



**Groundwater Sample Results,  
Level 2 Laboratory Report, Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Report, SDG 1601443**

*Marine Corps Air Station Yuma  
Yuma, Arizona*

November 2019

November 29, 2016

**Vista Work Order No. 1601443**

Mr. Curtis Moss  
AMEC Foster Wheeler  
9210 Sky Park Court Suite 200  
San Diego, CA 92123

Dear Mr. Moss,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 11, 2016. This sample set was analyzed on a rush turn-around time, under your Project Name 'MCAS Yuma, AZ / TO 105'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,



Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

**Vista Work Order No. 1601443**

**Case Narrative**

**Sample Condition on Receipt:**

Three aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**Modified EPA Method 537**

The samples were extracted and analyzed for PFOA, PFOS and PFBS using Modified EPA Method 537.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

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# Sample Inventory Report

<b>Vista Sample ID</b>	<b>Client Sample ID</b>	<b>Sampled</b>	<b>Received</b>	<b>Components/Containers</b>
1601443-01	VCT-SP-01-20161110	10-Nov-16 11:00	11-Nov-16 08:48	HDPE Bottle, 125 mL HDPE Bottle, 125 mL
1601443-02	VCT-SP-02-20161110	10-Nov-16 11:10	11-Nov-16 08:48	HDPE Bottle, 125 mL HDPE Bottle, 125 mL
1601443-03	VCT-SP-03-20161110	10-Nov-16 11:20	11-Nov-16 08:48	HDPE Bottle, 125 mL HDPE Bottle, 125 mL

## **ANALYTICAL RESULTS**

Sample ID: Method Blank						Modified EPA Method 537			
Matrix: Aqueous Sample Size: 0.125 L		QC Batch: B6K0156 Date Extracted: 23-Nov-2016 10:17		Lab Sample: B6K0156-BLK1 Date Analyzed: 28-Nov-16 15:13 Column: BEH C18					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.79	4.00	8.00		IS 13C3-PFBS	111	60 - 150	
PFOA	ND	0.651	2.00	8.00		IS 13C2-PFOA	111	60 - 150	
PFOS	ND	0.807	0.900	8.00		IS 13C8-PFOS	106	60 - 150	

DL - Detection limit  
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit  
Results reported to DL.  
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.  
Only the linear isomer is reported for all other analytes.

**Sample ID: OPR**

**Modified EPA Method 537**

Matrix: Aqueous Sample Size: 0.125 L	QC Batch: B6K0156 Date Extracted: 23-Nov-2016 10:17	Lab Sample: B6K0156-BS1 Date Analyzed: 28-Nov-16 14:22 Column: BEH C18					
Analyte	Amt Found (ng/L)	Spike Amt	%R	Limits	Labeled Standard	%R	LCL-UCL
PFBS	83.5	80.0	104	60 - 130	IS 13C3-PFBS	111	60 - 150
PFOA	93.1	80.0	116	70 - 130	IS 13C2-PFOA	100	60 - 150
PFOS	82.3	80.0	103	70 - 130	IS 13C8-PFOS	97.2	60 - 150

LCL-UCL - Lower control limit - upper control limit



**Sample ID: VCT-SP-01-20161110****Modified EPA Method 537**

Client Data		Sample Data			Laboratory Data					
Name:	AMEC Foster Wheeler	Matrix:	Water		Lab Sample:	1601443-01	Date Received:	11-Nov-2016 8:48		
Project:	MCAS Yuma, AZ / TO 105	Sample Size:	0.126 L		QC Batch:	B6K0156	Date Extracted:	23-Nov-2016 10:17		
Date Collected:	10-Nov-2016 11:00				Date Analyzed:	28-Nov-16 15:25 Column: BEH C18				
Location:										

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	148	1.77	3.97	7.91		IS 13C3-PFBS	119	60 - 150	
PFOA	22.8	0.644	1.98	7.91		IS 13C2-PFOA	97.2	60 - 150	
PFOS	9.56	0.798	0.893	7.91		IS 13C8-PFOS	106	60 - 150	

DL - Detection limit  
 RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit  
 Results reported to DL.  
 When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.  
 Only the linear isomer is reported for all other analytes.

**Sample ID: VCT-SP-02-20161110**

**Modified EPA Method 537**

Client Data		Sample Data		Laboratory Data			
Name:	AMEC Foster Wheeler	Matrix:	Water	Lab Sample:	1601443-02	Date Received:	11-Nov-2016 8:48
Project:	MCAS Yuma, AZ / TO 105	Sample Size:	0.119 L	QC Batch:	B6K0156	Date Extracted:	23-Nov-2016 10:17
Date Collected:	10-Nov-2016 11:10			Date Analyzed:	28-Nov-16 15:38	Column:	BEH C18
Location:							

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	143	1.88	4.20	8.39		IS 13C3-PFBS	124	60 - 150	
PFOA	21.1	0.683	2.10	8.39		IS 13C2-PFOA	107	60 - 150	
PFOS	7.24	0.846	0.945	8.39	J	IS 13C8-PFOS	111	60 - 150	

DL - Detection limit  
 RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit  
 Results reported to DL.  
 When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.  
 Only the linear isomer is reported for all other analytes.

**Sample ID: VCT-SP-03-20161110****Modified EPA Method 537**

Client Data		Sample Data			Laboratory Data				
Name:	AMEC Foster Wheeler	Matrix:	Water		Lab Sample:	1601443-03	Date Received:	11-Nov-2016 8:48	
Project:	MCAS Yuma, AZ / TO 105	Sample Size:	0.125 L		QC Batch:	B6K0156	Date Extracted:	23-Nov-2016 10:17	
Date Collected:	10-Nov-2016 11:20				Date Analyzed:	28-Nov-16 15:51 Column: BEH C18			
Location:									

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	152	1.79	4.00	8.02		IS 13C3-PFBS	130	60 - 150	
PFOA	20.8	0.653	2.00	8.02		IS 13C2-PFOA	112	60 - 150	
PFOS	9.05	0.809	0.900	8.02		IS 13C8-PFOS	114	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

## **DATA QUALIFIERS & ABBREVIATIONS**

<b>B</b>	<b>This compound was also detected in the method blank.</b>
<b>D</b>	<b>Dilution</b>
<b>E</b>	<b>The associated compound concentration exceeded the calibration range of the instrument.</b>
<b>H</b>	<b>Recovery and/or RPD was outside laboratory acceptance limits.</b>
<b>I</b>	<b>Chemical Interference</b>
<b>J</b>	<b>The amount detected is below the Reporting Limit/LOQ.</b>
<b>M</b>	<b>Estimated Maximum Possible Concentration. (CA Region 2 projects only)</b>
<b>*</b>	<b>See Cover Letter</b>
<b>Conc.</b>	<b>Concentration</b>
<b>NA</b>	<b>Not applicable</b>
<b>ND</b>	<b>Not Detected</b>
<b>TEQ</b>	<b>Toxic Equivalency</b>

**Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.**

## CERTIFICATIONS

<b>Accrediting Authority</b>	<b>Certificate Number</b>
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2014022
Nevada Division of Environmental Protection	CA004132015-1
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-004
Pennsylvania Department of Environmental Protection	012
South Carolina Department of Health	87002001
Texas Commission on Environmental Quality	T104704189-15-6
Virginia Department of General Services	7923
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request*

## NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B

Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

1601443  
 -0.3°C

LABORATORY CLIENT: <b>AMEC Foster Wheeler E &amp; I, Inc.</b>				CLIENT PROJECT NAME / NUMBER: <b>MCAS Yuma, AZ TO 105</b>				P.O. NO.: <b>TO 105</b>				
ADDRESS: <b>9210 Sky Park Court</b>				PROJECT CONTACT: <b>Medora Hackler/Marina Mitchell</b>				CONTRACT NO.: <b>N62473-12-D-2012</b>				
CITY: <b>San Diego, CA 92123</b>				SAMPLER(S): (SIGNATURE) <i>Wef Runk</i>				LAB USE ONLY <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				
TEL: <b>503.639.3400</b>		E-Mail <a href="mailto:medora.hackler@amecfw.com">medora.hackler@amecfw.com</a>		E-MAIL <a href="mailto:marina.mitchell@amecfw.com">marina.mitchell@amecfw.com</a>								
TURNAROUND TIME <input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HR <input type="checkbox"/> 48HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> 10 DAYS						<b>REQUESTED ANALYSIS</b>						
SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY) <input type="checkbox"/> RWQCB REPORTING <input type="checkbox"/> ARCHIVE SAMPLES UNTIL ___/___/___												
SPECIAL INSTRUCTIONS												
LAB USE ONLY	SAMPLE ID	SAMPLING		Matrix	#Cont	QC Level	PFOA, PFOS, and PFBS (U.S. EPA 537 Mod.)					
		DATE	TIME									
	VCT-SP-01-2016 1110	11/10/16	11:00	W	2		X					
	VCT-SP-02-2016 1110	"	11:10	"	2		X					
	VCT-SP-03-2016 1110	"	11:20	"	2		X					
						Wef 11/10/16 						
Relinquished by: (Signature) <i>Wef Runk</i>				Received by: (Signature) / Carrier Tracking Number FedEx 8101 0952 1987				Date: 11/10/16	Time: 11:35			
Relinquished by: (Signature) <i>FedEx</i>				Received by: (Signature) <i>Britt Burnett</i>				Date: 11/11/16	Time: 0903			
Relinquished by: (Signature)				Received by: (Signature)				Date:	Time:			



### SAMPLE LOG-IN CHECKLIST



Vista Project #: \_\_\_\_\_

1601443

TAT \_\_\_\_\_

Sfd

Samples Arrival:	Date/Time 11/11/16 0848	Initials: CBAB	Location: WR-8
			Shelf/Rack: N/A
Logged In:	Date/Time 11/11/16 1426	Initials: BAB	Location: WR-8
			Shelf/Rack: A4
Delivered By:	<input checked="" type="checkbox"/> FedEx	<input type="checkbox"/> UPS	<input type="checkbox"/> On Trac
		<input type="checkbox"/> DHL	<input type="checkbox"/> Hand Delivered
	<input type="checkbox"/> Other		
Preservation:	<input checked="" type="checkbox"/> Ice	<input type="checkbox"/> Blue Ice	<input type="checkbox"/> Dry Ice
	<input type="checkbox"/> None		
Temp °C: 0.3 (uncorrected)	Time: 0908	Thermometer ID: DT-1	
Temp °C: -0.3 (corrected)	Probe used: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	IR-1	
		CBAB	

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill	✓		
Trk # 8101 0952 1987	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?			✓
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓
Preservation Documented:	<input type="checkbox"/> Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	<input type="checkbox"/> Trizma	<input checked="" type="checkbox"/> NA
Shipping Container	<input checked="" type="checkbox"/> Vista	<input checked="" type="checkbox"/> Retain	<input type="checkbox"/> Return
			<input type="checkbox"/> Dispose

Comments:

November 29, 2016

**Vista Work Order No. 1601443**

Mr. Curtis Moss  
AMEC Foster Wheeler  
9210 Sky Park Court Suite 200  
San Diego, CA 92123

Dear Mr. Moss,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 11, 2016. This sample set was analyzed on a rush turn-around time, under your Project Name 'MCAS Yuma, AZ / TO 105'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,



Martha Maier  
Laboratory Director



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**Vista Work Order No. 1601443**

**Case Narrative**

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Three aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:**

**Modified EPA Method 537**

The samples were extracted and analyzed for PFOA, PFOS and PFBS using Modified EPA Method 537.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

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# Sample Inventory Report

<b>Vista Sample ID</b>	<b>Client Sample ID</b>	<b>Sampled</b>	<b>Received</b>	<b>Components/Containers</b>
1601443-01	VCT-SP-01-20161110	10-Nov-16 11:00	11-Nov-16 08:48	HDPE Bottle, 125 mL HDPE Bottle, 125 mL
1601443-02	VCT-SP-02-20161110	10-Nov-16 11:10	11-Nov-16 08:48	HDPE Bottle, 125 mL HDPE Bottle, 125 mL
1601443-03	VCT-SP-03-20161110	10-Nov-16 11:20	11-Nov-16 08:48	HDPE Bottle, 125 mL HDPE Bottle, 125 mL

## **ANALYTICAL RESULTS**

Sample ID: Method Blank						Modified EPA Method 537			
Matrix: Aqueous Sample Size: 0.125 L		QC Batch: B6K0156 Date Extracted: 23-Nov-2016 10:17		Lab Sample: B6K0156-BLK1 Date Analyzed: 28-Nov-16 15:13 Column: BEH C18					
Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	ND	1.79	4.00	8.00		IS 13C3-PFBS	111	60 - 150	
PFOA	ND	0.651	2.00	8.00		IS 13C2-PFOA	111	60 - 150	
PFOS	ND	0.807	0.900	8.00		IS 13C8-PFOS	106	60 - 150	

DL - Detection limit  
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit  
Results reported to DL.  
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.  
Only the linear isomer is reported for all other analytes.

**Sample ID: OPR**

**Modified EPA Method 537**

Matrix: Aqueous Sample Size: 0.125 L	QC Batch: B6K0156 Date Extracted: 23-Nov-2016 10:17	Lab Sample: B6K0156-BS1 Date Analyzed: 28-Nov-16 14:22 Column: BEH C18					
Analyte	Amt Found (ng/L)	Spike Amt	%R	Limits	Labeled Standard	%R	LCL-UCL
PFBS	83.5	80.0	104	60 - 130	IS 13C3-PFBS	111	60 - 150
PFOA	93.1	80.0	116	70 - 130	IS 13C2-PFOA	100	60 - 150
PFOS	82.3	80.0	103	70 - 130	IS 13C8-PFOS	97.2	60 - 150

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**Sample ID: VCT-SP-01-20161110****Modified EPA Method 537**

Client Data		Sample Data			Laboratory Data				
Name:	AMEC Foster Wheeler	Matrix:	Water		Lab Sample:	1601443-01	Date Received:	11-Nov-2016 8:48	
Project:	MCAS Yuma, AZ / TO 105	Sample Size:	0.126 L		QC Batch:	B6K0156	Date Extracted:	23-Nov-2016 10:17	
Date Collected:	10-Nov-2016 11:00				Date Analyzed:	28-Nov-16 15:25 Column: BEH C18			
Location:									

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	148	1.77	3.97	7.91		IS 13C3-PFBS	119	60 - 150	
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 Only the linear isomer is reported for all other analytes.

**Sample ID: VCT-SP-02-20161110****Modified EPA Method 537**

Client Data			Sample Data			Laboratory Data				
Name:	AMEC Foster Wheeler		Matrix:	Water		Lab Sample:	1601443-02	Date Received:	11-Nov-2016 8:48	
Project:	MCAS Yuma, AZ / TO 105		Sample Size:	0.119 L		QC Batch:	B6K0156	Date Extracted:	23-Nov-2016 10:17	
Date Collected:	10-Nov-2016 11:10					Date Analyzed:	28-Nov-16 15:38 Column: BEH C18			
Location:										

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
PFBS	143	1.88	4.20	8.39		IS 13C3-PFBS	124	60 - 150	
PFOA	21.1	0.683	2.10	8.39		IS 13C2-PFOA	107	60 - 150	
PFOS	7.24	0.846	0.945	8.39	J	IS 13C8-PFOS	111	60 - 150	

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 RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit  
 Results reported to DL.  
 When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.  
 Only the linear isomer is reported for all other analytes.

**Sample ID: VCT-SP-03-20161110****Modified EPA Method 537**

Client Data		Sample Data			Laboratory Data					
Name:	AMEC Foster Wheeler	Matrix:	Water		Lab Sample:	1601443-03	Date Received:	11-Nov-2016 8:48		
Project:	MCAS Yuma, AZ / TO 105	Sample Size:	0.125 L		QC Batch:	B6K0156	Date Extracted:	23-Nov-2016 10:17		
Date Collected:	10-Nov-2016 11:20				Date Analyzed:	28-Nov-16 15:51 Column: BEH C18				
Location:										

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Labeled Standard	%R	LCL-UCL	Qualifiers
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 RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit  
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## **DATA QUALIFIERS & ABBREVIATIONS**

<b>B</b>	<b>This compound was also detected in the method blank.</b>
<b>D</b>	<b>Dilution</b>
<b>E</b>	<b>The associated compound concentration exceeded the calibration range of the instrument.</b>
<b>H</b>	<b>Recovery and/or RPD was outside laboratory acceptance limits.</b>
<b>I</b>	<b>Chemical Interference</b>
<b>J</b>	<b>The amount detected is below the Reporting Limit/LOQ.</b>
<b>M</b>	<b>Estimated Maximum Possible Concentration. (CA Region 2 projects only)</b>
<b>*</b>	<b>See Cover Letter</b>
<b>Conc.</b>	<b>Concentration</b>
<b>NA</b>	<b>Not applicable</b>
<b>ND</b>	<b>Not Detected</b>
<b>TEQ</b>	<b>Toxic Equivalency</b>

**Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.**

## CERTIFICATIONS

<b>Accrediting Authority</b>	<b>Certificate Number</b>
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2014022
Nevada Division of Environmental Protection	CA004132015-1
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-004
Pennsylvania Department of Environmental Protection	012
South Carolina Department of Health	87002001
Texas Commission on Environmental Quality	T104704189-15-6
Virginia Department of General Services	7923
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request*

## NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B

Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

1601443  
 -0.3°C

LABORATORY CLIENT: <b>AMEC Foster Wheeler E &amp; I, Inc.</b>				CLIENT PROJECT NAME / NUMBER: <b>MCAS Yuma, AZ TO 105</b>				P.O. NO.: <b>TO 105</b>												
ADDRESS: <b>9210 Sky Park Court</b>				PROJECT CONTACT: <b>Medora Hackler/Marina Mitchell</b>				CONTRACT NO.: <b>N62473-12-D-2012</b>												
CITY: <b>San Diego, CA 92123</b>				SAMPLER(S): (SIGNATURE) <i>Wef Runk</i>				LAB USE ONLY <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>												
TEL: <b>503.639.3400</b>		E-Mail <a href="mailto:medora.hackler@amecfw.com">medora.hackler@amecfw.com</a>		E-MAIL <a href="mailto:marina.mitchell@amecfw.com">marina.mitchell@amecfw.com</a>																
TURNAROUND TIME <input type="checkbox"/> SAME DAY <input type="checkbox"/> 24 HR <input type="checkbox"/> 48HR <input type="checkbox"/> 72 HR <input type="checkbox"/> 5 DAYS <input checked="" type="checkbox"/> 10 DAYS						<b>REQUESTED ANALYSIS</b>														
SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY) <input type="checkbox"/> RWQCB REPORTING <input type="checkbox"/> ARCHIVE SAMPLES UNTIL ___/___/___																				
SPECIAL INSTRUCTIONS																				
<b>LAB USE ONLY</b>	<b>SAMPLE ID</b>	<b>SAMPLING</b>		<b>Matrix</b>	<b>#Cont</b>	<b>QC Level</b>	<b>PFOA, PFOS, and PFBS (U.S. EPA 537 Mod.)</b>													
		<b>DATE</b>	<b>TIME</b>																	
		<i>VCT-SP-01-2016 1110</i>						<i>11/10/16</i>	<i>11:00</i>	<i>W</i>	<i>2</i>	<i>X</i>								
		<i>VCT-SP-02-2016 1110</i>						<i>11/10/16</i>	<i>11:10</i>	<i>W</i>	<i>2</i>	<i>X</i>								
<i>VCT-SP-03-2016 1110</i>		<i>11/10/16</i>	<i>11:20</i>	<i>W</i>	<i>2</i>	<i>X</i>														
<i>Wef 11/10/16</i>																				
Relinquished by: (Signature) <i>Wef Runk</i>				Received by: (Signature) / Carrier Tracking Number <b>FedEx 8101 0952 1987</b>				Date: <i>11/10/16</i>		Time: <i>11:35</i>										
Relinquished by: (Signature) <i>FedEx</i>				Received by: (Signature) <i>Britt Burnett</i>				Date: <i>11/11/16</i>		Time: <i>0903</i>										
Relinquished by: (Signature)				Received by: (Signature)				Date:		Time:										



### SAMPLE LOG-IN CHECKLIST



Vista Project #: \_\_\_\_\_

1601443

TAT \_\_\_\_\_

Sfd

Samples Arrival:	Date/Time 11/11/16 0848	Initials: CBAB	Location: WR-8
			Shelf/Rack: N/A
Logged In:	Date/Time 11/11/16 1426	Initials: BAB	Location: WR-8
			Shelf/Rack: A4
Delivered By:	<input checked="" type="checkbox"/> FedEx	<input type="checkbox"/> UPS	<input type="checkbox"/> On Trac
		<input type="checkbox"/> DHL	<input type="checkbox"/> Hand Delivered
	<input type="checkbox"/> Other		
Preservation:	<input checked="" type="checkbox"/> Ice	<input type="checkbox"/> Blue Ice	<input type="checkbox"/> Dry Ice
	<input type="checkbox"/> None		
Temp °C: 0.3 (uncorrected)	Time: 0908	Thermometer ID: DT-1 IR-1 BAB	
Temp °C: -0.3 (corrected)	Probe used: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill	✓		
Trk # 8101 0952 1987	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓
Preservation Documented:	<input type="checkbox"/> Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	<input type="checkbox"/> Trizma	<input checked="" type="checkbox"/> NA
Shipping Container	Vista	Client	Retain
	Return		Dispose

Comments:

## **EXTRACTION INFORMATION**

Process Sheet  
**Workorder: 1601443**

Prep Expiration: 11/24/2016  
 Client: AMEC Foster Wheeler

**Workorder Due: 28-Nov-16 00:00**

TAT: 17

Method: **537 PFAS DOD (LOQ as mRL)**  
 Matrix: **Aqueous**

Prep Batch: B6K0156

Prep Data Entered: 11/25/16 JS  
Date and Initials

Version: PFOA, PFOS, and PFBS only

Initial Sequence: S6K00736

LabSampleID	Recon	ClientSampleID	Date Received	Location	Comments
1601443-01	<input checked="" type="checkbox"/>	VCT-SP-01-20161110	11-Nov-16 08:48	WR-2 A-4	
1601443-02	<input checked="" type="checkbox"/>	VCT-SP-02-20161110	11-Nov-16 08:48	WR-2 A-4	
1601443-03	<input checked="" type="checkbox"/>	VCT-SP-03-20161110	11-Nov-16 08:48	WR-2 A-4	

**WO Comments: DoD  
 MS/MSD per analytical batch**

Vista PM: Martha Maier

Vial Box ID: Mashed Potatoes

Sample Reconciled By: ES 11/28/16 \*

*\* reconciled on 11/26/16  
 11/23/16 9/11/16*

# Percent Solids

Project: BUK0156 + BUK0157

Balance ID: NA

Sample ID	Chemist: <u>NA</u>		Chemist: <u>NA</u>		Chemist/Date	
	Boat Wt.	Sample + Boat Wt.	Residue + Boat Wt.	pH before	pH* after	
1601455-1 A				6	2	
-2 A				6	2	
-3A				5	2	
-3B				5	2	
-3C				5	2	
-4 A				6	2	
-5				6	2	
-6				6	2	
-7				6	2	
-8				6	2	
-9				6	2	
-10				6	2	
-11				6	2	
-12				7	2	
-13				6	2	
-14				6	2	
-15A				5	2	
-15B <sup>ⓐ</sup>				5	2	
-15C <sup>A</sup>				5	2	
-16				5	2	

JS 11/25/16

**Procedure:**

- Tare the balance.
- Record Boat Weight.
- Add 2 - 10 g of sample.
- Record Wet Wt. + Boat Wt.
- Dry in oven overnight at 107°C.
- Tare the balance.
- Record Residue + Boat Wt.

**Notes:**

ⓐ 5 drops HCl added - ES 11/25/16

- Methods 8280, 613, 1613, 8290, 1614 - pH < 9
- Methods 1668/PCN - pH 2-3
- NCASI 551 - pH 1

# Percent Solids

Project: BUKO156 + BUKO157 Balance ID: NA

Sample ID	Chemist: <u>NA</u> Date: <u>J</u> Time: <u>J</u>		Chemist: <u>NA</u> Date: <u>J</u> Time: <u>J</u>		Chemist/Date: <u>ES 11/23/16</u>	
	Boat Wt.	Sample + Boat Wt.	Residue + Boat Wt.	pH before	pH after	
<u>1601433-17 A</u>				<u>6</u>	<u>2</u>	
<u>T -18</u>				<u>6</u>	<u>2</u>	
<u>↓ -19</u>				<u>6</u>	<u>2</u>	
<u>1601443-1</u>				<u>7</u>	<u>2</u>	
<u>T -2</u>				<u>7</u>	<u>2</u>	
<u>↓ -3</u>				<u>7</u>	<u>2</u>	

- Procedure:**
- Tare the balance.
  - Record Boat Weight.
  - Add 2 - 10 g of sample.
  - Record Wet Wt. + Boat Wt.
  - Dry in oven overnight at 107°C.
  - Tare the balance.
  - Record Residue + Boat Wt.

- Notes:**
- *Methods 8280, 613, 1613, 8290, 1614 - pH < 9*
  - *Methods 1668/PCN - pH 2-3*
  - *NCASI 551 - pH 1*

PREPARATION BENCH SHEET

Matrix: Aqueous

Method: 537 PFAS DOD (LOO as mRL)

B6K0156

Chemist: E. Schneider

Prep Date/Time: 23-Nov-16 10:17

Prepared using: LCMS - SPE Extraction-LCMS

C	VISTA Sample ID	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	C6K0130 SPE	RS CHEM/WIT DATE
<input type="checkbox"/>	B6K0156-BLK1	N/A	N/A	0.125	EG 35 11/23/16	8/10/35 11/23/16	Am 35 11/23/16
<input type="checkbox"/>	B6K0156-BS1						
<input type="checkbox"/>	B6K0156-BSD1						
<input type="checkbox"/>	B6K0156-MS1 1601455-03	138.10	27.43	0.11067			
<input type="checkbox"/>	B6K0156-MSD1 1601455-03	150.08	28.16	0.12192			
<input type="checkbox"/>	1601443-01 (A)	153.59	27.22	0.12637 ✓			
<input type="checkbox"/>	1601443-02 (A)	146.51	27.32	0.11919 ✓			
<input type="checkbox"/>	1601443-03	152.00	27.30	0.12470 ✓			
<input type="checkbox"/>	1601455-01 (A)	154.84	26.44	0.12840			
<input type="checkbox"/>	1601455-02 (A)	144.58	26.49	0.11809			
<input type="checkbox"/>	1601455-03	149.68	27.37	0.12231			
<input type="checkbox"/>	1601455-04 (A)	146.79	26.49	0.12030			
<input type="checkbox"/>	1601455-05	148.46	27.35	0.12111			
<input type="checkbox"/>	1601455-06 (A)	148.20	26.50	0.12170			
<input type="checkbox"/>	1601455-07	146.35	27.30	0.11905			
<input type="checkbox"/>	1601455-08 (A)	139.76	26.47	0.11329			

IS Name 16072604, 11-0 (V2)	NS Name 16071601, 11-0 (V1)	RS Name 16071105, 11-0 (V1)	SPE Chem: Strata XAW 33um 20um/6m	Check Out: EG 11/23/16
			Ele SOLV: 0.5% NH <sub>4</sub> OH in MeOH + MeOH	Check In: empty
			Final Volume(s): N/A 1 mL 25025714	Balance ID: HRMS-9

Comments: Assume 1 g = 1 mL

(A) Colored with sediment. centrifuged & transferred to new containers. ED 11/23/16

PREPARATION BENCH SHEET

Matrix: Aqueous

Method: 537 PFAS DOD (LOO as mRL)

B6K0156

Chemist: E. Schneider

Prep Date/Time: 23-Nov-16 10:17

Prepared using: LCMS - SPE Extraction-LCMS

C	VISTA Sample ID	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	<u>C6K0130</u> SPE	RS CHEM/WIT DATE
<input type="checkbox"/>	1601455-09 (A)	140.72	26.43	0.11429	ef JS 11/23/16	ef 12/1/16 11/23/16	DM JS 11/23/16
<input type="checkbox"/>	1601455-10 (A)	146.67	26.44	0.12023	J	J	J

IS Name <u>16072604, 10</u> (V2)	NS Name <u>16071601, 10</u> (V1)	RS Name <u>16071105, 10</u> (V4)	SPE Chem: <u>Skata KAW 32um 200mg/L</u>	Check Out: <u>ef 11/23/16</u> Chemist/Date:
			Ele SOLV: <u>0.5% NH<sub>4</sub>OH in MeOH + MeOH</u>	Check In: <u>empty</u> Chemist/Date:
			Final Volume(s) <u>1m</u>	Balance ID: <u>HP MS-9</u>

Comments: Assume 1 g = 1 mL

**SAMPLE DATA – MODIFIED EPA METHOD 537**



Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-31.qld

Last Altered: Tuesday, November 29, 2016 10:52:04 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: B6K0156-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161128G1\_31, Date: 28-Nov-2016, Time: 15:13:03

	# Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3 PFBS	299 > 79.7	4.721e0	6.382e3		0.125	3.04	0.692	
2	5 PFHpA	363 > 318.9	9.354e0	1.179e4		0.125	3.93	0.764	
3	6 PFHxS	398.9 > 79.6	3.410e1	5.279e3		0.125	4.05	0.499	
4	8 PFOA	413 > 368.7	2.239e2	2.003e4		0.125	4.32	0.427	
5	10 PFOS	499 > 79.9		6.702e3		0.125			
6	11 PFNA	463 > 418.8	3.200e0	9.475e3		0.125	4.65	0.852	
7	16 13C3-PFBS	302.0 > 98.8	6.382e3	1.900e4	0.302	0.125	3.04	111	111
8	17 13C2-PFHxA	315 > 269.8	4.419e3	1.900e4	0.620	0.125	3.40	37.5	93.9
9	18 13C4-PFHpA	367.2 > 321.8	1.179e4	1.095e4	1.139	0.125	3.92	94.6	94.6
10	19 18O2-PFHxS	403 > 102.6	5.279e3	1.095e4	0.449	0.125	4.04	107	107
11	20 13C2-6:2 FTS	429.1 > 408.9	4.247e3			0.125	4.27		
12	21 13C2-PFOA	414.9 > 369.7	2.003e4	8.011e3	2.262	0.125	4.33	111	111
13	22 13C8-PFOS	507.0 > 79.9	6.702e3	6.682e3	0.944	0.125	4.73	106	106
14	23 13C5-PFNA	468.2 > 422.9	9.475e3	1.018e4	1.082	0.125	4.67	86.0	86.0
15	24 13C2-PFDA	515.1 > 469.9	6.437e3	8.684e3	1.019	0.125	4.97	72.7	72.7
16	25 13C2-8:2 FTS	529.1 > 508.7				0.125			
17	26 13C4-PFBA	217 > 171.8	1.471e4	1.471e4	1.000	0.125	1.80	100	100
18	27 13C2-4:2 FTS	329.2 > 308.9				0.125			
19	28 13C5-PFHxA	318.0 > 272.9	1.900e4	1.900e4	1.000	0.125	3.40	100	100
20	29 13C3-PFHxS	401.9 > 79.9	1.095e4	1.095e4	1.000	0.125	4.04	100	100
21	30 13C8-PFOA	421.3 > 376	8.011e3	8.011e3	1.000	0.125	4.32	100	100
22	31 13C4-PFOS	503.0 > 79.9	6.682e3	6.682e3	1.000	0.125	4.73	100	100
23	32 13C9-PFNA	472.2 > 426.9	1.018e4	1.018e4	1.000	0.125	4.67	100	100
24	33 13C6-PFDA	519.1 > 473.7	8.684e3	8.684e3	1.000	0.125	4.97	100	100
25	34 Total PFBS	299 > 79.7		5.279e3		0.125		0.692	
26	35 Total PFHxS	398.9 > 79.6		5.279e3		0.125		0.662	
27	36 Total PFOA	413 > 368.7		2.003e4		0.125		0.427	
28	37 Total PFOS	499 > 79.9		6.702e3		0.125			

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-31.qld

Last Altered: Tuesday, November 29, 2016 10:52:04 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: B6K0156-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161128G1\_31, Date: 28-Nov-2016, Time: 15:13:03

**Total PFBS**

	# Name	Trace	RT	Area	IS Area	Conc.
1	3 PFBS	299 > 79.7	3.04	4.721	6382.098	0.7

**Total PFHxS**

	# Name	Trace	RT	Area	IS Area	Conc.
1	6 PFHxS	398.9 > 79.6	4.05	34.099	5278.728	0.5
2	35 Total PFHxS	398.9 > 79.6	3.97	3.526	5278.728	0.2

**Total PFOA**

	# Name	Trace	RT	Area	IS Area	Conc.
1	8 PFOA	413 > 368.7	4.32	223.912	20031.934	0.4

**Total PFOS**

	# Name	Trace	RT	Area	IS Area	Conc.
1						

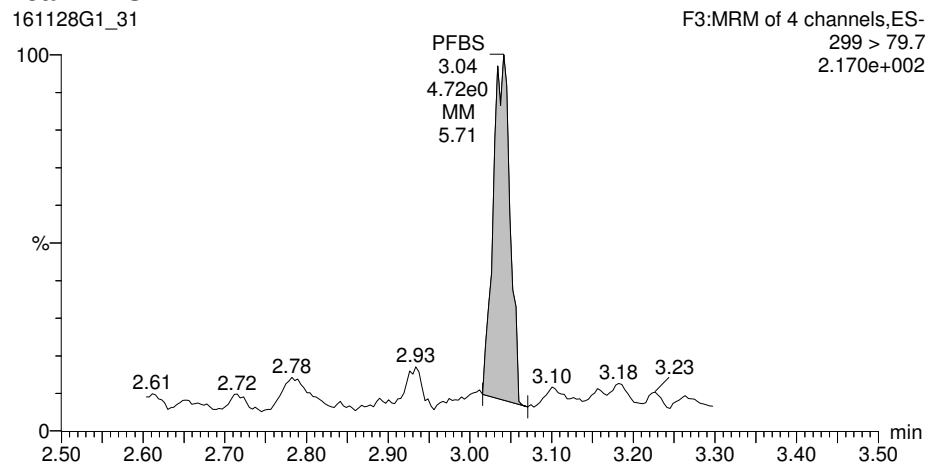
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Last Altered: Tuesday, November 29, 2016 10:52:04 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

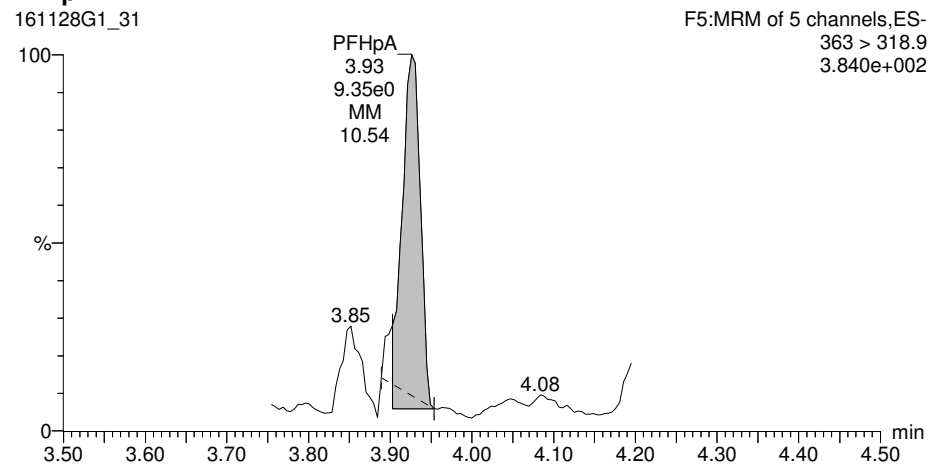
Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: B6K0156-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161128G1\_31, Date: 28-Nov-2016, Time: 15:13:03, Instrument: , Lab: , User:

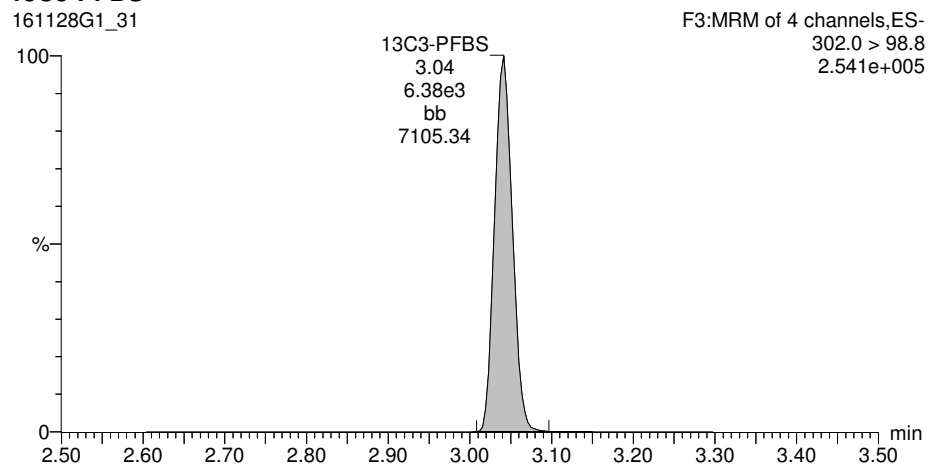
**Total PFBS**



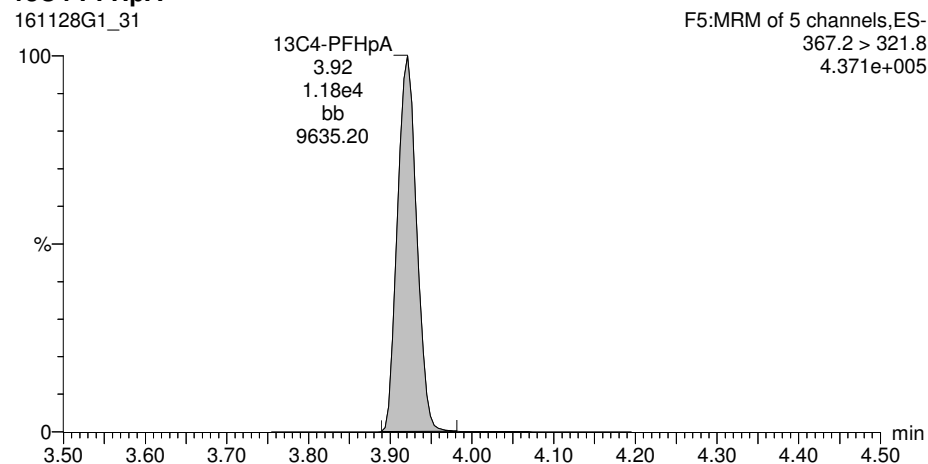
**PFHpA**



**13C3-PFBS**



**13C4-PFHpA**

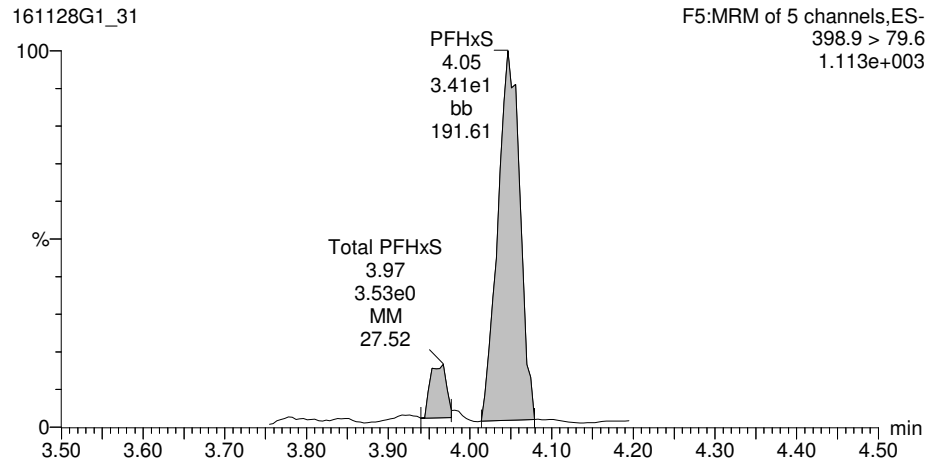


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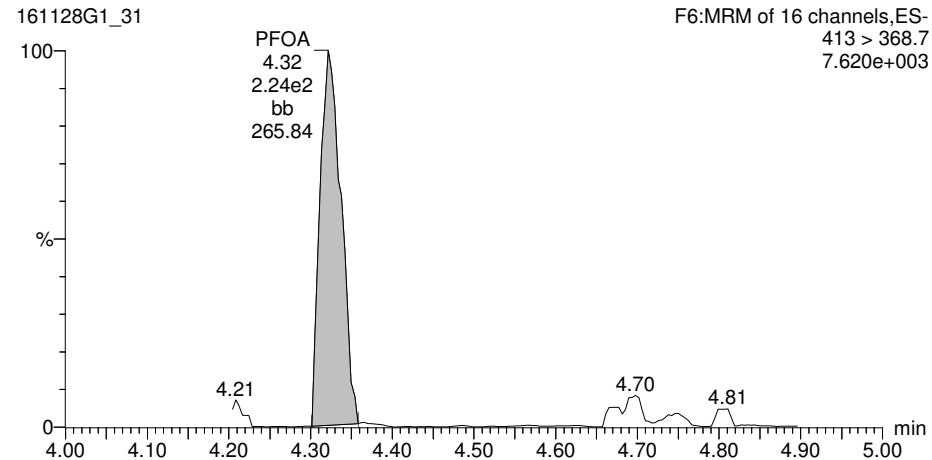
Last Altered: Tuesday, November 29, 2016 10:52:04 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

ID: B6K0156-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161128G1\_31, Date: 28-Nov-2016, Time: 15:13:03, Instrument: , Lab: , User:

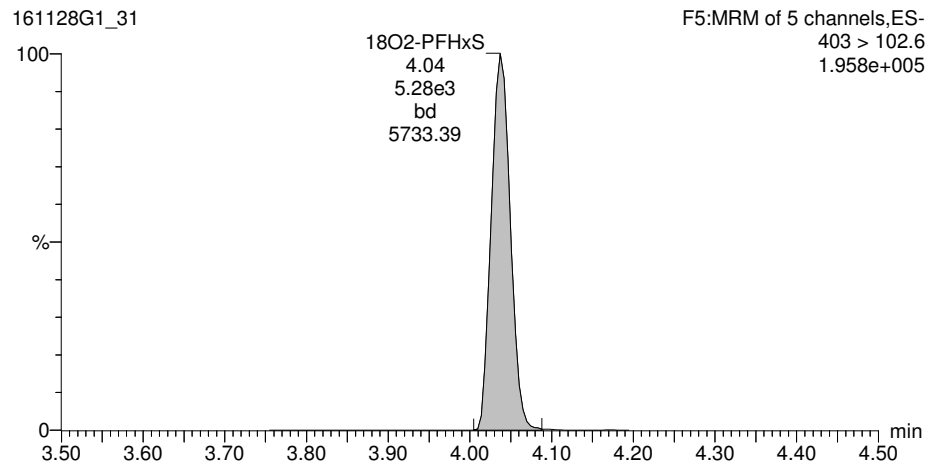
**Total PFHxS**



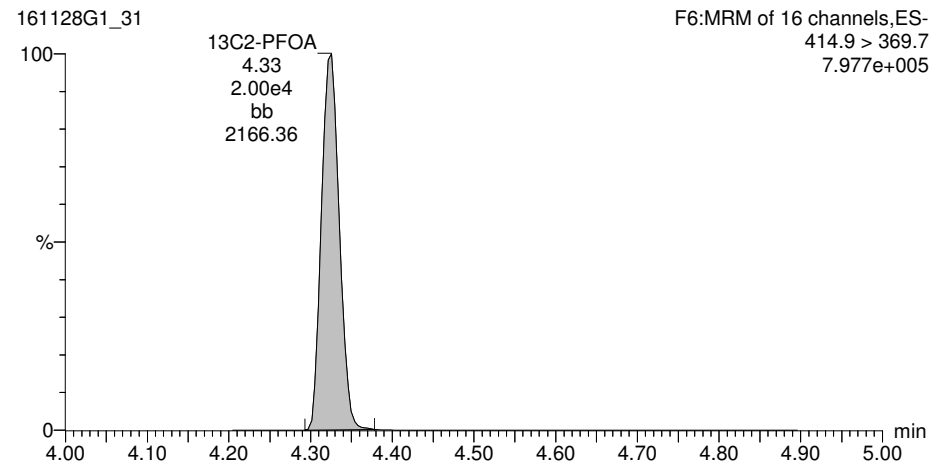
**Total PFOA**



**18O2-PFHxS**



**13C2-PFOA**

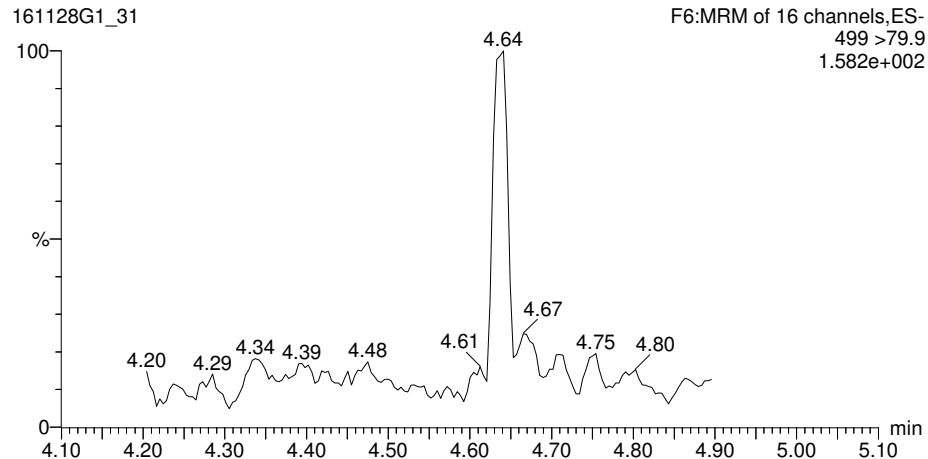


Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-31.qld

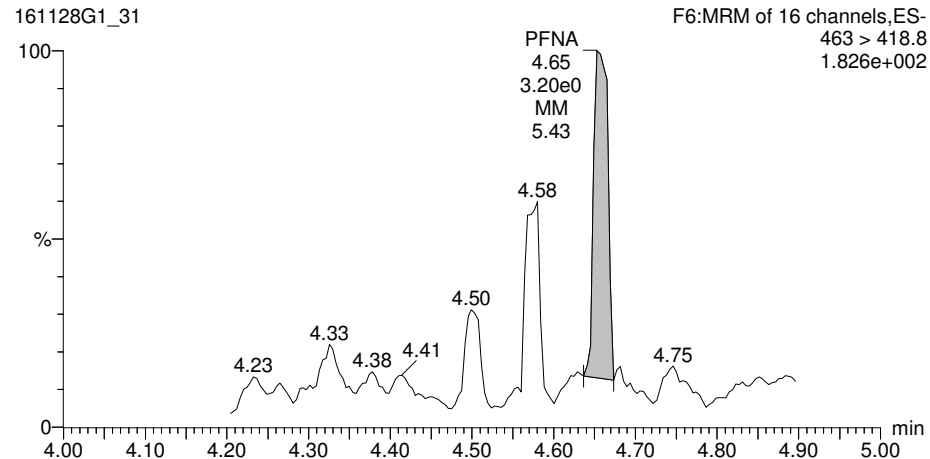
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Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

ID: B6K0156-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161128G1\_31, Date: 28-Nov-2016, Time: 15:13:03, Instrument: , Lab: , User:

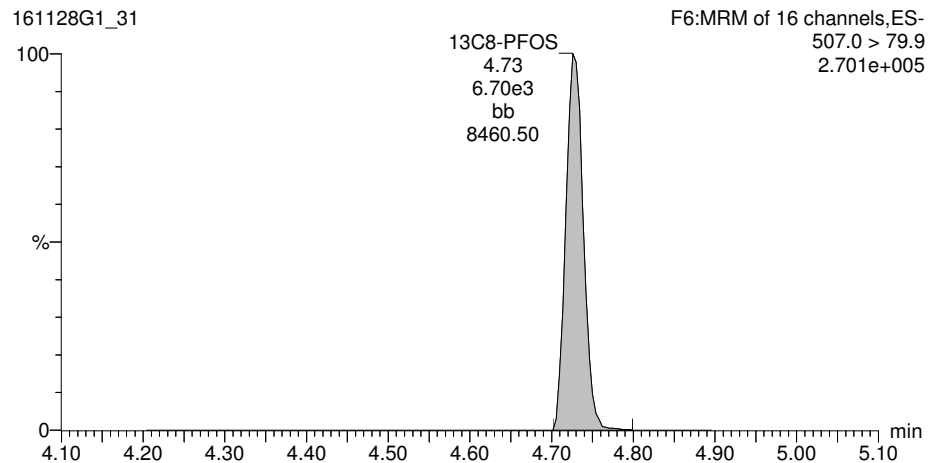
**Total PFOS**



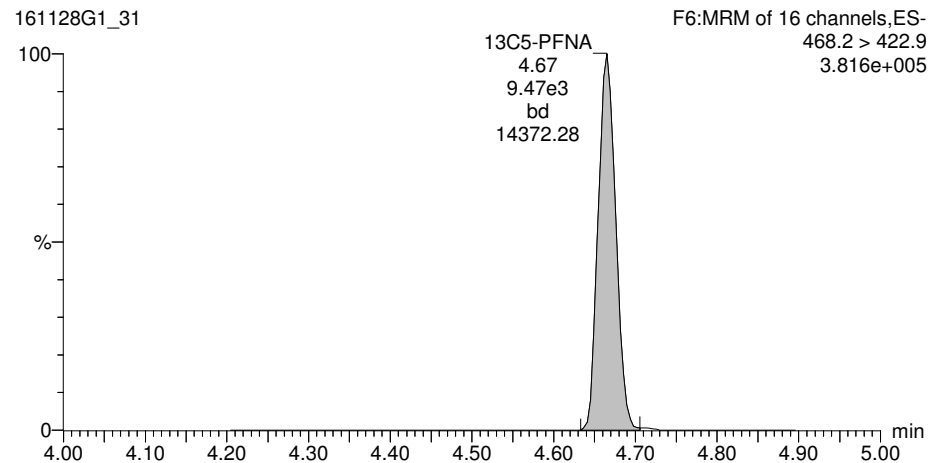
**PFNA**



**13C8-PFOS**



**13C5-PFNA**

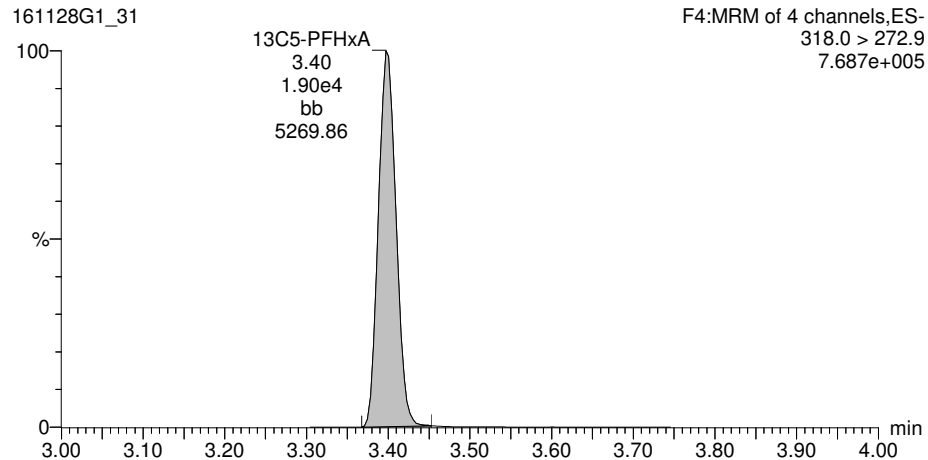


Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-31.qld

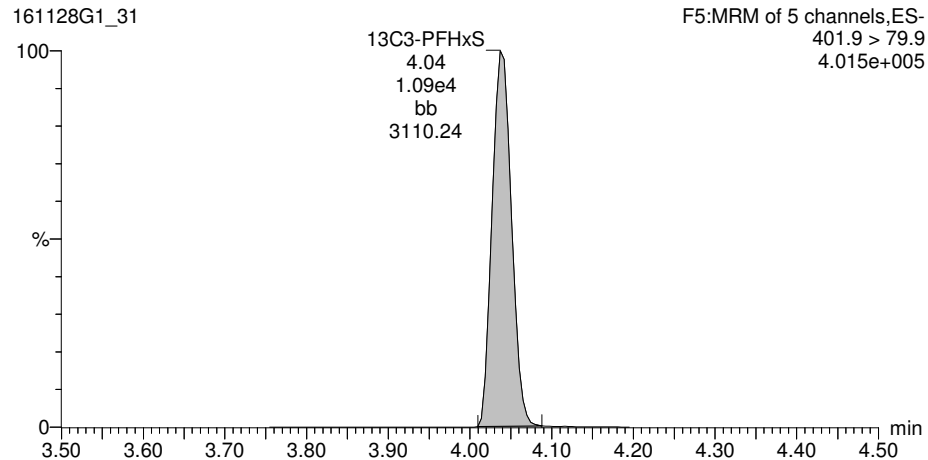
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Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

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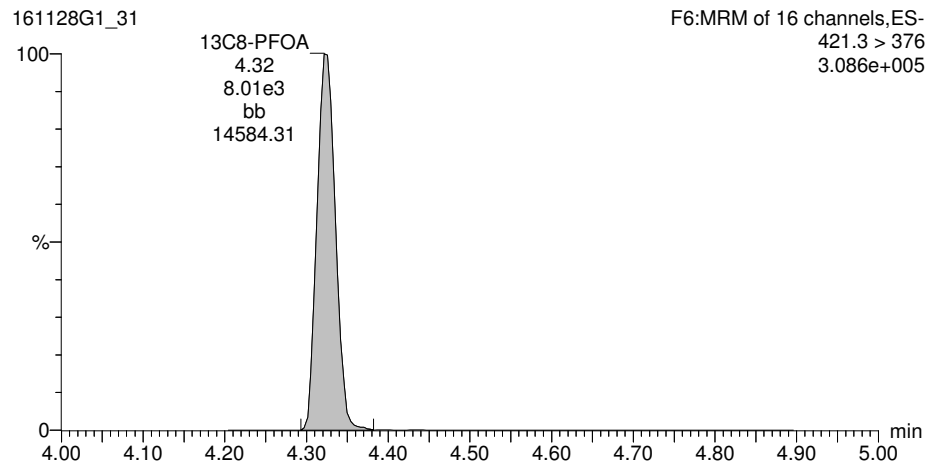
**13C5-PFHxA**



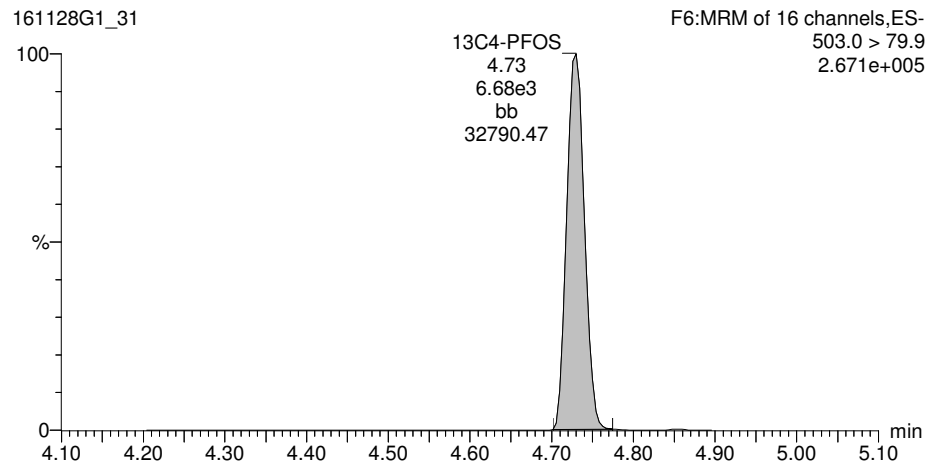
**13C3-PFHxS**



**13C8-PFOA**



**13C4-PFOS**



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-31.qld

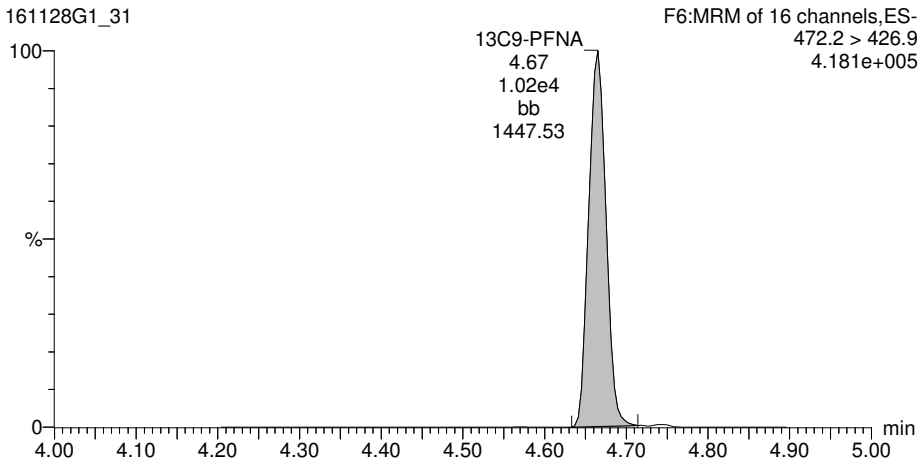
Last Altered: Tuesday, November 29, 2016 10:52:04 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:53:29 Pacific Standard Time

ID: B6K0156-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161128G1\_31, Date: 28-Nov-2016, Time: 15:13:03, Instrument: , Lab: , User:

13C9-PFNA

161128G1\_31



Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-27.qld

Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29

#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3 PFBS	299 > 79.7	9.439e3	6.359e3		0.125	3.04	83.5	104
2	5 PFHpA	363 > 318.9	1.778e4	1.330e4		0.125	3.92	86.8	109
3	6 PFHxS	398.9 > 79.6	8.895e3	5.627e3		0.125	4.04	92.0	115
4	8 PFOA	413 > 368.7	1.874e4	2.216e4		0.125	4.32	93.1	116
5	10 PFOS	499 > 79.9	4.871e3	7.229e3		0.125	4.73	82.3	103
6	11 PFNA	463 > 418.8	1.457e4	9.961e3		0.125	4.67	89.9	112
7	16 13C3-PFBS	302.0 > 98.8	6.359e3	1.905e4	0.302	0.125	3.04	111	111
8	17 13C2-PFHxA	315 > 269.8	4.305e3	1.905e4	0.620	0.125	3.40	36.5	91.2
9	18 13C4-PFHpA	367.2 > 321.8	1.330e4	1.303e4	1.139	0.125	3.92	89.6	89.6
10	19 18O2-PFHxS	403 > 102.6	5.627e3	1.303e4	0.449	0.125	4.04	96.1	96.1
11	20 13C2-6:2 FTS	429.1 > 408.9	5.613e3			0.125	4.27		
12	21 13C2-PFOA	414.9 > 369.7	2.216e4	9.760e3	2.262	0.125	4.32	100	100
13	22 13C8-PFOS	507.0 > 79.9	7.229e3	7.886e3	0.944	0.125	4.73	97.2	97.2
14	23 13C5-PFNA	468.2 > 422.9	9.961e3	1.218e4	1.082	0.125	4.66	75.6	75.6
15	24 13C2-PFDA	515.1 > 469.9	7.394e3	1.075e4	1.019	0.125	4.96	67.5	67.5
16	25 13C2-8:2 FTS	529.1 > 508.7				0.125			
17	26 13C4-PFBA	217 > 171.8	1.558e4	1.558e4	1.000	0.125	1.78	100	100
18	27 13C2-4:2 FTS	329.2 > 308.9				0.125			
19	28 13C5-PFHxA	318.0 > 272.9	1.905e4	1.905e4	1.000	0.125	3.40	100	100
20	29 13C3-PFHxS	401.9 > 79.9	1.303e4	1.303e4	1.000	0.125	4.04	100	100
21	30 13C8-PFOA	421.3 > 376	9.760e3	9.760e3	1.000	0.125	4.32	100	100
22	31 13C4-PFOS	503.0 > 79.9	7.886e3	7.886e3	1.000	0.125	4.73	100	100
23	32 13C9-PFNA	472.2 > 426.9	1.218e4	1.218e4	1.000	0.125	4.66	100	100
24	33 13C6-PFDA	519.1 > 473.7	1.075e4	1.075e4	1.000	0.125	4.96	100	100
25	34 Total PFBS	299 > 79.7		5.627e3		0.125		83.5	
26	35 Total PFHxS	398.9 > 79.6		5.627e3		0.125		92.0	
27	36 Total PFOA	413 > 368.7		2.216e4		0.125		93.1	
28	37 Total PFOS	499 > 79.9		7.229e3		0.125		82.3	



