
| 10   | JV72                 | L9                        | 5/14/2018 5:38:30 PM | 5-0371.dam         | 18-0313.wiff |
| 11   | JV63 ICC             | ICC                       | 5/14/2018 5:47:28 PM | 5-0371.dam         | 18-0313.wiff |
| 1    | MeOH                 |                           | 5/14/2018 5:56:24 PM | 5-0371.dam         | 18-0313.wiff |
| 12   | CQ753PB-FS(0)        | Procedural Blank          | 5/14/2018 6:05:20 PM | 5-0371.dam         | 18-0312.wiff |
| 13   | CQ754LCS-FS(0)       | Laboratory Control Sample | 5/14/2018 6:14:15 PM | 5-0371.dam         | 18-0312.wiff |
| 14   | J5965-FS(0)          | WGNA-043018-FRB-3103      | 5/14/2018 6:23:10 PM | 5-0371.dam         | 18-0312.wiff |
| 15   | J5967-FS(0)          | NAWC-043018-FRB-207       | 5/14/2018 6:32:06 PM | 5-0371.dam         | 18-0312.wiff |
| 16   | J5969-FS(0)          | WGNA-043018-FRB-3409      | 5/14/2018 6:41:03 PM | 5-0371.dam         | 18-0312.wiff |
| 17   | J5971-FS(0)          | WGNA-050118-FRB-3385      | 5/14/2018 6:49:59 PM | 5-0371.dam         | 18-0312.wiff |
| 18   | J5973-FS(0)          | WGNA-050118-FRB-3178      | 5/14/2018 6:58:53 PM | 5-0371.dam         | 18-0312.wiff |
| 19   | J5975-FS(0)          | NAWC-050118-FRB-304       | 5/14/2018 7:07:47 PM | 5-0371.dam         | 18-0312.wiff |
| 20   | J5977-FS(0)          | NAWC-050118-FRB-098       | 5/14/2018 7:16:43 PM | 5-0371.dam         | 18-0312.wiff |
| 6    | JV68 CCV             | CCV                       | 5/14/2018 7:25:38 PM | 5-0371.dam         | 18-0312.wiff |



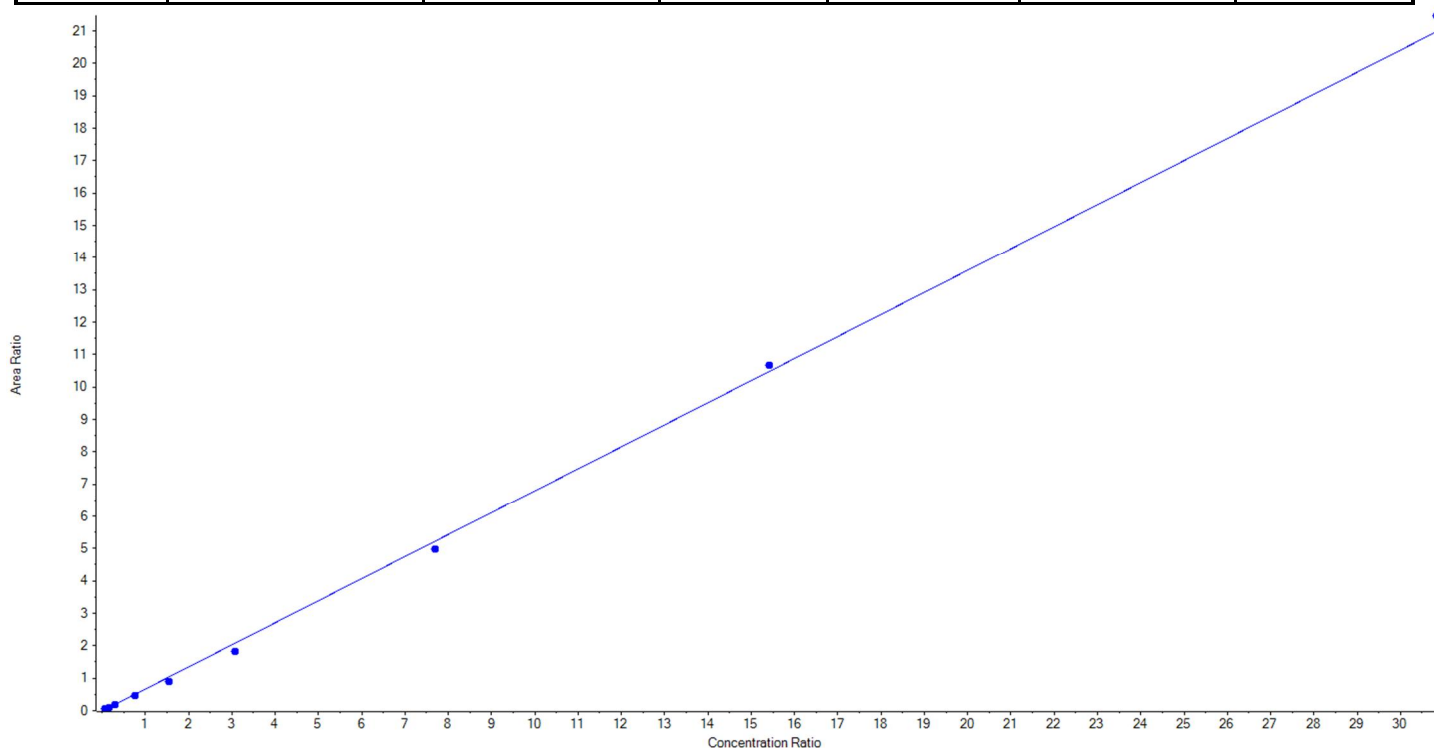
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFBS_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 298.9 / 80.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.68075x + -0.01541$  ( $r = 0.99887$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.15               | 28.045095               | 126.6        |
| 3    | JV65        | L2        | True          | 44.30               | 48.489227               | 109.5        |
| 4    | JV66        | L3        | True          | 88.60               | 86.791512               | 98.0         |
| 5    | JV67        | L4        | True          | 221.50              | 206.430305              | 93.2         |
| 6    | JV68        | L5        | True          | 443.00              | 379.492245              | 85.7         |
| 7    | JV69        | L6        | True          | 885.00              | 778.046261              | 87.9         |
| 8    | JV70        | L7        | True          | 2212.50             | 2102.243811             | 95.0         |
| 9    | JV71        | L8        | True          | 4425.00             | 4507.247954             | 101.9        |
| 10   | JV72        | L9        | True          | 8850.00             | 9055.263589             | 102.3        |







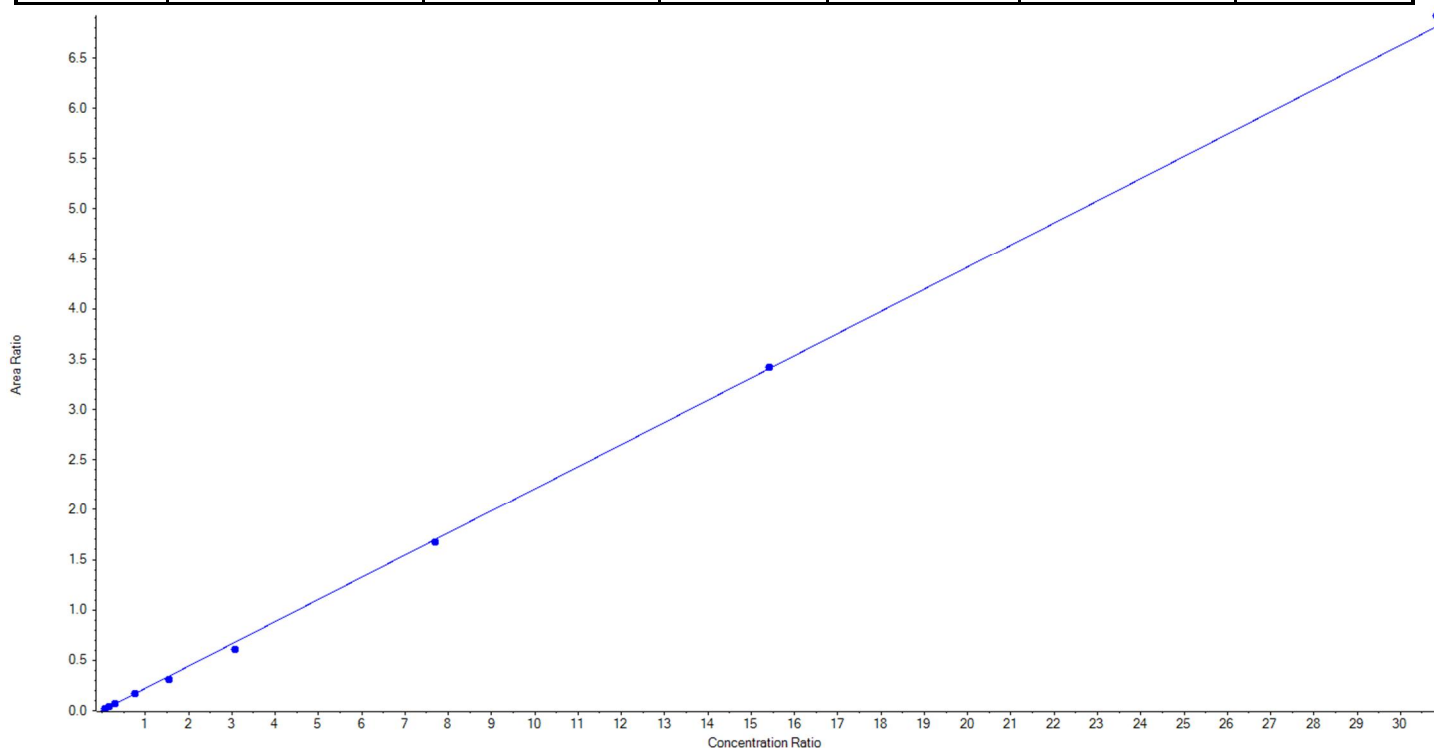
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFBS_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 298.9 / 99.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.22086x + 3.23106e-4$  ( $r = 0.99946$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.15               | 25.833478               | 116.6        |
| 3    | JV65        | L2        | True          | 44.30               | 47.169014               | 106.5        |
| 4    | JV66        | L3        | True          | 88.60               | 84.473566               | 95.3         |
| 5    | JV67        | L4        | True          | 221.50              | 224.337631              | 101.3        |
| 6    | JV68        | L5        | True          | 443.00              | 398.532474              | 90.0         |
| 7    | JV69        | L6        | True          | 885.00              | 793.604509              | 89.7         |
| 8    | JV70        | L7        | True          | 2212.50             | 2179.802809             | 98.5         |
| 9    | JV71        | L8        | True          | 4425.00             | 4448.710926             | 100.5        |
| 10   | JV72        | L9        | True          | 8850.00             | 8989.585593             | 101.6        |





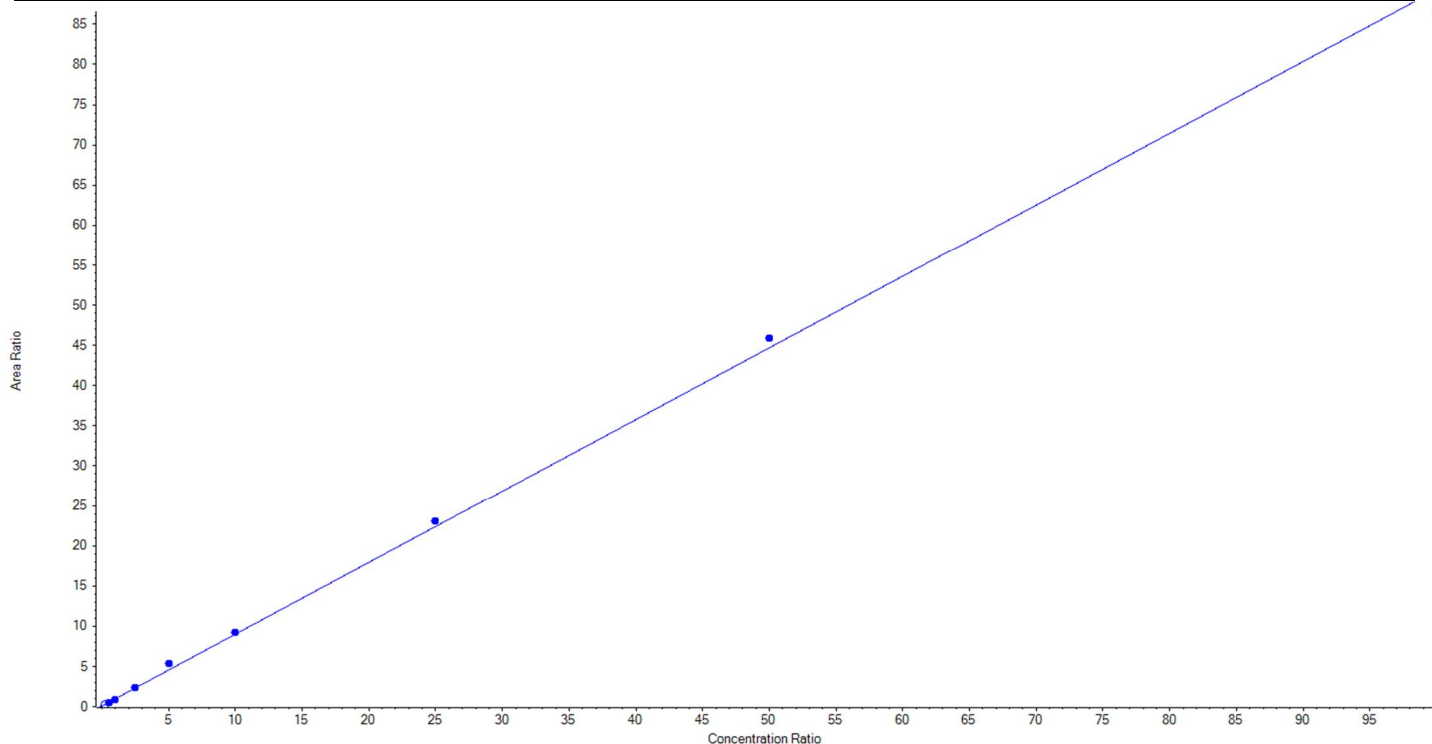
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 313.0 / 269.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.89190x + 0.09470$  ( $r = 0.99902$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 18.657460               | 74.6         |
| 3    | JV65        | L2        | True          | 50.00               | 42.893737               | 85.8         |
| 4    | JV66        | L3        | True          | 100.00              | 88.393959               | 88.4         |
| 5    | JV67        | L4        | True          | 250.00              | 258.426345              | 103.4        |
| 6    | JV68        | L5        | True          | 500.00              | 590.552971              | 118.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1017.252318             | 101.7        |
| 8    | JV70        | L7        | True          | 2500.00             | 2574.231542             | 103.0        |
| 9    | JV71        | L8        | True          | 5000.00             | 5136.044879             | 102.7        |
| 10   | JV72        | L9        | True          | 10000.00            | 9692.204248             | 96.9         |





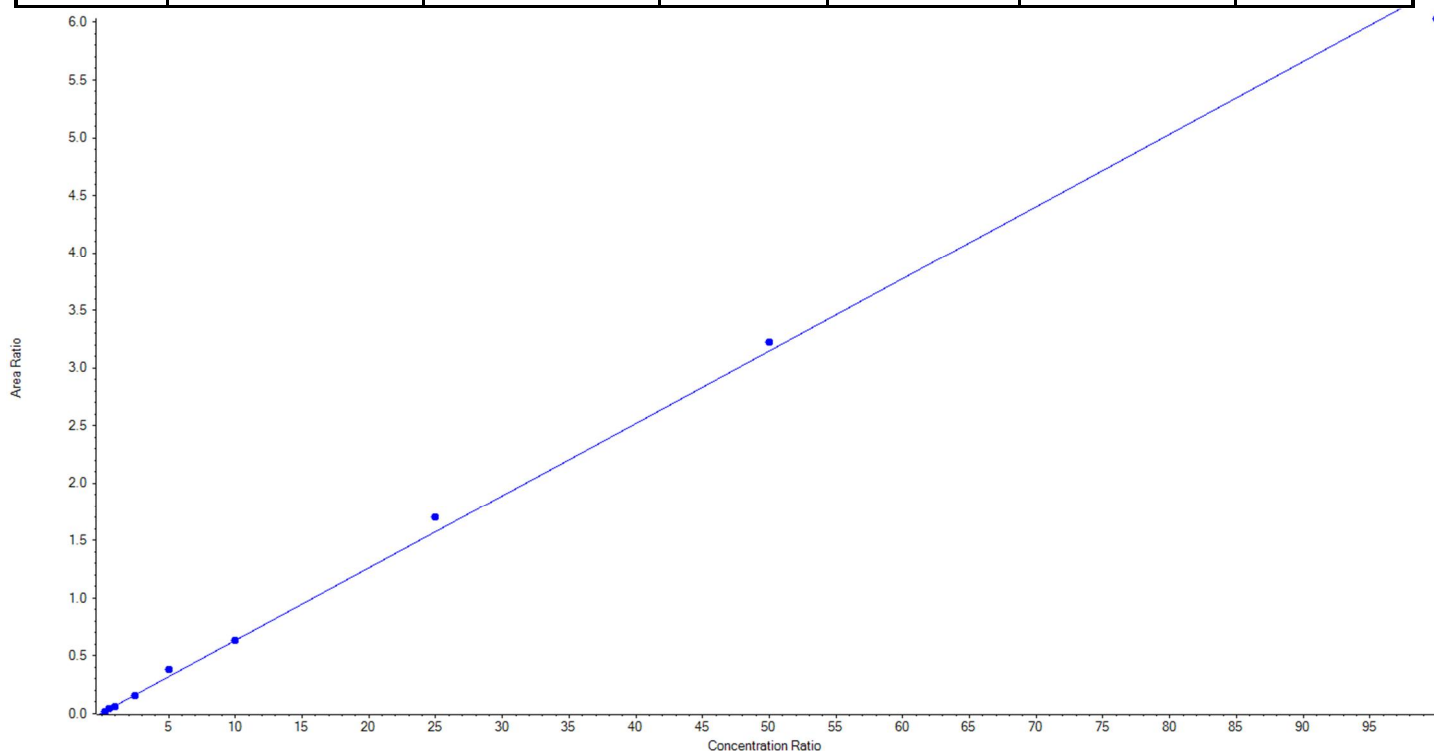
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 313.0 / 119.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.06281 x + 0.00625$  ( $r = 0.99818$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 15.890183               | 63.6         |
| 3    | JV65        | L2        | True          | 50.00               | 63.552557               | 127.1        |
| 4    | JV66        | L3        | True          | 100.00              | 85.128911               | 85.1         |
| 5    | JV67        | L4        | True          | 250.00              | 244.158146              | 97.7         |
| 6    | JV68        | L5        | True          | 500.00              | 602.362054              | 120.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 994.796286              | 99.5         |
| 8    | JV70        | L7        | True          | 2500.00             | 2705.114914             | 108.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 5124.538112             | 102.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9589.458837             | 95.9         |





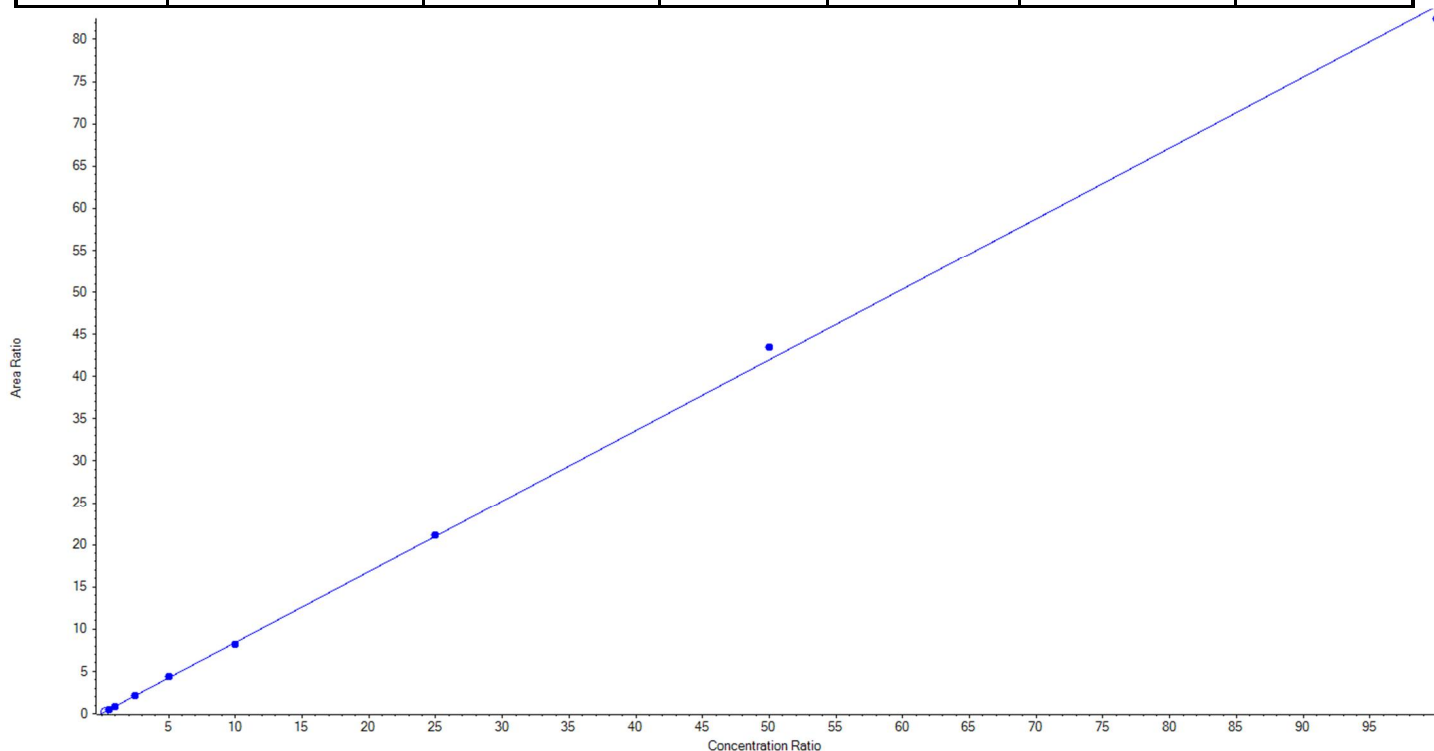
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHpA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 363.0 / 319.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.83876x + 0.04371$  ( $r = 0.99963$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 19.315174               | 77.3         |
| 3    | JV65        | L2        | True          | 50.00               | 54.414136               | 108.8        |
| 4    | JV66        | L3        | True          | 100.00              | 87.171830               | 87.2         |
| 5    | JV67        | L4        | True          | 250.00              | 253.853561              | 101.5        |
| 6    | JV68        | L5        | True          | 500.00              | 513.574414              | 102.7        |
| 7    | JV69        | L6        | True          | 1000.00             | 973.658392              | 97.4         |
| 8    | JV70        | L7        | True          | 2500.00             | 2512.774114             | 100.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5182.125230             | 103.6        |
| 10   | JV72        | L9        | True          | 10000.00            | 9822.428323             | 98.2         |





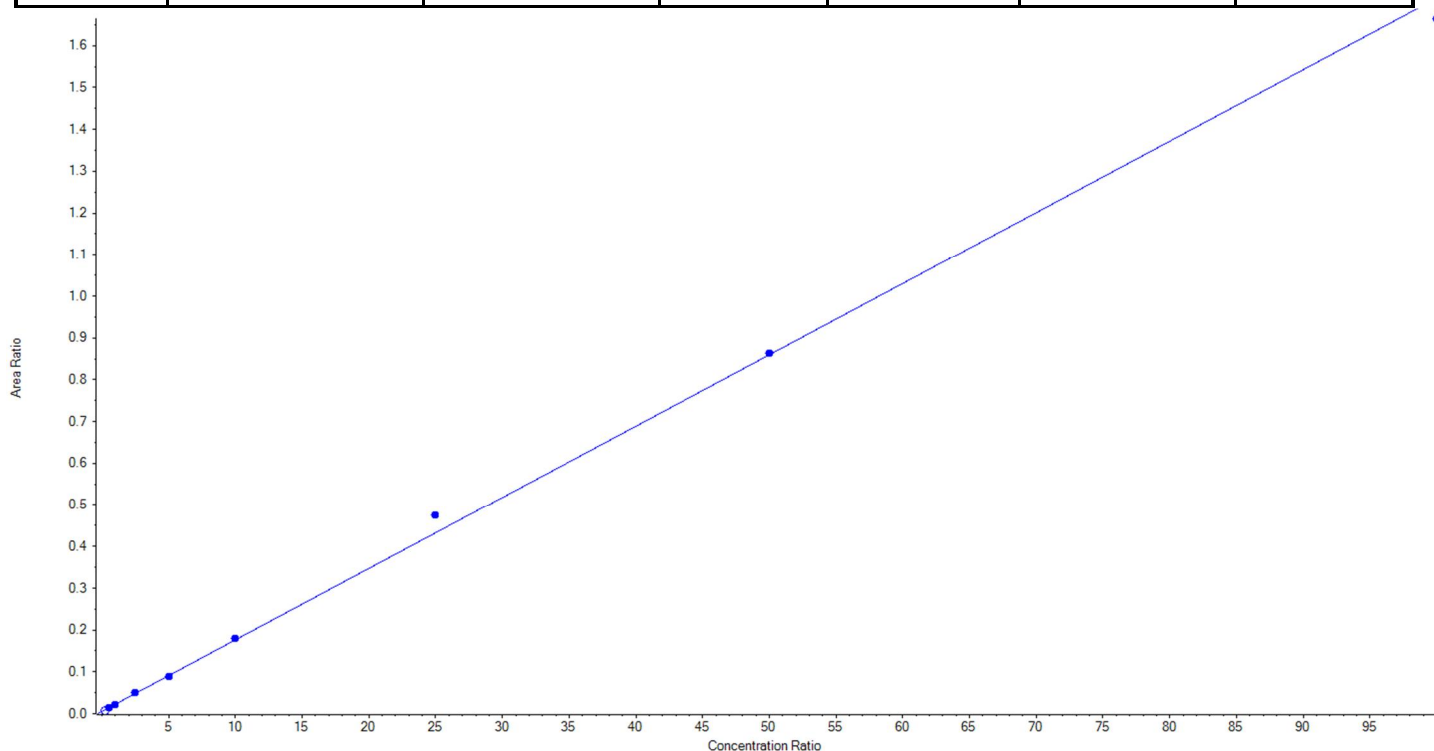
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHpA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 363.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.01708x + 0.00552$  ( $r = 0.99897$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 10.338123               | 41.4         |
| 3    | JV65        | L2        | True          | 50.00               | 48.862884               | 97.7         |
| 4    | JV66        | L3        | True          | 100.00              | 87.168294               | 87.2         |
| 5    | JV67        | L4        | True          | 250.00              | 268.362349              | 107.3        |
| 6    | JV68        | L5        | True          | 500.00              | 490.348842              | 98.1         |
| 7    | JV69        | L6        | True          | 1000.00             | 1022.051246             | 102.2        |
| 8    | JV70        | L7        | True          | 2500.00             | 2747.089212             | 109.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 5024.136423             | 100.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9711.980749             | 97.1         |





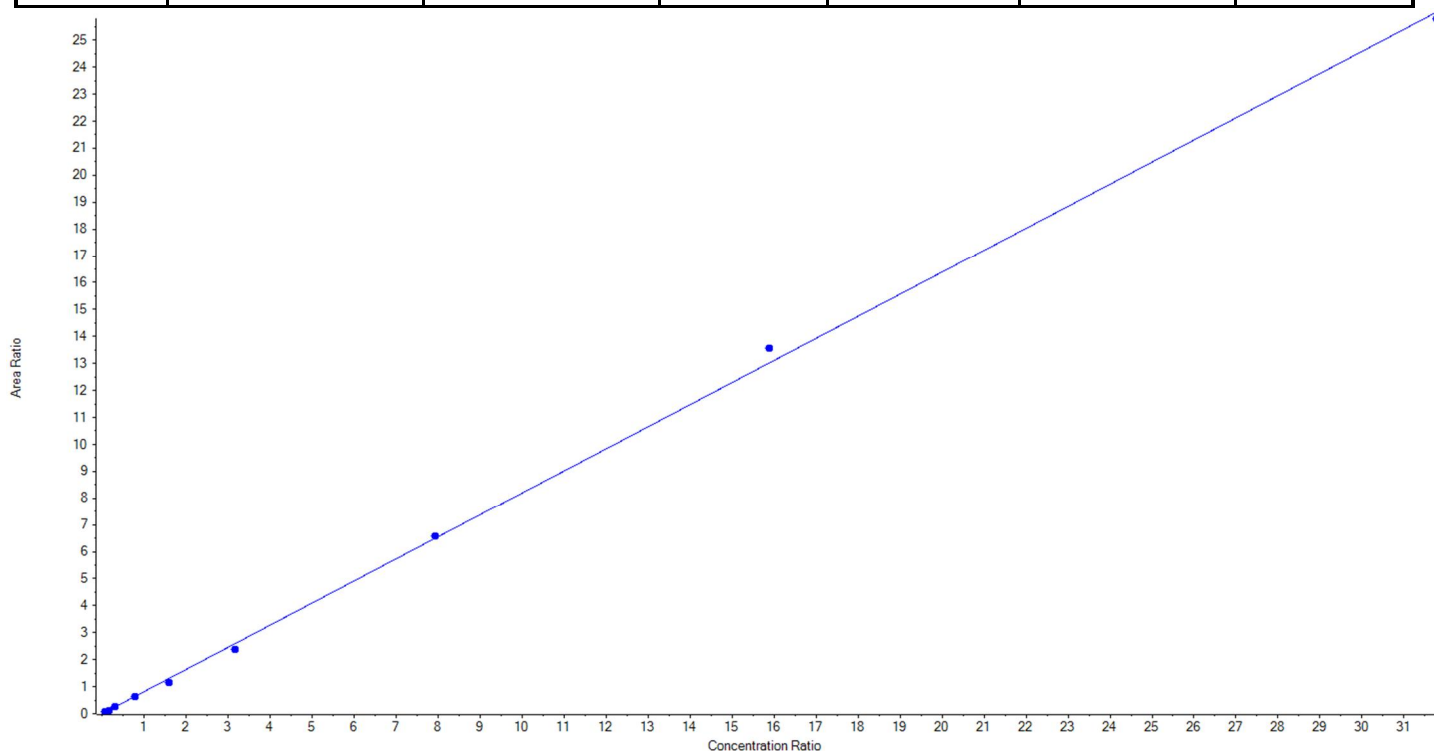
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxS_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 399.0 / 80.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.81953x + -0.00434$  ( $r = 0.99932$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.80               | 25.556500               | 112.1        |
| 3    | JV65        | L2        | True          | 45.60               | 45.328748               | 99.4         |
| 4    | JV66        | L3        | True          | 91.20               | 96.635739               | 106.0        |
| 5    | JV67        | L4        | True          | 228.00              | 225.752955              | 99.0         |
| 6    | JV68        | L5        | True          | 456.00              | 398.622698              | 87.4         |
| 7    | JV69        | L6        | True          | 912.00              | 837.957539              | 91.9         |
| 8    | JV70        | L7        | True          | 2280.00             | 2303.521436             | 101.0        |
| 9    | JV71        | L8        | True          | 4560.00             | 4749.618935             | 104.2        |
| 10   | JV72        | L9        | True          | 9120.00             | 9032.605450             | 99.0         |







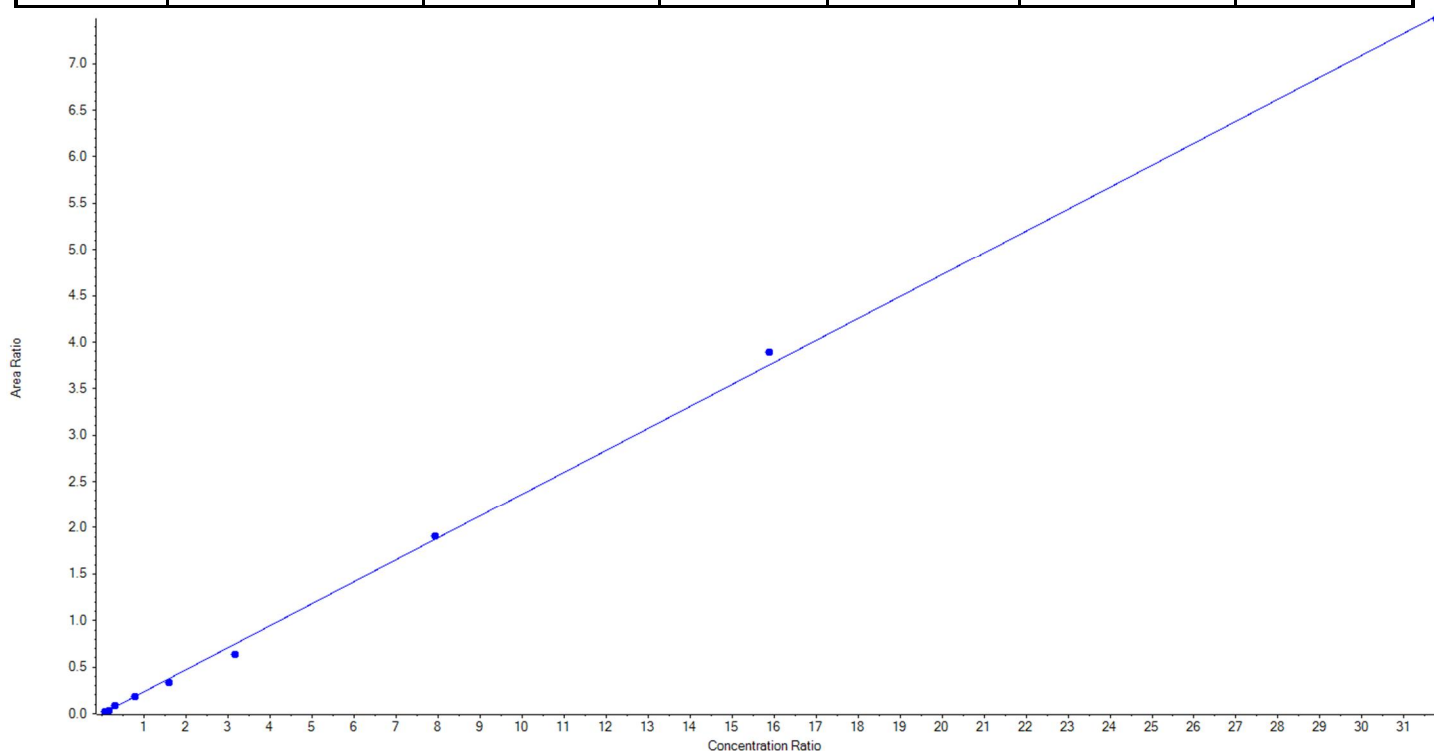
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFHxS_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 399.0 / 99.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.23641x + -9.70194e-4$  ( $r = 0.99901$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.80               | 24.128618               | 105.8        |
| 3    | JV65        | L2        | True          | 45.60               | 45.498258               | 99.8         |
| 4    | JV66        | L3        | True          | 91.20               | 106.207971              | 116.5        |
| 5    | JV67        | L4        | True          | 228.00              | 222.356004              | 97.5         |
| 6    | JV68        | L5        | True          | 456.00              | 410.686463              | 90.1         |
| 7    | JV69        | L6        | True          | 912.00              | 779.306332              | 85.5         |
| 8    | JV70        | L7        | True          | 2280.00             | 2318.419291             | 101.7        |
| 9    | JV71        | L8        | True          | 4560.00             | 4724.397363             | 103.6        |
| 10   | JV72        | L9        | True          | 9120.00             | 9084.599701             | 99.6         |





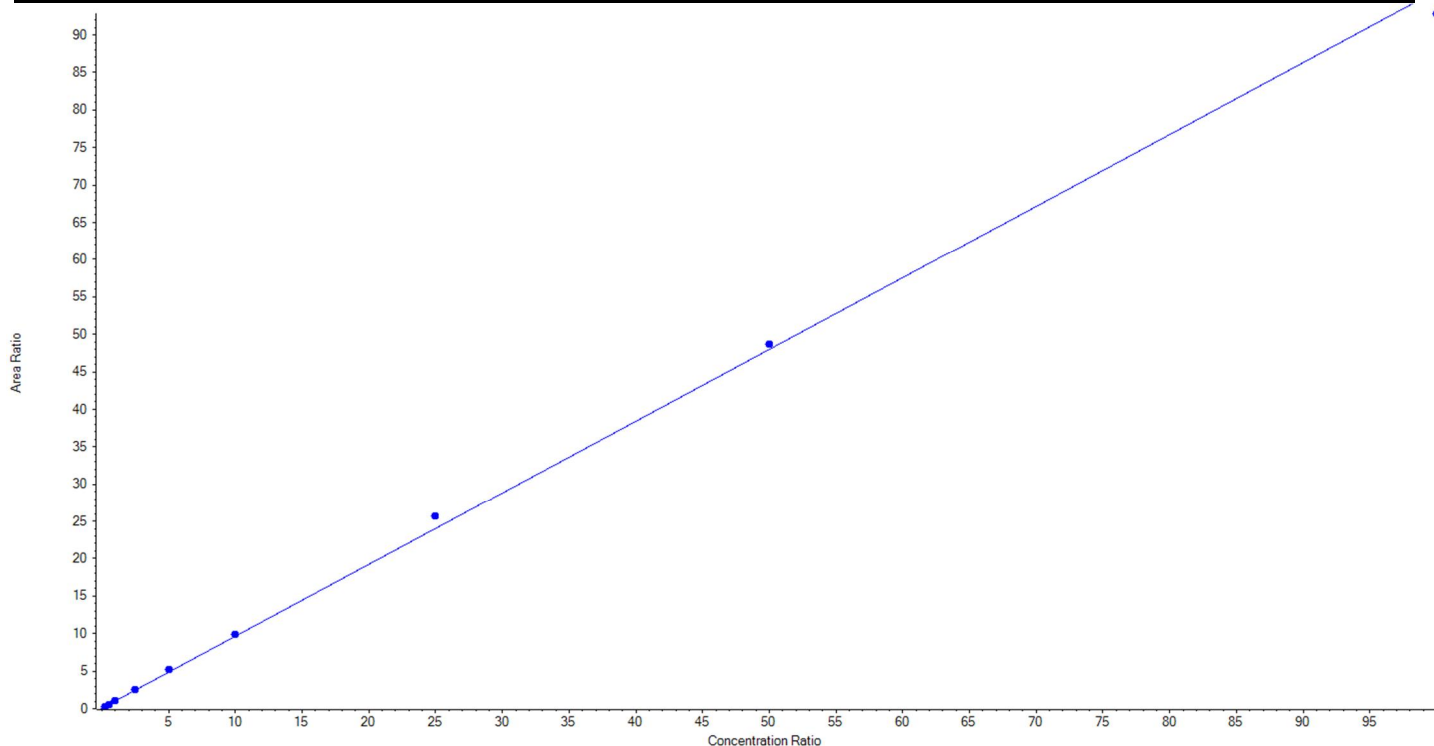
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOA_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 413.0 / 369.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.95821 x + 0.07420$  ( $r = 0.99920$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 20.271455               | 81.1         |
| 3    | JV65        | L2        | True          | 50.00               | 48.064799               | 96.1         |
| 4    | JV66        | L3        | True          | 100.00              | 104.359044              | 104.4        |
| 5    | JV67        | L4        | True          | 250.00              | 254.296931              | 101.7        |
| 6    | JV68        | L5        | True          | 500.00              | 542.897965              | 108.6        |
| 7    | JV69        | L6        | True          | 1000.00             | 1028.463388             | 102.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2676.545515             | 107.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5071.800474             | 101.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9678.300429             | 96.8         |





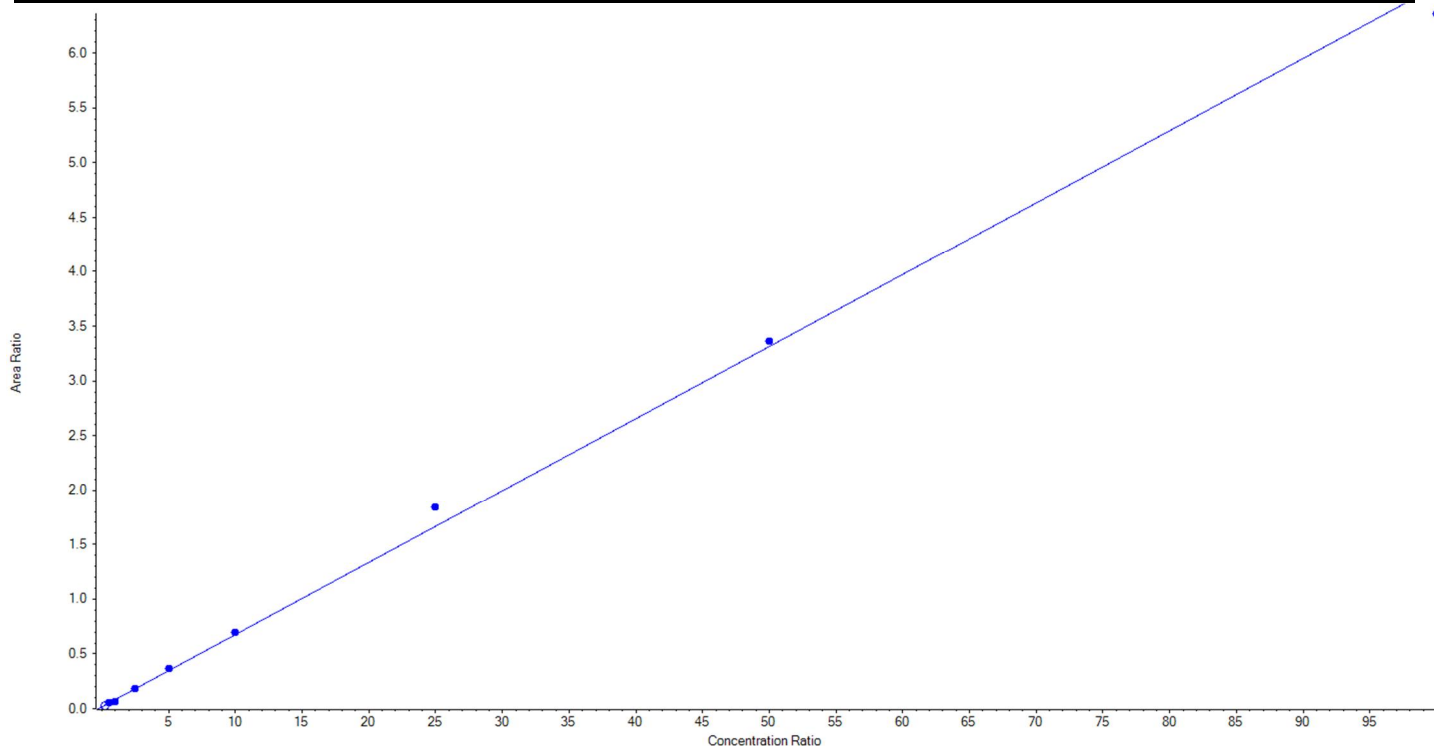
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOA_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 413.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.06594 x + 0.01732$  ( $r = 0.99846$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 8.864133                | 35.5         |
| 3    | JV65        | L2        | True          | 50.00               | 53.444479               | 106.9        |
| 4    | JV66        | L3        | True          | 100.00              | 72.590674               | 72.6         |
| 5    | JV67        | L4        | True          | 250.00              | 257.344048              | 102.9        |
| 6    | JV68        | L5        | True          | 500.00              | 535.062840              | 107.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 1023.026817             | 102.3        |
| 8    | JV70        | L7        | True          | 2500.00             | 2763.902729             | 110.6        |
| 9    | JV71        | L8        | True          | 5000.00             | 5076.510630             | 101.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9618.117783             | 96.2         |





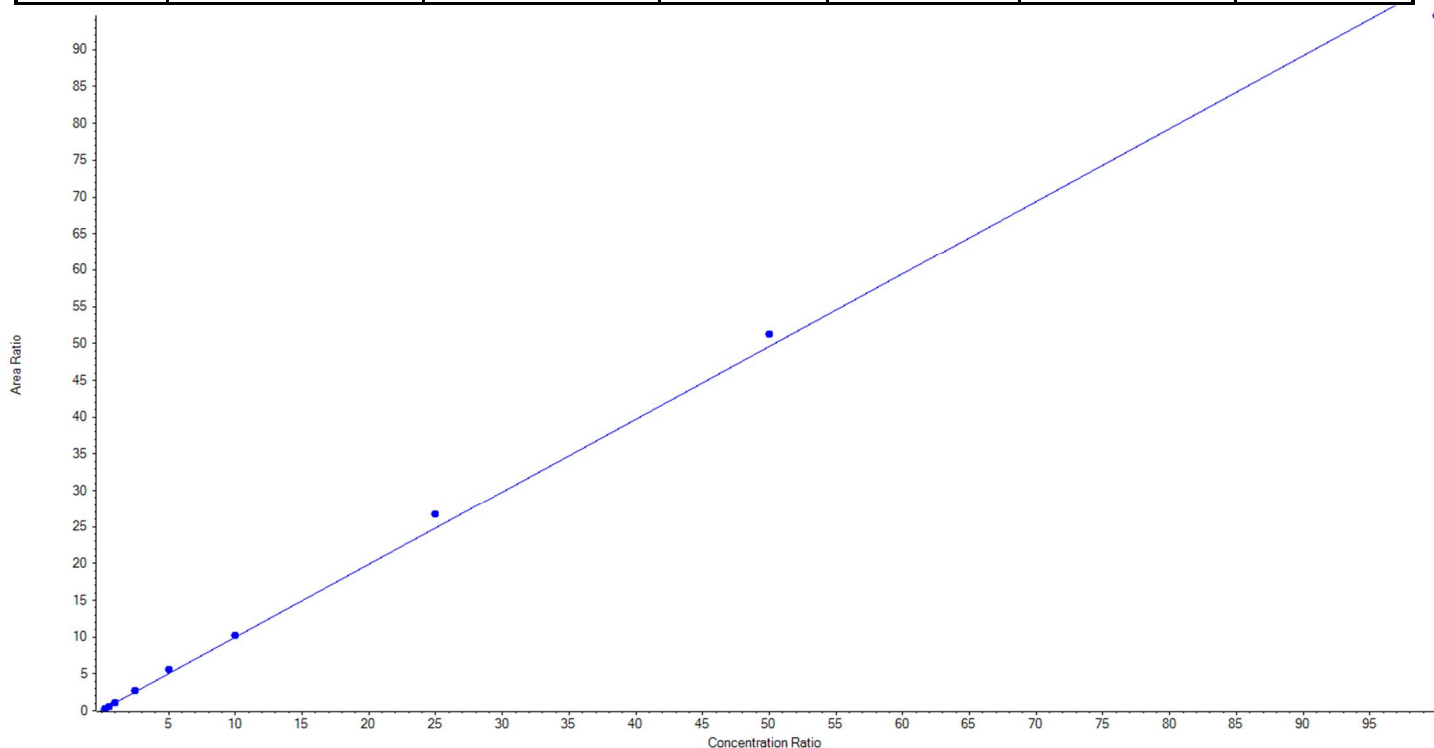
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFNA_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 463.0 / 419.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.99005x + 0.08354$  ( $r = 0.99862$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 18.792753               | 75.2         |
| 3    | JV65        | L2        | True          | 50.00               | 50.077219               | 100.2        |
| 4    | JV66        | L3        | True          | 100.00              | 97.651904               | 97.7         |
| 5    | JV67        | L4        | True          | 250.00              | 265.634549              | 106.3        |
| 6    | JV68        | L5        | True          | 500.00              | 556.615759              | 111.3        |
| 7    | JV69        | L6        | True          | 1000.00             | 1028.511506             | 102.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2695.858545             | 107.8        |
| 9    | JV71        | L8        | True          | 5000.00             | 5164.160418             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9547.697347             | 95.5         |





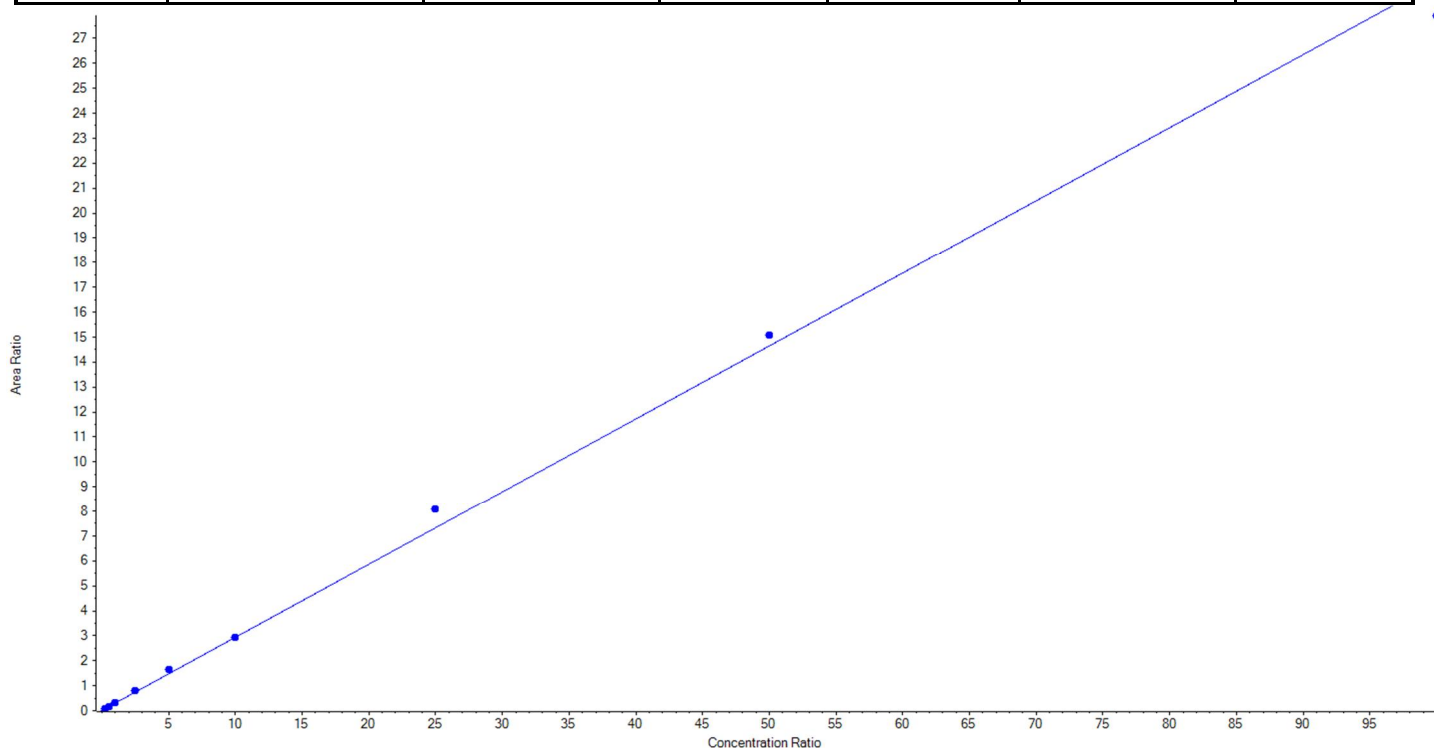
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFNA_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 463.0 / 219.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.29260x + 0.01417$  ( $r = 0.99832$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 18.357615               | 73.4         |
| 3    | JV65        | L2        | True          | 50.00               | 50.945275               | 101.9        |
| 4    | JV66        | L3        | True          | 100.00              | 98.707450               | 98.7         |
| 5    | JV67        | L4        | True          | 250.00              | 267.249370              | 106.9        |
| 6    | JV68        | L5        | True          | 500.00              | 552.006190              | 110.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1000.117057             | 100.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2760.876412             | 110.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 5145.638736             | 102.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9531.101896             | 95.3         |





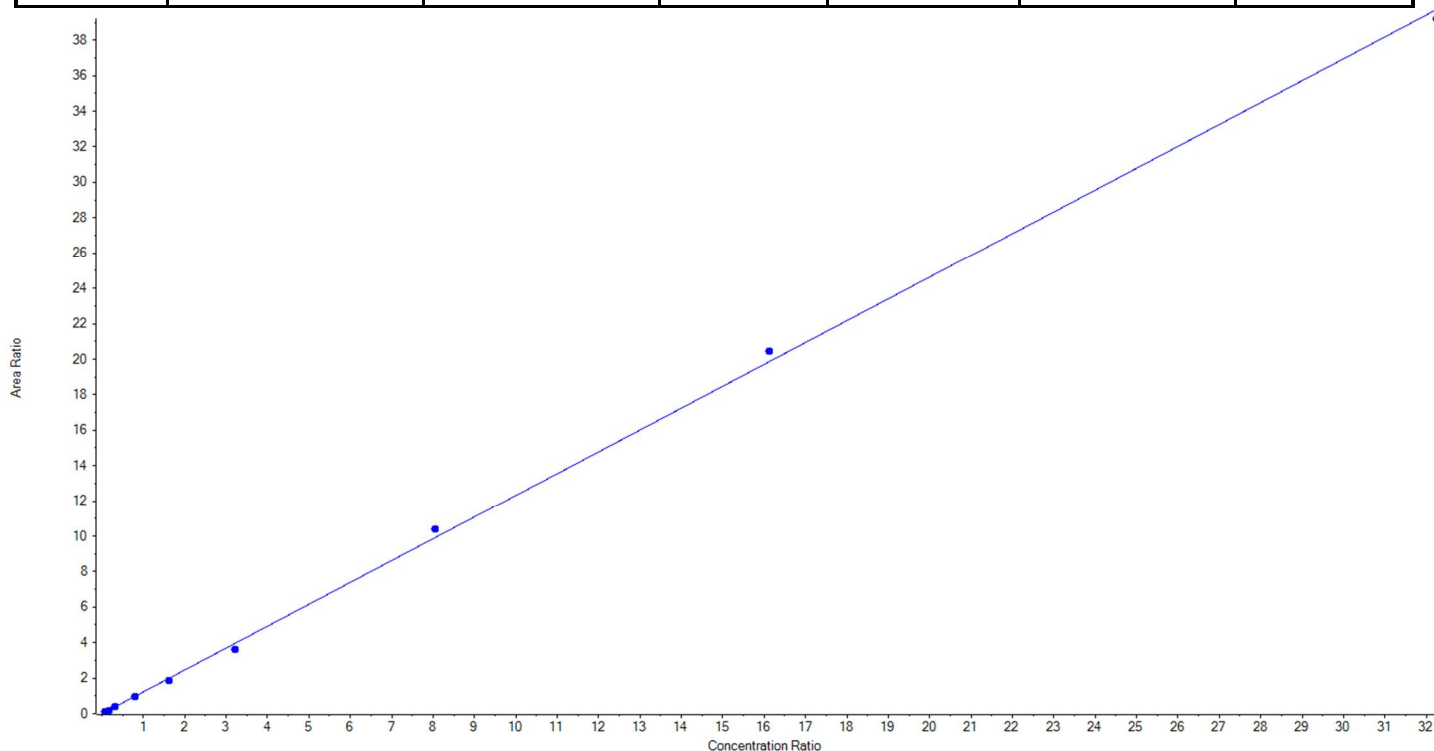
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOS_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 499.0 / 80.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.23183x + -0.00456$  ( $r = 0.99934$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 23.15               | 28.031094               | 121.1        |
| 3    | JV65        | L2        | True          | 46.30               | 42.301066               | 91.4         |
| 4    | JV66        | L3        | True          | 92.60               | 90.970659               | 98.2         |
| 5    | JV67        | L4        | True          | 231.50              | 230.459461              | 99.6         |
| 6    | JV68        | L5        | True          | 463.00              | 428.901519              | 92.6         |
| 7    | JV69        | L6        | True          | 925.00              | 840.100698              | 90.8         |
| 8    | JV70        | L7        | True          | 2314.00             | 2424.048404             | 104.8        |
| 9    | JV71        | L8        | True          | 4628.00             | 4760.602564             | 102.9        |
| 10   | JV72        | L9        | True          | 9256.00             | 9134.134535             | 98.7         |







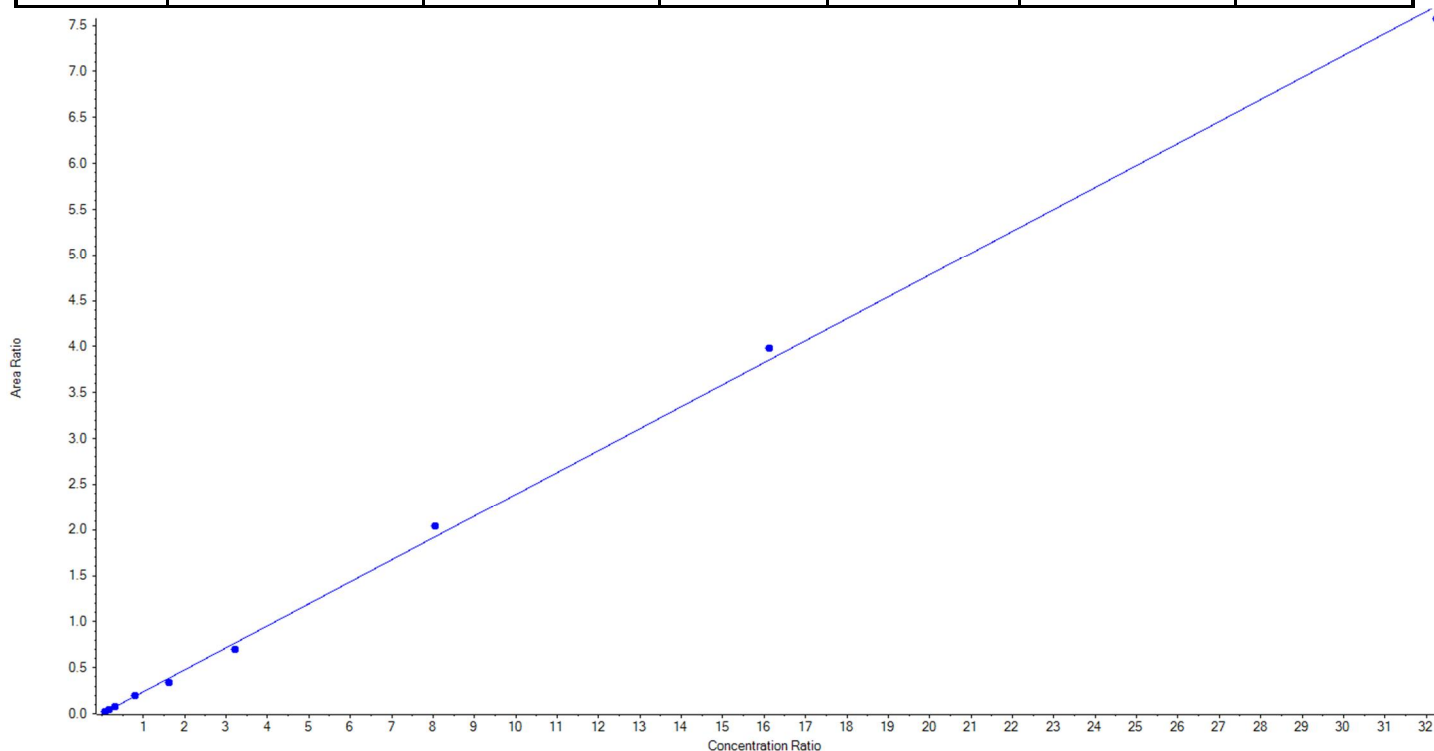
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFOS_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 499.0 / 99.0         | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C4-PFOS            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.23915x + -0.00150$  ( $r = 0.99909$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 23.15               | 23.346458               | 100.9        |
| 3    | JV65        | L2        | True          | 46.30               | 50.287062               | 108.6        |
| 4    | JV66        | L3        | True          | 92.60               | 92.083626               | 99.4         |
| 5    | JV67        | L4        | True          | 231.50              | 241.652806              | 104.4        |
| 6    | JV68        | L5        | True          | 463.00              | 409.963845              | 88.6         |
| 7    | JV69        | L6        | True          | 925.00              | 839.354013              | 90.7         |
| 8    | JV70        | L7        | True          | 2314.00             | 2449.080596             | 105.8        |
| 9    | JV71        | L8        | True          | 4628.00             | 4785.237481             | 103.4        |
| 10   | JV72        | L9        | True          | 9256.00             | 9088.544113             | 98.2         |





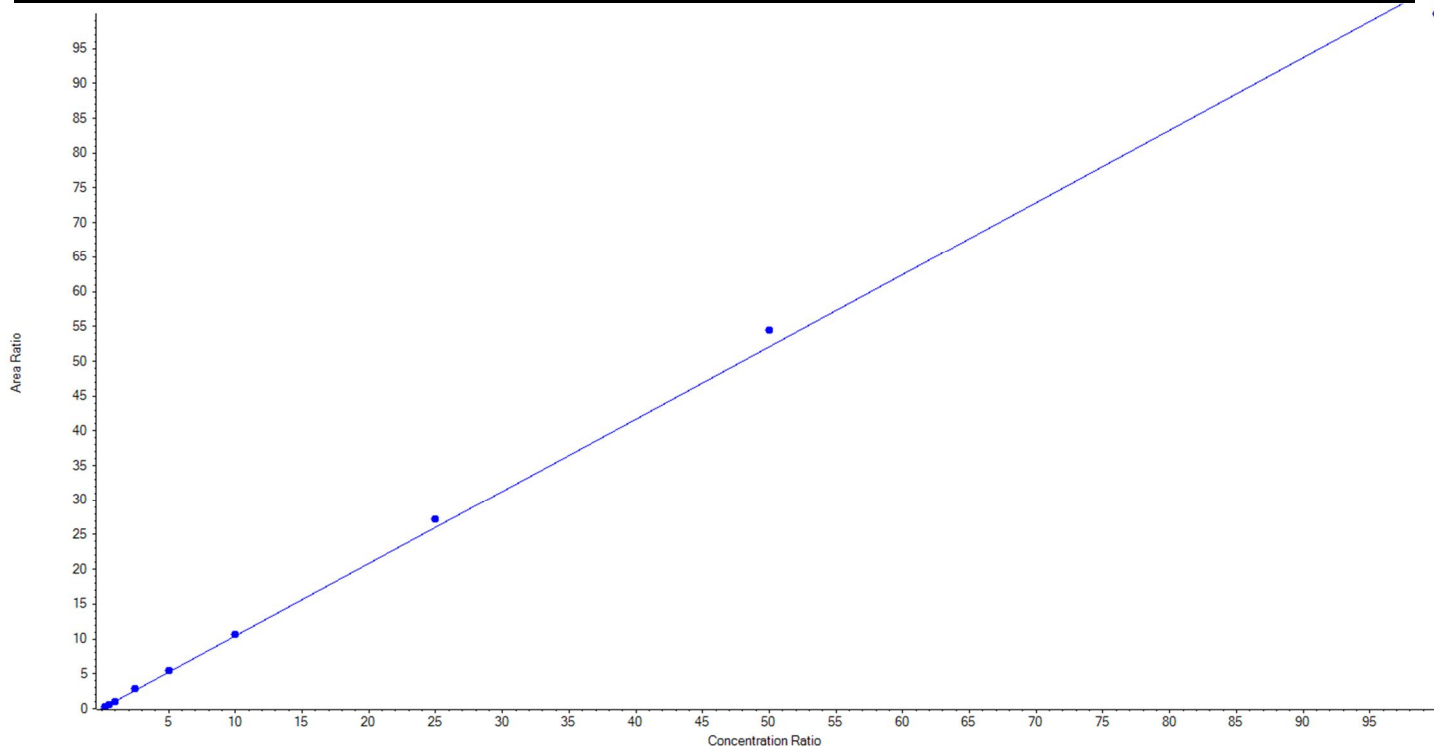
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDA_1               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 513.0 / 469.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.04056x + 0.03653$  ( $r = 0.99905$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.617757               | 86.5         |
| 3    | JV65        | L2        | True          | 50.00               | 46.915581               | 93.8         |
| 4    | JV66        | L3        | True          | 100.00              | 98.528321               | 98.5         |
| 5    | JV67        | L4        | True          | 250.00              | 274.358579              | 109.7        |
| 6    | JV68        | L5        | True          | 500.00              | 522.068312              | 104.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1020.948522             | 102.1        |
| 8    | JV70        | L7        | True          | 2500.00             | 2607.612929             | 104.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5228.352489             | 104.6        |
| 10   | JV72        | L9        | True          | 10000.00            | 9604.597509             | 96.1         |





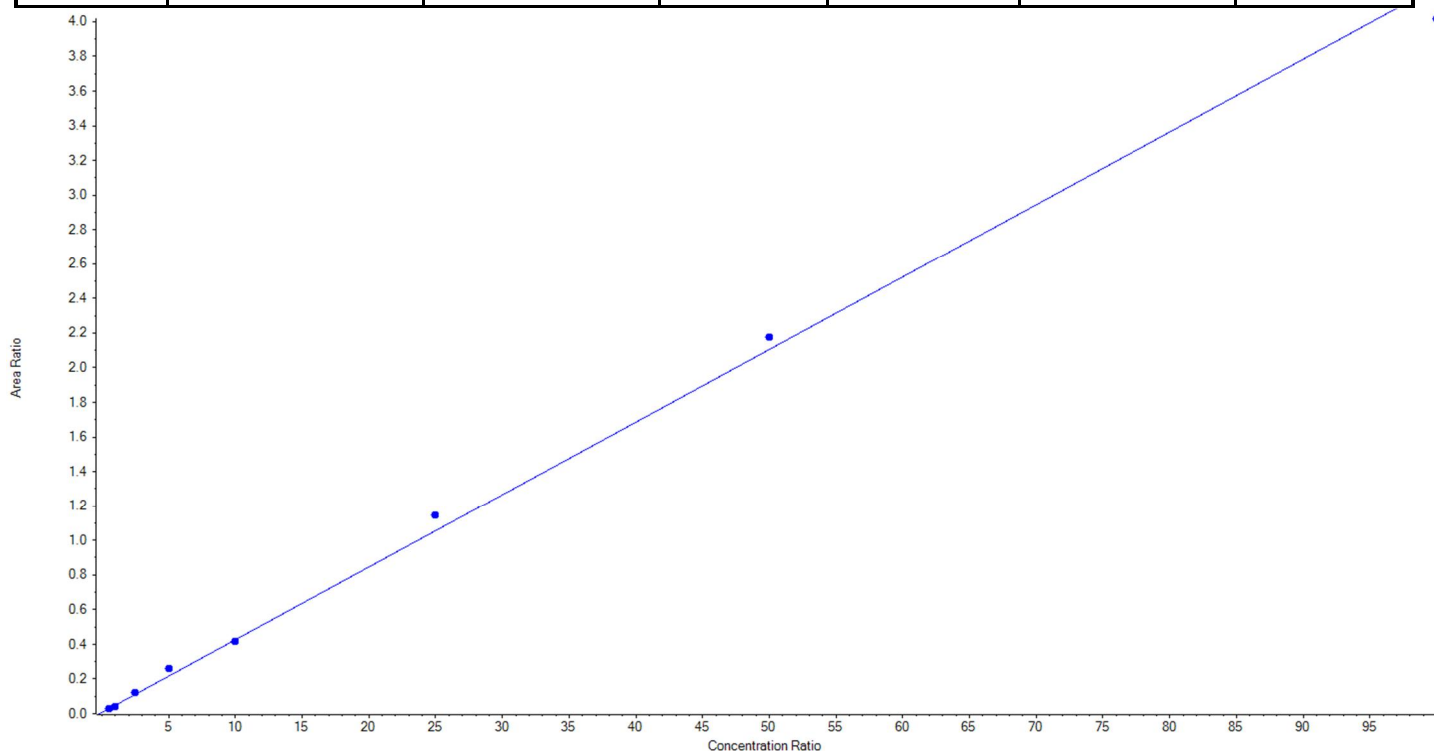
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDA_2               | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 513.0 / 219.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.04197 x + 0.00666$  ( $r = 0.99799$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | N/A                     | N/A          |
| 3    | JV65        | L2        | True          | 50.00               | 46.777482               | 93.6         |
| 4    | JV66        | L3        | True          | 100.00              | 74.434538               | 74.4         |
| 5    | JV67        | L4        | True          | 250.00              | 267.766863              | 107.1        |
| 6    | JV68        | L5        | True          | 500.00              | 598.449884              | 119.7        |
| 7    | JV69        | L6        | True          | 1000.00             | 978.090466              | 97.8         |
| 8    | JV70        | L7        | True          | 2500.00             | 2713.219176             | 108.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5166.334700             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9554.926891             | 95.6         |





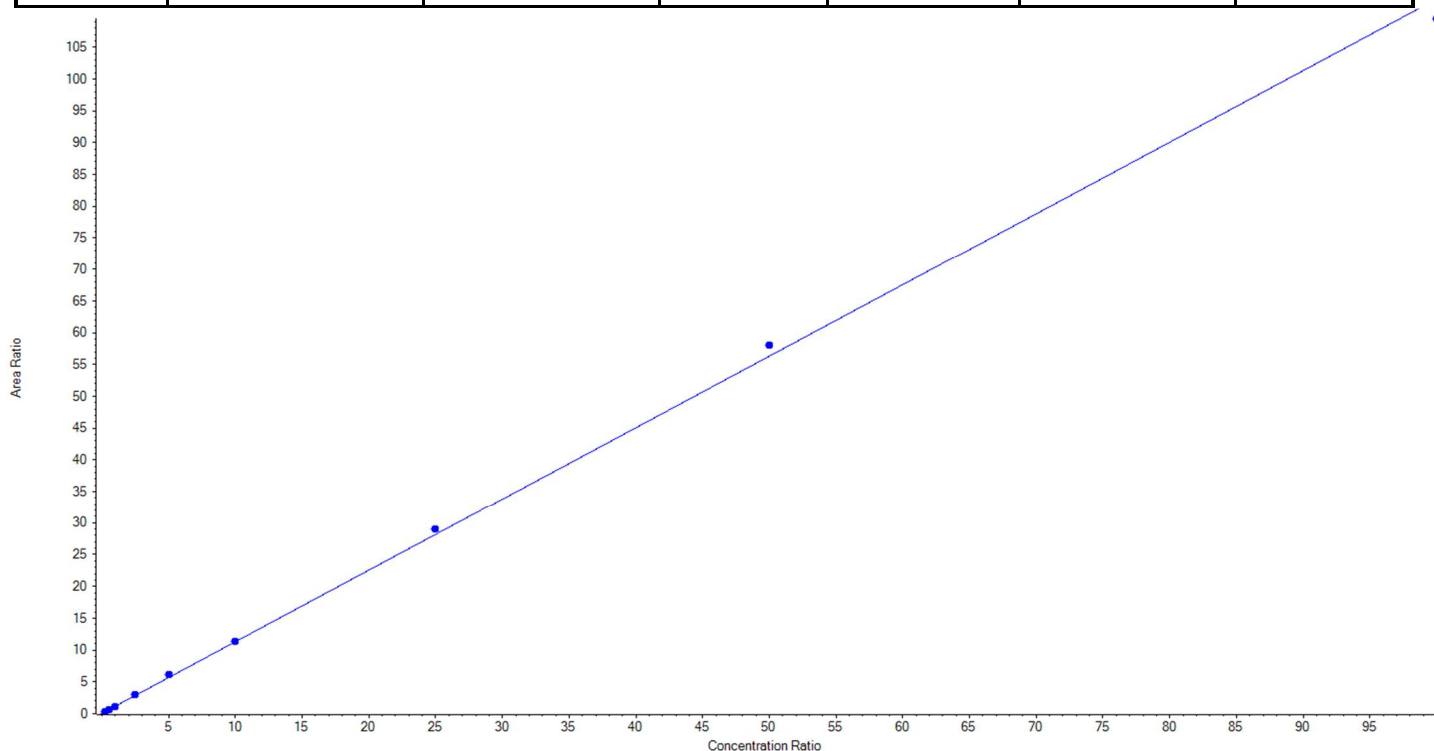
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFUnA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 563.0 / 519.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.12524 x + 0.05385$  ( $r = 0.99945$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 24.089066               | 96.4         |
| 3    | JV65        | L2        | True          | 50.00               | 45.924072               | 91.9         |
| 4    | JV66        | L3        | True          | 100.00              | 93.739853               | 93.7         |
| 5    | JV67        | L4        | True          | 250.00              | 263.505185              | 105.4        |
| 6    | JV68        | L5        | True          | 500.00              | 546.212628              | 109.2        |
| 7    | JV69        | L6        | True          | 1000.00             | 1000.964662             | 100.1        |
| 8    | JV70        | L7        | True          | 2500.00             | 2576.763887             | 103.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5150.610976             | 103.0        |
| 10   | JV72        | L9        | True          | 10000.00            | 9723.189670             | 97.2         |





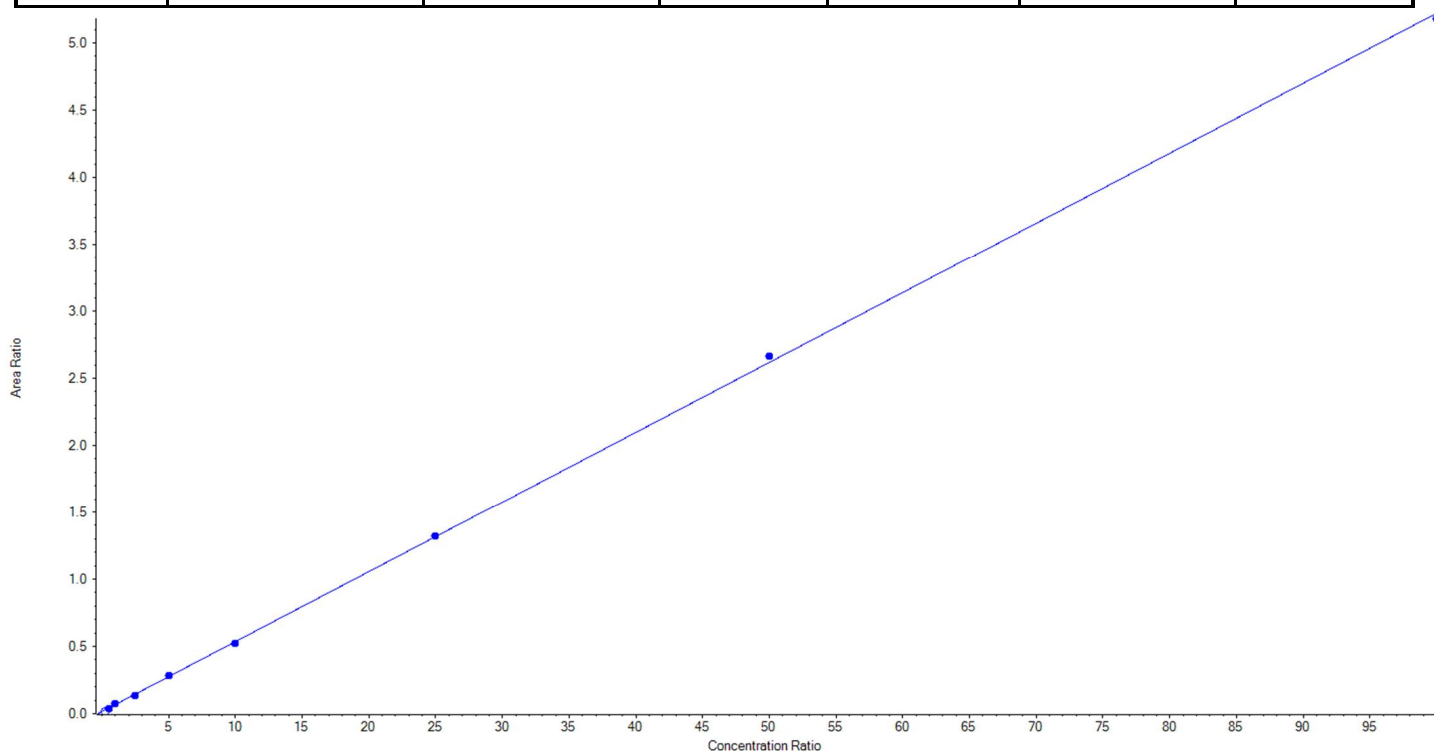
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFUnA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 563.0 / 269.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.05204 x + 0.01541$  ( $r = 0.99984$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 0.630758                | 2.5          |
| 3    | JV65        | L2        | True          | 50.00               | 46.402649               | 92.8         |
| 4    | JV66        | L3        | True          | 100.00              | 110.523860              | 110.5        |
| 5    | JV67        | L4        | True          | 250.00              | 233.942859              | 93.6         |
| 6    | JV68        | L5        | True          | 500.00              | 520.526486              | 104.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 978.427801              | 97.8         |
| 8    | JV70        | L7        | True          | 2500.00             | 2507.249455             | 100.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5082.637315             | 101.7        |
| 10   | JV72        | L9        | True          | 10000.00            | 9920.289573             | 99.2         |





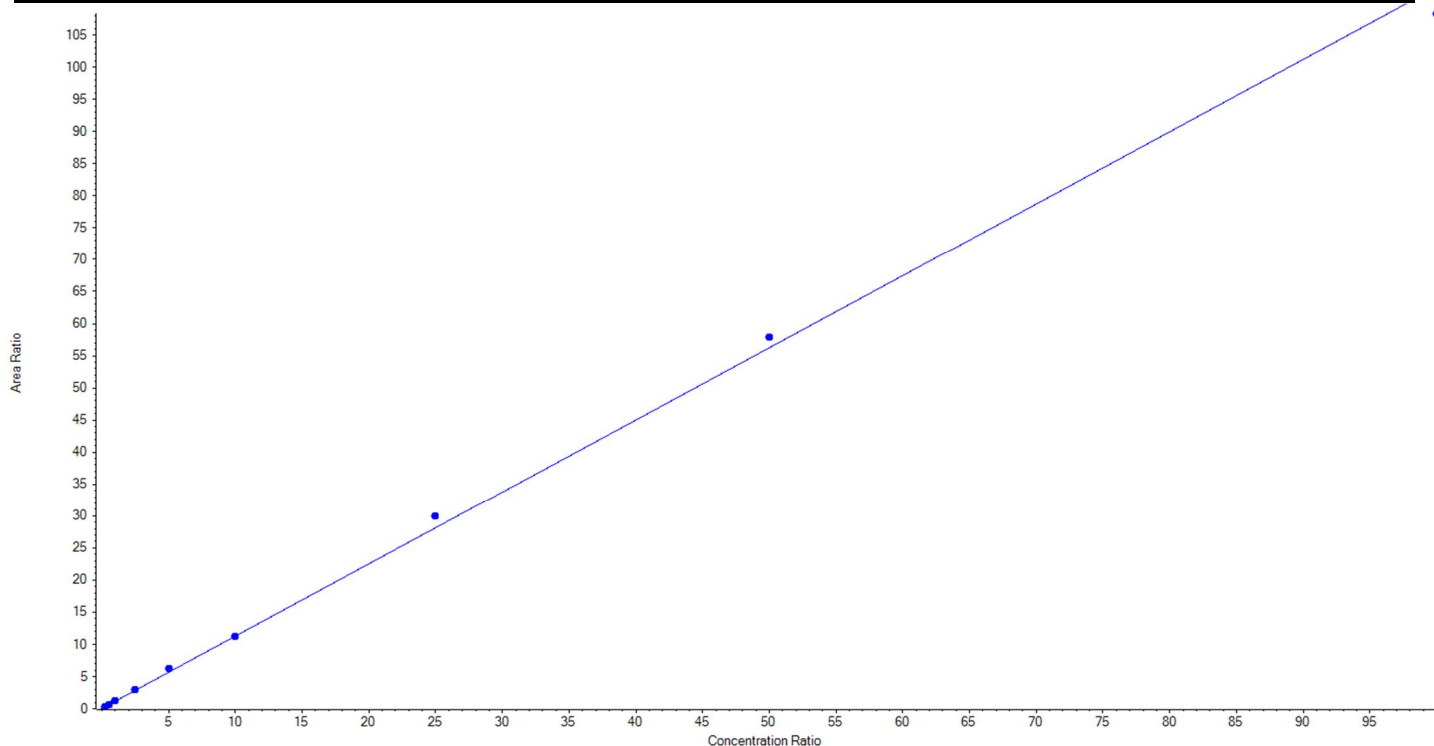
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDaA_1              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 613.0 / 569.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.12396 x + 0.04546$  ( $r = 0.99903$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.386025               | 85.5         |
| 3    | JV65        | L2        | True          | 50.00               | 46.149854               | 92.3         |
| 4    | JV66        | L3        | True          | 100.00              | 100.371982              | 100.4        |
| 5    | JV67        | L4        | True          | 250.00              | 261.955860              | 104.8        |
| 6    | JV68        | L5        | True          | 500.00              | 555.474506              | 111.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1002.365324             | 100.2        |
| 8    | JV70        | L7        | True          | 2500.00             | 2661.890707             | 106.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5144.074612             | 102.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9631.331130             | 96.3         |







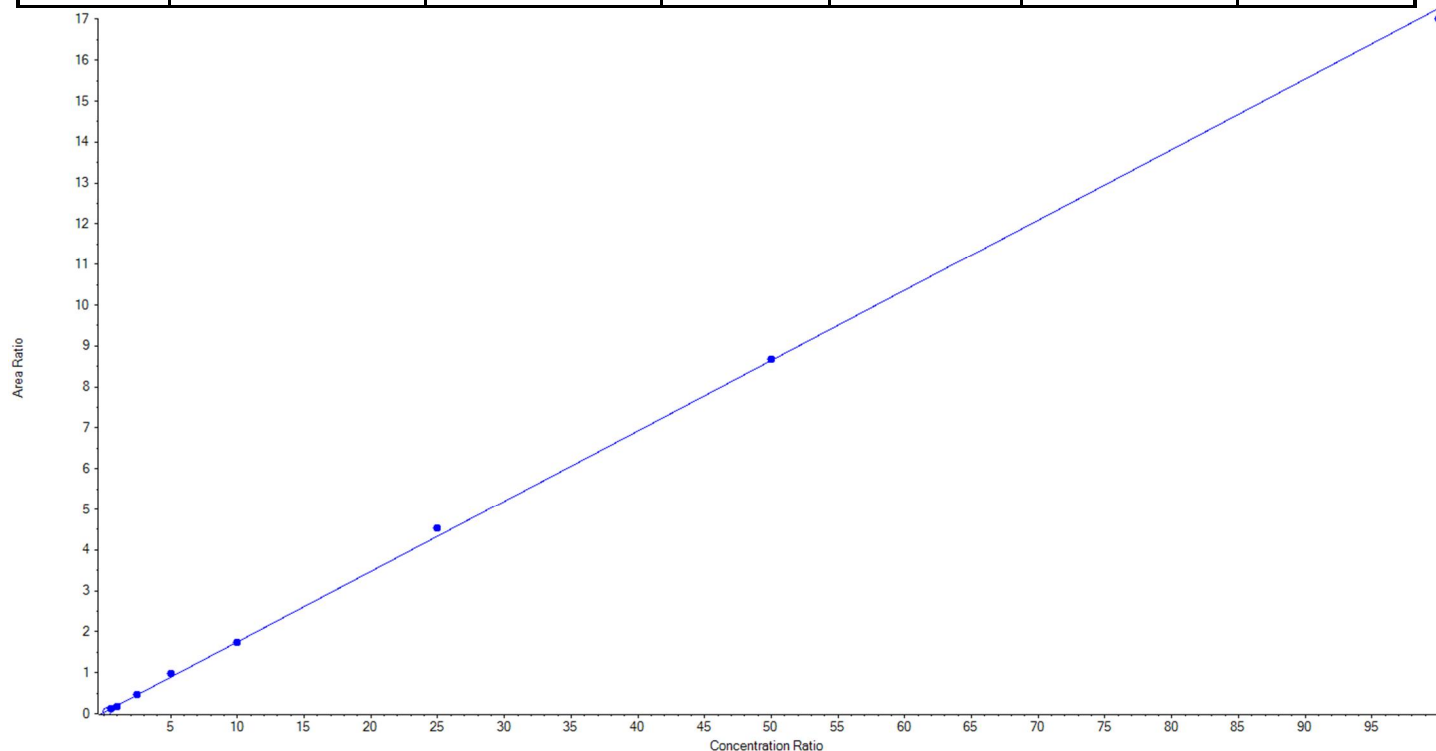
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFDaA_2              | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 613.0 / 319.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.17236 x + 0.02845$  ( $r = 0.99959$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 7.804720                | 31.2         |
| 3    | JV65        | L2        | True          | 50.00               | 53.040734               | 106.1        |
| 4    | JV66        | L3        | True          | 100.00              | 83.092603               | 83.1         |
| 5    | JV67        | L4        | True          | 250.00              | 247.417961              | 99.0         |
| 6    | JV68        | L5        | True          | 500.00              | 547.673098              | 109.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 991.539776              | 99.2         |
| 8    | JV70        | L7        | True          | 2500.00             | 2607.895936             | 104.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5016.091027             | 100.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9853.248864             | 98.5         |