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-27.qld

Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29

**Total PFBS**

	# Name	Trace	RT	Area	IS Area	Conc.
1	3 PFBS	299 > 79.7	3.04	9439.190	6358.556	83.5

**Total PFHxS**

	# Name	Trace	RT	Area	IS Area	Conc.
1	6 PFHxS	398.9 > 79.6	4.04	8894.979	5627.300	92.0

**Total PFOA**

	# Name	Trace	RT	Area	IS Area	Conc.
1	8 PFOA	413 > 368.7	4.32	18737.512	22162.826	93.1

**Total PFOS**

	# Name	Trace	RT	Area	IS Area	Conc.
1	10 PFOS	499 > 79.9	4.73	4871.361	7229.199	82.3

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-27.qld

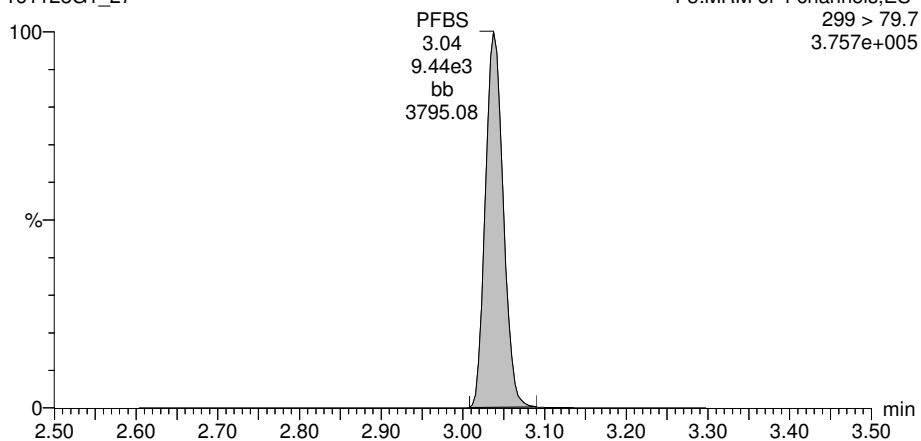
Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29, Instrument: , Lab: , User:

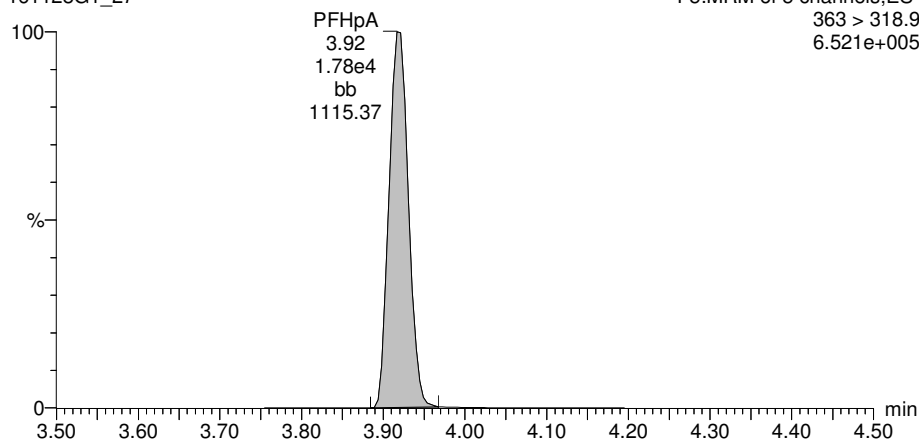
**Total PFBS**

161128G1\_27



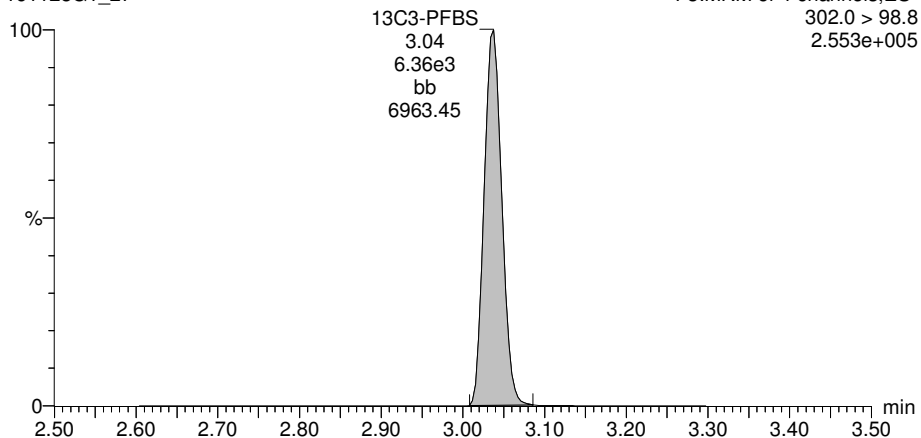
**PFHpA**

161128G1\_27



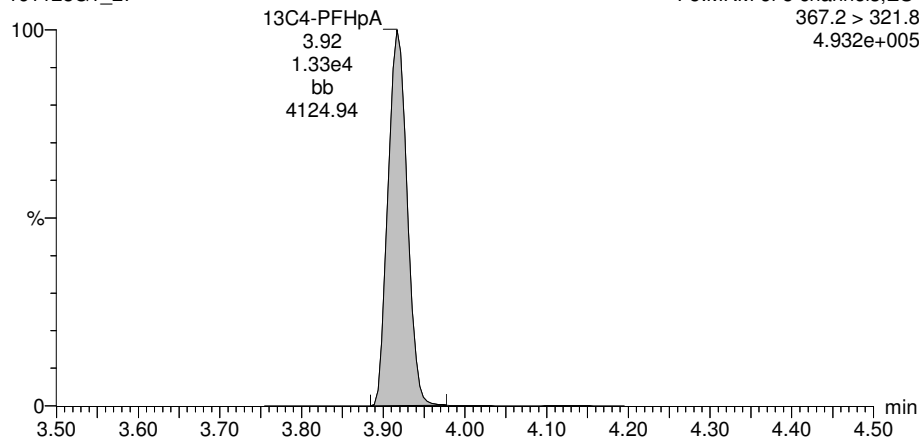
**13C3-PFBS**

161128G1\_27



**13C4-PFHpA**

161128G1\_27

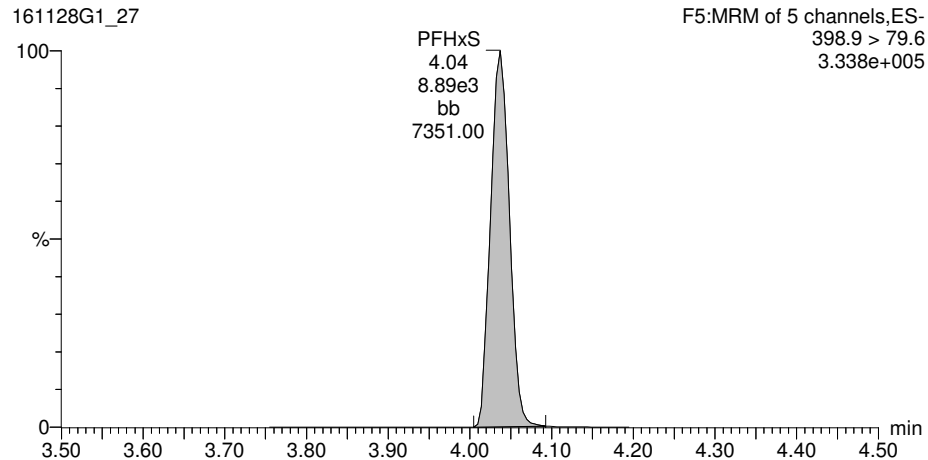


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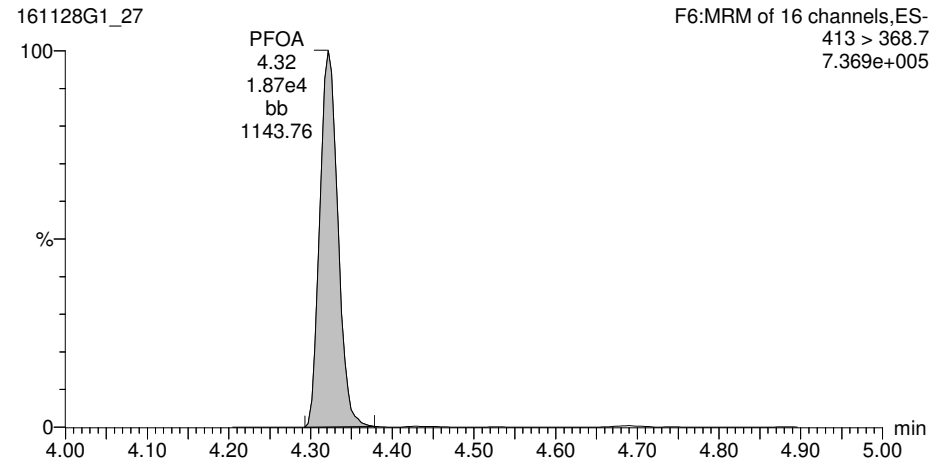
Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29, Instrument: , Lab: , User:

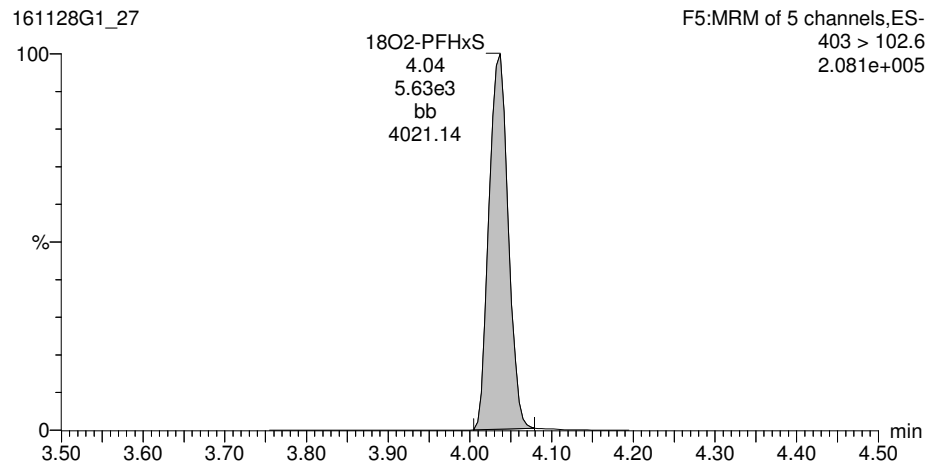
**Total PFHxS**



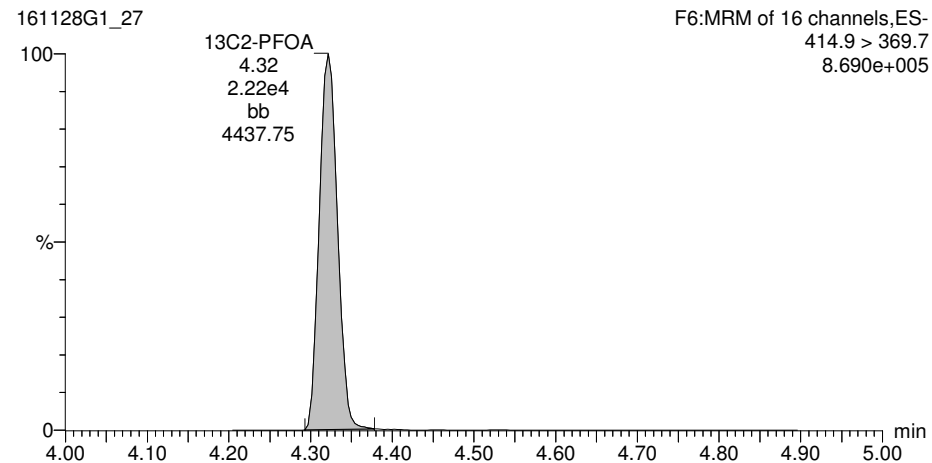
**Total PFOA**



**18O2-PFHxS**



**13C2-PFOA**

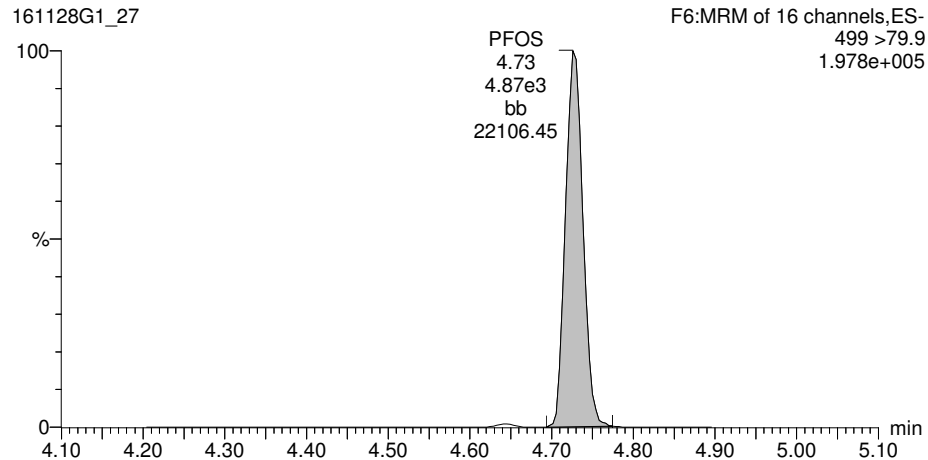


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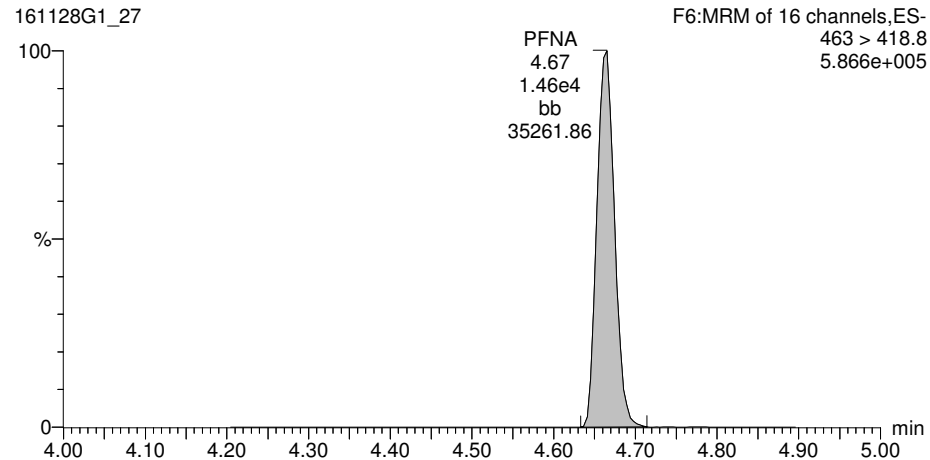
Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29, Instrument: , Lab: , User:

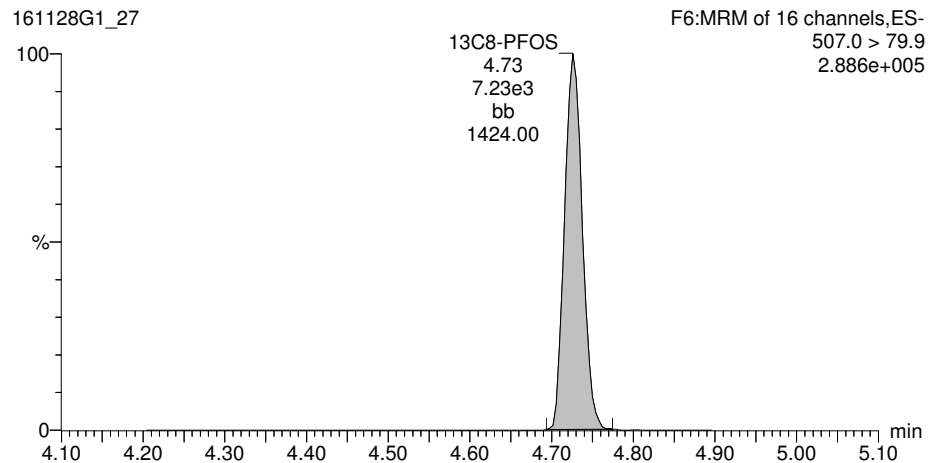
**Total PFOS**



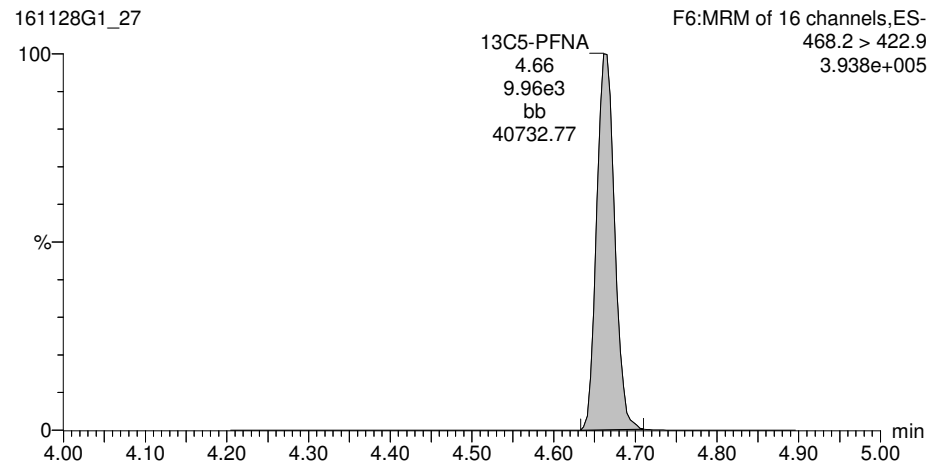
**PFNA**



**13C8-PFOS**



**13C5-PFNA**

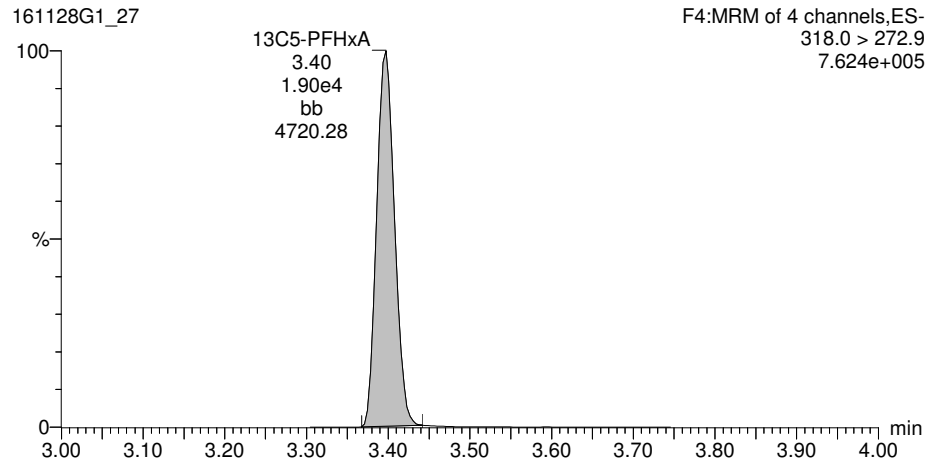


Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-27.qld

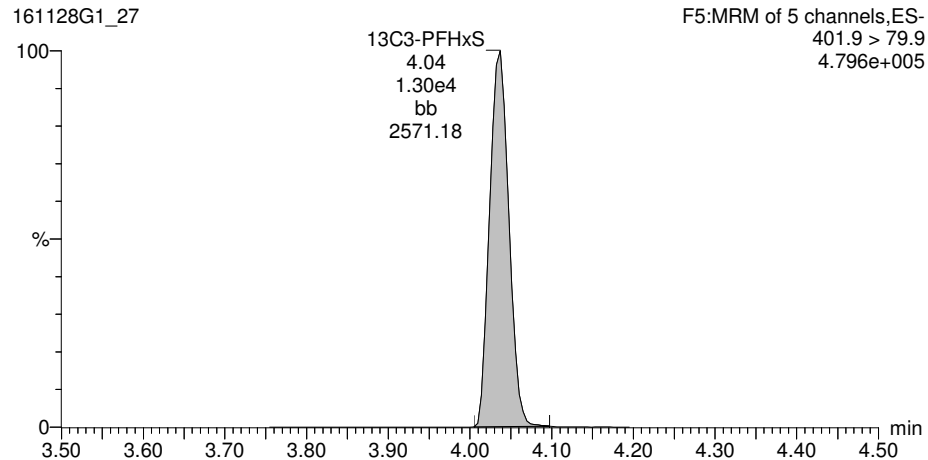
Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29, Instrument: , Lab: , User:

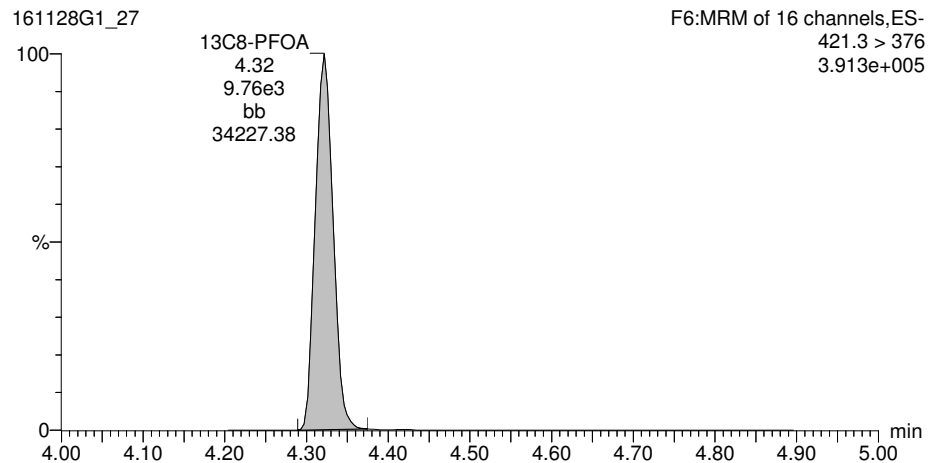
**13C5-PFHxA**



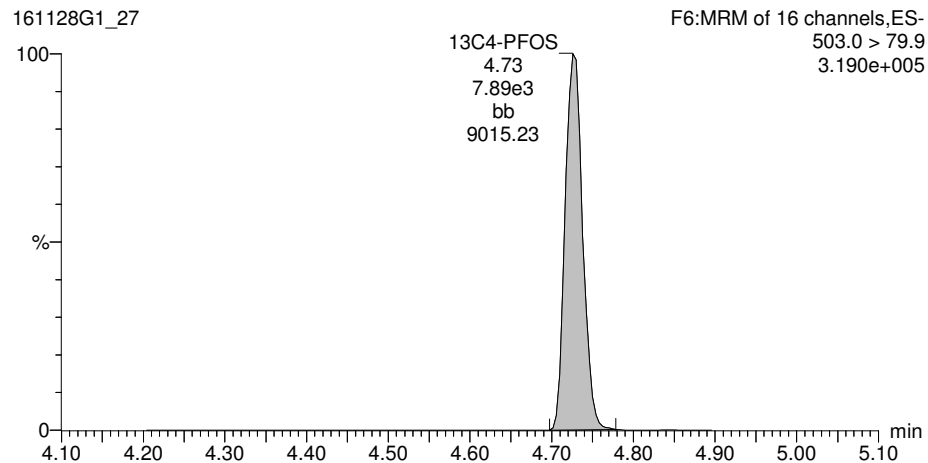
**13C3-PFHxS**



**13C8-PFOA**



**13C4-PFOS**



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-27.qld

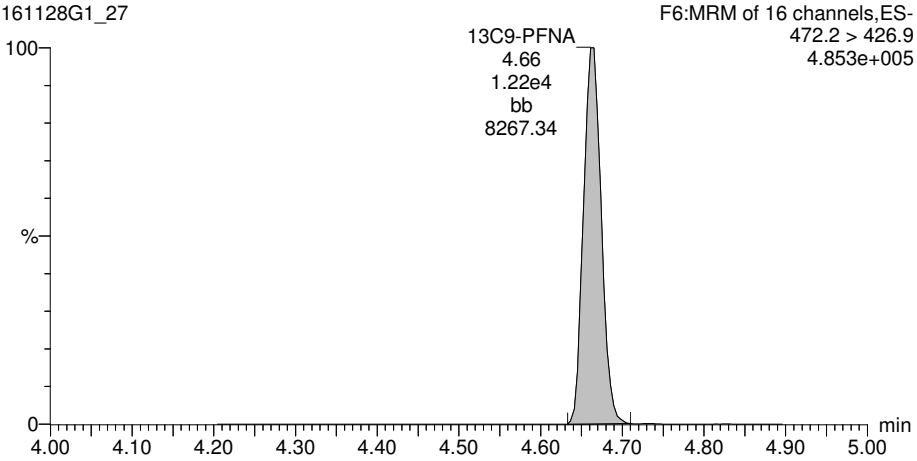
Last Altered: Tuesday, November 29, 2016 10:46:58 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:47:40 Pacific Standard Time

ID: B6K0156-BS1 OPR 0.125, Description: OPR, Name: 161128G1\_27, Date: 28-Nov-2016, Time: 14:22:29, Instrument: , Lab: , User:

13C9-PFNA

161128G1\_27



Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-32.qld

Last Altered: Tuesday, November 29, 2016 10:55:21 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:56:05 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: 1601443-01 VCT-SP-01-20161110 0.12637, Description: VCT-SP-01-20161110, Name: 161128G1\_32, Date: 28-Nov-2016, Time: 15:25:49

	# Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3 PFBS	299 > 79.7	1.525e4	5.996e3		0.126	3.04	141	
2	8 PFOA	413 > 368.7	3.552e3	2.025e4		0.126	4.33	18.5	
3	10 PFOS	499 > 79.9	5.171e1	6.651e3		0.126	4.73	2.49	
4	16 13C3-PFBS	302.0 > 98.8	5.996e3	1.674e4	0.302	0.126	3.04	117	119
5	17 13C2-PFHxA	315 > 269.8	4.217e3	1.674e4	0.620	0.126	3.40	40.2	102
6	18 13C4-PFHpA	367.2 > 321.8	1.339e4	1.132e4	1.139	0.126	3.92	103	104
7	19 18O2-PFHxS	403 > 102.6	5.119e3	1.132e4	0.449	0.126	4.04	99.5	101
8	20 13C2-6:2 FTS	429.1 > 408.9	4.836e3			0.126	4.28		*
9	21 13C2-PFOA	414.9 > 369.7	2.025e4	9.211e3	2.262	0.126	4.33	96.1	97.2
10	22 13C8-PFOS	507.0 > 79.9	6.651e3	6.640e3	0.944	0.126	4.73	105	106
11	28 13C5-PFHxA	318.0 > 272.9	1.674e4	1.674e4	1.000	0.126	3.40	98.9	100
12	29 13C3-PFHxS	401.9 > 79.9	1.132e4	1.132e4	1.000	0.126	4.04	98.9	100
13	30 13C8-PFOA	421.3 > 376	9.211e3	9.211e3	1.000	0.126	4.33	98.9	100
14	31 13C4-PFOS	503.0 > 79.9	6.640e3	6.640e3	1.000	0.126	4.73	98.9	100
15	32 13C9-PFNA	472.2 > 426.9	9.763e3	9.763e3	1.000	0.126	4.67	98.9	100
16	33 13C6-PFDA	519.1 > 473.7	9.699e3	9.699e3	1.000	0.126	4.97	98.9	100
17	34 Total PFBS	299 > 79.7		5.119e3		0.126		148	
18	36 Total PFOA	413 > 368.7		2.025e4		0.126		22.8	
19	37 Total PFOS	499 > 79.9		6.651e3		0.126		9.56	

\*Not used

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-32.qld

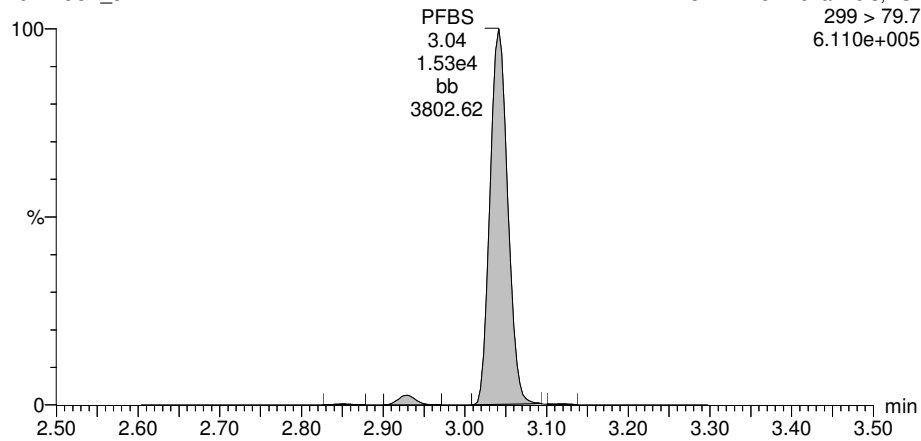
Last Altered: Tuesday, November 29, 2016 10:55:21 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:56:05 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: 1601443-01 VCT-SP-01-20161110 0.12637, Description: VCT-SP-01-20161110, Name: 161128G1\_32, Date: 28-Nov-2016, Time: 15:25:49, Instrument: , Lab: , User:

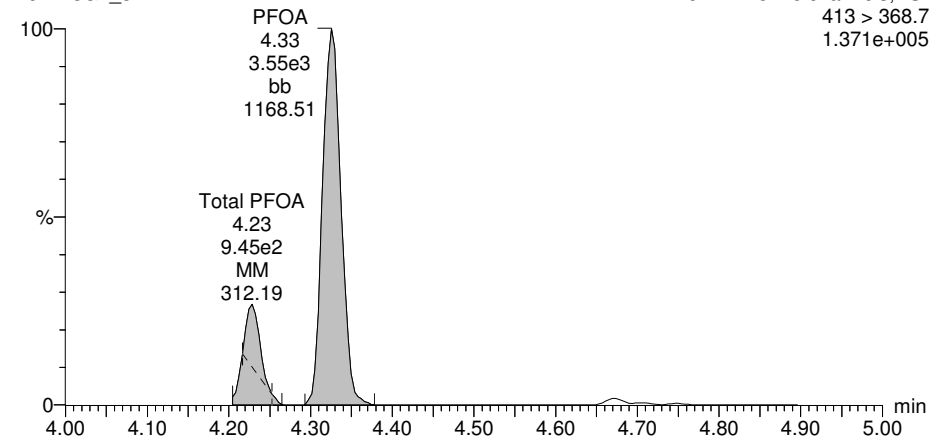
**Total PFBS**

161128G1\_32



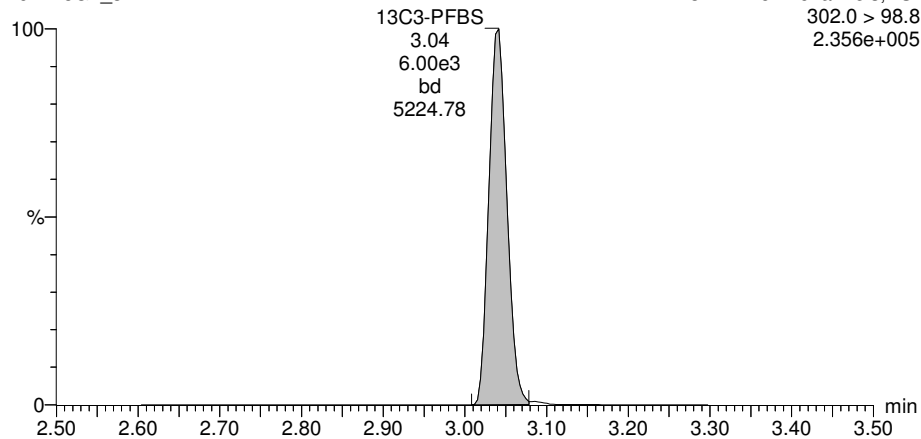
**Total PFOA**

161128G1\_32



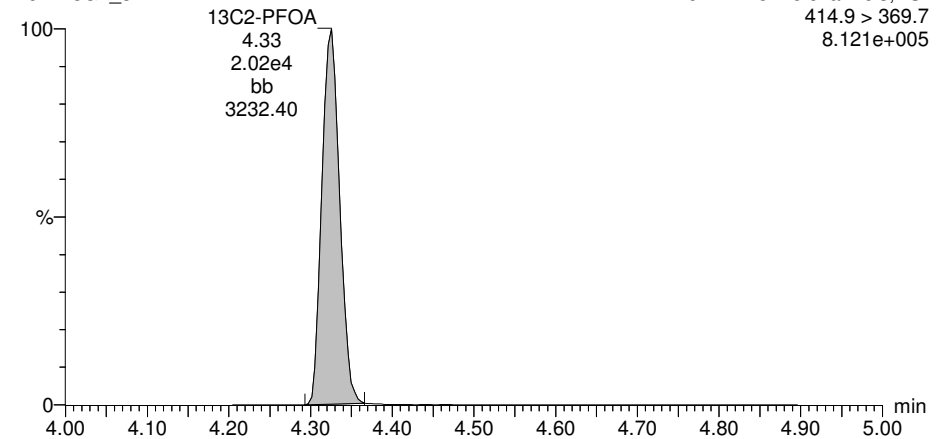
**13C3-PFBS**

161128G1\_32



**13C2-PFOA**

161128G1\_32





Vista Analytical Laboratory Q1

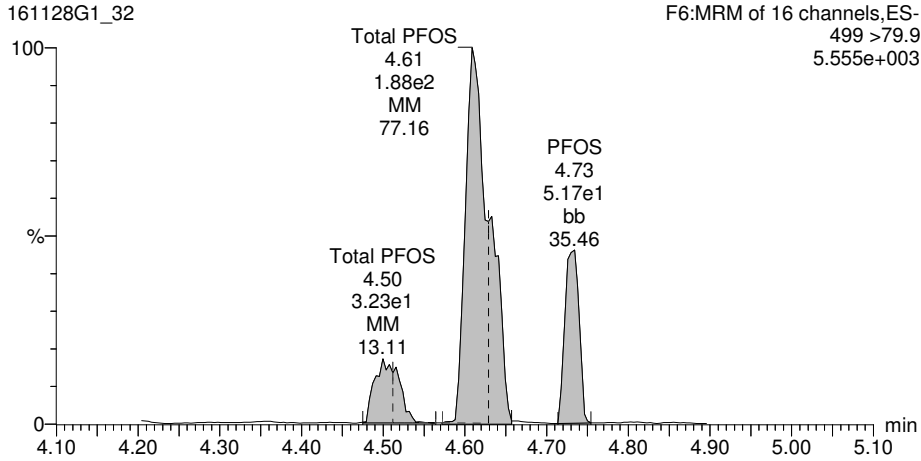
Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-32.qld

Last Altered: Tuesday, November 29, 2016 10:55:21 Pacific Standard Time

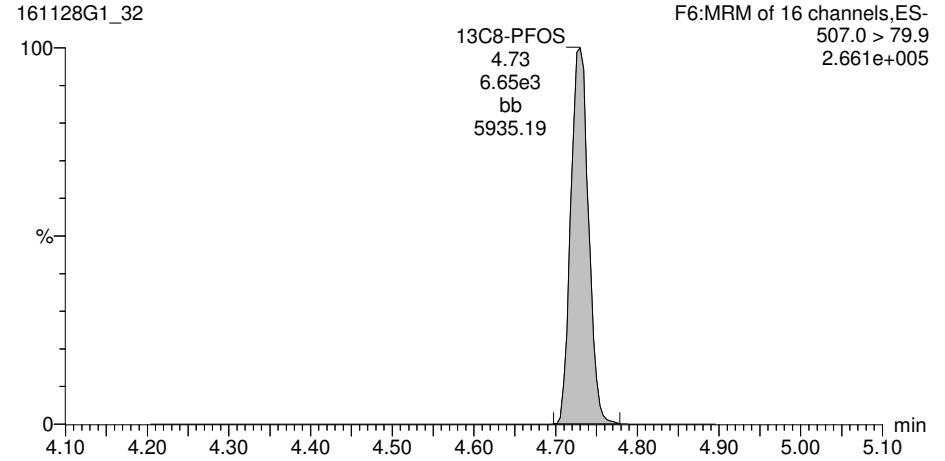
Printed: Tuesday, November 29, 2016 10:56:05 Pacific Standard Time

ID: 1601443-01 VCT-SP-01-20161110 0.12637, Description: VCT-SP-01-20161110, Name: 161128G1\_32, Date: 28-Nov-2016, Time: 15:25:49, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS

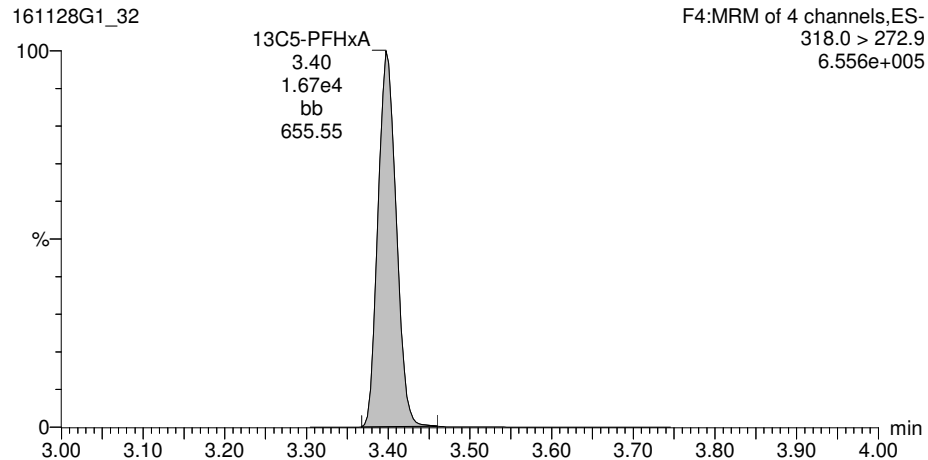


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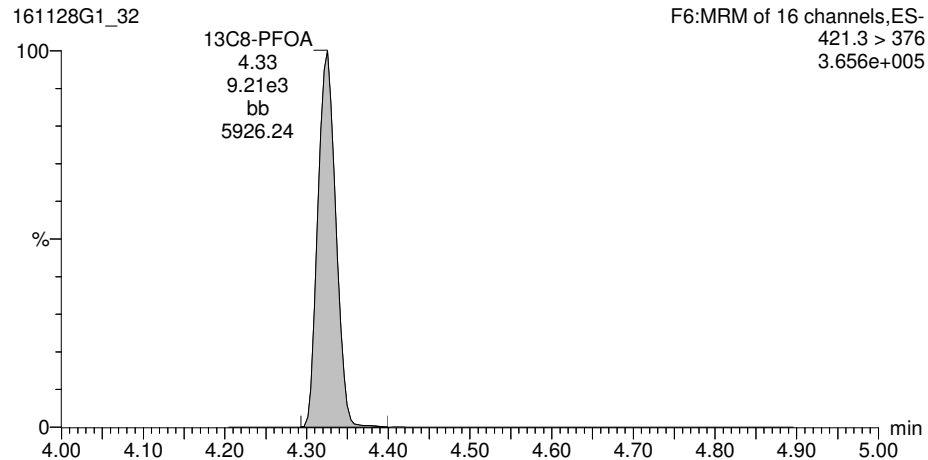
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Printed: Tuesday, November 29, 2016 10:56:05 Pacific Standard Time

ID: 1601443-01 VCT-SP-01-20161110 0.12637, Description: VCT-SP-01-20161110, Name: 161128G1\_32, Date: 28-Nov-2016, Time: 15:25:49, Instrument: , Lab: , User:

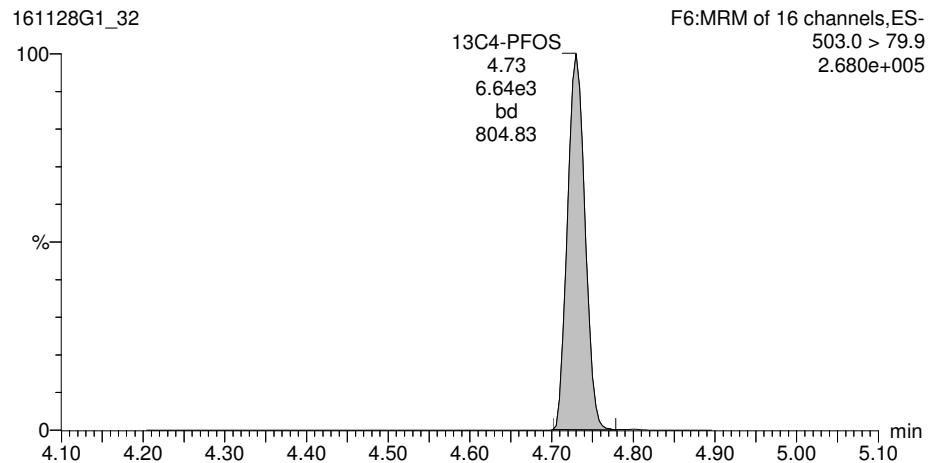
**13C5-PFHxA**



**13C8-PFOA**



**13C4-PFOS**



Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-33.qld

Last Altered: Tuesday, November 29, 2016 10:59:38 Pacific Standard Time

Printed: Tuesday, November 29, 2016 10:59:52 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: 1601443-02 VCT-SP-02-20161110 0.11919, Description: VCT-SP-02-20161110, Name: 161128G1\_33, Date: 28-Nov-2016, Time: 15:38:32

	# Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3 PFBS	299 > 79.7	1.408e4	5.999e3		0.119	3.04	138	
2	8 PFOA	413 > 368.7	3.190e3	2.073e4		0.119	4.33	17.1	
3	10 PFOS	499 > 79.9	1.086e1	6.959e3		0.119	4.74	1.86	
4	16 13C3-PFBS	302.0 > 98.8	5.999e3	1.603e4	0.302	0.119	3.04	130	124
5	17 13C2-PFHxA	315 > 269.8	4.168e3	1.603e4	0.620	0.119	3.40	44.0	105
6	18 13C4-PFHpA	367.2 > 321.8	1.298e4	1.158e4	1.139	0.119	3.92	103	98.5
7	19 18O2-PFHxS	403 > 102.6	5.320e3	1.158e4	0.449	0.119	4.04	107	102
8	20 13C2-6:2 FTS	429.1 > 408.9	5.159e3			0.119	4.28		*
9	21 13C2-PFOA	414.9 > 369.7	2.073e4	8.596e3	2.262	0.119	4.33	112	107
10	22 13C8-PFOS	507.0 > 79.9	6.959e3	6.659e3	0.944	0.119	4.73	116	111
11	28 13C5-PFHxA	318.0 > 272.9	1.603e4	1.603e4	1.000	0.119	3.40	105	100
12	29 13C3-PFHxS	401.9 > 79.9	1.158e4	1.158e4	1.000	0.119	4.04	105	100
13	30 13C8-PFOA	421.3 > 376	8.596e3	8.596e3	1.000	0.119	4.33	105	100
14	31 13C4-PFOS	503.0 > 79.9	6.659e3	6.659e3	1.000	0.119	4.73	105	100
15	32 13C9-PFNA	472.2 > 426.9	9.315e3	9.315e3	1.000	0.119	4.67	105	100
16	33 13C6-PFDA	519.1 > 473.7	8.886e3	8.886e3	1.000	0.119	4.97	105	100
17	34 Total PFBS	299 > 79.7		5.320e3		0.119		143	
18	36 Total PFOA	413 > 368.7		2.073e4		0.119		21.1	
19	37 Total PFOS	499 > 79.9		6.959e3		0.119		7.24	

\*Not used.

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-33.qld

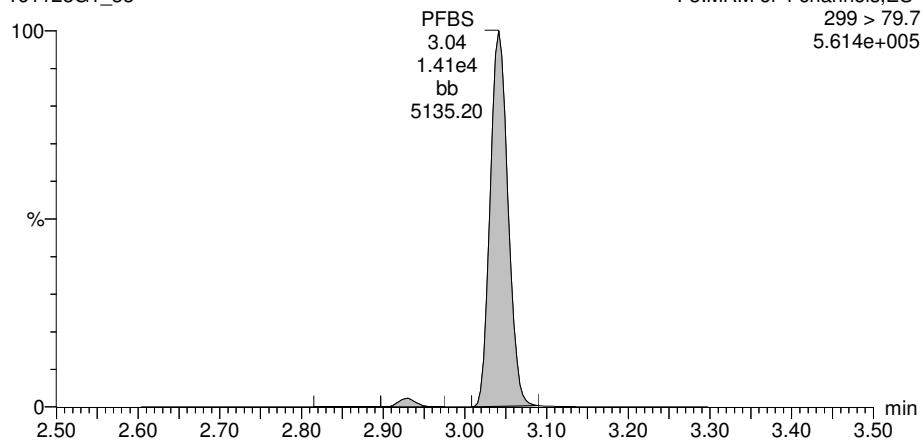
Last Altered: Tuesday, November 29, 2016 10:59:38 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 10:59:52 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: 1601443-02 VCT-SP-02-20161110 0.11919, Description: VCT-SP-02-20161110, Name: 161128G1\_33, Date: 28-Nov-2016, Time: 15:38:32, Instrument: , Lab: , User:

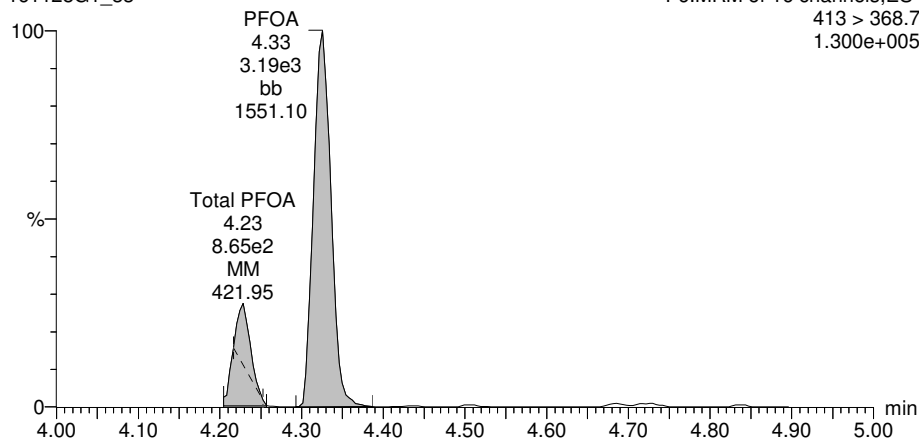
**Total PFBS**

161128G1\_33



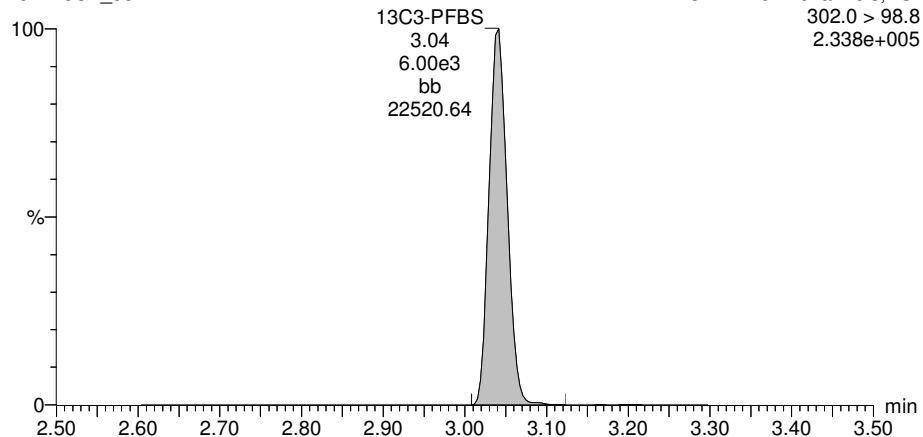
**Total PFOA**

161128G1\_33



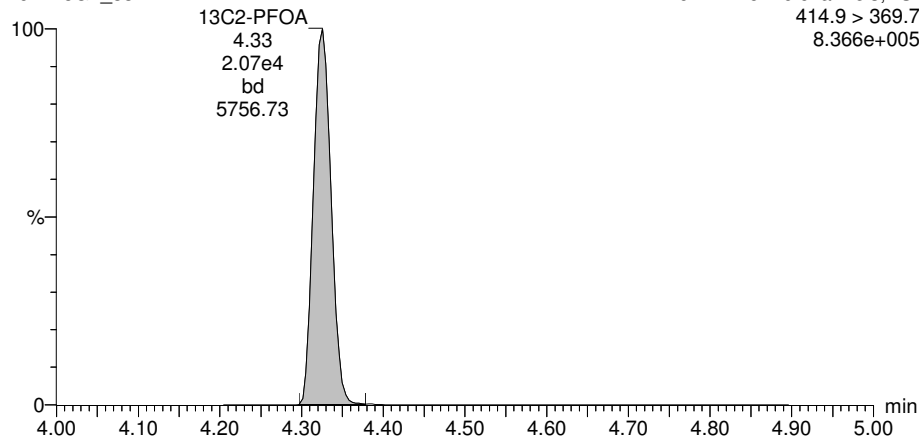
**13C3-PFBS**

161128G1\_33



**13C2-PFOA**

161128G1\_33



Vista Analytical Laboratory Q1

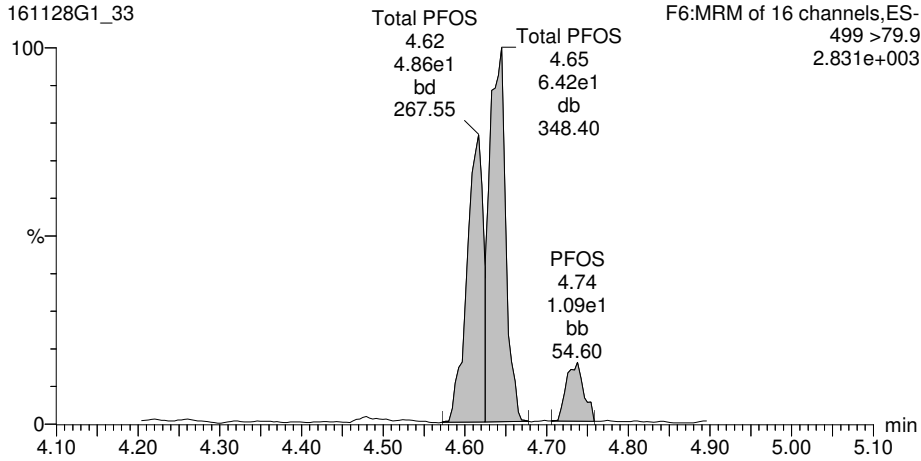
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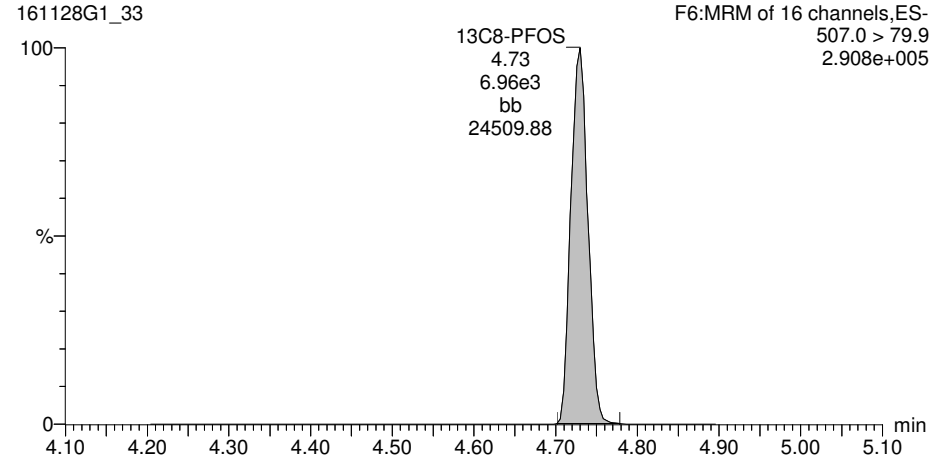
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Total PFOS



13C8-PFOS

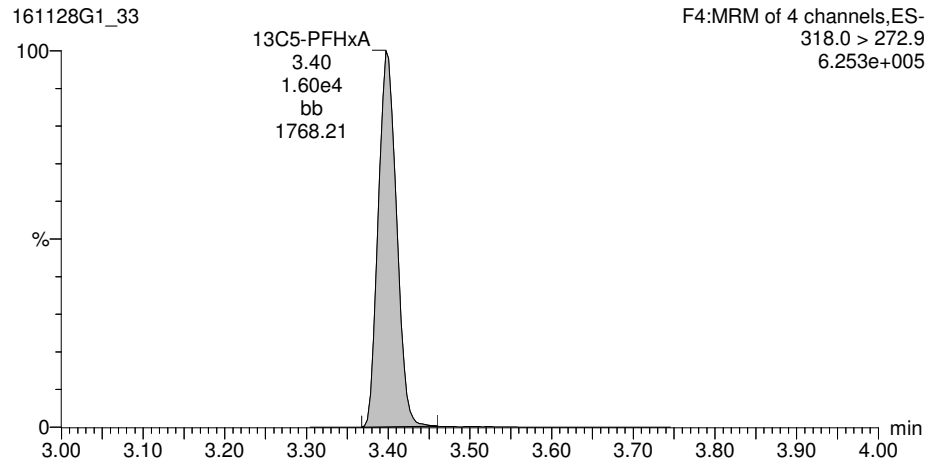


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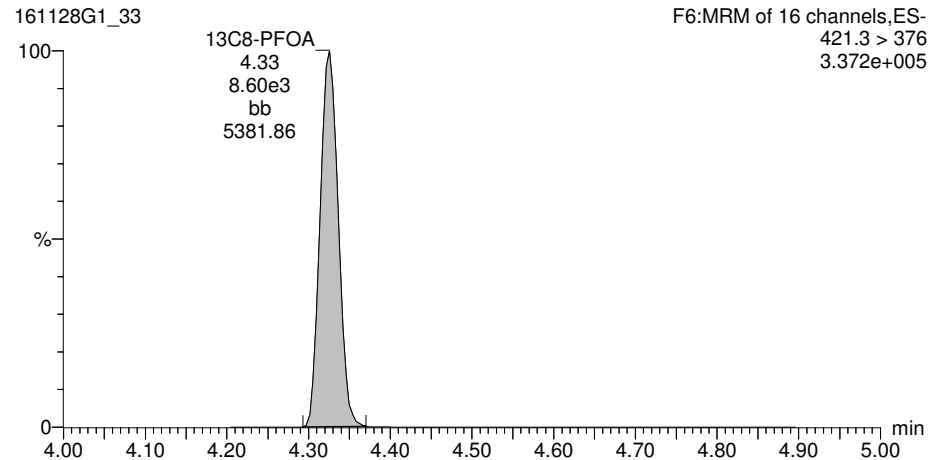
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Printed: Tuesday, November 29, 2016 10:59:52 Pacific Standard Time

ID: 1601443-02 VCT-SP-02-20161110 0.11919, Description: VCT-SP-02-20161110, Name: 161128G1\_33, Date: 28-Nov-2016, Time: 15:38:32, Instrument: , Lab: , User:

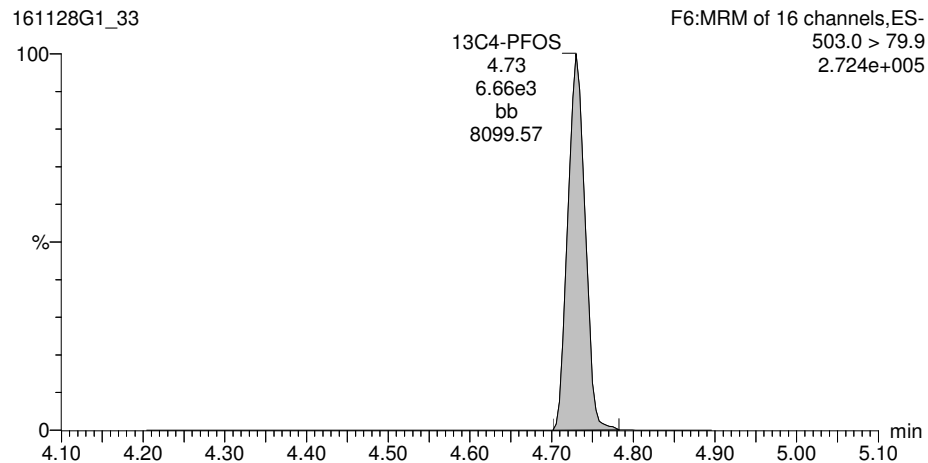
**13C5-PFHxA**



**13C8-PFOA**



**13C4-PFOS**



Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-34.qld

Last Altered: Tuesday, November 29, 2016 11:08:56 Pacific Standard Time

Printed: Tuesday, November 29, 2016 11:09:41 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: 1601443-03 VCT-SP-03-20161110 0.1247, Description: VCT-SP-03-20161110, Name: 161128G1\_34, Date: 28-Nov-2016, Time: 15:51:17

	# Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3 PFBS	299 > 79.7	1.606e4	6.156e3		0.125	3.04	147	
2	8 PFOA	413 > 368.7	3.790e3	2.312e4		0.125	4.33	17.4	
3	10 PFOS	499 > 79.9	1.889e1	8.006e3		0.125	4.73	1.88	
4	16 13C3-PFBS	302.0 > 98.8	6.156e3	1.571e4	0.302	0.125	3.04	130	130
5	17 13C2-PFHxA	315 > 269.8	4.203e3	1.571e4	0.620	0.125	3.40	43.3	108
6	18 13C4-PFHpA	367.2 > 321.8	1.348e4	1.223e4	1.139	0.125	3.92	97.1	96.8
7	19 18O2-PFHxS	403 > 102.6	5.504e3	1.223e4	0.449	0.125	4.04	100	100
8	20 13C2-6:2 FTS	429.1 > 408.9	5.960e3			0.125	4.27		*
9	21 13C2-PFOA	414.9 > 369.7	2.312e4	9.097e3	2.262	0.125	4.33	113	112
10	22 13C8-PFOS	507.0 > 79.9	8.006e3	7.419e3	0.944	0.125	4.73	115	114
11	28 13C5-PFHxA	318.0 > 272.9	1.571e4	1.571e4	1.000	0.125	3.40	100	100
12	29 13C3-PFHxS	401.9 > 79.9	1.223e4	1.223e4	1.000	0.125	4.04	100	100
13	30 13C8-PFOA	421.3 > 376	9.097e3	9.097e3	1.000	0.125	4.33	100	100
14	31 13C4-PFOS	503.0 > 79.9	7.419e3	7.419e3	1.000	0.125	4.73	100	100
15	32 13C9-PFNA	472.2 > 426.9	1.133e4	1.133e4	1.000	0.125	4.67	100	100
16	33 13C6-PFDA	519.1 > 473.7	9.887e3	9.887e3	1.000	0.125	4.97	100	100
17	34 Total PFBS	299 > 79.7		5.504e3		0.125		152	
18	36 Total PFOA	413 > 368.7		2.312e4		0.125		20.8	
19	37 Total PFOS	499 > 79.9		8.006e3		0.125		9.05	

\*Not used.