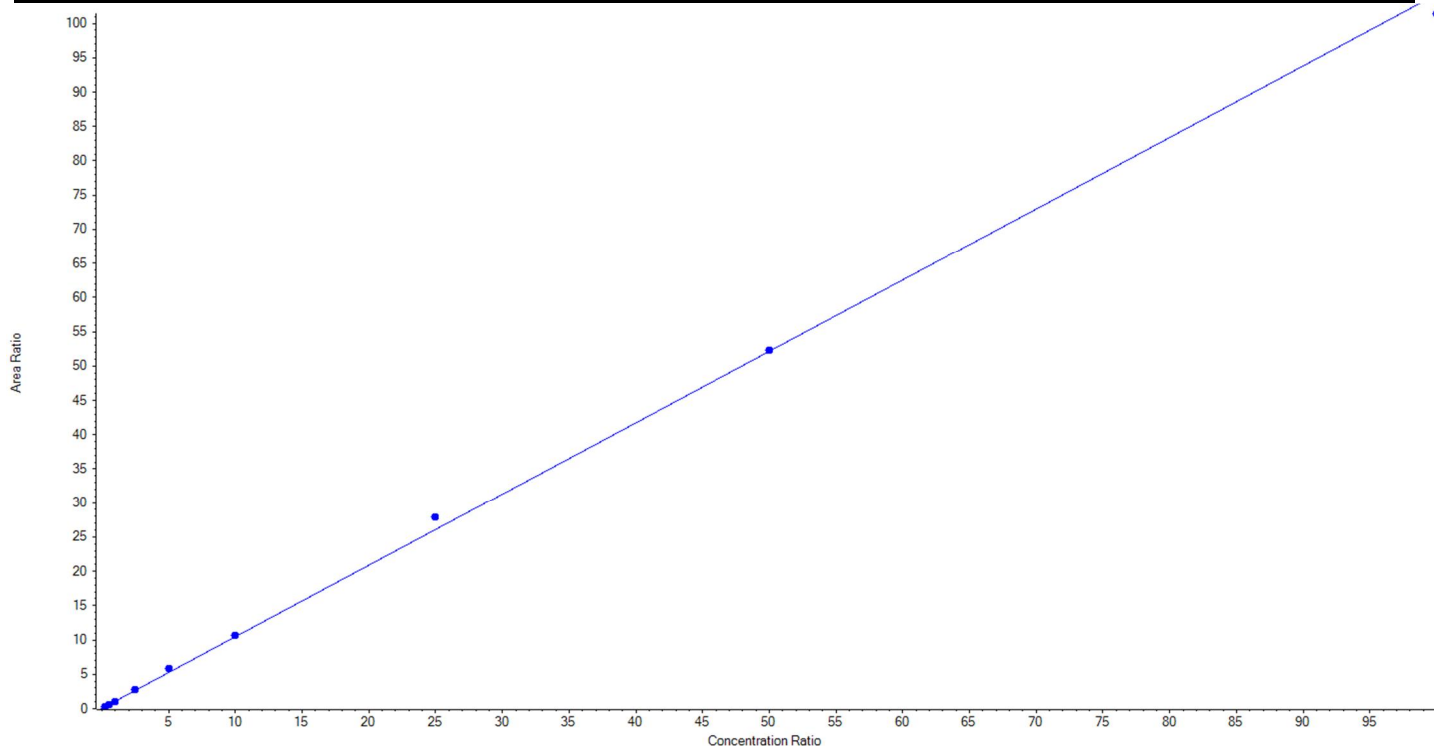
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTTrDA_1            | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 663.0 / 619.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.04170x + 0.05468$  ( $r = 0.99926$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.242461               | 85.0         |
| 3    | JV65        | L2        | True          | 50.00               | 47.209992               | 94.4         |
| 4    | JV66        | L3        | True          | 100.00              | 97.574463               | 97.6         |
| 5    | JV67        | L4        | True          | 250.00              | 266.206145              | 106.5        |
| 6    | JV68        | L5        | True          | 500.00              | 549.792324              | 110.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 1017.912346             | 101.8        |
| 8    | JV70        | L7        | True          | 2500.00             | 2679.029289             | 107.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 5018.204996             | 100.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9727.827984             | 97.3         |





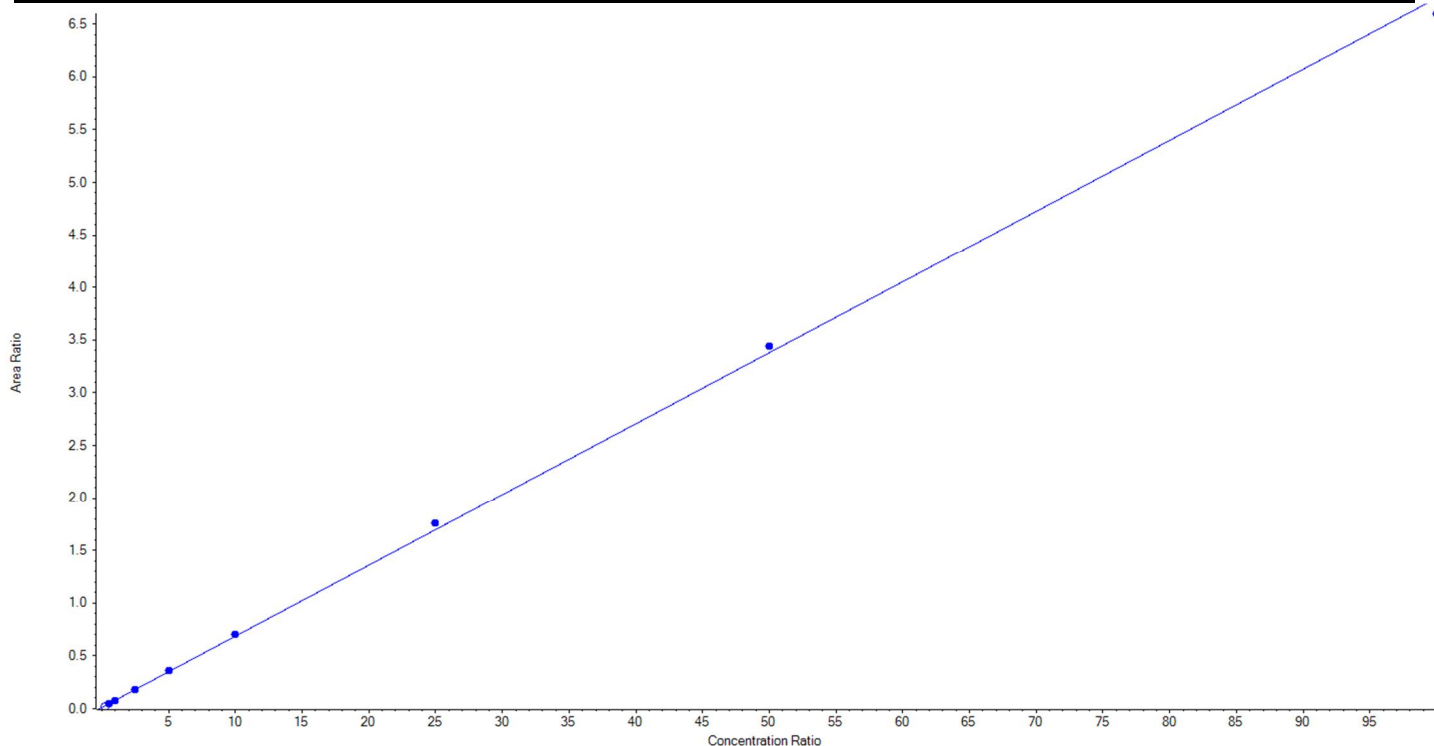
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTTrDA_2            | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 663.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.06731 x + 0.01330$  ( $r = 0.99966$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 2.049840                | 8.2          |
| 3    | JV65        | L2        | True          | 50.00               | 46.658919               | 93.3         |
| 4    | JV66        | L3        | True          | 100.00              | 98.013127               | 98.0         |
| 5    | JV67        | L4        | True          | 250.00              | 247.103066              | 98.8         |
| 6    | JV68        | L5        | True          | 500.00              | 522.356398              | 104.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 1018.579760             | 101.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2597.383911             | 103.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 5090.414923             | 101.8        |
| 10   | JV72        | L9        | True          | 10000.00            | 9779.489896             | 97.8         |





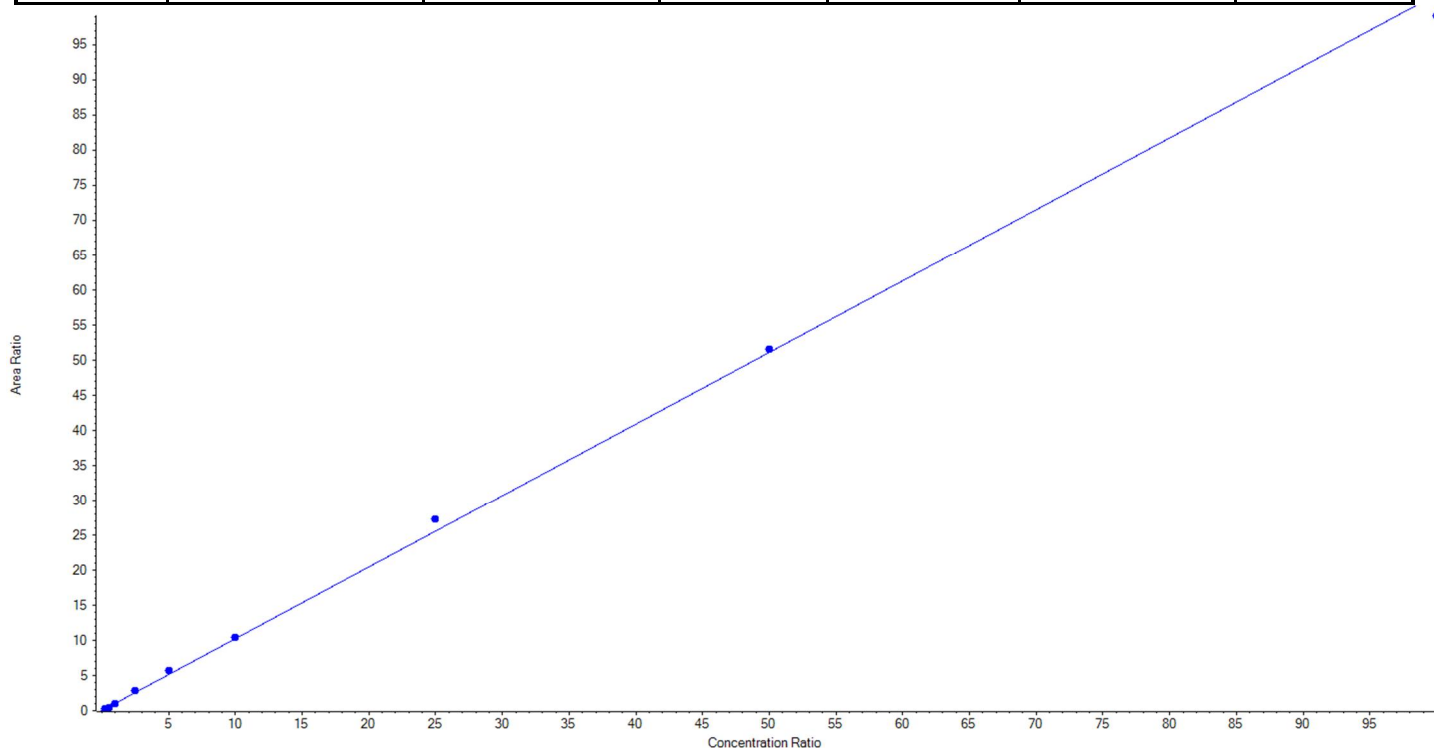
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTeDA_1             | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 713.0 / 669.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 1.02134 x + 0.03267$  ( $r = 0.99917$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 22.789628               | 91.2         |
| 3    | JV65        | L2        | True          | 50.00               | 44.447403               | 88.9         |
| 4    | JV66        | L3        | True          | 100.00              | 92.488743               | 92.5         |
| 5    | JV67        | L4        | True          | 250.00              | 276.378112              | 110.6        |
| 6    | JV68        | L5        | True          | 500.00              | 550.845491              | 110.2        |
| 7    | JV69        | L6        | True          | 1000.00             | 1020.383286             | 102.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2667.997144             | 106.7        |
| 9    | JV71        | L8        | True          | 5000.00             | 5048.267960             | 101.0        |
| 10   | JV72        | L9        | True          | 10000.00            | 9701.402232             | 97.0         |





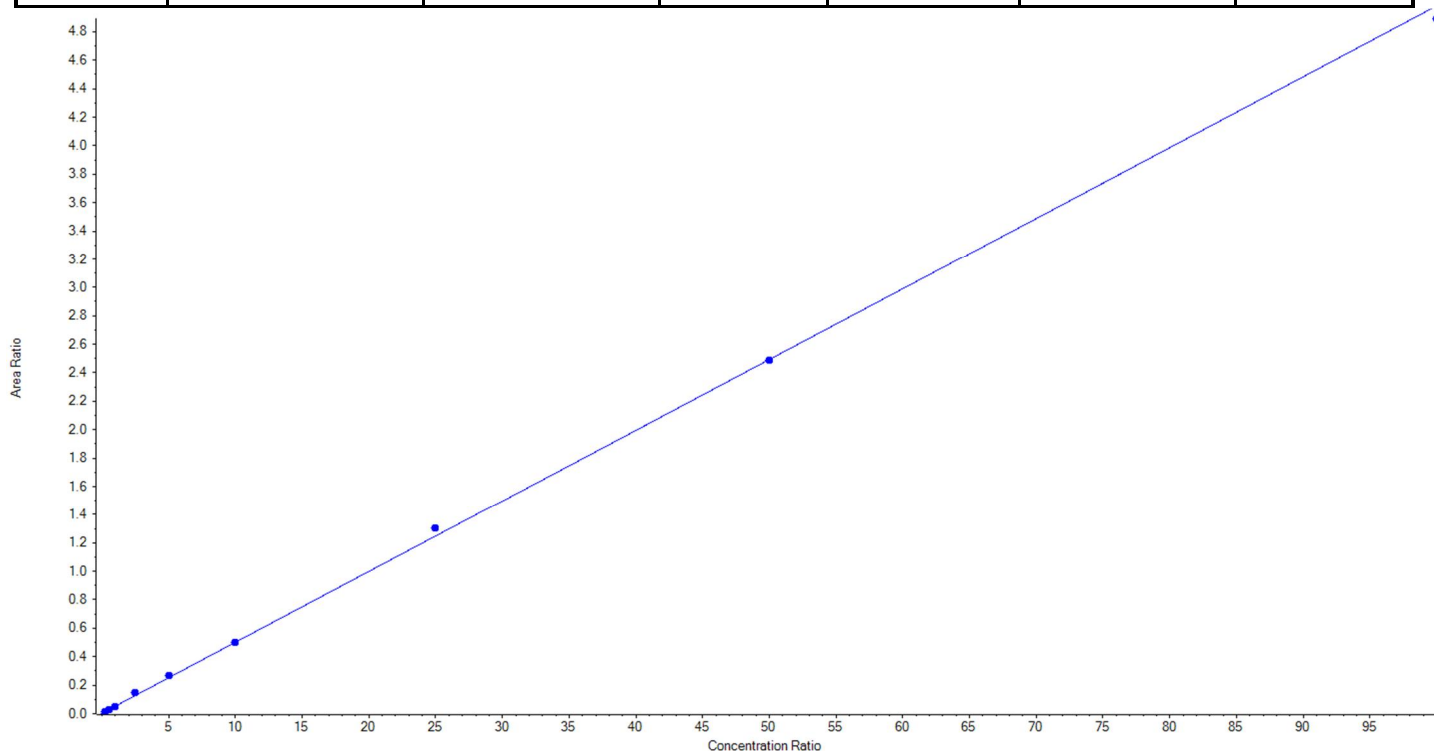
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | PFTeDA_2             | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 713.0 / 169.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | 13C2-PFOA            | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.04978x + 0.00345$  ( $r = 0.99942$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 20.961194               | 83.8         |
| 3    | JV65        | L2        | True          | 50.00               | 44.351644               | 88.7         |
| 4    | JV66        | L3        | True          | 100.00              | 98.814825               | 98.8         |
| 5    | JV67        | L4        | True          | 250.00              | 296.168648              | 118.5        |
| 6    | JV68        | L5        | True          | 500.00              | 535.567580              | 107.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1003.798782             | 100.4        |
| 8    | JV70        | L7        | True          | 2500.00             | 2617.205633             | 104.7        |
| 9    | JV71        | L8        | True          | 5000.00             | 4990.671418             | 99.8         |
| 10   | JV72        | L9        | True          | 10000.00            | 9817.460276             | 98.2         |





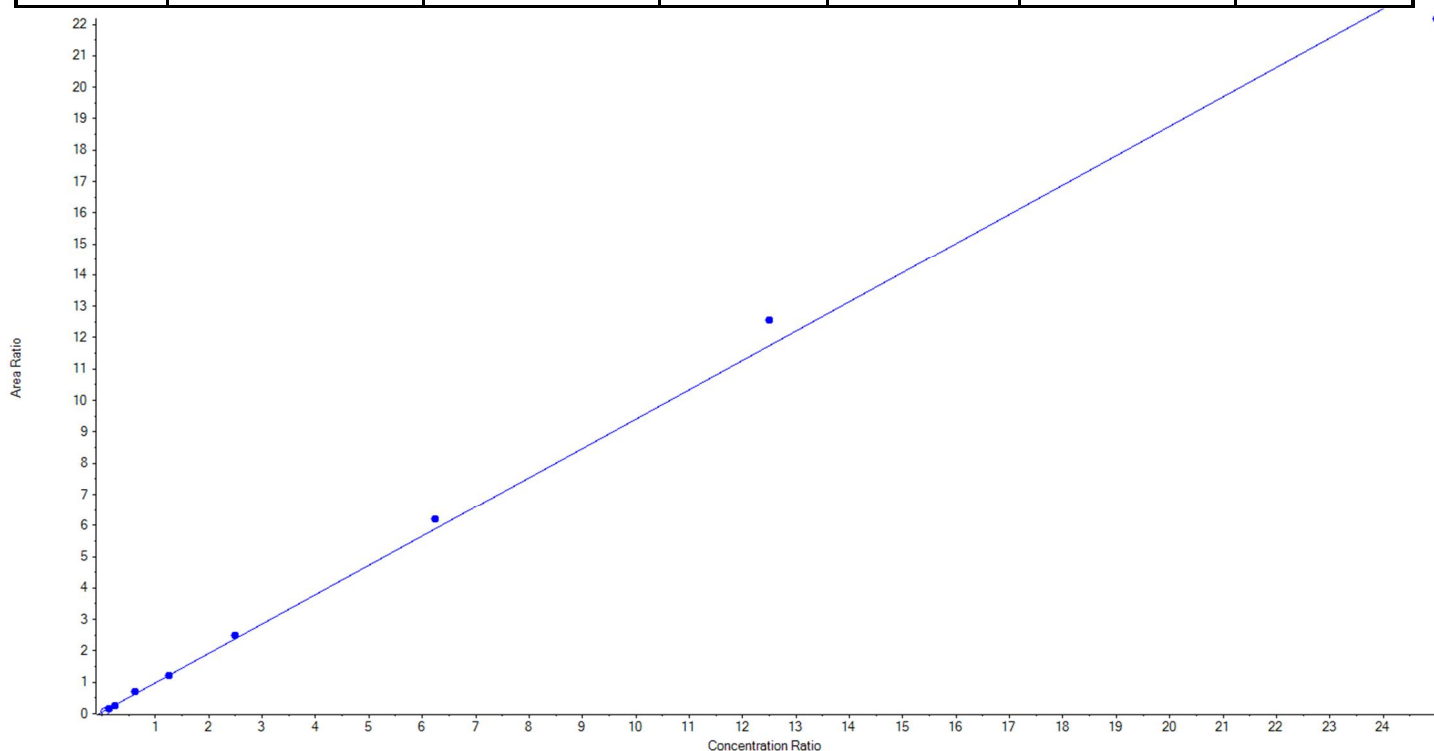
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NMeFOSAA_1           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 570.0 / 419.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.93548x + 0.04710$  ( $r = 0.99806$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 10.005275               | 40.0         |
| 3    | JV65        | L2        | True          | 50.00               | 45.576655               | 91.2         |
| 4    | JV66        | L3        | True          | 100.00              | 86.775272               | 86.8         |
| 5    | JV67        | L4        | True          | 250.00              | 279.677441              | 111.9        |
| 6    | JV68        | L5        | True          | 500.00              | 495.256714              | 99.1         |
| 7    | JV69        | L6        | True          | 1000.00             | 1040.135137             | 104.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2635.295656             | 105.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 5355.092820             | 107.1        |
| 10   | JV72        | L9        | True          | 10000.00            | 9462.190305             | 94.6         |







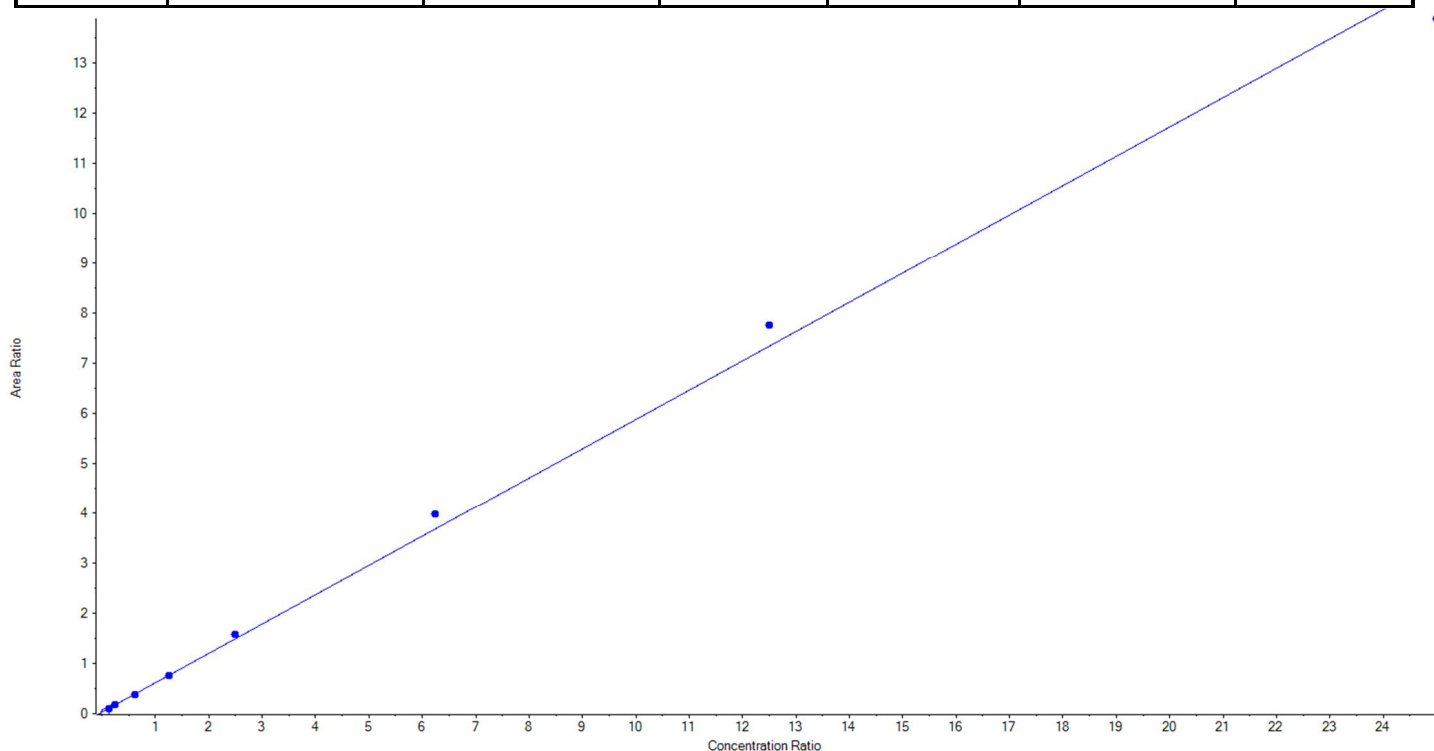
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NMeFOSAA_2           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 570.0 / 512.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.58489x + 0.03127$  ( $r = 0.99817$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | < 0                     | N/A          |
| 3    | JV65        | L2        | True          | 50.00               | 47.530013               | 95.1         |
| 4    | JV66        | L3        | True          | 100.00              | 97.243811               | 97.2         |
| 5    | JV67        | L4        | True          | 250.00              | 235.372178              | 94.2         |
| 6    | JV68        | L5        | True          | 500.00              | 496.856842              | 99.4         |
| 7    | JV69        | L6        | True          | 1000.00             | 1055.751249             | 105.6        |
| 8    | JV70        | L7        | True          | 2500.00             | 2699.865712             | 108.0        |
| 9    | JV71        | L8        | True          | 5000.00             | 5293.236830             | 105.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9474.143366             | 94.7         |





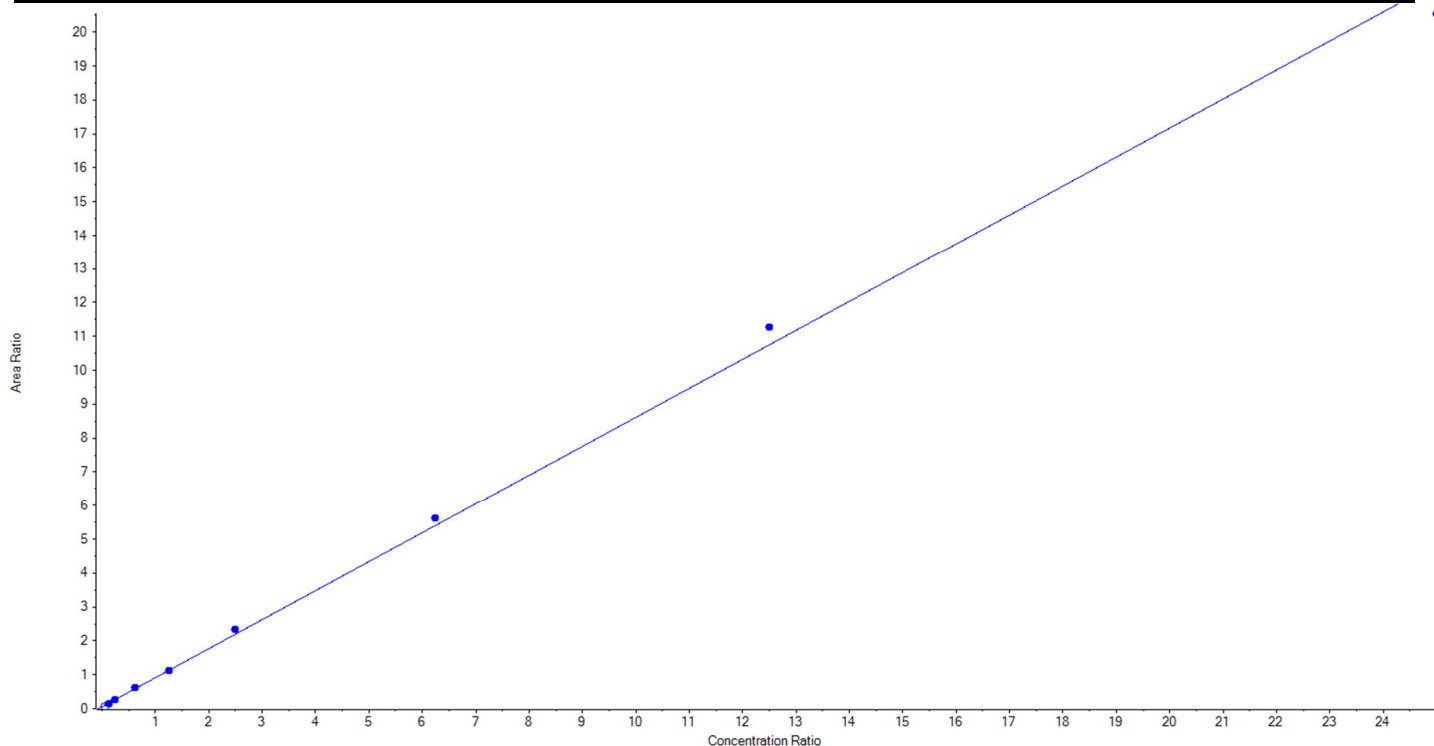
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NEtFOSAA_1           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 584.0 / 419.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.85558x + 0.05717$  ( $r = 0.99884$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 3.138261                | 12.6         |
| 3    | JV65        | L2        | True          | 50.00               | 42.784938               | 85.6         |
| 4    | JV66        | L3        | True          | 100.00              | 97.864659               | 97.9         |
| 5    | JV67        | L4        | True          | 250.00              | 260.601917              | 104.2        |
| 6    | JV68        | L5        | True          | 500.00              | 502.172020              | 100.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1069.526868             | 107.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2607.040747             | 104.3        |
| 9    | JV71        | L8        | True          | 5000.00             | 5245.588850             | 104.9        |
| 10   | JV72        | L9        | True          | 10000.00            | 9574.420001             | 95.7         |





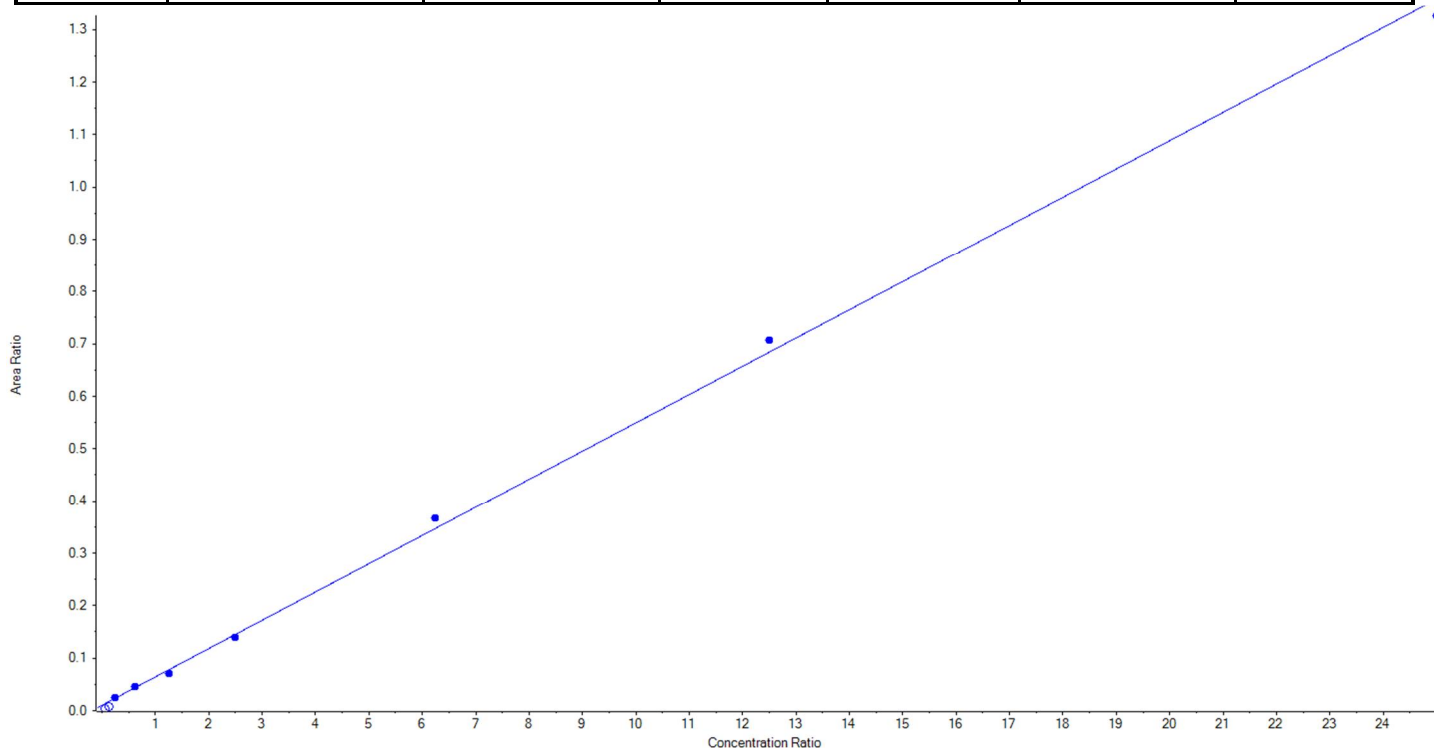
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 18/05/2018 3:49:00 PM

|                          |                      |                           |              |
|--------------------------|----------------------|---------------------------|--------------|
| <b>Analyte Name</b>      | NEtFOSAA_2           | <b>Data File</b>          | 18-0313.wiff |
| <b>MRM Transition</b>    | 584.0 / 483.0        | <b>Result Table</b>       | 18-0312_BASE |
| <b>Internal Standard</b> | d3-MeFOSAA           | <b>Instrument Name</b>    | QTRAP 5500   |
| <b>Acquisition Date</b>  | 5/14/2018 4:18:10 PM | <b>Acquisition Method</b> | 5-0371.dam   |

Regression Equation:  $y = 0.05390 x + 0.01038$  ( $r = 0.99914$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | < 0                     | N/A          |
| 3    | JV65        | L2        | False         | 50.00               | < 0                     | N/A          |
| 4    | JV66        | L3        | True          | 100.00              | 102.682341              | 102.7        |
| 5    | JV67        | L4        | True          | 250.00              | 263.060335              | 105.2        |
| 6    | JV68        | L5        | True          | 500.00              | 448.299583              | 89.7         |
| 7    | JV69        | L6        | True          | 1000.00             | 953.973248              | 95.4         |
| 8    | JV70        | L7        | True          | 2500.00             | 2651.575627             | 106.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5166.916956             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9763.491910             | 97.6         |



[illegible]

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:23 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV64                | Injection Vial   | 2            |
| Sample ID          | L1                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:27:07 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.3953    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.74 | PFHxA       | 0.0719             | 0.0622    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | PFHpA       | 0.0228             | 0.0354    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2754    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.48 | PFOA        | 0.0728             | 0.0863    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.85 | PFNA        | 0.2872             | 0.2518    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.85 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.85 | PFOS        | 0.1938             | 0.1551    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.21 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | N/A  | PFDA        | 0.0419             | N/A       | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0484    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.81 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.81 | PFDoA       | 0.1596             | 0.1466    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.0677             | 0.0532    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.0503             | 0.0523    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.35 | NMeFOSAA    | 0.6292             | 0.2625    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.89 | NEtFOSSA    | 0.0685             | 0.0710    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:25 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV65                | Injection Vial   | 3            |
| Sample ID          | L2                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:36:03 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3677    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0967    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.07 | PFHpA       | 0.0228             | 0.0277    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2918    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.47 | PFOA        | 0.0728             | 0.0983    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.2872             | 0.2818    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.2282    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.21 | PFDA        | 0.0419             | 0.0501    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0693    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | PFDoA       | 0.1596             | 0.2125    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0818    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0525    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6557    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0545    | ü                     |



## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:27 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV66                | Injection Vial   | 4            |
| Sample ID          | L3                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:45:01 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.3480             | 0.3430    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0676    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0263    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.3185    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.48 | PFOA        | 0.0728             | 0.0607    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2885    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.1938             | 0.1949    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.20 | PFDA        | 0.0419             | 0.0357    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | PFUnA       | 0.0515             | 0.0658    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1463    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | PFTTrDA     | 0.0677             | 0.0740    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.0503             | 0.0539    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.6292             | 0.6937    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0909    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:29 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV67                | Injection Vial   | 5            |
| Sample ID          | L4                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T16:53:56 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3647    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0665    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0236    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2845    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0745    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2934    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.2030    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0412    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0454    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1522    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | PFTTrDA     | 0.0677             | 0.0635    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0528    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.5354    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0746    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:32 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68                | Injection Vial   | 6            |
| Sample ID          | L5                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:02:52 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3470    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0717    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0205    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2975    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0701    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2913    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1852    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0471    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | PFUnA       | 0.0515             | 0.0462    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.78 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1546    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0631    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.0503             | 0.0477    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.32 | NMeFOSAA    | 0.6292             | 0.6287    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0626    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:34 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV69                | Injection Vial   | 7            |
| Sample ID          | L6                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:11:47 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3339    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0688    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.0228             | 0.0219    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2684    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0697    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.2872             | 0.2864    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1938    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.19 | PFDA        | 0.0419             | 0.0391    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0464    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | PFDoA       | 0.1596             | 0.1536    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0656    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0481    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.6292             | 0.6352    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.0685             | 0.0592    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:36 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV70                | Injection Vial   | 8            |
| Sample ID          | L7                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:20:42 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3375    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | PFHxA       | 0.0719             | 0.0740    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0225    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.09 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2904    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0715    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.3023    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1961    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0422    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0455    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1510    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0630    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0479    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6407    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0653    | ü                     |

## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:39 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV71                | Injection Vial   | 9            |
| Sample ID          | L8                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:29:36 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3207    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.0719             | 0.0703    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0198    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2870    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0691    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2943    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.1938             | 0.1951    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.19 | PFDA        | 0.0419             | 0.0399    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.0515             | 0.0459    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1499    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0657    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | PFTeDA      | 0.0503             | 0.0482    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6182    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.0685             | 0.0627    | ü                     |



## Summary Ion Ratio Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:11:41 PM

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV72                | Injection Vial   | 10           |
| Sample ID          | L9                  | Injection Volume | 10.00        |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:38:30 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Expected Ion Ratio | Ion Ratio | Ratio Pass (<50% RPD) |
|------------|----------------|------|-------------|--------------------|-----------|-----------------------|
| PFBS_1     | 298.9 / 80.0   | 1.44 | PFBS        | 1.0000             | 1.0000    | ü                     |
| PFBS_2     | 298.9 / 99.0   | 1.44 | PFBS        | 0.3480             | 0.3223    | ü                     |
| PFHxA_1    | 313.0 / 269.0  | 1.72 | PFHxA       | 1.0000             | 1.0000    | ü                     |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | PFHxA       | 0.0719             | 0.0697    | ü                     |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | PFHpA       | 1.0000             | 1.0000    | ü                     |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.0228             | 0.0202    | ü                     |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       | 1.0000             | 1.0000    | ü                     |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | PFHxS       | 0.2893             | 0.2901    | ü                     |
| PFOA_1     | 413.0 / 369.0  | 2.46 | PFOA        | 1.0000             | 1.0000    | ü                     |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.0728             | 0.0685    | ü                     |
| PFNA_1     | 463.0 / 419.0  | 2.83 | PFNA        | 1.0000             | 1.0000    | ü                     |
| PFNA_2     | 463.0 / 219.0  | 2.83 | PFNA        | 0.2872             | 0.2949    | ü                     |
| PFOS_1     | 499.0 / 80.0   | 2.82 | PFOS        | 1.0000             | 1.0000    | ü                     |
| PFOS_2     | 499.0 / 99.0   | 2.82 | PFOS        | 0.1938             | 0.1932    | ü                     |
| PFDA_1     | 513.0 / 469.0  | 3.18 | PFDA        | 1.0000             | 1.0000    | ü                     |
| PFDA_2     | 513.0 / 219.0  | 3.18 | PFDA        | 0.0419             | 0.0402    | ü                     |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | PFUnA       | 1.0000             | 1.0000    | ü                     |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.0515             | 0.0473    | ü                     |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | PFDoA       | 1.0000             | 1.0000    | ü                     |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | PFDoA       | 0.1596             | 0.1571    | ü                     |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | PFTTrDA     | 1.0000             | 1.0000    | ü                     |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | PFTTrDA     | 0.0677             | 0.0651    | ü                     |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | PFTeDA      | 1.0000             | 1.0000    | ü                     |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | PFTeDA      | 0.0503             | 0.0493    | ü                     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | NMeFOSAA    | 1.0000             | 1.0000    | ü                     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.6292             | 0.6261    | ü                     |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | NEtFOSSA    | 1.0000             | 1.0000    | ü                     |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.48 | NEtFOSSA    | 0.0685             | 0.0646    | ü                     |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 804.339298   | 885.00              | 90.89        |
| PFBS_2     | 298.9 / 99.0   | 1.44 | 802.043754   | 885.00              | 90.63        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 969.289643   | 1000.00             | 96.93        |
| PFHxA_2    | 313.0 / 119.0  | 1.72 | 925.770240   | 1000.00             | 92.58        |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 924.919724   | 1000.00             | 92.49        |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 888.021349   | 1000.00             | 88.80        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 876.341070   | 912.00              | 96.09        |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 864.142918   | 912.00              | 94.75        |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 936.688375   | 1000.00             | 93.67        |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 930.333375   | 1000.00             | 93.03        |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 943.286988   | 1000.00             | 94.33        |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 1003.563557  | 1000.00             | 100.36       |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 792.672994   | 925.00              | 85.69        |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 849.682836   | 925.00              | 91.86        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 979.295546   | 1000.00             | 97.93        |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 926.354949   | 1000.00             | 92.64        |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 959.774620   | 1000.00             | 95.98        |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 927.941985   | 1000.00             | 92.79        |
| PFDoA_1    | 613.0 / 569.0  | 3.79 | 979.912690   | 1000.00             | 97.99        |
| PFDoA_2    | 613.0 / 319.0  | 3.79 | 948.169769   | 1000.00             | 94.82        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 937.629546   | 1000.00             | 93.76        |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 934.557623   | 1000.00             | 93.46        |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 952.033212   | 1000.00             | 95.20        |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 925.189660   | 1000.00             | 92.52        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 1046.178270  | 1000.00             | 104.62       |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 1030.939699  | 1000.00             | 103.09       |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 1116.177819  | 1000.00             | 111.62       |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 1220.574679  | 1000.00             | 122.06       |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11           |
| Sample ID          | ICC                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T17:47:28 | Data File        | 18-0313.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 92.199053    | 100.00              | 92.20        |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 88.871352    | 100.00              | 88.87        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 373.700865   | 400.00              | 93.43        |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_BASE |
| Sample Comment     |                     |                  |              |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 393.941239   | 443.00              | 88.93        |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 389.069756   | 443.00              | 87.83        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 538.564060   | 500.00              | 107.71       |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 494.472205   | 500.00              | 98.89        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 501.861924   | 500.00              | 100.37       |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 526.266950   | 500.00              | 105.25       |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 415.104170   | 456.00              | 91.03        |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 417.708313   | 456.00              | 91.60        |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 508.842825   | 500.00              | 101.77       |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 513.589300   | 500.00              | 102.72       |
| PFNA_1     | 463.0 / 419.0  | 2.83 | 503.011917   | 500.00              | 100.60       |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 512.620705   | 500.00              | 102.52       |
| PFOS_1     | 499.0 / 80.0   | 2.82 | 433.102471   | 463.00              | 93.54        |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 438.321868   | 463.00              | 94.67        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 516.203166   | 500.00              | 103.24       |
| PFDA_2     | 513.0 / 219.0  | 3.18 | 479.335212   | 500.00              | 95.87        |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 495.832201   | 500.00              | 99.17        |
| PFUnA_2    | 563.0 / 269.0  | 3.49 | 527.429111   | 500.00              | 105.49       |
| PFDoA_1    | 613.0 / 569.0  | 3.78 | 529.388851   | 500.00              | 105.88       |
| PFDoA_2    | 613.0 / 319.0  | 3.78 | 527.919162   | 500.00              | 105.58       |
| PFTTrDA_1  | 663.0 / 619.0  | 4.03 | 498.401940   | 500.00              | 99.68        |
| PFTTrDA_2  | 663.0 / 169.0  | 4.03 | 504.822257   | 500.00              | 100.96       |
| PFTeDA_1   | 713.0 / 669.0  | 4.25 | 522.276225   | 500.00              | 104.46       |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 515.611624   | 500.00              | 103.12       |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 537.634252   | 500.00              | 107.53       |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 546.797228   | 500.00              | 109.36       |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.49 | 511.007033   | 500.00              | 102.20       |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.47 | 606.078028   | 500.00              | 121.22       |

|                    |                     |                  |              |
|--------------------|---------------------|------------------|--------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6            |
| Sample ID          | CCV                 | Injection Volume | 10.00        |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500   |
| Acquisition Date   | 2018-05-14T19:25:38 | Data File        | 18-0312.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0312_SIS  |
| Sample Comment     |                     |                  |              |

---

**Results Summary**

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 98.408789    | 100.00              | 98.41        |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 94.732022    | 100.00              | 94.73        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.48 | 404.091728   | 400.00              | 101.02       |

## QA/QC Summary Batch 18-0299

|                   |                                                            |
|-------------------|------------------------------------------------------------|
| Project:          | CTO-WE04 Naval Air Station Joint Reserve Base Willow Grove |
| Parameters:       | PFAS                                                       |
| Laboratory:       | Battelle, Norwell, MA                                      |
| Matrix:           | DW                                                         |
| Data Set:         | DP-18-0103                                                 |
| Analytical SOP:   | 5-371                                                      |
| Method Reference: | USEPA 537 rev. 1.1, QSM 5.1                                |

### Sample Custody

| Collection Date | Receipt Date | Temp (°C) |
|-----------------|--------------|-----------|
| 4/30/2018       | 5/1/2018     | 1.9       |
| 5/1/2018        | 5/2/2018     | 1.7       |

|                    |                                                              |
|--------------------|--------------------------------------------------------------|
| Corrective Actions | None                                                         |
| Sample Storage     | The water samples were stored refrigerated until extraction. |
| Related samples    | FRB samples are extracted in SDG 18-0312                     |

### METHOD SUMMARIES

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Preparation | Water samples were spiked with surrogates in the original sample container from the field. The water was extracted using a weak ion exchange solid phase extraction (SPE) cartridge and eluted from the SPE with methanol. Extracts were split and concentrated to dryness under nitrogen with a water bath set between 60 °C and 65 °C, reconstituted with 96:4 methanol/water (V/V) and fortified with internal standard. Extracts were transferred for LC-MS/MS analysis.                                                                       |
| Prep comments      | Sample WGNA-050118-RW-3178 contained particulate matter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Analysis           | PFAS were measured by liquid chromatography tandem mass spectrometry (LC-MS/MS) in the multiple reaction monitoring (MRM). An initial calibration consisting of representative target analytes, labelled analogs, and internal standards was analyzed prior to analysis to demonstrate the linear range of analysis. Calibration verification was performed at the beginning and end of 10 injections and at the end of each sequence. Target PFAS were quantified using the isotope dilution method. Samples are reported in ng/L concentrations. |
| Analysis Comments  | Samples analyzed on the Sciex 5500.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Holding Times | Extraction Date(s) | Analysis Date(s) |
|---------------|--------------------|------------------|
|               | 5/4/2018           | 5/13/2018        |

|                       |                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------|
| Procedural Blank (PB) | A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods are free of contamination. |
| ≤ 1/3 the MRL         | No exceedances noted.<br>No comments.                                                                                        |



**QA/QC Summary**  
**Batch 18-0299**

|                                                                                                             |                                                                                                                                                                                                        |
|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Laboratory Control Spike (LCS)                                                                              | A LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.                                                                          |
| 70-130% of true value                                                                                       | No exceedances noted.<br>No comments.                                                                                                                                                                  |
| Matrix Spike (MS) / Duplicate (MSD)                                                                         | A MS/MSD were prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy. The relative percent difference was calculated to measure precision. |
| 70-130% of true value, RPD $\leq$ 30%                                                                       | No exceedances noted.<br>No Comments.                                                                                                                                                                  |
| Surrogates Standard Analytes                                                                                | Labelled surrogate compounds were added prior to extraction. The recoveries are calculated to measure extraction efficiency.                                                                           |
| 70-130% of true value                                                                                       | No exceedances noted.<br>No Comments.                                                                                                                                                                  |
| Internal Standard Analytes                                                                                  | Labelled analog compounds were added prior to analysis.                                                                                                                                                |
| ICal high and low points RPD $\leq$ 20%, 50-150% of average area of the ICAL and 70-140% of most recent CCV | No exceedances noted.<br>No Comments.                                                                                                                                                                  |
| Initial Calibration (ICAL)                                                                                  | The LC-MS/MS was calibrated with multi-level calibration curve for all compounds using linear or quadratic curve fitting.                                                                              |
| R <sup>2</sup> > 0.99                                                                                       | No exceedances noted.                                                                                                                                                                                  |
| Target and SIS compounds +/- 30% of true value, Low point 50-150% of true value                             | No comments.                                                                                                                                                                                           |
| Independent Calibration Check (ICC)                                                                         | The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.                                                        |
| Target and SIS compounds +/- 30% of true value                                                              | No exceedances noted.<br>No comments.                                                                                                                                                                  |

**QA/QC Summary**  
**Batch 18-0299**

|                                                |                                                                                                                                                                       |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Continuing Calibration Verification (CCV)      | Continuing calibration standards were run at the beginning and end of 10 injections and at the end of the sequence to ensure that initial calibration is still valid. |
| Target and SIS compounds +/- 30% of true value | No exceedances noted.                                                                                                                                                 |
| Low point 50-150% of true value                | No comments.                                                                                                                                                          |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project Number: 100117920-WE04  
 Preparation Batch: 18-0299  
 Data Set: DP-18-0103  
 Test Code: Master\_371

| QC Parameter:                                     | Exceed: | Justification: |
|---------------------------------------------------|---------|----------------|
| Procedural Blank                                  | 0       | None           |
| PB Measurement Quality Objective                  | 0       | None           |
| Laboratory Control Sample                         | 0       | None           |
| Matrix Spike / Matrix Spike Duplicate Recovery    | 0       | None           |
| Matrix Spike / Matrix Spike Duplicate Precision   | 0       | None           |
| Extracted Internal Standard Analytes (Surrogates) | 0       | None           |
| Instrument Calibration                            | 0       | None           |
| Instrument Blank                                  | 0       | None           |
| Independent Calibration Check                     | 0       | None           |
| Continuing Calibration Verification               | 0       | None           |

It can be done

**BATTELLE - NORWELL OPERATIONS  
SAMPLE IDENTIFICATION PAGE****Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0299****WE04 PFAS Analysis****DW**

| <b>Sample ID</b> | <b>Description</b>                            |
|------------------|-----------------------------------------------|
| CQ689PB-FS       | Procedural Blank                              |
| CQ690LCS-FS      | Laboratory Control Sample                     |
| J5964-FS         | WGNA-043018-RW-3103                           |
| J5964MS-FS       | Matrix Spike of WGNA-043018-RW-3103           |
| J5964MSD-FS      | Matrix Spike Duplicate of WGNA-043018-RW-3103 |
| J5966-FS         | NAWC-043018-RW-207                            |
| J5968-FS         | WGNA-043018-RW-3409                           |
| J5970-FS         | WGNA-050118-RW-3385                           |
| J5972-FS         | WGNA-050118-RW-3178                           |
| J5974-FS         | NAWC-050118-RW-304                            |
| J5976-FS         | NAWC-050118-RW-098                            |

Samples Assigned By:

Stephanie Schultz

Date :

May 4, 2018

Comments:



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

| Client ID             | Procedural Blank    |      |      |      |  |
|-----------------------|---------------------|------|------|------|--|
| Battelle ID           | CQ689PB-FS          |      |      |      |  |
| Sample Type           | PB                  |      |      |      |  |
| Collection Date       | 05/04/2018          |      |      |      |  |
| Extraction Date       | 05/04/2018          |      |      |      |  |
| Analysis Date         | 05/13/2018          |      |      |      |  |
| Analytical Instrument | Sciex 5500 LC/MS/MS |      |      |      |  |
| % Moisture            | NA                  |      |      |      |  |
| Matrix                | WATER               |      |      |      |  |
| Sample Size           | 0.250               |      |      |      |  |
| Size Unit-Basis       | L                   |      |      |      |  |
| Units                 | ng/L                | MDL  | LOD  | LOQ  |  |
| PFHxA                 | 0.22 U              | 0.22 | 0.50 | 2.50 |  |
| PFHpA                 | 0.34 U              | 0.34 | 1.00 | 2.50 |  |
| PFOA                  | 0.38 U              | 0.38 | 1.00 | 2.50 |  |
| PFNA                  | 0.37 U              | 0.37 | 1.00 | 2.50 |  |
| PFDA                  | 0.39 U              | 0.39 | 1.00 | 2.50 |  |
| PFUnA                 | 0.38 U              | 0.38 | 1.00 | 2.50 |  |
| PFDoA                 | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| PFTTrDA               | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| PFTeDA                | 0.73 U              | 0.73 | 1.50 | 2.50 |  |
| NMeFOSAA              | 0.42 U              | 0.42 | 1.00 | 2.50 |  |
| NEtFOSAA              | 0.44 U              | 0.44 | 1.00 | 2.50 |  |
| PFBS                  | 0.21 U              | 0.21 | 0.50 | 2.50 |  |
| PFHxS                 | 0.34 U              | 0.34 | 1.00 | 2.50 |  |
| PFOS                  | 0.30 U              | 0.30 | 1.00 | 2.50 |  |

**Surrogate Recoveries (%)**

|            |     |
|------------|-----|
| 13C2-PFHxA | 111 |
| 13C2-PFDA  | 109 |
| d5-EtFOSAA | 95  |



Project Client: Tetra Tech

Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA

Project No.: 100117920-WE04

| Client ID                       | Laboratory Control Sample |        |          |      |                |       |
|---------------------------------|---------------------------|--------|----------|------|----------------|-------|
| Battelle ID                     | CQ690LCS-FS               |        |          |      |                |       |
| Sample Type                     | LCS                       |        |          |      |                |       |
| Collection Date                 | 05/04/2018                |        |          |      |                |       |
| Extraction Date                 | 05/04/2018                |        |          |      |                |       |
| Analysis Date                   | 05/13/2018                |        |          |      |                |       |
| Analytical Instrument           | Sciex 5500 LC/MS/MS       |        |          |      |                |       |
| % Moisture                      | NA                        |        |          |      |                |       |
| Matrix                          | WATER                     |        |          |      |                |       |
| Sample Size                     | 0.250                     |        |          |      |                |       |
| Size Unit-Basis                 | L                         |        |          |      |                |       |
| Units                           | ng/L                      | Target | Recovery | Qual | Control Limits |       |
|                                 |                           |        |          |      | Lower          | Upper |
| PFHxA                           | 9.69                      | 10.00  | 97       |      | 70             | 130   |
| PFHpA                           | 8.97                      | 10.00  | 90       |      | 70             | 130   |
| PFOA                            | 9.03                      | 10.00  | 90       |      | 70             | 130   |
| PFNA                            | 9.09                      | 10.00  | 91       |      | 70             | 130   |
| PFDA                            | 9.09                      | 10.00  | 91       |      | 70             | 130   |
| PFUnA                           | 8.35                      | 10.00  | 84       |      | 70             | 130   |
| PFDoA                           | 8.30                      | 10.00  | 83       |      | 70             | 130   |
| PFTTrDA                         | 8.53                      | 10.00  | 85       |      | 70             | 130   |
| PFTeDA                          | 9.91                      | 10.00  | 99       |      | 70             | 130   |
| NMeFOSAA                        | 9.14                      | 10.00  | 91       |      | 70             | 130   |
| NEtFOSAA                        | 9.36                      | 10.00  | 94       |      | 70             | 130   |
| PFBS                            | 7.37                      | 8.85   | 83       |      | 70             | 130   |
| PFHxS                           | 7.56                      | 9.45   | 80       |      | 70             | 130   |
| PFOS                            | 7.26                      | 9.55   | 76       |      | 70             | 130   |
| <b>Surrogate Recoveries (%)</b> |                           |        |          |      |                |       |
| 13C4-PFBA                       | 106                       |        |          |      |                |       |
| 13C5-PFPeA                      | 97                        |        |          |      |                |       |
| 13C5-PFHxA                      | 92                        |        |          |      |                |       |





Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

|                                 |                     |                     |        |          |      |                |       |  |
|---------------------------------|---------------------|---------------------|--------|----------|------|----------------|-------|--|
| Client ID                       | WGNA-043018-RW-3103 | WGNA-043018-RW-3103 |        |          |      |                |       |  |
| Battelle ID                     | J5964-FS            | J5964MS-FS          |        |          |      |                |       |  |
| Sample Type                     | SA                  | MS                  |        |          |      |                |       |  |
| Collection Date                 | 04/30/2018          | 04/30/2018          |        |          |      |                |       |  |
| Extraction Date                 | 05/04/2018          | 05/04/2018          |        |          |      |                |       |  |
| Analysis Date                   | 05/13/2018          | 05/13/2018          |        |          |      |                |       |  |
| Analytical Instrument           | Sciex 5500 LC/MS/MS | Sciex 5500 LC/MS/MS |        |          |      |                |       |  |
| % Moisture                      | NA                  | NA                  |        |          |      |                |       |  |
| Matrix                          | DW                  | DW                  |        |          |      |                |       |  |
| Sample Size                     | 0.265               | 0.255               |        |          |      |                |       |  |
| Size Unit-Basis                 | L                   | L                   |        |          |      |                |       |  |
| Units                           | ng/L                | ng/L                | Target | Recovery | Qual | Control Limits |       |  |
|                                 |                     |                     |        |          |      | Lower          | Upper |  |
| PFHxA                           | 3.96                | 26.00               | 19.61  | 112      |      | 70             | 130   |  |
| PFHpA                           | 2.32 J              | 22.80               | 19.61  | 104      |      | 70             | 130   |  |
| PFOA                            | 8.38                | 26.74               | 19.61  | 94       |      | 70             | 130   |  |
| PFNA                            | 2.24 J              | 20.09               | 19.61  | 91       |      | 70             | 130   |  |
| PFDA                            | 0.39 U              | 17.85               | 19.61  | 91       |      | 70             | 130   |  |
| PFUnA                           | 0.38 U              | 17.05               | 19.61  | 87       |      | 70             | 130   |  |
| PFDoA                           | 0.42 U              | 16.42               | 19.61  | 84       |      | 70             | 130   |  |
| PFTTrDA                         | 0.42 U              | 17.69               | 19.61  | 90       |      | 70             | 130   |  |
| PFTeDA                          | 0.73 U              | 20.67               | 19.61  | 105      |      | 70             | 130   |  |
| NMeFOSAA                        | 0.42 U              | 19.12               | 19.61  | 98       |      | 70             | 130   |  |
| NEtFOSAA                        | 0.44 U              | 18.51               | 19.61  | 94       |      | 70             | 130   |  |
| PFBS                            | 3.91                | 22.50               | 17.35  | 107      |      | 70             | 130   |  |
| PFHxS                           | 4.94                | 23.60               | 18.53  | 101      |      | 70             | 130   |  |
| PFOS                            | 7.27                | 22.76               | 18.73  | 83       |      | 70             | 130   |  |
| <b>Surrogate Recoveries (%)</b> |                     |                     |        |          |      |                |       |  |
| 13C4-PFBA                       | 122                 | 128                 |        |          |      |                |       |  |
| 13C5-PFPeA                      | 104                 | 107                 |        |          |      |                |       |  |
| 13C5-PFHxA                      | 93                  | 91                  |        |          |      |                |       |  |



Project Client: Tetra Tech  
 Project Name: Naval Air Station Joint Reserve Base Willow Grove, PA  
 Project No.: 100117920-WE04

Client ID WGNA-043018-RW-3103

Battelle ID J5964MSD-FS  
 Sample Type MSD  
 Collection Date 04/30/2018  
 Extraction Date 05/04/2018  
 Analysis Date 05/13/2018  
 Analytical Instrument Sciex 5500 LC/MS/MS

% Moisture NA  
 Matrix DW

Sample Size 0.255

Size Unit-Basis L

| Units    | ng/L  | Target | Recovery | Qual | Control Limits |       | RPD | Qual | RPD Limit |
|----------|-------|--------|----------|------|----------------|-------|-----|------|-----------|
|          |       |        |          |      | Lower          | Upper |     |      |           |
| PFHxA    | 25.64 | 19.61  | 111      |      | 70             | 130   | 0.9 |      | ≤ 30      |
| PFHpA    | 22.18 | 19.61  | 101      |      | 70             | 130   | 2.9 |      | ≤ 30      |
| PFOA     | 25.49 | 19.61  | 87       |      | 70             | 130   | 7.7 |      | ≤ 30      |
| PFNA     | 20.07 | 19.61  | 91       |      | 70             | 130   | 0.0 |      | ≤ 30      |
| PFDA     | 18.21 | 19.61  | 93       |      | 70             | 130   | 2.2 |      | ≤ 30      |
| PFUnA    | 16.80 | 19.61  | 86       |      | 70             | 130   | 1.2 |      | ≤ 30      |
| PFDoA    | 16.47 | 19.61  | 84       |      | 70             | 130   | 0.0 |      | ≤ 30      |
| PFTTrDA  | 17.57 | 19.61  | 90       |      | 70             | 130   | 0.0 |      | ≤ 30      |
| PFTeDA   | 20.17 | 19.61  | 103      |      | 70             | 130   | 1.9 |      | ≤ 30      |
| NMeFOSAA | 19.47 | 19.61  | 99       |      | 70             | 130   | 1.0 |      | ≤ 30      |
| NEtFOSAA | 19.41 | 19.61  | 99       |      | 70             | 130   | 5.2 |      | ≤ 30      |
| PFBS     | 21.96 | 17.35  | 104      |      | 70             | 130   | 2.8 |      | ≤ 30      |
| PFHxS    | 23.20 | 18.53  | 99       |      | 70             | 130   | 2.0 |      | ≤ 30      |
| PFOS     | 22.46 | 18.73  | 81       |      | 70             | 130   | 2.4 |      | ≤ 30      |

#### Surrogate Recoveries (%)

|            |     |
|------------|-----|
| 13C4-PFBA  | 124 |
| 13C5-PFPeA | 106 |
| 13C5-PFHxA | 94  |

Project Client: Tetra Tech  
Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA  
Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte   | Area       | RPD (L1/L9) |
|-------------|-----------|---------------|-----------|------------|-------------|
| JV64        | L1        | 5/13/18 12:35 | 13C4-PFOS | 103,556.52 | -           |
| JV65        | L2        | 5/13/18 12:43 | 13C4-PFOS | 101,898.46 | -           |
| JV66        | L3        | 5/13/18 12:52 | 13C4-PFOS | 122,639.56 | -           |
| JV67        | L4        | 5/13/18 13:01 | 13C4-PFOS | 116,127.04 | -           |
| JV68        | L5        | 5/13/18 13:10 | 13C4-PFOS | 133,761.77 | -           |
| JV69        | L6        | 5/13/18 13:19 | 13C4-PFOS | 114,144.90 | -           |
| JV70        | L7        | 5/13/18 13:28 | 13C4-PFOS | 112,747.09 | -           |
| JV71        | L8        | 5/13/18 13:37 | 13C4-PFOS | 124,076.03 | -           |
| JV72        | L9        | 5/13/18 13:46 | 13C4-PFOS | 115,482.86 | 10.9        |

PASS

Average      Lower      Upper  
116,048.25    58,024.13    174,072.38

| Sample Name    | Sample ID                 | Analysis Date | Analyte   | Area       | Lower     | Upper      | Qualifier | CCV Lower | CCV Upper  | Qualifier |
|----------------|---------------------------|---------------|-----------|------------|-----------|------------|-----------|-----------|------------|-----------|
| JV64           | L1                        | 5/13/18 12:35 | 13C4-PFOS | 103,556.52 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV65           | L2                        | 5/13/18 12:43 | 13C4-PFOS | 101,898.46 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV66           | L3                        | 5/13/18 12:52 | 13C4-PFOS | 122,639.56 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV67           | L4                        | 5/13/18 13:01 | 13C4-PFOS | 116,127.04 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV68           | L5                        | 5/13/18 13:10 | 13C4-PFOS | 133,761.77 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV69           | L6                        | 5/13/18 13:19 | 13C4-PFOS | 114,144.90 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV70           | L7                        | 5/13/18 13:28 | 13C4-PFOS | 112,747.09 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV71           | L8                        | 5/13/18 13:37 | 13C4-PFOS | 124,076.03 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV72           | L9                        | 5/13/18 13:46 | 13C4-PFOS | 115,482.86 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV63 ICC       | ICC                       | 5/13/18 13:55 | 13C4-PFOS | 117,840.43 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| CQ689PB-FS(0)  | Procedural Blank          | 5/13/18 14:13 | 13C4-PFOS | 137,545.49 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| CQ690LCS-FS(0) | Laboratory Control Sample | 5/13/18 14:22 | 13C4-PFOS | 94,353.12  | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| J5964-FS(0)    | WGNA-043018-RW-3103       | 5/13/18 14:31 | 13C4-PFOS | 107,669.01 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| J5964MS-FS(0)  | WGNA-043018-RW-3103       | 5/13/18 14:40 | 13C4-PFOS | 155,345.44 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| J5964MSD-FS(0) | WGNA-043018-RW-3103       | 5/13/18 14:49 | 13C4-PFOS | 150,140.27 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| J5966-FS(0)    | NAWC-0403018-RW-204       | 5/13/18 14:58 | 13C4-PFOS | 95,718.36  | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| JV69 CCV       | CCV                       | 5/13/18 15:07 | 13C4-PFOS | 123,755.73 | 58,024.13 | 174,072.38 |           | 93,633.24 | 187,266.48 |           |
| J5968-FS(0)    | WGNA-043018-RW-3409       | 5/13/18 15:24 | 13C4-PFOS | 114,396.01 | 58,024.13 | 174,072.38 |           | 86,629.01 | 173,258.02 |           |
| J5970-FS(0)    | WGNA-050118-RW-3385       | 5/13/18 15:33 | 13C4-PFOS | 112,575.01 | 58,024.13 | 174,072.38 |           | 86,629.01 | 173,258.02 |           |
| J5972-FS(0)    | WGNA-050118-RW-3178       | 5/13/18 15:42 | 13C4-PFOS | 89,355.46  | 58,024.13 | 174,072.38 |           | 86,629.01 | 173,258.02 |           |
| J5974-FS(0)    | NAWC-050118-RW-304        | 5/13/18 15:51 | 13C4-PFOS | 97,256.69  | 58,024.13 | 174,072.38 |           | 86,629.01 | 173,258.02 |           |
| J5976-FS(0)    | NAWC-050118-RW-098        | 5/13/18 16:00 | 13C4-PFOS | 100,605.26 | 58,024.13 | 174,072.38 |           | 86,629.01 | 173,258.02 |           |
| JV68 CCV       | CCV                       | 5/13/18 16:09 | 13C4-PFOS | 145,223.90 | 58,024.13 | 174,072.38 |           | 86,629.01 | 173,258.02 |           |

Project Client: Tetra Tech

Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA

Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte   | Area      | RPD (L1/L9) |
|-------------|-----------|---------------|-----------|-----------|-------------|
| JV64        | L1        | 5/13/18 12:35 | 13C2-PFOA | 33,570.37 | -           |
| JV65        | L2        | 5/13/18 12:43 | 13C2-PFOA | 33,102.51 | -           |
| JV66        | L3        | 5/13/18 12:52 | 13C2-PFOA | 39,040.73 | -           |
| JV67        | L4        | 5/13/18 13:01 | 13C2-PFOA | 37,854.04 | -           |
| JV68        | L5        | 5/13/18 13:10 | 13C2-PFOA | 39,476.20 | -           |
| JV69        | L6        | 5/13/18 13:19 | 13C2-PFOA | 38,376.85 | -           |
| JV70        | L7        | 5/13/18 13:28 | 13C2-PFOA | 36,444.16 | -           |
| JV71        | L8        | 5/13/18 13:37 | 13C2-PFOA | 40,686.28 | -           |
| JV72        | L9        | 5/13/18 13:46 | 13C2-PFOA | 40,060.11 | 17.6        |

PASS

Average  
37,623.47

Lower  
18,811.74

Upper  
56,435.21

| Sample Name    | Sample ID                 | Analysis Date | Analyte   | Area      | Lower     | Upper     | Qualifier | CCV Lower | CCV Upper | Qualifier |
|----------------|---------------------------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| JV64           | L1                        | 5/13/18 12:35 | 13C2-PFOA | 33,570.37 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV65           | L2                        | 5/13/18 12:43 | 13C2-PFOA | 33,102.51 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV66           | L3                        | 5/13/18 12:52 | 13C2-PFOA | 39,040.73 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV67           | L4                        | 5/13/18 13:01 | 13C2-PFOA | 37,854.04 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV68           | L5                        | 5/13/18 13:10 | 13C2-PFOA | 39,476.20 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV69           | L6                        | 5/13/18 13:19 | 13C2-PFOA | 38,376.85 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV70           | L7                        | 5/13/18 13:28 | 13C2-PFOA | 36,444.16 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV71           | L8                        | 5/13/18 13:37 | 13C2-PFOA | 40,686.28 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV72           | L9                        | 5/13/18 13:46 | 13C2-PFOA | 40,060.11 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV63 ICC       | ICC                       | 5/13/18 13:55 | 13C2-PFOA | 37,999.50 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| CQ689PB-FS(0)  | Procedural Blank          | 5/13/18 14:13 | 13C2-PFOA | 37,813.28 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| CQ690LCS-FS(0) | Laboratory Control Sample | 5/13/18 14:22 | 13C2-PFOA | 28,684.35 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| J5964-FS(0)    | WGNA-043018-RW-3103       | 5/13/18 14:31 | 13C2-PFOA | 35,415.11 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| J5964MS-FS(0)  | WGNA-043018-RW-3103       | 5/13/18 14:40 | 13C2-PFOA | 53,357.66 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| J5964MSD-FS(0) | WGNA-043018-RW-3103       | 5/13/18 14:49 | 13C2-PFOA | 51,375.99 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| J5966-FS(0)    | NAWC-0403018-RW-204       | 5/13/18 14:58 | 13C2-PFOA | 30,659.63 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| JV69 CCV       | CCV                       | 5/13/18 15:07 | 13C2-PFOA | 36,763.73 | 18,811.74 | 56,435.21 |           | 27,633.34 | 55,266.68 |           |
| J5968-FS(0)    | WGNA-043018-RW-3409       | 5/13/18 15:24 | 13C2-PFOA | 38,050.45 | 18,811.74 | 56,435.21 |           | 25,734.61 | 51,469.22 |           |
| J5970-FS(0)    | WGNA-050118-RW-3385       | 5/13/18 15:33 | 13C2-PFOA | 36,967.82 | 18,811.74 | 56,435.21 |           | 25,734.61 | 51,469.22 |           |
| J5972-FS(0)    | WGNA-050118-RW-3178       | 5/13/18 15:42 | 13C2-PFOA | 29,662.93 | 18,811.74 | 56,435.21 |           | 25,734.61 | 51,469.22 |           |
| J5974-FS(0)    | NAWC-050118-RW-304        | 5/13/18 15:51 | 13C2-PFOA | 30,048.74 | 18,811.74 | 56,435.21 |           | 25,734.61 | 51,469.22 |           |
| J5976-FS(0)    | NAWC-050118-RW-098        | 5/13/18 16:00 | 13C2-PFOA | 30,805.66 | 18,811.74 | 56,435.21 |           | 25,734.61 | 51,469.22 |           |
| JV68 CCV       | CCV                       | 5/13/18 16:09 | 13C2-PFOA | 42,861.34 | 18,811.74 | 56,435.21 |           | 25,734.61 | 51,469.22 |           |

Project Client: Tetra Tech

Project Client: Naval Air Station Joint Reserve Base Willow Grove, PA

Project Client: 100117920-WE04



| Sample Name | Sample ID | Analysis Date | Analyte    | Area      | RPD (L1/L9) |
|-------------|-----------|---------------|------------|-----------|-------------|
| JV64        | L1        | 5/13/18 12:35 | d3-MeFOSAA | 29,182.21 | -           |
| JV65        | L2        | 5/13/18 12:43 | d3-MeFOSAA | 30,504.47 | -           |
| JV66        | L3        | 5/13/18 12:52 | d3-MeFOSAA | 35,909.56 | -           |
| JV67        | L4        | 5/13/18 13:01 | d3-MeFOSAA | 34,064.77 | -           |
| JV68        | L5        | 5/13/18 13:10 | d3-MeFOSAA | 36,517.78 | -           |
| JV69        | L6        | 5/13/18 13:19 | d3-MeFOSAA | 34,187.31 | -           |
| JV70        | L7        | 5/13/18 13:28 | d3-MeFOSAA | 32,780.98 | -           |
| JV71        | L8        | 5/13/18 13:37 | d3-MeFOSAA | 35,979.73 | -           |
| JV72        | L9        | 5/13/18 13:46 | d3-MeFOSAA | 35,477.74 | 19.5        |

PASS

Average  
33,844.95

Lower  
16,922.48

Upper  
50,767.43

| Sample Name    | Sample ID                 | Analysis Date | Analyte    | Area      | Lower     | Upper     | Qualifier | CCV Lower | CCV Upper | Qualifier |
|----------------|---------------------------|---------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| JV64           | L1                        | 5/13/18 12:35 | d3-MeFOSAA | 29,182.21 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV65           | L2                        | 5/13/18 12:43 | d3-MeFOSAA | 30,504.47 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV66           | L3                        | 5/13/18 12:52 | d3-MeFOSAA | 35,909.56 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV67           | L4                        | 5/13/18 13:01 | d3-MeFOSAA | 34,064.77 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV68           | L5                        | 5/13/18 13:10 | d3-MeFOSAA | 36,517.78 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV69           | L6                        | 5/13/18 13:19 | d3-MeFOSAA | 34,187.31 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV70           | L7                        | 5/13/18 13:28 | d3-MeFOSAA | 32,780.98 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV71           | L8                        | 5/13/18 13:37 | d3-MeFOSAA | 35,979.73 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV72           | L9                        | 5/13/18 13:46 | d3-MeFOSAA | 35,477.74 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV63 ICC       | ICC                       | 5/13/18 13:55 | d3-MeFOSAA | 36,861.29 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| CQ689PB-FS(0)  | Procedural Blank          | 5/13/18 14:13 | d3-MeFOSAA | 38,457.65 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| CQ690LCS-FS(0) | Laboratory Control Sample | 5/13/18 14:22 | d3-MeFOSAA | 27,237.74 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| J5964-FS(0)    | WGNA-043018-RW-3103       | 5/13/18 14:31 | d3-MeFOSAA | 30,250.69 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| J5964MS-FS(0)  | WGNA-043018-RW-3103       | 5/13/18 14:40 | d3-MeFOSAA | 50,038.18 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| J5964MSD-FS(0) | WGNA-043018-RW-3103       | 5/13/18 14:49 | d3-MeFOSAA | 46,629.57 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| J5966-FS(0)    | NAWC-0403018-RW-204       | 5/13/18 14:58 | d3-MeFOSAA | 26,759.87 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| JV69 CCV       | CCV                       | 5/13/18 15:07 | d3-MeFOSAA | 32,115.57 | 16,922.48 | 50,767.43 |           | 25,562.45 | 51,124.89 |           |
| J5968-FS(0)    | WGNA-043018-RW-3409       | 5/13/18 15:24 | d3-MeFOSAA | 35,189.78 | 16,922.48 | 50,767.43 |           | 22,480.90 | 44,961.80 |           |
| J5970-FS(0)    | WGNA-050118-RW-3385       | 5/13/18 15:33 | d3-MeFOSAA | 32,815.03 | 16,922.48 | 50,767.43 |           | 22,480.90 | 44,961.80 |           |
| J5972-FS(0)    | WGNA-050118-RW-3178       | 5/13/18 15:42 | d3-MeFOSAA | 28,190.62 | 16,922.48 | 50,767.43 |           | 22,480.90 | 44,961.80 |           |
| J5974-FS(0)    | NAWC-050118-RW-304        | 5/13/18 15:51 | d3-MeFOSAA | 28,505.77 | 16,922.48 | 50,767.43 |           | 22,480.90 | 44,961.80 |           |
| J5976-FS(0)    | NAWC-050118-RW-098        | 5/13/18 16:00 | d3-MeFOSAA | 29,098.01 | 16,922.48 | 50,767.43 |           | 22,480.90 | 44,961.80 |           |
| JV68 CCV       | CCV                       | 5/13/18 16:09 | d3-MeFOSAA | 40,593.45 | 16,922.48 | 50,767.43 |           | 22,480.90 | 44,961.80 |           |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV70                | Injection Vial   | 8              |
| Sample ID          | L7                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:28:47 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | N/A            |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte | MRM Transition | RT   | Asymmetry Factor | Passing Range |
|---------|----------------|------|------------------|---------------|
| PFBS_1  | 298.9 / 80.0   | 1.46 | 1.44             | 0.8 – 1.5     |
| PFHxA_1 | 313.0 / 269.0  | 1.73 | 1.35             | 0.8 – 1.5     |



# Mass Spectral Acquisition Rate Report

Created with Analyst Reporter  
Printed: 14/05/2018 5:00:17 PM

|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Sample Name        | JV70                 | Injection Vial   | 8              |
| Sample ID          | L7                   | Injection Volume | 10.00          |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 5/13/2018 1:28:47 PM | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | N/A            |
| Sample Comment     |                      |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Spectra Acquisition Rate | Passing Range |
|------------|----------------|------|--------------------------|---------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 32                       | >10           |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 101                      | >10           |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 31                       | >10           |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 62                       | >10           |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 26                       | >10           |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 46                       | >10           |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 54                       | >10           |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | 55                       | >10           |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 60                       | >10           |
| PFOA_2     | 413.0 / 169.0  | 2.47 | 29                       | >10           |
| PFNA_1     | 463.0 / 419.0  | 2.85 | 50                       | >10           |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 51                       | >10           |
| PFOS_1     | 499.0 / 80.0   | 2.84 | 55                       | >10           |
| PFOS_2     | 499.0 / 99.0   | 2.84 | 54                       | >10           |
| PFDA_1     | 513.0 / 469.0  | 3.20 | 49                       | >10           |
| PFDA_2     | 513.0 / 219.0  | 3.20 | 45                       | >10           |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | 50                       | >10           |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | 32                       | >10           |
| PFDoA_1    | 613.0 / 569.0  | 3.81 | 63                       | >10           |
| PFDoA_2    | 613.0 / 319.0  | 3.81 | 37                       | >10           |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | 67                       | >10           |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | 36                       | >10           |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | 73                       | >10           |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | 42                       | >10           |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | 49                       | >10           |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 53                       | >10           |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | 53                       | >10           |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 34                       | >10           |

|                    |                      |                  |                |
|--------------------|----------------------|------------------|----------------|
| Sample Name        | JV70                 | Injection Vial   | 8              |
| Sample ID          | L7                   | Injection Volume | 10.00          |
| Sample Type        | Standard             | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 5/13/2018 1:28:47 PM | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam           | Result Table     | 18-0299_SIS    |
| Sample Comment     |                      |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Spectra<br>Acquisition Rate | Passing Range |
|------------|----------------|------|-----------------------------|---------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 54                          | >10           |
| 13C2-PFDA  | 515.0 / 470.0  | 3.19 | 40                          | >10           |
| d5-EtFOSAA | 589.0 / 419.0  | 3.50 | 28                          | >10           |

### Analytical Transitions for PFAS in drinking water

SOP 5-371 (EPA 537 Version 1.1)

| Analyte                                 | CAS No.    | Type   | Primary Transition | Secondary Transition |
|-----------------------------------------|------------|--------|--------------------|----------------------|
| <b>PFHxA</b>                            | 307-24-4   | Target | 313.0 / 269.0      | 313.0 / 119.0        |
| <b>PFHpA</b>                            | 375-85-9   | Target | 363.0 / 319.0      | 363.0 / 169.0        |
| <b>PFOA</b>                             | 335-67-1   | Target | 413.0 / 369.0      | 413.0 / 169.0        |
| <b>PFNA</b>                             | 375-95-1   | Target | 463.0 / 419.0      | 463.0 / 219.0        |
| <b>PFDA</b>                             | 335-76-2   | Target | 513.0 / 469.0      | 513.0 / 219.0        |
| <b>PFUnA</b>                            | 2058-94-8  | Target | 563.0 / 519.0      | 563.0 / 269.0        |
| <b>PFDoA</b>                            | 307-55-1   | Target | 613.0 / 569.0      | 613.0 / 319.0        |
| <b>PFTTrDA</b>                          | 72629-94-8 | Target | 663.0 / 619.0      | 663.0 / 169.0        |
| <b>PFTeDA</b>                           | 376-06-7   | Target | 713.0 / 669.0      | 713.0 / 169.0        |
| <b>NMeFOSAA</b>                         | 2355-31-9  | Target | 570.0 / 419.0      | 570.0 / 512.0        |
| <b>NEtFOSAA</b>                         | 2991-50-6  | Target | 584.0 / 419.0      | 584.0 / 483.0        |
| <b>PFBS</b>                             | 375-73-5   | Target | 298.9.0 / 80.0     | 298.9.0 / 99.0       |
| <b>PFHxS</b>                            | 355-46-4   | Target | 399.0 / 80.0       | 399.0 / 99.0         |
| <b>PFOS</b>                             | 1763-23-1  | Target | 499.0 / 80.0       | 499.0 / 99.0         |
| <b><sup>13</sup>C<sub>2</sub>-PFHxA</b> | NA         | SIS    | 315.0 / 270.0      | NA                   |
| <b><sup>13</sup>C<sub>2</sub>-PFDA</b>  | NA         | SIS    | 515.0 / 470.0      | NA                   |
| <b>d<sub>5</sub>-EtFOSAA</b>            | NA         | SIS    | 589.0 / 419.0      | NA                   |
| <b><sup>13</sup>C<sub>2</sub>-PFOA</b>  | NA         | IS     | 415.0 / 270.0      | NA                   |
| <b><sup>13</sup>C<sub>4</sub>-PFOS</b>  | NA         | IS     | 503.0 / 80.0       | NA                   |
| <b>d<sub>3</sub>-MeFOSAA</b>            | NA         | IS     | 573.0 / 419.0      | NA                   |

# BATTELLE DETECTION LIMITS FOR PFAS IN DRINKING WATER

Page 51 of 560

Battelle SOP 5-371 (EPA Method 537 Version 1.1)

| Analyte         | CAS No.    | MDL (ng/L) | LOD (ng/L) | LOQ (ng/L) | MRL (ng/L) |
|-----------------|------------|------------|------------|------------|------------|
| <b>PFHxA</b>    | 307-24-4   | 0.22       | 0.5        | 2.5        | 2.5        |
| <b>PFHpA</b>    | 375-85-9   | 0.34       | 1.0        | 2.5        | 2.5        |
| <b>PFOA</b>     | 335-67-1   | 0.38       | 1.0        | 2.5        | 2.5        |
| <b>PFNA</b>     | 375-95-1   | 0.37       | 1.0        | 2.5        | 2.5        |
| <b>PFDA</b>     | 335-76-2   | 0.39       | 1.0        | 2.5        | 2.5        |
| <b>PFUnA</b>    | 2058-94-8  | 0.38       | 1.0        | 2.5        | 2.5        |
| <b>PFDoA</b>    | 307-55-1   | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>PFTrDA</b>   | 72629-94-8 | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>PFTeDA</b>   | 376-06-7   | 0.73       | 1.5        | 2.5        | 2.5        |
| <b>NMeFOSAA</b> | 2355-31-9  | 0.42       | 1.0        | 2.5        | 2.5        |
| <b>NEtFOSAA</b> | 2991-50-6  | 0.44       | 1.0        | 2.5        | 2.5        |
| <b>PFBS</b>     | 375-73-5   | 0.21       | 0.5        | 2.5        | 2.5        |
| <b>PFHxS</b>    | 3871-99-6  | 0.34       | 1.0        | 2.5        | 2.5        |
| <b>PFOS</b>     | 1763-23-1  | 0.30       | 1.0        | 2.5        | 2.5        |

*Analytes on NELAP and ELAP QSM 5.1 Scope of accreditation*

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

Mass calibration and tune check

## QTRAP 5500 Preventive Maintenance Checklist

|                              |                             |
|------------------------------|-----------------------------|
| Preventive Maintenance Date: | 22-Feb-2017                 |
| Request ID:                  | 3683                        |
| Company Name:                | Battelle Memorial Institute |
| Instrument ID:               | X60666                      |
| Instrument Model:            | QTRAP 5500                  |
| Instrument Serial Number:    | AU23051004                  |

☒ **PASS**

☐ **FAIL**

**Any failure will lead to an automatic Service Call being open to investigate fault.**

Preventive Maintenance is performed twice every year unless specified in the Service Contract. It is designed to help maintain optimum system performance and to help diagnose any system deficiencies.