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-34.qld

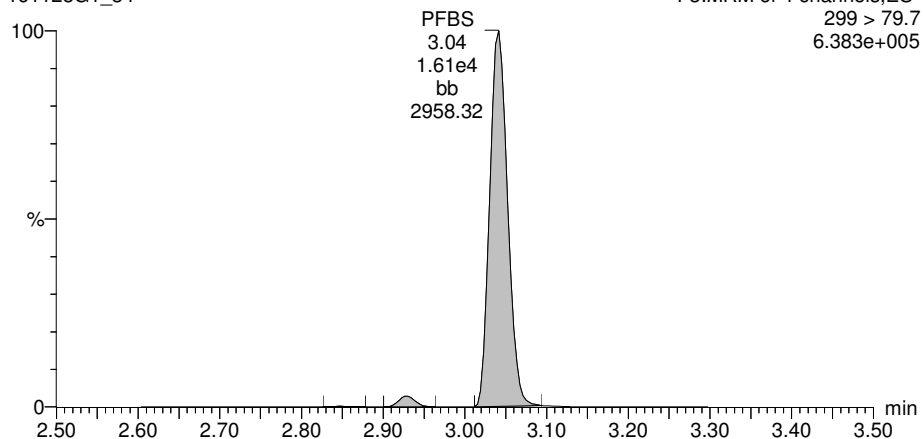
Last Altered: Tuesday, November 29, 2016 11:08:56 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 11:09:41 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

ID: 1601443-03 VCT-SP-03-20161110 0.1247, Description: VCT-SP-03-20161110, Name: 161128G1\_34, Date: 28-Nov-2016, Time: 15:51:17, Instrument: , Lab: , User:

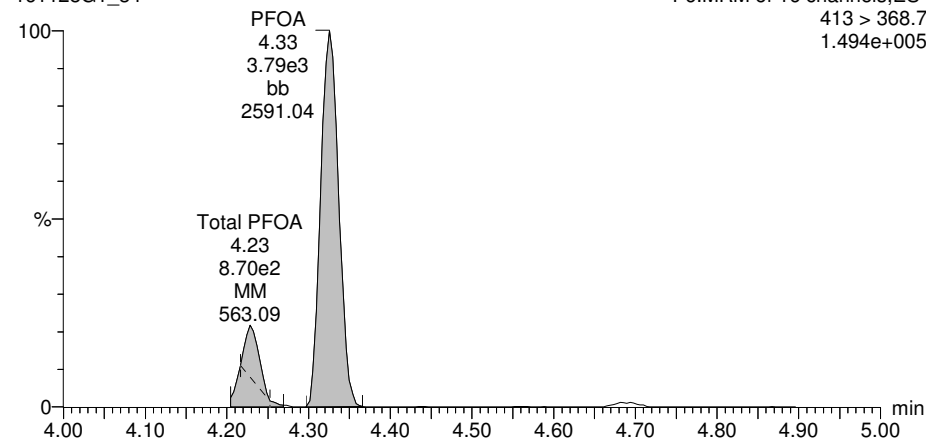
**Total PFBS**

161128G1\_34



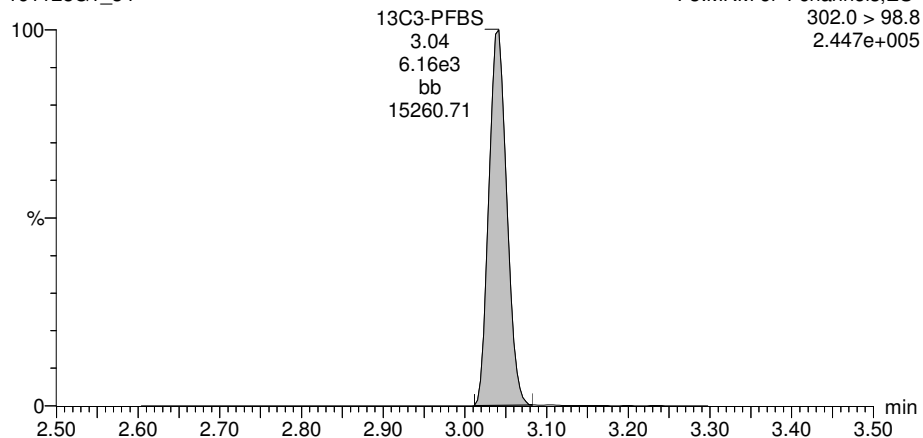
**Total PFOA**

161128G1\_34



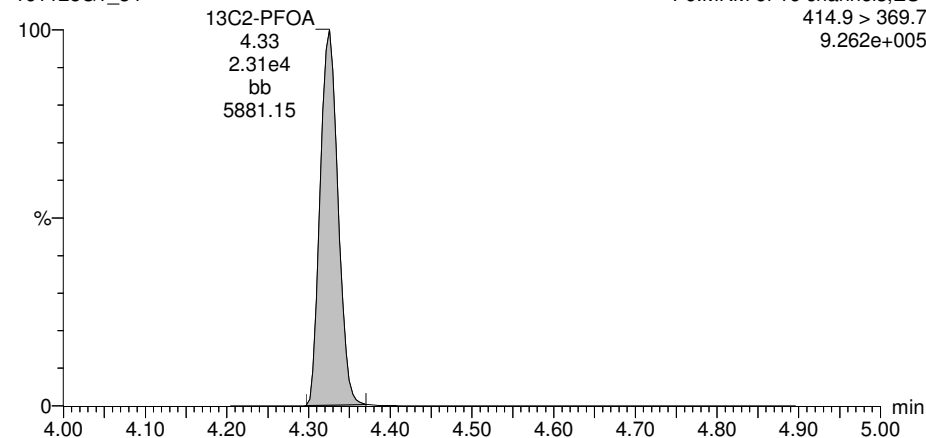
**13C3-PFBS**

161128G1\_34



**13C2-PFOA**

161128G1\_34





Vista Analytical Laboratory Q1

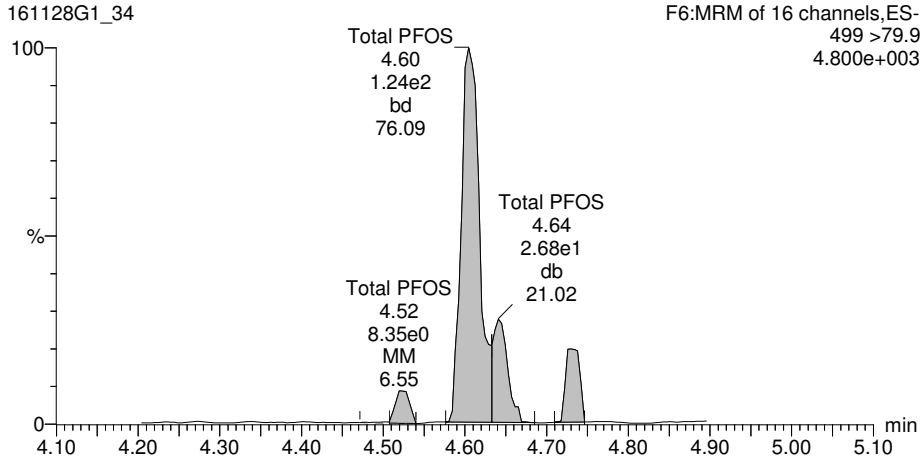
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Last Altered: Tuesday, November 29, 2016 11:08:56 Pacific Standard Time

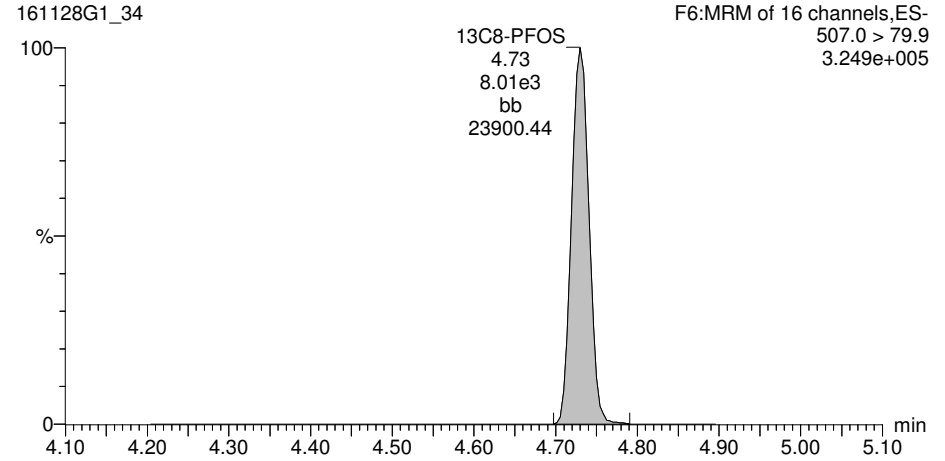
Printed: Tuesday, November 29, 2016 11:09:41 Pacific Standard Time

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Total PFOS



13C8-PFOS

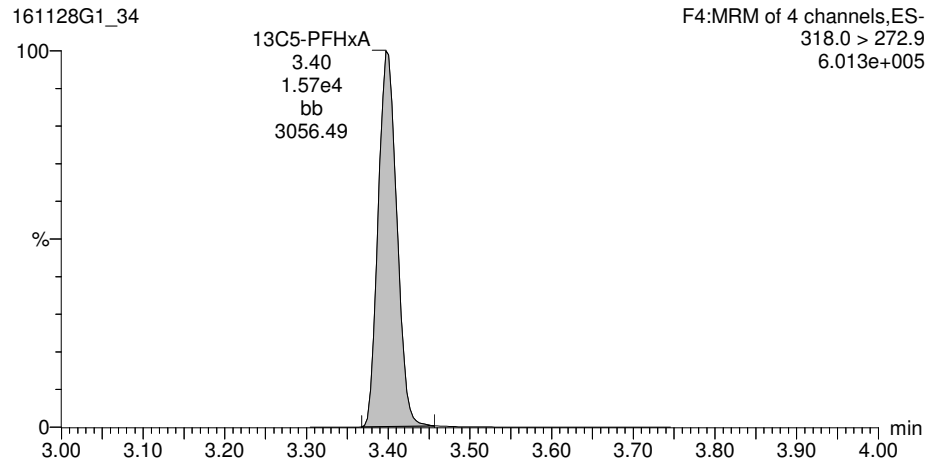


Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-34.qld

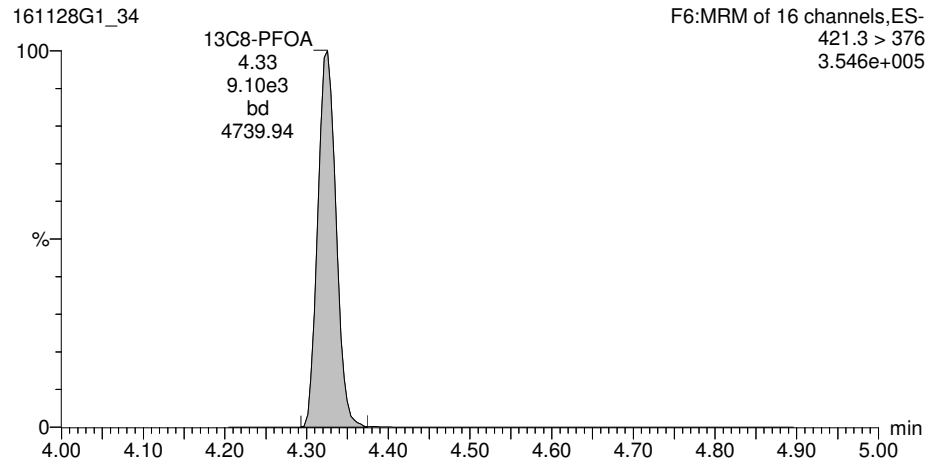
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Printed: Tuesday, November 29, 2016 11:09:41 Pacific Standard Time

ID: 1601443-03 VCT-SP-03-20161110 0.1247, Description: VCT-SP-03-20161110, Name: 161128G1\_34, Date: 28-Nov-2016, Time: 15:51:17, Instrument: , Lab: , User:

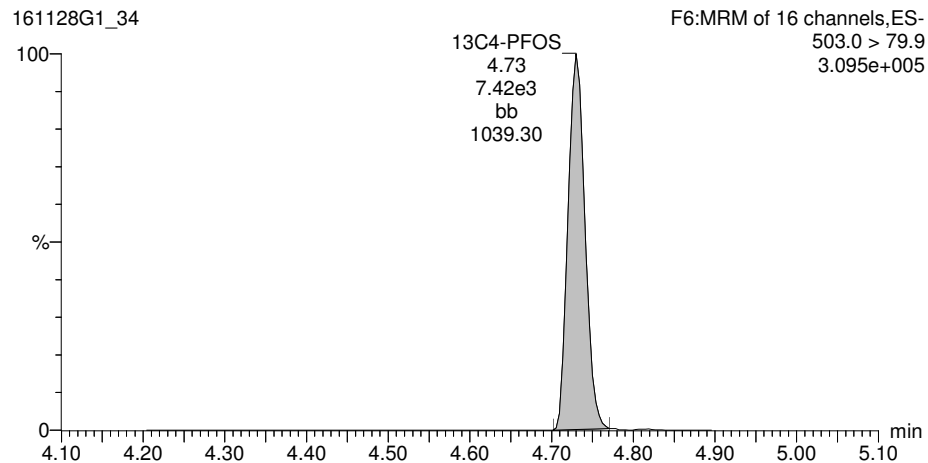
**13C5-PFHxA**



**13C8-PFOA**



**13C4-PFOS**



## **CONTINUING CALIBRATION**

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-18.qld

Last Altered: Monday, November 28, 2016 14:03:31 Pacific Standard Time

Printed: Monday, November 28, 2016 14:05:16 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 28 Nov 2016 07:43:22

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

Name: 161128G1\_18, Date: 28-Nov-2016, Time: 12:28:54, ID: ST161128G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc	%Rec
1	1 PFBA	213.1 > 168.8	1.96e4	2.03e4		1.000	1.95	24.6	98.6
2	2 PFPeA	263.1 > 218.9	1.75e4	8.38e3		1.000	2.86	26.1	104.4
3	3 PFBS	299 > 79.7	2.34e4	6.31e3		1.000	3.11	26.0	104.0
4	4 PFHxA	313.2 > 268.9	1.51e4	4.38e3		1.000	3.48	28.8	115.1
5	5 PFHpA	363 > 318.9	4.54e4	1.46e4		1.000	3.99	25.1	100.4
6	6 PFHxS	398.9 > 79.6	2.07e4	6.06e3		1.000	4.10	24.8	99.2
7	7 6:2 FTS	427.1 > 407	5.86e3	5.18e3		1.000	4.33	31.2	124.8
8	8 PFOA	413 > 368.7	4.86e4	2.57e4		1.000	4.38	26.2	104.7
9	9 PFHpS	449 > 98.7	4.91e3	2.57e4		1.000	4.46	26.1	104.6
10	10 PFOS	499 > 79.9	1.15e4	8.98e3		1.000	4.77	19.4	77.7
11	11 PFNA	463 > 418.8	3.80e4	1.32e4		1.000	4.71	22.0	87.9
12	12 PFDA	513 > 468.8	9.07e3	7.56e3		1.000	5.01	25.2	100.8
13	13 8:2 FTS	527 > 506.9	3.14e3	2.64e3		1.000	4.99	30.4	121.6
14	14 13C3-PFBA	216.1 > 171.8	2.03e4	1.61e4	1.205	1.000	1.95	13.0	104.4
15	15 13C3-PFPeA	266 > 221.8	8.38e3	1.85e4	0.448	1.000	2.86	12.6	101.0
16	16 13C3-PFBS	302.0 > 98.8	6.31e3	1.85e4	0.302	1.000	3.11	14.1	112.7
17	17 13C2-PFHxA	315 > 269.8	4.38e3	1.85e4	0.620	1.000	3.48	4.76	95.3
18	18 13C4-PFHpA	367.2 > 321.8	1.46e4	1.33e4	1.139	1.000	3.98	12.1	96.9
19	19 18O2-PFHxS	403 > 102.6	6.06e3	1.33e4	0.449	1.000	4.09	12.7	101.7
20	20 13C2-6:2 FTS	429.1 > 408.9	5.18e3	5.16e3	1.073	1.000	4.33	11.7	93.6
21	21 13C2-PFOA	414.9 > 369.7	2.57e4	1.22e4	2.262	1.000	4.38	11.7	93.5
22	22 13C8-PFOS	507.0 > 79.9	8.98e3	7.71e3	0.944	1.000	4.77	15.4	123.3
23	23 13C5-PFNA	468.2 > 422.9	1.32e4	1.25e4	1.082	1.000	4.71	12.3	98.0
24	24 13C2-PFDA	515.1 > 469.9	7.56e3	9.70e3	1.019	1.000	5.01	9.56	76.4
25	25 13C2-8:2 FTS	529.1 > 508.7	2.64e3	5.16e3	0.569	1.000	4.99	11.3	90.1
26	26 13C4-PFBA	217 > 171.8	1.61e4	1.61e4	1.000	1.000	1.94	12.5	100.0
27	27 13C2-4:2 FTS	329.2 > 308.9	5.16e3	5.16e3	1.000	1.000	3.38	12.5	100.0
28	28 13C5-PFHxA	318.0 > 272.9	1.85e4	1.85e4	1.000	1.000	3.48	12.5	100.0
29	29 13C3-PFHxS	401.9 > 79.9	1.33e4	1.33e4	1.000	1.000	4.09	12.5	100.0
30	30 13C8-PFOA	421.3 > 376	1.22e4	1.22e4	1.000	1.000	4.38	12.5	100.0
31	31 13C4-PFOS	503.0 > 79.9	7.71e3	7.71e3	1.000	1.000	4.77	12.5	100.0

75-125  
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 11/28/16  
 AMS C 11/29/16

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-18.qld

Last Altered: Monday, November 28, 2016 14:03:31 Pacific Standard Time

Printed: Monday, November 28, 2016 14:05:16 Pacific Standard Time

Name: 161128G1\_18, Date: 28-Nov-2016, Time: 12:28:54, ID: ST161128G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
32	32 13C9-PFNA	472.2 > 426.9	1.25e4	1.25e4	1.000	1.000	4.71	12.5	100.0
33	33 13C6-PFDA	519.1 > 473.7	9.70e3	9.70e3	1.000	1.000	5.01	12.5	100.0

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Last Altered: Tuesday, November 29, 2016 07:55:03 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 07:55:40 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 28 Nov 2016 07:43:22  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

Compound name: PFBA

	Name	ID	Acq Date	Acq Time
1	161128G1_1	IPA	28-Nov-16	08:54:20
2	161128G1_2	ST161128G1-1 PFC CS3.5 16K2701	28-Nov-16	09:06:57
3	161128G1_3	IPA	28-Nov-16	09:19:33
4	161128G1_4	B6K0165-BS1 OPR 0.125	28-Nov-16	09:32:10
5	161128G1_5	IPA	28-Nov-16	09:44:45
6	161128G1_6	B6K0165-BLK1 Method Blank 0.125	28-Nov-16	09:57:24
7	161128G1_7	1601433-16@5X WURTS-VAS11022-27-30 0....	28-Nov-16	10:10:00
8	161128G1_8	1601451-09@5X OUAI-MW08-20161114 0.12...	28-Nov-16	10:22:38
9	161128G1_9	1601461-09 OUAI-MW25-20161115 0.11991	28-Nov-16	10:35:17
10	161128G1_10	1601461-10 OUAI-MW11-20161115 0.1289	28-Nov-16	10:47:53
11	161128G1_11	1601460-01 Outfall-5 (420-113272-1) 0.125	28-Nov-16	11:00:31
12	161128G1_12	1601460-02 Outfall-4 (420-113272-2) 0.125	28-Nov-16	11:13:09
13	161128G1_13	1601460-03 Outfall-7 (420-113272-4) 0.125	28-Nov-16	11:25:46
14	161128G1_14	1601460-04 Outfall-6 (420-113272-5) 0.125	28-Nov-16	11:38:24
15	161128G1_15	1601460-05 Outfall-9A (420-113272-6) 0.125	28-Nov-16	11:51:02
16	161128G1_16	1601460-06 Outfall-9B (420-113272-7) 0.125	28-Nov-16	12:03:41
17	161128G1_17	IPA	28-Nov-16	12:16:16
18	161128G1_18	ST161128G1-2 PFC CS3.5 16K2701	28-Nov-16	12:28:54
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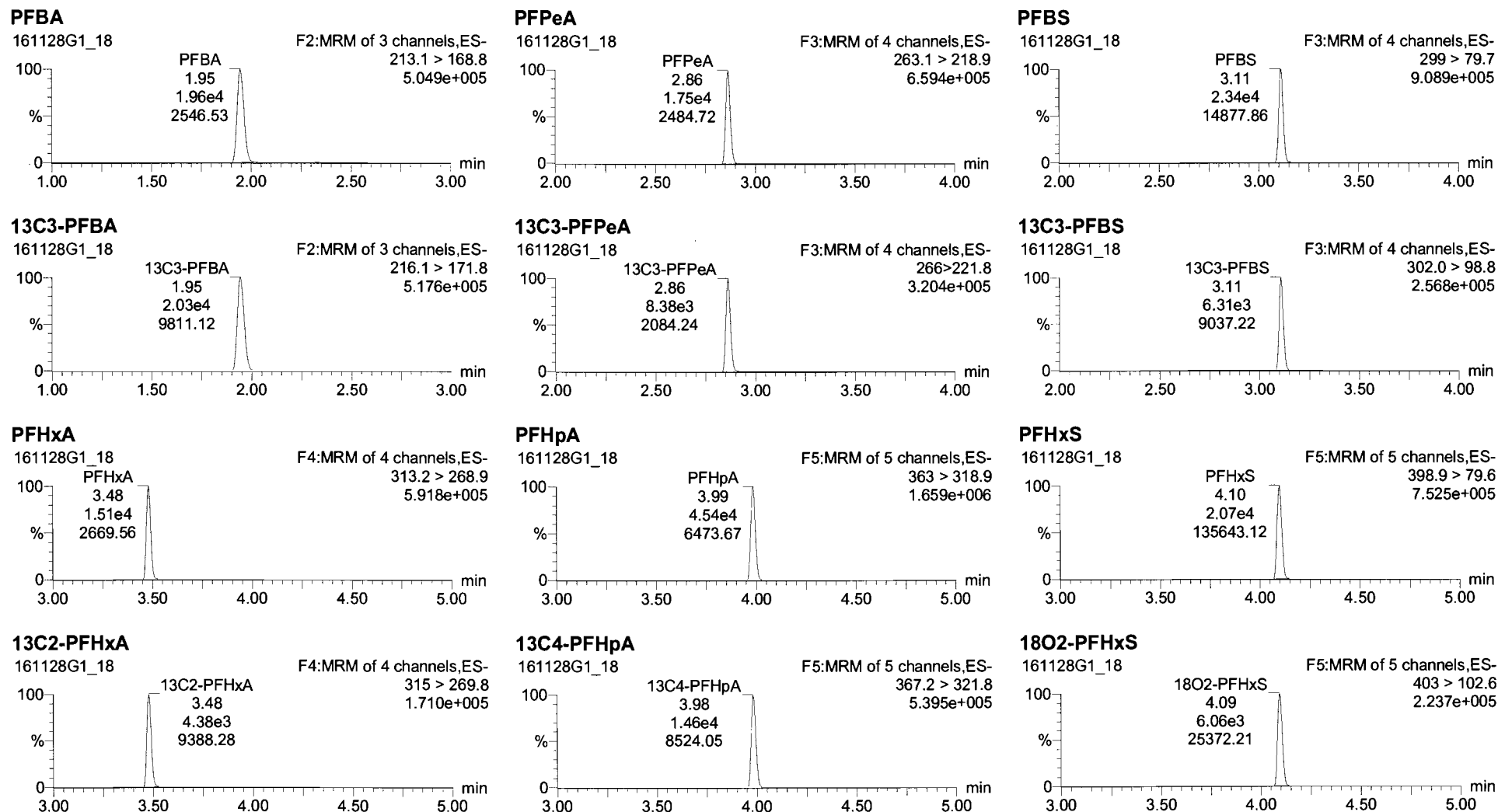
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Printed: Monday, November 28, 2016 14:00:56 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

Name: 161128G1\_18, Date: 28-Nov-2016, Time: 12:28:54, ID: ST161128G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

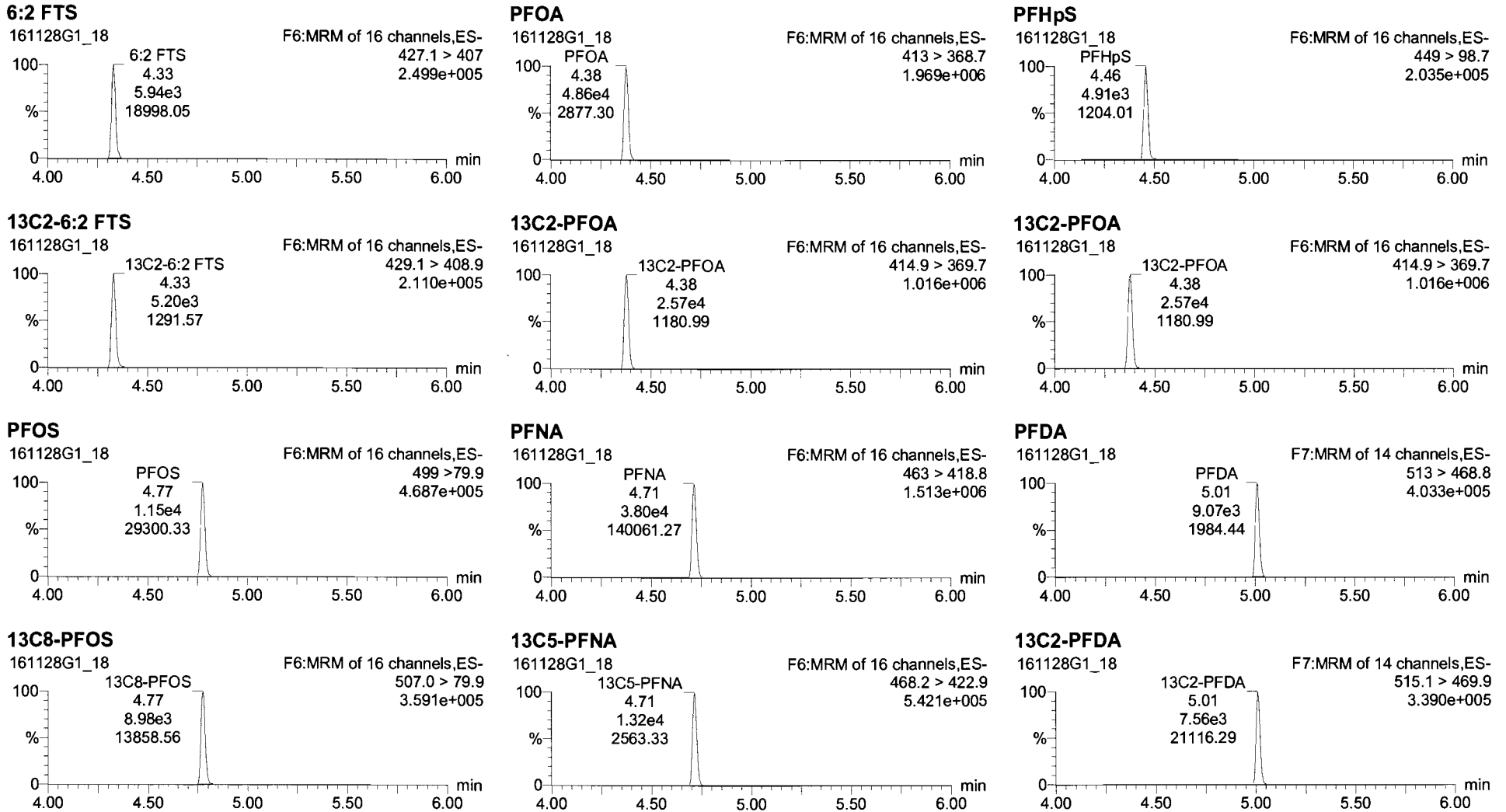


Dataset: Untitled

Last Altered: Monday, November 28, 2016 14:00:45 Pacific Standard Time

Printed: Monday, November 28, 2016 14:00:56 Pacific Standard Time

Name: 161128G1\_18, Date: 28-Nov-2016, Time: 12:28:54, ID: ST161128G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

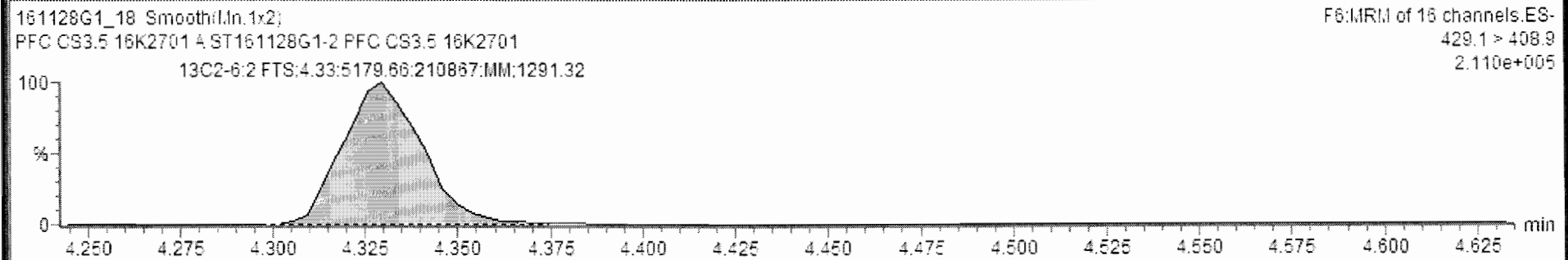
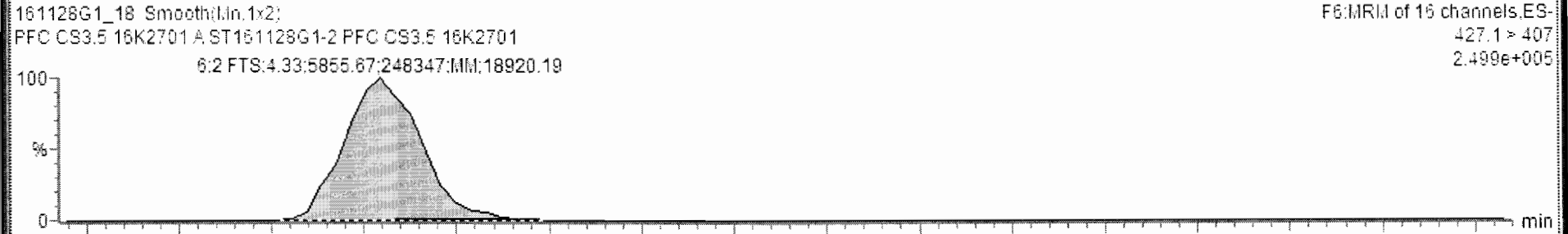






161128G1\_18 - ST161128G1-2 PFC CS3.5 16K2701 - PFC CS3.5 16K2701 A

Name	Trace	Area	Response	RRF	Wt/Vol	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
1	PFBA	213.1 > 168.8	1.96e4	12.106	0.484	1.95	24.6	98.6	0.1075564		0.9984
2	PFPeA	263.1 > 218.9	1.75e4	26.054	1.042	2.88	26.1	104.4	0.1455074		0.9987
3	PFBS	299 > 79.7	2.34e4	46.440	1.858	3.11	26.0	104.0	0.0854324		0.9988
4	PFHxA	313.2 > 268.9	1.51e4	17.237	0.689	3.48	26.8	115.1	0.0111786		0.9985
5	PFHpA	363 > 318.9	4.54e4	38.826	1.553	3.99	25.1	100.4	0.0986956		0.9993
6	PFHxS	395.9 > 79.6	2.07e4	42.661	1.708	4.10	24.8	99.2	0.0159222		0.9975
7	6:2 FTS	427.1 > 407	5.86e3	14.131	0.566	4.33	31.2	124.8	0.2820661		0.9789
8	PFOA	413 > 368.7	4.86e4	23.640	0.948	4.38	26.2	104.7	0.0000000		0.9990
9	PFHpS	449 > 98.7	4.91e3	2.387	0.095	4.46	26.1	104.6	0.3042877		0.9956
10	PFOS	489 > 79.9	1.15e4	16.044	0.642	4.77	19.4	77.7	0.2004210		0.9935
11	PFNA	483 > 418.8	3.80e4	35.895	1.436	4.71	22.0	87.9	0.1043076		0.9954
12	PFDA	513 > 468.8	9.07e3	15.009	0.600	5.01	25.2	100.8	0.0649822		0.9973
13	8:2 FTS	527 > 506.9	3.14e3	14.826	0.593	4.99	30.4	121.6	0.0000000		0.9841



Dataset:        Untitled

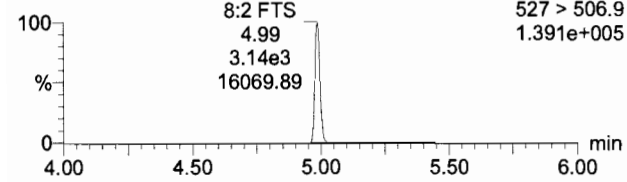
Last Altered:    Monday, November 28, 2016 14:00:45 Pacific Standard Time  
Printed:         Monday, November 28, 2016 14:00:56 Pacific Standard Time

Name: 161128G1\_18, Date: 28-Nov-2016, Time: 12:28:54, ID: ST161128G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

**8:2 FTS**

161128G1\_18

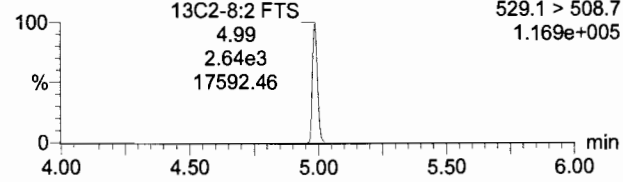
F7:MRM of 14 channels,ES-  
527 > 506.9  
1.391e+005



**13C2-8:2 FTS**

161128G1\_18

F7:MRM of 14 channels,ES-  
529.1 > 508.7  
1.169e+005

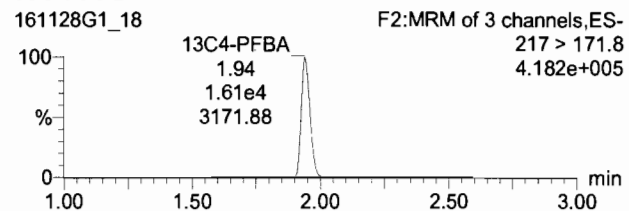


Dataset: Untitled

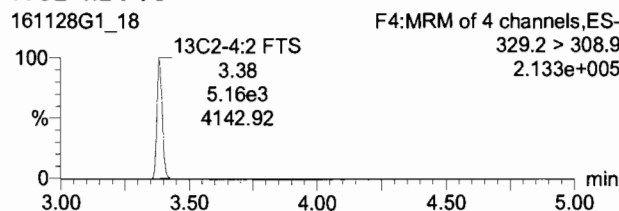
Last Altered: Monday, November 28, 2016 14:00:45 Pacific Standard Time  
Printed: Monday, November 28, 2016 14:00:56 Pacific Standard Time

Name: 161128G1\_18, Date: 28-Nov-2016, Time: 12:28:54, ID: ST161128G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

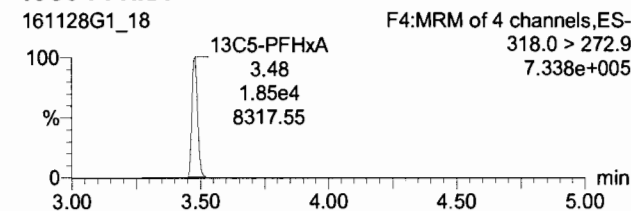
**13C4-PFBA**



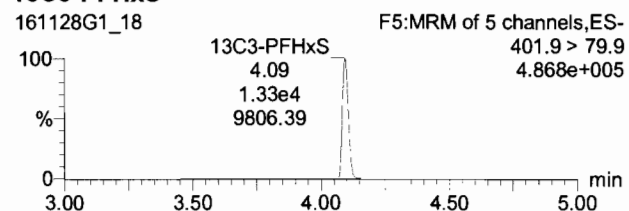
**13C2-4:2 FTS**



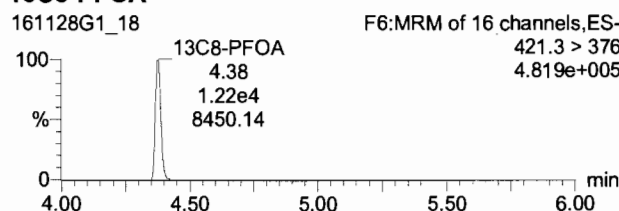
**13C5-PFHxA**



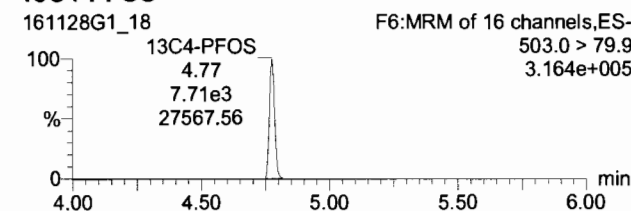
**13C3-PFHxS**



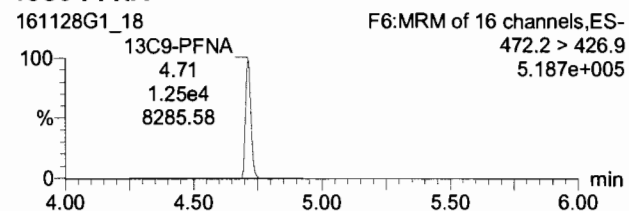
**13C8-PFOA**



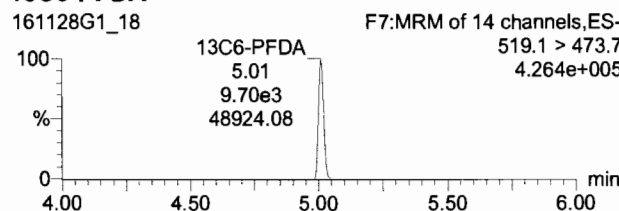
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-38.qld

Last Altered: Tuesday, November 29, 2016 13:13:58 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 13:15:06 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 10:32:39  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

Name: 161128G1\_38, Date: 28-Nov-2016, Time: 16:42:22, ID: ST161128G1-3 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
1	1 PFBA	213.1 > 168.8	2.16e4	2.23e4	1.000	1.000	1.84	24.6	98.5
2	2 PFPeA	263.1 > 218.9	1.92e4	9.36e3	1.000	1.000	2.78	25.6	102.6
3	3 PFBS	299 > 79.7	2.52e4	6.83e3	1.000	1.000	3.04	25.8	103.2
4	4 PFHxA	313.2 > 268.9	1.56e4	5.37e3	1.000	1.000	3.40	24.3	97.1
5	5 PFHpA	363 > 318.9	5.03e4	1.53e4	1.000	1.000	3.92	26.5	106.1
6	6 PFHxS	398.9 > 79.6	2.37e4	6.78e3	1.000	1.000	4.04	25.4	101.4
7	7 6:2 FTS	427.1 > 407	6.13e3	7.05e3	1.000	1.000	4.28	24.5	98.2
8	8 PFOA	413 > 368.7	5.32e4	2.95e4	1.000	1.000	4.33	24.9	99.6
9	9 PFHpS	449 > 98.7	5.00e3	2.95e4	1.000	1.000	4.41	23.2	92.9
10	10 PFOS	499 > 79.9	1.55e4	9.11e3	1.000	1.000	4.73	25.8	103.0
11	11 PFNA	463 > 418.8	4.81e4	1.42e4	1.000	1.000	4.67	25.9	103.6
12	12 PFDA	513 > 468.8	1.11e4	9.15e3	1.000	1.000	4.97	25.4	101.7
13	13 8:2 FTS	527 > 506.9	4.17e3	3.45e3	1.000	1.000	4.94	30.9	123.8
14	14 13C3-PFBA	216.1 > 171.8	2.23e4	1.85e4	1.205	1.000	1.84	12.5	100.4
15	15 13C3-PFPeA	266 > 221.8	9.36e3	2.12e4	0.448	1.000	2.78	12.3	98.4
16	16 13C3-PFBS	302.0 > 98.8	6.83e3	2.12e4	0.302	1.000	3.04	13.3	106.4
17	17 13C2-PFHxA	315 > 269.8	5.37e3	2.12e4	0.620	1.000	3.40	5.10	102.0
18	18 13C4-PFHpA	367.2 > 321.8	1.53e4	1.43e4	1.139	1.000	3.92	11.7	93.8
19	19 18O2-PFHxS	403 > 102.6	6.78e3	1.43e4	0.449	1.000	4.04	13.2	105.4
20	20 13C2-6:2 FTS	429.1 > 408.9	7.05e3			1.000	4.28		
21	21 13C2-PFOA	414.9 > 369.7	2.95e4	1.13e4	2.262	1.000	4.33	14.5	116.1
22	22 13C8-PFOS	507.0 > 79.9	9.11e3	9.11e3	0.944	1.000	4.73	13.2	106.0
23	23 13C5-PFNA	468.2 > 422.9	1.42e4	1.33e4	1.082	1.000	4.67	12.4	98.9
24	24 13C2-PFDA	515.1 > 469.9	9.15e3	1.03e4	1.019	1.000	4.97	10.9	87.4
25	25 13C2-8:2 FTS	529.1 > 508.7	3.45e3			1.000	4.94		
26	26 13C4-PFBA	217 > 171.8	1.85e4	1.85e4	1.000	1.000	1.84	12.5	100.0
27	27 13C2-4:2 FTS	329.2 > 308.9				1.000			
28	28 13C5-PFHxA	318.0 > 272.9	2.12e4	2.12e4	1.000	1.000	3.40	12.5	100.0
29	29 13C3-PFHxS	401.9 > 79.9	1.43e4	1.43e4	1.000	1.000	4.04	12.5	100.0
30	30 13C8-PFOA	421.3 > 376	1.13e4	1.13e4	1.000	1.000	4.33	12.5	100.0
31	31 13C4-PFOS	503.0 > 79.9	9.11e3	9.11e3	1.000	1.000	4.73	12.5	100.0

19-125  
Ⓐ Not used in this sequence.  
AC  
11/29/16  
PW  
11/29/16

60-150  
60-150  
50-150  
60-150

Ⓐ  
Ⓐ  
Ⓐ

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161128G1\161128G1-38.qld

Last Altered: Tuesday, November 29, 2016 13:13:58 Pacific Standard Time

Printed: Tuesday, November 29, 2016 13:15:06 Pacific Standard Time

Name: 161128G1\_38, Date: 28-Nov-2016, Time: 16:42:22, ID: ST161128G1-3 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc	%Rec
32	32 13C9-PFNA	472.2 > 426.9	1.33e4	1.33e4	1.000	1.000	4.67	12.5	100.0
33	33 13C6-PFDA	519.1 > 473.7	1.03e4	1.03e4	1.000	1.000	4.97	12.5	100.0

Dataset: Untitled

Last Altered: Tuesday, November 29, 2016 13:49:19 Pacific Standard Time

Printed: Tuesday, November 29, 2016 13:49:35 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 29 Nov 2016 13:36:56  
 Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

Compound name: PFBA

	Name	ID	Acq Date	Acq Time
1	161128G1_20	1601460-07 Outfall-1 (420-113272-8) 0.125	28-Nov-16	12:54:11
2	161128G1_21	1601460-08 Outfall-8 (420-113272-3) 0.125	28-Nov-16	13:06:47
3	161128G1_22	1601465-01 MARCH-GW-032 0.125	28-Nov-16	13:19:23
4	161128G1_23	1601465-02 MARCH-GW-033 0.125	28-Nov-16	13:32:00
5	161128G1_24	1601465-03 FB1-11162016 0.125	28-Nov-16	13:44:38
6	161128G1_25	IPA	28-Nov-16	13:57:16
7	161128G1_26	B6K0147-BS1 OPR 0.125	28-Nov-16	14:09:54
8	161128G1_27	B6K0156-BS1 OPR 0.125	28-Nov-16	14:22:29
9	161128G1_28	B6K0156-BSD1 LCS Dup 0.125	28-Nov-16	14:35:05
10	161128G1_29	IPA	28-Nov-16	14:47:41
11	161128G1_30	B6K0147-BLK1 Method Blank 0.125	28-Nov-16	15:00:21
12	161128G1_31	B6K0156-BLK1 Method Blank 0.125	28-Nov-16	15:13:03
13	161128G1_32	1601443-01 VCT-SP-01-20161110 0.12637	28-Nov-16	15:25:49
14	161128G1_33	1601443-02 VCT-SP-02-20161110 0.11919	28-Nov-16	15:38:32
15	161128G1_34	1601443-03 VCT-SP-03-20161110 0.1247	28-Nov-16	15:51:17
16	161128G1_35	1601455-01 PFAS-SW09-110916 0.1284	28-Nov-16	16:04:05
17	161128G1_36	1601455-02 PFAS-SW16-110916 0.11809	28-Nov-16	16:16:50
18	161128G1_37	IPA	28-Nov-16	16:29:35
19	161128G1_38	ST161128G1-3 PFC CS3.5 16K2701	28-Nov-16	16:42:22
20	161128G1_39	IPA	28-Nov-16	16:55:07
21	161128G1_40	1601455-03 PFAS-WGL-MW-904S-111116 0....	28-Nov-16	17:07:56
22	161128G1_41	B6K0156-MS1 Matrix Spike 0.11067	28-Nov-16	17:20:55
23	161128G1_42	B6K0156-MSD1 Matrix Spike Dup 0.12192	28-Nov-16	17:33:56
24	161128G1_43	1601455-04 PFAS-SW27-111016 0.1203	28-Nov-16	17:46:58
25	161128G1_44	1601455-05 PFAS-SW34-111116 0.12111	28-Nov-16	17:59:54
26	161128G1_45	1601455-06 PFAS-SW33-111116 0.1217	28-Nov-16	18:12:47
27	161128G1_46	1601455-07 PFAS-SW30-111116 0.11905	28-Nov-16	18:25:48
28	161128G1_47	1601455-08 PFAS-SW23-111016 0.11329	28-Nov-16	18:38:47
29	161128G1_48	1601455-09 PFAS-SW26-111016 0.11429	28-Nov-16	18:51:39
30	161128G1_49	1601455-10 PFAS-SW21-111016 0.12023	28-Nov-16	19:04:28
31	161128G1_50	1601410-01RE1 WURTS-EB008JH-110216 0....	28-Nov-16	19:17:15

Dataset: Untitled

Last Altered: Tuesday, November 29, 2016 13:49:19 Pacific Standard Time  
 Printed: Tuesday, November 29, 2016 13:49:35 Pacific Standard Time

Compound name: PFBA

	Name	ID	Acq Date	Acq Time
32	161128G1_51	1601410-02RE1 WURTS-VAS04006-32-35_F...	28-Nov-16	19:30:02
33	161128G1_52	IPA	28-Nov-16	19:42:50
34	161128G1_53	ST161128G1-4 PFC CS3.5 16K2701	28-Nov-16	19:55:42
35	161128G1_54	IPA	28-Nov-16	20:08:29
36	161128G1_55	1601410-03RE1 WURTS-VAS04006-42-45 0....	28-Nov-16	20:21:20
37	161128G1_56	1601410-04RE1 WURTS-VAS04006-52-55 0....	28-Nov-16	20:34:08
38	161128G1_57	1601410-05RE1 WURTS-VAS17001-21-24 0....	28-Nov-16	20:46:58
39	161128G1_58	1601410-06RE1 WURTS-VAS17001-21-24_F...	28-Nov-16	20:59:44
40	161128G1_59	1601410-07RE1 WURTS-VAS17001-31-34 0....	28-Nov-16	21:12:28
41	161128G1_60	1601410-08RE1 WURTS-VAS17001-41-44 0....	28-Nov-16	21:25:13
42	161128G1_61	1601410-09RE1 WURTS-VAS17003-22-25 0....	28-Nov-16	21:37:58
43	161128G1_62	1601410-10RE1 WURTS-VAS17003-32-35 0....	28-Nov-16	21:50:44
44	161128G1_63	1601410-11RE1 WURTS-VAS17003-42-45 0....	28-Nov-16	22:03:30
45	161128G1_64	1601410-12RE1 WURTS-VAS17003-52-55 0....	28-Nov-16	22:16:15
46	161128G1_65	IPA	28-Nov-16	22:29:00
47	161128G1_66	ST161128G1-5 PFC CS3.5 16K2701	28-Nov-16	22:41:47
48	161128G1_67	IPA	28-Nov-16	22:54:31
49	161128G1_68	B6K0133-BS1 OPR 0.125	28-Nov-16	23:07:22
50	161128G1_69	IPA	28-Nov-16	23:20:07
51	161128G1_70	B6K0133-BLK1 Method Blank 0.125	28-Nov-16	23:32:54
52	161128G1_71	1601432-01 WURTS-EB011JH-110716 0.12773	28-Nov-16	23:45:40
53	161128G1_72	1601432-02 WURTS-EB012JH-110716 0.13049	28-Nov-16	23:58:27
54	161128G1_73	1601432-03 WURTS-VAS13006-27-30 0.12766	29-Nov-16	00:11:15
55	161128G1_74	B6K0133-MS1 Matrix Spike 0.1336	29-Nov-16	00:24:04
56	161128G1_75	B6K0133-MSD1 Matrix Spike Dup 0.12866	29-Nov-16	00:36:47
57	161128G1_76	1601432-04 WURTS-VAS13006-27-30_FD 0....	29-Nov-16	00:49:32
58	161128G1_77	1601432-05 WURTS-VAS13006-37-40 0.12493	29-Nov-16	01:02:17
59	161128G1_78	1601432-06 WURTS-VAS13006-47-50 0.12703	29-Nov-16	01:15:03
60	161128G1_79	1601432-07 WURTS-VAS13006-57-60 0.13017	29-Nov-16	01:27:46
61	161128G1_80	1601432-08 WURTS-VAS15009-18-21 0.12505	29-Nov-16	01:40:33
62	161128G1_81	B6K0133-MS2 Matrix Spike 0.12587	29-Nov-16	01:53:20
63	161128G1_82	B6K0133-MSD2 Matrix Spike Dup 0.12959	29-Nov-16	02:06:13
64	161128G1_83	1601432-09 WURTS-VAS15009-18-21_FD 0....	29-Nov-16	02:18:53
65	161128G1_84	1601432-10 WURTS-VAS15009-28-31 0.13091	29-Nov-16	02:31:30

Dataset: Untitled

Last Altered: Tuesday, November 29, 2016 13:49:19 Pacific Standard Time

Printed: Tuesday, November 29, 2016 13:49:35 Pacific Standard Time

Compound name: PFBA

	Name	ID	Acq. Date	Acq. Time
66	161128G1_85	IPA	29-Nov-16	02:44:07
67	161128G1_86	ST161128G1-6 PFC CS3.5 16K2701	29-Nov-16	02:56:45
68	161128G1_87	IPA	29-Nov-16	03:09:21
69	161128G1_88	B6K0170-BS1 OPR 0.125	29-Nov-16	03:21:58
70	161128G1_89	IPA	29-Nov-16	03:34:36
71	161128G1_90	B6K0170-BLK1 Method Blank 0.125	29-Nov-16	03:47:14
72	161128G1_91	1601418-02RE1 MATPXX001FRB 0.12981	29-Nov-16	03:59:53
73	161128G1_92	1601432-11 WURTS-VAS15009-38-41 0.13037	29-Nov-16	04:12:32
74	161128G1_93	1601432-12 WURTS-VAS15009-48-51 0.13223	29-Nov-16	04:25:09
75	161128G1_94	IPA	29-Nov-16	04:37:47
76	161128G1_95	ST161128G1-7 PFC CS3.5 16K2701	29-Nov-16	04:50:26
77	161128G1_96	IPA	29-Nov-16	05:03:02



# LC Calibration Standards Review Checklist Q1

Calibration ID:		L M H	ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manual Integrations	N/A
ST161128G1-3			<del>N/A</del>	<input checked="" type="checkbox"/> (A)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	-4		<input type="checkbox"/>	<input checked="" type="checkbox"/> (A)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	-5		<input type="checkbox"/>	<input checked="" type="checkbox"/> (A)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	-6		<input type="checkbox"/>	<input checked="" type="checkbox"/> (A)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/> -7		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (A)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		L M H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		L M H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		L M H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		L M H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		L M H	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Full Mass Cal. Date: 11/21/16

Reviewed By: PW 11/29/16  
Initials/Date

**Comments:**  
(A) 6:2, 8:2, 4:2 FTS  
labeled not used  
in this sequence. AC 11/29/16

Dataset: Untitled

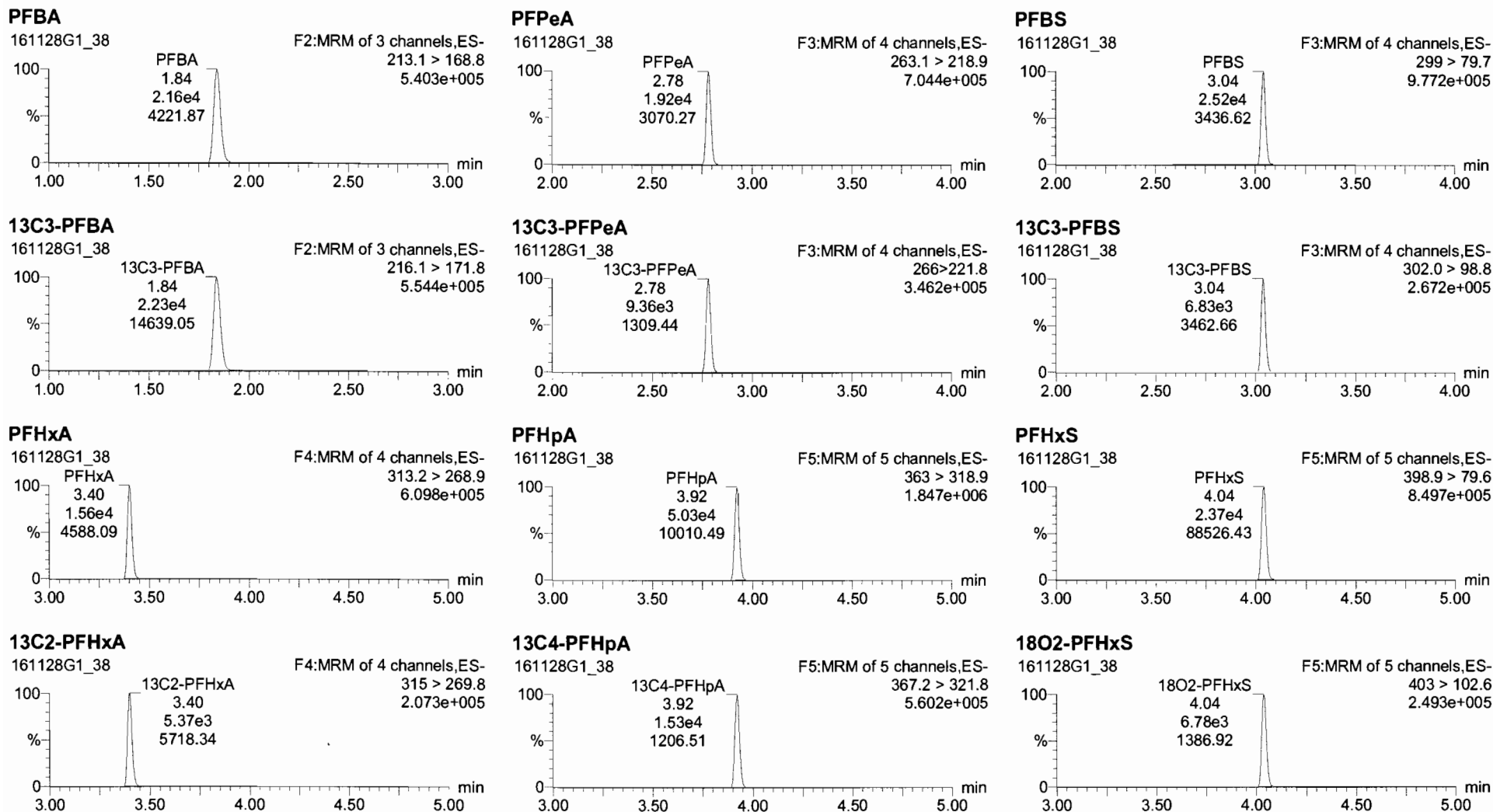
Last Altered: Tuesday, November 29, 2016 09:28:37 Pacific Standard Time

Printed: Tuesday, November 29, 2016 09:28:59 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 28 Nov 2016 07:43:22

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

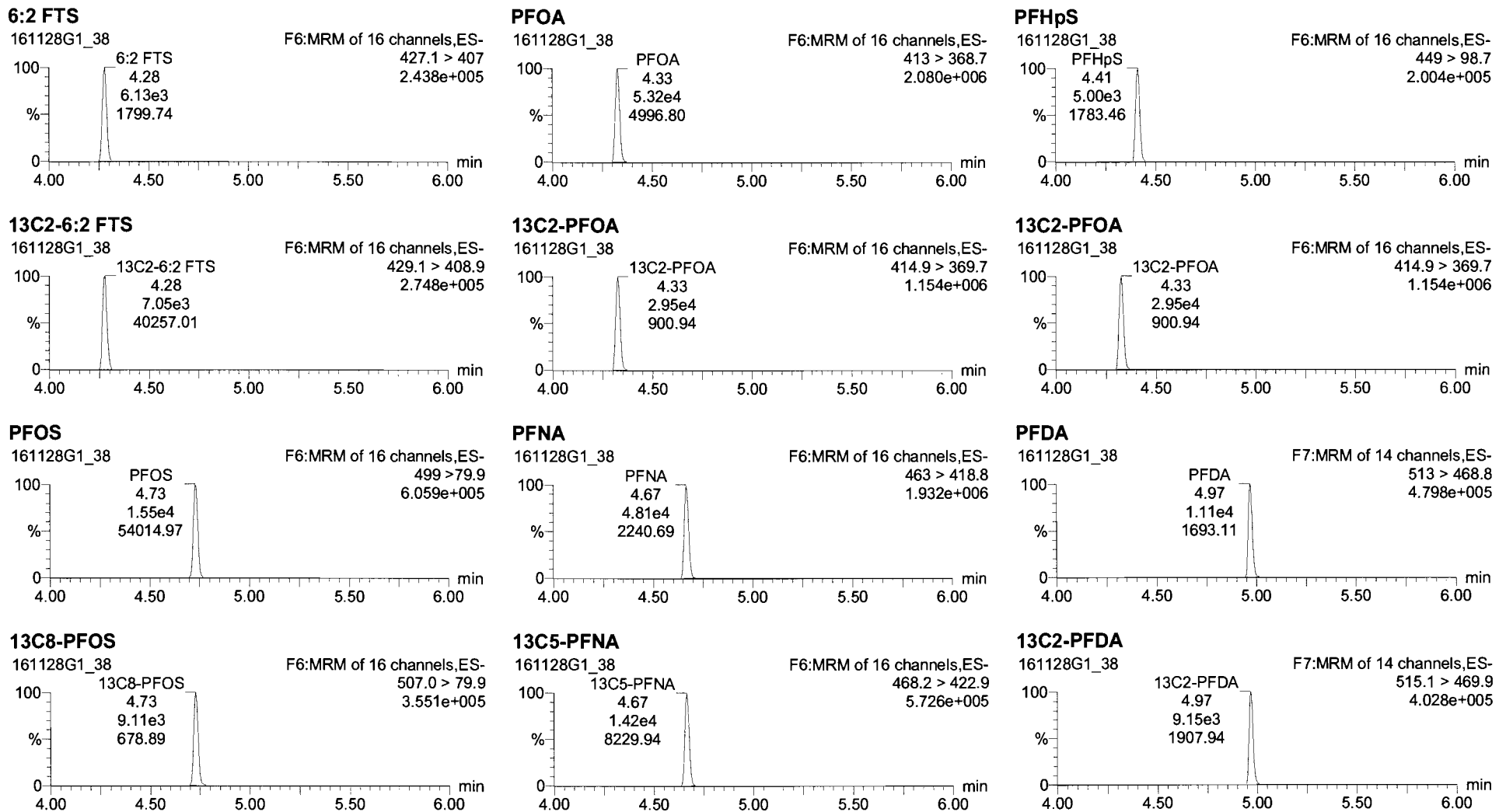
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Dataset: Untitled

Last Altered: Tuesday, November 29, 2016 09:28:37 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 09:28:59 Pacific Standard Time

Name: 161128G1\_38, Date: 28-Nov-2016, Time: 16:42:22, ID: ST161128G1-3 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

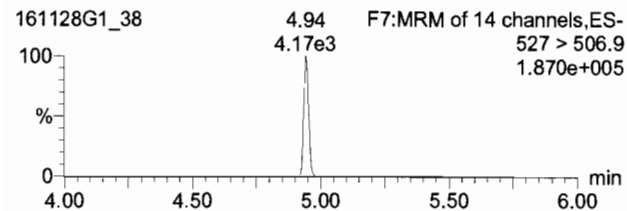


Dataset: Untitled

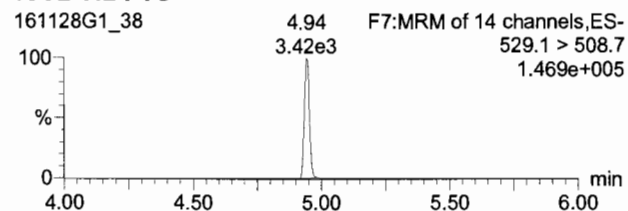
Last Altered: Tuesday, November 29, 2016 09:28:37 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 09:28:59 Pacific Standard Time

Name: 161128G1\_38, Date: 28-Nov-2016, Time: 16:42:22, ID: ST161128G1-3 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

8:2 FTS



13C2-8:2 FTS



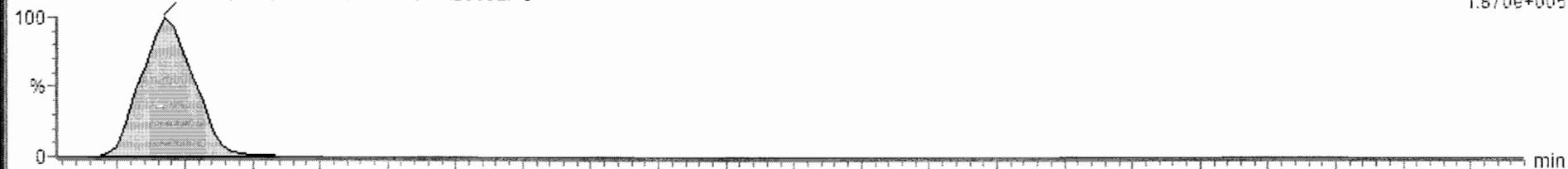


161128G1\_38 - ST161128G1-3 PFC CS3.5 16K2701 - PFC CS3.5 16K2701 A

Name	Trace	Area	RRF	Wt/Vol	Pred. RT	RT	Conc.	>MDL	%Rec	DL
1	PFBA	213.1 > 168.8	2.16e4	1.000	1.84	1.84	24.6	YES	98.5	0.0979380
2	PFPeA	263.1 > 218.9	1.92e4	1.000	2.78	2.78	25.6	YES	102.6	0.1403250
3	PFBS	299 > 79.7	2.52e4	1.000	3.04	3.04	25.8	YES	103.2	0.0998188
4	PFHxA	313.2 > 268.9	1.56e4	1.000	3.40	3.40	24.3	YES	97.1	0.0000000
5	PFHpA	363 > 318.9	5.03e4	1.000	3.92	3.92	28.5	YES	106.1	0.0957791
6	PFHxS	396.9 > 79.6	2.37e4	1.000	4.04	4.04	25.4	YES	101.4	0.0161711
7	6:2 FTS	427.1 > 407	6.13e3	1.000	4.28	4.28	24.5	YES	98.2	0.3145173
8	PFOA	413 > 368.7	5.32e4	1.000	4.33	4.33	24.9	YES	99.6	0.0000000
9	PFHpS	449 > 98.7	5.00e3	1.000	4.33	4.41	23.2	YES	92.9	0.2809614
10	PFOS	499 > 79.9	1.55e4	1.000	4.73	4.73	25.8	YES	103.0	0.1999379
11	PFNA	483 > 418.8	4.81e4	1.000	4.67	4.67	25.9	YES	103.6	0.1325772
12	PFDA	513 > 468.8	1.11e4	1.000	4.97	4.97	25.4	NO	101.7	0.0705456
13	8:2 FTS	527 > 506.9	4.17e3	1.000	4.94	4.94	30.9	YES	123.8	0.0000000

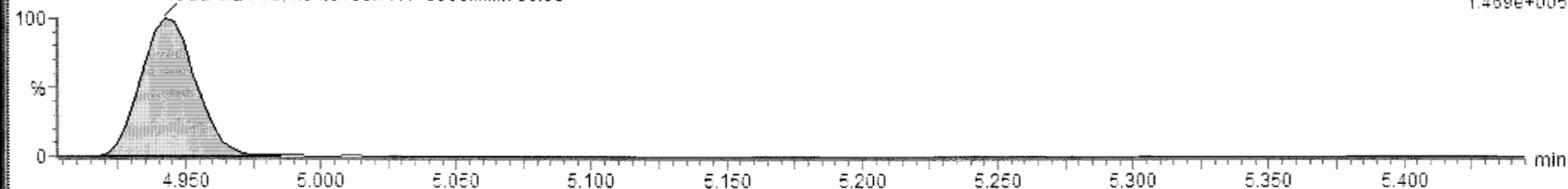
161128G1\_38 Smooth(Mn,1x2)  
 PFC CS3.5 16K2701 A ST161128G1-3 PFC CS3.5 16K2701  
 8:2 FTS:4.94:4168.14:186956:MM:28592.48

F7:MRM of 14 channels.ES-  
 527 > 506.9  
 1.870e+005



161128G1\_38 Smooth(Mn,1x2)  
 PFC CS3.5 16K2701 A ST161128G1-3 PFC CS3.5 16K2701  
 13C2-8:2 FTS:4.94:3453.77:145866:MM:750.93

F7:MRM of 14 channels.ES-  
 529.1 > 508.7  
 1.459e+005

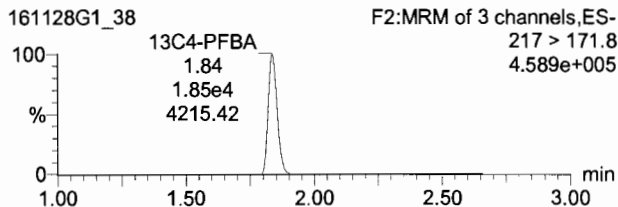


Dataset: Untitled

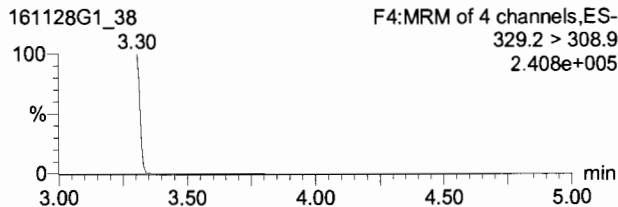
Last Altered: Tuesday, November 29, 2016 09:28:37 Pacific Standard Time  
Printed: Tuesday, November 29, 2016 09:28:59 Pacific Standard Time

Name: 161128G1\_38, Date: 28-Nov-2016, Time: 16:42:22, ID: ST161128G1-3 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

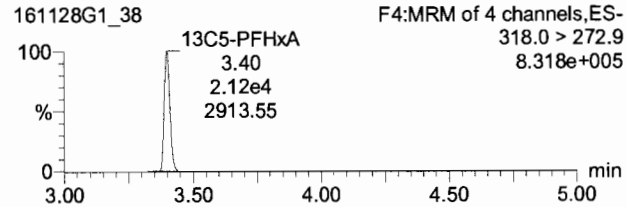
**13C4-PFBA**



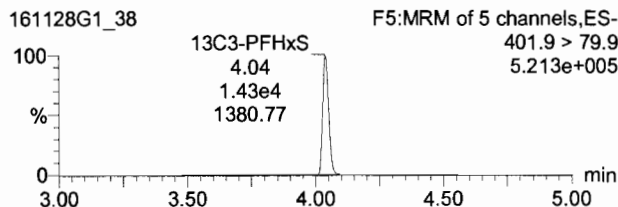
**13C2-4:2 FTS**



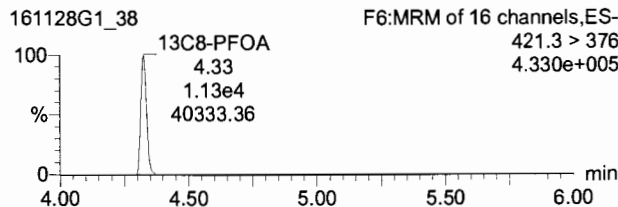
**13C5-PFHxA**



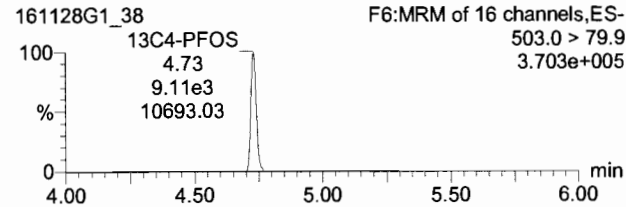
**13C3-PFHxS**



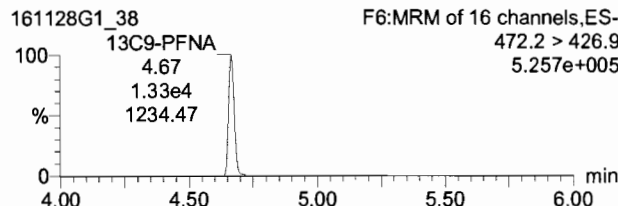
**13C8-PFOA**



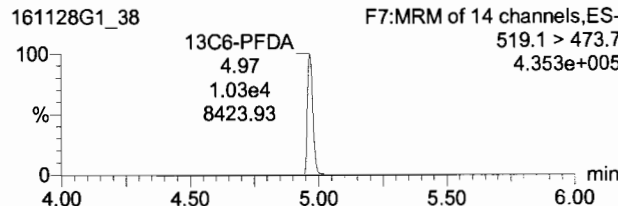
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



## **INITIAL CALIBRATION**

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 22 Nov 2016 14:48:05

Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

**Compound name: PFBA**

Correlation coefficient:  $r = 0.999216$ ,  $r^2 = 0.998432$

Calibration curve:  $0.492927 * x + -0.0410615$

Response type: Internal Std ( Ref 14 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	1.93	4.29e2	2.07e4	0.608	0.518	21.7
2	2 161122G2_3	1.00	1.93	7.79e2	2.25e4	0.959	0.432	-4.1
3	3 161122G2_4	2.00	1.93	1.63e3	2.32e4	1.86	0.439	-6.8
4	4 161122G2_5	5.00	1.93	3.55e3	2.31e4	3.97	0.383	-20.6
5	5 161122G2_6	10.0	1.93	8.96e3	2.17e4	10.6	0.516	5.6
6	6 161122G2_7	25.0	1.93	1.94e4	1.87e4	26.4	0.519	5.5
7	7 161122G2_8	50.0	1.93	3.75e4	1.90e4	50.0	0.492	0.0
8	8 161122G2_9	75.0	1.93	5.74e4	1.98e4	73.5	0.482	-2.0
9	9 161122G2_10	100	1.93	7.24e4	1.83e4	101	0.496	0.7

AC  
11/22/16

**Compound name: PFPeA**

Correlation coefficient:  $r = 0.999341$ ,  $r^2 = 0.998683$

Calibration curve:  $1.00273 * x + -0.119981$

Response type: Internal Std ( Ref 15 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	2.85	3.66e2	9.28e3	0.611	0.986	22.2
2	2 161122G2_3	1.00	2.85	6.80e2	9.67e3	0.996	0.879	-0.4
3	3 161122G2_4	2.00	2.86	1.32e3	9.90e3	1.79	0.836	-10.6
4	4 161122G2_5	5.00	2.85	3.20e3	1.02e4	4.02	0.782	-19.6
5	5 161122G2_6	10.0	2.85	8.05e3	9.55e3	10.6	1.05	6.4
6	6 161122G2_7	25.0	2.85	1.68e4	8.18e3	25.7	1.03	2.7
7	7 161122G2_8	50.0	2.85	3.26e4	8.27e3	49.3	0.986	-1.5
8	8 161122G2_9	75.0	2.85	4.96e4	8.14e3	76.0	1.01	1.4
9	9 161122G2_10	100	2.85	5.76e4	7.23e3	99.5	0.996	-0.5

CS 4.5 & 5 excluded  
from 6:2 FTS regression.



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

**Compound name: PFBS**

Correlation coefficient:  $r = 0.999283$ ,  $r^2 = 0.998566$

Calibration curve:  $1.79216 * x + -0.145672$

Response type: Internal Std ( Ref 16 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	3.10	4.84e2	6.26e3	0.620	1.93	24.1
2	2 161122G2_3	1.00	3.10	8.53e2	6.27e3	1.03	1.70	3.1
3	3 161122G2_4	2.00	3.10	1.59e3	6.78e3	1.72	1.47	-14.0
4	4 161122G2_5	5.00	3.10	4.15e3	7.36e3	4.01	1.41	-19.7
5	5 161122G2_6	10.0	3.10	9.73e3	6.40e3	10.7	1.90	7.0
6	6 161122G2_7	25.0	3.10	2.06e4	5.76e3	25.0	1.79	-0.1
7	7 161122G2_8	50.0	3.10	3.75e4	5.35e3	48.9	1.75	-2.2
8	8 161122G2_9	75.0	3.10	5.77e4	5.29e3	76.2	1.82	1.6
9	9 161122G2_10	100	3.10	7.03e4	4.89e3	100	1.80	0.4

**Compound name: PFHxA**

Correlation coefficient:  $r = 0.999245$ ,  $r^2 = 0.998491$

Calibration curve:  $0.598427 * x + 0.0095449$

Response type: Internal Std ( Ref 17 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	3.47	3.91e2	5.21e3	0.612	0.751	22.3
2	2 161122G2_3	1.00	3.47	6.55e2	5.44e3	0.989	0.602	-1.1
3	3 161122G2_4	2.00	3.47	1.13e3	5.54e3	1.69	0.512	-15.3
4	4 161122G2_5	5.00	3.47	2.82e3	5.55e3	4.23	0.508	-15.5
5	5 161122G2_6	10.0	3.47	6.63e3	5.30e3	10.4	0.625	4.3
6	6 161122G2_7	25.0	3.47	1.40e4	4.52e3	25.9	0.621	3.6
7	7 161122G2_8	50.0	3.47	2.69e4	4.31e3	52.1	0.624	4.2
8	8 161122G2_9	75.0	3.47	4.00e4	4.48e3	74.5	0.594	-0.7
9	9 161122G2_10	100	3.47	4.95e4	4.22e3	98.0	0.587	-2.0

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

**Compound name: PFHpA**

Correlation coefficient:  $r = 0.999639$ ,  $r^2 = 0.999279$

Calibration curve:  $1.55279 * x + -0.138431$

Response type: Internal Std ( Ref 18 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	3.98	9.73e2	1.51e4	0.608	1.61	21.5
2	2 161122G2_3	1.00	3.98	1.74e3	1.58e4	0.979	1.38	-2.1
3	3 161122G2_4	2.00	3.98	3.68e3	1.71e4	1.82	1.34	-9.2
4	4 161122G2_5	5.00	3.98	8.49e3	1.63e4	4.28	1.30	-14.3
5	5 161122G2_6	10.0	3.98	2.03e4	1.60e4	10.3	1.58	3.0
6	6 161122G2_7	25.0	3.98	4.48e4	1.42e4	25.4	1.57	1.7
7	7 161122G2_8	50.0	3.98	8.30e4	1.36e4	49.2	1.52	-1.7
8	8 161122G2_9	75.0	3.98	1.27e5	1.35e4	75.5	1.56	0.7
9	9 161122G2_10	100	3.98	1.54e5	1.23e4	100	1.56	0.4

**Compound name: PFHxS**

Correlation coefficient:  $r = 0.998761$ ,  $r^2 = 0.997524$

Calibration curve:  $1.72095 * x + -0.0266266$

Response type: Internal Std ( Ref 19 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.09	4.64e2	6.01e3	0.576	1.93	15.3
2	2 161122G2_3	1.00	4.09	8.63e2	6.30e3	1.01	1.71	1.1
3	3 161122G2_4	2.00	4.09	1.70e3	7.02e3	1.78	1.51	-11.2
4	4 161122G2_5	5.00	4.09	3.79e3	6.33e3	4.36	1.49	-12.8
5	5 161122G2_6	10.0	4.09	8.81e3	6.15e3	10.4	1.79	4.1
6	6 161122G2_7	25.0	4.09	2.00e4	5.33e3	27.2	1.87	8.9
7	7 161122G2_8	50.0	4.09	3.53e4	5.46e3	47.1	1.62	-5.9
8	8 161122G2_9	75.0	4.09	5.41e4	5.36e3	73.4	1.68	-2.2
9	9 161122G2_10	100	4.09	7.00e4	4.95e3	103	1.77	2.7

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

**Compound name: 6:2 FTS**

Coefficient of Determination:  $R^2 = 0.978941$

Calibration curve:  $0.00135992 * x^2 + 0.414129 * x + -0.114975$

Response type: Internal Std ( Ref 20 ), Area \* ( IS Conc. / IS Area )

Curve type: 2nd Order, Origin: Exclude, Weighting:  $1/x^2$ , Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc	RRF	%Dev
1	1 161122G2_2	0.500	4.33	4.92e1	6.03e3	0.523	0.204	4.6
2	2 161122G2_3	1.00	4.33	1.34e2	6.29e3	0.919	0.267	-8.1
3	3 161122G2_4	2.00	4.33	3.55e2	6.05e3	2.03	0.366	1.7
4	4 161122G2_5	5.00	4.32	9.08e2	6.94e3	4.17	0.327	-16.6
5	5 161122G2_6	10.0	4.32	1.95e3	5.43e3	10.7	0.449	7.3
6	6 161122G2_7	25.0	4.32	5.91e3	5.54e3	29.6	0.534	18.5
7	7 161122G2_8	50.0	4.32	9.32e3	5.35e3	45.9	0.436	-8.1
8	8 161122G2_9	75.0	4.32	1.61e4	7.05e3	58.2	0.381	-22.5
9	9 161122G2_10	100	4.32	2.02e4	6.58e3	74.5	0.383	-25.5

**Compound name: PFOA**

Correlation coefficient:  $r = 0.999524$ ,  $r^2 = 0.999048$

Calibration curve:  $0.899906 * x + 0.0917344$

Response type: Internal Std ( Ref 21 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting:  $1/x$ , Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc	RRF	%Dev
1	1 161122G2_2	0.500	4.37	1.09e3	2.40e4	0.527	1.13	5.5
2	2 161122G2_3	1.00	4.37	2.24e3	2.87e4	0.983	0.976	-1.7
3	3 161122G2_4	2.00	4.37	4.08e3	2.79e4	1.93	0.915	-3.4
4	4 161122G2_5	5.00	4.37	9.24e3	2.85e4	4.40	0.811	-11.9
5	5 161122G2_6	10.0	4.37	2.04e4	2.60e4	10.8	0.982	8.1
6	6 161122G2_7	25.0	4.37	4.59e4	2.44e4	26.0	0.941	4.2
7	7 161122G2_8	50.0	4.37	8.53e4	2.35e4	50.3	0.908	0.7
8	8 161122G2_9	75.0	4.37	1.30e5	2.38e4	75.6	0.908	0.8
9	9 161122G2_10	100	4.37	1.53e5	2.17e4	97.9	0.882	-2.1

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

**Compound name: PFHpS**

Correlation coefficient:  $r = 0.997800$ ,  $r^2 = 0.995604$

Calibration curve:  $0.0921515 * x + -0.0228444$

Response type: Internal Std ( Ref 21 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.45	5.82e1	2.40e4	0.577	0.0606	15.3
2	2 161122G2_3	1.00	4.45	1.24e2	2.87e4	0.834	0.0540	-16.6
3	3 161122G2_4	2.00	4.45	3.98e2	2.79e4	2.18	0.0892	9.2
4	4 161122G2_5	5.00	4.45	9.47e2	2.85e4	4.76	0.0832	-4.8
5	5 161122G2_6	10.0	4.45	1.65e3	2.60e4	8.86	0.0794	-11.4
6	6 161122G2_7	25.0	4.45	5.10e3	2.44e4	28.6	0.105	14.5
7	7 161122G2_8	50.0	4.45	8.06e3	2.35e4	46.8	0.0858	-6.4
8	8 161122G2_9	75.0	4.45	1.27e4	2.38e4	72.8	0.0891	-3.0
9	9 161122G2_10	100	4.45	1.64e4	2.17e4	103	0.0948	3.1

**Compound name: PFOS**

Correlation coefficient:  $r = 0.996761$ ,  $r^2 = 0.993532$

Calibration curve:  $0.83439 * x + -0.165838$

Response type: Internal Std ( Ref 22 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.78	1.21e2	5.26e3	0.543	0.574	8.5
2	2 161122G2_3	1.00	4.77	3.67e2	7.35e3	0.947	0.624	-5.3
3	3 161122G2_4	2.00	4.77	8.56e2	8.95e3	1.63	0.598	-18.4
4	4 161122G2_5	5.00	4.77	2.17e3	6.87e3	4.93	0.790	-1.4
5	5 161122G2_6	10.0	4.77	4.69e3	7.23e3	9.90	0.810	-1.0
6	6 161122G2_7	25.0	4.77	1.42e4	6.95e3	30.8	1.02	23.3
7	7 161122G2_8	50.0	4.78	1.92e4	5.80e3	49.9	0.830	-0.1
8	8 161122G2_9	75.0	4.77	3.52e4	7.19e3	73.6	0.817	-1.8
9	9 161122G2_10	100	4.77	4.44e4	6.93e3	96.1	0.800	-3.9

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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**Compound name: PFNA**

Correlation coefficient:  $r = 0.997674$ ,  $r^2 = 0.995354$

Calibration curve:  $1.64181 * x + -0.17063$

Response type: Internal Std ( Ref 23 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.72	5.63e2	1.06e4	0.509	1.33	1.7
2	2 161122G2_3	1.00	4.71	1.61e3	1.33e4	1.02	1.51	2.5
3	3 161122G2_4	2.00	4.71	3.31e3	1.23e4	2.16	1.68	7.8
4	4 161122G2_5	5.00	4.71	7.19e3	1.28e4	4.37	1.40	-12.5
5	5 161122G2_6	10.0	4.71	1.72e4	1.33e4	10.0	1.63	0.1
6	6 161122G2_7	25.0	4.71	4.06e4	1.21e4	25.6	1.67	2.3
7	7 161122G2_8	50.0	4.71	6.88e4	1.04e4	50.5	1.65	1.0
8	8 161122G2_9	75.0	4.71	1.10e5	1.23e4	68.0	1.49	-9.3
9	9 161122G2_10	100	4.71	1.49e5	1.07e4	106	1.74	6.3

**Compound name: PFDA**

Correlation coefficient:  $r = 0.998669$ ,  $r^2 = 0.997340$

Calibration curve:  $0.596457 * x + -0.0200723$

Response type: Internal Std ( Ref 24 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	5.01	1.30e2	6.01e3	0.486	0.540	-2.7
2	2 161122G2_3	1.00	5.01	3.72e2	8.51e3	0.949	0.546	-5.1
3	3 161122G2_4	2.00	5.01	8.65e2	8.73e3	2.11	0.620	5.6
4	4 161122G2_5	5.00	5.01	1.70e3	8.07e3	4.44	0.526	-11.1
5	5 161122G2_6	10.0	5.01	3.83e3	7.02e3	11.5	0.683	14.8
6	6 161122G2_7	25.0	5.01	1.25e4	1.01e4	26.1	0.622	4.4
7	7 161122G2_8	50.0	5.01	1.45e4	6.60e3	46.1	0.550	-7.7
8	8 161122G2_9	75.0	5.01	3.19e4	8.88e3	75.4	0.599	0.5
9	9 161122G2_10	100	5.01	4.34e4	8.96e3	101	0.605	1.5

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**Compound name: 8:2 FTS**

Coefficient of Determination: R<sup>2</sup> = 0.984052

Calibration curve: -0.000479329 \* x<sup>2</sup> + 0.502189 \* x + 0.00235356

Response type: Internal Std ( Ref 25 ), Area \* ( IS Conc. / IS Area )

Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.99	4.13e1	2.12e3	0.479	0.486	-4.1
2	2 161122G2_3	1.00	4.99	1.45e2	3.66e3	0.984	0.496	-1.6
3	3 161122G2_4	2.00	4.99	2.64e2	2.69e3	2.44	0.613	22.1
4	4 161122G2_5	5.00	4.99	4.56e2	2.74e3	4.16	0.416	-16.8
5	5 161122G2_6	10.0	4.99	1.14e3	3.15e3	9.07	0.452	-9.3
6	6 161122G2_7	25.0	4.99	4.23e3	3.62e3	29.9	0.584	19.7
7	7 161122G2_8	50.0	4.99	4.24e3	2.69e3	40.8	0.394	-18.4
8	8 161122G2_9	75.0	4.99	1.23e4	3.97e3	84.1	0.518	12.1
9	9 161122G2_10	100	4.99	1.62e4	4.58e3	96.8	0.441	-3.2

**Compound name: 13C3-PFBA**

Response Factor: 1.20506

RRF SD: 0.0553973, Relative SD: 4.59706

Response type: Internal Std ( Ref 26 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	1.93	2.07e4	1.76e4	12.2	1.18	-2.2
2	2 161122G2_3	12.5	1.93	2.25e4	1.85e4	12.6	1.22	1.0
3	3 161122G2_4	12.5	1.93	2.32e4	1.80e4	13.4	1.29	7.0
4	4 161122G2_5	12.5	1.93	2.31e4	1.91e4	12.6	1.21	0.8
5	5 161122G2_6	12.5	1.93	2.17e4	1.69e4	13.3	1.29	6.8
6	6 161122G2_7	12.5	1.93	1.87e4	1.58e4	12.3	1.18	-2.0
7	7 161122G2_8	12.5	1.93	1.90e4	1.64e4	12.1	1.16	-3.6
8	8 161122G2_9	12.5	1.93	1.98e4	1.66e4	12.4	1.20	-0.7
9	9 161122G2_10	12.5	1.93	1.83e4	1.63e4	11.6	1.12	-7.1

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**Compound name: 13C3-PFPeA**

Response Factor: 0.447597

RRF SD: 0.0175301, Relative SD: 3.9165

Response type: Internal Std ( Ref 28 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	2.85	9.28e3	2.07e4	12.5	0.448	0.1
2	2 161122G2_3	12.5	2.85	9.67e3	2.17e4	12.4	0.445	-0.6
3	3 161122G2_4	12.5	2.85	9.90e3	2.11e4	13.1	0.469	4.8
4	4 161122G2_5	12.5	2.85	1.02e4	2.20e4	13.0	0.466	4.1
5	5 161122G2_6	12.5	2.85	9.55e3	2.15e4	12.4	0.445	-0.6
6	6 161122G2_7	12.5	2.85	8.18e3	1.89e4	12.1	0.434	-3.1
7	7 161122G2_8	12.5	2.85	8.27e3	1.78e4	13.0	0.465	3.9
8	8 161122G2_9	12.5	2.85	8.14e3	1.84e4	12.4	0.443	-1.0
9	9 161122G2_10	12.5	2.85	7.23e3	1.75e4	11.6	0.414	-7.5

**Compound name: 13C3-PFBS**

Response Factor: 0.302055

RRF SD: 0.0171236, Relative SD: 5.66905

Response type: Internal Std ( Ref 28 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.10	6.26e3	2.07e4	12.5	0.302	0.1
2	2 161122G2_3	12.5	3.10	6.27e3	2.17e4	11.9	0.288	-4.6
3	3 161122G2_4	12.5	3.10	6.78e3	2.11e4	13.3	0.321	6.4
4	4 161122G2_5	12.5	3.10	7.36e3	2.20e4	13.8	0.335	10.8
5	5 161122G2_6	12.5	3.10	6.40e3	2.15e4	12.3	0.298	-1.4
6	6 161122G2_7	12.5	3.10	5.76e3	1.89e4	12.6	0.306	1.1
7	7 161122G2_8	12.5	3.10	5.35e3	1.78e4	12.5	0.301	-0.4
8	8 161122G2_9	12.5	3.10	5.29e3	1.84e4	11.9	0.288	-4.7
9	9 161122G2_10	12.5	3.10	4.89e3	1.75e4	11.6	0.280	-7.3

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**Compound name: 13C2-PFHxA**

Response Factor: 0.619528

RRF SD: 0.0178176, Relative SD: 2.876

Response type: Internal Std ( Ref 28 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	5.00	3.47	5.21e3	2.07e4	5.07	0.628	1.4
2	2 161122G2_3	5.00	3.47	5.44e3	2.17e4	5.05	0.626	1.0
3	3 161122G2_4	5.00	3.47	5.54e3	2.11e4	5.29	0.656	5.9
4	4 161122G2_5	5.00	3.47	5.55e3	2.20e4	5.09	0.631	1.8
5	5 161122G2_6	5.00	3.47	5.30e3	2.15e4	4.98	0.617	-0.4
6	6 161122G2_7	5.00	3.47	4.52e3	1.89e4	4.83	0.598	-3.4
7	7 161122G2_8	5.00	3.47	4.31e3	1.78e4	4.89	0.606	-2.2
8	8 161122G2_9	5.00	3.47	4.48e3	1.84e4	4.92	0.610	-1.5
9	9 161122G2_10	5.00	3.47	4.22e3	1.75e4	4.87	0.603	-2.6

**Compound name: 13C4-PFHpA**

Response Factor: 1.13869

RRF SD: 0.046436, Relative SD: 4.078

Response type: Internal Std ( Ref 29 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.98	1.51e4	1.32e4	12.6	1.14	0.5
2	2 161122G2_3	12.5	3.97	1.58e4	1.36e4	12.7	1.16	1.9
3	3 161122G2_4	12.5	3.98	1.71e4	1.42e4	13.2	1.21	5.8
4	4 161122G2_5	12.5	3.97	1.63e4	1.48e4	12.1	1.10	-3.3
5	5 161122G2_6	12.5	3.97	1.60e4	1.44e4	12.2	1.11	-2.4
6	6 161122G2_7	12.5	3.97	1.42e4	1.23e4	12.7	1.16	1.7
7	7 161122G2_8	12.5	3.97	1.36e4	1.16e4	12.8	1.17	2.7
8	8 161122G2_9	12.5	3.97	1.35e4	1.17e4	12.7	1.15	1.3
9	9 161122G2_10	12.5	3.97	1.23e4	1.18e4	11.5	1.05	-8.2



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**Compound name: 18O2-PFHxS**

Response Factor: 0.449434

RRF SD: 0.0241405, Relative SD: 5.37132

Response type: Internal Std ( Ref 29 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.09	6.01e3	1.32e4	12.6	0.455	1.1
2	2 161122G2_3	12.5	4.09	6.30e3	1.36e4	12.9	0.463	3.1
3	3 161122G2_4	12.5	4.09	7.02e3	1.42e4	13.7	0.494	9.8
4	4 161122G2_5	12.5	4.09	6.33e3	1.48e4	11.9	0.428	-4.8
5	5 161122G2_6	12.5	4.09	6.15e3	1.44e4	11.9	0.427	-5.0
6	6 161122G2_7	12.5	4.09	5.33e3	1.23e4	12.1	0.434	-3.4
7	7 161122G2_8	12.5	4.08	5.46e3	1.16e4	13.0	0.468	4.2
8	8 161122G2_9	12.5	4.09	5.36e3	1.17e4	12.7	0.456	1.5
9	9 161122G2_10	12.5	4.09	4.95e3	1.18e4	11.7	0.420	-6.6

**Compound name: 13C2-6:2 FTS**

Response Factor: 1.07309

RRF SD: 0.0967215, Relative SD: 9.01333

Response type: Internal Std ( Ref 27 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.33	6.03e3	5.89e3	11.9	1.02	-4.5
2	2 161122G2_3	12.5	4.33	6.29e3	5.82e3	12.6	1.08	0.7
3	3 161122G2_4	12.5	4.33	6.05e3	5.56e3	12.7	1.09	1.3
4	4 161122G2_5	12.5	4.32	6.94e3	5.84e3	13.8	1.19	10.8
5	5 161122G2_6	12.5	4.32	5.43e3	5.76e3	11.0	0.942	-12.2
6	6 161122G2_7	12.5	4.32	5.54e3	4.77e3	13.5	1.16	8.2
7	7 161122G2_8	12.5	4.32	5.35e3	5.78e3	10.8	0.925	-13.8
8	8 161122G2_9	12.5	4.32	7.05e3	5.95e3	13.8	1.18	10.3
9	9 161122G2_10	12.5	4.32	6.58e3	6.18e3	12.4	1.06	-0.8

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**Compound name: 13C2-PFOA**

Response Factor: 2.26193

RRF SD: 0.103705, Relative SD: 4.58481

Response type: Internal Std ( Ref 30 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.37	2.40e4	1.14e4	11.7	2.12	-6.4
2	2 161122G2_3	12.5	4.37	2.87e4	1.22e4	13.0	2.36	4.4
3	3 161122G2_4	12.5	4.37	2.79e4	1.22e4	12.6	2.28	0.8
4	4 161122G2_5	12.5	4.37	2.85e4	1.19e4	13.3	2.40	6.0
5	5 161122G2_6	12.5	4.37	2.60e4	1.12e4	12.9	2.33	3.0
6	6 161122G2_7	12.5	4.37	2.44e4	1.17e4	11.5	2.09	-7.7
7	7 161122G2_8	12.5	4.37	2.35e4	1.03e4	12.6	2.28	0.9
8	8 161122G2_9	12.5	4.37	2.38e4	1.06e4	12.4	2.24	-1.2
9	9 161122G2_10	12.5	4.37	2.17e4	9.56e3	12.5	2.27	0.2

**Compound name: 13C8-PFOS**

Response Factor: 0.943547

RRF SD: 0.0953243, Relative SD: 10.1028

Response type: Internal Std ( Ref 31 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.77	5.26e3	6.09e3	11.4	0.863	-8.5
2	2 161122G2_3	12.5	4.77	7.35e3	8.00e3	12.2	0.918	-2.7
3	3 161122G2_4	12.5	4.77	8.95e3	7.63e3	15.5	1.17	24.2
4	4 161122G2_5	12.5	4.77	6.87e3	7.71e3	11.8	0.892	-5.5
5	5 161122G2_6	12.5	4.77	7.23e3	7.12e3	13.5	1.02	7.6
6	6 161122G2_7	12.5	4.77	6.95e3	7.59e3	12.1	0.917	-2.9
7	7 161122G2_8	12.5	4.77	5.80e3	6.40e3	12.0	0.906	-4.0
8	8 161122G2_9	12.5	4.77	7.19e3	7.90e3	12.1	0.910	-3.5
9	9 161122G2_10	12.5	4.77	6.93e3	7.73e3	11.9	0.898	-4.9

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**Compound name: 13C5-PFNA**

Response Factor: 1.08198

RRF SD: 0.109173, Relative SD: 10.0901

Response type: Internal Std ( Ref 32 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.71	1.06e4	9.86e3	12.4	1.07	-0.7
2	2 161122G2_3	12.5	4.71	1.33e4	1.10e4	14.0	1.21	11.8
3	3 161122G2_4	12.5	4.71	1.23e4	1.19e4	12.0	1.04	-4.3
4	4 161122G2_5	12.5	4.71	1.28e4	1.06e4	14.0	1.21	12.3
5	5 161122G2_6	12.5	4.71	1.33e4	1.18e4	13.0	1.13	4.1
6	6 161122G2_7	12.5	4.71	1.21e4	1.04e4	13.4	1.16	7.4
7	7 161122G2_8	12.5	4.71	1.04e4	1.14e4	10.5	0.909	-16.0
8	8 161122G2_9	12.5	4.71	1.23e4	1.16e4	12.3	1.07	-1.4
9	9 161122G2_10	12.5	4.71	1.07e4	1.14e4	10.8	0.938	-13.3

**Compound name: 13C2-PFDA**

Response Factor: 1.01921

RRF SD: 0.0876435, Relative SD: 8.59913

Response type: Internal Std ( Ref 33 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	5.01	6.01e3	6.35e3	11.6	0.947	-7.1
2	2 161122G2_3	12.5	5.01	8.51e3	9.85e3	10.6	0.864	-15.2
3	3 161122G2_4	12.5	5.01	8.73e3	8.39e3	12.8	1.04	2.1
4	4 161122G2_5	12.5	5.01	8.07e3	7.46e3	13.3	1.08	6.1
5	5 161122G2_6	12.5	5.01	7.02e3	6.59e3	13.1	1.07	4.5
6	6 161122G2_7	12.5	5.01	1.01e4	9.85e3	12.5	1.02	0.3
7	7 161122G2_8	12.5	5.01	6.60e3	5.70e3	14.2	1.16	13.6
8	8 161122G2_9	12.5	5.01	8.88e3	8.46e3	12.9	1.05	2.9
9	9 161122G2_10	12.5	5.01	8.96e3	9.48e3	11.6	0.945	-7.3

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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**Compound name: 13C2-8:2 FTS**

Response Factor: 0.568768

RRF SD: 0.137212, Relative SD: 24.1245

Response type: Internal Std ( Ref 27 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.99	2.12e3	5.89e3	7.93	0.361	-36.6
2	2 161122G2_3	12.5	4.99	3.66e3	5.82e3	13.8	0.629	10.6
3	3 161122G2_4	12.5	4.99	2.69e3	5.56e3	10.6	0.483	-15.1
4	4 161122G2_5	12.5	4.99	2.74e3	5.84e3	10.3	0.468	-17.7
5	5 161122G2_6	12.5	4.99	3.15e3	5.76e3	12.0	0.546	-4.1
6	6 161122G2_7	12.5	4.99	3.62e3	4.77e3	16.7	0.759	33.4
7	7 161122G2_8	12.5	4.99	2.69e3	5.78e3	10.2	0.466	-18.0
8	8 161122G2_9	12.5	4.99	3.97e3	5.95e3	14.7	0.667	17.3
9	9 161122G2_10	12.5	4.99	4.58e3	6.18e3	16.3	0.740	30.1

**Compound name: 13C4-PFBA**

Response Factor: 1

RRF SD: 0, Relative SD: 0

Response type: Internal Std ( Ref 26 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#.Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	1.93	1.76e4	1.76e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	1.92	1.85e4	1.85e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	1.93	1.80e4	1.80e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	1.93	1.91e4	1.91e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	1.93	1.69e4	1.69e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	1.93	1.58e4	1.58e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	1.93	1.64e4	1.64e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	1.93	1.66e4	1.66e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	1.92	1.63e4	1.63e4	12.5	1.00	0.0

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**Compound name: 13C2-4:2 FTS**

Response Factor: 1

RRF SD: 0, Relative SD: 0

Response type: Internal Std ( Ref 27 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.37	5.89e3	5.89e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	3.37	5.82e3	5.82e3	12.5	1.00	0.0
3	3 161122G2_4	12.5	3.37	5.56e3	5.56e3	12.5	1.00	0.0
4	4 161122G2_5	12.5	3.38	5.84e3	5.84e3	12.5	1.00	0.0
5	5 161122G2_6	12.5	3.38	5.76e3	5.76e3	12.5	1.00	0.0
6	6 161122G2_7	12.5	3.38	4.77e3	4.77e3	12.5	1.00	0.0
7	7 161122G2_8	12.5	3.38	5.78e3	5.78e3	12.5	1.00	0.0
8	8 161122G2_9	12.5	3.38	5.95e3	5.95e3	12.5	1.00	0.0
9	9 161122G2_10	12.5	3.38	6.18e3	6.18e3	12.5	1.00	0.0

**Compound name: 13C5-PFHxA**

Response Factor: 1

RRF SD: 3.92523e-017, Relative SD: 3.92523e-015

Response type: Internal Std ( Ref 28 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.47	2.07e4	2.07e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	3.46	2.17e4	2.17e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	3.47	2.11e4	2.11e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	3.47	2.20e4	2.20e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	3.47	2.15e4	2.15e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	3.47	1.89e4	1.89e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	3.47	1.78e4	1.78e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	3.47	1.84e4	1.84e4	12.5	1.00	-0.0
9	9 161122G2_10	12.5	3.47	1.75e4	1.75e4	12.5	1.00	0.0

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**Compound name: 13C3-PFHxS**

Response Factor: 1

RRF SD: 7.85046e-017, Relative SD: 7.85046e-015

Response type: Internal Std ( Ref 29 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.09	1.32e4	1.32e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.09	1.36e4	1.36e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.09	1.42e4	1.42e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.09	1.48e4	1.48e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.09	1.44e4	1.44e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.09	1.23e4	1.23e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.09	1.16e4	1.16e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.09	1.17e4	1.17e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.09	1.18e4	1.18e4	12.5	1.00	0.0

**Compound name: 13C8-PFOA**

Response Factor: 1

RRF SD: 0, Relative SD: 0

Response type: Internal Std ( Ref 30 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.37	1.14e4	1.14e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.37	1.22e4	1.22e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.37	1.22e4	1.22e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.37	1.19e4	1.19e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.37	1.12e4	1.12e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.37	1.17e4	1.17e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.37	1.03e4	1.03e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.37	1.06e4	1.06e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.37	9.56e3	9.56e3	12.5	1.00	0.0

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**Compound name: 13C4-PFOS**

Response Factor: 1

RRF SD: 7.85046e-017, Relative SD: 7.85046e-015

Response type: Internal Std ( Ref 31 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	# Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.78	6.09e3	6.09e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.77	8.00e3	8.00e3	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.78	7.63e3	7.63e3	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.77	7.71e3	7.71e3	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.77	7.12e3	7.12e3	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.77	7.59e3	7.59e3	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.78	6.40e3	6.40e3	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.77	7.90e3	7.90e3	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.77	7.73e3	7.73e3	12.5	1.00	0.0

**Compound name: 13C9-PFNA**

Response Factor: 1

RRF SD: 0, Relative SD: 0

Response type: Internal Std ( Ref 32 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	# Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.71	9.86e3	9.86e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.71	1.10e4	1.10e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.71	1.19e4	1.19e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.71	1.06e4	1.06e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.71	1.18e4	1.18e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.71	1.04e4	1.04e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.71	1.14e4	1.14e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.71	1.16e4	1.16e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.71	1.14e4	1.14e4	12.5	1.00	0.0

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**Compound name: 13C6-PFDA**

Response Factor: 1

RRF SD: 3.92523e-017, Relative SD: 3.92523e-015

Response type: Internal Std ( Ref 33 ), Area \* ( IS Conc. / IS Area )

Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	5.01	6.35e3	6.35e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	5.01	9.85e3	9.85e3	12.5	1.00	0.0
3	3 161122G2_4	12.5	5.01	8.39e3	8.39e3	12.5	1.00	0.0
4	4 161122G2_5	12.5	5.01	7.46e3	7.46e3	12.5	1.00	0.0
5	5 161122G2_6	12.5	5.01	6.59e3	6.59e3	12.5	1.00	0.0
6	6 161122G2_7	12.5	5.01	9.85e3	9.85e3	12.5	1.00	0.0
7	7 161122G2_8	12.5	5.01	5.70e3	5.70e3	12.5	1.00	0.0
8	8 161122G2_9	12.5	5.01	8.46e3	8.46e3	12.5	1.00	-0.0
9	9 161122G2_10	12.5	5.01	9.48e3	9.48e3	12.5	1.00	0.0

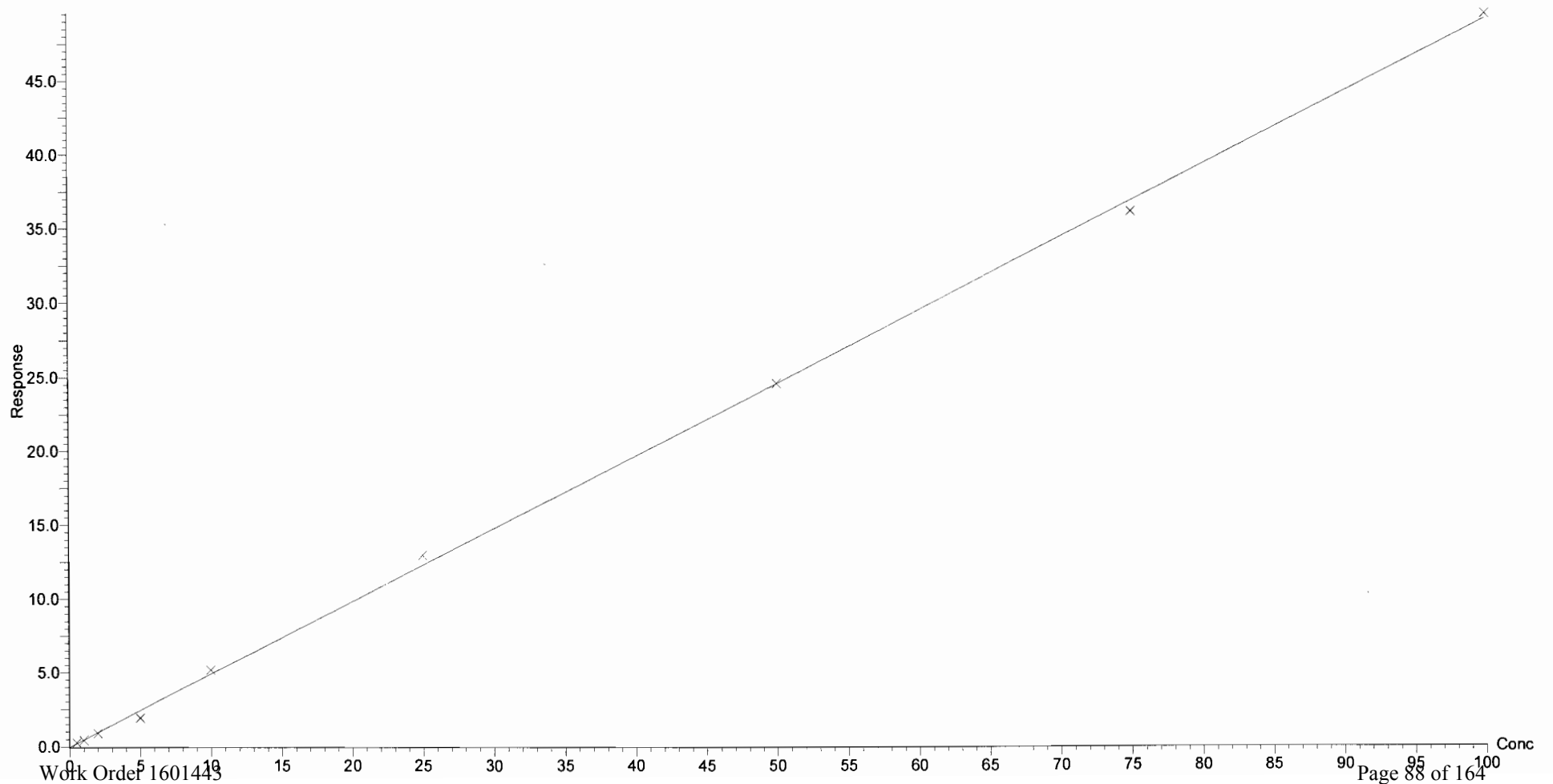


Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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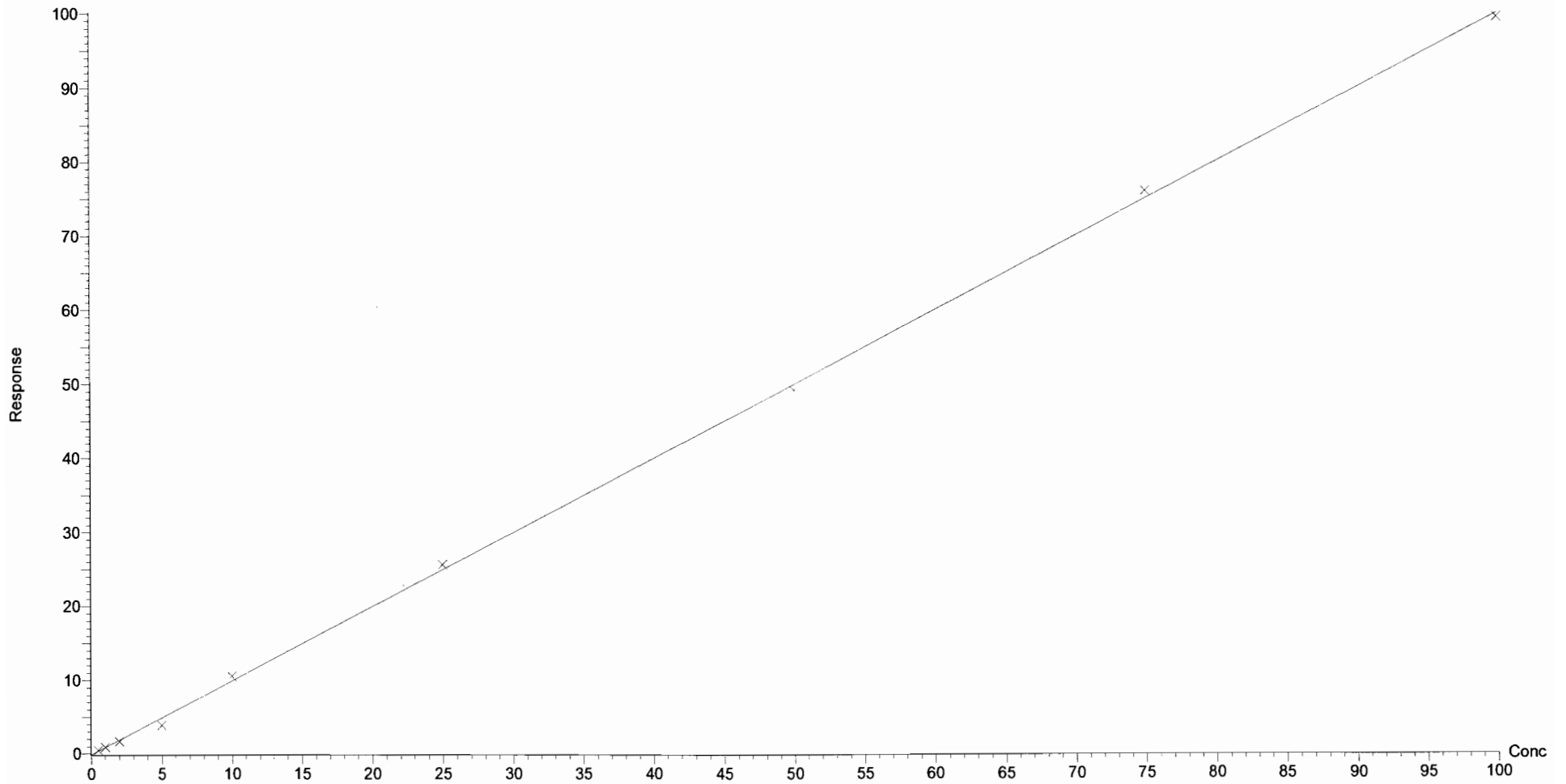
Compound name: PFBA  
Correlation coefficient:  $r = 0.999216$ ,  $r^2 = 0.998432$   
Calibration curve:  $0.492927 * x + -0.0410615$   
Response type: Internal Std ( Ref 14 ), Area \* ( IS Conc. / IS Area )  
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



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Compound name: PFPeA  
Correlation coefficient:  $r = 0.999341$ ,  $r^2 = 0.998683$   
Calibration curve:  $1.00273 * x + -0.119981$   
Response type: Internal Std ( Ref 15 ), Area \* ( IS Conc. / IS Area )  
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



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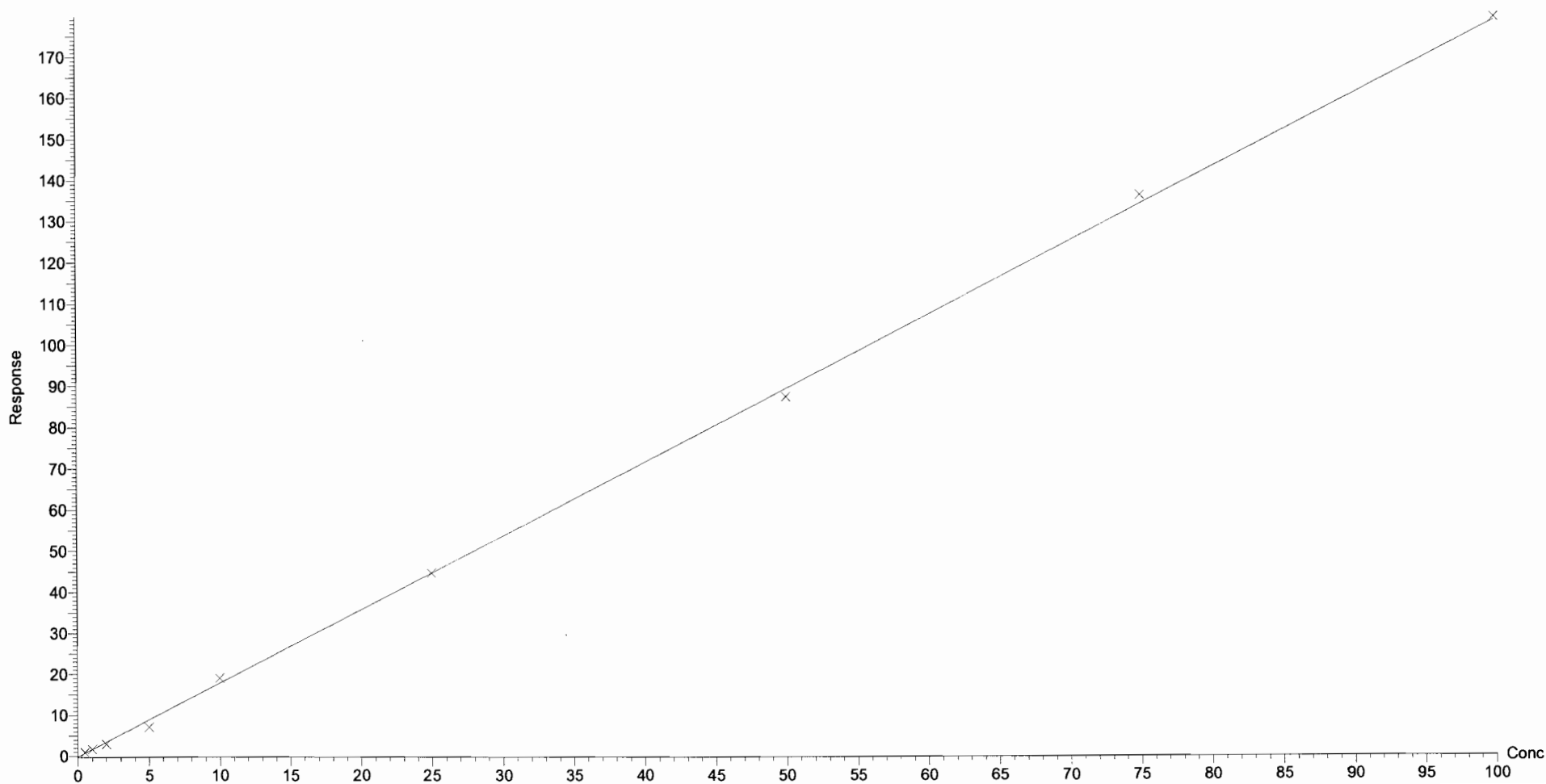
Compound name: PFBS

Correlation coefficient:  $r = 0.999283$ ,  $r^2 = 0.998566$

Calibration curve:  $1.79216 * x + -0.145672$

Response type: Internal Std ( Ref 16 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



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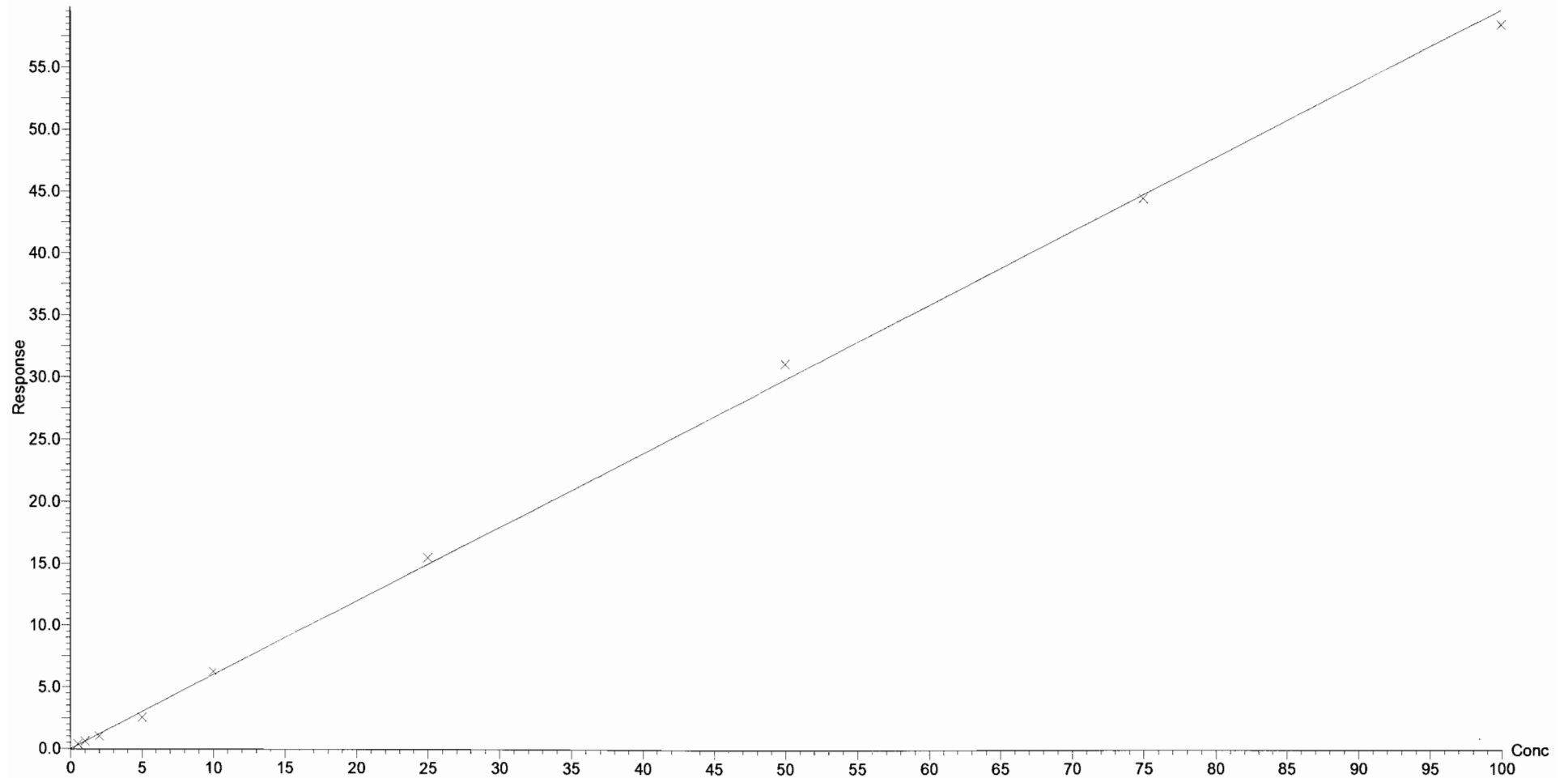
Compound name: PFHxA

Correlation coefficient:  $r = 0.999245$ ,  $r^2 = 0.998491$

Calibration curve:  $0.598427 * x + 0.0095449$

Response type: Internal Std ( Ref 17 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



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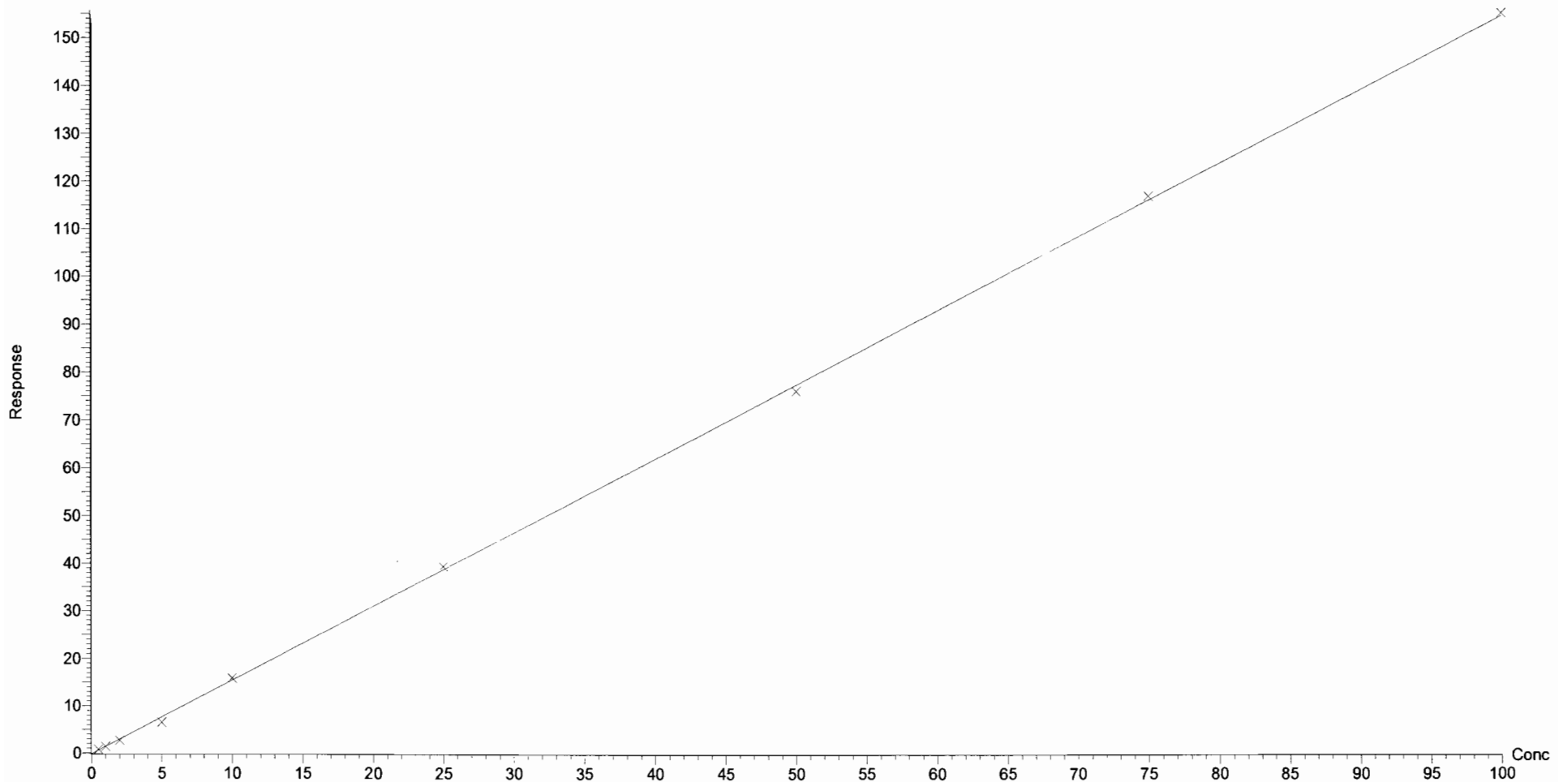
Compound name: PFHpA

Correlation coefficient:  $r = 0.999639$ ,  $r^2 = 0.999279$

Calibration curve:  $1.55279 * x + -0.138431$

Response type: Internal Std ( Ref 18 ), Area \* ( IS Conc. / IS Area )