Engineer is required the assigned Request ID for this PM otherwise making this job invalid.

**Comments:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Performed By:** Kaustubh Dhayagude **Date:** 22-Feb-2017

**Approved By :** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## PRE PM PPG PERFORMANCE EVALUATION:

- ☒ Consult Customer concerning the unit overall performance.
- ☒ Check Logbook for Services recently performed.
- ☒ Check Vacuum Pressure:

| CAD Settings                                   | Vacuum Reading<br>( x 10 <sup>-5</sup> Torr) | Acceptance Criteria               |
|------------------------------------------------|----------------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> CAD 0      | 0.5                                          | 0.4 to 1.1 x10 <sup>-5</sup> Torr |
| <input checked="" type="checkbox"/> CAD Low    | 1.9                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD Medium | 2.4                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD High   | 3.4                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD 12     | 3.4                                          | 2.4 to 4.5 x10 <sup>-5</sup> Torr |

- ☒ Check for Front end contamination symptoms. Run Q1 POS PPG using PPG 2e-7for a few minutes and check for any TIC signal degradation or huge sensitivity drop where the sensitivity result can't pass specification
  - ☒ No degradation or Sensitivity drop
- ☒ Check for Q3 contamination symptoms. Run Q3 POS PPG using PPG 2e-7for a few minutes and check for any TIC signal degradation or huge sensitivity drop where the sensitivity result can't pass specification
  - ☒ No degradation or Sensitivity drop

**Pre PM PPG Test:** Perform each of the following tests. Optimize ion source position only. The specifications listed for these Pre PM tests are guidelines only, not required to be met.

- ☒ Perform Q1 POS using POS PPG 2e-7M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q1 Intensity |           | Q1 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q1 175.133 | 1.64 e6      | Read Only | 0.8095         | Read Only   |
| Q1 500.380 | 2.40 e7      | Read Only | 0.8592         | Read Only   |
| Q1 906.673 | 2.86 e7      | Read Only | 0.9633         | Read Only   |

- ☒ Perform Q3 POS using POS PPG 2e-7M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q3 Intensity |           | Q3 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q3 175.133 | 1.26 e6      | Read Only | 0.6252         | Read Only   |
| Q3 500.380 | 2.19 e7      | Read Only | 0.7275         | Read Only   |
| Q3 906.673 | 3.02 e7      | Read Only | 0.7662         | Read Only   |



**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

☒ Perform MSMS POS in Product Ion scan with 609.3 parent and record daughter 195.1 using Reserpine 0.167 pmol/ul at the scan rate of 10 Da/s for 10 MCA. Calculate transmission efficiency comparing Q1POS 609 intensity. Transmission Efficiency: : 19.51% (Read Only)

| Mass        | MSMS Intensity |           | MSMS Width Value | Width Specs |
|-------------|----------------|-----------|------------------|-------------|
|             | Value          | Spec      |                  |             |
| Q1 609.3    | 7.43 e7        | Read Only | 0.9981           | Read Only   |
| MS/MS 195.1 | 1.45 e7        | Read Only | 0.6582           | Read Only   |

☒ Perform Q1 NEG using NEG PPG 3e-5M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q1 Intensity |           | Q1 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q1 933.636 | 1.43 e7      | Read Only | 0.7330         | Read Only   |

☒ Perform Q3 NEG using NEG PPG 3e-5M. Scan Rate 10 Da/s. Record 10 mca.

| Mass       | Q3 Intensity |           | Q3 Width Value | Width Specs |
|------------|--------------|-----------|----------------|-------------|
|            | Value        | Spec      |                |             |
| Q3 933.636 | 2.22 e7      | Read Only | 0.8138         | Read Only   |

☒ Perform Product Ion scan using NEG PPG 3e-5M. Record 10 mca.

| Mass    | Scan Rate | MCA | MSMS Intensity |           | MSMS Width Value | Width Specs |
|---------|-----------|-----|----------------|-----------|------------------|-------------|
|         |           |     | Value          | Spec      |                  |             |
| MSMS 45 | 10        | 10  | 3.35 e6        | Read Only | 0.6495           | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

## PREVENTIVE MAINTENANCE CHECKLIST:

- ☒ Check Cooling Fans for Turbo Pumps while MS is ON.
- ☒ Check QJet and QPS tuning voltage for reference.
- ☐ Record AC input Voltage while MS is OFF: \_\_\_\_\_ (200-240VAC).  
If Out-of-Range, notify customer.
- ☒ Clean Interface
  - ☒ Curtain Plate
  - ☒ Orifice Plate
  - ☒ QJet
  - ☒ Q0 Rods.
- ☒ Replace Roughing Pump Oil.
- ☒ Inspect Oil Exhaust Filter, if Applicable. ☐ N/A
- ☒ Clean and inspect built-in divert valve if used. ☐ N/A
- ☒ Check Multiplier Voltage, optimize if necessary.
- ☒ Replace four Air Filters at the bottom of the mass spectrometer.
- ☒ Pump down overnight if possible. ☐ N/A
- ☒ Perform Maintenance on Turbo V source.
- ☒ Replace Electrode, if necessary. ☐ N/A
- ☒ Check Turbo heaters resistances.
- ☒ Check if Temperature is reached at 500C with TIS Probe installed.
- ☐ Check if Temperature is reached at 500C with APCI Probe installed. ☒ N/A

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

### POST PM PPG PERFORMANCE TESTS:

- ☒ Set-up Sample for Infusion.
- ☒ Check spray and adjust sprayer's position of the TIS source.
- ☒ Check Vacuum Pressure:

| CAD Settings                                   | Vacuum Reading<br>( x 10 <sup>-5</sup> Torr) | Acceptance Criteria               |
|------------------------------------------------|----------------------------------------------|-----------------------------------|
| <input checked="" type="checkbox"/> CAD 0      | 0.8                                          | 0.4 to 1.1 x10 <sup>-5</sup> Torr |
| <input checked="" type="checkbox"/> CAD Low    | 2.1                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD Medium | 2.6                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD High   | 3.7                                          | Read Only                         |
| <input checked="" type="checkbox"/> CAD 12     | 3.7                                          | 2.4 to 4.5 x10 <sup>-5</sup> Torr |

- ☒ Perform Q1 POS using POS PPG 2e-7M. Mass calibrate to less than 0.1 amu.

| Mass                              | Q1 Intensity |                    | Q1 Width Value | Width Specs |
|-----------------------------------|--------------|--------------------|----------------|-------------|
|                                   | Value        | Spec               |                |             |
| Scan Rate 10 Da/s Record 10 mca   |              |                    |                |             |
| Q1 175.133                        | 5.94 e6      | ≥1.2 <sup>e6</sup> | 0.6933         | 0.6 to 0.8  |
| Q1 500.380                        | 2.25 e7      | ≥9.0 <sup>e6</sup> | 0.7444         | 0.6 to 0.8  |
| Q1 906.673                        | 2.74 e7      | ≥1.4 <sup>e7</sup> | 0.7347         | 0.6 to 0.8  |
| Scan Rate 1000 Da/s Record 50 mca |              |                    |                |             |
| Q1 906.673                        | 1.33 e8      | ≥6.8 <sup>e7</sup> | 0.7656         | 0.6 to 0.8  |

- ☒ Perform Q3 POS using POS PPG 2e-7M. Mass calibrate to less than 0.1 amu.

| Mass                              | Q3 Intensity |                    | Q3 Width Value | Width Specs |
|-----------------------------------|--------------|--------------------|----------------|-------------|
|                                   | Value        | Spec               |                |             |
| Scan Rate 10 Da/s Record 10 mca   |              |                    |                |             |
| Q3 175.133                        | 4.54 e6      | ≥1.2 <sup>e6</sup> | 0.6390         | 0.6 to 0.8  |
| Q3 500.380                        | 2.13 e7      | ≥9.0 <sup>e6</sup> | 0.7008         | 0.6 to 0.8  |
| Q3 906.673                        | 3.04 e7      | ≥1.4 <sup>e7</sup> | 0.7683         | 0.6 to 0.8  |
| Scan Rate 1000 Da/s Record 50 mca |              |                    |                |             |
| Q3 906.673                        | 1.51 e8      | ≥6.8 <sup>e7</sup> | 0.7118         | 0.6 to 0.8  |

- ☒ Perform "Product of 609.3" POS and record product ion 195.1 using Reserpine 0.167pmol/uL. Record 10 mca. Calculate Transmission efficiency comparing Q1POS 609 intensity.

Transmission Efficiency: 16.93% (≥ 10.0%)

| Mass        | MSMS Intensity |      | Width<br>Value | Width Specs |
|-------------|----------------|------|----------------|-------------|
|             | Value          | Spec |                |             |
| Q1 609.3    | 5.74 e7        | N/A  | 0.7667         | Read Only   |
| MS/MS 195.1 | 9.72 e6        | N/A  | 0.6751         | Read Only   |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

## LC/MS/MS Detector System

Appendix ZEFPM003-2L

☒ Perform Q1 NEG using NEG PPG 3e-5M. Mass calibrate to less than 0.1 amu.

| Mass       | Scan Rate | Mca | Q1 Intensity |               | Q1 Width Value | Width Specs |
|------------|-----------|-----|--------------|---------------|----------------|-------------|
|            |           |     | Value        | Spec          |                |             |
| Q1 933.636 | 10        | 10  | 1.31 e7      | $\geq 1.0^e7$ | 0.6895         | 0.6 to 0.8  |
| Q1 933.636 | 1000      | 50  | 6.32 e7      | $\geq 4.0^e7$ | 0.6740         | 0.6 to 0.8  |

☒ Perform Q3 NEG using NEG PPG 3e-5M. Mass calibrate to less than 0.1 amu.

| Mass       | Scan Rate | Mca | Q3 Intensity |               | Q3 Width Value | Width Specs |
|------------|-----------|-----|--------------|---------------|----------------|-------------|
|            |           |     | Value        | Spec          |                |             |
| Q3 933.636 | 10        | 10  | 1.70 e7      | $\geq 8.0^e6$ | 0.7665         | 0.6 to 0.8  |
| Q3 933.636 | 1000      | 50  | 7.41 e7      | $\geq 4.0^e7$ | 0.7292         | 0.6 to 0.8  |

☒ Perform Product Ion scan using NEG PPG 3e-5M.

| Mass    | Scan Rate | Mca | MSMS Intensity |           | MSMS Width Value | Width Specs |
|---------|-----------|-----|----------------|-----------|------------------|-------------|
|         |           |     | Value          | Spec      |                  |             |
| MSMS 45 | 10        | 10  | 3.33 e6        | Read Only | 0.6387           | Read Only   |

☒ Perform ER POS 118.087 and 922.01 using ESI Tuning Mix 1:100 in ES Tuning Dilution Solvent. Apply suggested Scan Rate and Record number of MCA. Mass calibrate to less than 0.1 amu.

| Mass                           | Fill Time<br>(ms) | ER Intensity |         | ER Width<br>Value | Width Specs |
|--------------------------------|-------------------|--------------|---------|-------------------|-------------|
|                                |                   | Value        | Spec    |                   |             |
| ScanRate : 1000 Da/s ; 50 Mca  |                   |              |         |                   |             |
| ER 118.087                     | 0.05              | 8.08 e6      | ≥7.2 e6 | 0.1302            | <0.35       |
| ER 922.010                     | 0.05              | 3.89 e7      | ≥2.8 e6 | 0.2603            | <0.35       |
| ScanRate : 10000 Da/s ; 50 Mca |                   |              |         |                   |             |
| ER 118.087                     | 0.05              | 2.55 e7      | ≥2.4 e7 | 0.3740            | <0.65       |
| ER 922.010                     | 0.05              | 2.37 e8      | ≥6.8 e7 | 0.5407            | <0.65       |

☒ Perform ER NEG 431.982 and 601.978 using ESI Tuning Mix 1:100 in ES Tuning Dilution Solvent. Apply suggested Scan Rate and Record number of MCA. Mass calibrate to less than 0.1 amu.

| Mass                           | Fill Time<br>(ms) | ER Intensity |                    | ER Width<br>Value | Width Specs |
|--------------------------------|-------------------|--------------|--------------------|-------------------|-------------|
|                                |                   | Value        | Spec               |                   |             |
| ScanRate : 1000 Da/s ; 50 Mca  |                   |              |                    |                   |             |
| ER 431.982                     | 0.05              | 1.05 e8      | ≥4.4 <sup>e7</sup> | 0.1840            | <0.35       |
| ER 601.978                     | 0.05              | 7.74 e7      | ≥5.6 <sup>e7</sup> | 0.1849            | <0.35       |
| ScanRate : 10000 Da/s ; 50 Mca |                   |              |                    |                   |             |
| ER 431.982                     | 0.05              | 3.43 e8      | ≥1.2 <sup>e8</sup> | 0.4382            | <0.65       |
| ER 601.978                     | 0.05              | 2.55 e8      | ≥1.6 <sup>e8</sup> | 0.6205            | <0.65       |

**Zef Scientific Inc.**

12707 High Bluff Dr.  
Suite 200  
San Diego, CA  
USA 92130

1975 Hymus Blvd.  
Suite 230  
Dorval, QC  
Canada H9P 1J8

Phone: 1.866.854.7988

# QTRAP 5500

**LC/MS/MS Detector System**

Appendix ZEFPM003-2L

- ☒ Perform EPI POS 397.2 using Reserpine 0.167pmol/uL. Record 20 mca.

| Mass      | Scan Rate<br>(Da/s) | Q0 Trapping OFF |         | Q0 Trapping ON |         |
|-----------|---------------------|-----------------|---------|----------------|---------|
|           |                     | Intensity       | Spec    | Intensity      | Spec    |
| EPI 397.2 | 10000               | > 3.5 e6        | ≥2.0 e6 | > 4.0 e7       | ≥6.4 e6 |

- ☒ Perform MS3 POS full scan Fragmentation ON & OFF using Reserpine 0.167pmol/uL. Record 20 mca.

| Mass                                                                    | Scan Rate<br>(Da/s) | Fragamentation OFF |                     | Fragmentation ON |                        |
|-------------------------------------------------------------------------|---------------------|--------------------|---------------------|------------------|------------------------|
|                                                                         |                     | Intensity          | Spec                | Intensity        | Spec                   |
| MS3 397.2                                                               | 1000                | 3.2 e7             | Contains only 397.2 | N/A              | N/A                    |
| <input type="checkbox"/> 236 OR <input checked="" type="checkbox"/> 365 | 1000                | 1.19 e8            | Fragment Intensity  | > 4.4 e6         | ≥1.6x 10 <sup>e6</sup> |

## REVIEW:

- ☒ Attach all spectrums printouts to this procedure.
- ☒ If any parameter setting access modes were changed during the PM, ensure they are returned to their normal access mode and that their offsets are adjusted to match optimized values from the post-PM acquisition files.
- ☐ Empty tuning cache folder, if necessary. ☒ N/A
- ☒ Update Service Work Order status
- ☒ Fill and replace PM Label.

## END OF PREVENTIVE MAINTENANCE CHECKLIST

## Document history:

06 OCT 2016: Appendix ZEFPM003-2L: Removed requirements to fit Manufacturer's testing criteria.

It can be done

**BATTELLE - NORWELL OPERATIONS  
LIQUID SAMPLE ID FORM****Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0299****WE04 PFAS Analysis****DW**

| Sample ID   | Description               | Volume (mL) | Bottles | *  | Date<br>Initials |
|-------------|---------------------------|-------------|---------|----|------------------|
| CQ689PB-FS  | Procedural Blank          | 250.0       | NA      | -- | 05/04/18 SAS     |
| CQ690LCS-FS | Laboratory Control Sample | 250.0       | NA      | -- | 05/04/18 SAS     |
| J5964-FS    | WGNA-043018-RW-3103       | 265.0       | 1       | C  | 05/04/18 SAS     |
| J5964MS-FS  | Matrix Spike              | 255.0       | 3       | C  | 05/04/18 SAS     |
| J5964MSD-FS | Matrix Spike Duplicate    | 255.0       | 5       | C  | 05/04/18 SAS     |
| J5966-FS    | NAWC-043018-RW-207        | 265.0       | 1       | C  | 05/04/18 SAS     |
| J5968-FS    | WGNA-043018-RW-3409       | 275.0       | 1       | C  | 05/04/18 SAS     |
| J5970-FS    | WGNA-050118-RW-3385       | 280.0       | 1       | C  | 05/04/18 SAS     |
| J5972-FS    | WGNA-050118-RW-3178       | 285.0       | 1       | C  | 05/04/18 SAS     |
| J5974-FS    | NAWC-050118-RW-304        | 275.0       | 1       | C  | 05/04/18 SAS     |
| J5976-FS    | NAWC-050118-RW-098        | 280.0       | 1       | C  | 05/04/18 SAS     |

**Comments:**

| Sample ID:  | Comments:                                   |
|-------------|---------------------------------------------|
| CQ689PB-FS  | 1.24g Trizma (170526-01) weighed on BAL-009 |
| CQ690LCS-FS | 1.24g Trizma (170526-01) weighed on BAL-009 |

Samples Assigned By

Stephanie Schultz

Date :

May 4, 2018

\* - "C" = Sample is Consumed





**It can be done**

## BATTELLE - NORWELL OPERATIONS SURROGATE SPIKE FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**

100117920-  
WE04

**18-0299**

**WE04 PFAS Analysis**

**DW**

| Sample ID   | Standard ID | Type   | Vial No. | Vol Added (uL) | Date Spiked/<br>Spiked By | Witn'd By | Comment |
|-------------|-------------|--------|----------|----------------|---------------------------|-----------|---------|
| CQ689PB-FS  | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| CQ690LCS-FS | JV41        | LCS/MS | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| CQ690LCS-FS | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5964-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5964MS-FS  | JV41        | LCS/MS | 1        | 100            | 05/04/18 SAS              | JCT       | NA      |
| J5964MS-FS  | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5964MSD-FS | JV41        | LCS/MS | 1        | 100            | 05/04/18 SAS              | JCT       | NA      |
| J5964MSD-FS | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5966-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5968-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5970-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5972-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5974-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |
| J5976-FS    | JV60        | SIS    | 1        | 50             | 05/04/18 SAS              | JCT       | NA      |

Syringes/Pipettes Used:

| Std ID | Type    | Syr/Pip   |
|--------|---------|-----------|
| JV41   | Pipette | I0793912B |
| JV60   | Pipette | I0793912B |



It can be done

## BATTELLE - NORWELL OPERATIONS SAMPLE EXTRACTION FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0299****WE04 PFAS Analysis****DW**

| Sample ID   | 1st<br>Extraction | 2nd<br>Extraction | 3rd<br>Extraction | Conc.<br>ID | Turbo<br>°C | Turbo<br>PSI | KD<br>°C | Comment |
|-------------|-------------------|-------------------|-------------------|-------------|-------------|--------------|----------|---------|
| CQ689PB-FS  | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| CQ690LCS-FS | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5964-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5964MS-FS  | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5964MSD-FS | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5966-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5968-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5970-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5972-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5974-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |
| J5976-FS    | 05/04/18 SAS      | NA                | NA                | NA          | NA          | NA           | NA       | NA      |

**Solvents/Reagent Preparations:**

| Name                  | ID          | Expires  | Lot No    | Procedure             | Comments |
|-----------------------|-------------|----------|-----------|-----------------------|----------|
| Pre-packed SPE Column | RP-180504-1 | 05/04/18 | S214-0071 | Pre-packed SPE Column |          |

**Solvents/Reagents:**

| Name                        | Lot No | Comments |
|-----------------------------|--------|----------|
| Methanol (HPLC) (180227-02) | 178212 |          |



It can be done

## BATTELLE - NORWELL OPERATIONS INTERNAL STANDARD SPIKING FORM

**Project Title(s)**

Naval Air Station Joint Reserve Base Willow Grove, PA

**Project No.(s)**100117920-  
WE04**18-0299****WE04 PFAS Analysis****DW****(N/A Fraction)**

| Extract Id     | Extr.<br>Vol. (uL) | Added<br>(uL) | Std. Id | Accm<br>. (uL) | Vial<br>No. | Pre Inj.<br>Vol. (uL)^ | Final<br>Dilution<br>* | Date Spiked/<br>Spiked By | With'd<br>By |
|----------------|--------------------|---------------|---------|----------------|-------------|------------------------|------------------------|---------------------------|--------------|
| CQ689PB-FS(0)  | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| CQ690LCS-FS(0) | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5964-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5964MS-FS(0)  | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5964MSD-FS(0) | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5966-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5968-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5970-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5972-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5974-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |
| J5976-FS(0)    | 950                | 50            | JV59    | 50             | 1           | 1000                   | 1.000                  | 05/07/18 SAS              | LMG          |

Syringes/Pipettes Used:

| Std ID | Type    | Syr/Pip   |
|--------|---------|-----------|
| JV59   | Pipette | I0793912B |

| Extract Id: | Comments:                                                    |
|-------------|--------------------------------------------------------------|
| CQ689PB-FS  | Samples reconstituted in 96/4 methanol/milli-q (RP-180507-1) |

\* - Final Dilution is any HPLC, dilutions, or other manipulation

^ - Pre Injection Volume (PIV) includes any RIS spikes.

## Sequence Report

Created with Analyst Reporter  
Printed: 15/05/2018 10:26:09 AM

| Vial | Laboratory Sample ID | Client Sample ID          | Acquisition Date      | Acquisition Method | Data File      |
|------|----------------------|---------------------------|-----------------------|--------------------|----------------|
| 1    | MeOH                 |                           | 5/13/2018 12:26:05 PM | 5-0371.dam         | 18-0299_A.wiff |
| 2    | JV64                 | L1                        | 5/13/2018 12:35:02 PM | 5-0371.dam         | 18-0299_A.wiff |
| 3    | JV65                 | L2                        | 5/13/2018 12:43:59 PM | 5-0371.dam         | 18-0299_A.wiff |
| 4    | JV66                 | L3                        | 5/13/2018 12:52:57 PM | 5-0371.dam         | 18-0299_A.wiff |
| 5    | JV67                 | L4                        | 5/13/2018 1:01:55 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 6    | JV68                 | L5                        | 5/13/2018 1:10:53 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 7    | JV69                 | L6                        | 5/13/2018 1:19:50 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 8    | JV70                 | L7                        | 5/13/2018 1:28:47 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 9    | JV71                 | L8                        | 5/13/2018 1:37:43 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 10   | JV72                 | L9                        | 5/13/2018 1:46:40 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 11   | JV63 ICC             | ICC                       | 5/13/2018 1:55:37 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 1    | MeOH                 |                           | 5/13/2018 2:04:35 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 12   | CQ689PB-FS(0)        | Procedural Blank          | 5/13/2018 2:13:32 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 13   | CQ690LCS-FS(0)       | Laboratory Control Sample | 5/13/2018 2:22:27 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 14   | J5964-FS(0)          | WGNA-043018-RW-3103       | 5/13/2018 2:31:24 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 15   | J5964MS-FS(0)        | WGNA-043018-RW-3103       | 5/13/2018 2:40:20 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 16   | J5964MSD-FS(0)       | WGNA-043018-RW-3103       | 5/13/2018 2:49:16 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 17   | J5966-FS(0)          | NAWC-0403018-RW-204       | 5/13/2018 2:58:13 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 7    | JV69 CCV             | CCV                       | 5/13/2018 3:07:07 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 1    | MeOH                 |                           | 5/13/2018 3:16:03 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 18   | J5968-FS(0)          | WGNA-043018-RW-3409       | 5/13/2018 3:24:59 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 19   | J5970-FS(0)          | WGNA-050118-RW-3385       | 5/13/2018 3:33:54 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 20   | J5972-FS(0)          | WGNA-050118-RW-3178       | 5/13/2018 3:42:49 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 21   | J5974-FS(0)          | NAWX-050118-RW-304        | 5/13/2018 3:51:45 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 22   | J5976-FS(0)          | NAWC-050118-RW-098        | 5/13/2018 4:00:39 PM  | 5-0371.dam         | 18-0299_A.wiff |
| 6    | JV68 CCV             | CCV                       | 5/13/2018 4:09:36 PM  | 5-0371.dam         | 18-0299_A.wiff |



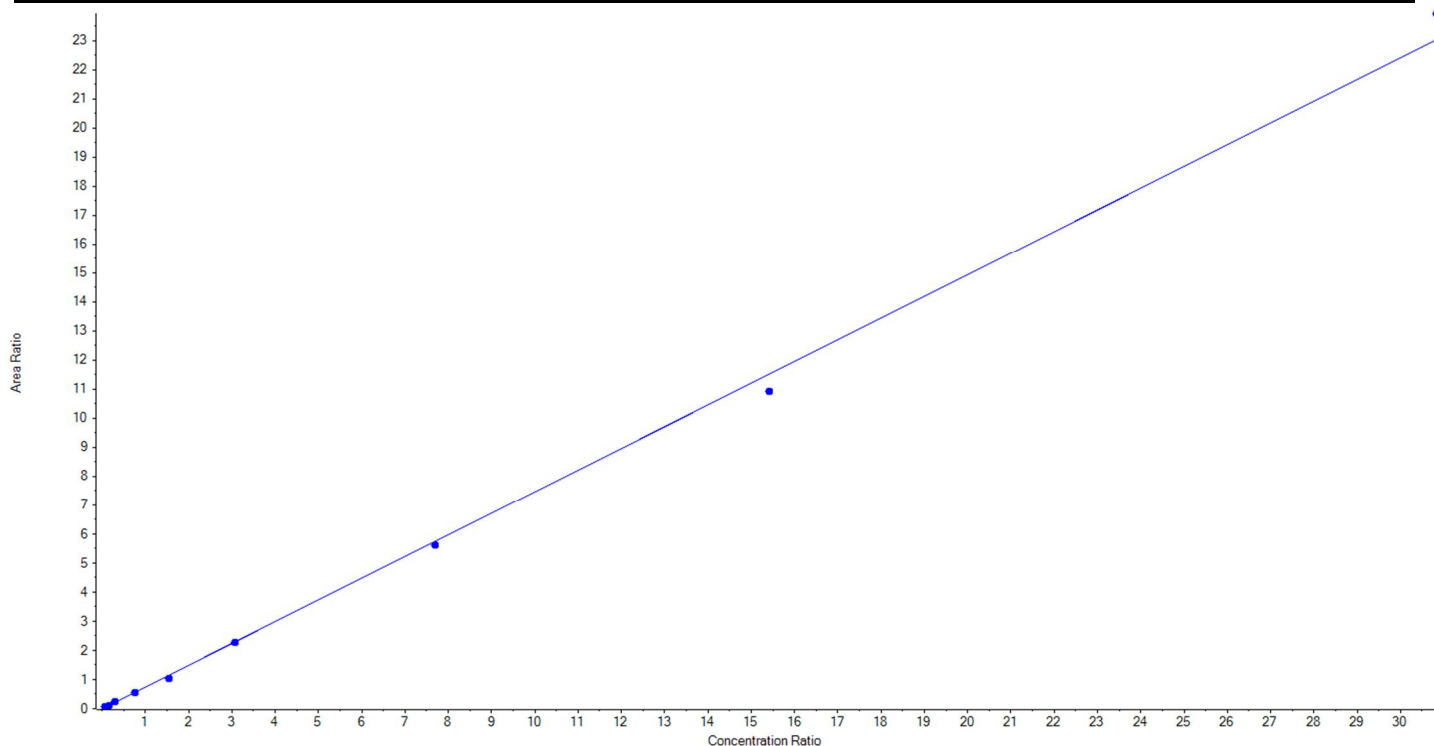
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFBS_1                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 298.9 / 80.0          | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C4-PFOS             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.74710x + -0.00415$  ( $r = 0.99901$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.15               | 26.086029               | 117.8        |
| 3    | JV65        | L2        | True          | 44.30               | 41.308305               | 93.3         |
| 4    | JV66        | L3        | True          | 88.60               | 96.021884               | 108.4        |
| 5    | JV67        | L4        | True          | 221.50              | 208.146645              | 94.0         |
| 6    | JV68        | L5        | True          | 443.00              | 405.020980              | 91.4         |
| 7    | JV69        | L6        | True          | 885.00              | 877.849575              | 99.2         |
| 8    | JV70        | L7        | True          | 2212.50             | 2155.432631             | 97.4         |
| 9    | JV71        | L8        | True          | 4425.00             | 4193.522342             | 94.8         |
| 10   | JV72        | L9        | True          | 8850.00             | 9188.661608             | 103.8        |





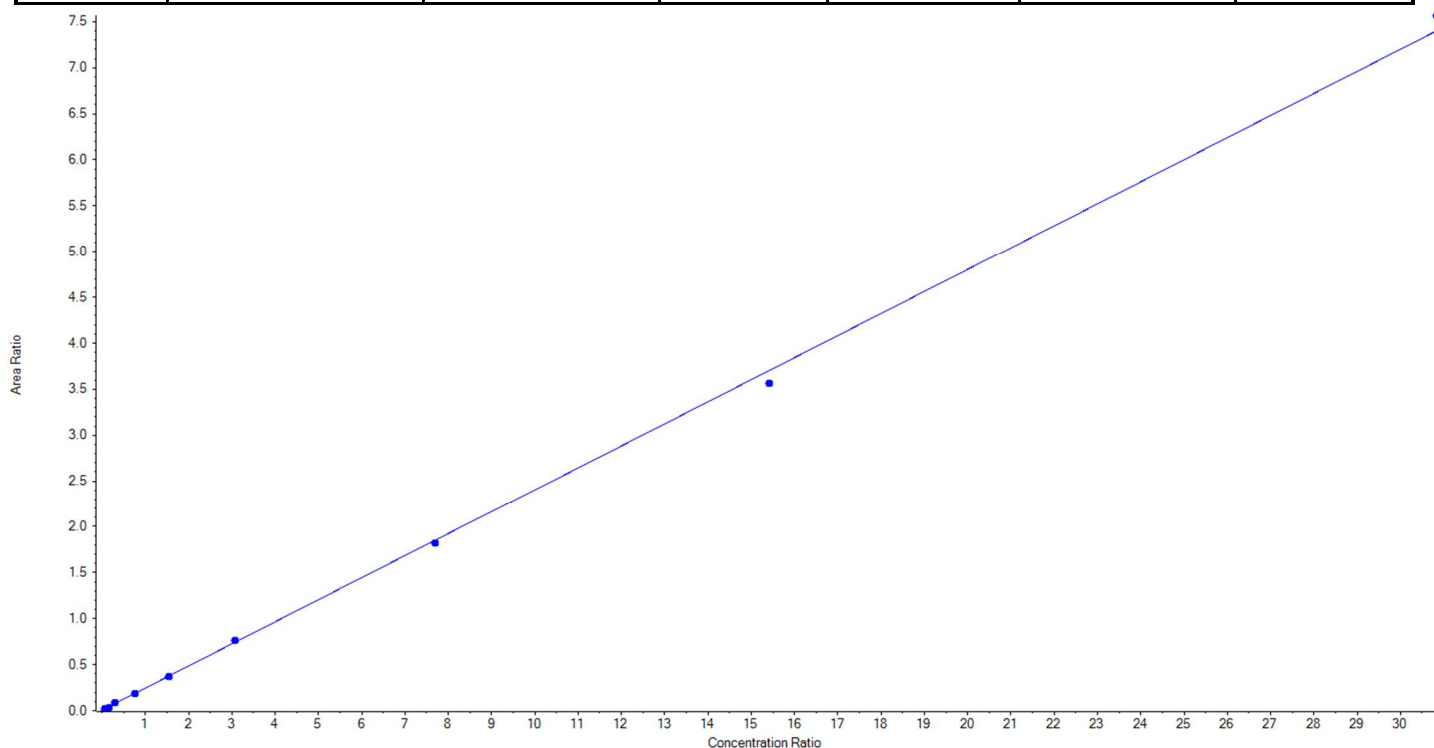
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFBS_2                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 298.9 / 99.0          | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C4-PFOS             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.23985x + 0.00536$  ( $r = 0.99956$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.15               | 25.597219               | 115.6        |
| 3    | JV65        | L2        | True          | 44.30               | 37.367171               | 84.4         |
| 4    | JV66        | L3        | True          | 88.60               | 93.848247               | 105.9        |
| 5    | JV67        | L4        | True          | 221.50              | 215.325493              | 97.2         |
| 6    | JV68        | L5        | True          | 443.00              | 431.256726              | 97.4         |
| 7    | JV69        | L6        | True          | 885.00              | 910.253876              | 102.9        |
| 8    | JV70        | L7        | True          | 2212.50             | 2174.982043             | 98.3         |
| 9    | JV71        | L8        | True          | 4425.00             | 4258.852824             | 96.3         |
| 10   | JV72        | L9        | True          | 8850.00             | 9044.566400             | 102.2        |







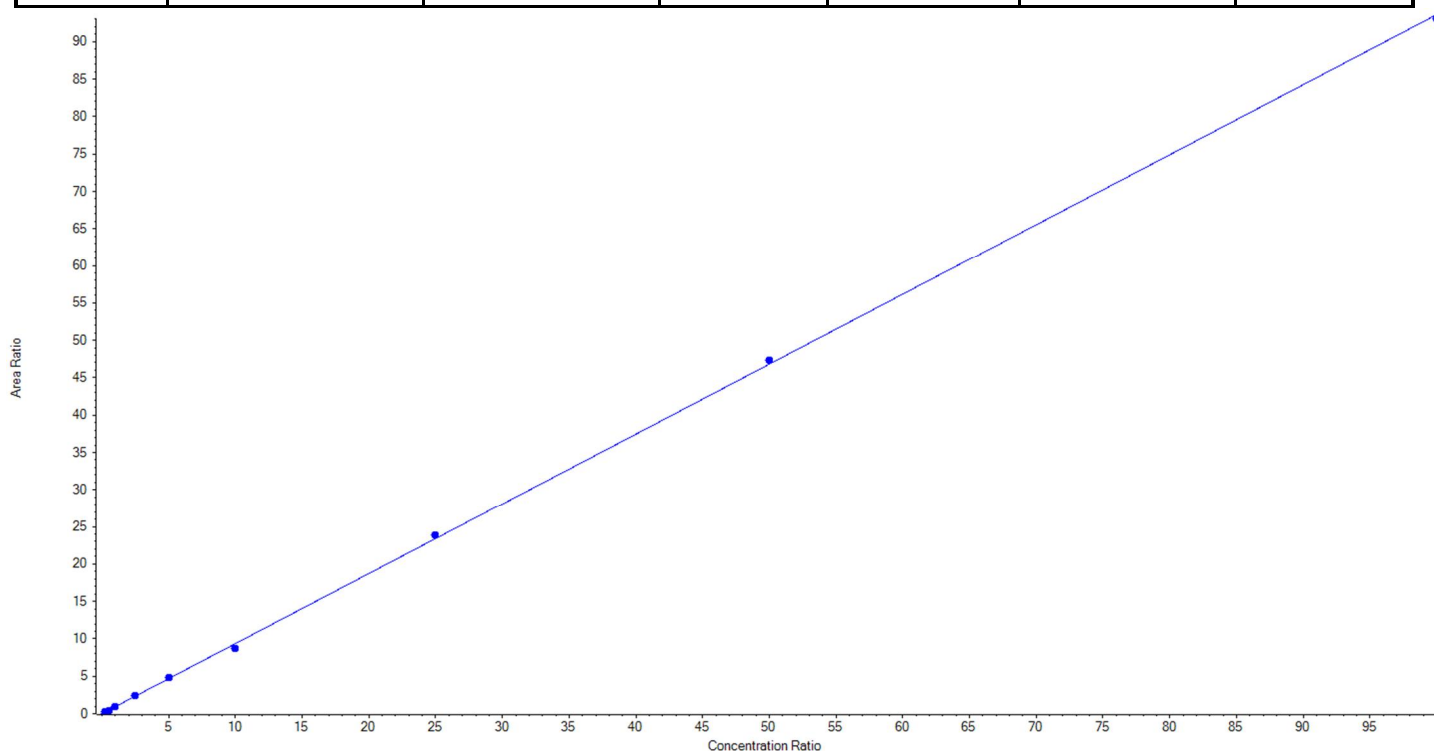
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFHxA_1               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 313.0 / 269.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.93620x + 0.00273$  ( $r = 0.99981$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 24.867979               | 99.5         |
| 3    | JV65        | L2        | True          | 50.00               | 47.319166               | 94.6         |
| 4    | JV66        | L3        | True          | 100.00              | 103.981147              | 104.0        |
| 5    | JV67        | L4        | True          | 250.00              | 257.782122              | 103.1        |
| 6    | JV68        | L5        | True          | 500.00              | 514.874973              | 103.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 934.548992              | 93.5         |
| 8    | JV70        | L7        | True          | 2500.00             | 2546.645589             | 101.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 5055.023878             | 101.1        |
| 10   | JV72        | L9        | True          | 10000.00            | 9939.956154             | 99.4         |





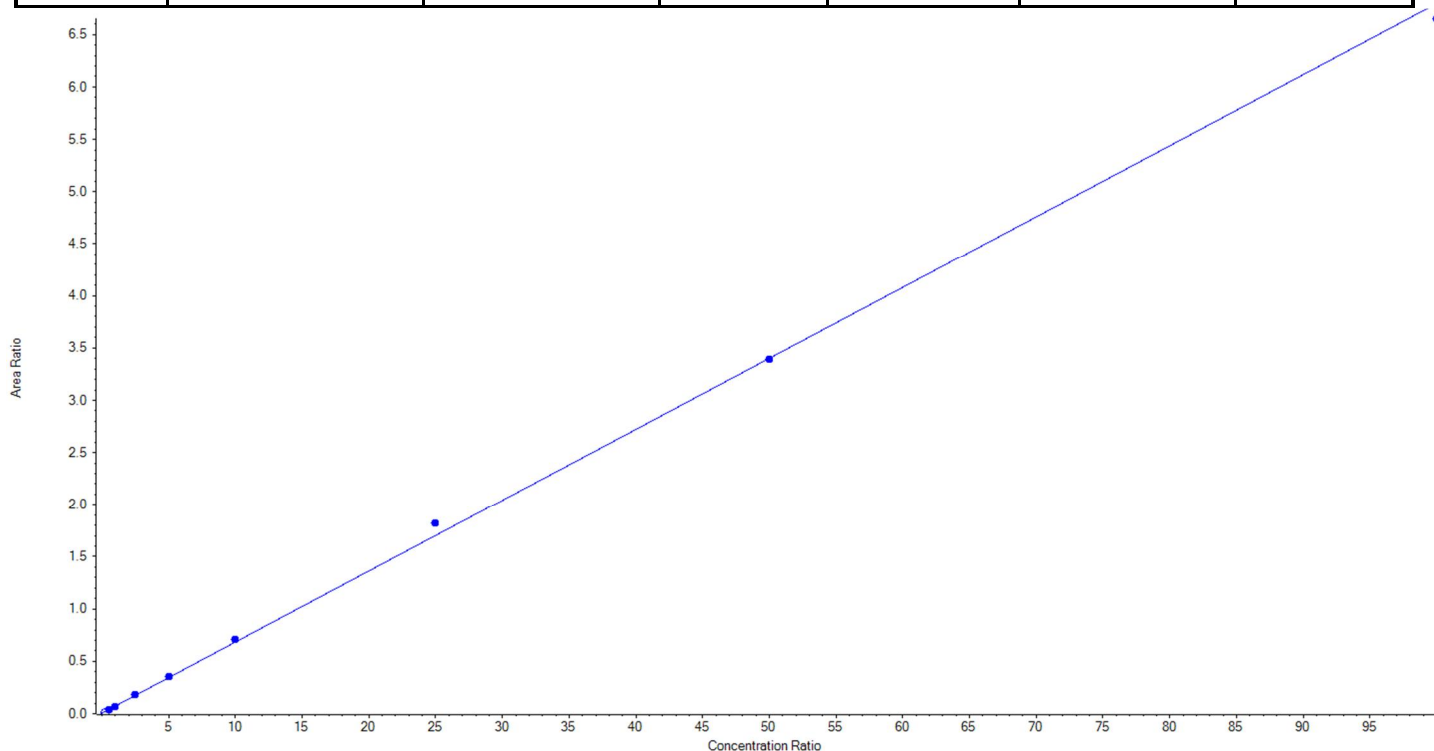
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFHxA_2               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 313.0 / 119.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.06792 x + 0.00483$  ( $r = 0.99943$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 12.761716               | 51.1         |
| 3    | JV65        | L2        | True          | 50.00               | 43.727148               | 87.5         |
| 4    | JV66        | L3        | True          | 100.00              | 95.641837               | 95.6         |
| 5    | JV67        | L4        | True          | 250.00              | 263.693056              | 105.5        |
| 6    | JV68        | L5        | True          | 500.00              | 515.484261              | 103.1        |
| 7    | JV69        | L6        | True          | 1000.00             | 1039.124444             | 103.9        |
| 8    | JV70        | L7        | True          | 2500.00             | 2670.924305             | 106.8        |
| 9    | JV71        | L8        | True          | 5000.00             | 4986.632621             | 99.7         |
| 10   | JV72        | L9        | True          | 10000.00            | 9784.772327             | 97.9         |