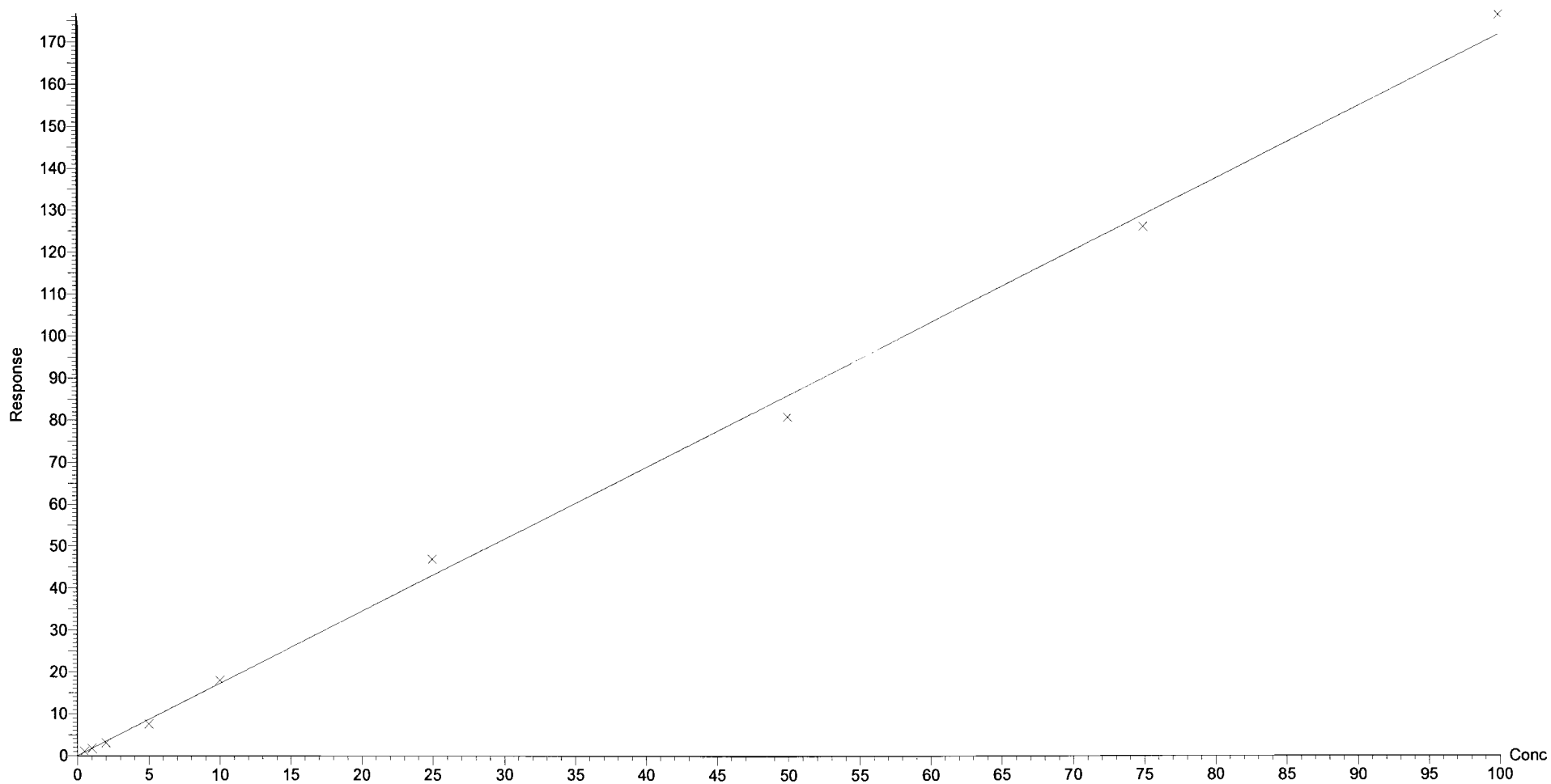
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



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Compound name: PFHxS  
Correlation coefficient:  $r = 0.998761$ ,  $r^2 = 0.997524$   
Calibration curve:  $1.72095 * x + -0.0266266$   
Response type: Internal Std ( Ref 19 ), Area \* ( IS Conc. / IS Area )  
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

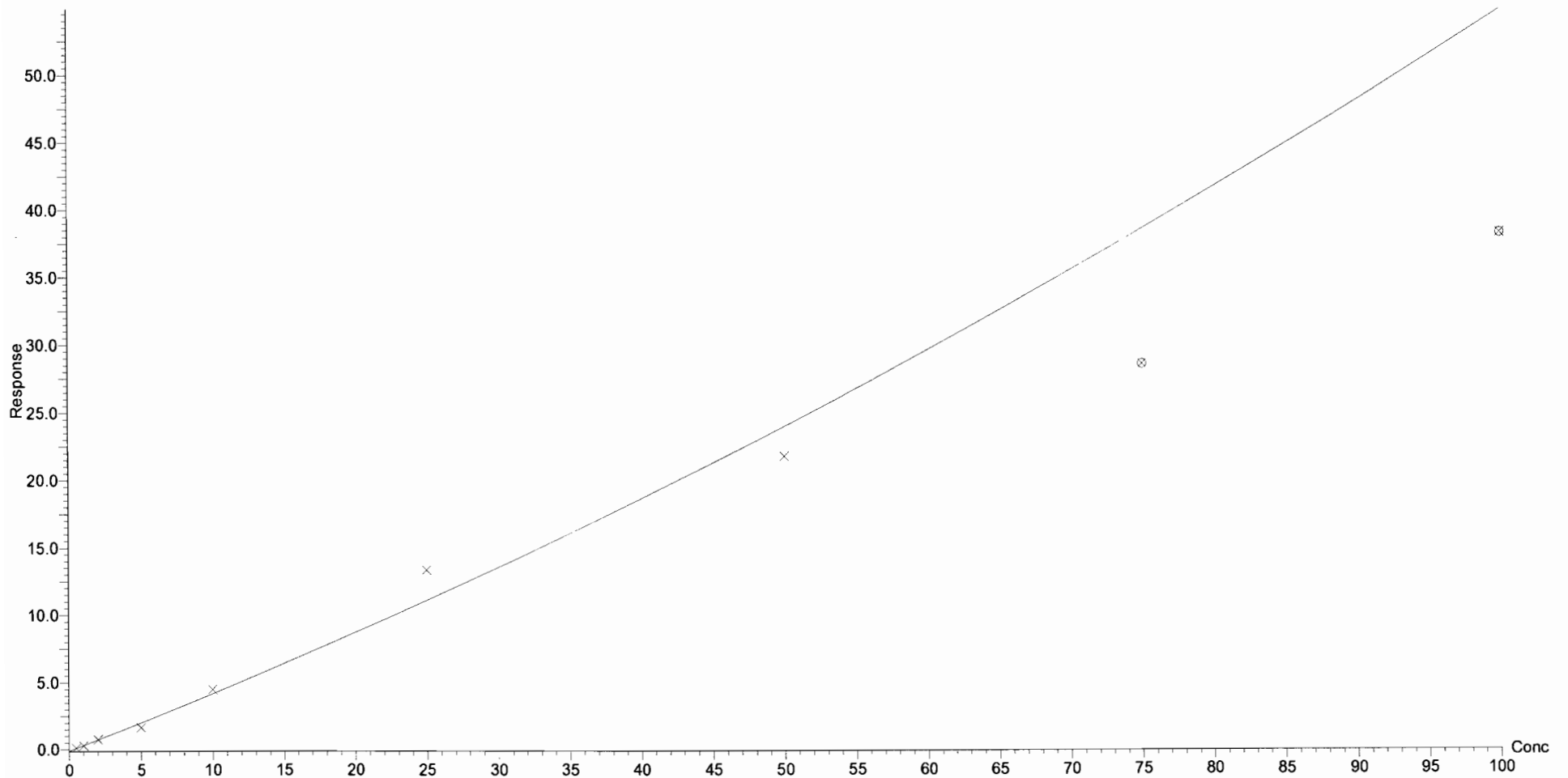


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Compound name: 6:2 FTS  
Coefficient of Determination:  $R^2 = 0.978941$   
Calibration curve:  $0.00135992 * x^2 + 0.414129 * x + -0.114975$   
Response type: Internal Std ( Ref 20 ), Area \* ( IS Conc. / IS Area )  
Curve type: 2nd Order, Origin: Exclude, Weighting:  $1/x^2$ , Axis trans: None



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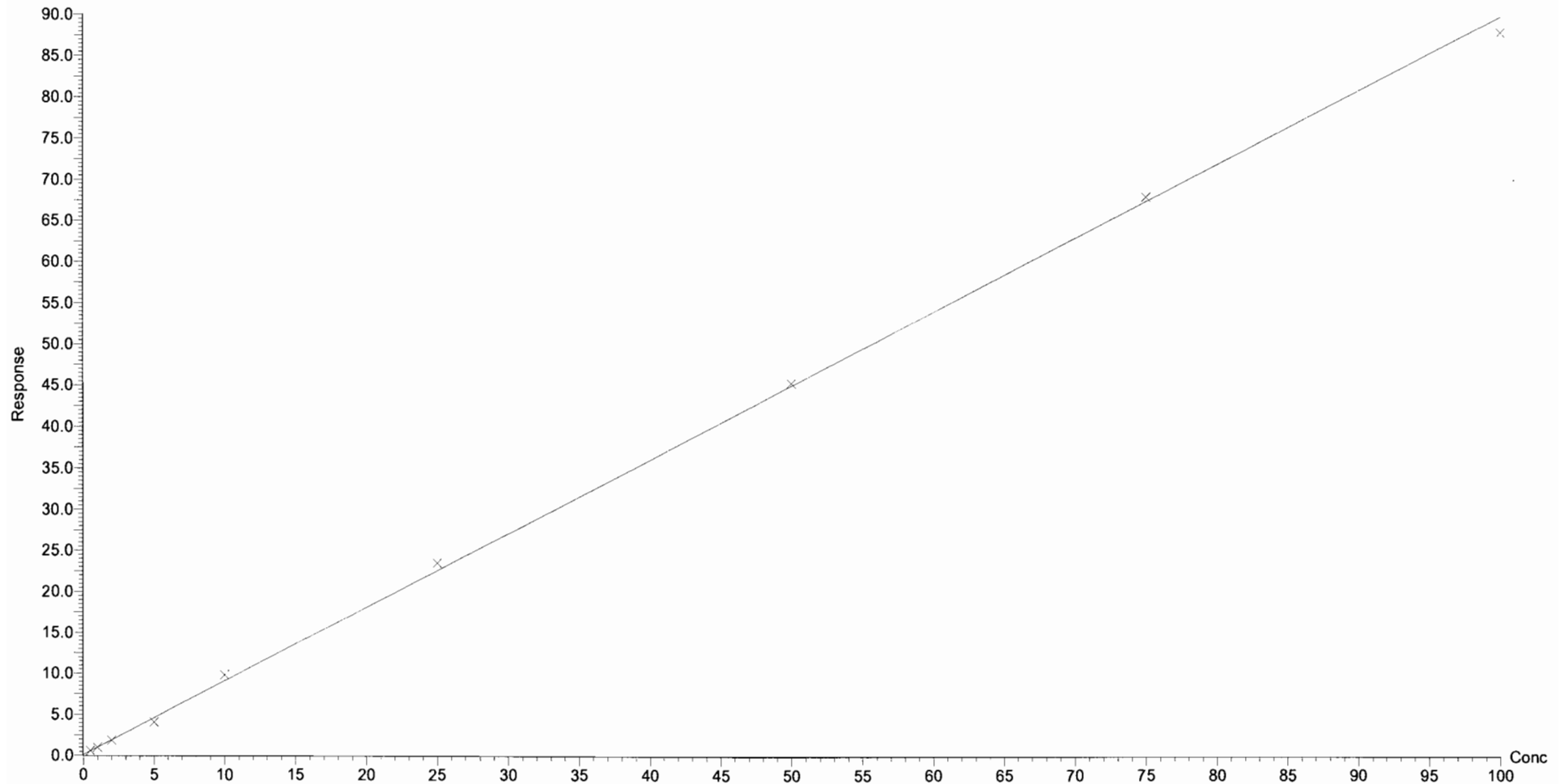
Compound name: PFOA

Correlation coefficient:  $r = 0.999524$ ,  $r^2 = 0.999048$

Calibration curve:  $0.899906 * x + 0.0917344$

Response type: Internal Std ( Ref 21 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None





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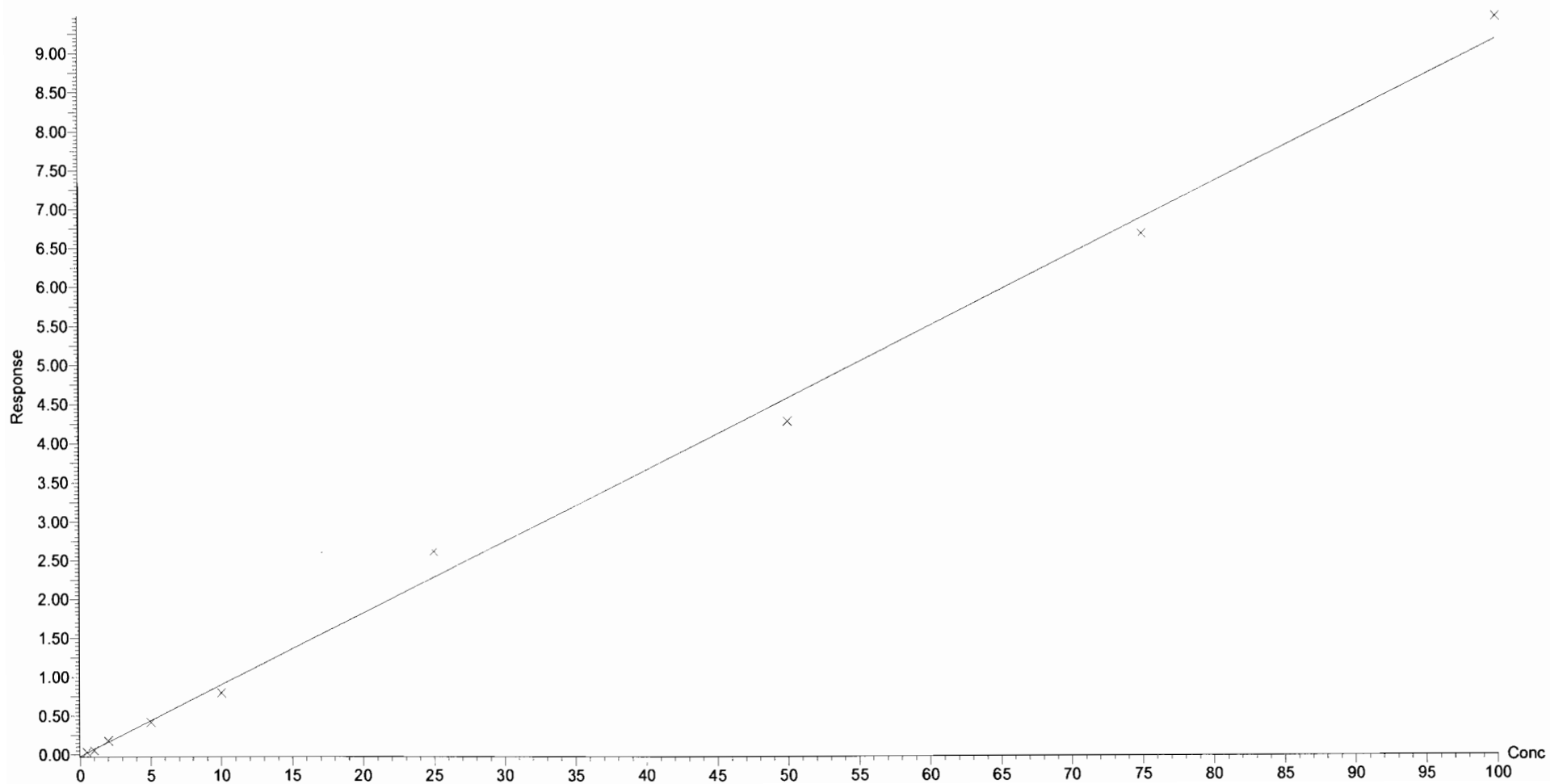
Compound name: PFHpS

Correlation coefficient:  $r = 0.997800$ ,  $r^2 = 0.995604$

Calibration curve:  $0.0921515 * x + -0.0228444$

Response type: Internal Std ( Ref 21 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Vista Analytical Laboratory Q1

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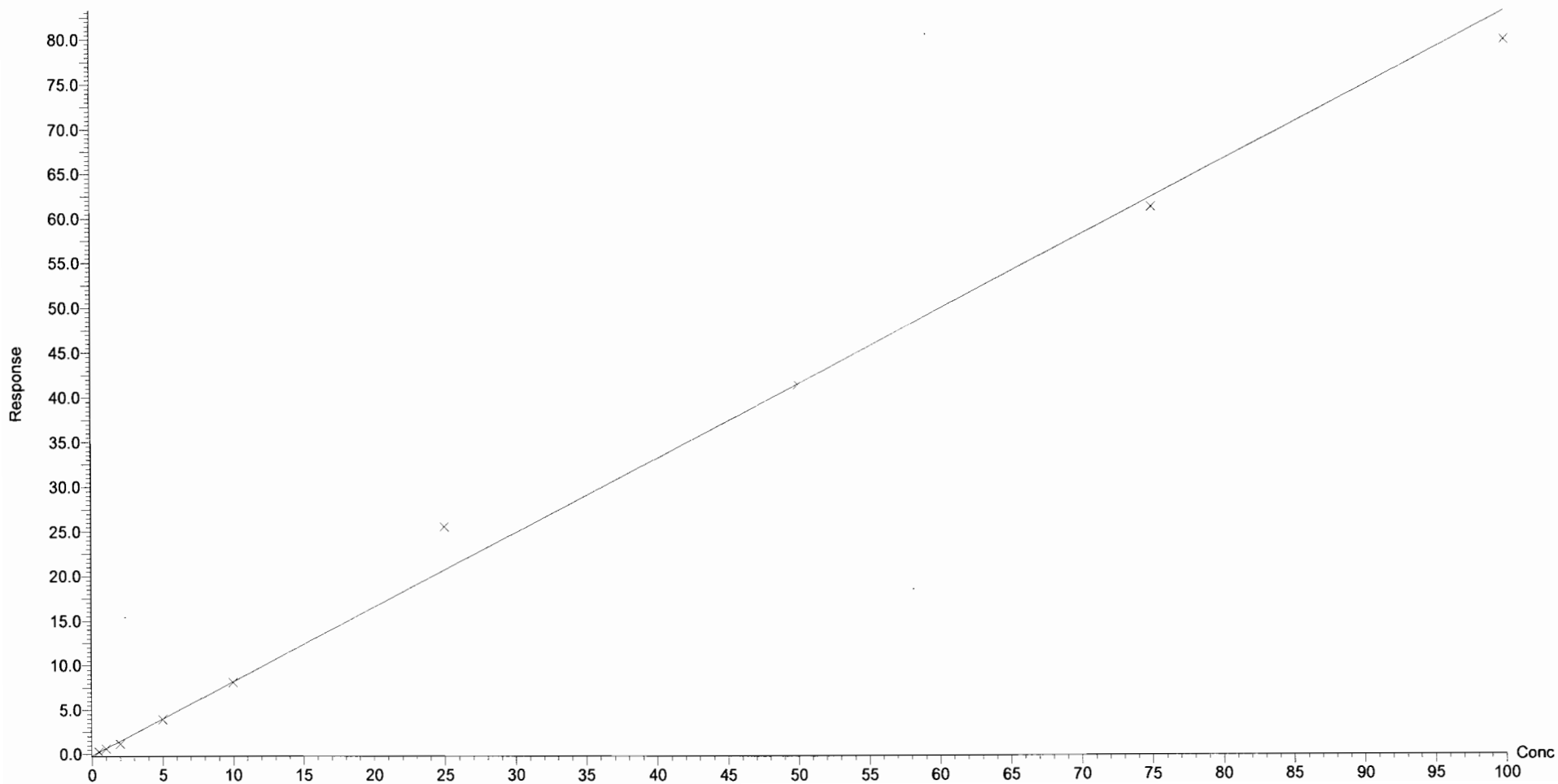
Compound name: PFOS

Correlation coefficient:  $r = 0.996761$ ,  $r^2 = 0.993532$

Calibration curve:  $0.83439 * x + -0.165838$

Response type: Internal Std ( Ref 22 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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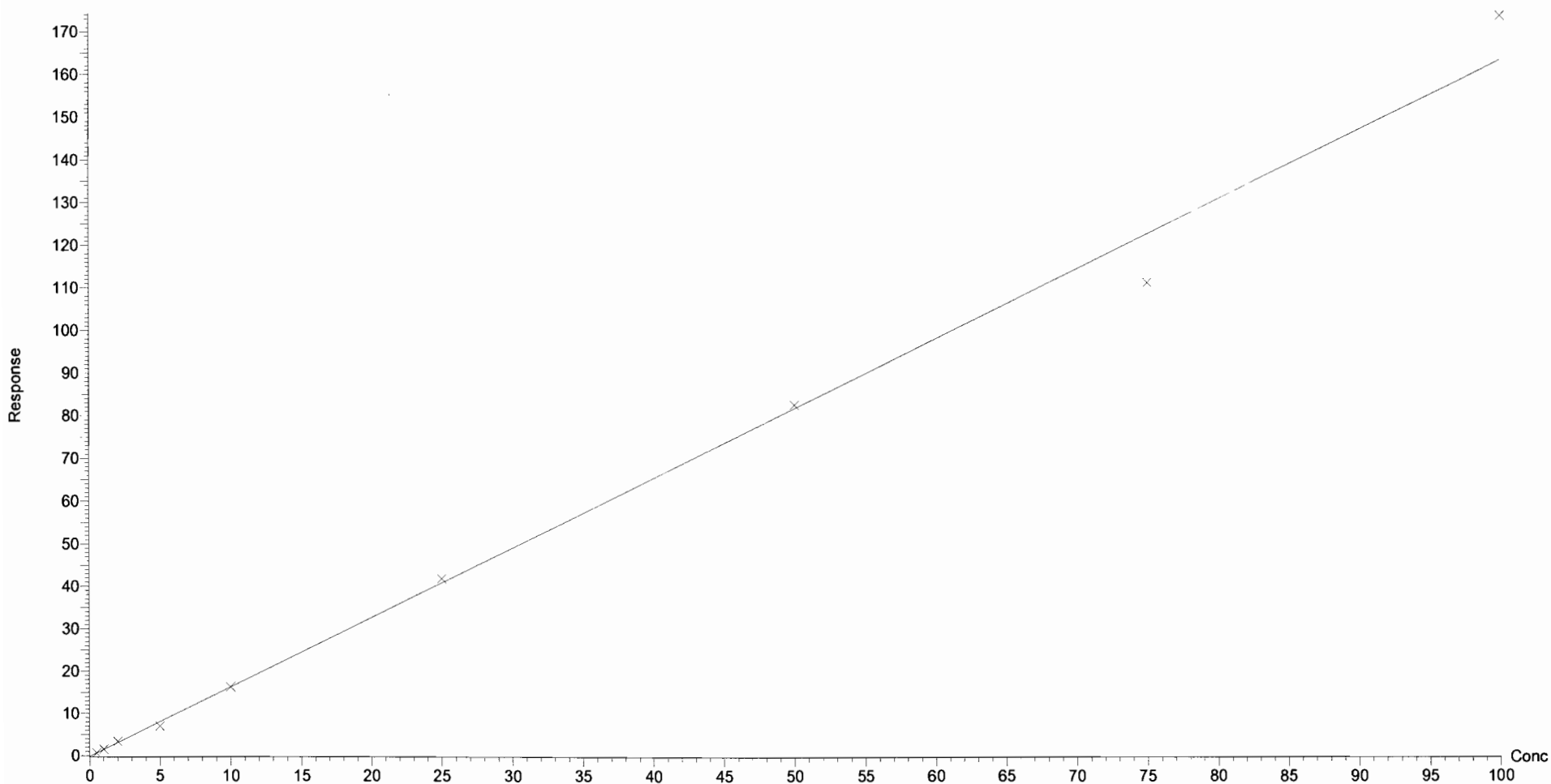
Compound name: PFNA

Correlation coefficient:  $r = 0.997674$ ,  $r^2 = 0.995354$

Calibration curve:  $1.64181 * x + -0.17063$

Response type: Internal Std ( Ref 23 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

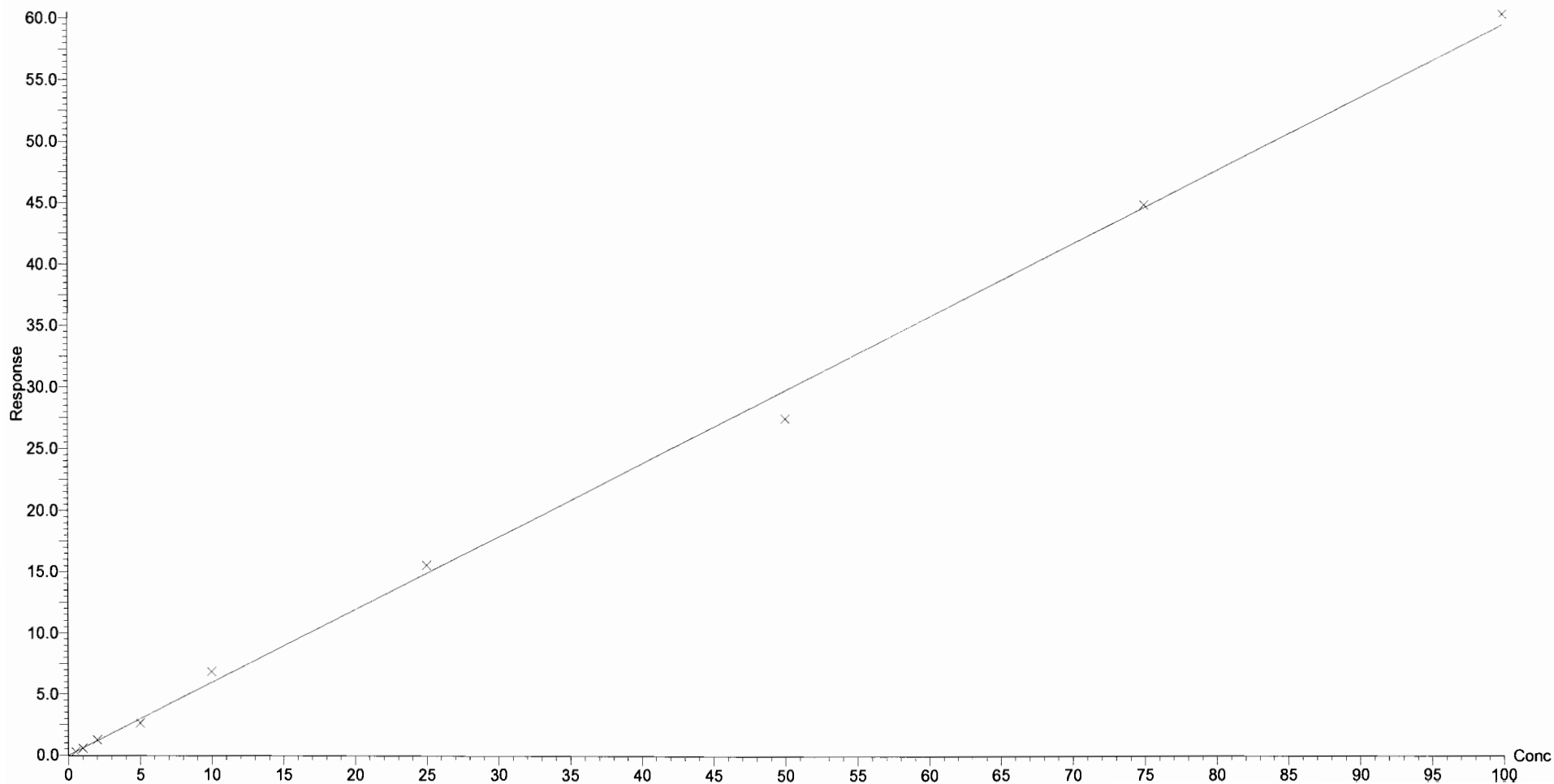
Compound name: PFDA

Correlation coefficient:  $r = 0.998669$ ,  $r^2 = 0.997340$

Calibration curve:  $0.596457 * x + -0.0200723$

Response type: Internal Std ( Ref 24 ), Area \* ( IS Conc. / IS Area )

Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

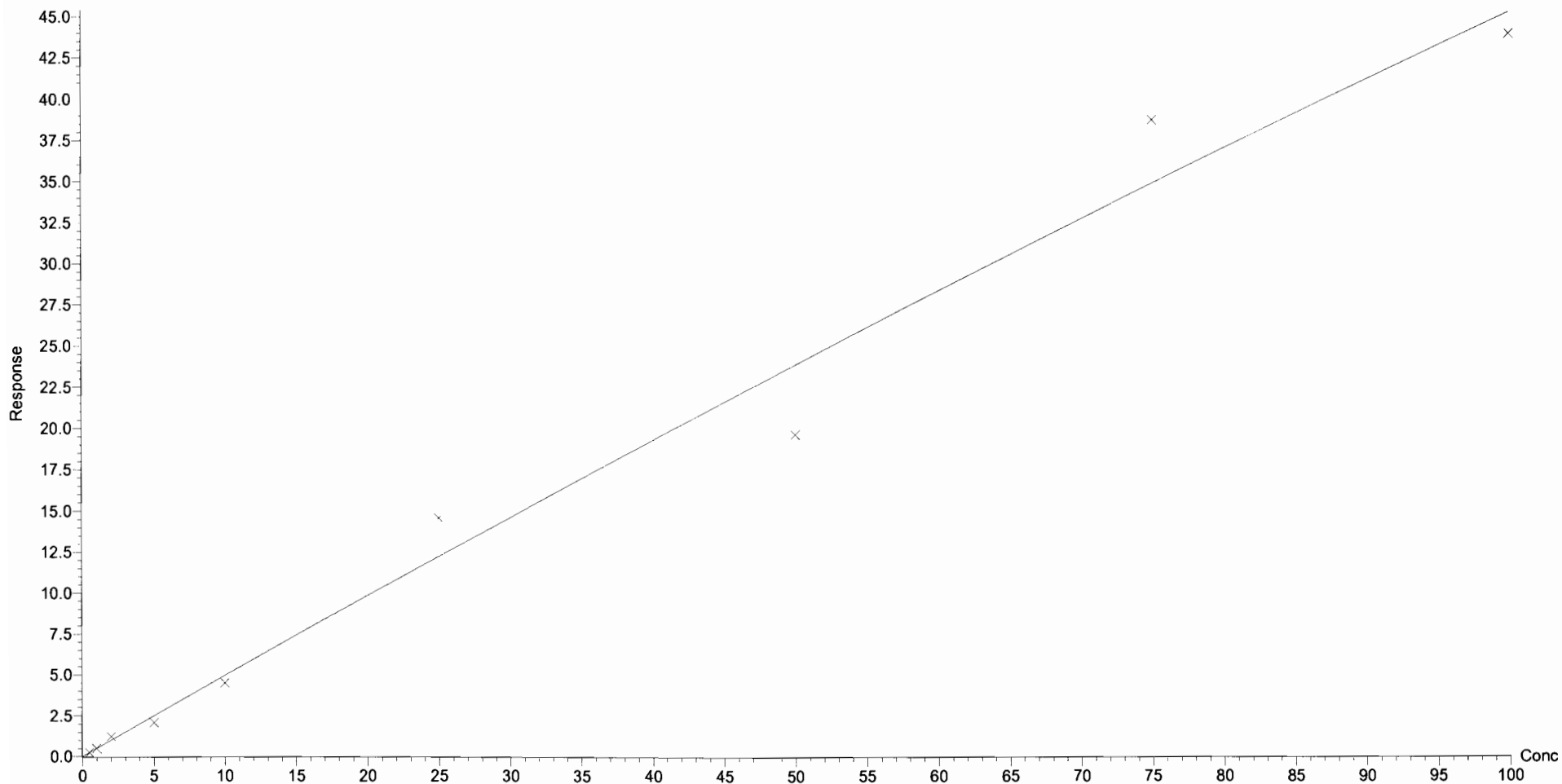
Compound name: 8:2 FTS

Coefficient of Determination:  $R^2 = 0.984052$

Calibration curve:  $-0.000479329 * x^2 + 0.502189 * x + 0.00235356$

Response type: Internal Std ( Ref 25 ), Area \* ( IS Conc. / IS Area )

Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 15:08:21 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 15:09:10 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 22 Nov 2016 14:48:20  
Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 14:59:27

Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
1	161122G2_1	IPA	22-Nov-16	09:47:54
2	161122G2_2	ST161122G2-2 PFC CS-1 16K1705	22-Nov-16	10:00:32
3	161122G2_3	ST161122G2-3 PFC CS0 16K1706	22-Nov-16	10:13:07
4	161122G2_4	ST161122G2-4 PFC CS1 16K1707	22-Nov-16	10:25:42
5	161122G2_5	ST161122G2-5 PFC CS2 16K1708	22-Nov-16	10:38:18
6	161122G2_6	ST161122G2-6 PFC CS3 16K1709	22-Nov-16	10:50:54
7	161122G2_7	ST161122G2-7 PFC CS3.5 16K1710	22-Nov-16	11:03:32
8	161122G2_8	ST161122G2-8 PFC CS4 16K1711	22-Nov-16	11:16:11
9	161122G2_9	ST161122G2-9 PFC CS4.5 16K1712	22-Nov-16	11:28:50
10	161122G2_10	ST161122G2-10 PFC CS5 16K1713	22-Nov-16	11:41:28
11	161122G2_11	IPA	22-Nov-16	11:54:03
12	161122G2_12	SS161122G2-1 PFC SS 16K2201	22-Nov-16	12:06:50
13	161122G2_13	IPA	22-Nov-16	12:19:32

Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

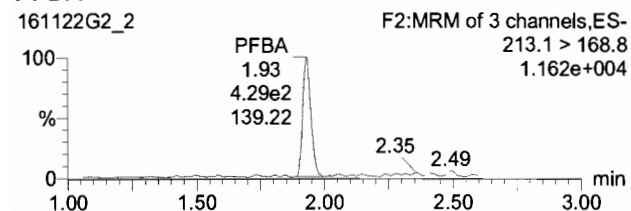
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS\_A\_FULL\_LINEAR.mdb 22 Nov 2016 14:48:05

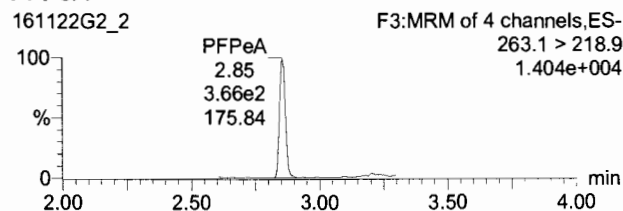
Calibration: 22 Nov 2016 14:43:00

Name: 161122G2\_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

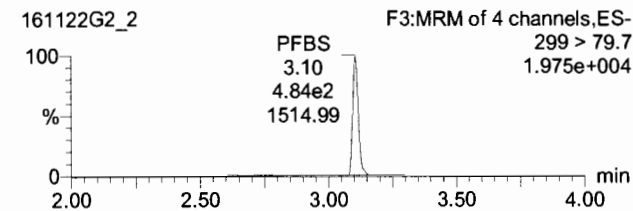
**PFBA**



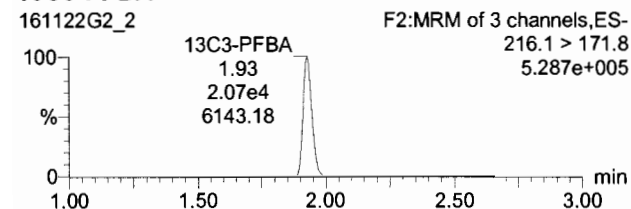
**PFPeA**



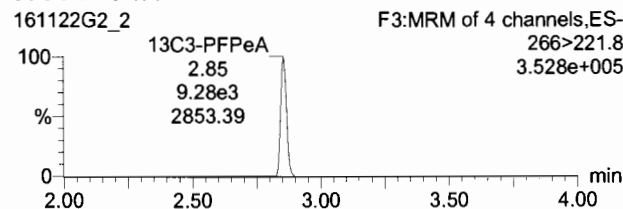
**PFBS**



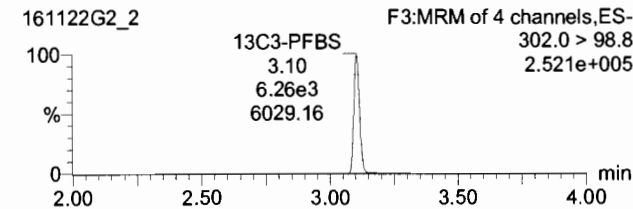
**13C3-PFBA**



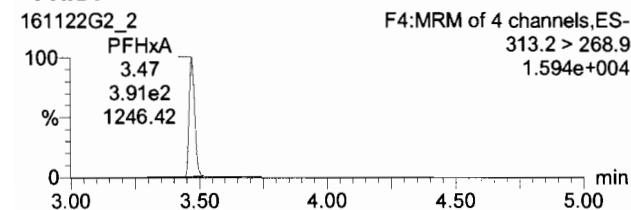
**13C3-PFPeA**



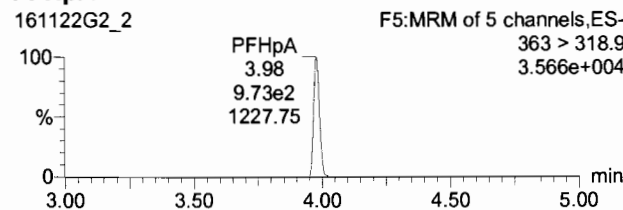
**13C3-PFBS**



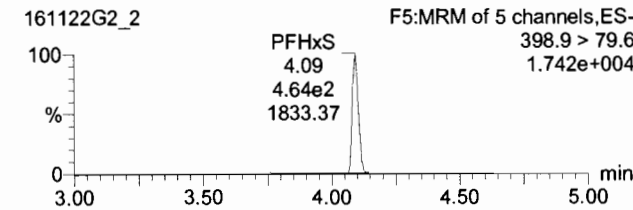
**PFHxA**



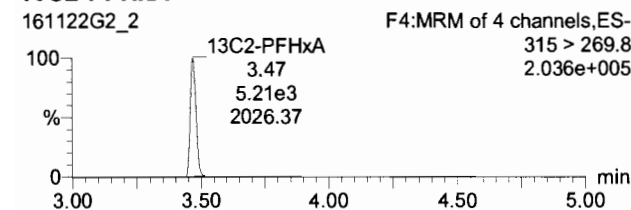
**PFHpA**



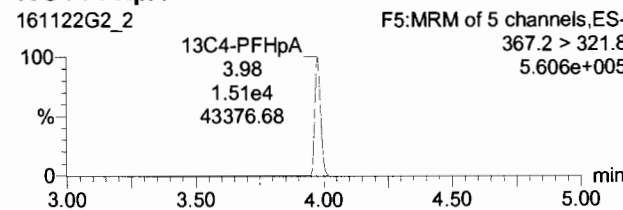
**PFHxS**



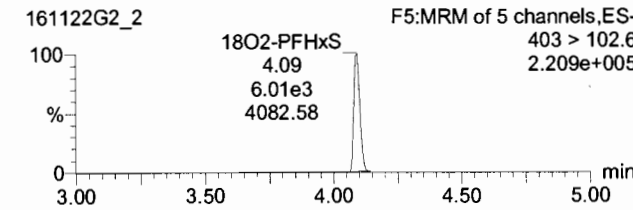
**13C2-PFHxA**



**13C4-PFHpA**



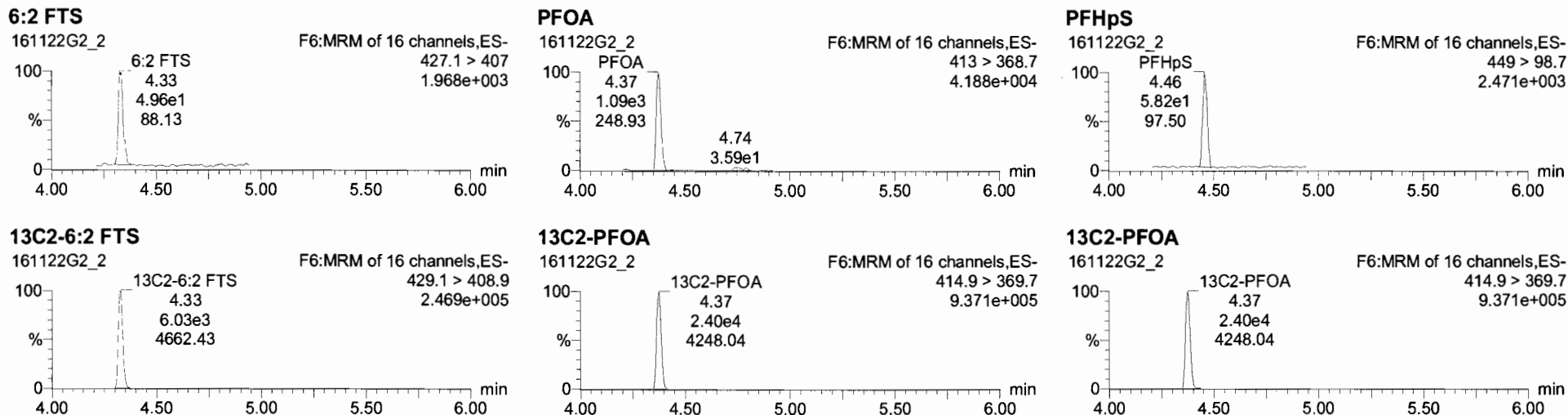
**18O2-PFHxS**



Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

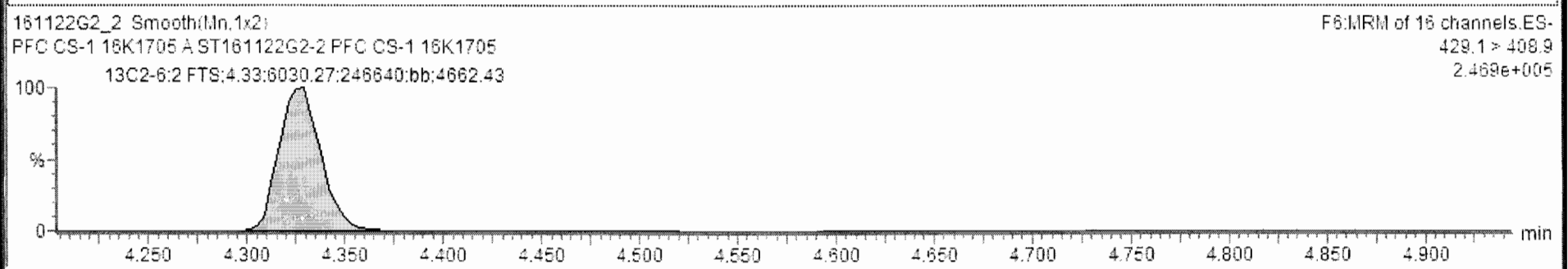
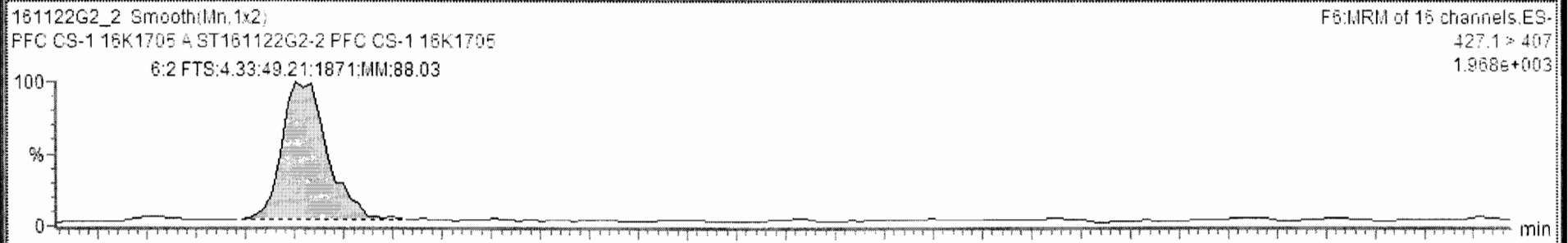






161122G2\_2 - ST161122G2-2 PFC CS-1 16K1705 - PFC CS-1 16K1705 A

Name	Trace	Area	Response	RRF	Wt/VoL	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
1	PFBA	213.1 > 168.8	4.29e2	0.259	0.518	1.93	0.608	121.7	0.0932282		0.9984
2	PFPeA	263.1 > 218.9	3.66e2	0.493	0.986	2.85	0.611	122.2	0.1266747		0.9987
3	PFBS	299 > 79.7	4.84e2	0.966	1.932	3.10	0.620	124.1	0.0821816		0.9986
4	PFHxA	313.2 > 268.9	3.91e2	0.376	0.751	3.47	0.612	122.3	0.0000000		0.9985
5	PFHpA	363 > 218.9	9.73e2	0.805	1.610	3.98	0.608	121.5	0.0901896		0.9993
6	PFHxS	398.9 > 79.8	4.64e2	0.965	1.931	4.09	0.576	115.3	0.0162512		0.9975
7	6:2 FTS	427.1 > 407	4.92e1	0.102	0.204	4.33	0.523	104.6	0.2638680		0.9789
8	PFOA	413 > 368.7	1.09e3	0.566	1.133	4.37	0.527	105.5	0.0000000		0.9990
9	PFHpS	449 > 98.7	5.82e1	0.030	0.061	4.46	0.577	115.3	0.2567614		0.9958
10	PFOS	499 > 79.9	1.21e2	0.267	0.574	4.76	0.543	108.5	0.2386134		0.9935
11	PFNA	463 > 418.8	5.63e2	0.664	1.329	4.72	0.509	101.7	0.1047001		0.9954
12	PFDA	513 > 468.8	1.30e2	0.270	0.540	5.01	0.486	97.3	0.0368964		0.9973
13	6:2 FTS	527 > 506.9	4.13e1	0.243	0.486	4.99	0.485	97.0	0.0169968		0.9823



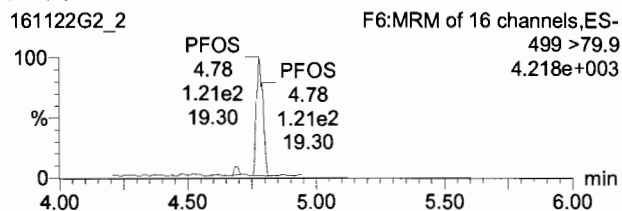
Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

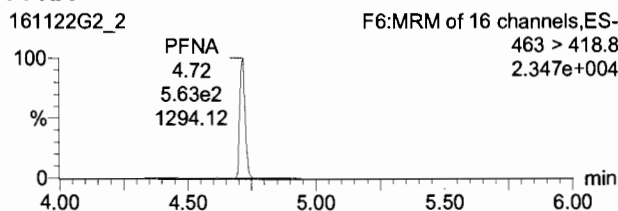
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

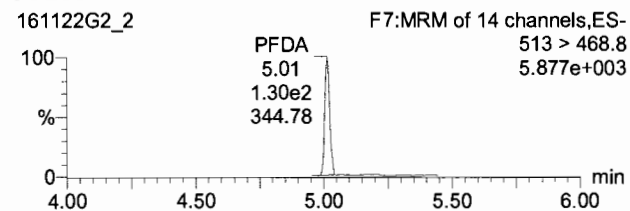
**PFOS**



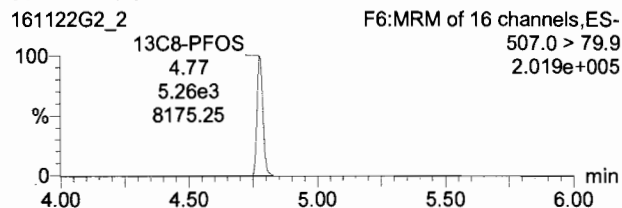
**PFNA**



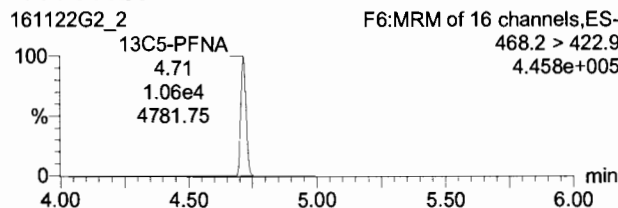
**PFDA**



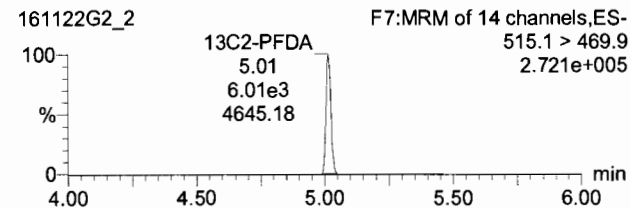
**13C8-PFOS**



**13C5-PFNA**



**13C2-PFDA**



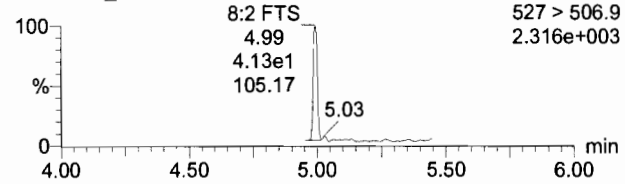
Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

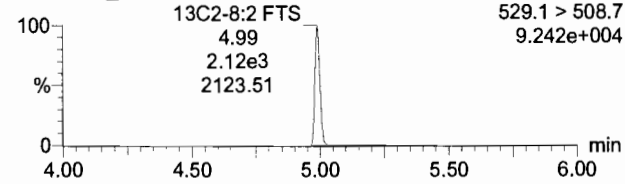
8:2 FTS

161122G2\_2



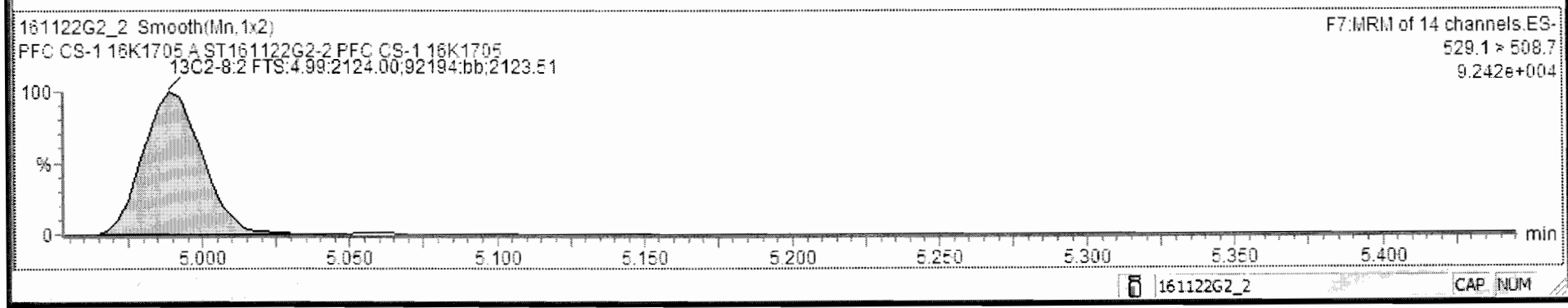
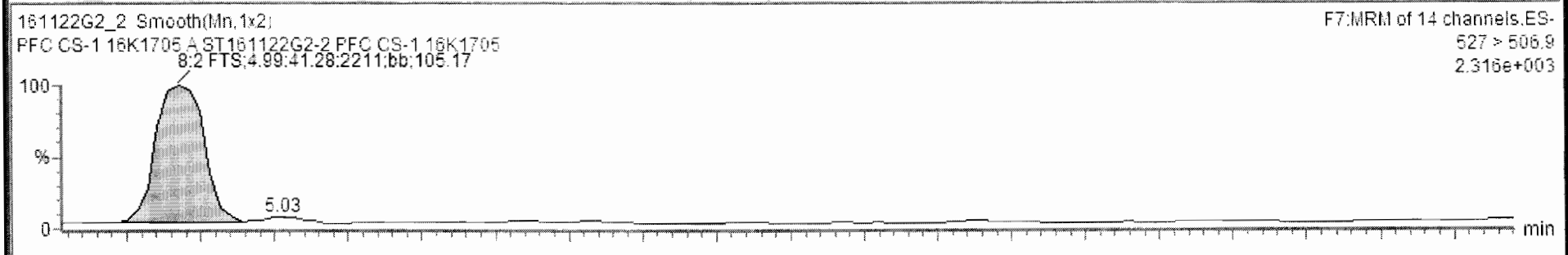
13C2-8:2 FTS

161122G2\_2



161122G2\_2 - ST161122G2-2 PFC CS-1 16K1705 - PFC CS-1 16K1705 A

Name	Trace	Area	RRF	Wt/Vol	Pred. RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	3.91e2	1.000	3.47	3.47	0.612	NO	122.3	0.0000000
5	PFHpA	263 > 318.9	9.73e2	1.000	3.98	3.98	0.608	NO	121.5	0.0903976
6	PFHxS	398.9 > 79.6	4.64e2	1.000	4.09	4.09	0.578	NO	115.3	0.0164070
7	6:2 FTS	427.1 > 407	4.92e1	1.000	4.33	4.33	0.645	NO	129.1	0.4501268
8	PFOA	413 > 365.7	1.09e3	1.000	4.37	4.37	0.527	NO	105.5	0.0000000
9	PFHpS	449 > 98.7	5.82e1	1.000	4.37	4.45	0.577	NO	115.3	0.2585335
10	PFOS	499 > 79.9	1.21e2	1.000	4.78	4.78	0.543	NO	108.5	0.2465854
11	PFNA	463 > 418.8	5.63e2	1.000	4.71	4.72	0.509	NO	101.7	0.1048546
12	PFDA	513 > 468.8	1.30e2	1.000	5.01	5.01	0.486	NO	97.3	0.0375452
13	8:2 FTS	527 > 506.9	4.13e1	1.000	4.99	4.99	0.479	NO	95.9	0.0123962
14	13C3-PFBA	216.1 > 171.8	2.07e4	1.21	1.93	1.93	12.2	NO	97.8	0.0060004
15	13C3-PFPeA	266 > 221.8	9.28e3	0.448	2.83	2.85	12.5	NO	100.1	0.0125741
16	13C3-PFBS	302.0 > 96.8	6.26e3	0.302	3.09	3.10	12.5	NO	100.1	0.0062980



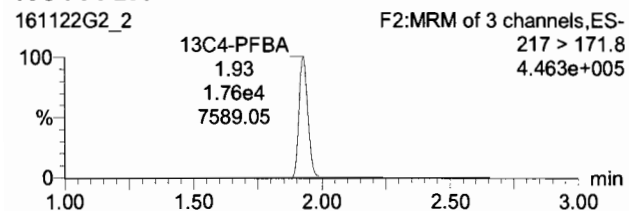
Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

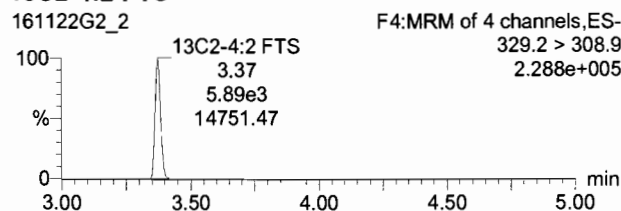
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

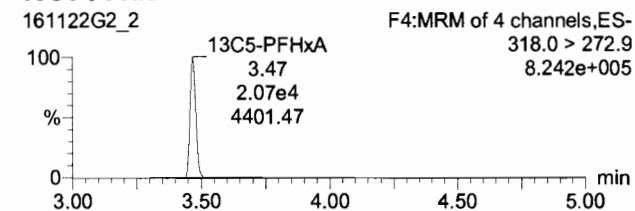
**13C4-PFBA**



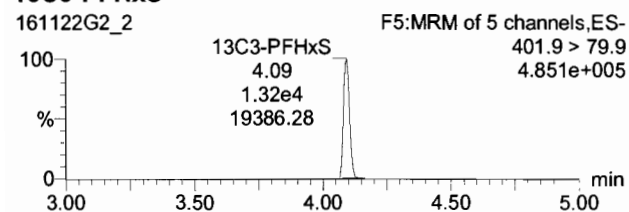
**13C2-4:2 FTS**



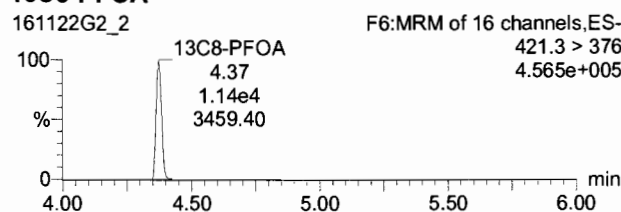
**13C5-PFHxA**



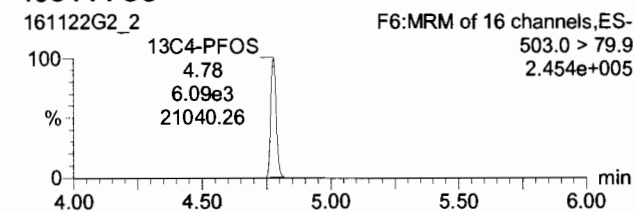
**13C3-PFHxS**



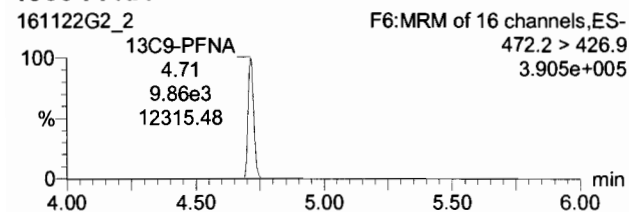
**13C8-PFOA**



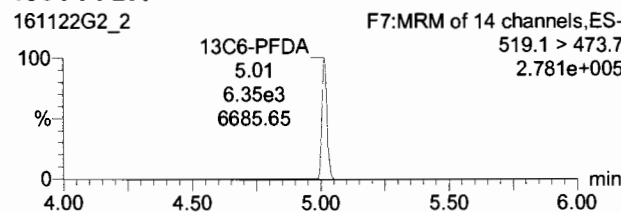
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**

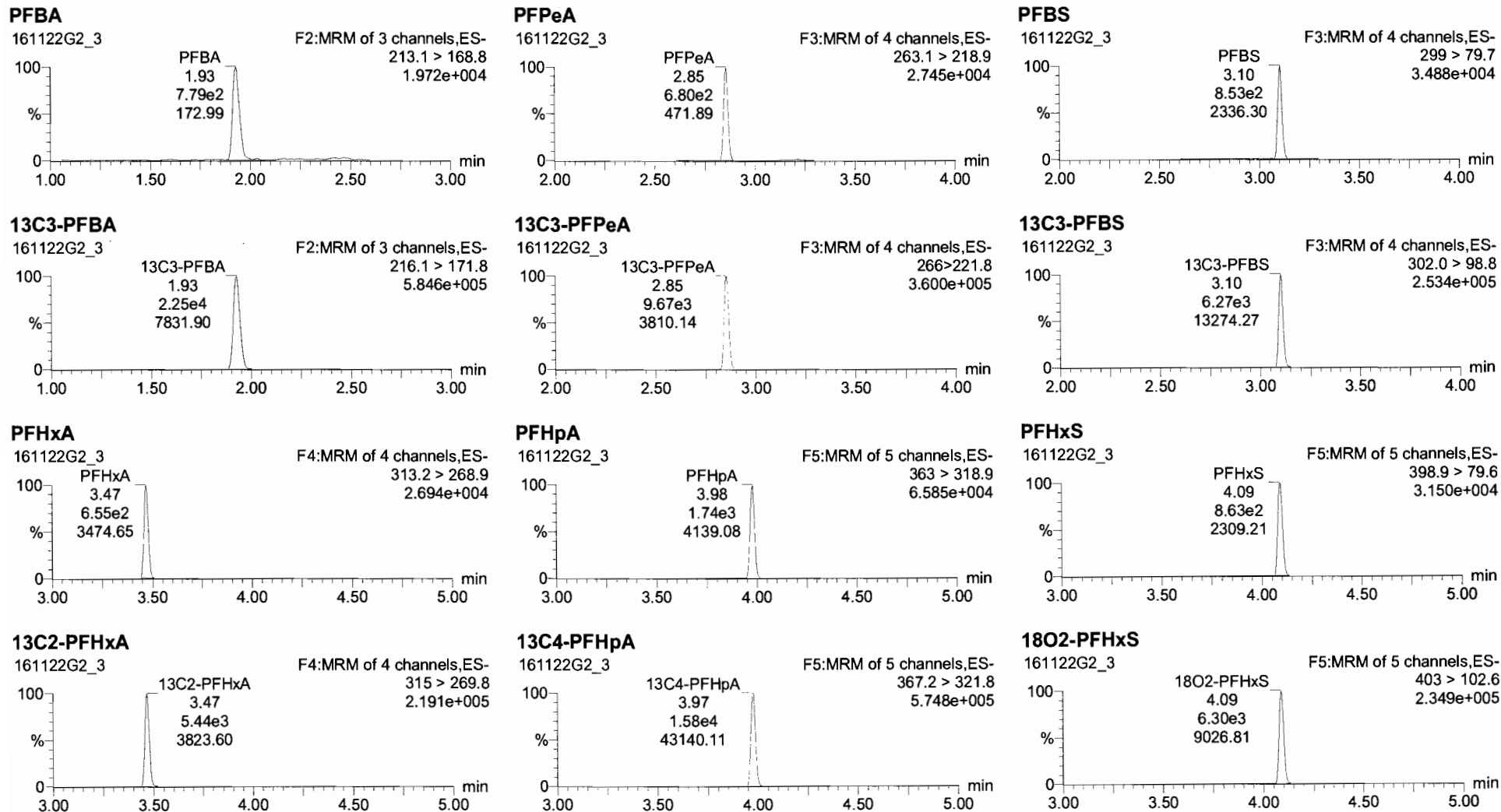


Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

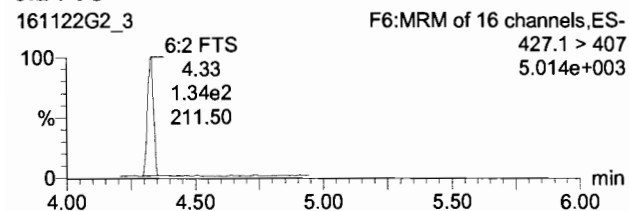


Dataset: Untitled

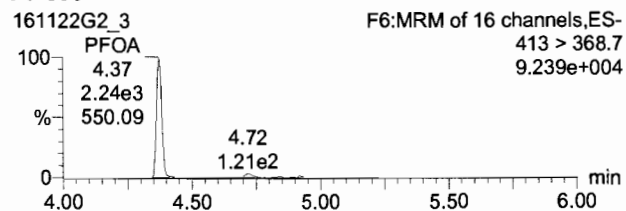
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