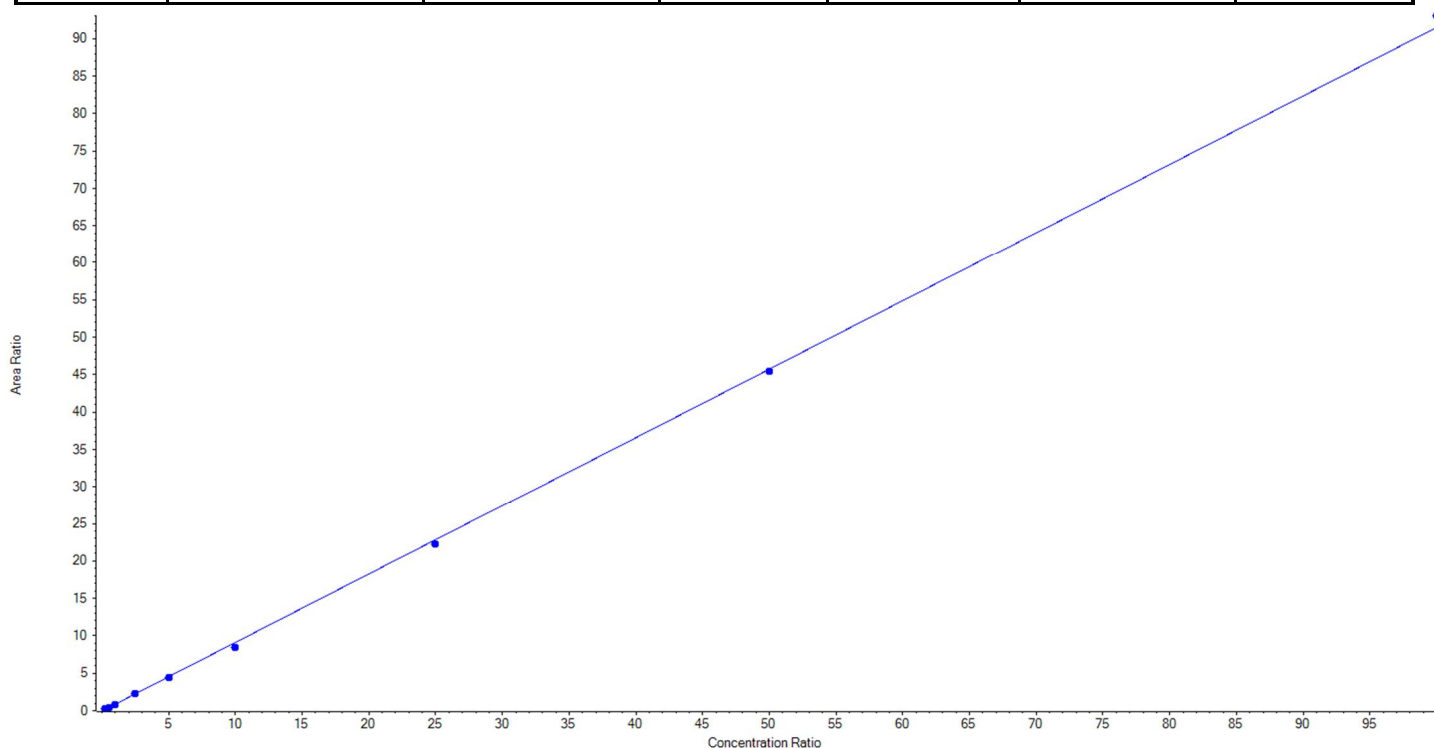
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFHpA_1               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 363.0 / 319.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.91541x + -0.03753$  ( $r = 0.99968$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 30.376574               | 121.5        |
| 3    | JV65        | L2        | True          | 50.00               | 45.439028               | 90.9         |
| 4    | JV66        | L3        | True          | 100.00              | 97.496950               | 97.5         |
| 5    | JV67        | L4        | True          | 250.00              | 250.225261              | 100.1        |
| 6    | JV68        | L5        | True          | 500.00              | 493.346877              | 98.7         |
| 7    | JV69        | L6        | True          | 1000.00             | 925.558519              | 92.6         |
| 8    | JV70        | L7        | True          | 2500.00             | 2441.983591             | 97.7         |
| 9    | JV71        | L8        | True          | 5000.00             | 4971.829107             | 99.4         |
| 10   | JV72        | L9        | True          | 10000.00            | 10168.744092            | 101.7        |





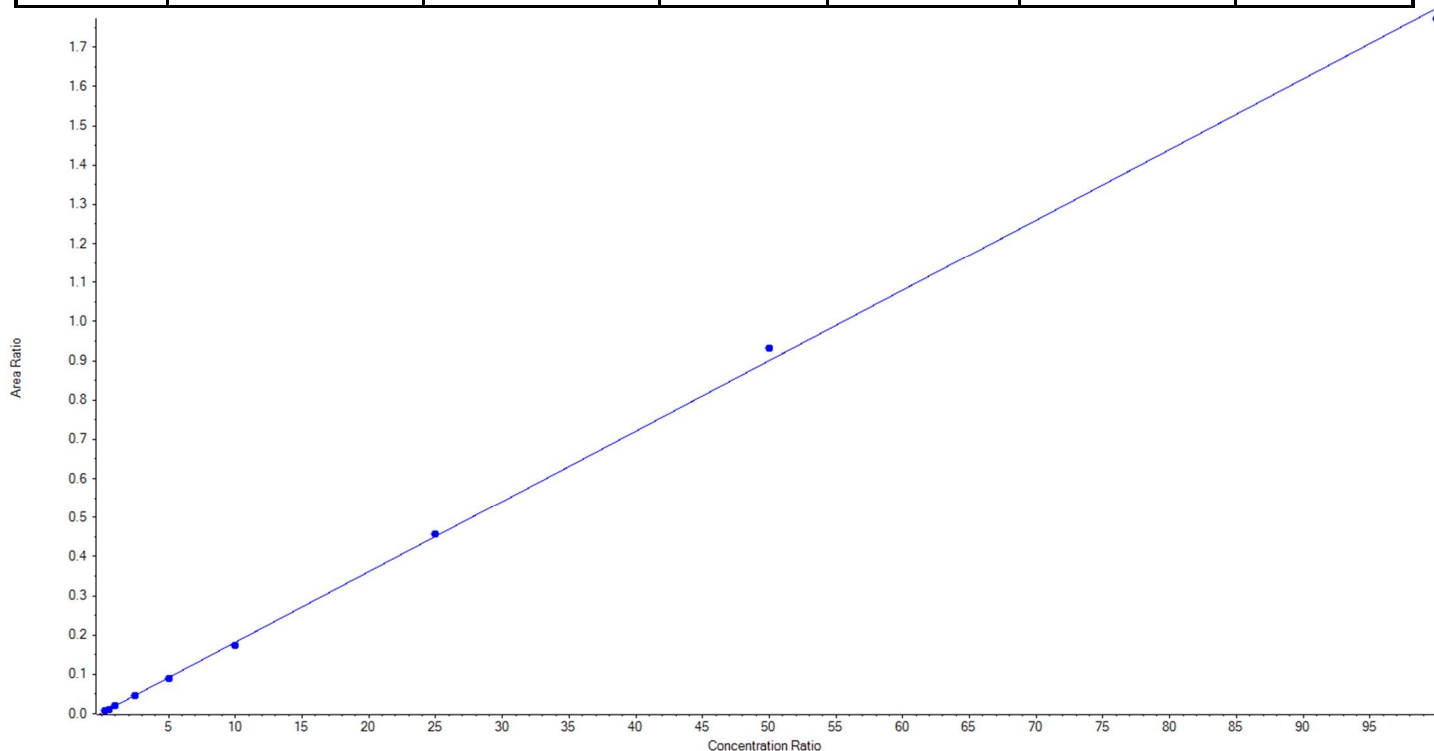
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFHpA_2               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 363.0 / 169.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.01797 x + 0.00202$  ( $r = 0.99965$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 29.725633               | 118.9        |
| 3    | JV65        | L2        | True          | 50.00               | 45.978740               | 92.0         |
| 4    | JV66        | L3        | True          | 100.00              | 95.624568               | 95.6         |
| 5    | JV67        | L4        | True          | 250.00              | 242.906065              | 97.2         |
| 6    | JV68        | L5        | True          | 500.00              | 483.731030              | 96.8         |
| 7    | JV69        | L6        | True          | 1000.00             | 961.157631              | 96.1         |
| 8    | JV70        | L7        | True          | 2500.00             | 2534.040073             | 101.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 5181.105707             | 103.6        |
| 10   | JV72        | L9        | True          | 10000.00            | 9850.730552             | 98.5         |





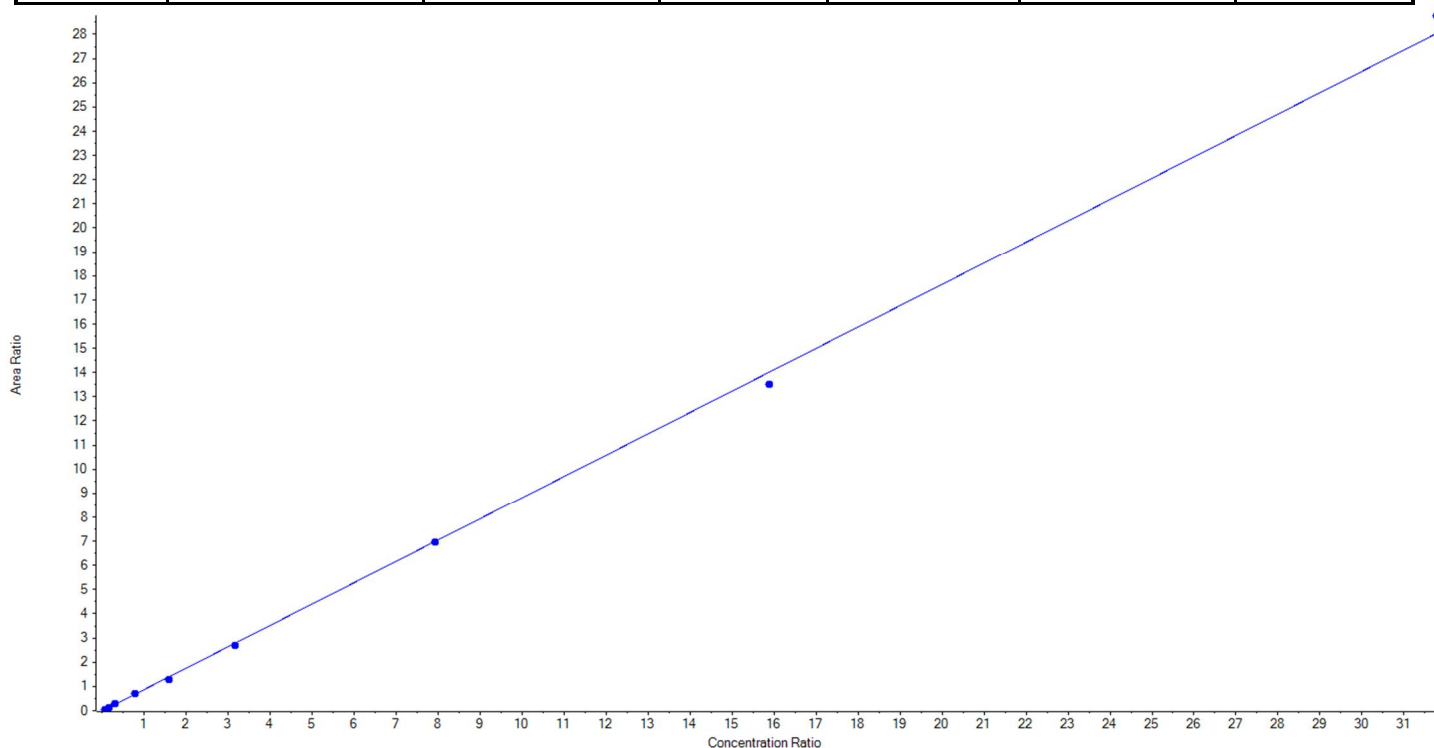
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFHxS_1               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 399.0 / 80.0          | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C4-PFOS             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.88291 x + -0.01367$  ( $r = 0.99951$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.80               | 21.964158               | 96.3         |
| 3    | JV65        | L2        | True          | 45.60               | 49.398431               | 108.3        |
| 4    | JV66        | L3        | True          | 91.20               | 97.865642               | 107.3        |
| 5    | JV67        | L4        | True          | 228.00              | 228.868301              | 100.4        |
| 6    | JV68        | L5        | True          | 456.00              | 425.120183              | 93.2         |
| 7    | JV69        | L6        | True          | 912.00              | 876.037044              | 96.1         |
| 8    | JV70        | L7        | True          | 2280.00             | 2266.476902             | 99.4         |
| 9    | JV71        | L8        | True          | 4560.00             | 4394.803214             | 96.4         |
| 10   | JV72        | L9        | True          | 9120.00             | 9355.066126             | 102.6        |





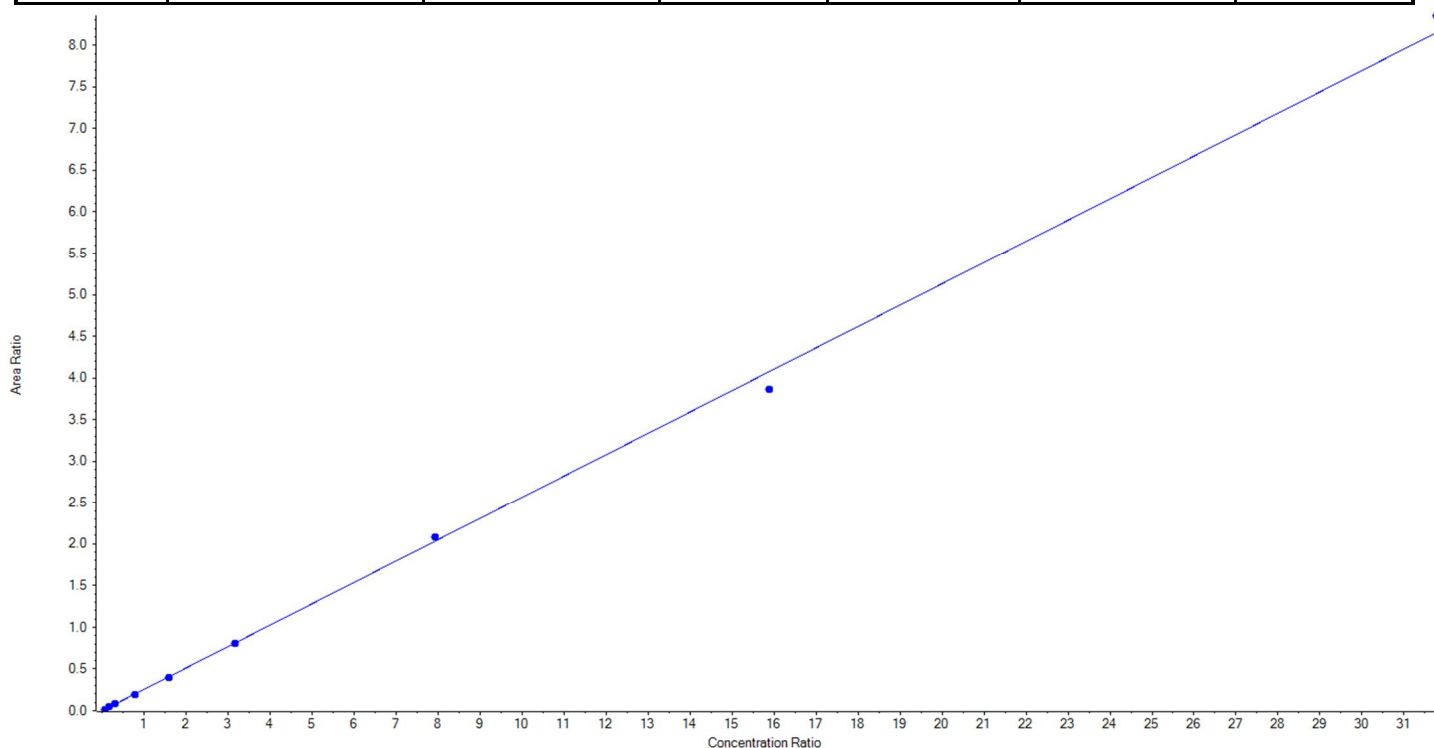
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFHxS_2               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 399.0 / 99.0          | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C4-PFOS             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.25661x + -0.00178$  ( $r = 0.99935$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 22.80               | 20.563117               | 90.2         |
| 3    | JV65        | L2        | True          | 45.60               | 53.831556               | 118.1        |
| 4    | JV66        | L3        | True          | 91.20               | 95.330404               | 104.5        |
| 5    | JV67        | L4        | True          | 228.00              | 212.264019              | 93.1         |
| 6    | JV68        | L5        | True          | 456.00              | 439.490801              | 96.4         |
| 7    | JV69        | L6        | True          | 912.00              | 897.362513              | 98.4         |
| 8    | JV70        | L7        | True          | 2280.00             | 2325.261565             | 102.0        |
| 9    | JV71        | L8        | True          | 4560.00             | 4328.857532             | 94.9         |
| 10   | JV72        | L9        | True          | 9120.00             | 9342.638493             | 102.4        |





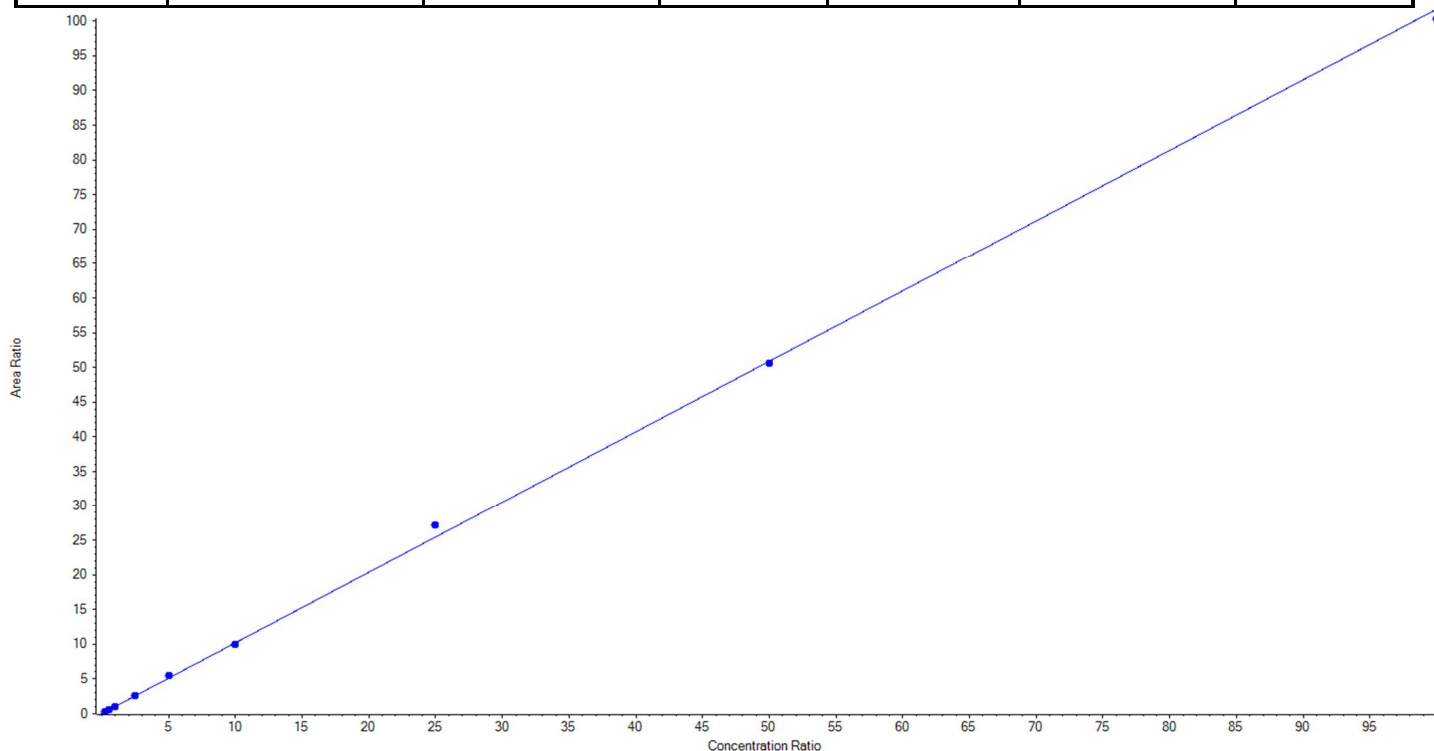
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFOA_1                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 413.0 / 369.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.01678x + 0.03792$  ( $r = 0.99956$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 24.183670               | 96.7         |
| 3    | JV65        | L2        | True          | 50.00               | 46.719992               | 93.4         |
| 4    | JV66        | L3        | True          | 100.00              | 101.886336              | 101.9        |
| 5    | JV67        | L4        | True          | 250.00              | 249.445858              | 99.8         |
| 6    | JV68        | L5        | True          | 500.00              | 530.855181              | 106.2        |
| 7    | JV69        | L6        | True          | 1000.00             | 973.222838              | 97.3         |
| 8    | JV70        | L7        | True          | 2500.00             | 2666.217472             | 106.7        |
| 9    | JV71        | L8        | True          | 5000.00             | 4969.395260             | 99.4         |
| 10   | JV72        | L9        | True          | 10000.00            | 9863.073393             | 98.6         |







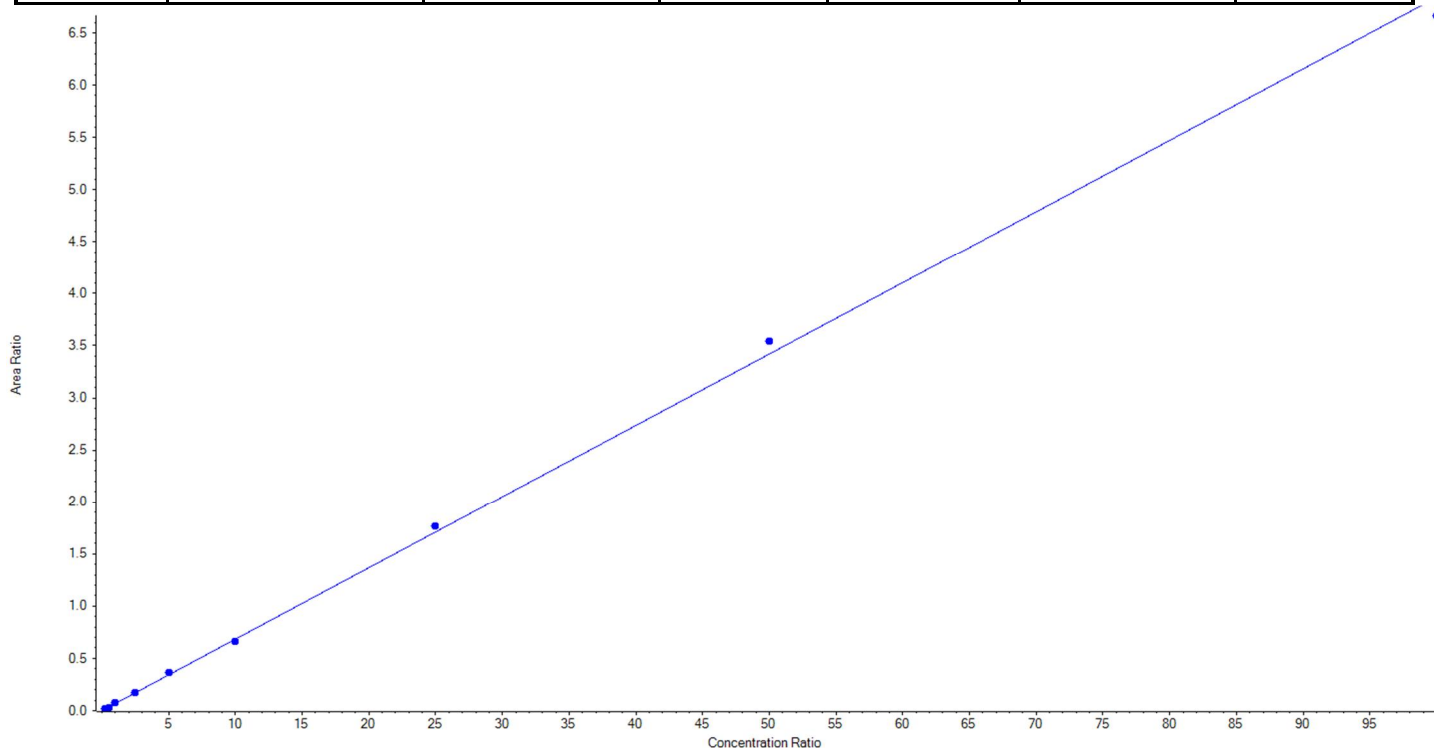
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFOA_2                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 413.0 / 169.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.06839x + 1.47376e-4$  ( $r = 0.99938$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 26.539591               | 106.2        |
| 3    | JV65        | L2        | True          | 50.00               | 36.985333               | 74.0         |
| 4    | JV66        | L3        | True          | 100.00              | 108.966567              | 109.0        |
| 5    | JV67        | L4        | True          | 250.00              | 259.322647              | 103.7        |
| 6    | JV68        | L5        | True          | 500.00              | 531.937160              | 106.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 968.055899              | 96.8         |
| 8    | JV70        | L7        | True          | 2500.00             | 2576.703127             | 103.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5174.930026             | 103.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9741.559650             | 97.4         |





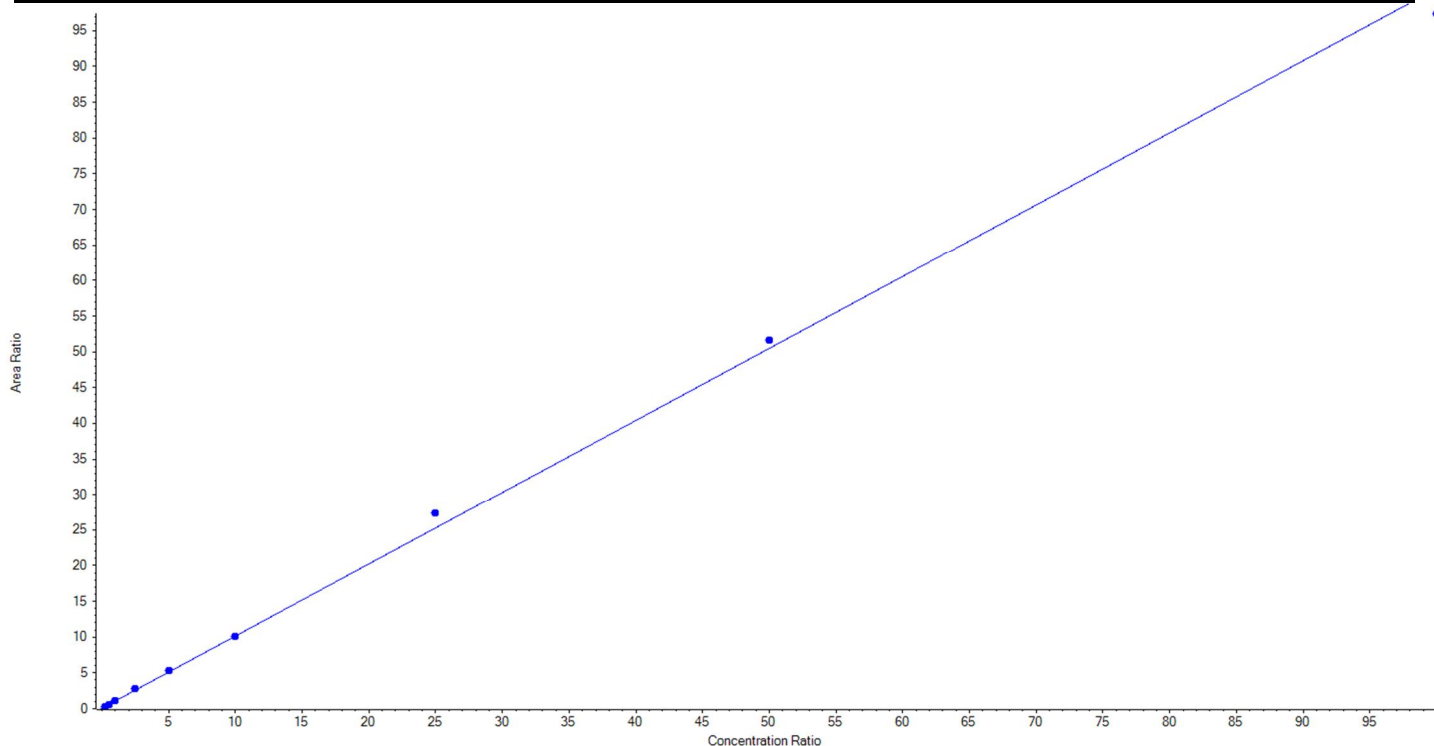
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFNA_1                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 463.0 / 419.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.00813x + 0.07245$  ( $r = 0.99905$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 23.740151               | 95.0         |
| 3    | JV65        | L2        | True          | 50.00               | 42.975473               | 86.0         |
| 4    | JV66        | L3        | True          | 100.00              | 101.182264              | 101.2        |
| 5    | JV67        | L4        | True          | 250.00              | 268.785560              | 107.5        |
| 6    | JV68        | L5        | True          | 500.00              | 517.047940              | 103.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 999.530435              | 100.0        |
| 8    | JV70        | L7        | True          | 2500.00             | 2704.725597             | 108.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 5117.017892             | 102.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9649.994688             | 96.5         |





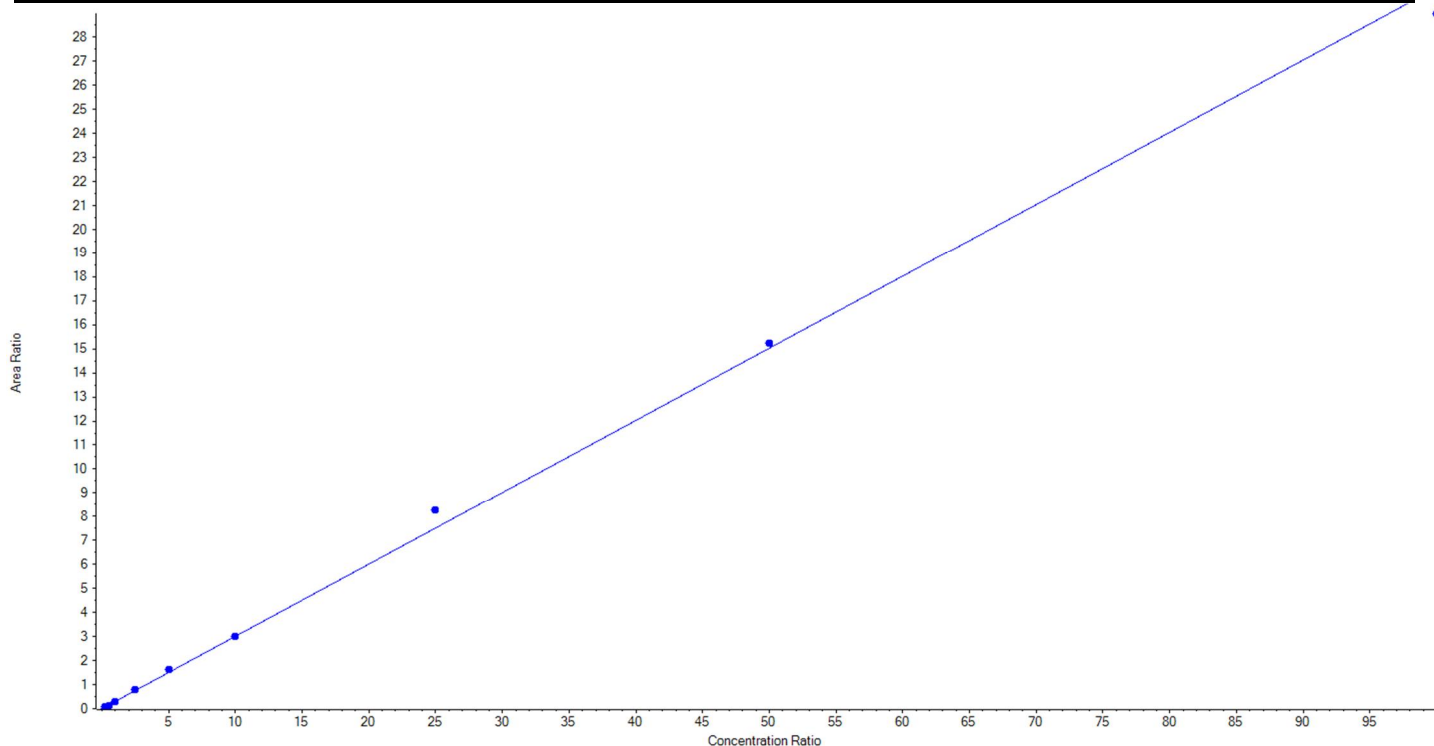
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFNA_2                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 463.0 / 219.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.30048x + 0.00430$  ( $r = 0.99885$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 22.662021               | 90.7         |
| 3    | JV65        | L2        | True          | 50.00               | 45.195262               | 90.4         |
| 4    | JV66        | L3        | True          | 100.00              | 99.545416               | 99.6         |
| 5    | JV67        | L4        | True          | 250.00              | 257.343516              | 102.9        |
| 6    | JV68        | L5        | True          | 500.00              | 541.800847              | 108.4        |
| 7    | JV69        | L6        | True          | 1000.00             | 1005.731807             | 100.6        |
| 8    | JV70        | L7        | True          | 2500.00             | 2744.428190             | 109.8        |
| 9    | JV71        | L8        | True          | 5000.00             | 5068.516419             | 101.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9639.776524             | 96.4         |





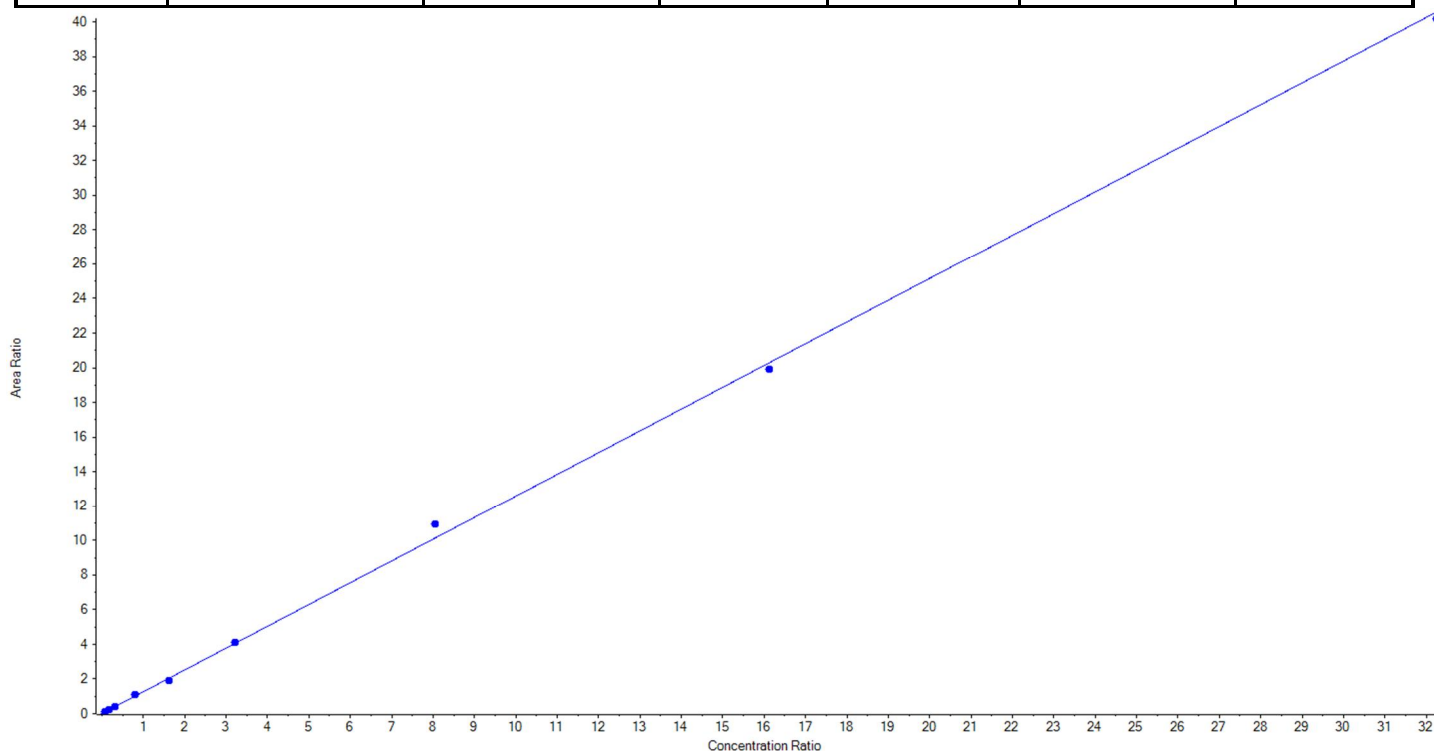
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFOS_1                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 499.0 / 80.0          | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C4-PFOS             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.25771 x + 0.00689$  ( $r = 0.99940$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 23.15               | 23.150192               | 100.0        |
| 3    | JV65        | L2        | True          | 46.30               | 44.854344               | 96.9         |
| 4    | JV66        | L3        | True          | 92.60               | 87.630476               | 94.6         |
| 5    | JV67        | L4        | True          | 231.50              | 249.641933              | 107.8        |
| 6    | JV68        | L5        | True          | 463.00              | 435.534206              | 94.1         |
| 7    | JV69        | L6        | True          | 925.60              | 941.138109              | 101.7        |
| 8    | JV70        | L7        | True          | 2314.00             | 2495.785437             | 107.9        |
| 9    | JV71        | L8        | True          | 4628.00             | 4536.443745             | 98.0         |
| 10   | JV72        | L9        | True          | 9256.00             | 9165.971558             | 99.0         |





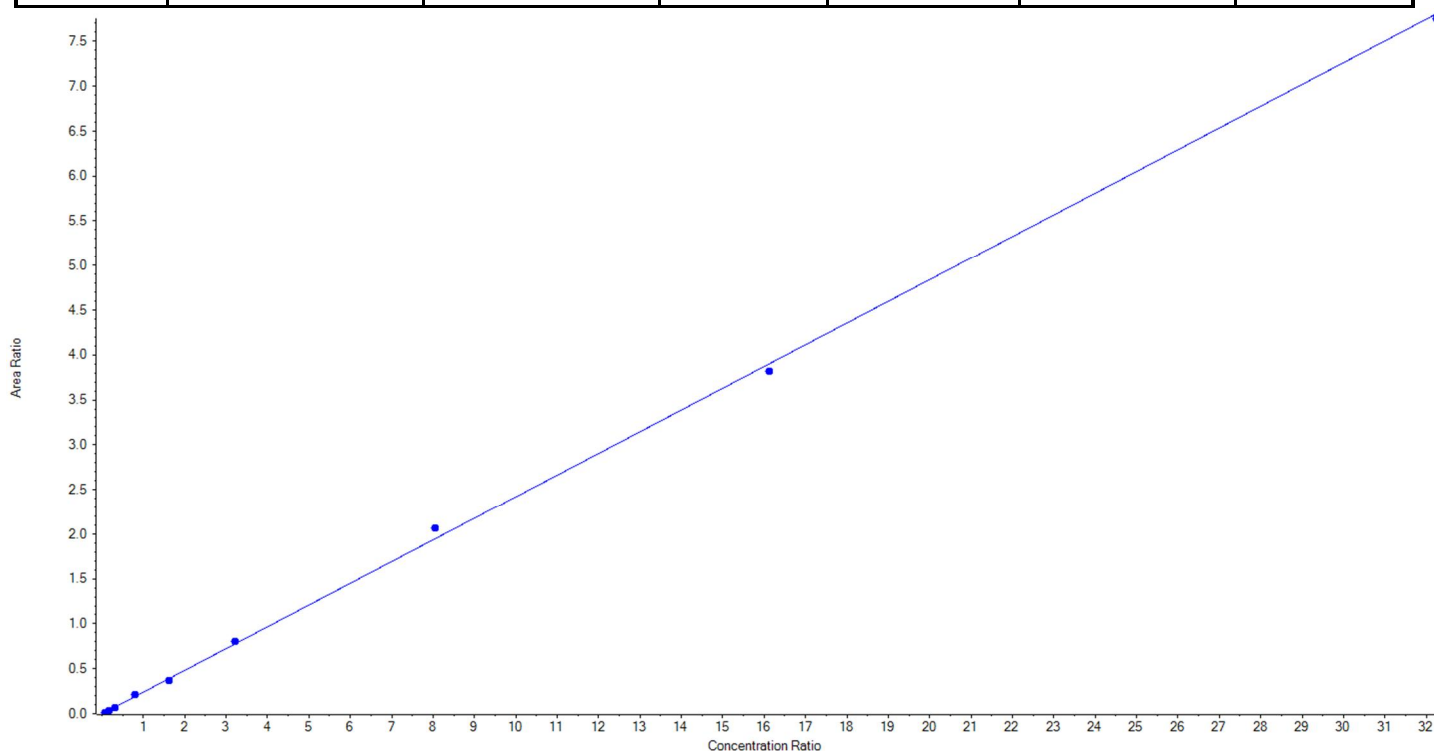
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFOS_2                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 499.0 / 99.0          | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C4-PFOS             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.24213x + -0.00234$  ( $r = 0.99955$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 23.15               | 21.053424               | 90.9         |
| 3    | JV65        | L2        | True          | 46.30               | 48.395966               | 104.5        |
| 4    | JV66        | L3        | True          | 92.60               | 87.362064               | 94.3         |
| 5    | JV67        | L4        | True          | 231.50              | 250.658478              | 108.3        |
| 6    | JV68        | L5        | True          | 463.00              | 442.003637              | 95.5         |
| 7    | JV69        | L6        | True          | 925.60              | 953.967651              | 103.1        |
| 8    | JV70        | L7        | True          | 2314.00             | 2457.835156             | 106.2        |
| 9    | JV71        | L8        | True          | 4628.00             | 4530.670558             | 97.9         |
| 10   | JV72        | L9        | True          | 9256.00             | 9188.203066             | 99.3         |