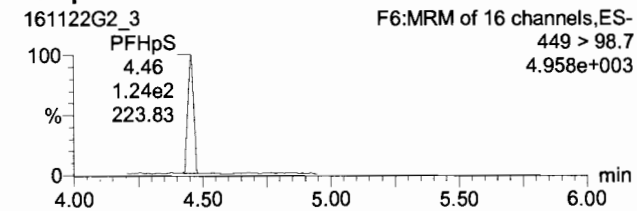
**6:2 FTS**



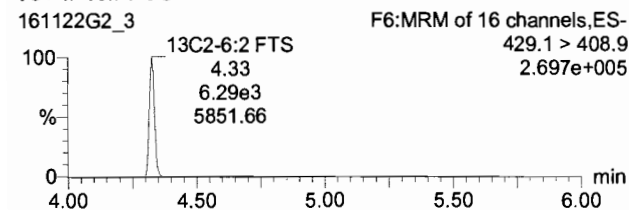
**PFOA**



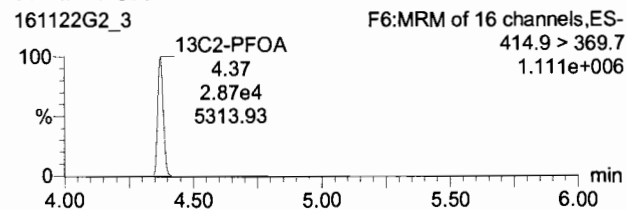
**PFHpS**



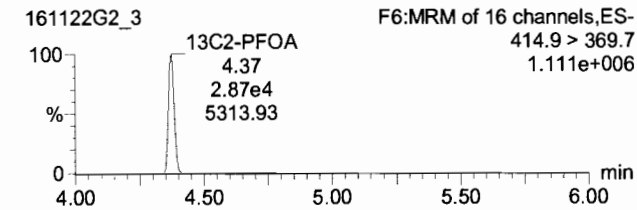
**13C2-6:2 FTS**



**13C2-PFOA**



**13C2-PFOA**



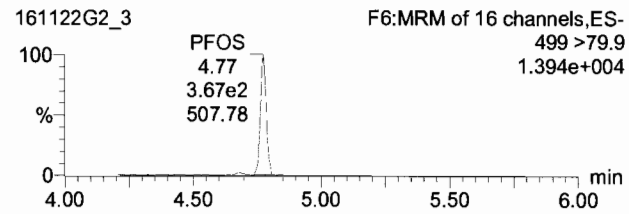
Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

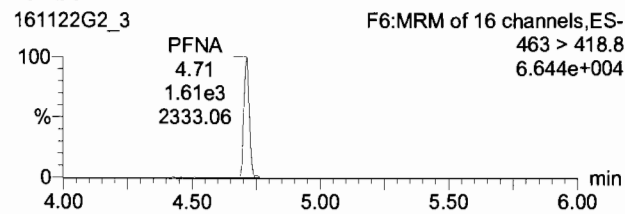
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

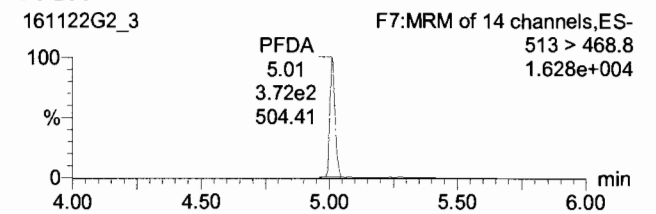
**PFOS**



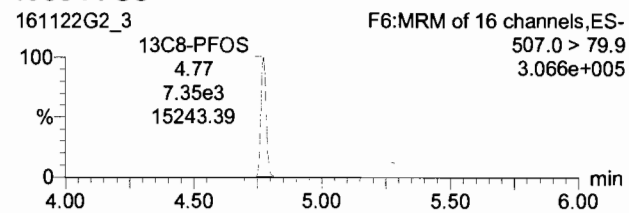
**PFNA**



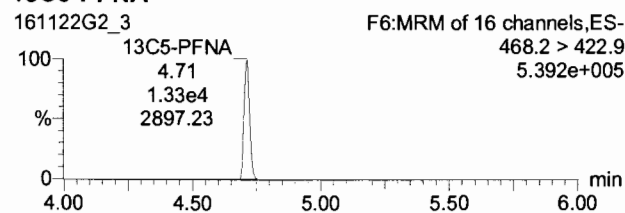
**PFDA**



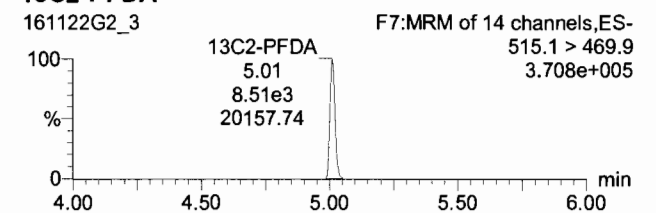
**13C8-PFOS**



**13C5-PFNA**



**13C2-PFDA**





Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

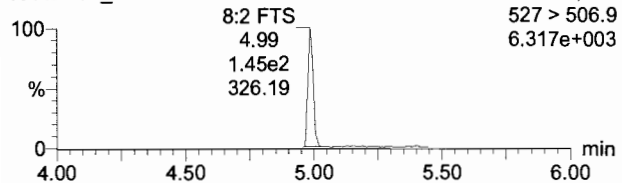
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

8:2 FTS

161122G2\_3

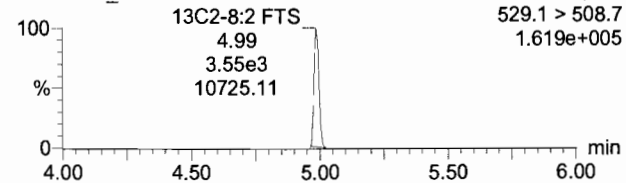
F7:MRM of 14 channels,ES-  
527 > 506.9  
6.317e+003



13C2-8:2 FTS

161122G2\_3

F7:MRM of 14 channels,ES-  
529.1 > 508.7  
1.619e+005





161122G2\_3 - ST161122G2-3 PFC CS0 16K1706 - PFC CS0 16K1706 A

Name	Trace	Area	RRF	Wt/Vol	Pred. RT	RT	Conc.	>MDL	%Rec	DL
4 PFHxA	313.2 > 268.9	6.55e2		1.000	3.47	3.47	0.989	NO	98.9	0.0000000
5 PFHpA	363 > 318.9	1.74e3		1.000	3.97	3.96	0.979	NO	97.9	0.0697062
6 PFHxS	398.9 > 79.6	8.63e2		1.000	4.09	4.09	1.01	NO	101.1	0.0165248
7 6:2 FTS	427.1 > 407	1.34e2		1.000	4.33	4.33	0.971	NO	97.1	0.4490742
8 PFOA	413 > 368.7	2.24e3		1.000	4.37	4.37	0.983	NO	98.3	0.0000000
9 PFHpS	449 > 98.7	1.24e2		1.000	4.37	4.45	0.834	NO	83.4	0.2545461
10 PFOS	499 > 79.9	3.67e2		1.000	4.78	4.77	0.947	NO	94.7	0.2020921
11 PFNA	483 > 418.8	1.61e3		1.000	4.71	4.71	1.02	NO	102.5	0.1049328
12 PFDA	513 > 468.8	3.72e2		1.000	5.01	5.01	0.949	NO	94.9	0.0381871
13 8:2 FTS	527 > 506.9	1.45e2		1.000	4.99	4.99	0.984	NO	98.4	0.0027010
14 13C3-PFBA	216.1 > 171.8	2.25e4	1.21	1.000	1.92	1.92	12.6	NO	101.0	0.0041450
15 13C3-PFPeA	266 > 221.8	9.67e3	0.448	1.000	2.83	2.85	12.4	NO	99.4	0.0077179
16 13C3-PFBS	302.0 > 98.8	6.27e3	0.302	1.000	3.09	3.10	11.9	NO	95.4	0.0023082

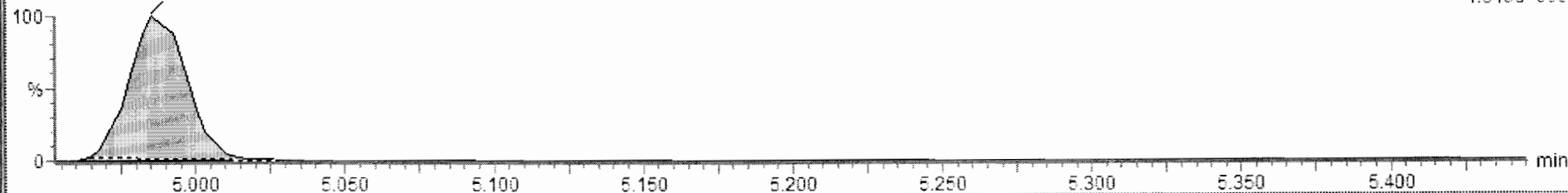
161122G2\_3 Smooth(Mn,1x2)  
 PFC CS0 16K1706 A ST161122G2-3 PFC CS0 16K1706  
 8:2 FTS:4.99:145.29:6219:bb:326.19

F7:MRM of 14 channels,ES-  
 527 > 506.9  
 6.317e+003



161122G2\_3 Smooth(Mn,1x2)  
 PFC CS0 16K1706 A ST161122G2-3 PFC CS0 16K1706  
 13C2-8:2 FTS:4.99:3659.70:161797:MM:10867.64

F7:MRM of 14 channels,ES-  
 529.1 > 508.7  
 1.619e+005



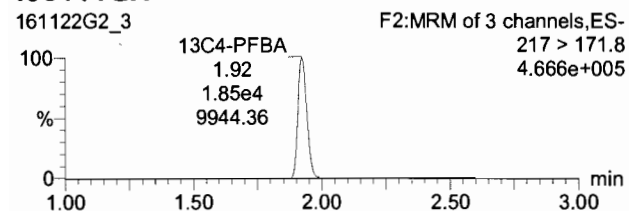
Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

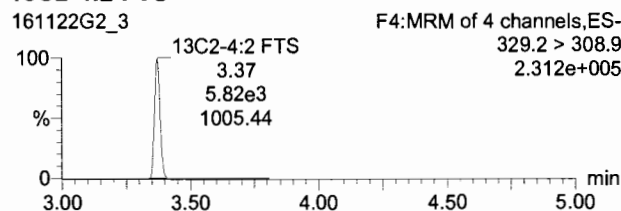
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

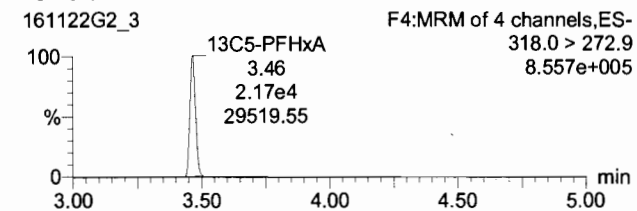
**13C4-PFBA**



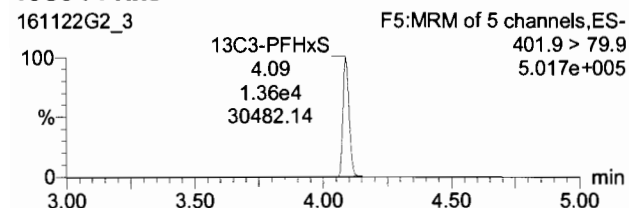
**13C2-4:2 FTS**



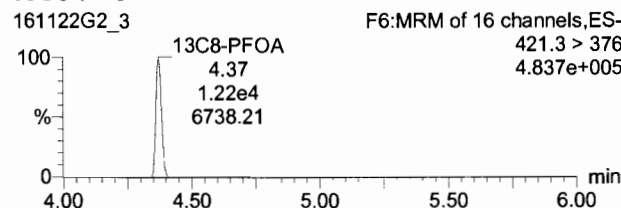
**13C5-PFHxA**



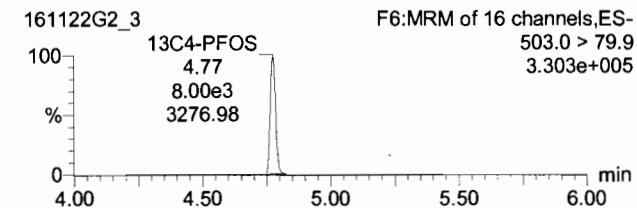
**13C3-PFHxS**



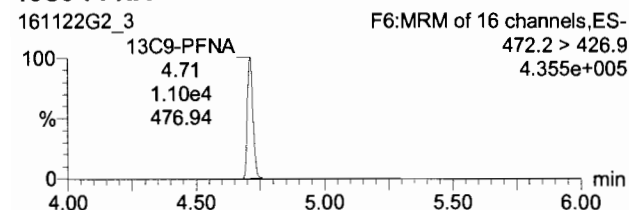
**13C8-PFOA**



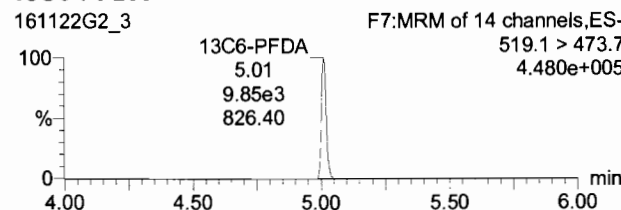
**13C4-PFOS**



**13C9-PFNA**



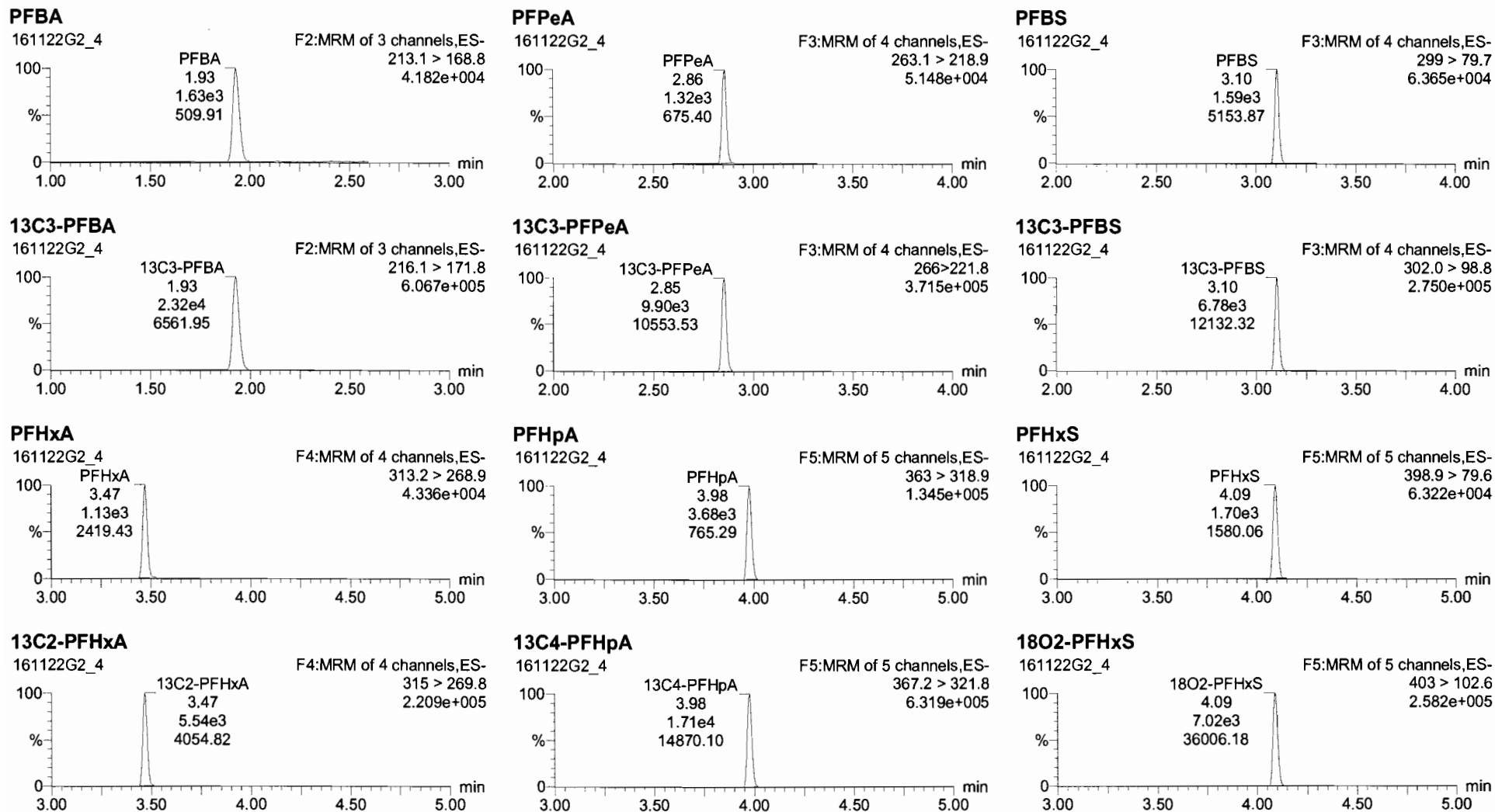
**13C6-PFDA**



Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

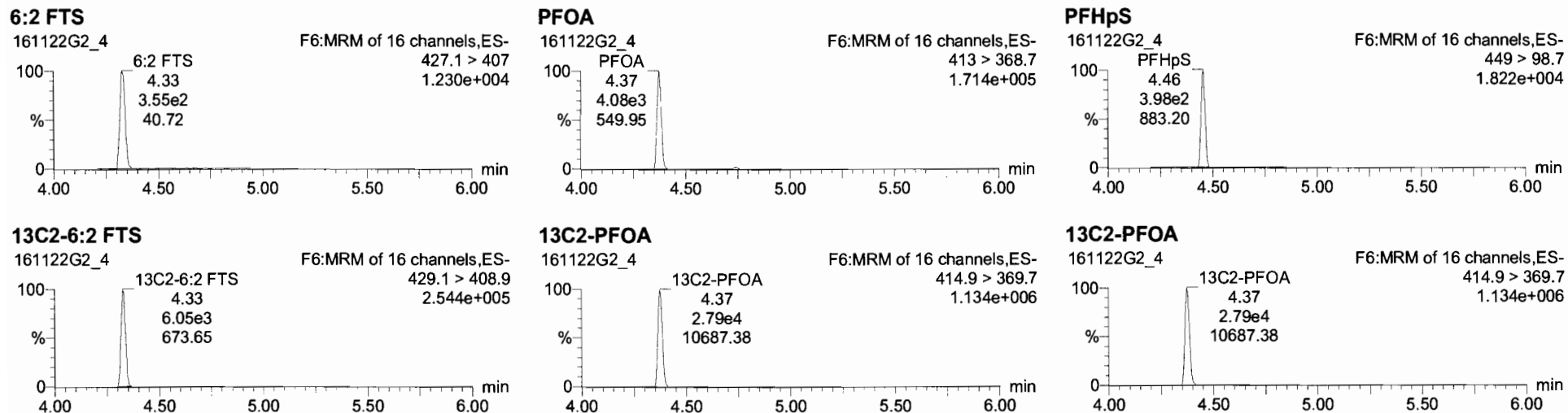
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Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

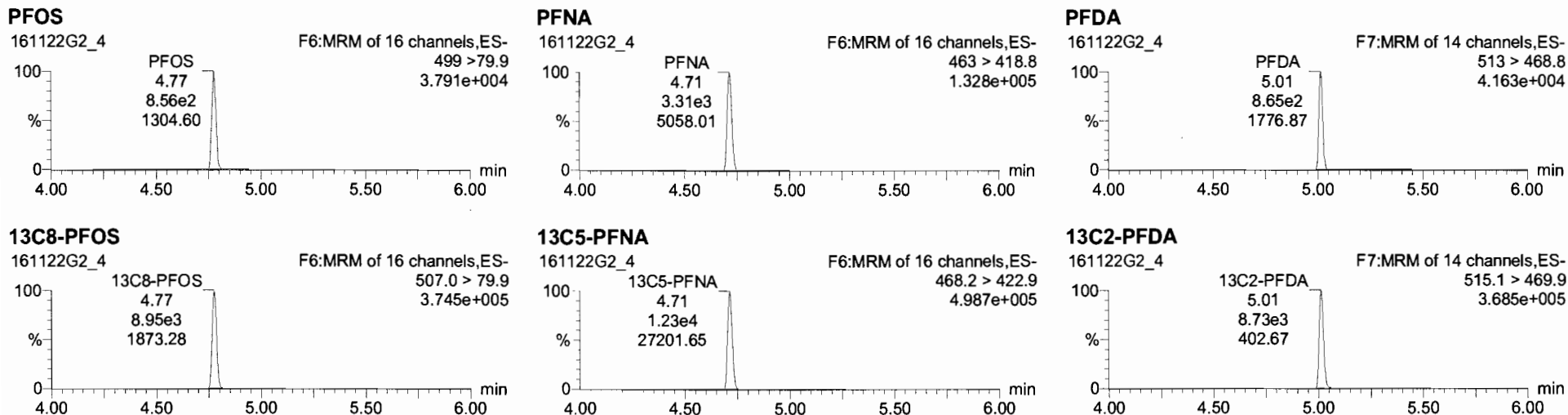
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Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A



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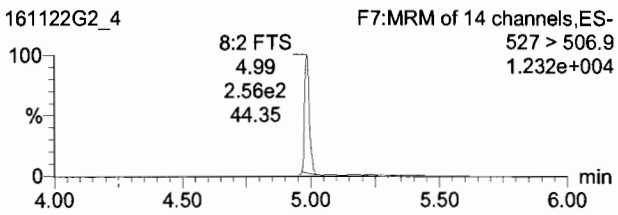
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A

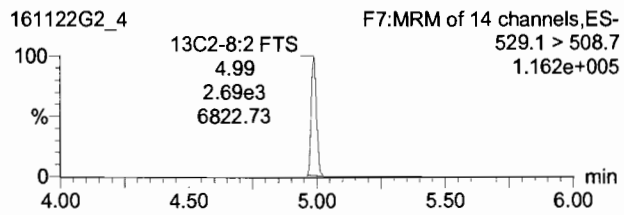
8:2 FTS

161122G2\_4



13C2-8:2 FTS

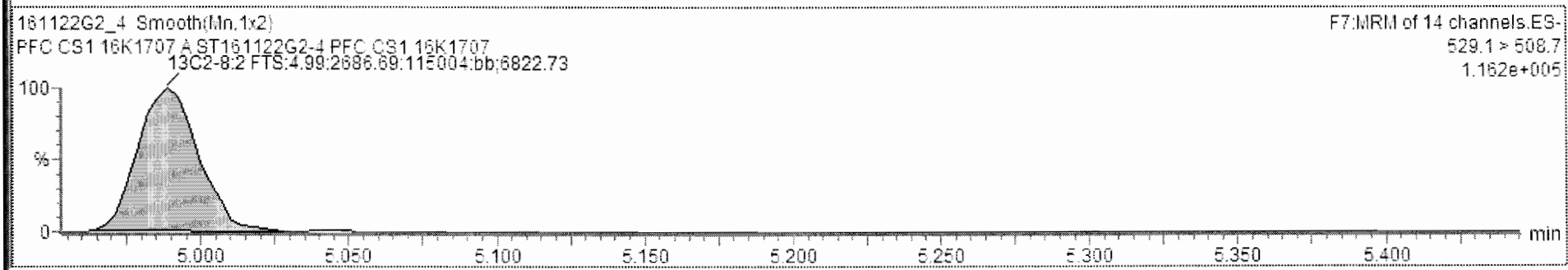
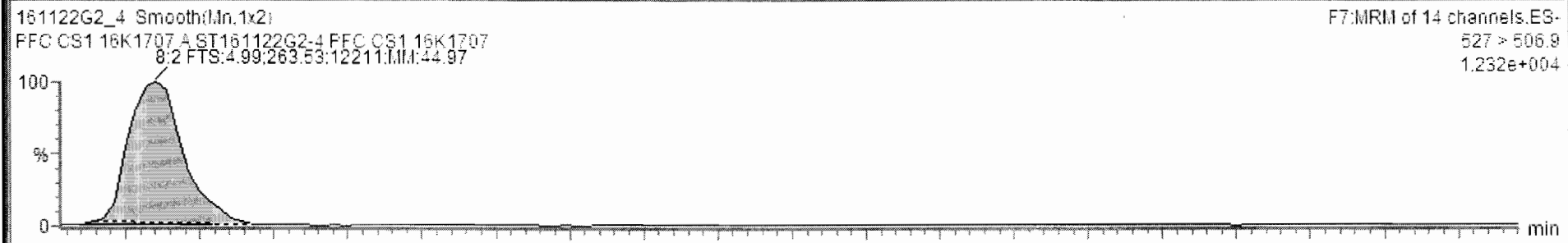
161122G2\_4





161122G2\_4 - ST161122G2-4 PFC CS1 16K1707 - PFC CS1 16K1707 A

Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	1.13e3	1.000	3.47	3.47	1.69	NO	84.7	0.0000000
5	PFHpA	263 > 318.9	3.68e3	1.000	3.98	2.98	1.82	NO	90.8	0.0947461
6	PFHxS	398.9 > 79.6	1.70e3	1.000	4.09	4.09	1.78	NO	88.8	0.0182811
7	6:2 FTS	427.1 > 407	3.55e2	1.000	4.33	4.33	1.90	NO	94.8	0.5167321
8	PFOA	413 > 368.7	4.08e3	1.000	4.37	4.37	1.93	NO	98.8	0.0000000
9	PFHpS	449 > 98.7	3.98e2	1.000	4.37	4.45	2.18	NO	109.2	0.2540463
10	PFOS	499 > 79.9	8.56e2	1.000	4.78	4.77	1.63	NO	81.8	0.2016580
11	PFNA	483 > 418.8	3.31e3	1.000	4.71	4.71	2.16	NO	107.8	0.1049312
12	PFDA	513 > 468.8	8.65e2	1.000	5.01	5.01	2.11	NO	105.6	0.0389790
13	6:2 FTS	527 > 506.9	2.64e2	1.000	4.99	4.99	2.44	NO	122.1	0.1423108
14	13C3-PFBA	216.1 > 171.8	2.32e4	1.21	1.93	1.93	13.4	NO	107.0	0.0051901
15	13C3-PFPeA	266 > 221.8	9.90e3	0.448	2.83	2.85	13.1	NO	104.8	0.0029331
16	13C3-PFBS	302.0 > 98.8	6.78e3	0.302	3.09	3.10	13.3	NO	106.4	0.0028004





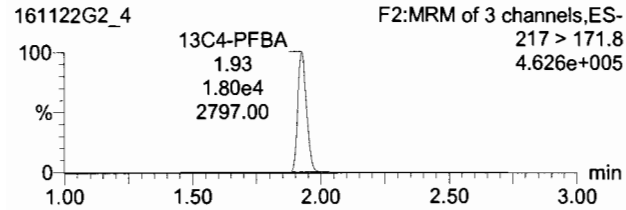
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

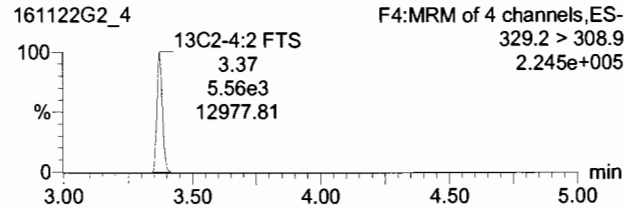
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A

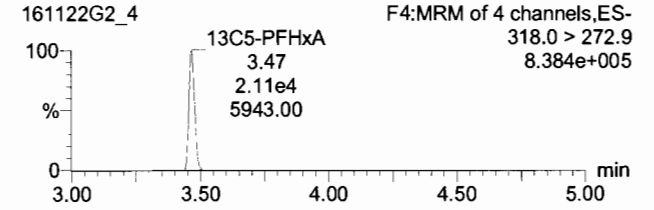
**13C4-PFBA**



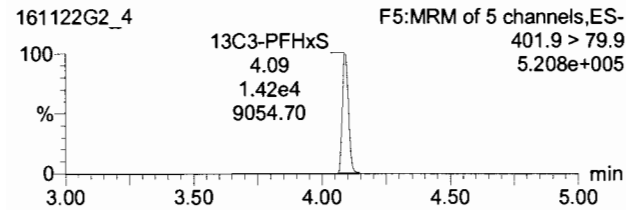
**13C2-4:2 FTS**



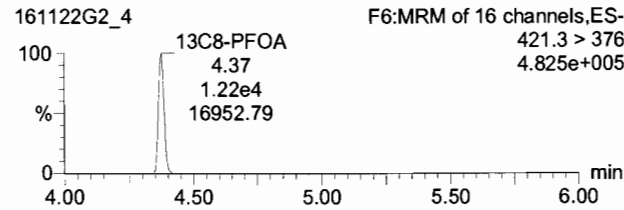
**13C5-PFHxA**



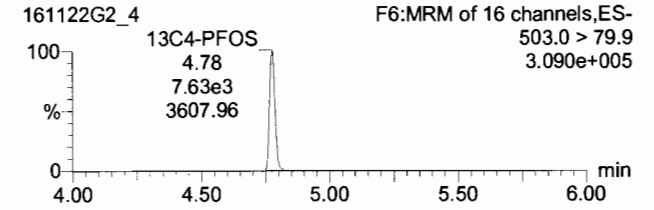
**13C3-PFHxS**



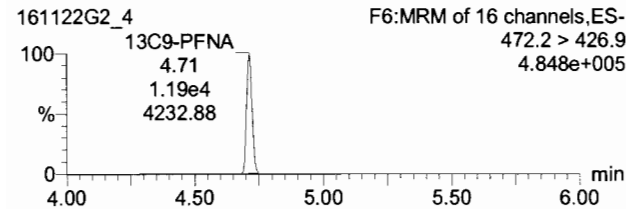
**13C8-PFOA**



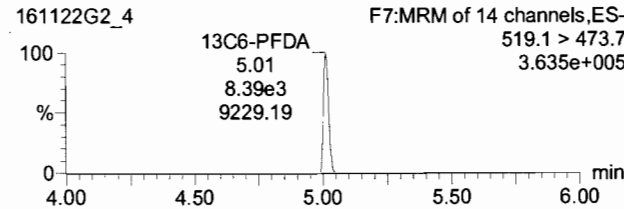
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



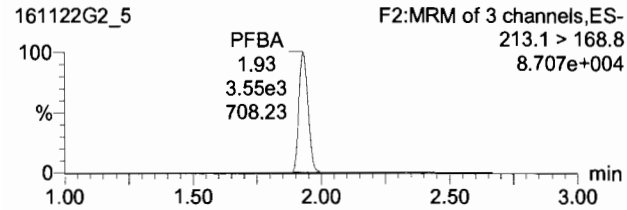
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

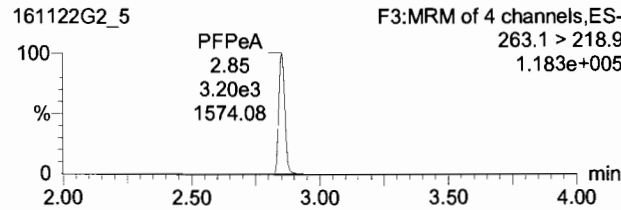
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

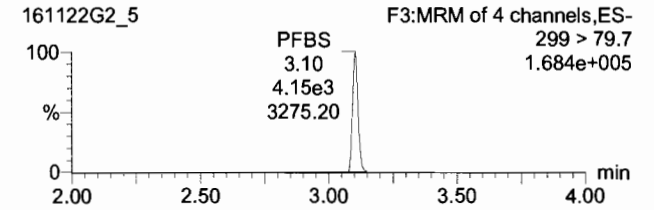
**PFBA**



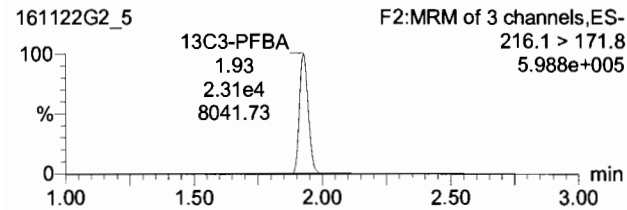
**PFPeA**



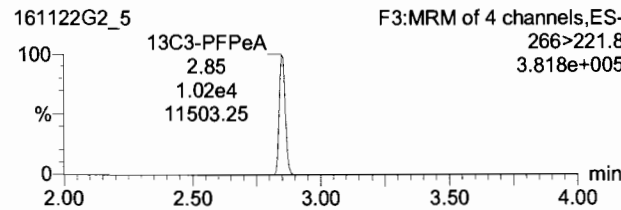
**PFBS**



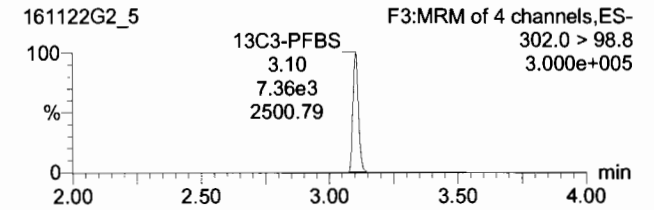
**13C3-PFBA**



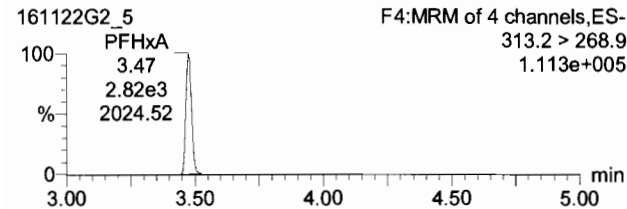
**13C3-PFPeA**



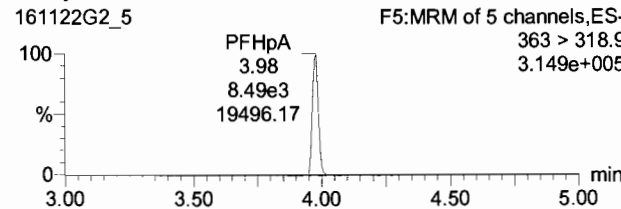
**13C3-PFBS**



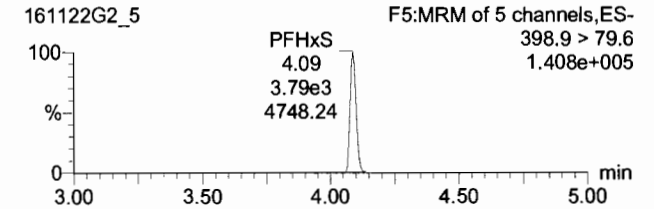
**PFHxA**



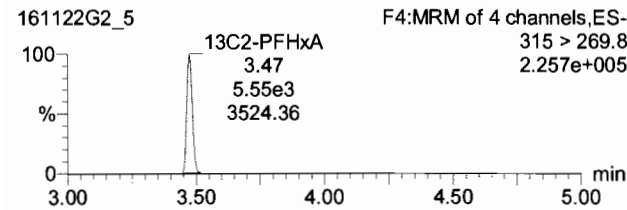
**PFHpA**



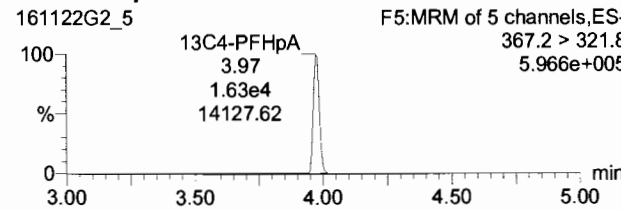
**PFHxS**



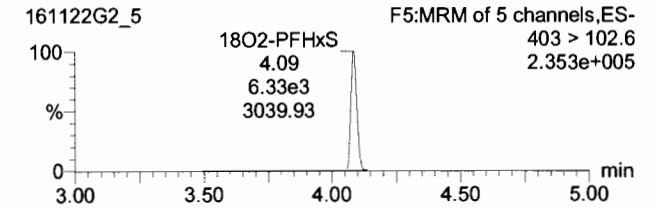
**13C2-PFHxA**



**13C4-PFHpA**



**18O2-PFHxS**



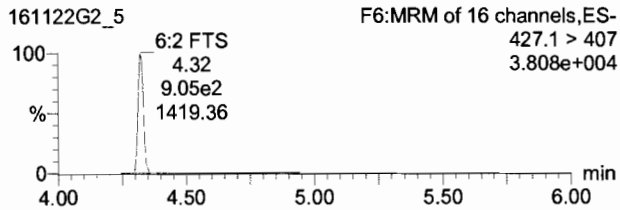
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

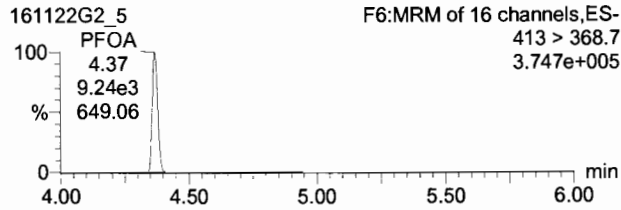
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

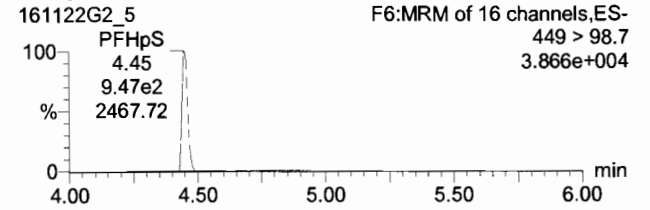
**6:2 FTS**



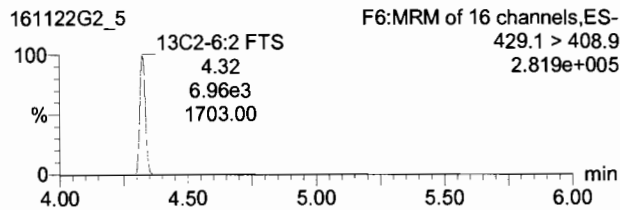
**PFOA**



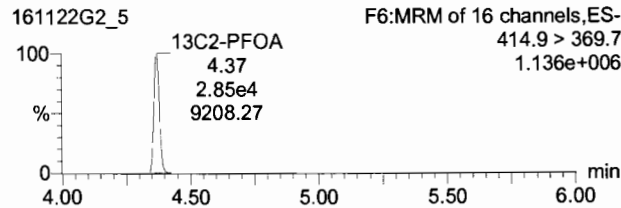
**PFHpS**



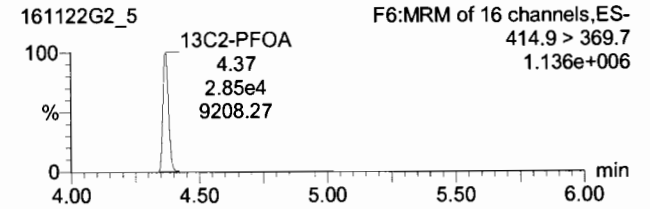
**13C2-6:2 FTS**



**13C2-PFOA**



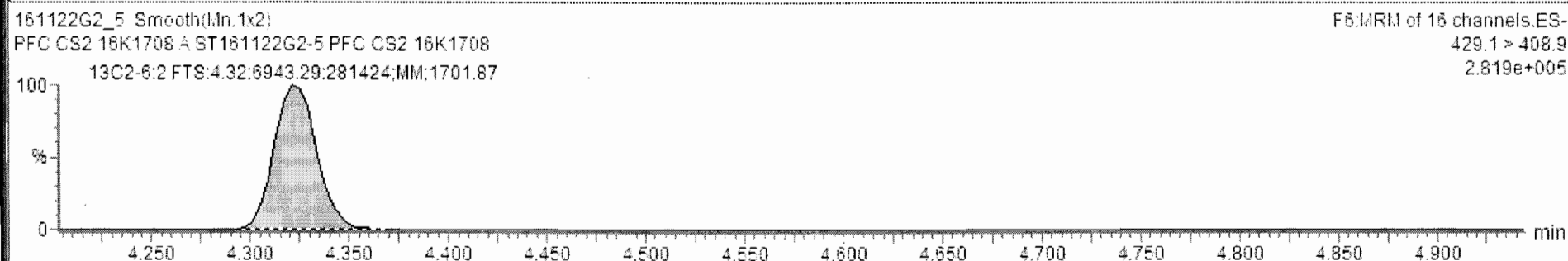
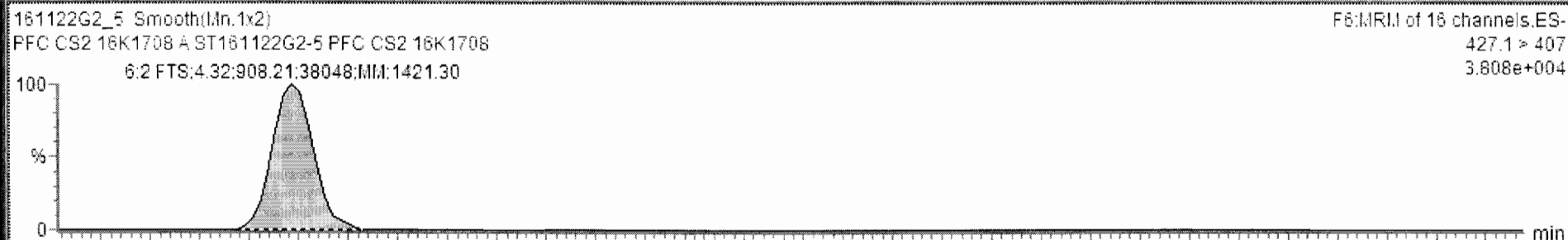
**13C2-PFOA**





161122G2\_5 - ST161122G2-5 PFC CS2 16K1708 - PFC CS2 16K1708 A

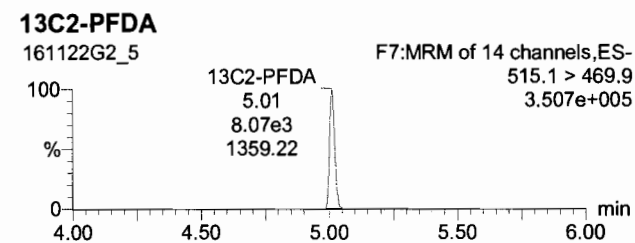
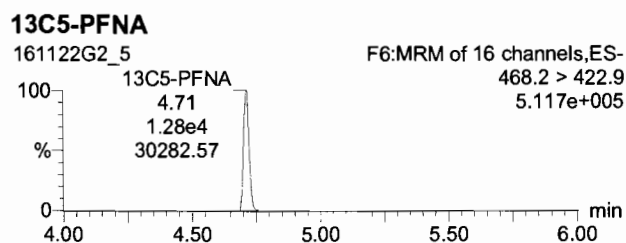
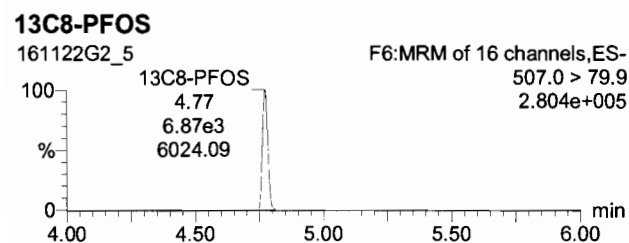
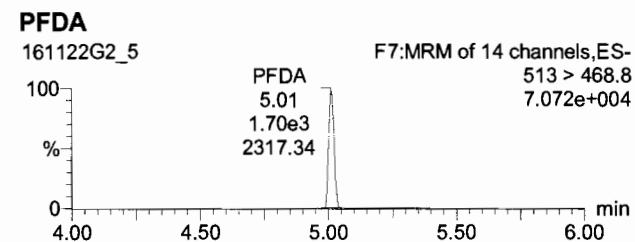
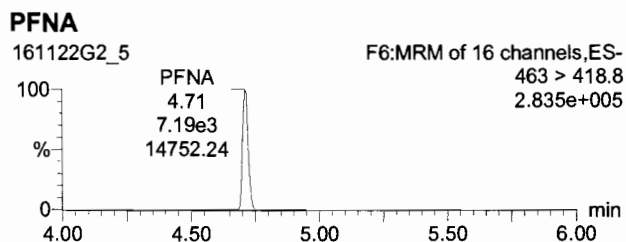
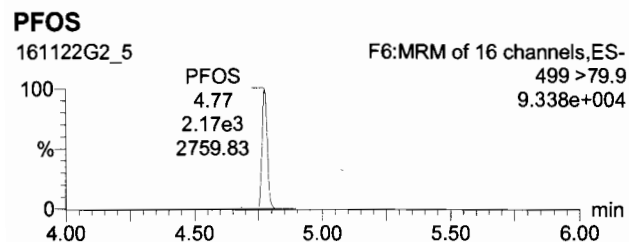
Name	Trace	Area	Response	RRF	Wt/Vol	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
4	PFHxA	313.2 > 268.9	2.82e3	2.538	0.508	1.000	3.47	4.23	84.5	0.0000000	0.9985
5	PFHpA	363 > 318.9	8.49e3	8.514	1.303	1.000	3.98	4.28	85.7	0.0898946	0.9993
6	PFHxS	398.9 > 79.6	3.79e3	7.475	1.495	1.000	4.09	4.36	87.2	0.0177626	0.9975
7	6:2 FTS	427.1 > 407	9.08e2	1.635	0.327	1.000	4.32	4.17	83.4	0.2827957	0.9789
8	PFOA	413 > 368.7	9.24e3	4.054	0.811	1.000	4.37	4.40	88.1	0.0000000	0.9990
9	PFHpS	449 > 98.7	9.47e2	0.416	0.083	1.000	4.45	4.76	95.2	0.2525704	0.9956
10	PFOS	499 > 79.9	2.17e3	3.949	0.790	1.000	4.77	4.93	98.6	0.2032607	0.9935
11	PFNA	463 > 418.8	7.19e3	7.012	1.402	1.000	4.71	4.37	87.5	0.1046439	0.9954
12	PFDA	513 > 468.8	1.70e3	2.630	0.526	1.000	5.01	4.44	88.9	0.0382137	0.9973
13	8:2 FTS	527 > 506.9	4.40e2	2.081	0.416	1.000	4.99	4.15	82.9	0.0149202	0.9823
14	13C3-PFBA	216.1 > 171.8	2.31e4	15.177	1.214	1.000	1.93	12.6	100.8	0.0039178	4.60
15	13C3-PFPeA	266 > 221.8	1.02e4	5.822	0.466	1.000	2.85	13.0	104.1	0.0026412	3.92
16	13C3-PFBS	302.0 > 98.8	7.36e3	4.183	0.335	1.000	3.10	13.8	110.8	0.0141320	5.67



Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
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Name: 161122G2\_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A



Dataset: Untitled

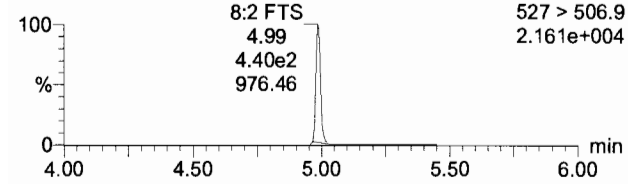
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

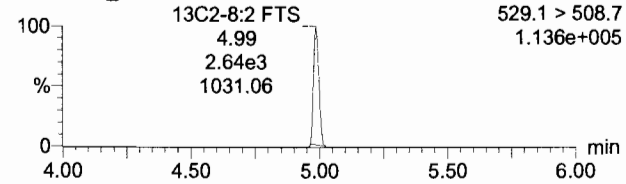
8:2 FTS

161122G2\_5



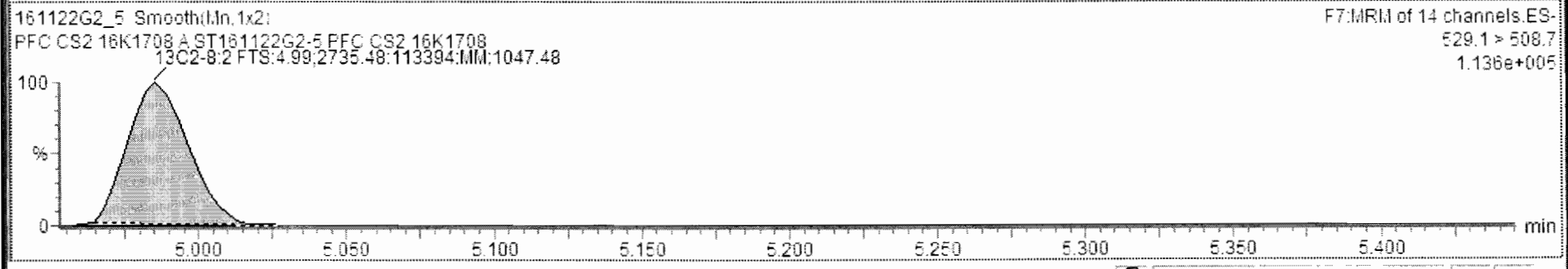
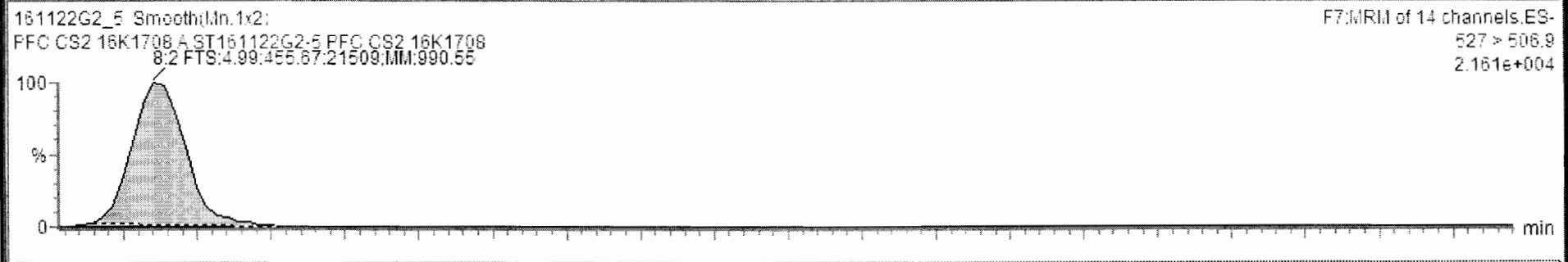
13C2-8:2 FTS

161122G2\_5



161122G2\_5 - ST161122G2-5 PFC CS2 16K1708 - PFC CS2 16K1708 A

Name	Trace	Area	RRF	Wt/Vol	Pred. RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	2.82e3	1.000	3.47	3.47	4.23	NO	84.5	0.0000000
5	PFHpA	363 > 318.9	8.49e3	1.000	3.97	3.98	4.28	NO	85.7	0.0896946
6	PFHxS	398.9 > 79.6	3.79e3	1.000	4.09	4.09	4.36	YES	87.2	0.0177626
7	6:2 FTS	427.1 > 407	9.08e2	1.000	4.32	4.32	3.89	NO	73.9	0.4496157
8	PFOA	413 > 368.7	9.24e3	1.000	4.37	4.37	4.40	YES	88.1	0.0000000
9	PFHpS	449 > 98.7	9.47e2	1.000	4.37	4.45	4.76	YES	95.2	0.2525704
10	PFOS	499 > 79.9	2.17e3	1.000	4.77	4.77	4.93	YES	98.6	0.2032607
11	PFNA	463 > 418.8	7.19e3	1.000	4.71	4.71	4.37	YES	87.5	0.1046439
12	PFDA	513 > 468.8	1.70e3	1.000	5.01	5.01	4.44	NO	88.9	0.0382137
13	8:2 FTS	527 > 508.9	4.56e2	1.000	4.99	4.99	4.16	NO	83.2	0.0072296
14	13C3-PFB4	216.1 > 171.8	2.31e4	1.21	1.93	1.93	12.6	NO	100.8	0.0039178
15	13C3-PFPeA	266 > 221.8	1.02e4	0.448	2.84	2.85	13.0	NO	104.1	0.0026412
16	13C3-PFBS	302.0 > 98.8	7.36e3	0.302	3.10	3.10	13.8	NO	110.8	0.0141320



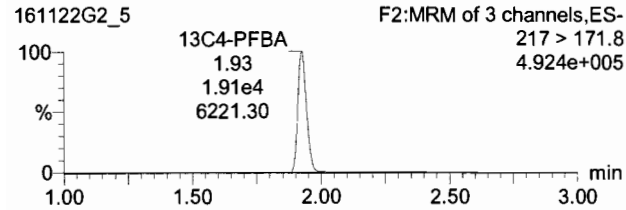
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

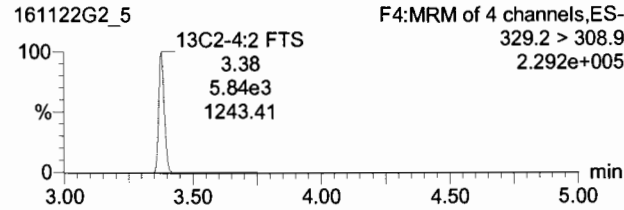
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

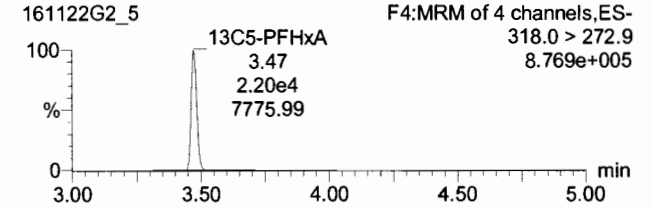
**13C4-PFBA**



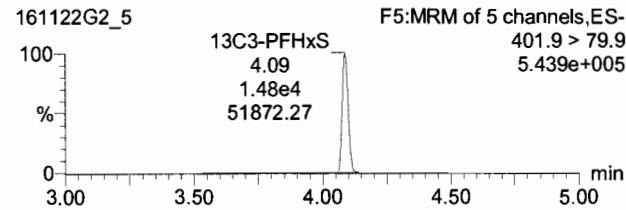
**13C2-4:2 FTS**



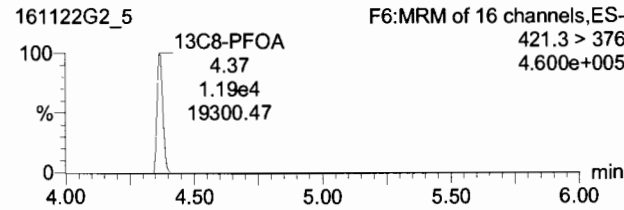
**13C5-PFHxA**



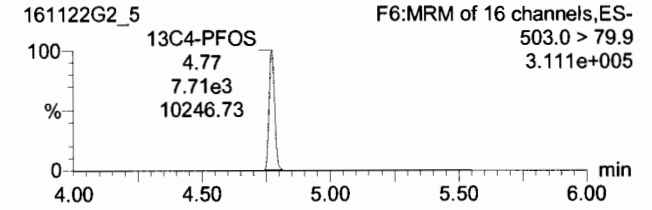
**13C3-PFHxS**



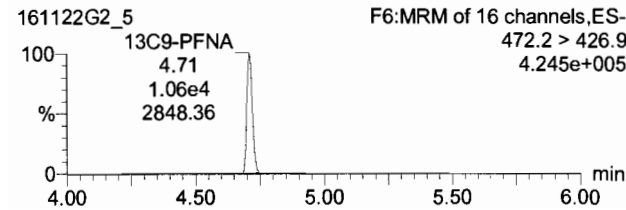
**13C8-PFOA**



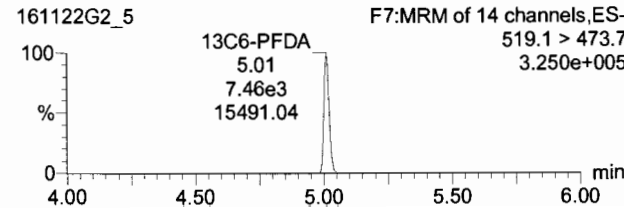
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



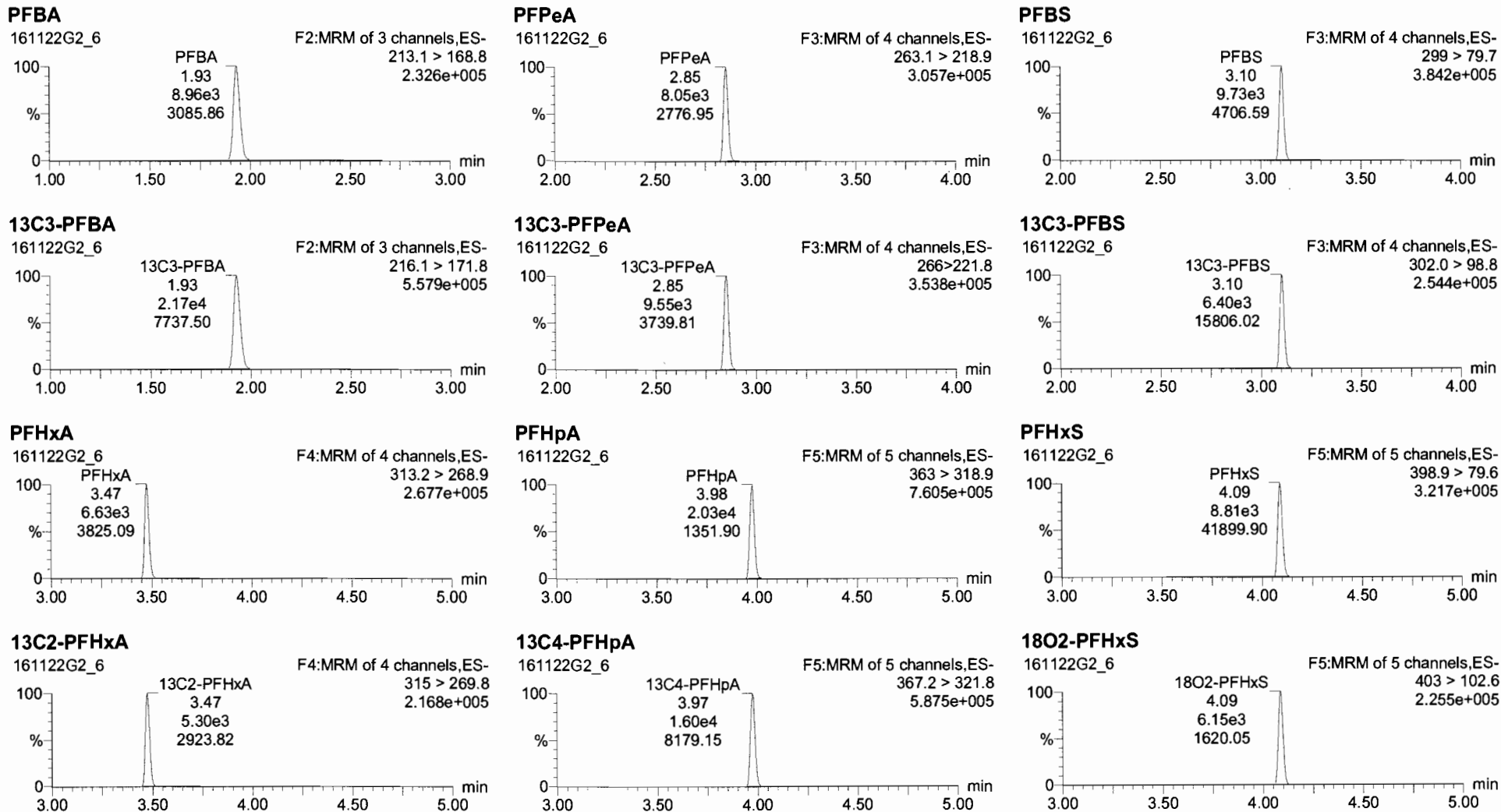


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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_6, Date: 22-Nov-2016, Time: 10:50:54, ID: ST161122G2-6 PFC CS3 16K1709, Description: PFC CS3 16K1709 A



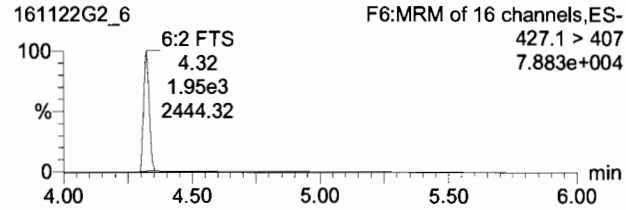
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

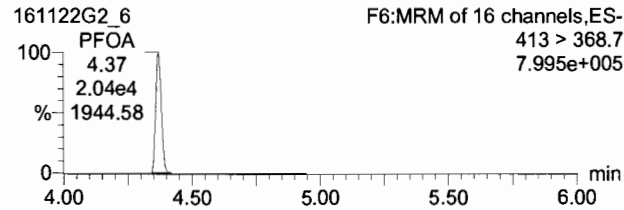
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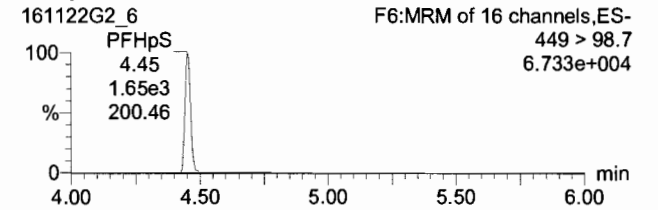
**6:2 FTS**



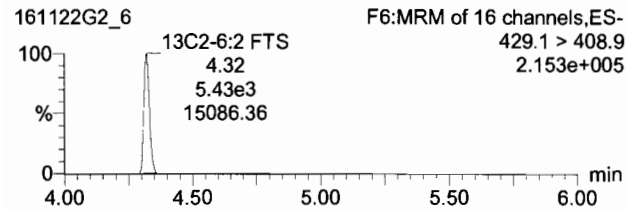
**PFOA**



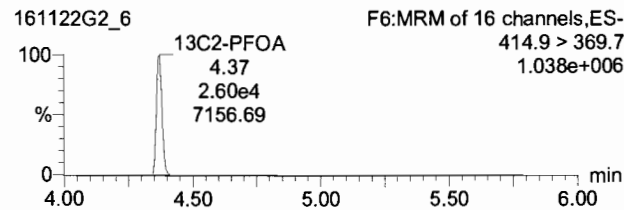
**PFHpS**



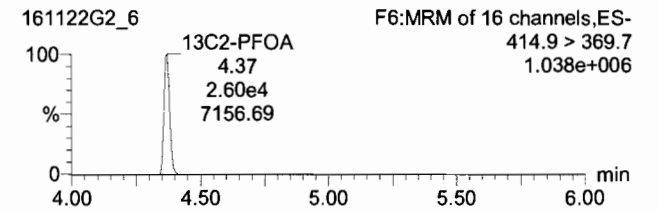
**13C2-6:2 FTS**



**13C2-PFOA**



**13C2-PFOA**



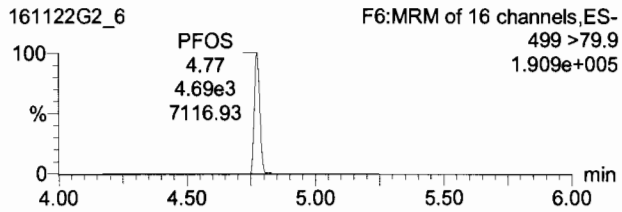
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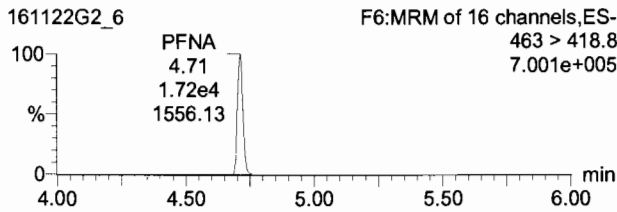
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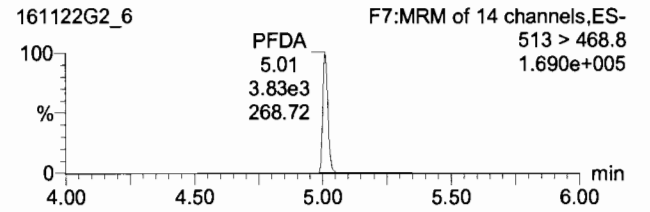
**PFOS**



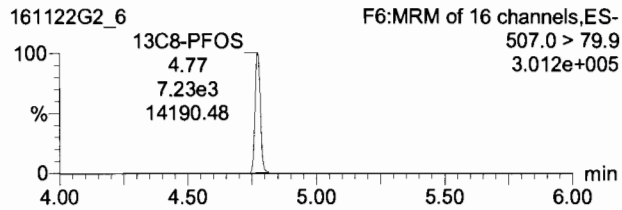
**PFNA**



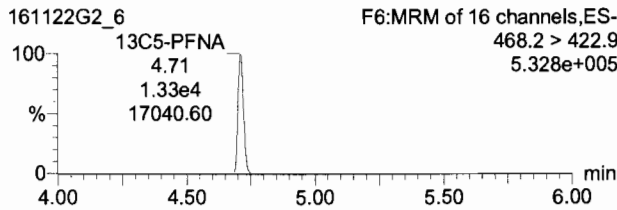
**PFDA**



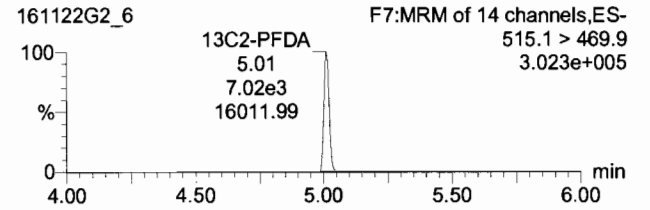
**13C8-PFOS**



**13C5-PFNA**



**13C2-PFDA**



Dataset: Untitled

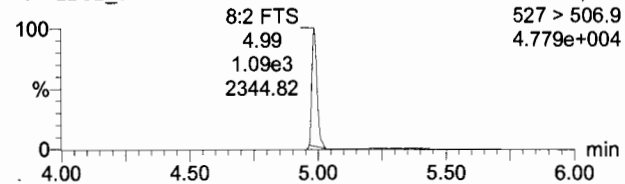
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

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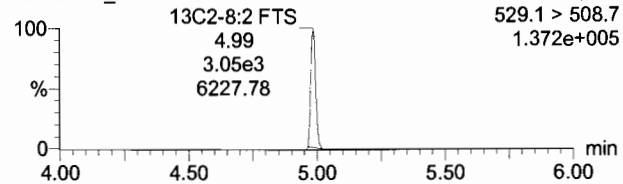
8:2 FTS

161122G2\_6



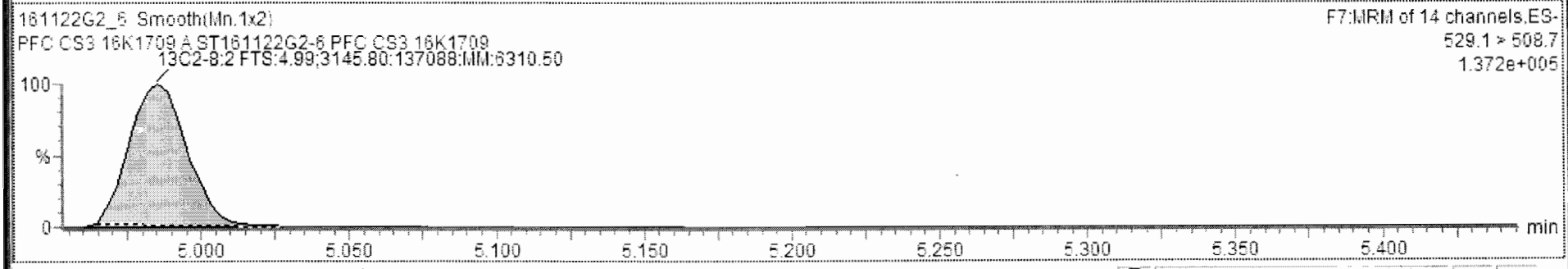
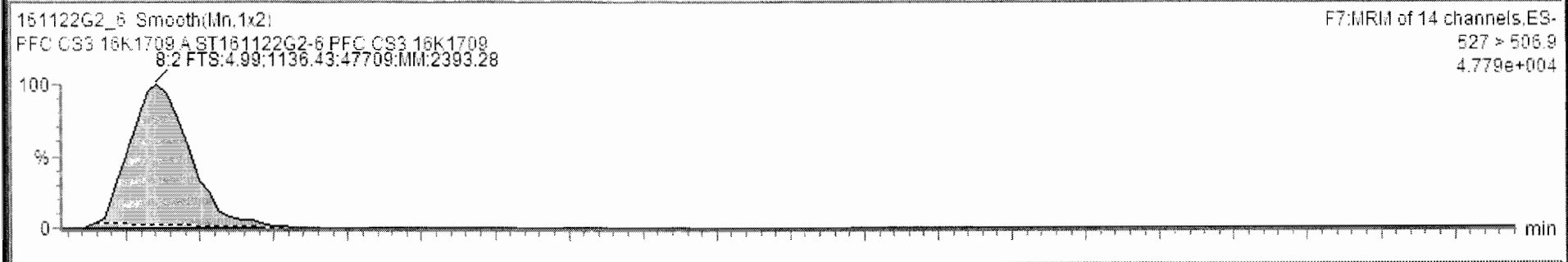
13C2-8:2 FTS

161122G2\_6



161122G2\_6 - ST161122G2-6 PFC CS3 16K1709 - PFC CS3 16K1709 A

Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9		1.000	3.47	3.47	10.4	YES	104.3	0.0000000
5	PFHpA	363 > 318.9		1.000	3.97	3.98	10.3	YES	103.0	0.1083914
6	PFHxS	398.9 > 79.6		1.000	4.09	4.09	10.4	YES	104.1	0.0160911
7	6:2 FTS	427.1 > 407		1.000	4.32	4.32	9.48	YES	94.8	0.4529547
8	PFOA	413 > 368.7		1.000	4.37	4.37	10.8	YES	108.1	0.0000000
9	PFHpS	449 > 98.7		1.000	4.37	4.45	8.86	YES	88.6	0.3575371
10	PFOS	459 > 79.9		1.000	4.76	4.77	9.90	YES	99.0	0.2020896
11	PFNA	463 > 418.8		1.000	4.71	4.71	10.0	YES	100.1	0.1200018
12	PFDA	513 > 468.8		1.000	5.01	5.01	11.5	NO	114.8	0.1427597
13	8:2 FTS	527 > 506.9		1.000	4.99	4.99	9.07	YES	90.7	0.0043622
14	13C3-PFBA	216.1 > 171.8	1.21	1.000	1.93	1.93	13.3	NO	106.8	0.0044280
15	13C3-PFPeA	266 > 221.8	0.448	1.000	2.84	2.85	12.4	NO	99.4	0.0076173
16	13C3-PFBS	302.0 > 98.8	0.302	1.000	3.10	3.10	12.3	NO	98.6	0.0019245



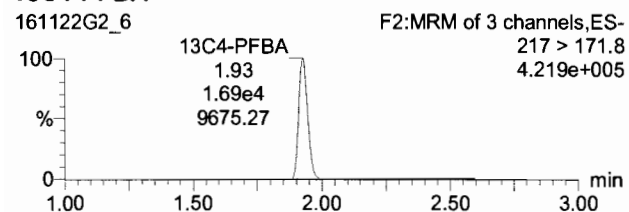
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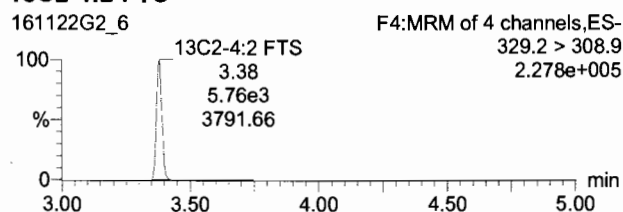
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

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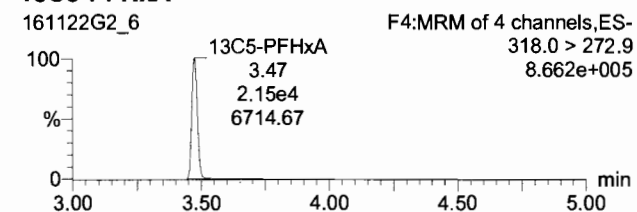
**13C4-PFBA**



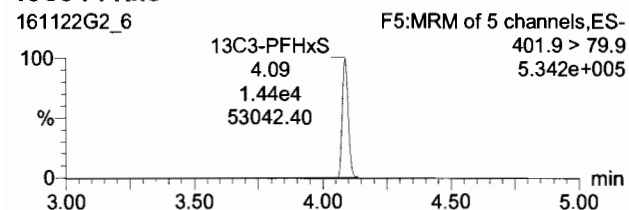
**13C2-4:2 FTS**



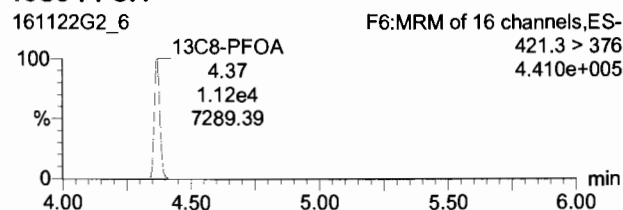
**13C5-PFHxA**



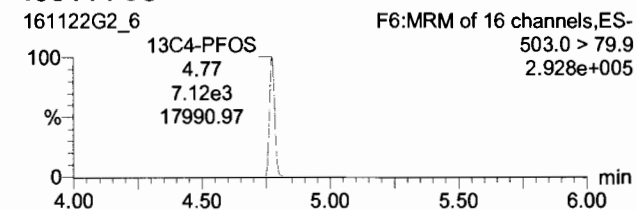
**13C3-PFHxS**



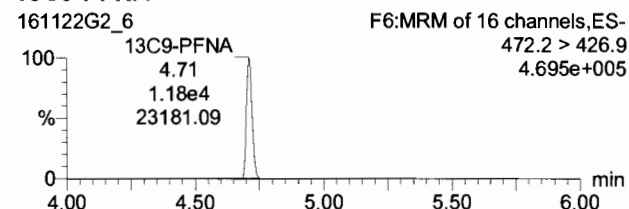
**13C8-PFOA**



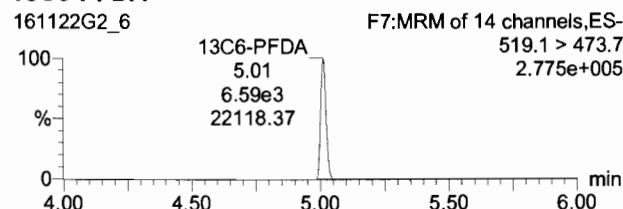
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**

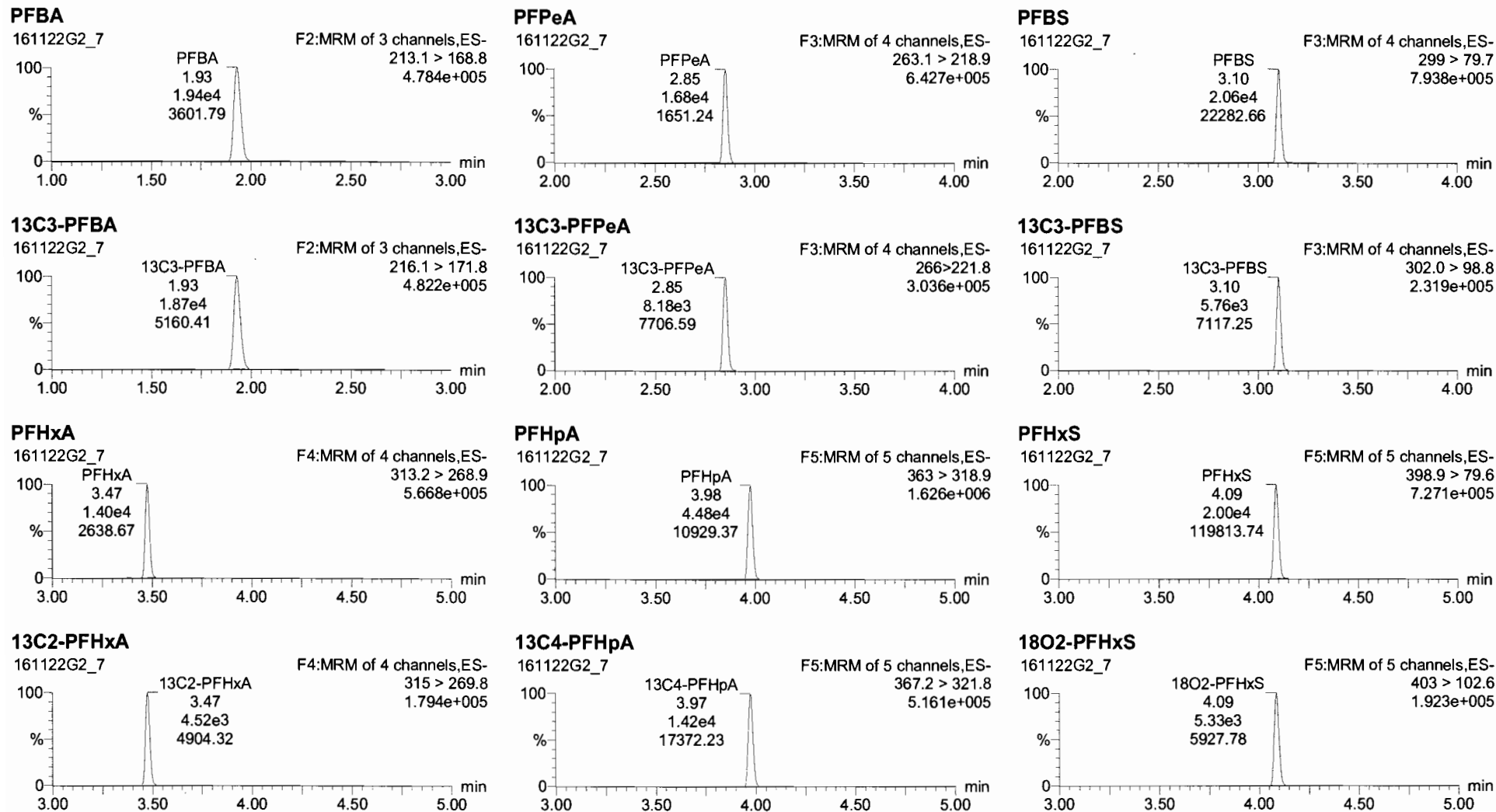


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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A

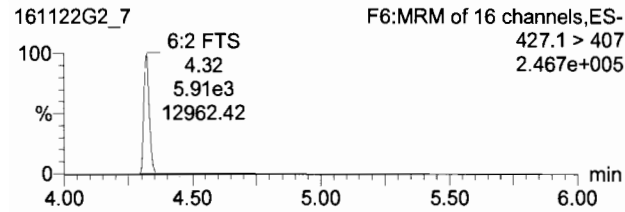


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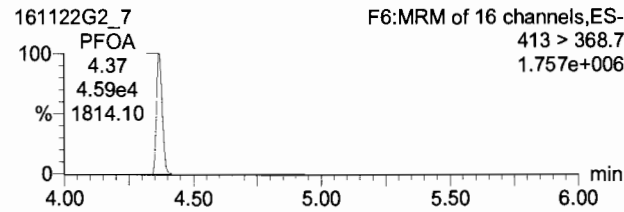
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Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

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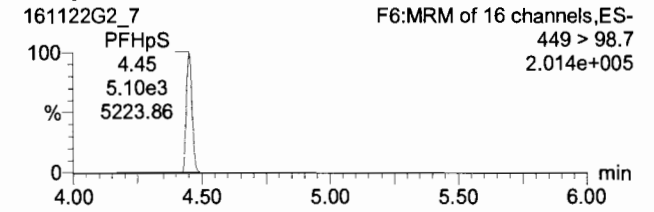
**6:2 FTS**



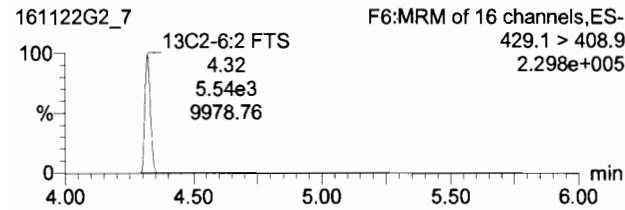
**PFOA**



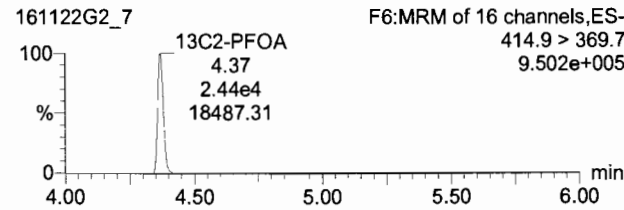
**PFHpS**



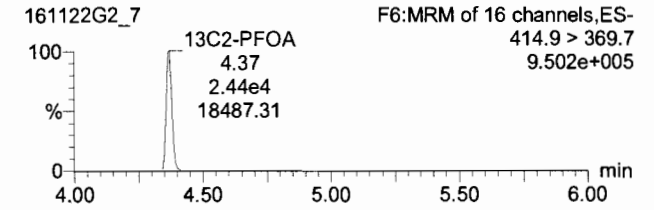
**13C2-6:2 FTS**



**13C2-PFOA**



**13C2-PFOA**



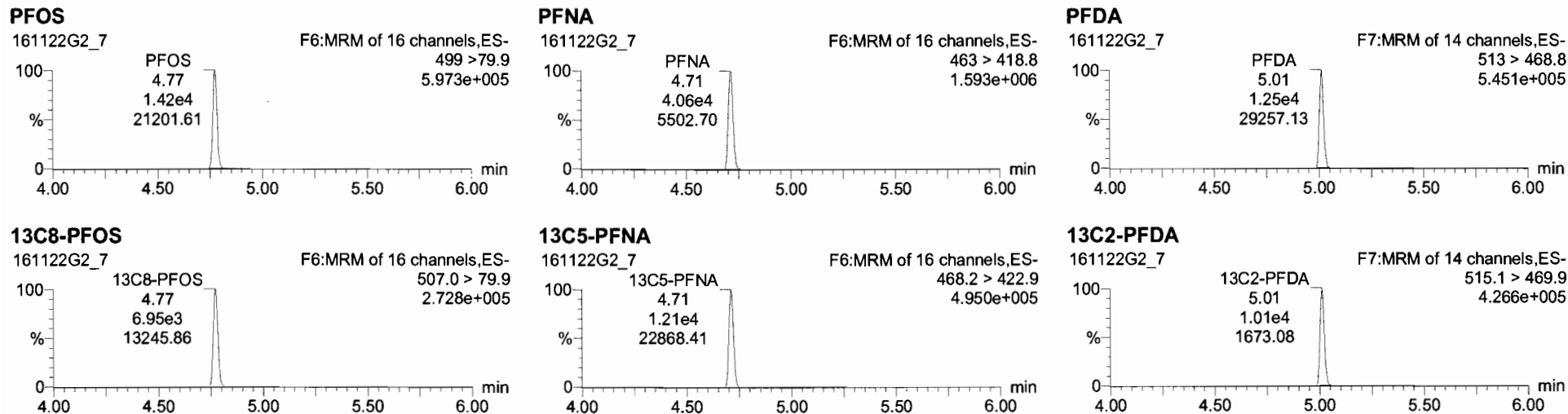


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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A



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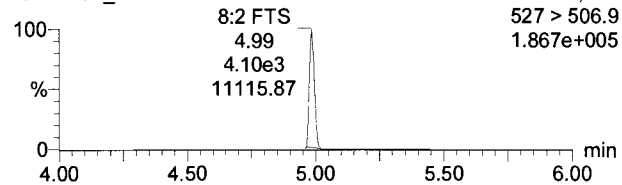
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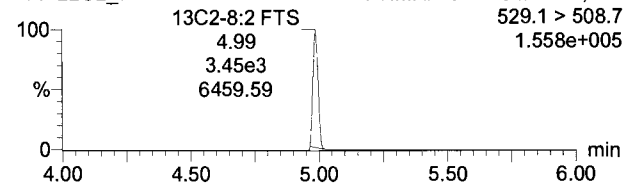
8:2 FTS

161122G2\_7



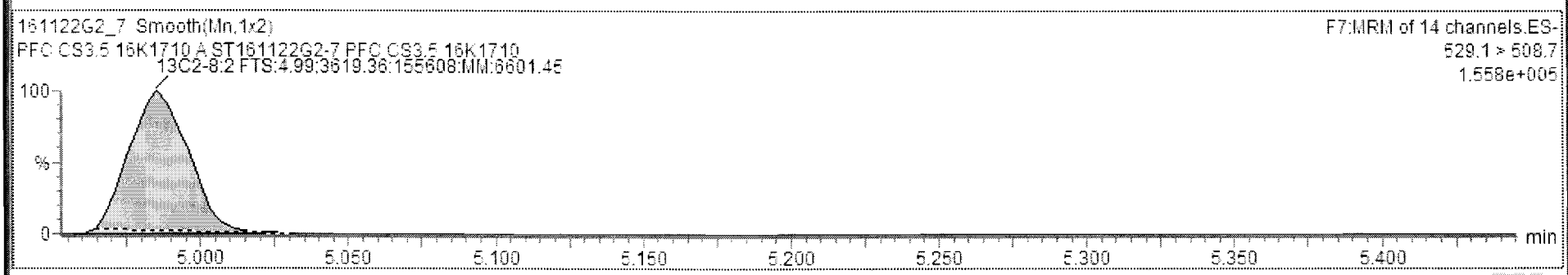
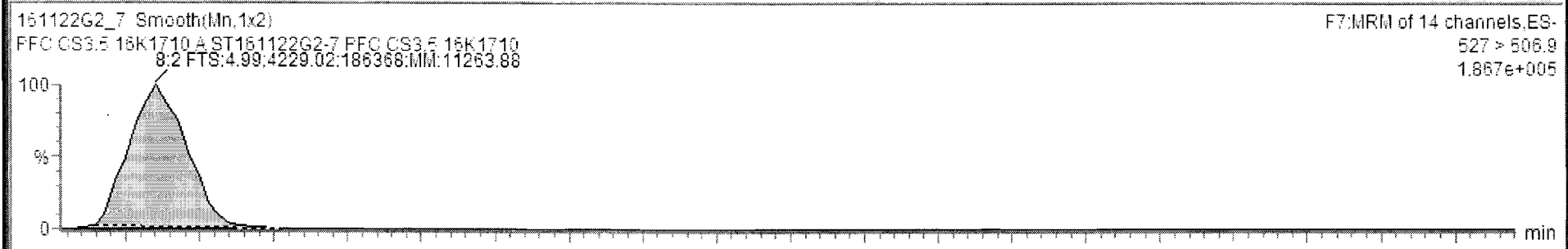
13C2-8:2 FTS

161122G2\_7



161122G2\_7 - ST161122G2-7 PFC CS3.5 16K1710 - PFC CS3.5 16K1710 A

Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	1.40e4	1.000	3.47	3.47	25.9	YES	103.8	0.0090379
5	PFHpA	363 > 318.9	4.48e4	1.000	3.97	3.98	25.4	YES	101.7	0.0949494
6	PFHxS	398.9 > 79.6	2.00e4	1.000	4.09	4.09	27.2	YES	108.9	0.0160447
7	6:2 FTS	427.1 > 407	5.91e3	1.000	4.32	4.32	28.5	YES	113.9	0.4488833
8	PFOA	413 > 368.7	4.59e4	1.000	4.37	4.37	26.0	YES	104.2	0.0000000
9	PFHpS	449 > 98.7	5.10e3	1.000	4.37	4.45	28.6	YES	114.5	0.2816466
10	PFOS	459 > 79.9	1.42e4	1.000	4.77	4.77	30.8	YES	123.3	0.2026154
11	PFNA	463 > 418.8	4.06e4	1.000	4.71	4.71	25.6	YES	102.3	0.1150548
12	PFDA	513 > 468.8	1.25e4	1.000	5.01	5.01	26.1	NO	104.4	0.0359396
13	8:2 FTS	527 > 506.9	4.23e3	1.000	4.99	4.99	29.9	YES	119.7	0.0019300
14	13C3-PFBA	216.1 > 171.8	1.87e4	1.21	1.93	1.93	12.3	NO	98.0	0.0058610
15	13C3-PFPeA	266 > 221.8	6.18e3	0.448	2.84	2.85	12.1	NO	98.9	0.0036860
16	13C3-PFBS	302.0 > 98.8	5.76e3	0.302	3.10	3.10	12.6	NO	101.1	0.0045157

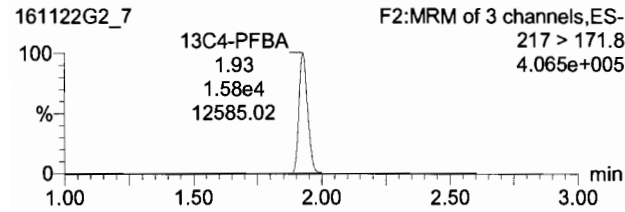


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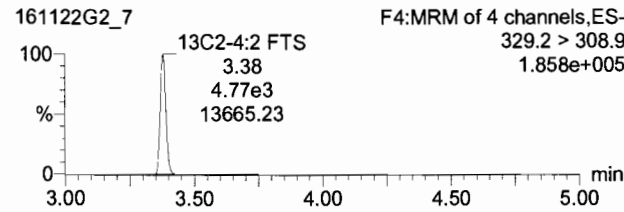
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Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

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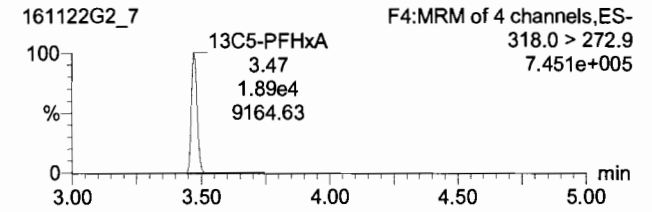
**13C4-PFBA**



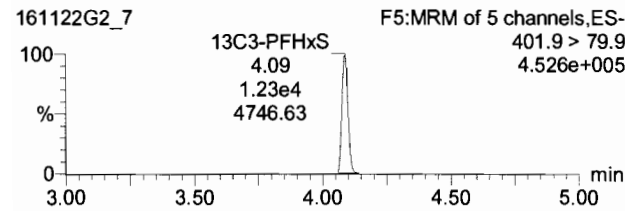
**13C2-4:2 FTS**



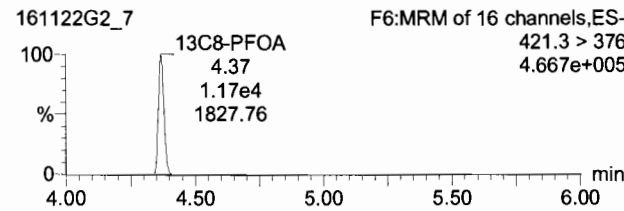
**13C5-PFHxA**



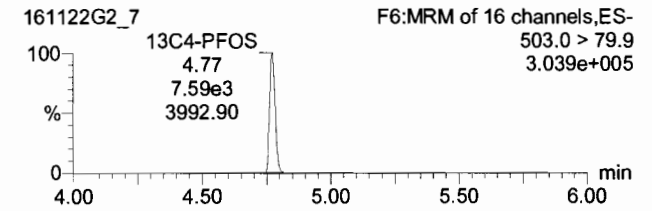
**13C3-PFHxS**



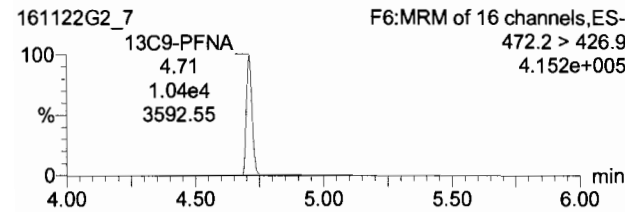
**13C8-PFOA**



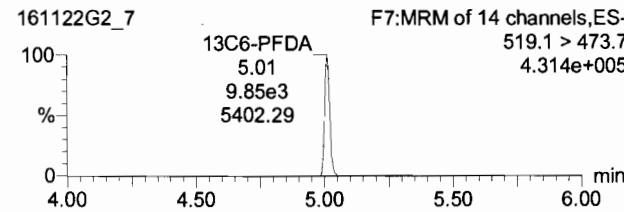
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**

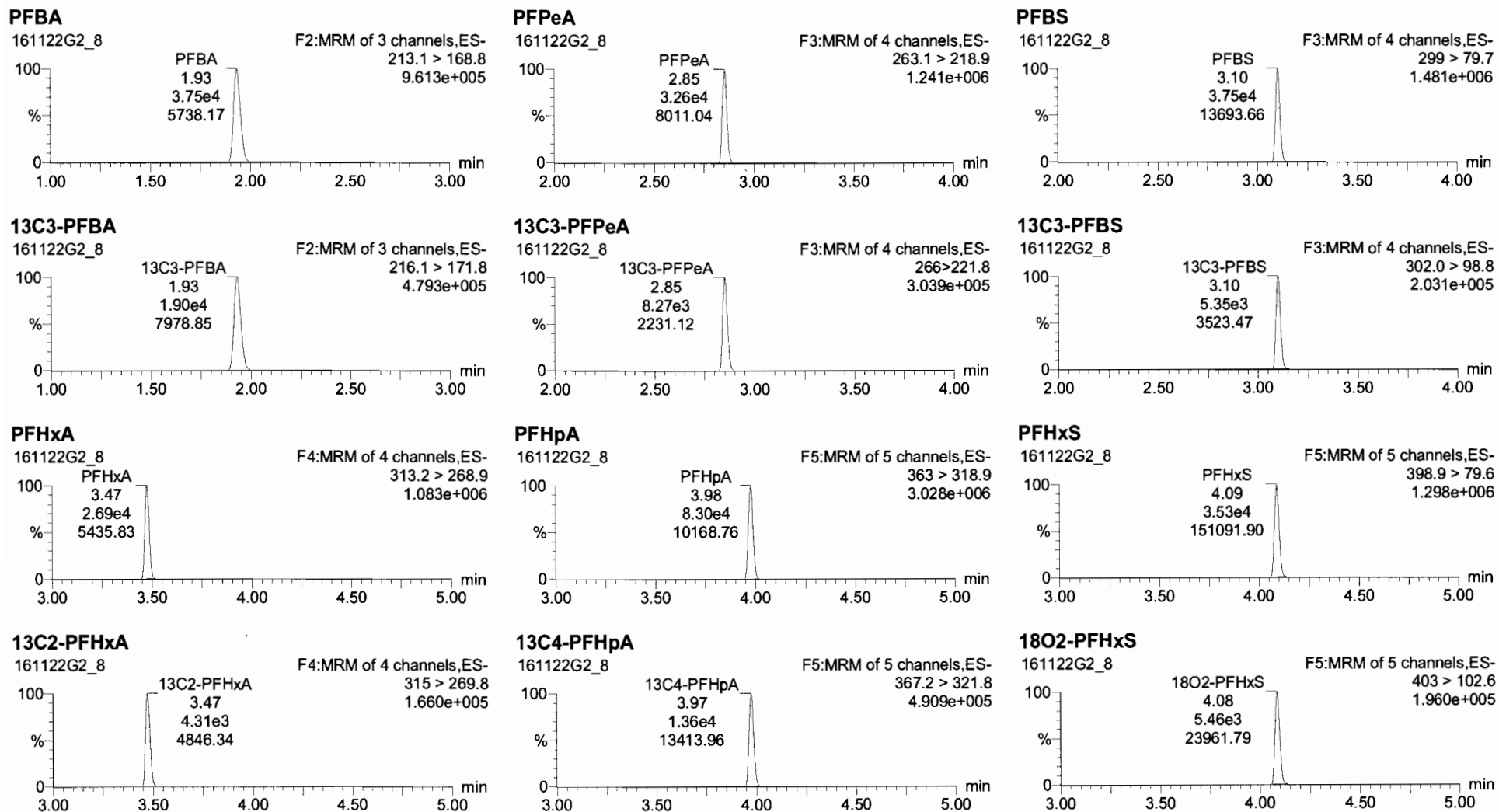


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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A



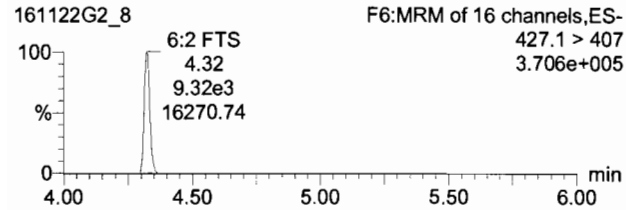
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

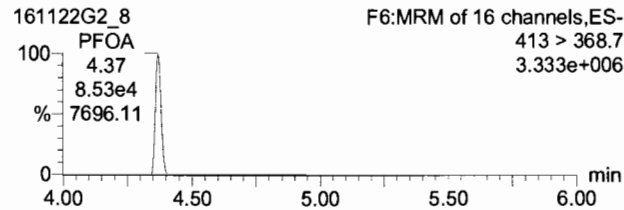
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

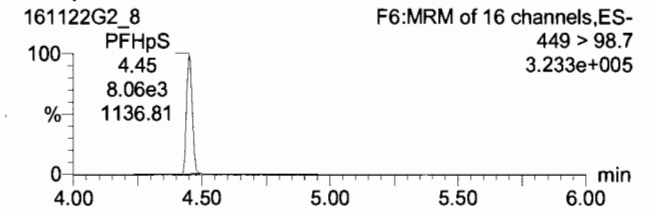
**6:2 FTS**



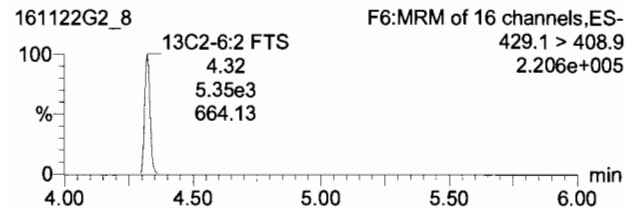
**PFOA**



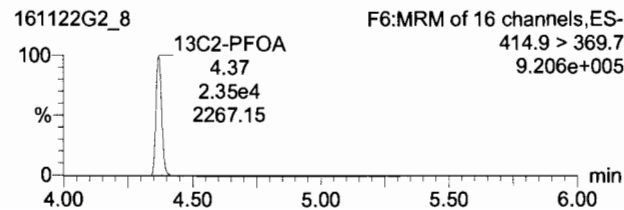
**PFHpS**



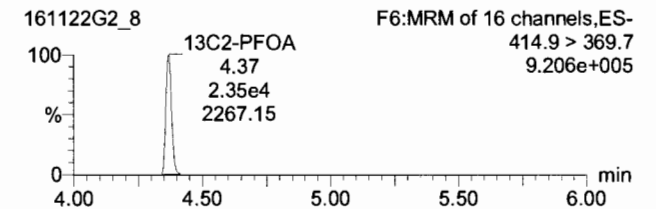
**13C2-6:2 FTS**



**13C2-PFOA**



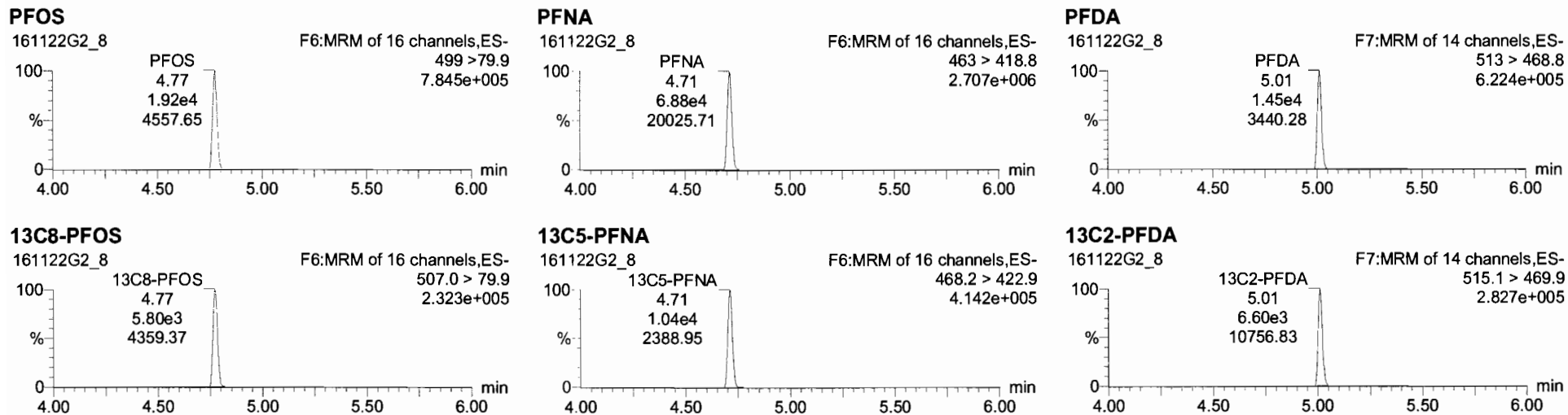
**13C2-PFOA**



Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A



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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

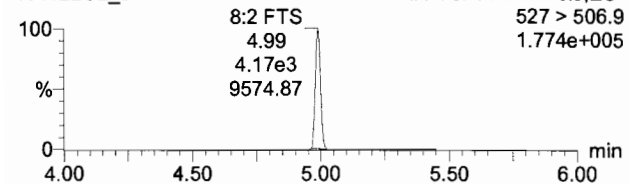
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

8:2 FTS

161122G2\_8

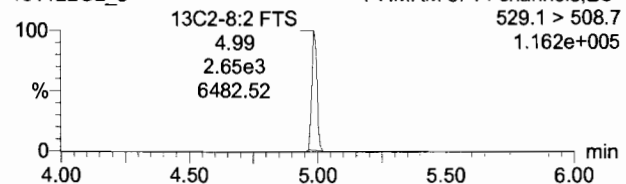
F7:MRM of 14 channels,ES-



13C2-8:2 FTS

161122G2\_8

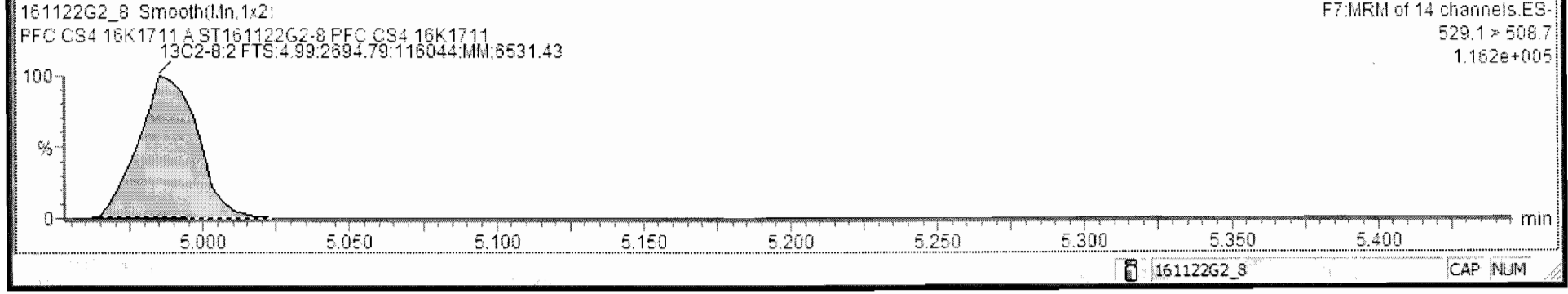
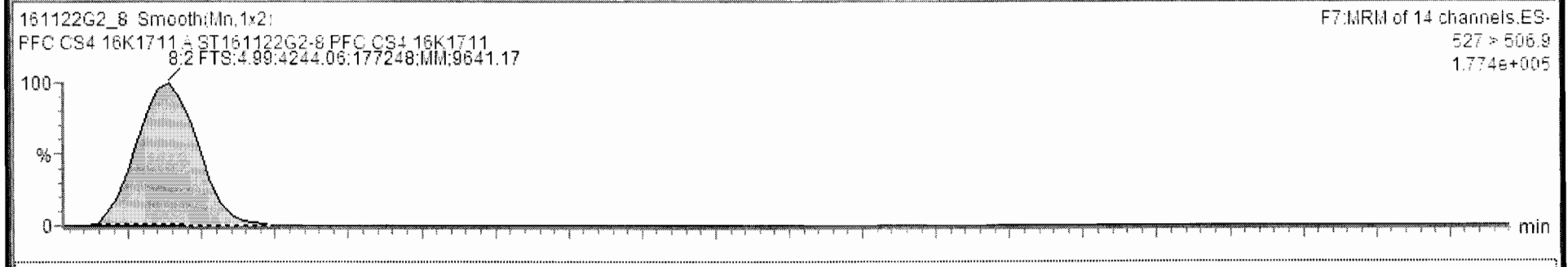
F7:MRM of 14 channels,ES-





161122G2\_8 - ST161122G2-8 PFC CS4 16K1711 - PFC CS4 16K1711 A

Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9		1.000	3.47	3.47	52.1	YES	104.2	0.0090824
5	PFHpA	363 > 318.9		1.000	3.97	3.98	49.2	YES	98.3	0.1013540
6	PFHxS	398.9 > 79.6		1.000	4.08	4.09	47.1	YES	94.1	0.0162677
7	6:2 FTS	427.1 > 407		1.000	4.32	4.32	48.3	YES	96.7	0.4501120
8	PFOA	413 > 368.7		1.000	4.37	4.37	50.3	YES	100.7	0.0000000
9	PFHpS	449 > 98.7		1.000	4.37	4.45	46.8	YES	93.6	0.3525158
10	PFOS	499 > 79.9		1.000	4.78	4.78	49.9	YES	99.9	0.2265026
11	PFNA	483 > 418.8		1.000	4.71	4.71	50.5	YES	101.0	0.1101360
12	PFDA	513 > 468.8		1.000	5.01	5.01	46.1	NO	92.3	0.0671726
13	8:2 FTS	527 > 506.9		1.000	4.99	4.99	40.8	YES	81.6	0.0051719
14	13C3-PFBA	216.1 > 171.8	1.21	1.000	1.93	1.93	12.1	NO	96.4	0.0037281
15	13C3-PFPeA	266 > 221.8	0.448	1.000	2.84	2.85	13.0	NO	103.9	0.0135113
16	13C3-PFBS	302.0 > 98.8	0.302	1.000	3.10	3.10	12.5	NO	99.6	0.0084692

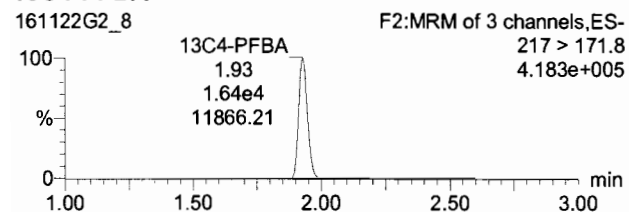


Dataset: Untitled

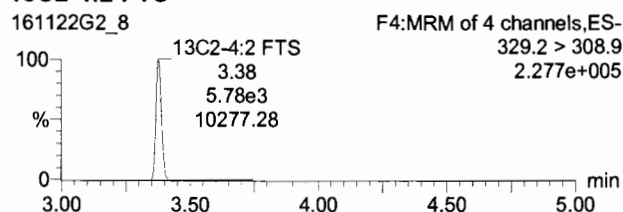
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

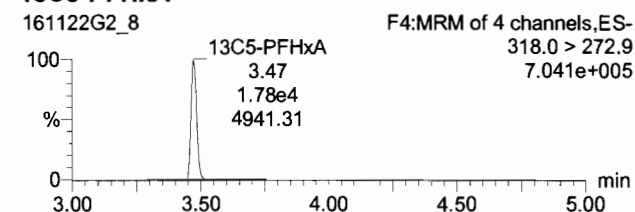
**13C4-PFBA**



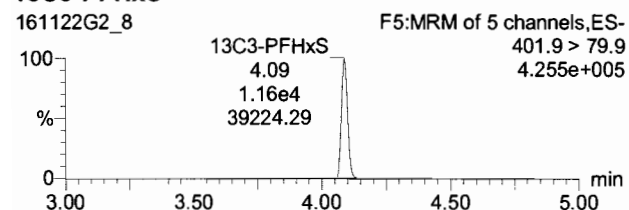
**13C2-4:2 FTS**



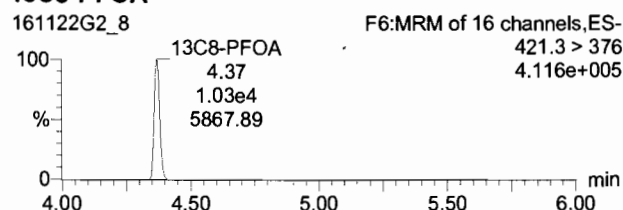
**13C5-PFHxA**



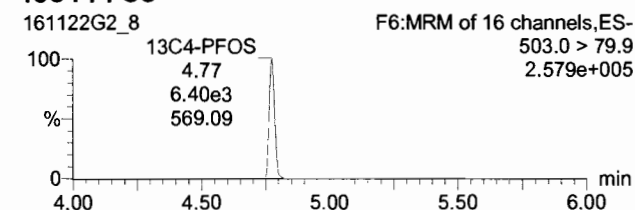
**13C3-PFHxS**



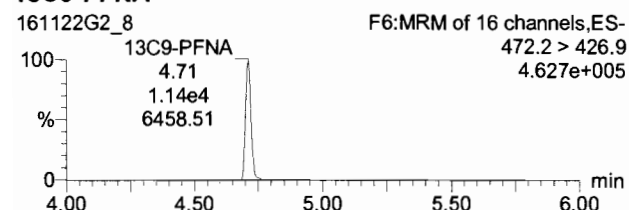
**13C8-PFOA**



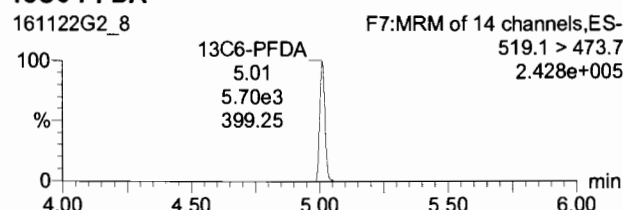
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**

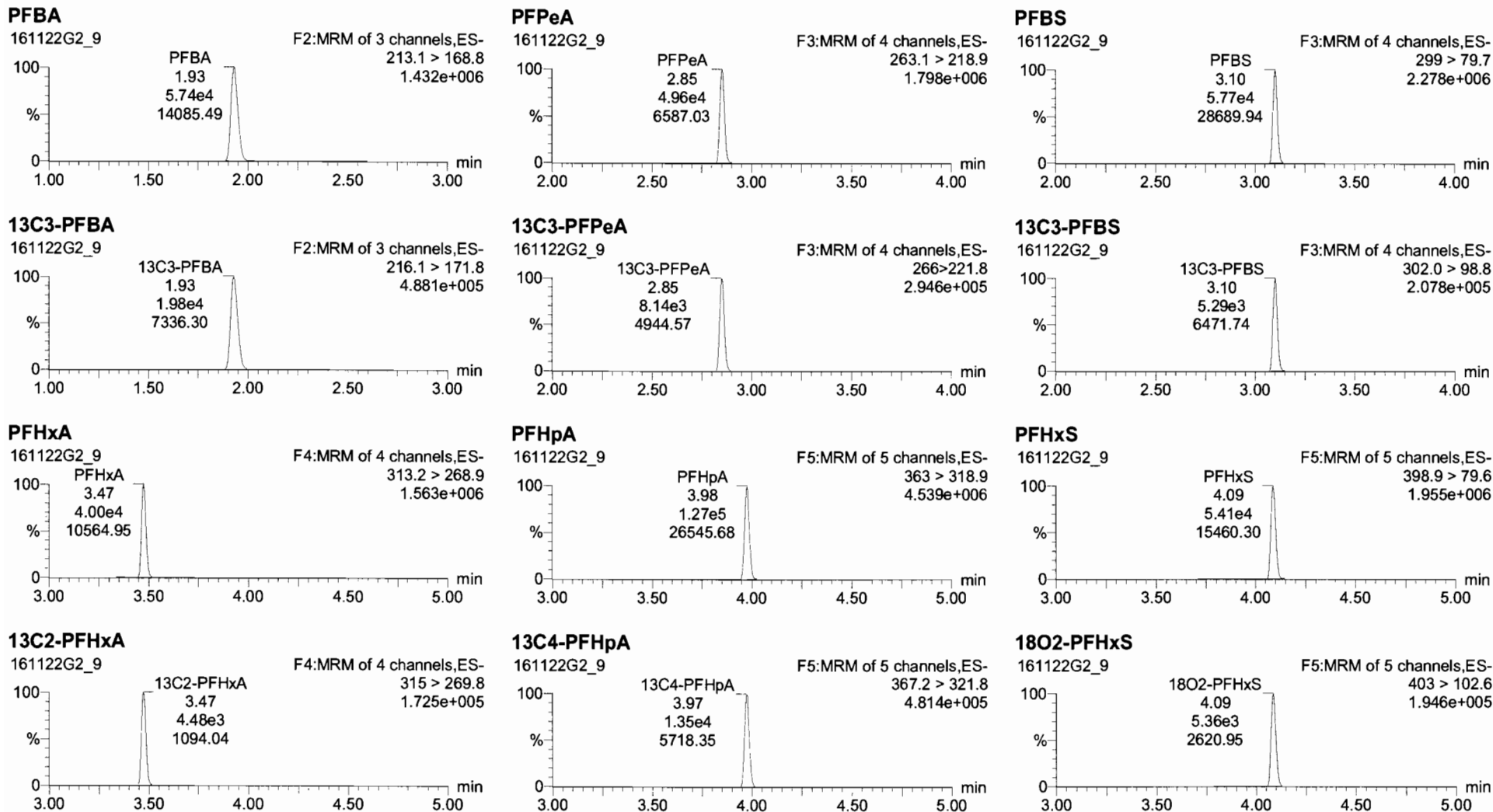


Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

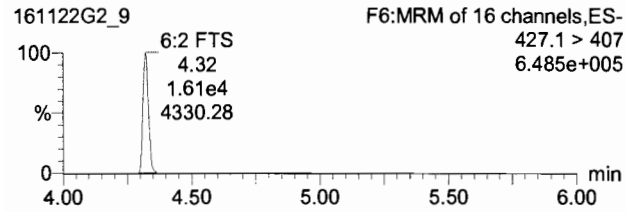


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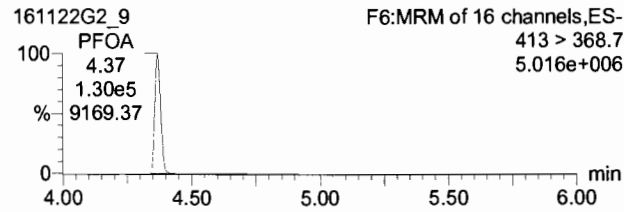
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

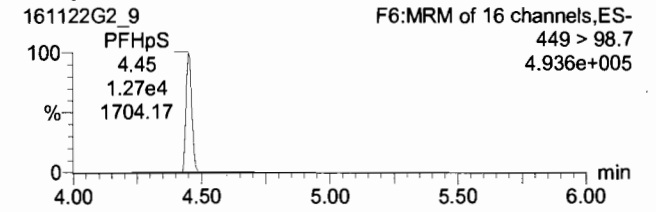
**6:2 FTS**



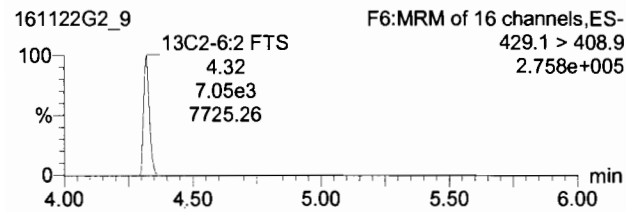
**PFOA**



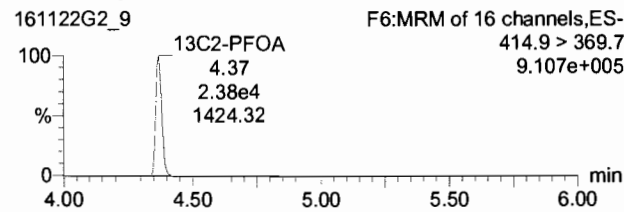
**PFHpS**



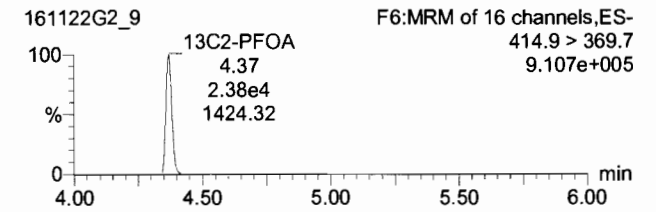
**13C2-6:2 FTS**



**13C2-PFOA**



**13C2-PFOA**



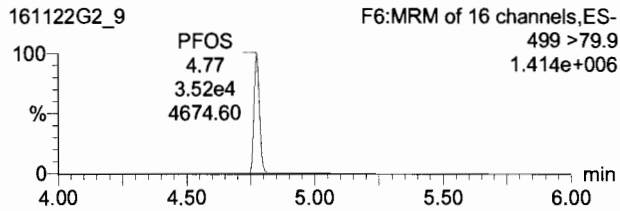
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

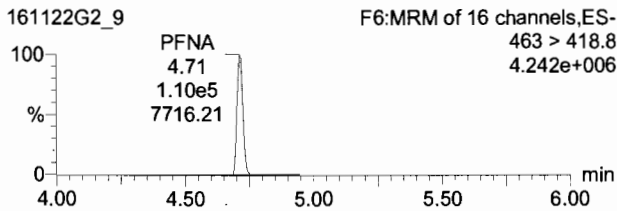
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

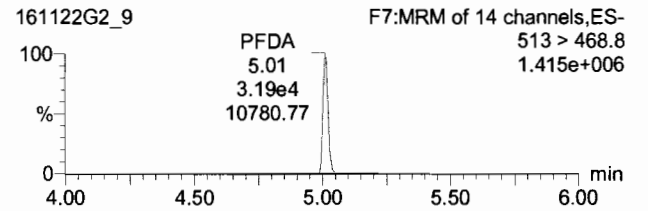
**PFOS**



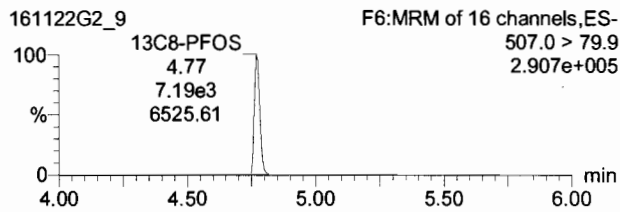
**PFNA**



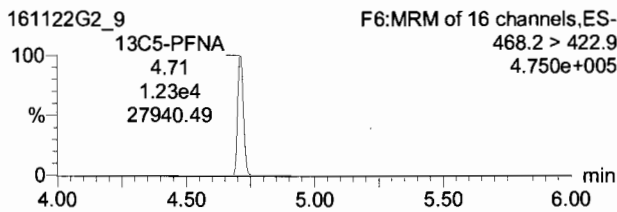
**PFDA**



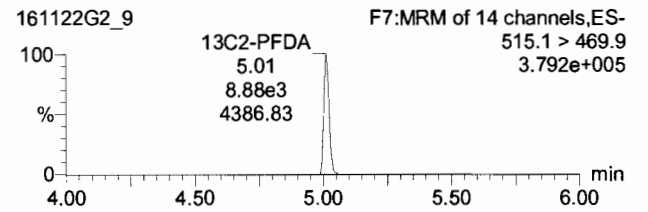
**13C8-PFOS**



**13C5-PFNA**



**13C2-PFDA**



Dataset: Untitled

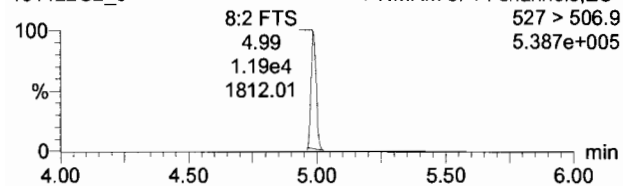
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