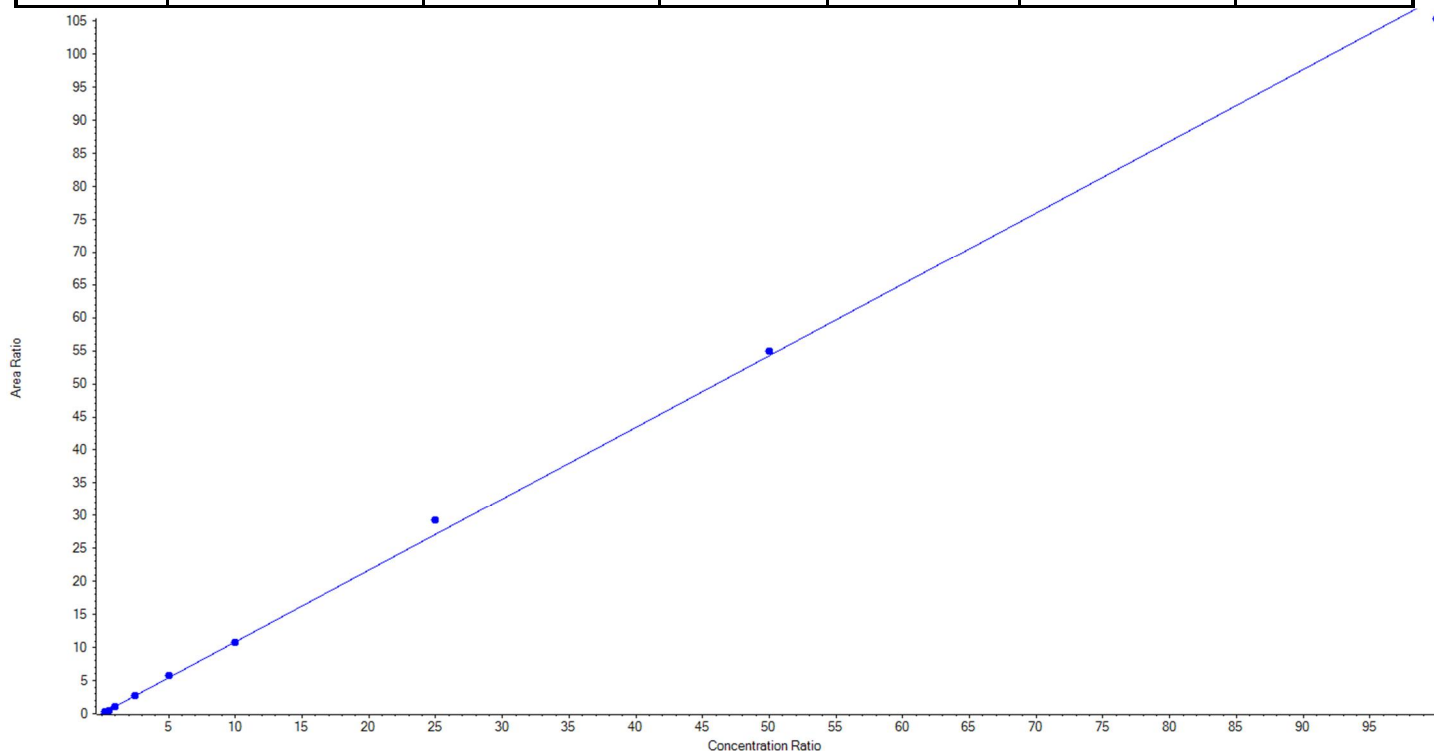
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFDA_1                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 513.0 / 469.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.08508x + 0.01047$  ( $r = 0.99922$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 23.082339               | 92.3         |
| 3    | JV65        | L2        | True          | 50.00               | 46.509322               | 93.0         |
| 4    | JV66        | L3        | True          | 100.00              | 103.688531              | 103.7        |
| 5    | JV67        | L4        | True          | 250.00              | 246.728844              | 98.7         |
| 6    | JV68        | L5        | True          | 500.00              | 531.714602              | 106.3        |
| 7    | JV69        | L6        | True          | 1000.00             | 993.391259              | 99.3         |
| 8    | JV70        | L7        | True          | 2500.00             | 2703.309157             | 108.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5069.175999             | 101.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9707.399947             | 97.1         |





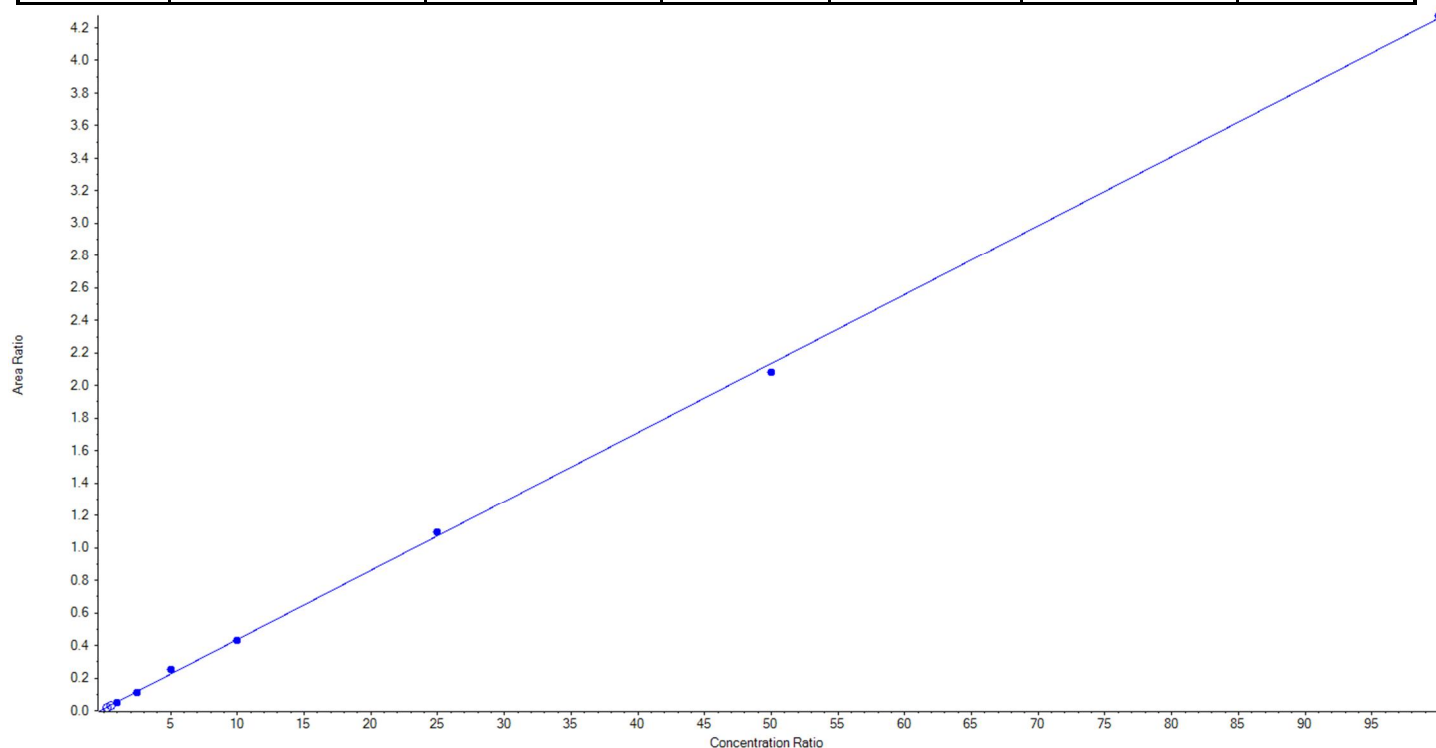
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFDA_2                | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 513.0 / 219.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.04247 x + 0.01203$  ( $r = 0.99952$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | 14.577888               | 58.3         |
| 3    | JV65        | L2        | False         | 50.00               | 51.392828               | 102.8        |
| 4    | JV66        | L3        | True          | 100.00              | 91.768016               | 91.8         |
| 5    | JV67        | L4        | True          | 250.00              | 238.590038              | 95.4         |
| 6    | JV68        | L5        | True          | 500.00              | 569.414772              | 113.9        |
| 7    | JV69        | L6        | True          | 1000.00             | 988.478191              | 98.9         |
| 8    | JV70        | L7        | True          | 2500.00             | 2559.041262             | 102.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 4867.646769             | 97.4         |
| 10   | JV72        | L9        | True          | 10000.00            | 10035.060952            | 100.4        |







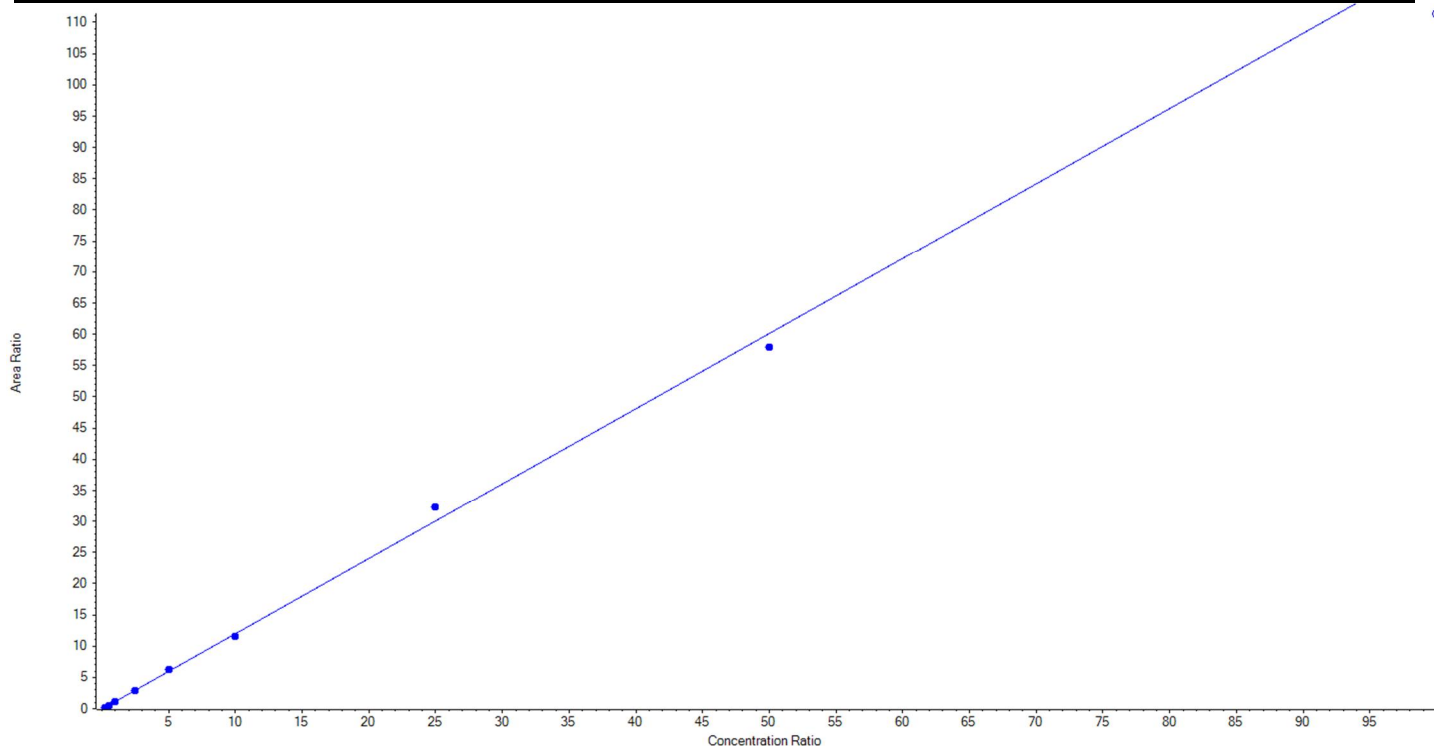
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFUnA_1               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 563.0 / 519.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.20341x + -0.05430$  ( $r = 0.99871$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 23.264189               | 93.1         |
| 3    | JV65        | L2        | True          | 50.00               | 49.048218               | 98.1         |
| 4    | JV66        | L3        | True          | 100.00              | 103.732205              | 103.7        |
| 5    | JV67        | L4        | True          | 250.00              | 245.728477              | 98.3         |
| 6    | JV68        | L5        | True          | 500.00              | 530.835336              | 106.2        |
| 7    | JV69        | L6        | True          | 1000.00             | 970.257301              | 97.0         |
| 8    | JV70        | L7        | True          | 2500.00             | 2679.386413             | 107.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 4822.747861             | 96.5         |
| 10   | JV72        | L9        | False         | 10000.00            | 9258.449511             | 92.6         |





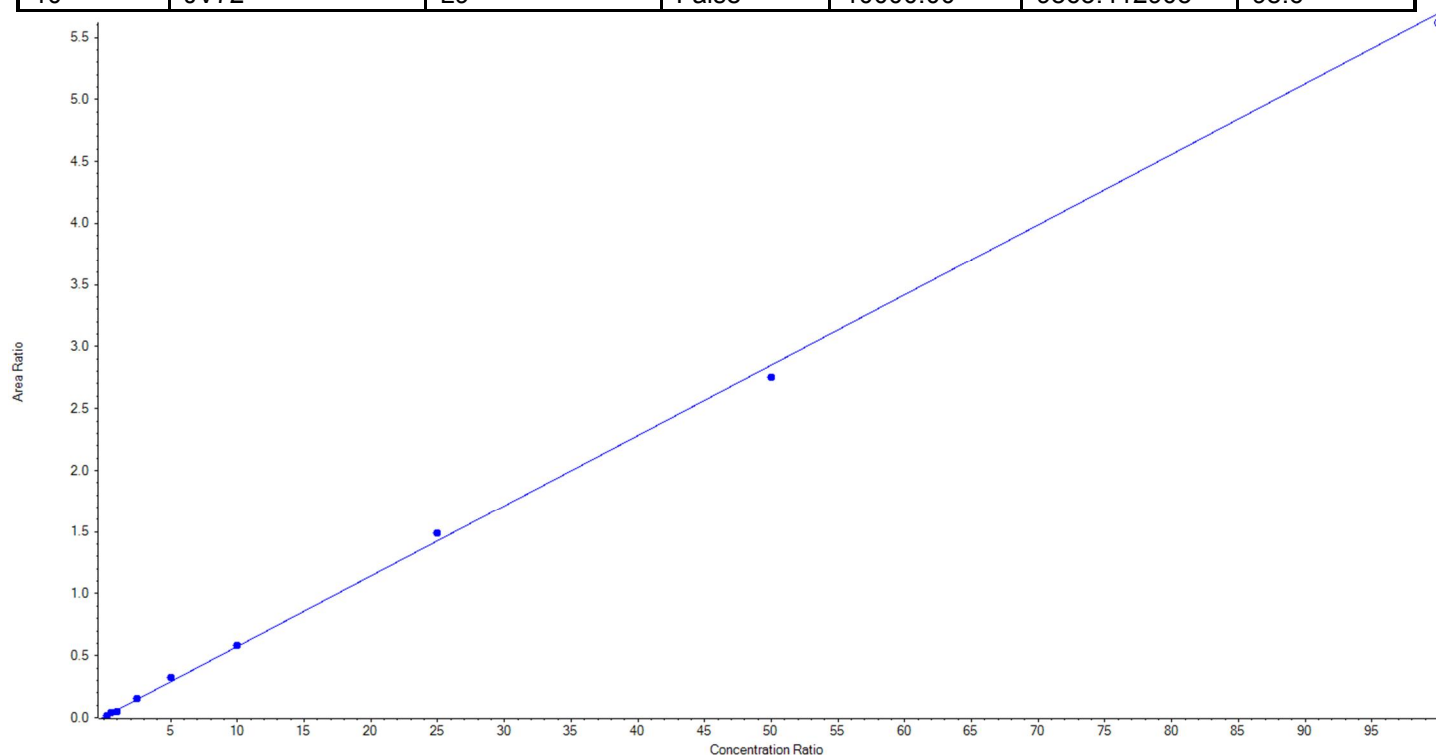
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFUnA_2               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 563.0 / 269.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.05690 x + 0.00530$  ( $r = 0.99866$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.888997               | 87.6         |
| 3    | JV65        | L2        | True          | 50.00               | 57.026228               | 114.1        |
| 4    | JV66        | L3        | True          | 100.00              | 79.581698               | 79.6         |
| 5    | JV67        | L4        | True          | 250.00              | 263.669538              | 105.5        |
| 6    | JV68        | L5        | True          | 500.00              | 554.929646              | 111.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 1016.215001             | 101.6        |
| 8    | JV70        | L7        | True          | 2500.00             | 2605.041713             | 104.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 4826.647179             | 96.5         |
| 10   | JV72        | L9        | False         | 10000.00            | 9863.412905             | 98.6         |





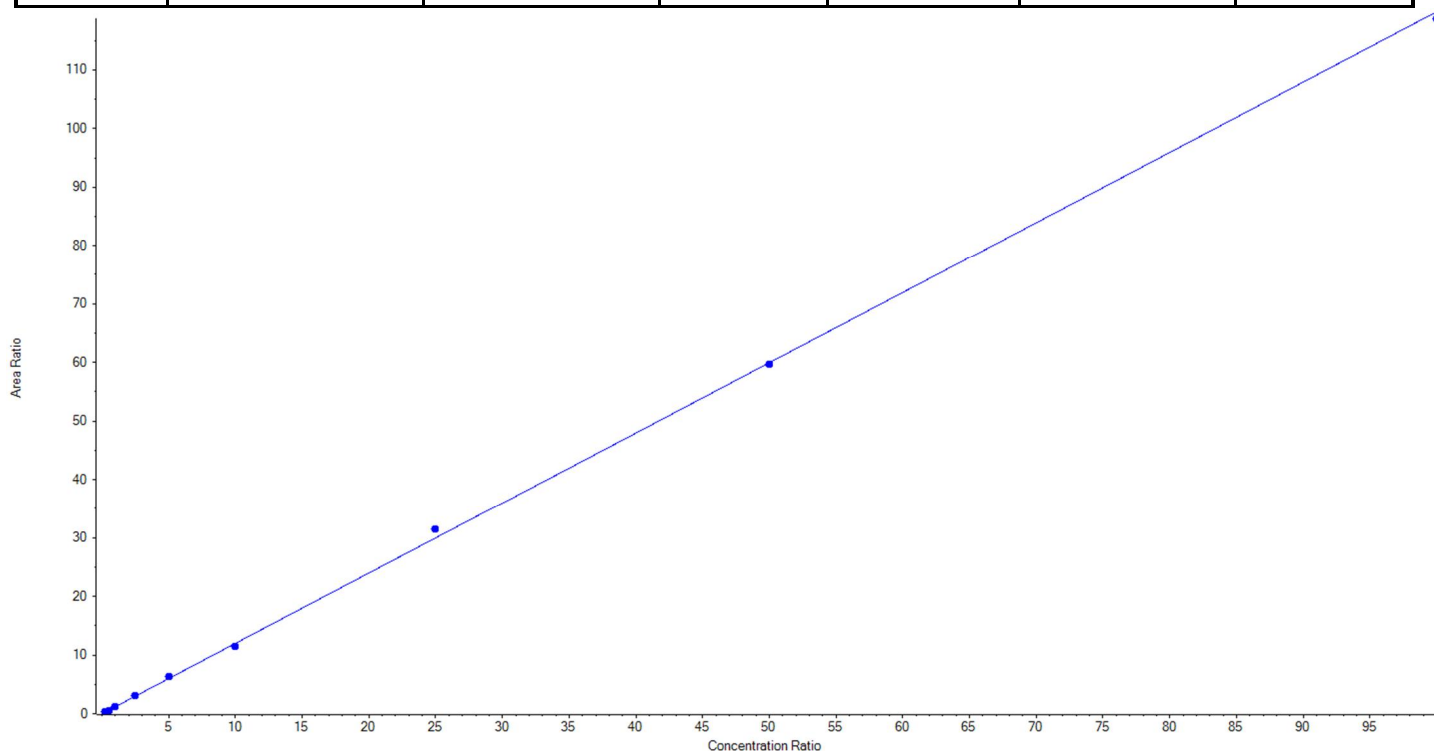
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFDaA_1               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 613.0 / 569.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.19917x + -0.01173$  ( $r = 0.99967$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 25.967186               | 103.9        |
| 3    | JV65        | L2        | True          | 50.00               | 44.420766               | 88.8         |
| 4    | JV66        | L3        | True          | 100.00              | 101.194737              | 101.2        |
| 5    | JV67        | L4        | True          | 250.00              | 250.774680              | 100.3        |
| 6    | JV68        | L5        | True          | 500.00              | 529.744553              | 106.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 959.455534              | 96.0         |
| 8    | JV70        | L7        | True          | 2500.00             | 2630.688671             | 105.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 4983.556616             | 99.7         |
| 10   | JV72        | L9        | True          | 10000.00            | 9899.197259             | 99.0         |





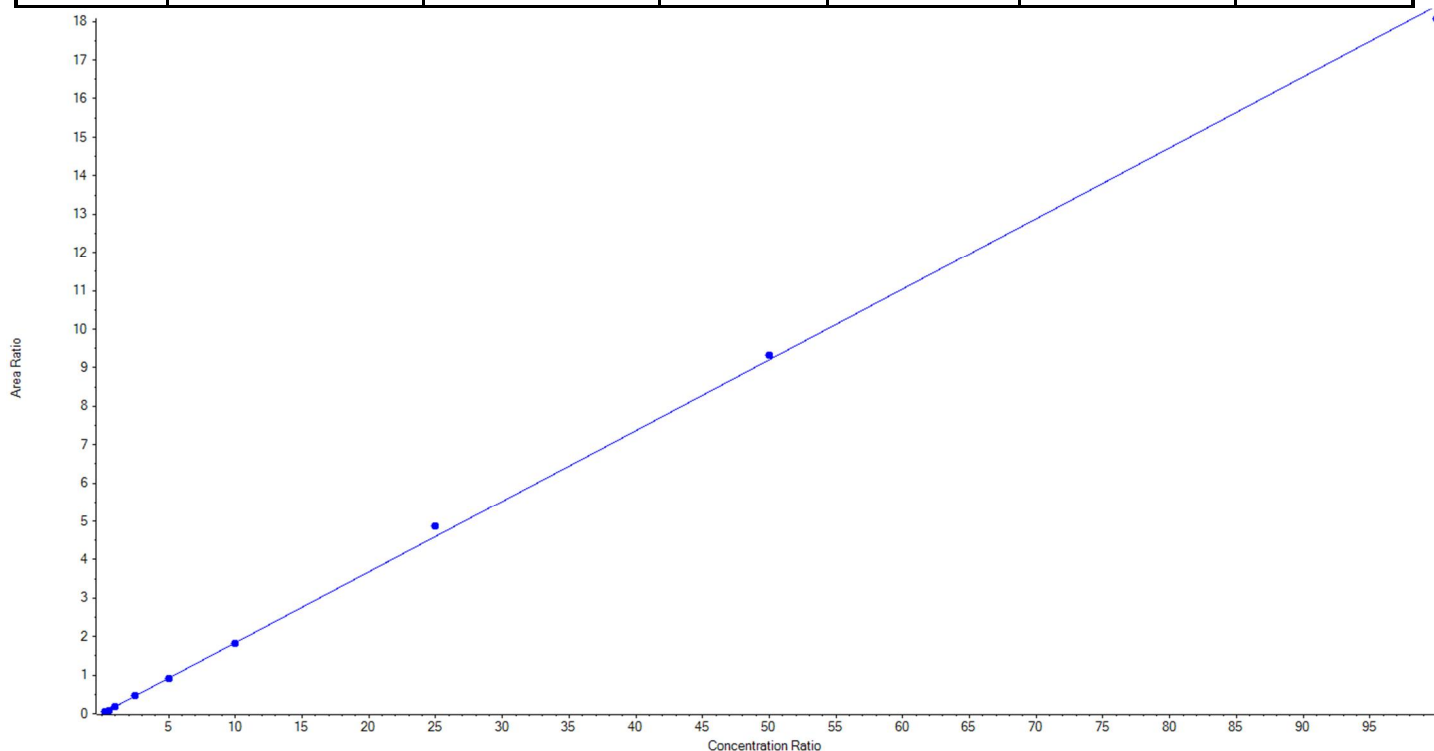
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFDaA_2               | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 613.0 / 319.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.18405x + 1.41024e-4$  ( $r = 0.99955$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 29.863711               | 119.5        |
| 3    | JV65        | L2        | True          | 50.00               | 39.136838               | 78.3         |
| 4    | JV66        | L3        | True          | 100.00              | 100.480568              | 100.5        |
| 5    | JV67        | L4        | True          | 250.00              | 250.417323              | 100.2        |
| 6    | JV68        | L5        | True          | 500.00              | 489.477404              | 97.9         |
| 7    | JV69        | L6        | True          | 1000.00             | 983.211792              | 98.3         |
| 8    | JV70        | L7        | True          | 2500.00             | 2646.724038             | 105.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 5068.147886             | 101.4        |
| 10   | JV72        | L9        | True          | 10000.00            | 9817.540440             | 98.2         |





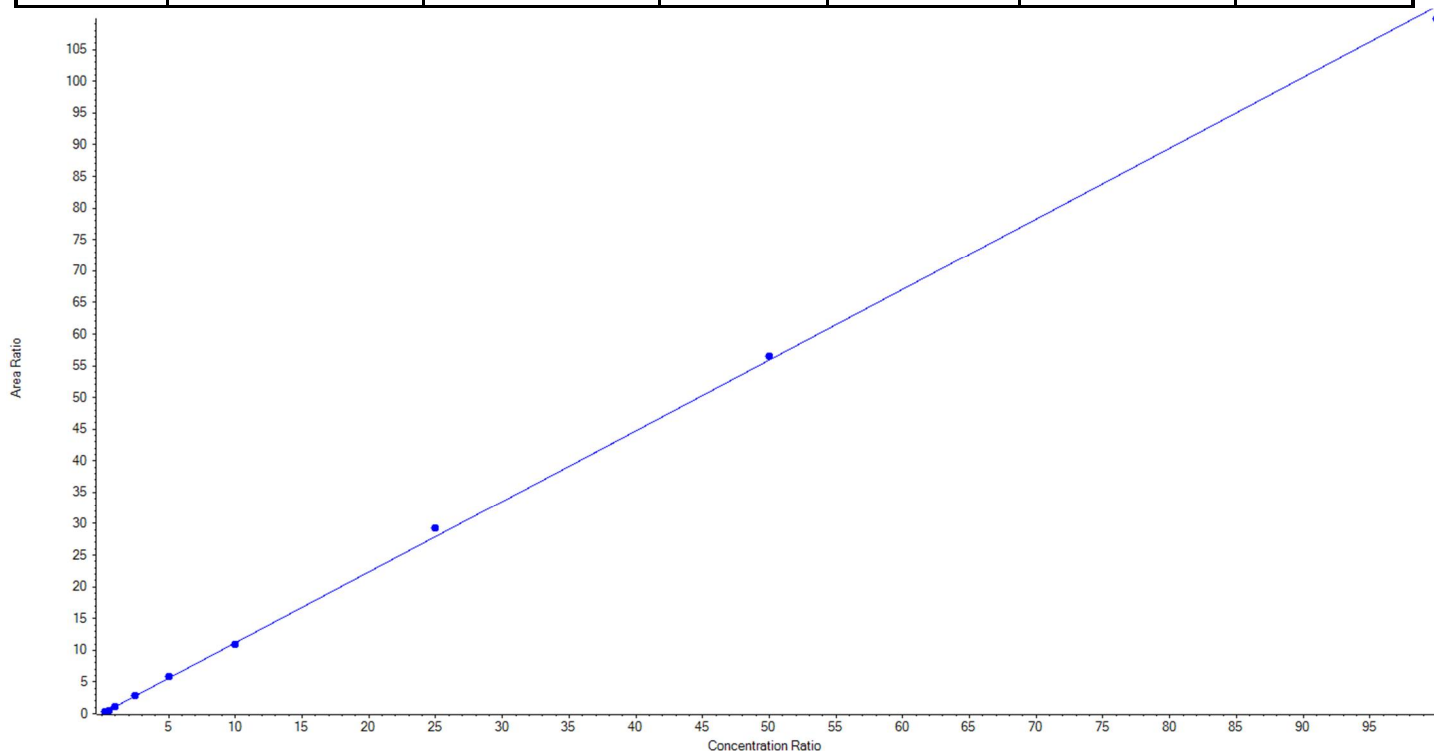
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFTTrDA_1             | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 663.0 / 619.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.11812 x + -0.00570$  ( $r = 0.99969$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 24.190968               | 96.8         |
| 3    | JV65        | L2        | True          | 50.00               | 46.449685               | 92.9         |
| 4    | JV66        | L3        | True          | 100.00              | 103.263944              | 103.3        |
| 5    | JV67        | L4        | True          | 250.00              | 253.836581              | 101.5        |
| 6    | JV68        | L5        | True          | 500.00              | 517.231413              | 103.5        |
| 7    | JV69        | L6        | True          | 1000.00             | 978.097997              | 97.8         |
| 8    | JV70        | L7        | True          | 2500.00             | 2624.607976             | 105.0        |
| 9    | JV71        | L8        | True          | 5000.00             | 5052.456613             | 101.1        |
| 10   | JV72        | L9        | True          | 10000.00            | 9824.864823             | 98.3         |





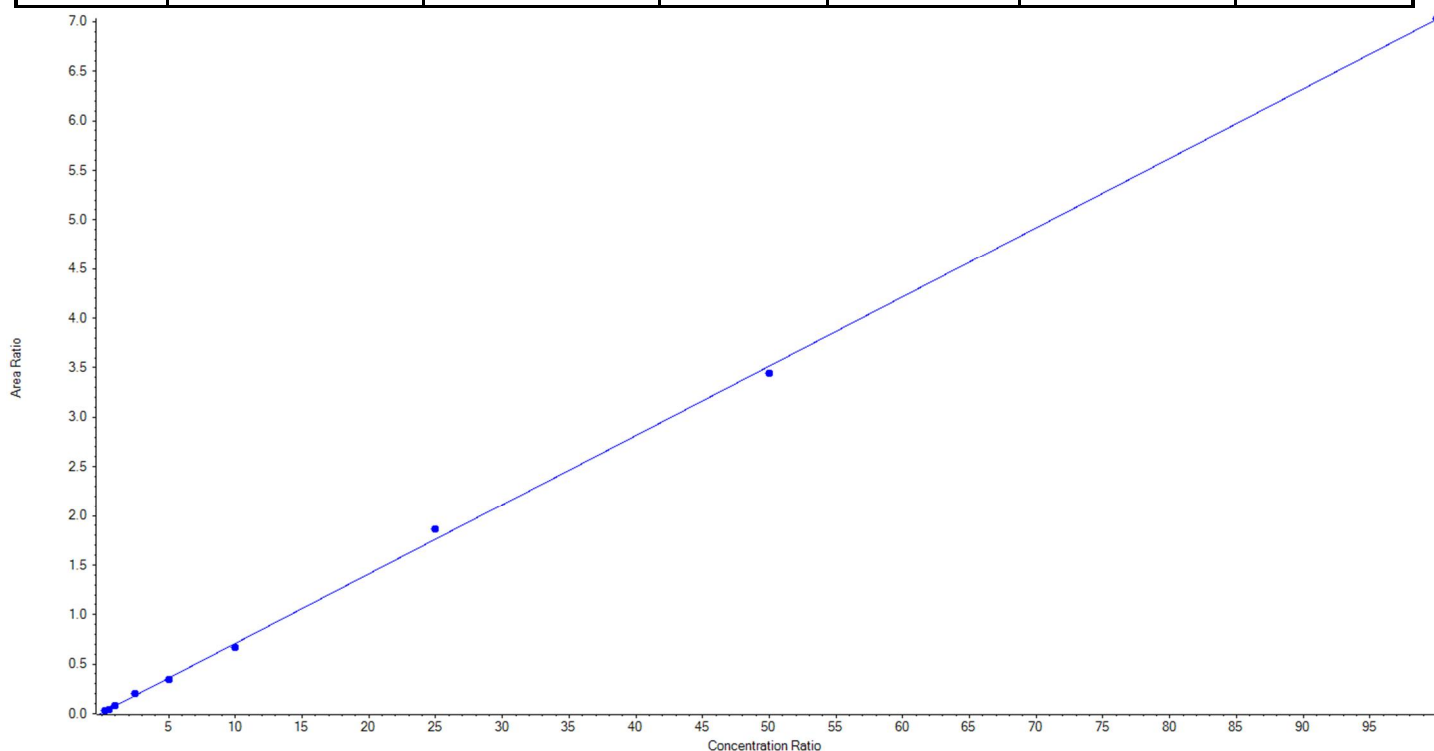
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFTTrDA_2             | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 663.0 / 169.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.07015x + 0.00820$  ( $r = 0.99949$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 25.870465               | 103.5        |
| 3    | JV65        | L2        | True          | 50.00               | 46.103574               | 92.2         |
| 4    | JV66        | L3        | True          | 100.00              | 98.341516               | 98.3         |
| 5    | JV67        | L4        | True          | 250.00              | 278.960178              | 111.6        |
| 6    | JV68        | L5        | True          | 500.00              | 482.960722              | 96.6         |
| 7    | JV69        | L6        | True          | 1000.00             | 938.483509              | 93.9         |
| 8    | JV70        | L7        | True          | 2500.00             | 2646.740377             | 105.9        |
| 9    | JV71        | L8        | True          | 5000.00             | 4899.989841             | 98.0         |
| 10   | JV72        | L9        | True          | 10000.00            | 10007.549817            | 100.1        |





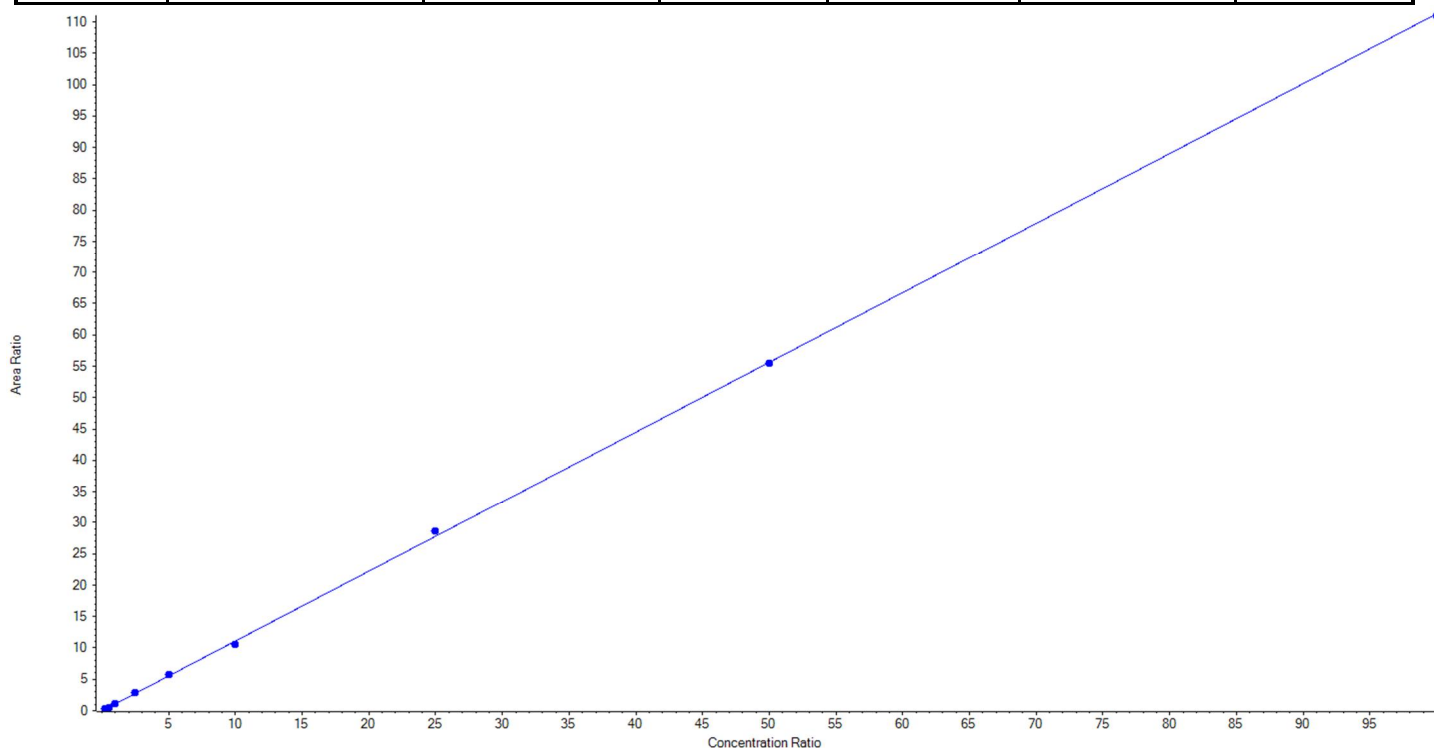
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFTeDA_1              | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 713.0 / 669.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.11313 x + -0.03456$  ( $r = 0.99987$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 24.963851               | 99.9         |
| 3    | JV65        | L2        | True          | 50.00               | 47.189816               | 94.4         |
| 4    | JV66        | L3        | True          | 100.00              | 102.694534              | 102.7        |
| 5    | JV67        | L4        | True          | 250.00              | 256.610028              | 102.6        |
| 6    | JV68        | L5        | True          | 500.00              | 513.956500              | 102.8        |
| 7    | JV69        | L6        | True          | 1000.00             | 954.781459              | 95.5         |
| 8    | JV70        | L7        | True          | 2500.00             | 2568.486466             | 102.7        |
| 9    | JV71        | L8        | True          | 5000.00             | 4985.434252             | 99.7         |
| 10   | JV72        | L9        | True          | 10000.00            | 9970.883095             | 99.7         |







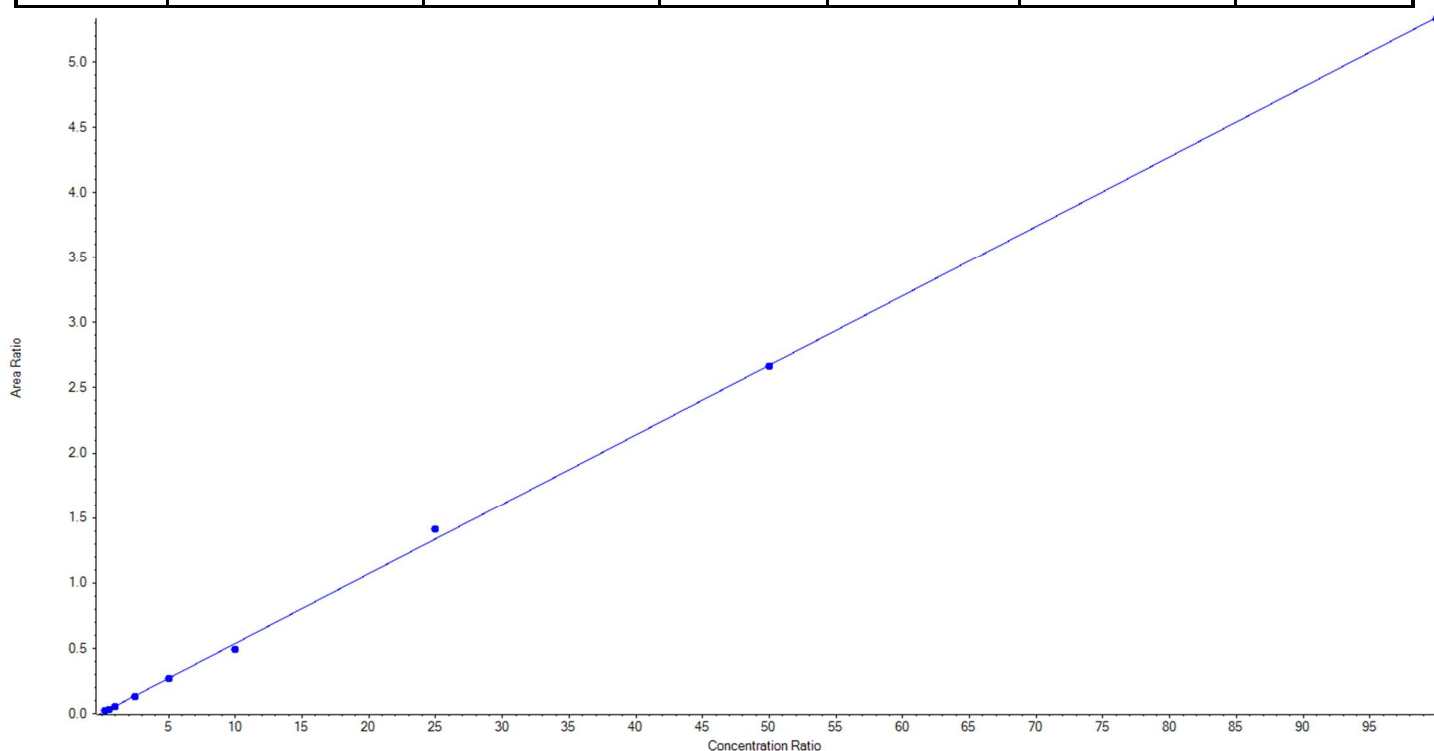
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | PFTeDA_2              | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 713.0 / 169.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | 13C2-PFOA             | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.05337 x + 0.00432$  ( $r = 0.99957$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 28.901673               | 115.6        |
| 3    | JV65        | L2        | True          | 50.00               | 49.580004               | 99.2         |
| 4    | JV66        | L3        | True          | 100.00              | 97.203998               | 97.2         |
| 5    | JV67        | L4        | True          | 250.00              | 232.187833              | 92.9         |
| 6    | JV68        | L5        | True          | 500.00              | 490.456940              | 98.1         |
| 7    | JV69        | L6        | True          | 1000.00             | 919.989421              | 92.0         |
| 8    | JV70        | L7        | True          | 2500.00             | 2635.801402             | 105.4        |
| 9    | JV71        | L8        | True          | 5000.00             | 4992.299518             | 99.9         |
| 10   | JV72        | L9        | True          | 10000.00            | 9978.579211             | 99.8         |





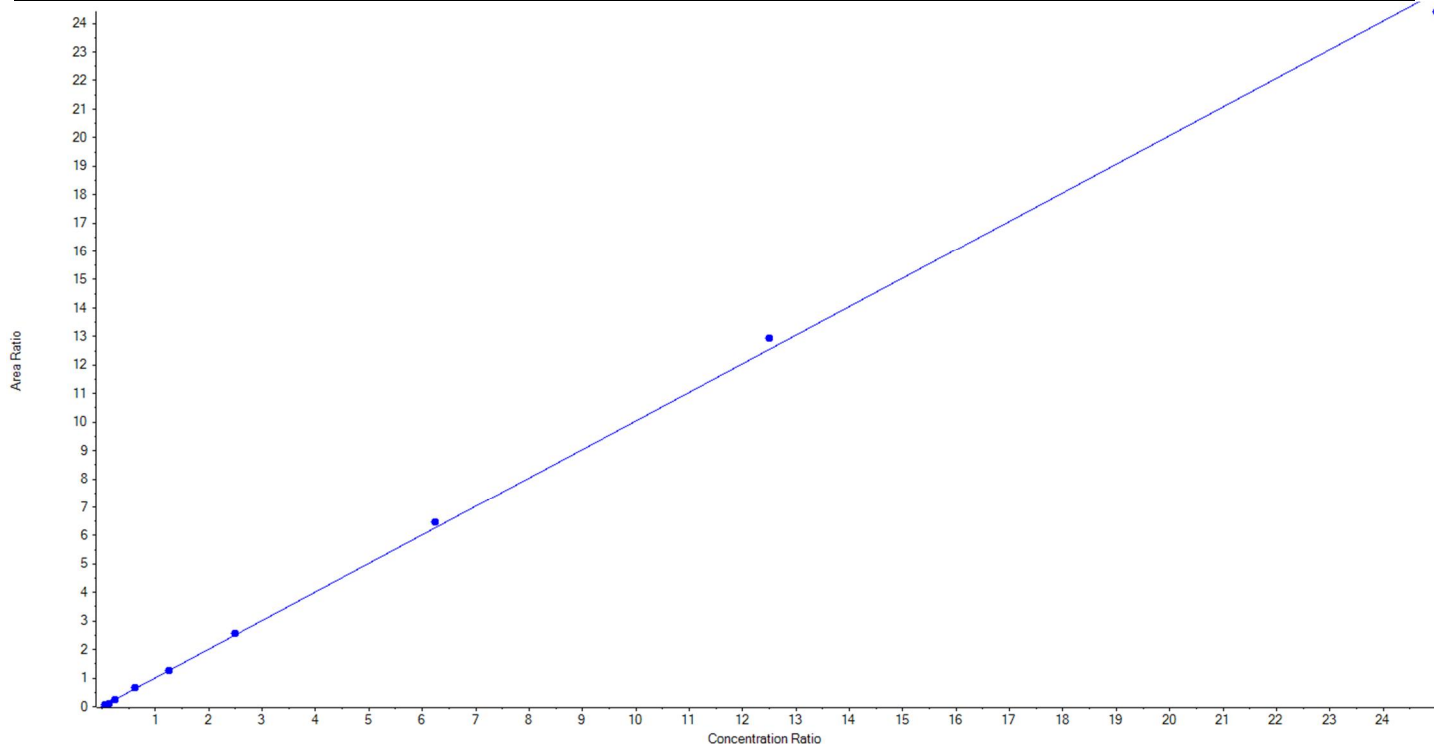
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | NMeFOSAA_1            | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 570.0 / 419.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | d3-MeFOSAA            | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 1.00331 x + 0.00638$  ( $r = 0.99952$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 26.216312               | 104.9        |
| 3    | JV65        | L2        | True          | 50.00               | 43.262935               | 86.5         |
| 4    | JV66        | L3        | True          | 100.00              | 97.560992               | 97.6         |
| 5    | JV67        | L4        | True          | 250.00              | 262.440074              | 105.0        |
| 6    | JV68        | L5        | True          | 500.00              | 500.191836              | 100.0        |
| 7    | JV69        | L6        | True          | 1000.00             | 1022.381129             | 102.2        |
| 8    | JV70        | L7        | True          | 2500.00             | 2580.979914             | 103.2        |
| 9    | JV71        | L8        | True          | 5000.00             | 5163.651353             | 103.3        |
| 10   | JV72        | L9        | True          | 10000.00            | 9728.315454             | 97.3         |





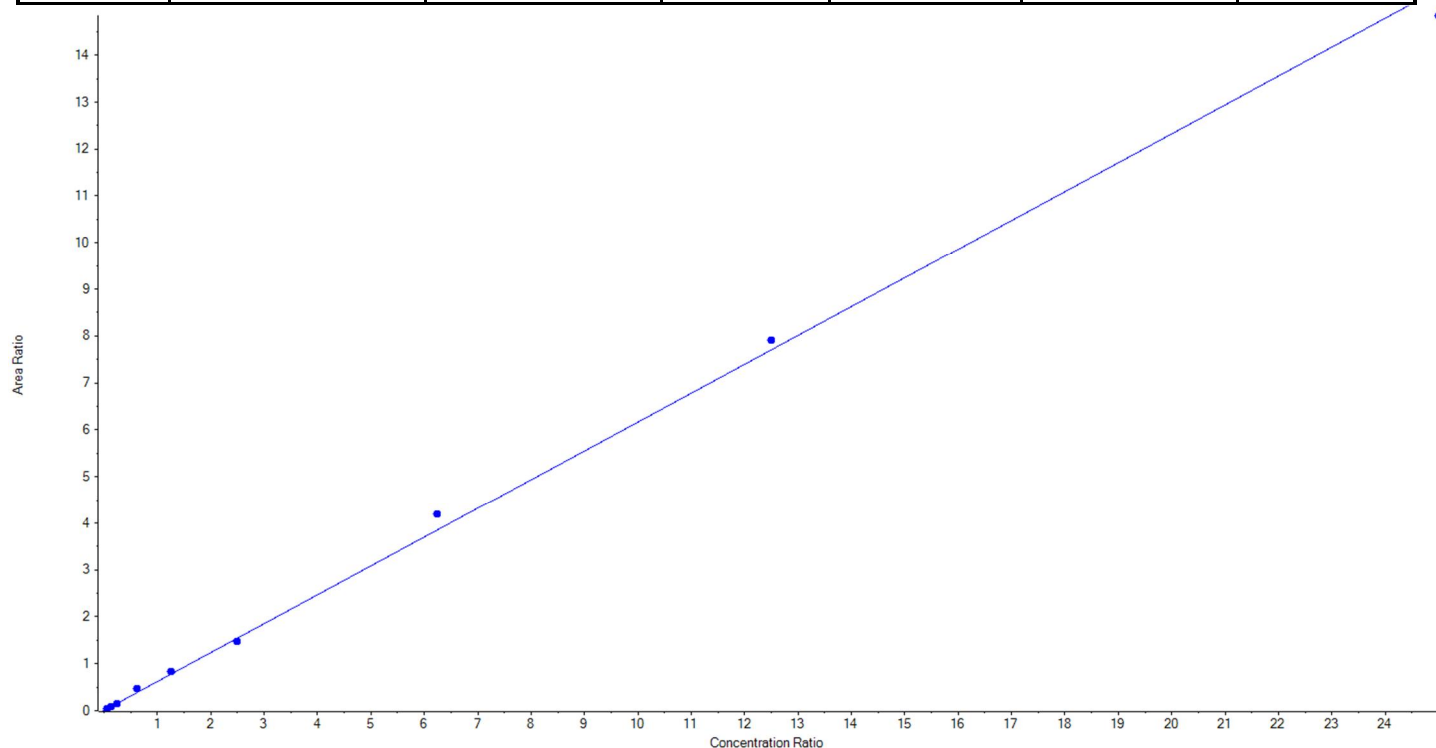
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | NMeFOSAA_2            | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 570.0 / 512.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | d3-MeFOSAA            | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.61594x + 0.00453$  ( $r = 0.99864$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 20.864881               | 83.5         |
| 3    | JV65        | L2        | True          | 50.00               | 46.623952               | 93.3         |
| 4    | JV66        | L3        | True          | 100.00              | 93.928839               | 93.9         |
| 5    | JV67        | L4        | True          | 250.00              | 297.243177              | 118.9        |
| 6    | JV68        | L5        | True          | 500.00              | 538.566592              | 107.7        |
| 7    | JV69        | L6        | True          | 1000.00             | 953.461105              | 95.4         |
| 8    | JV70        | L7        | True          | 2500.00             | 2712.415852             | 108.5        |
| 9    | JV71        | L8        | True          | 5000.00             | 5129.144605             | 102.6        |
| 10   | JV72        | L9        | True          | 10000.00            | 9632.750998             | 96.3         |





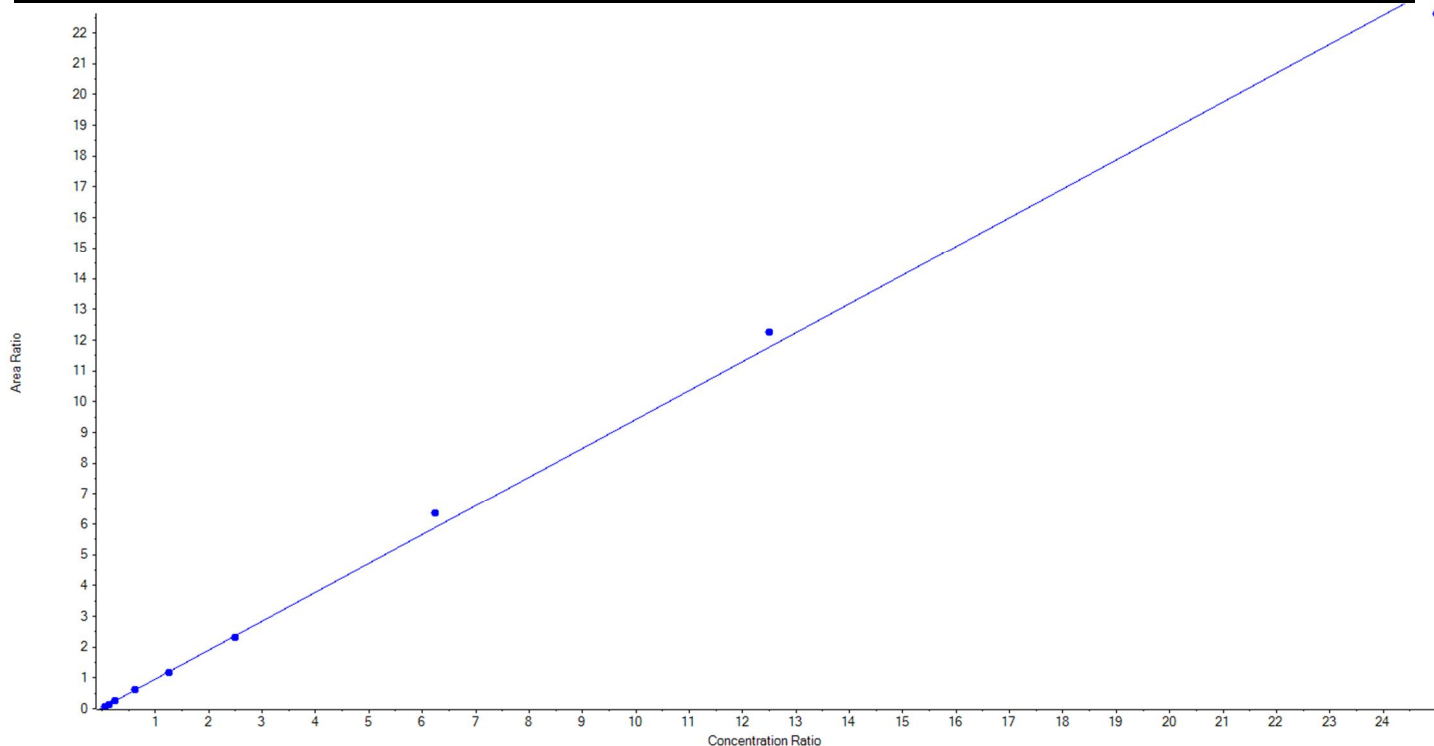
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | NEtFOSAA_1            | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 584.0 / 419.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | d3-MeFOSAA            | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.93990x + 0.02037$  ( $r = 0.99890$ ) (weighting:  $1/x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | True          | 25.00               | 21.391576               | 85.6         |
| 3    | JV65        | L2        | True          | 50.00               | 52.162161               | 104.3        |
| 4    | JV66        | L3        | True          | 100.00              | 103.244176              | 103.2        |
| 5    | JV67        | L4        | True          | 250.00              | 256.585755              | 102.6        |
| 6    | JV68        | L5        | True          | 500.00              | 489.803136              | 98.0         |
| 7    | JV69        | L6        | True          | 1000.00             | 979.832668              | 98.0         |
| 8    | JV70        | L7        | True          | 2500.00             | 2701.999272             | 108.1        |
| 9    | JV71        | L8        | True          | 5000.00             | 5200.721822             | 104.0        |
| 10   | JV72        | L9        | True          | 10000.00            | 9619.259433             | 96.2         |





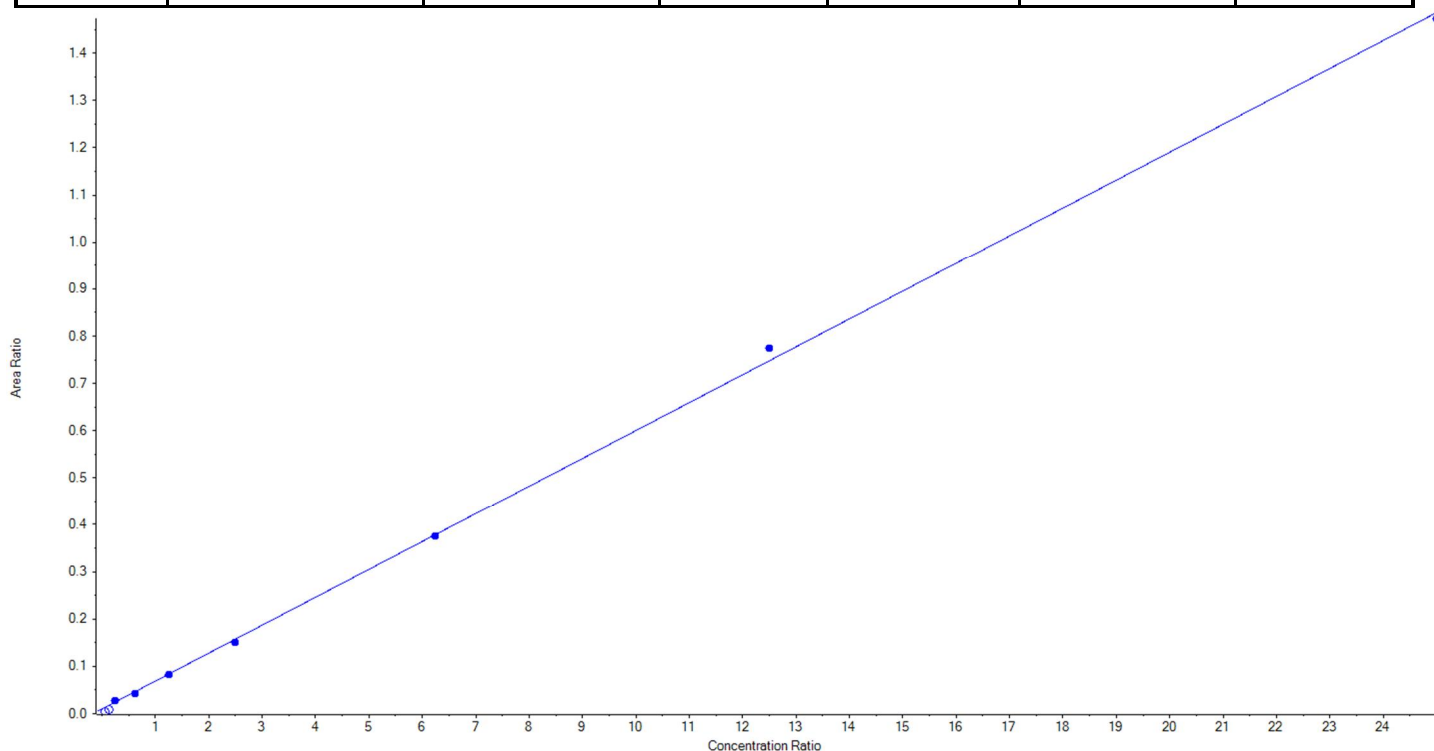
## Calibration Summary Report

Created with Analyst Reporter  
Printed: 21/05/2018 2:00:06 PM

|                          |                       |                           |                |
|--------------------------|-----------------------|---------------------------|----------------|
| <b>Analyte Name</b>      | NEtFOSAA_2            | <b>Data File</b>          | 18-0299_A.wiff |
| <b>MRM Transition</b>    | 584.0 / 483.0         | <b>Result Table</b>       | 18-0299_BASE   |
| <b>Internal Standard</b> | d3-MeFOSAA            | <b>Instrument Name</b>    | QTRAP 5500     |
| <b>Acquisition Date</b>  | 5/13/2018 12:26:05 PM | <b>Acquisition Method</b> | 5-0371.dam     |

Regression Equation:  $y = 0.05903 x + 0.00991$  ( $r = 0.99958$ ) (weighting:  $1 / x$ )

| Vial | Sample Name | Sample ID | Used for ICAL | Target Conc. (ng/L) | Calculated Conc. (ng/L) | Recovery (%) |
|------|-------------|-----------|---------------|---------------------|-------------------------|--------------|
| 2    | JV64        | L1        | False         | 25.00               | < 0                     | N/A          |
| 3    | JV65        | L2        | False         | 50.00               | < 0                     | N/A          |
| 4    | JV66        | L3        | True          | 100.00              | 114.536509              | 114.5        |
| 5    | JV67        | L4        | True          | 250.00              | 224.642239              | 89.9         |
| 6    | JV68        | L5        | True          | 500.00              | 491.538738              | 98.3         |
| 7    | JV69        | L6        | True          | 1000.00             | 955.724291              | 95.6         |
| 8    | JV70        | L7        | True          | 2500.00             | 2478.112433             | 99.1         |
| 9    | JV71        | L8        | True          | 5000.00             | 5174.746301             | 103.5        |
| 10   | JV72        | L9        | True          | 10000.00            | 9910.699488             | 99.1         |



[illegible]

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV64                | Injection Vial   | 2              |
| Sample ID          | L1                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T12:35:02 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.47 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.47 | PFBS        | 0.420                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.75 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.75 | PFHxA       | 0.057                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.11 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | PFHpA       | 0.031                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.308                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.48 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.52 | PFOA        | 0.065                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.232                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.85 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.142                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.21 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.22 | PFDA        | 0.070                | 0.041              |          |
| PFUnA_1    | 563.0 / 519.0  | 3.53 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | PFUnA       | 0.079                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | PFDaA       | 0.184                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.07 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.07 | PFTTrDA     | 0.100                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.28 | PFTeDA      | 0.081                | 0.053              |          |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | NMeFOSAA    | 0.508                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.48 | NEtFOSSA    | 0.067                | 0.071              | ü        |



|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV65                | Injection Vial   | 3              |
| Sample ID          | L2                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T12:43:59 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.47 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.47 | PFBS        | 0.354                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.75 | PFHxA       | 0.078                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.10 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.08 | PFHpA       | 0.027                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.335                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.48 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.49 | PFOA        | 0.050                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.277                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.85 | PFOS        | 0.189                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.20 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.19 | PFDA        | 0.066                | 0.041              |          |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.55 | PFUnA       | 0.070                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.81 | PFDaA       | 0.139                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.07 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.079                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.29 | PFTeDA      | 0.063                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.35 | NMeFOSAA    | 0.664                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.53 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.55 | NEtFOSSA    | 0.063                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV66                | Injection Vial   | 4              |
| Sample ID          | L3                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T12:52:57 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.341                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.072                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.023                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.290                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.46 | PFOA        | 0.070                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.85 | PFNA        | 0.278                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.183                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.20 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.22 | PFDA        | 0.045                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.042                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | PFDaA       | 0.154                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.067                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.051                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.594                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.102                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV67                | Injection Vial   | 5              |
| Sample ID          | L4                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:01:55 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.46 | PFBS        | 0.345                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.076                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.10 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | PFHpA       | 0.020                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.272                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.48 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.48 | PFOA        | 0.069                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.85 | PFNA        | 0.280                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.85 | PFOS        | 0.190                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.21 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.21 | PFDA        | 0.042                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | PFUnA       | 0.054                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.81 | PFDaA       | 0.154                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.072                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.28 | PFTeDA      | 0.045                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.696                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.51 | NEtFOSSA    | 0.069                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV68                | Injection Vial   | 6              |
| Sample ID          | L5                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:10:53 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.348                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.074                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.020                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.302                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.47 | PFOA        | 0.067                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.85 | PFNA        | 0.309                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.194                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.20 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.20 | PFDA        | 0.044                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | PFUnA       | 0.051                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.81 | PFDaA       | 0.142                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.060                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.28 | PFTeDA      | 0.047                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.661                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.49 | NEtFOSSA    | 0.070                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV69                | Injection Vial   | 7              |
| Sample ID          | L6                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:19:50 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.46 | PFBS        | 0.336                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.74 | PFHxA       | 0.081                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.10 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.10 | PFHpA       | 0.021                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.299                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.48 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.48 | PFOA        | 0.067                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.85 | PFNA        | 0.298                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.85 | PFOS        | 0.194                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.21 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.21 | PFDA        | 0.040                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | PFUnA       | 0.050                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.81 | PFDaA       | 0.158                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.07 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.07 | PFTTrDA     | 0.061                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.28 | PFTeDA      | 0.047                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.35 | NMeFOSAA    | 0.573                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.52 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.51 | NEtFOSSA    | 0.065                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV70                | Injection Vial   | 8              |
| Sample ID          | L7                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:28:47 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.325                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.076                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.021                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.299                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.47 | PFOA        | 0.065                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.85 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.302                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.189                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.20 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.20 | PFDA        | 0.037                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.52 | PFUnA       | 0.046                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.81 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.81 | PFDaA       | 0.155                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.064                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.28 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.049                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.645                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.059                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV71                | Injection Vial   | 9              |
| Sample ID          | L8                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:37:43 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.327                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.072                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.021                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.286                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.47 | PFOA        | 0.070                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.295                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.84 | PFOS        | 0.192                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.20 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.20 | PFDA        | 0.038                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.52 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.048                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | PFDaA       | 0.156                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.06 | PFTTrDA     | 0.061                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.048                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.35 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.610                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.063                | 0.071              | ü        |



|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV72                | Injection Vial   | 10             |
| Sample ID          | L9                  | Injection Volume | 10.00          |
| Sample Type        | Standard            | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:46:40 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Ratio Group | Calculated Ion ratio | Expected Ion Ratio | Ratio OK |
|------------|----------------|------|-------------|----------------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | PFBS        |                      |                    |          |
| PFBS_2     | 298.9 / 99.0   | 1.45 | PFBS        | 0.316                | 0.346              | ü        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | PFHxA       |                      |                    |          |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | PFHxA       | 0.072                | 0.075              | ü        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | PFHpA       |                      |                    |          |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | PFHpA       | 0.019                | 0.022              | ü        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | PFHxS       |                      |                    |          |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | PFHxS       | 0.290                | 0.298              | ü        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | PFOA        |                      |                    |          |
| PFOA_2     | 413.0 / 169.0  | 2.47 | PFOA        | 0.066                | 0.065              | ü        |
| PFNA_1     | 463.0 / 419.0  | 2.84 | PFNA        |                      |                    |          |
| PFNA_2     | 463.0 / 219.0  | 2.84 | PFNA        | 0.298                | 0.285              | ü        |
| PFOS_1     | 499.0 / 80.0   | 2.83 | PFOS        |                      |                    |          |
| PFOS_2     | 499.0 / 99.0   | 2.83 | PFOS        | 0.193                | 0.185              | ü        |
| PFDA_1     | 513.0 / 469.0  | 3.19 | PFDA        |                      |                    |          |
| PFDA_2     | 513.0 / 219.0  | 3.19 | PFDA        | 0.041                | 0.041              | ü        |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | PFUnA       |                      |                    |          |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | PFUnA       | 0.050                | 0.055              | ü        |
| PFDaA_1    | 613.0 / 569.0  | 3.80 | PFDaA       |                      |                    |          |
| PFDaA_2    | 613.0 / 319.0  | 3.80 | PFDaA       | 0.152                | 0.155              | ü        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.06 | PFTTrDA     |                      |                    |          |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | PFTTrDA     | 0.064                | 0.070              | ü        |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | PFTeDA      |                      |                    |          |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | PFTeDA      | 0.048                | 0.053              | ü        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | NMeFOSAA    |                      |                    |          |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | NMeFOSAA    | 0.608                | 0.618              | ü        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | NEtFOSSA    |                      |                    |          |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | NEtFOSSA    | 0.065                | 0.071              | ü        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11             |
| Sample ID          | ICC                 | Injection Volume | 10.00          |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:55:37 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.45 | 809.809079   | 885.00              | 91.50        |
| PFBS_2     | 298.9 / 99.0   | 1.45 | 755.655045   | 885.00              | 85.38        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 951.504547   | 1000.00             | 95.15        |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 976.056617   | 1000.00             | 97.61        |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 872.945084   | 1000.00             | 87.29        |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 900.472399   | 1000.00             | 90.05        |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 829.070335   | 912.00              | 90.91        |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | 793.652278   | 912.00              | 87.02        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 902.554040   | 1000.00             | 90.26        |
| PFOA_2     | 413.0 / 169.0  | 2.47 | 908.321028   | 1000.00             | 90.83        |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 951.107113   | 1000.00             | 95.11        |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 971.010398   | 1000.00             | 97.10        |
| PFOS_1     | 499.0 / 80.0   | 2.84 | 829.385489   | 925.60              | 89.61        |
| PFOS_2     | 499.0 / 99.0   | 2.84 | 922.111774   | 925.60              | 99.62        |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 970.750770   | 1000.00             | 97.08        |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 897.604709   | 1000.00             | 89.76        |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 942.781236   | 1000.00             | 94.28        |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 935.184412   | 1000.00             | 93.52        |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | 937.427338   | 1000.00             | 93.74        |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | 965.543980   | 1000.00             | 96.55        |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 915.967642   | 1000.00             | 91.60        |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | 868.878458   | 1000.00             | 86.89        |
| PFTeDA_1   | 713.0 / 669.0  | 4.27 | 933.641680   | 1000.00             | 93.36        |
| PFTeDA_2   | 713.0 / 169.0  | 4.27 | 897.107289   | 1000.00             | 89.71        |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 987.000603   | 1000.00             | 98.70        |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 875.674400   | 1000.00             | 87.57        |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.51 | 970.181857   | 1000.00             | 97.02        |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 832.410377   | 1000.00             | 83.24        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV63 ICC            | Injection Vial   | 11             |
| Sample ID          | ICC                 | Injection Volume | 10.00          |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T13:55:37 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_SIS    |
| Sample Comment     |                     |                  |                |

---

**Results Summary**

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.71 | 91.255435    | 100.00              | 91.26        |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 94.107294    | 100.00              | 94.11        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.50 | 356.096301   | 400.00              | 89.02        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV69 CCV            | Injection Vial   | 7              |
| Sample ID          | CCV                 | Injection Volume | 10.00          |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T15:07:07 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 857.952126   | 885.00              | 96.94        |
| PFBS_2     | 298.9 / 99.0   | 1.46 | 832.372607   | 885.00              | 94.05        |
| PFHxA_1    | 313.0 / 269.0  | 1.74 | 1103.321529  | 1000.00             | 110.33       |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 1046.024723  | 1000.00             | 104.60       |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 994.975477   | 1000.00             | 99.50        |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 1115.462289  | 1000.00             | 111.55       |
| PFHxS_1    | 399.0 / 80.0   | 2.11 | 835.770344   | 912.00              | 91.64        |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | 855.149811   | 912.00              | 93.77        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 1050.149668  | 1000.00             | 105.01       |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 1099.457433  | 1000.00             | 109.95       |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 1013.067622  | 1000.00             | 101.31       |
| PFNA_2     | 463.0 / 219.0  | 2.84 | 1016.774026  | 1000.00             | 101.68       |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 873.503923   | 925.60              | 94.37        |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 848.468626   | 925.60              | 91.67        |
| PFDA_1     | 513.0 / 469.0  | 3.19 | 1074.769319  | 1000.00             | 107.48       |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 1039.876267  | 1000.00             | 103.99       |
| PFUnA_1    | 563.0 / 519.0  | 3.51 | 1015.078946  | 1000.00             | 101.51       |
| PFUnA_2    | 563.0 / 269.0  | 3.51 | 1133.714697  | 1000.00             | 113.37       |
| PFDoA_1    | 613.0 / 569.0  | 3.80 | 1023.327388  | 1000.00             | 102.33       |
| PFDoA_2    | 613.0 / 319.0  | 3.80 | 1030.706414  | 1000.00             | 103.07       |
| PFTTrDA_1  | 663.0 / 619.0  | 4.05 | 1017.219205  | 1000.00             | 101.72       |
| PFTTrDA_2  | 663.0 / 169.0  | 4.05 | 1079.046641  | 1000.00             | 107.90       |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 1033.540714  | 1000.00             | 103.35       |
| PFTeDA_2   | 713.0 / 169.0  | 4.26 | 1035.118117  | 1000.00             | 103.51       |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.34 | 1047.961387  | 1000.00             | 104.80       |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.34 | 1130.310814  | 1000.00             | 113.03       |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 987.616038   | 1000.00             | 98.76        |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.50 | 978.464009   | 1000.00             | 97.85        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV69 CCV            | Injection Vial   | 7              |
| Sample ID          | CCV                 | Injection Volume | 10.00          |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T15:07:07 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_SIS    |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 102.116571   | 100.00              | 102.12       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.18 | 105.826776   | 100.00              | 105.83       |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 441.065715   | 400.00              | 110.27       |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | IV68 CCV            | Injection Vial   | 6              |
| Sample ID          | CCV                 | Injection Volume | 10.00          |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T16:09:36 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 417.914638   | 443.00              | 94.34        |
| PFBS_2     | 298.9 / 99.0   | 1.46 | 385.869960   | 443.00              | 87.10        |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 518.610092   | 500.00              | 103.72       |
| PFHxA_2    | 313.0 / 119.0  | 1.74 | 566.713946   | 500.00              | 113.34       |
| PFHpA_1    | 363.0 / 319.0  | 2.09 | 479.530261   | 500.00              | 95.91        |
| PFHpA_2    | 363.0 / 169.0  | 2.09 | 481.000211   | 500.00              | 96.20        |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 389.977460   | 456.00              | 85.52        |
| PFHxS_2    | 399.0 / 99.0   | 2.11 | 396.671051   | 456.00              | 86.99        |
| PFOA_1     | 413.0 / 369.0  | 2.47 | 479.809379   | 500.00              | 95.96        |
| PFOA_2     | 413.0 / 169.0  | 2.46 | 512.062843   | 500.00              | 102.41       |
| PFNA_1     | 463.0 / 419.0  | 2.84 | 510.400948   | 500.00              | 102.08       |
| PFNA_2     | 463.0 / 219.0  | 2.83 | 522.674289   | 500.00              | 104.53       |
| PFOS_1     | 499.0 / 80.0   | 2.83 | 420.395326   | 463.00              | 90.80        |
| PFOS_2     | 499.0 / 99.0   | 2.83 | 424.640659   | 463.00              | 91.72        |
| PFDA_1     | 513.0 / 469.0  | 3.18 | 516.389069   | 500.00              | 103.28       |
| PFDA_2     | 513.0 / 219.0  | 3.19 | 523.404927   | 500.00              | 104.68       |
| PFUnA_1    | 563.0 / 519.0  | 3.50 | 472.292789   | 500.00              | 94.46        |
| PFUnA_2    | 563.0 / 269.0  | 3.50 | 505.894222   | 500.00              | 101.18       |
| PFDaA_1    | 613.0 / 569.0  | 3.79 | 532.774820   | 500.00              | 106.55       |
| PFDaA_2    | 613.0 / 319.0  | 3.79 | 517.324318   | 500.00              | 103.46       |
| PFTTrDA_1  | 663.0 / 619.0  | 4.04 | 519.782345   | 500.00              | 103.96       |
| PFTTrDA_2  | 663.0 / 169.0  | 4.04 | 525.531849   | 500.00              | 105.11       |
| PFTeDA_1   | 713.0 / 669.0  | 4.26 | 515.142696   | 500.00              | 103.03       |
| PFTeDA_2   | 713.0 / 169.0  | 4.25 | 512.102311   | 500.00              | 102.42       |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 482.199675   | 500.00              | 96.44        |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.33 | 506.812485   | 500.00              | 101.36       |
| NEtFOSAA_1 | 584.0 / 419.0  | 3.50 | 508.102875   | 500.00              | 101.62       |
| NEtFOSAA_2 | 584.0 / 483.0  | 3.48 | 435.168571   | 500.00              | 87.03        |

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | JV68 CCV            | Injection Vial   | 6              |
| Sample ID          | CCV                 | Injection Volume | 10.00          |
| Sample Type        | Quality Control     | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T16:09:36 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_SIS    |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Conc. (ng/L) | Target Conc. (ng/L) | Recovery (%) |
|------------|----------------|------|--------------|---------------------|--------------|
| 13C2-PFHxA | 315.0 / 270.0  | 1.72 | 100.648179   | 100.00              | 100.65       |
| 13C2-PFDA  | 515.0 / 470.0  | 3.17 | 95.420251    | 100.00              | 95.42        |
| d5-EtFOSAA | 589.0 / 419.0  | 3.49 | 386.659468   | 400.00              | 96.66        |



## Sample calculation

|                    |                     |                  |                |
|--------------------|---------------------|------------------|----------------|
| Sample Name        | J5964-FS(0)         | Injection Vial   | 14             |
| Sample ID          | WGNA-043018-RW-3103 | Injection Volume | 10.00          |
| Sample Type        | Unknown             | Instrument Name  | QTRAP 5500     |
| Acquisition Date   | 2018-05-13T14:31:24 | Data File        | 18-0299_A.wiff |
| Acquisition Method | 5-0371.dam          | Result Table     | 18-0299_BASE   |
| Sample Comment     |                     |                  |                |

## Results Summary

| Analyte    | MRM Transition | RT   | Area      | Conc. (ng/L) | Signal/Noise Ratio | Modified |
|------------|----------------|------|-----------|--------------|--------------------|----------|
| PFBS_1     | 298.9 / 80.0   | 1.46 | 290066.85 | 1036.518610  | 408.6              | true     |
| PFBS_2     | 298.9 / 99.0   | 1.46 | 95801.63  | 1058.274464  | 397.1              | false    |
| PFHxA_1    | 313.0 / 269.0  | 1.73 | 347851.32 | 1048.858540  | 175.0              | false    |
| PFHxA_2    | 313.0 / 119.0  | 1.73 | 24744.82  | 1021.598386  | 205.6              | false    |
| PFHpA_1    | 363.0 / 319.0  | 2.08 | 197931.91 | 614.638751   | 110.8              | false    |
| PFHpA_2    | 363.0 / 169.0  | 2.05 | 6595.78   | 1025.302554  | 118.5              | false    |
| PFHxS_1    | 399.0 / 80.0   | 2.10 | 431775.76 | 1308.003760  | 211.7              | false    |
| PFHxS_2    | 399.0 / 99.0   | 2.10 | 122106.38 | 1270.361115  | 280.1              | false    |
| PFOA_1     | 413.0 / 369.0  | 2.46 | 801424.37 | 2221.874100  | 254.5              | true     |
| PFOA_2     | 413.0 / 169.0  | 2.42 | 87758.79  | 3623.028028  | 266.9              | true     |
| PFNA_1     | 463.0 / 419.0  | 2.75 | 214314.88 | 593.086512   | 197.2              | false    |
| PFNA_2     | 463.0 / 219.0  | 2.75 | 71577.22  | 671.191725   | 212.2              | false    |
| PFOS_1     | 499.0 / 80.0   | 2.77 | 909205.57 | 1925.384251  | 235.3              | false    |
| PFOS_2     | 499.0 / 99.0   | 2.82 | 128260.69 | 1414.782669  | 340.7              | false    |
| PFDA_1     | 513.0 / 469.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFDA_2     | 513.0 / 219.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFUnA_1    | 563.0 / 519.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFUnA_2    | 563.0 / 269.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFDoA_1    | 613.0 / 569.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFDoA_2    | 613.0 / 319.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFTTrDA_1  | 663.0 / 619.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFTTrDA_2  | 663.0 / 169.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFTeDA_1   | 713.0 / 669.0  | N/A  | N/A       | N/A          | N/A                | true     |
| PFTeDA_2   | 713.0 / 169.0  | N/A  | N/A       | N/A          | N/A                | true     |
| NMeFOSAA_1 | 570.0 / 419.0  | 3.33 | 285.23    | 1.216713     | 26.4               | true     |
| NMeFOSAA_2 | 570.0 / 512.0  | 3.30 | 172.10    | 0.753304     | 8.5                | true     |
| NEtFOSAA_1 | 584.0 / 419.0  | N/A  | N/A       | N/A          | N/A                | true     |
| NEtFOSAA_2 | 584.0 / 483.0  | N/A  | N/A       | N/A          | N/A                | true     |

Sample calc PFOA 8.38 ng/L  
 $y = 1.01678x + 0.03792$

$((801424.57/35415.11) - 0.03792) / 1.01678 * 100 * 0.001 / 0.265 = 8.38 \text{ ng/L}$

MS PFOA 94%       $26.74 - 8.38 / 19.61 * 100 = 93.6\%$   
MSD PFOA 87%       $25.49 - 8.38 / 19.61 * 100 = 87.2\%$   
MS/MSD RPD 7.7%       $(94 - 87) / ((94 + 87) / 2) * 100 = 7.73\%$

LCS PFOA 90%       $9.03 / 10.0 * 100 = 90.3\%$

| DODCMD_ID    | INSTALLATION_ID  | SDG     | SITE_NAME | NORM_SITE_NAME | LOCATION_NAME | LOCATION_TYPE_DESC | COORD_X | COORD_Y | CONTRACT_ID   | DO_CTO_NUMBER | CONTR_NAME       | SAMPLE_NAME          | SAMPLE_MATRIX_DESC   | SAMPLE_TYPE_DESC    | COLLECT_DATE | ANALYTICAL_METHOD | ANALYTICAL_METHOD_GRP_DESC |
|--------------|------------------|---------|-----------|----------------|---------------|--------------------|---------|---------|---------------|---------------|------------------|----------------------|----------------------|---------------------|--------------|-------------------|----------------------------|
| MID_ATLANTIC | WILLOW_GROVE_NAS | 18-0312 |           |                |               |                    |         |         | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-050118-FRB-3385 | Water for QC samples | Field Reagent Blank | 1-May-18     | PFAS_QSM5.1       | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 18-0312 |           |                |               |                    |         |         | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-050118-FRB-3178 | Water for QC samples | Field Reagent Blank | 1-May-18     | PFAS_QSM5.1       | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 18-0312 |           |                |               |                    |         |         | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-043018-FRB-3103 | Water for QC samples | Field Reagent Blank | 30-Apr-18    | PFAS_QSM5.1       | Perfluoroalkyl Compounds   |
| MID_ATLANTIC | WILLOW_GROVE_NAS | 18-0312 |           |                |               |                    |         |         | N6247016D9008 | WE04          | TETRA TECH, INC. | WGNA-043018-FRB-3409 | Water for QC samples | Field Reagent Blank | 30-Apr-18    | PFAS_QSM5.1       | Perfluoroalkyl Compounds   |