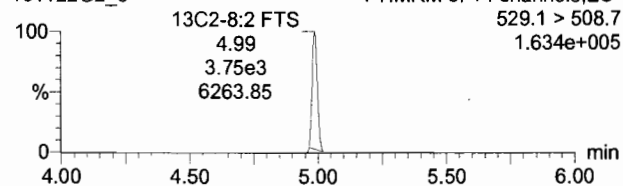
8:2 FTS

161122G2\_9



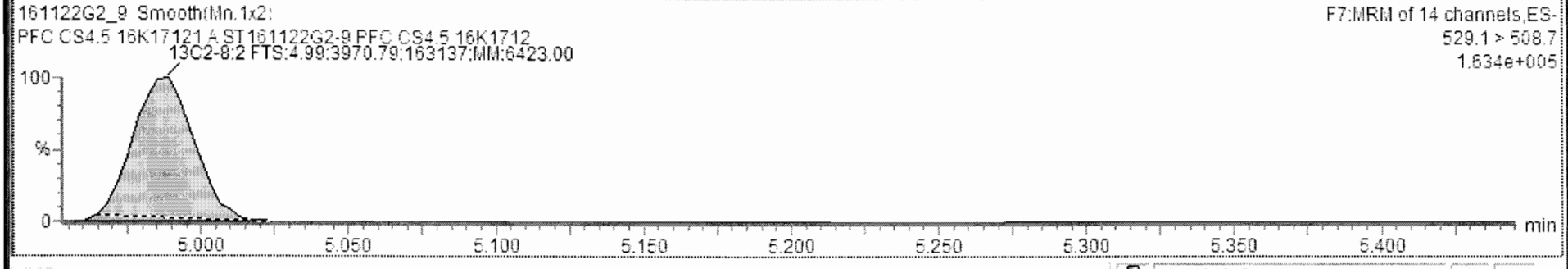
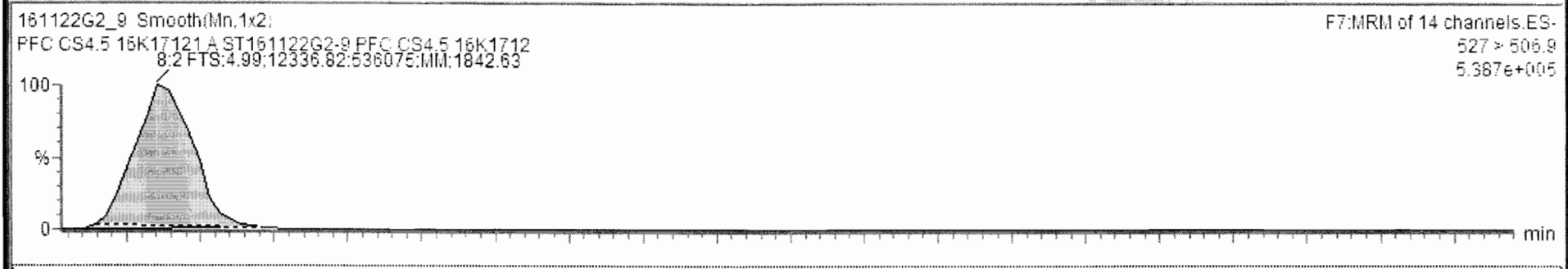
13C2-8:2 FTS

161122G2\_9



161122G2\_9 - ST161122G2-9 PFC CS4.5 16K1712 - PFC CS4.5 16K17121 A

Name	Trace	Area	RRF	Wt/Vol	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 288.9		1.000	3.47	3.47	74.5	YES	99.3	0.0019930
5	PFHpA	363 > 318.9		1.000	3.97	3.98	75.5	YES	100.7	0.0962936
6	PFHxS	398.9 > 79.6		1.000	4.09	4.09	73.4	YES	97.8	0.0272887
7	6:2 FTS	427.1 > 407		1.000	4.32	4.32	66.1	YES	88.1	0.4772740
8	PFOA	413 > 368.7		1.000	4.37	4.37	75.6	YES	100.8	0.0000000
9	PFHpS	449 > 98.7		1.000	4.37	4.45	72.8	YES	97.0	0.3559161
10	PFOS	499 > 79.9		1.000	4.77	4.77	73.6	YES	98.2	0.2377618
11	PFNA	463 > 418.8		1.000	4.71	4.71	68.0	YES	90.7	0.1259394
12	PFDA	513 > 468.8		1.000	5.01	5.01	75.4	NO	100.5	0.0517738
13	8:2 FTS	527 > 506.9		1.000	4.99	4.99	84.1	YES	112.1	0.1062973
14	13C3-PFBA	216.1 > 171.8	1.21	1.000	1.93	1.93	12.4	NO	99.3	0.0041429
15	13C3-PFPeA	266 > 221.8	0.448	1.000	2.84	2.85	12.4	NO	99.0	0.0056902
16	13C3-PFBS	302.0 > 98.8	0.302	1.000	3.10	3.10	11.9	NO	95.3	0.0045397

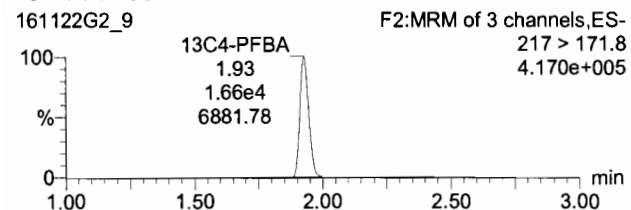


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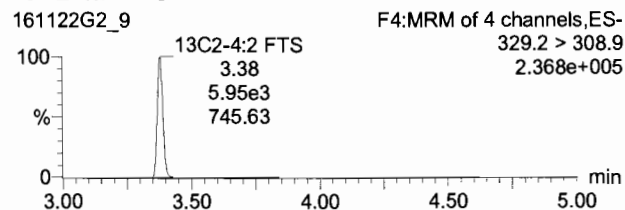
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

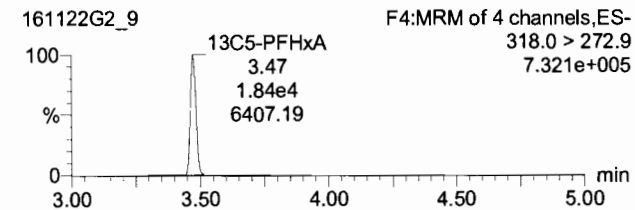
**13C4-PFBA**



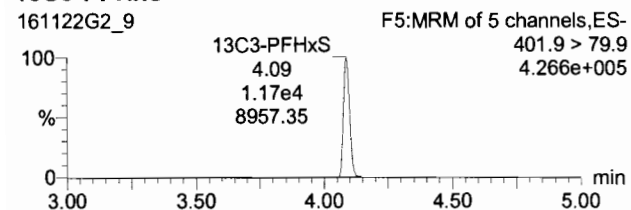
**13C2-4:2 FTS**



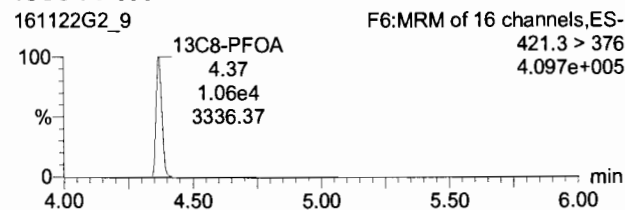
**13C5-PFHxA**



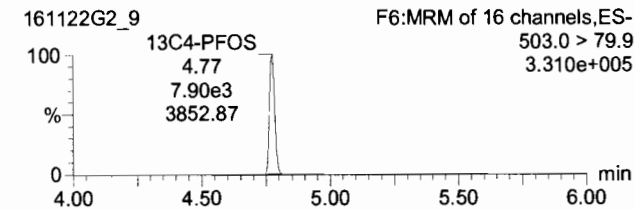
**13C3-PFHxS**



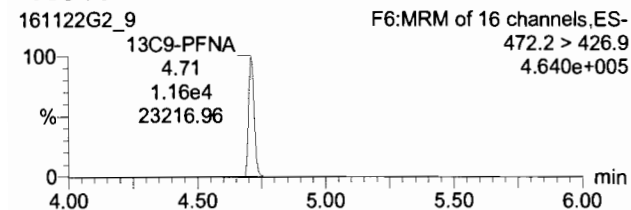
**13C8-PFOA**



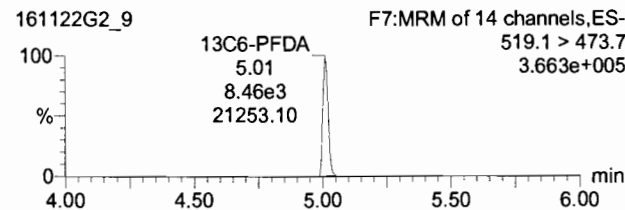
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



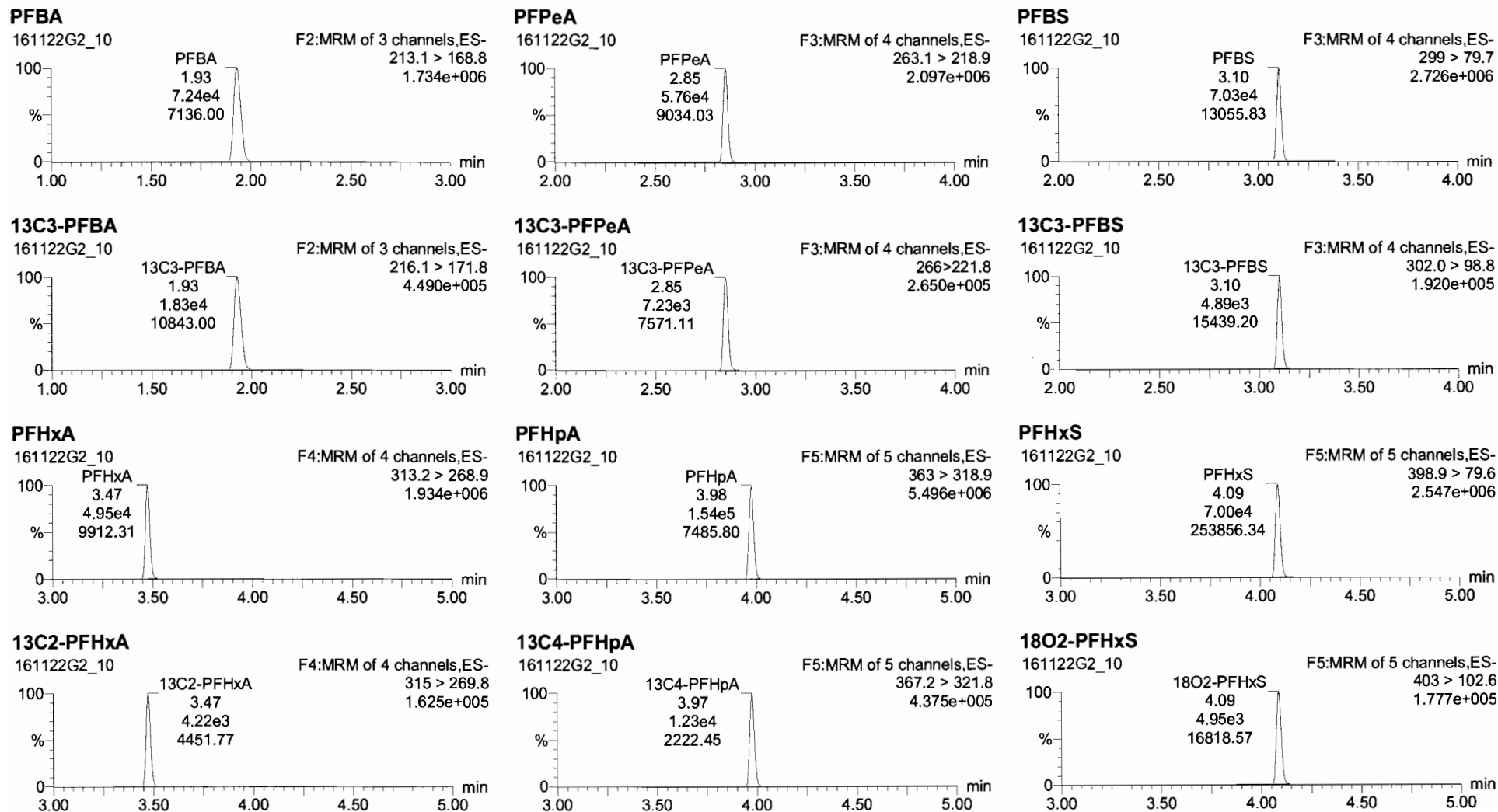


Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A



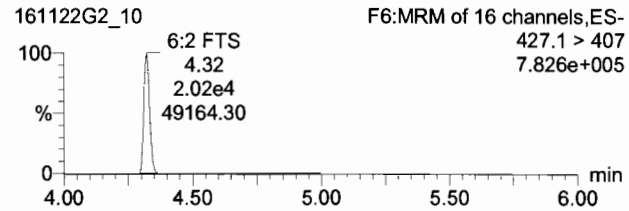
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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time

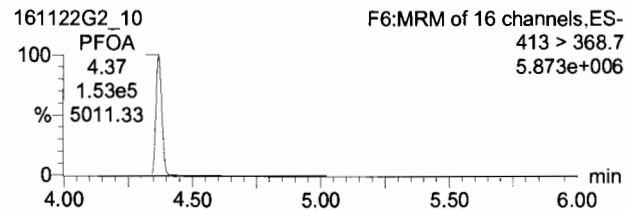
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

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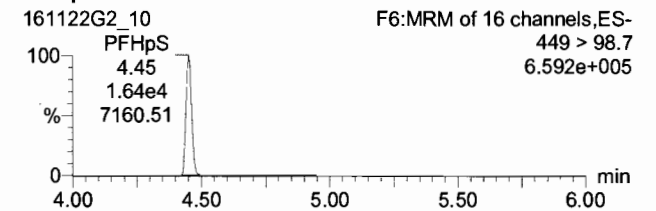
**6:2 FTS**



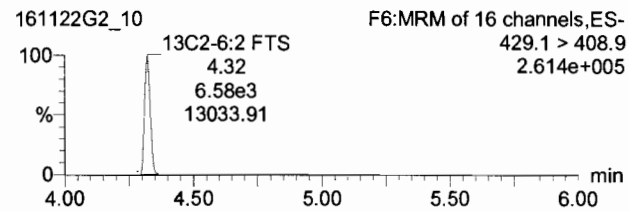
**PFOA**



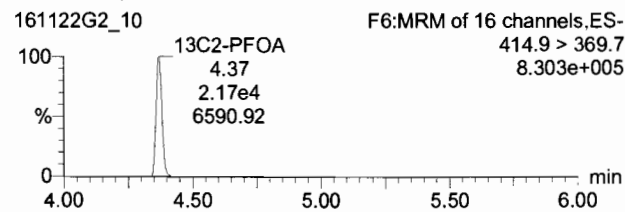
**PFHpS**



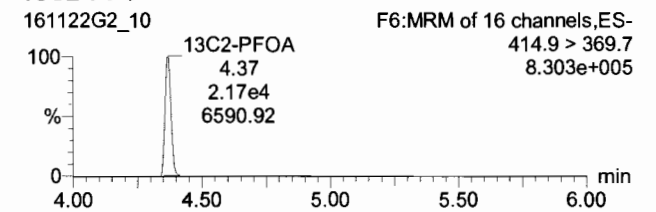
**13C2-6:2 FTS**



**13C2-PFOA**



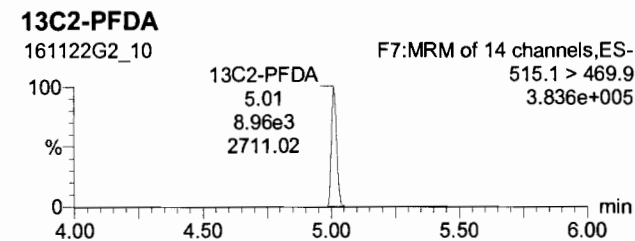
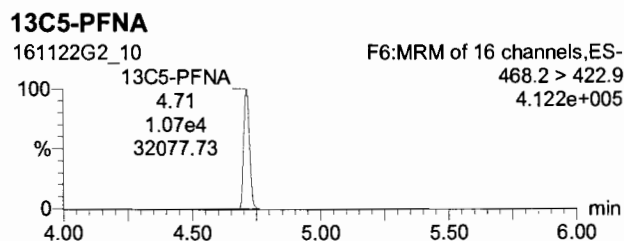
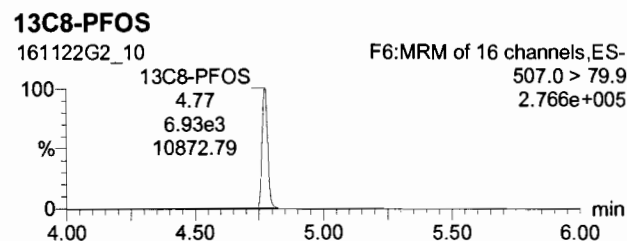
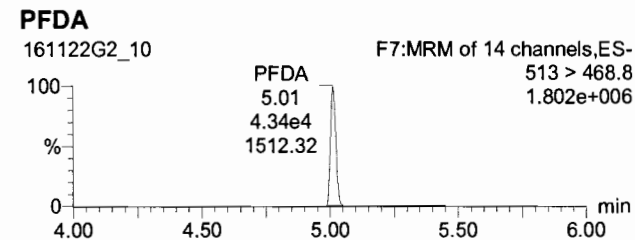
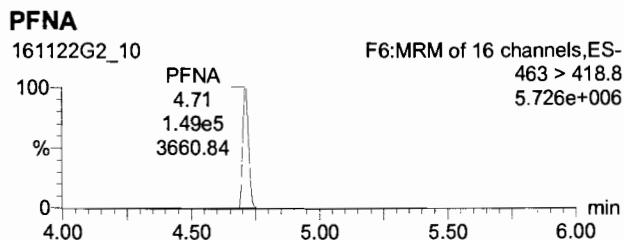
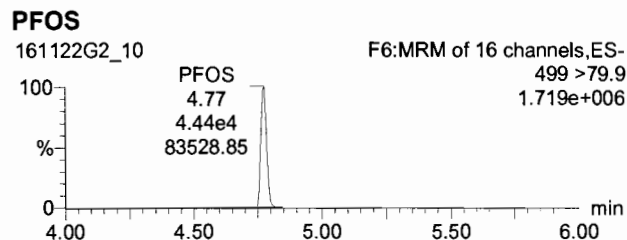
**13C2-PFOA**



Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A

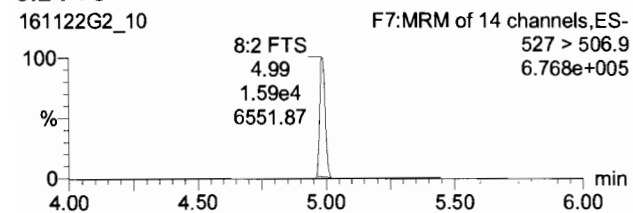


Dataset: Untitled

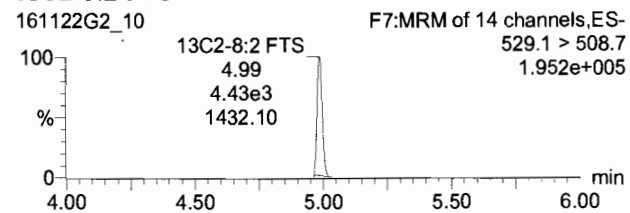
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A

8:2 FTS



13C2-8:2 FTS



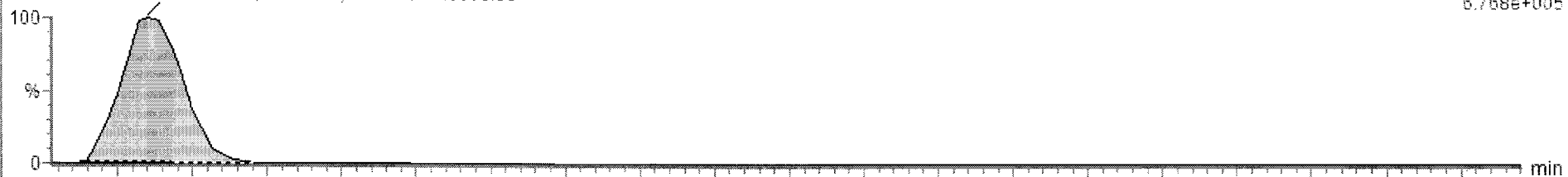


161122G2\_10 - ST161122G2-10 PFC CS5 16K1713 - PFC CS5 16K1713 A

Name	Trace	Area	RRF	Wt/Vol	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	4.95e4	1.000	3.47	3.47	98.0	YES	98.0	0.0091413
5	PFHpA	263 > 218.9	1.54e5	1.000	3.97	3.98	100	YES	100.4	0.1228809
6	PFHxS	398.9 > 79.8	7.00e4	1.000	4.09	4.09	103	YES	102.7	0.0184978
7	8:2 FTS	427.1 > 407	2.02e4	1.000	4.32	4.32	95.3	YES	95.3	0.4475018
8	PFOA	413 > 368.7	1.53e5	1.000	4.37	4.37	97.9	YES	97.9	0.0000000
9	PFHpS	449 > 98.7	1.64e4	1.000	4.37	4.45	103	YES	103.1	0.2855073
10	PFOS	499 > 79.9	4.44e4	1.000	4.78	4.77	96.1	YES	96.1	0.2015386
11	PFNA	483 > 418.8	1.49e5	1.000	4.71	4.71	106	YES	106.2	0.1762378
12	PFDA	513 > 468.8	4.34e4	1.000	5.01	5.01	101	NO	101.5	0.1963398
13	8:2 FTS	527 > 506.9	1.62e4	1.000	4.99	4.99	96.8	YES	96.8	0.0280690
14	13C3-PFBA	218.1 > 171.8	1.83e4	1.21	1.92	1.93	11.6	NO	92.9	0.0026509
15	13C3-PFPeA	286 > 221.8	7.23e3	0.448	2.84	2.85	11.6	NO	92.5	0.0036027
16	13C3-PFBS	302.0 > 98.8	4.89e3	0.302	3.10	3.10	11.6	NO	92.7	0.0018920

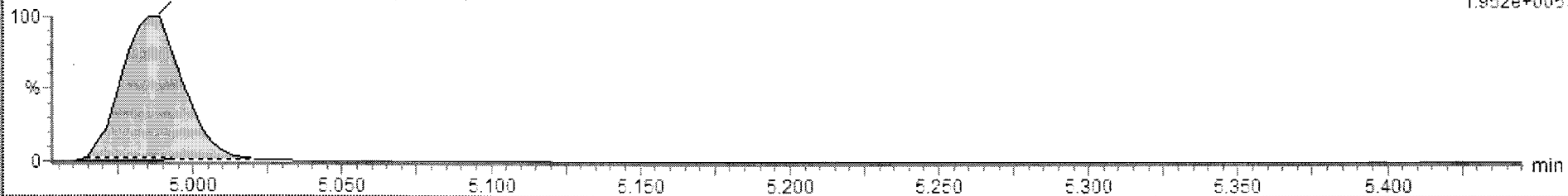
161122G2\_10 Smooth(Mn,1x2)  
 PFC CS5 16K1713 A ST161122G2-10 PFC CS5 16K1713  
 8:2 FTS:4.99;16150.15;674800;MM:6606.53

F7:MRM of 14 channels,ES-  
 527 > 506.9  
 6.768e+005



161122G2\_10 Smooth(Mn,1x2)  
 PFC CS5 16K1713 A ST161122G2-10 PFC CS5 16K1713  
 13C2-8:2 FTS:4.99;4575.85;194048;MM:1452.71

F7:MRM of 14 channels,ES-  
 529.1 > 508.7  
 1.952e+005

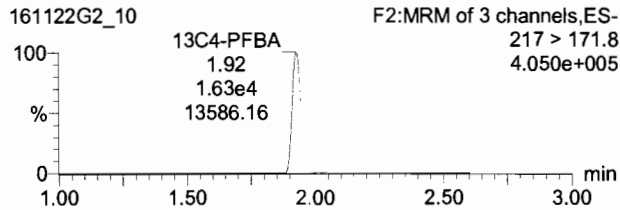


Dataset: Untitled

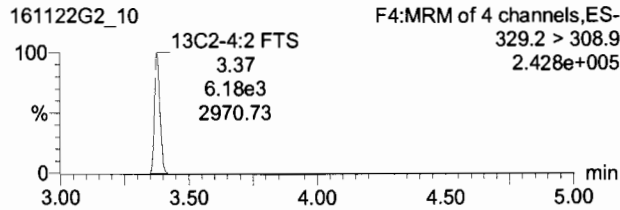
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2\_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A

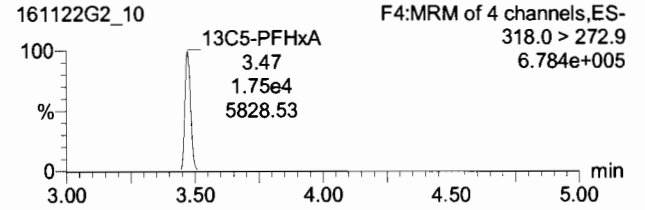
**13C4-PFBA**



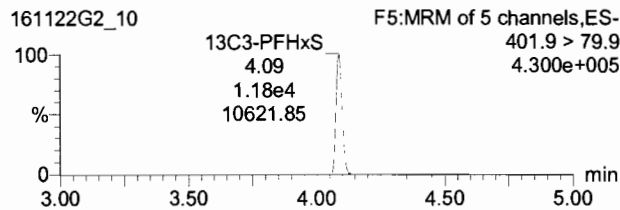
**13C2-4:2 FTS**



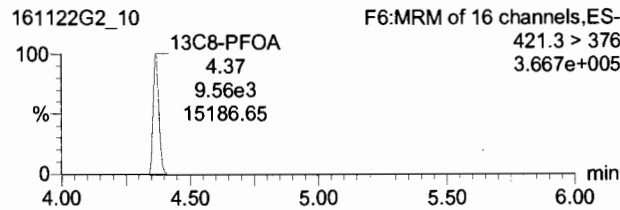
**13C5-PFHxA**



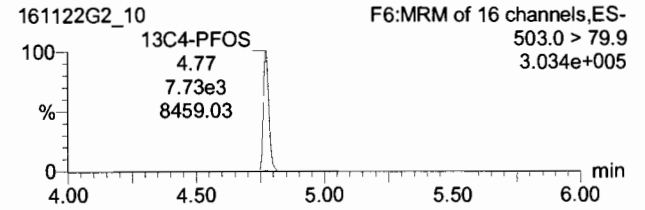
**13C3-PFHxS**



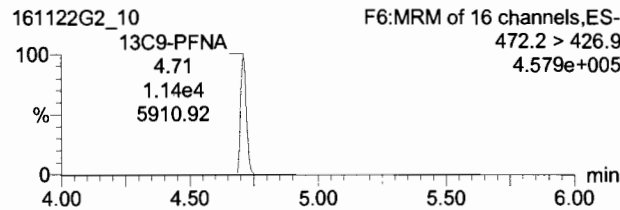
**13C8-PFOA**



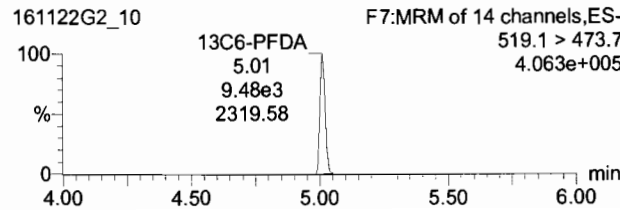
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-12.qld

Last Altered: Tuesday, November 22, 2016 15:30:24 Pacific Standard Time  
Printed: Tuesday, November 22, 2016 15:30:54 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 15:25:21

Name: 161122G2\_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
1	1 PFBA	213.1 > 168.8	1.99e4	1.93e4	1.000	1.94	1.94	26.3	105.2
2	2 PFPeA	263.1 > 218.9	1.36e4	8.81e3	1.000	2.85	2.85	19.4	77.4
3	3 PFBS	299 > 79.7	1.87e4	6.07e3	1.000	3.10	3.10	21.5	86.2
4	4 PFHxA	313.2 > 268.9	1.51e4	4.56e3	1.000	3.47	3.47	27.6	110.5
5	5 PFHpA	363 > 318.9	4.67e4	1.40e4	1.000	3.98	3.98	26.9	107.5
6	6 PFHxS	398.9 > 79.6	1.55e4	5.82e3	1.000	4.09	4.09	19.4	77.7
7	7 6:2 FTS	427.1 > 407	4.23e3	5.80e3	1.000	4.32	4.32	20.8	83.4
8	8 PFOA	413 > 368.7	3.78e4	2.49e4	1.000	4.37	4.37	21.0	82.9
9	9 PFHpS	449 > 98.7	4.68e3	2.49e4	1.000	4.45	4.45	25.7	103.0
10	10 PFOS	499 > 79.9	9.75e3	7.54e3	1.000	4.77	4.77	19.6	78.3
11	11 PFNA	463 > 418.8	4.01e4	1.20e4	1.000	4.71	4.71	25.5	102.1
12	12 PFDA	513 > 468.8	1.01e4	9.03e3	1.000	5.01	5.01	23.6	94.4
13	13 8:2 FTS	527 > 506.9	2.65e3	2.91e3	1.000	4.99	4.99	23.2	92.8
14	14 13C3-PFBA	216.1 > 171.8	1.93e4	1.41e4	1.205	1.94	1.94	14.2	113.8
15	15 13C3-PFPeA	266 > 221.8	8.81e3	1.61e4	0.448	2.85	2.85	15.3	122.1
16	16 13C3-PFBS	302.0 > 98.8	6.07e3	1.61e4	0.302	3.10	3.10	15.6	124.7
17	17 13C2-PFHxA	315 > 269.8	4.56e3	1.61e4	0.620	3.47	3.47	5.71	114.1
18	18 13C4-PFHpA	367.2 > 321.8	1.40e4	1.10e4	1.139	3.97	3.97	14.1	112.6
19	19 18O2-PFHxS	403 > 102.6	5.82e3	1.10e4	0.449	4.09	4.09	14.8	118.2
20	20 13C2-6:2 FTS	429.1 > 408.9	5.80e3	4.58e3	1.073	4.32	4.32	14.8	118.1
21	21 13C2-PFOA	414.9 > 369.7	2.49e4	8.18e3	2.262	4.37	4.37	16.8	134.6
22	22 13C8-PFOS	507.0 > 79.9	7.54e3	6.29e3	0.944	4.77	4.77	15.9	127.2
23	23 13C5-PFNA	468.2 > 422.9	1.20e4	9.84e3	1.082	4.71	4.71	14.1	113.0
24	24 13C2-PFDA	515.1 > 469.9	9.03e3	6.86e3	1.019	5.01	5.01	16.1	129.0
25	25 13C2-8:2 FTS	529.1 > 508.7	2.91e3	4.58e3	0.569	4.99	4.99	14.0	111.7
26	26 13C4-PFBA	217 > 171.8	1.41e4	1.41e4	1.000	1.94	1.94	12.5	100.0
27	27 13C2-4:2 FTS	329.2 > 308.9	4.58e3	4.58e3	1.000	3.38	3.38	12.5	100.0
28	28 13C5-PFHxA	318.0 > 272.9	1.61e4	1.61e4	1.000	3.47	3.47	12.5	100.0
29	29 13C3-PFHxS	401.9 > 79.9	1.10e4	1.10e4	1.000	4.09	4.09	12.5	100.0
30	30 13C8-PFOA	421.3 > 376	8.18e3	8.18e3	1.000	4.37	4.37	12.5	100.0
31	31 13C4-PFOS	503.0 > 79.9	6.29e3	6.29e3	1.000	4.77	4.77	12.5	100.0

75-125



AC  
11/22/16  
PW  
11/23/16

Ⓐ Percent recovery based on linear isomer only.

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-12.qld

Last Altered: Tuesday, November 22, 2016 15:30:24 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:30:54 Pacific Standard Time

Name: 161122G2\_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc	%Rec
32	32 13C9-PFNA	472.2 > 426.9	9.84e3	9.84e3	1.000	1.000	4.71	12.5	100.0
33	33 13C6-PFDA	519.1 > 473.7	6.86e3	6.86e3	1.000	1.000	5.01	12.5	100.0

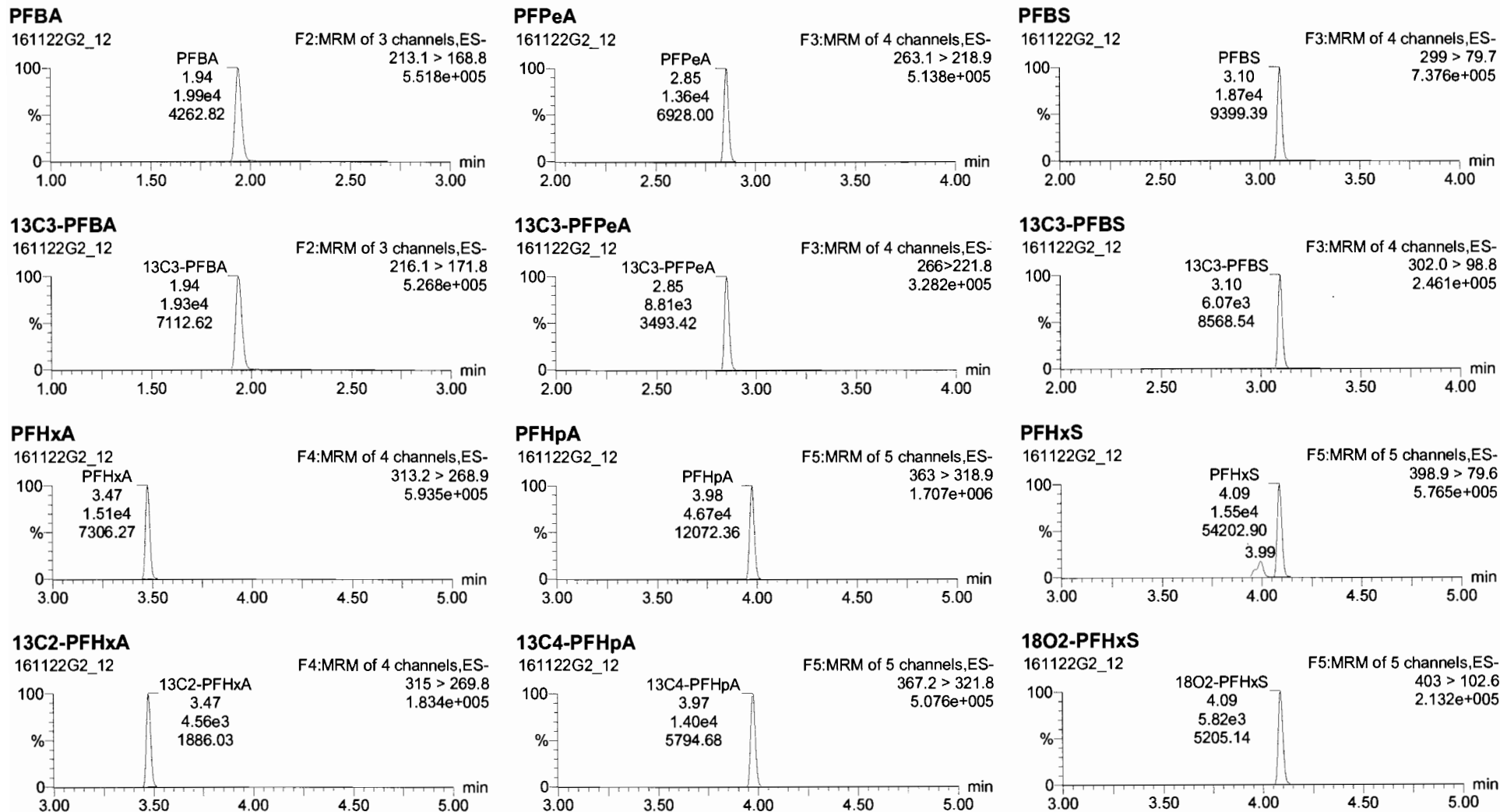


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Printed: Tuesday, November 22, 2016 15:11:00 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18\_VAL-PFC\_Q1\_11-22-16\_FULL\_A.cdb 22 Nov 2016 14:59:27

Name: 161122G2\_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

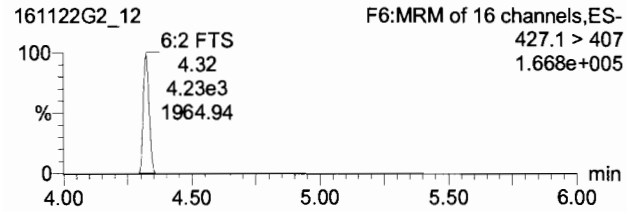


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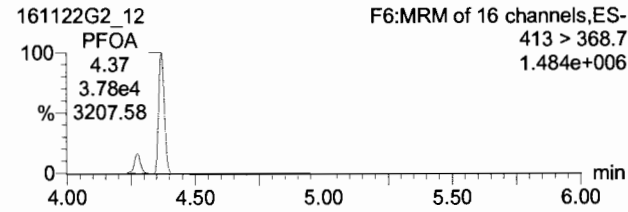
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Printed: Tuesday, November 22, 2016 15:11:00 Pacific Standard Time

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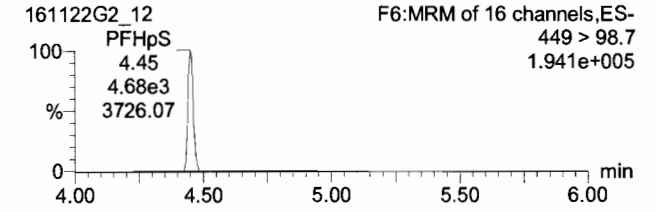
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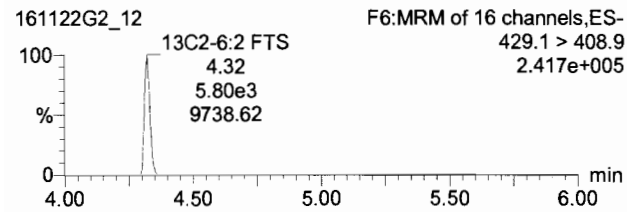
**PFOA**



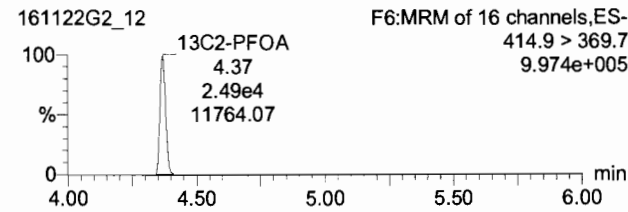
**PFHpS**



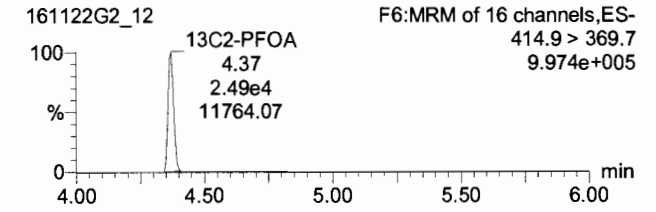
**13C2-6:2 FTS**



**13C2-PFOA**



**13C2-PFOA**

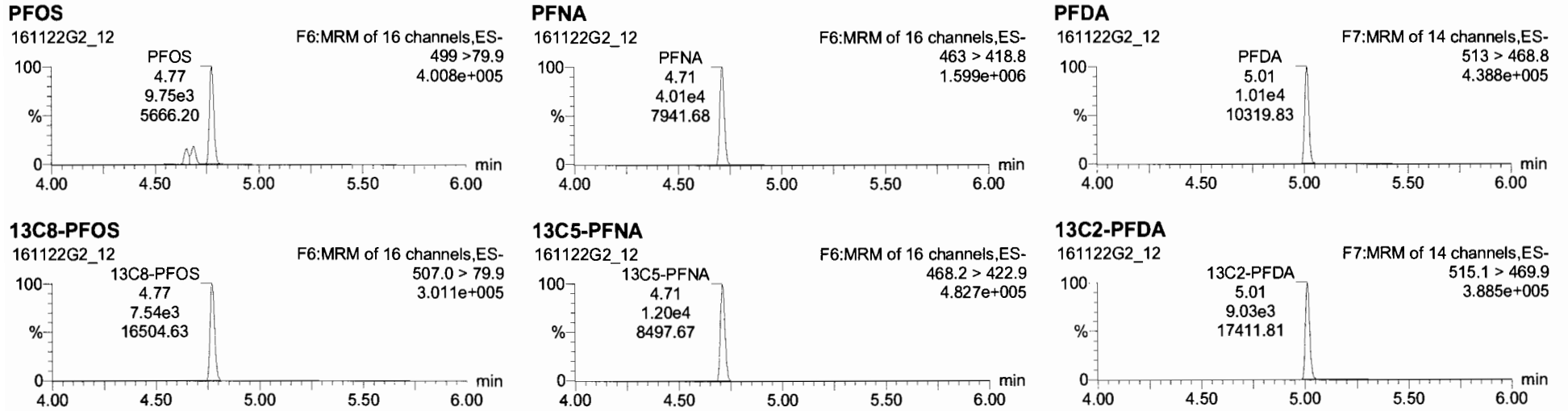


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Last Altered: Tuesday, November 22, 2016 15:10:09 Pacific Standard Time

Printed: Tuesday, November 22, 2016 15:11:00 Pacific Standard Time

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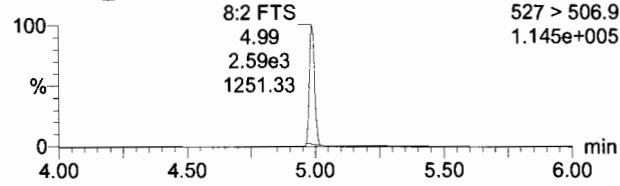
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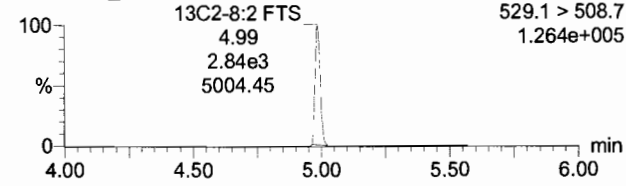
8:2 FTS

161122G2\_12



13C2-8:2 FTS

161122G2\_12

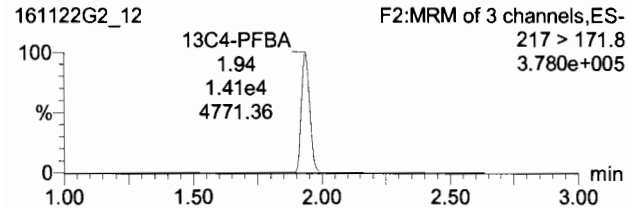


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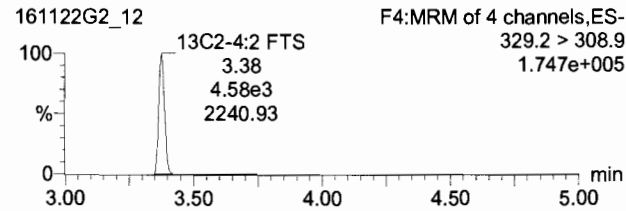
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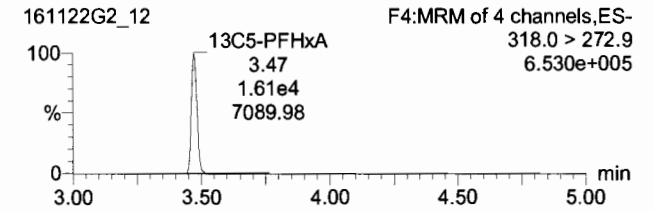
**13C4-PFBA**



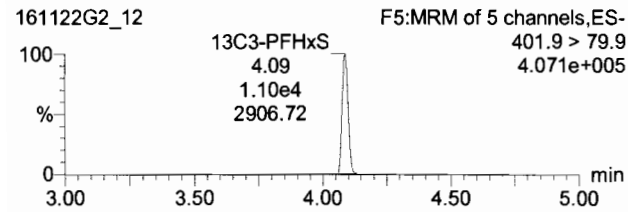
**13C2-4:2 FTS**



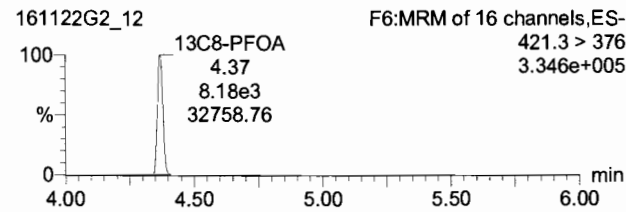
**13C5-PFHxA**



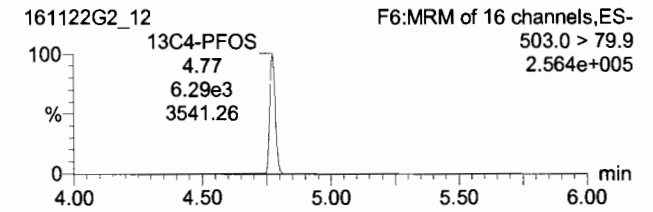
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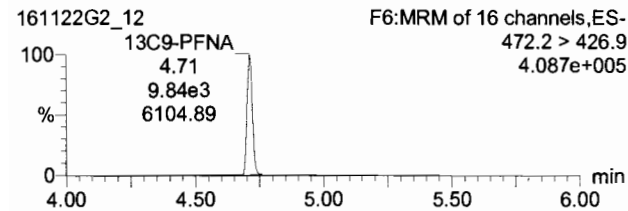
**13C8-PFOA**



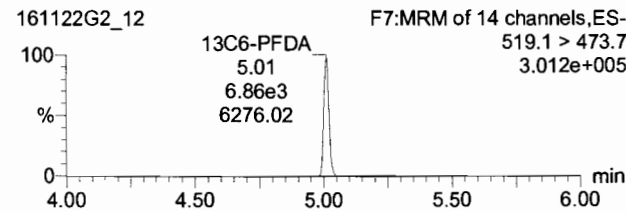
**13C4-PFOS**



**13C9-PFNA**



**13C6-PFDA**



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tus"

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"VCT-SP-02-20161110","537\_MOD","11/28/16","15:38","N","NA","000","13C8-PFOS","13C8-  
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"60","150","",""

"VCT-SP-03-20161110","537\_MOD","11/28/16","15:51","N","NA","000","375-73-  
5","PFBS","152","","TRG","Yes","Y","","Y","1.79","4.00","8.02","NG\_L","NG\_L","","","","",  
"","","","",""

"VCT-SP-03-20161110","537\_MOD","11/28/16","15:51","N","NA","000","335-67-1","PERFLUOROOC  
TANOIC ACID (PFOA)","20.8","","TRG","Yes","Y","","Y","0.653","2.00","8.02","NG\_L","NG\_L","","","","",  
"","","","",""

"" "" "" ""  
,  
"VCT-SP-03-20161110","537\_MOD","11/28/16","15:51","N","NA","000","1763-23-1","HEPTADEC AFLUOROACTANESULFONIC ACID SOLUTION  
","9.05","","TRG","Yes","Y","","Y","0.809","0.900","8.02","NG\_L","NG\_L","","","","","","","","","","","","","","",""  
,""  
,  
"VCT-SP-03-20161110","537\_MOD","11/28/16","15:51","N","NA","000","13C3-PFBS","13C3-PFBS","130","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","130","130","","","","","","","60","150","",""  
,""  
,  
"VCT-SP-03-20161110","537\_MOD","11/28/16","15:51","N","NA","000","13C2-PFOA","13C2-PFOA","112","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","112","112","","","","","","","60","150","",""  
,""  
,  
"VCT-SP-03-20161110","537\_MOD","11/28/16","15:51","N","NA","000","13C8-PFOS","13C8-PFOS","114","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","114","114","","","","","","","60","150","",""  
,""  
,  
"B6K0156-BLK1","537\_MOD","11/28/16","15:13","N","NA","000","375-73-5","PFBS","","","TRG","Yes","N","","Y","1.79","4.00","8.00","NG\_L","NG\_L","","","","","","","","","","","","","",""  
,""  
,  
"B6K0156-BLK1","537\_MOD","11/28/16","15:13","N","NA","000","335-67-1","PERFLUORO OCTANOIC ACID (PFOA)","","","TRG","Yes","N","","Y","0.651","2.00","8.00","NG\_L","NG\_L","","","","","","","","","","","","",""  
,""  
,  
"B6K0156-BLK1","537\_MOD","11/28/16","15:13","N","NA","000","1763-23-1","HEPTADEC AFLUOROACTANESULFONIC ACID SOLUTION  
","","","TRG","Yes","N","","Y","0.807","0.900","8.00","NG\_L","NG\_L","","","","","","","","","","","","",""  
"B6K0156-BLK1","537\_MOD","11/28/16","15:13","N","NA","000","13C3-PFBS","13C3-PFBS","111","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","111","111","","","","","","","60","150","",""  
,""  
,  
"B6K0156-BLK1","537\_MOD","11/28/16","15:13","N","NA","000","13C2-PFOA","13C2-PFOA","111","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","111","111","","","","","","","60","150","",""  
,""  
,  
"B6K0156-BLK1","537\_MOD","11/28/16","15:13","N","NA","000","13C8-PFOS","13C8-PFOS","106","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","106","106","","","","","","","60","150","",""  
,""  
,  
"B6K0156-BS1","537\_MOD","11/28/16","14:22","N","NA","000","375-73-5","PFBS","83.5","","TRG","Yes","Y","","Y","1.79","4.00","8.00","NG\_L","NG\_L","","","","","80.0","83.5","104","","",""  
,"","60","130",""  
,  
"B6K0156-BS1","537\_MOD","11/28/16","14:22","N","NA","000","335-67-1","PERFLUORO OCTANOIC ACID (PFOA)","93.1","","TRG","Yes","Y","","Y","0.651","2.00","8.00","NG\_L","NG\_L","","","","","80.0","93.1","116","","",""  
,"","70","130",""  
,  
"B6K0156-BS1","537\_MOD","11/28/16","14:22","N","NA","000","1763-23-1","HEPTADEC AFLUOROACTANESULFONIC ACID SOLUTION  
","82.3","","TRG","Yes","Y","","Y","0.807","0.900","8.00","NG\_L","NG\_L","","","","","80.0","82.3","103","","",""  
,"70","130",""  
,  
"B6K0156-BS1","537\_MOD","11/28/16","14:22","N","NA","000","13C3-PFBS","13C3-PFBS","111","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","111","111","","","","","","60","150","",""  
,""  
,  
"B6K0156-BS1","537\_MOD","11/28/16","14:22","N","NA","000","13C2-PFOA","13C2-PFOA","100","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","100","100","","","","","","60","150","",""  
,""  
,  
"B6K0156-BS1","537\_MOD","11/28/16","14:22","N","NA","000","13C8-PFOS","13C8-PFOS","97.2","","IS","Yes","Y","","Y","","","","PCT\_REC","","","","","100","97.2","97.2","","","","","60","150","",""  
,""  
,



## LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AMEC Foster Wheeler, Inc.  
7376 SW Durham Road  
Portland, OR 97224  
Attn: Ms. Marina Mitchell

February 2, 2017

SUBJECT: MCAS Yuma, Data Validation

Dear Ms. Mitchell,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 20, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #37797:

<u>SDG #</u>	<u>Fraction</u>
280-91405-1, 1601443	Volatiles, 1,4-Dioxane, , Wet Chemistry, Perfluorinated Alkyl Acids

The data validation was performed under Stage 2B & 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

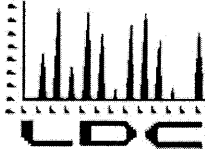
- Final Addendum 3 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, February 2017
- Final Addendum 2 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, September 2015
- Final Addendum 1 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, May 2013
- Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, May 2013
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0, July 2013
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

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

Sincerely,

Pei Geng  
Project Manager/Senior Chemist





## LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AMEC Foster Wheeler, Inc.  
7376 SW Durham Road  
Portland, OR 97224  
Attn: Ms. Marina Mitchell

January 9, 2017

SUBJECT: MCAS Yuma, Data Validation

Dear Ms. Mitchell,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 20, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

### LDC Project #37797:

<u>SDG #</u>	<u>Fraction</u>
280-91405-1, 1601443	Volatiles, 1,4-Dioxane, Perfluorinated Alkyl Acids

The data validation was performed under Stage 2B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Addendum 2 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, September 2015
- Final Addendum 1 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, May 2013
- Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona, May 2013
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0, July 2013
- USEPA, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, August 2014
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

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

Sincerely,

Pei Geng  
Project Manager/Senior Chemist



**Laboratory Data Consultants, Inc.  
Data Validation Report**

**Project/Site Name:** MCAS Yuma  
**LDC Report Date:** January 5, 2017  
**Parameters:** Volatiles  
**Validation Level:** Stage 2B  
**Laboratory:** TestAmerica, Inc. <sup>5</sup>  
**Sample Delivery Group (SDG):** 280-91405-1

<b>Sample Identification</b>	<b>Laboratory Sample Identification</b>	<b>Matrix</b>	<b>Collection Date</b>
VCT-SP-01-2016-1121	280-91405-1	Water	11/21/16
VCT-SP-02-2016-1121	280-91405-2	Water	11/21/16
VCT-SP-03-2016-1121	280-91405-3	Water	11/21/16

## Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Addendum 2 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (September 2015), the Final Addendum 1 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (May 2013), the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (May 2013), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

## **I. Sample Receipt and Technical Holding Times**

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

## **II. GC/MS Instrument Performance Check**

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

## **III. Initial Calibration and Initial Calibration Verification**

An initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending CCVs were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

## **V. Laboratory Blanks**

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

## **VI. Field Blanks**

Sample TB-2016-1121 was identified as a trip blank. No contaminants were found.

## **VII. Surrogates**

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

## **VIII. Matrix Spike/Matrix Spike Duplicates**

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

## **IX. Laboratory Control Samples**

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

## **XI. Internal Standards**

All internal standard areas and retention times were within QC limits.

## **XII. Compound Quantitation**

Raw data were not reviewed for Stage 2B validation.

## **XIII. Target Compound Identifications**

Raw data were not reviewed for Stage 2B validation.

## **XIV. System Performance**

Raw data were not reviewed for Stage 2B validation.

## **XV. Overall Assessment of Data**

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

**MCAS Yuma**  
**Volatiles - Data Qualification Summary - SDG 280-91405-1**

No Sample Data Qualified in this SDG

**MCAS Yuma**  
**Volatiles - Laboratory Blank Data Qualification Summary - SDG 280-91405-1**

No Sample Data Qualified in this SDG

**MCAS Yuma**  
**Volatiles - Field Blank Data Qualification Summary - SDG 280-91405-1**

No Sample Data Qualified in this SDG



LDC #: 37797E1

**VALIDATION COMPLETENESS WORKSHEET**

SDG #: 280-91405-1

Stage 2B

Laboratory: Test America, Inc.

Date: 12/9/16

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: JVG

**METHOD:** GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15% 1CV ≤ 20%
IV.	Continuing calibration / 12nd day	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = A
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	CS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable      ND = No compounds detected      D = Duplicate      SB=Source blank  
 N = Not provided/applicable      R = Rinsate      TB = Trip blank      OTHER:  
 SW = See worksheet      FB = Field blank      EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	VCT-SP-01-2016-1121	280-91405-1	Water	11/21/16
2	VCT-SP-02-2016-1121	280-91405-2	Water	11/21/16
3	VCT-SP-03-2016-1121	280-91405-3	Water	11/21/16
4	TB-2016-1121	280-91405-4	Water	11/21/16
5				
6				
7				
8				
9				

Notes:


## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** MCAS Yuma  
**LDC Report Date:** January 4, 2017  
**Parameters:** 1,4-Dioxane  
**Validation Level:** Stage 2B  
**Laboratory:** TestAmerica, Inc.  
**Sample Delivery Group (SDG):** 280-91405-1

<b>Sample Identification</b>	<b>Laboratory Sample Identification</b>	<b>Matrix</b>	<b>Collection Date</b>
VCT-SP-01-2016-1121	280-91405-1	Water	11/21/16
VCT-SP-02-2016-1121	280-91405-2	Water	11/21/16
VCT-SP-03-2016-1121	280-91405-3	Water	11/21/16

## Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Addendum 2 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (September 2015), the Final Addendum 1 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (May 2013), the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (May 2013), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270C

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered not detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

## **I. Sample Receipt and Technical Holding Times**

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

## **II. GC/MS Instrument Performance Check**

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

## **III. Initial Calibration and Initial Calibration Verification**

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

## **IV. Continuing Calibration**

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

## **V. Laboratory Blanks**

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

## **VI. Field Blanks**

No field blanks were identified in this SDG.

## **VII. Surrogates**

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

## **VIII. Matrix Spike/Matrix Spike Duplicates**

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

## **IX. Laboratory Control Samples**

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

## **X. Field Duplicates**

No field duplicates were identified in this SDG.

## **XI. Internal Standards**

All internal standard areas and retention times were within QC limits.

## **XII. Compound Quantitation**

Raw data were not reviewed for Stage 2B validation.

## **XIII. Target Compound Identifications**

Raw data were not reviewed for Stage 2B validation.

## **XIV. System Performance**

Raw data were not reviewed for Stage 2B validation.

## **XV. Overall Assessment of Data**

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

**MCAS Yuma**  
**1,4-Dioxane - Data Qualification Summary - SDG 280-91405-1**

No Sample Data Qualified in this SDG

**MCAS Yuma**  
**1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG 280-91405-1**

No Sample Data Qualified in this SDG

**MCAS Yuma**  
**1,4-Dioxane - Field Blank Data Qualification Summary - SDG 280-91405-1**

No Sample Data Qualified in this SDG

LDC #: 37797E2b

# VALIDATION COMPLETENESS WORKSHEET

Date: 11/29/16

SDG #: 280-91405-1

Stage 2B

Page: 1 of 1

Laboratory: Test America, Inc.

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD:** GC/MS 1,4-Dioxane (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%.   CV ≤ 20%
IV.	Continuing calibration / ending	A	CV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	CS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

SB=Source blank  
 OTHER:

	Client ID	Lab ID	Matrix	Date
1	VCT-SP-01-2016-1121	280-91405-1	Water	11/21/16
2	VCT-SP-02-2016-1121	280-91405-2	Water	11/21/16
3	VCT-SP-03-2016-1121	280-91405-3	Water	11/21/16
4				
5				
6				
7				
8				
9				
10				

Notes:




## Laboratory Data Consultants, Inc. Data Validation Report

**Project/Site Name:** MCAS Yuma  
**LDC Report Date:** January 4, 2017  
**Parameters:** Perfluorinated Alkyl Acids  
**Validation Level:** Stage 2B  
**Laboratory:** Vista Analytical Laboratory  
**Sample Delivery Group (SDG):** 1601443

<b>Sample Identification</b>	<b>Laboratory Sample Identification</b>	<b>Matrix</b>	<b>Collection Date</b>
VCT-SP-01-20161110	1601443-01	Water	11/10/16
VCT-SP-02-20161110	1601443-02	Water	11/10/16
VCT-SP-03-20161110	1601443-03	Water	11/10/16

## Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Addendum 3 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (February 2017), the Final Addendum 2 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (September 2015), the Final Addendum 1 to the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (May 2013), the Final Sampling and Analysis Plan, Field Sampling Plan and Quality Assurance Project Plan, for Groundwater Long Term Monitoring and System Operation at Marine Corps Air Station Yuma, Yuma, Arizona (May 2013), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Superfund Organic Methods Data Review (August 2014). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

- J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.
- U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).
- UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.
- R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.
- NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
- NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

## **I. Sample Receipt and Technical Holding Times**

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

## **II. LC/MS Instrument Performance Check**

Instrument performance was not required by the method.

## **III. Initial Calibration and Initial Calibration Verification**

Initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination ( $r^2$ ) were greater than or equal to 0.990.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

## **IV. Continuing Calibration**

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

## **V. Laboratory Blanks**

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

## **VI. Field Blanks**

No field blanks were identified in this SDG.

## **VII. Matrix Spike/Matrix Spike Duplicates**

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

## **VIII. Ongoing Precision Recovery Samples**

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

## **IX. Field Duplicates**

No field duplicates were identified in this SDG.

## **X. Internal Standards**

All internal standard areas and retention times were within QC limits.

## **XI. Compound Quantitation**

Raw data were not reviewed for Stage 2B validation.

## **XII. Target Compound Identifications**

Raw data were not reviewed for Stage 2B validation.

## **XIII. System Performance**

Raw data were not reviewed for Stage 2B validation.

## **XIV. Overall Assessment of Data**

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

**MCAS Yuma  
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601443**

No Sample Data Qualified in this SDG

**MCAS Yuma  
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG  
1601443**

No Sample Data Qualified in this SDG

**MCAS Yuma  
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG  
1601443**

No Sample Data Qualified in this SDG

LDC #: 37797F96

# VALIDATION COMPLETENESS WORKSHEET

Date: 11/9/16

SDG #: 1601443

Stage 2B

Page: 1 of 1

Laboratory: Vista Analytical Laboratory

Reviewer: [Signature]

2nd Reviewer: [Signature]

**METHOD:** LC/MS Perfluorinated Alkyl Acids (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A-A	$RSO \leq 25\%$ , $r^2 \geq 0.99$ , $1CV \leq 3\%$
IV.	Continuing calibration	A	$2CV \text{ limits} \leq 30\%$
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	OK
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable  
 N = Not provided/applicable  
 SW = See worksheet

ND = No compounds detected  
 R = Rinsate  
 FB = Field blank

D = Duplicate  
 TB = Trip blank  
 EB = Equipment blank

SB=Source blank  
 OTHER:

	Client ID	Lab ID	Matrix	Date
1	VCT-SP-01-20161110	1601443-01	Water	11/10/16
2	VCT-SP-02-20161110	1601443-02	Water	11/10/16
3	VCT-SP-03-20161110	1601443-03	Water	11/10/16
4				
5				
6				
7				
8				
9				

Notes:


INSTALLATION_ID	SDG	LOCATION-NAME	SITE_NAME	INSTALLATION_ID	LOCATION_TYPE	LOCATION_TYPE_DESC	COORD_X	COORD_Y	SAMPLE_NAME	SAMPLE_MATRIX	SAMPLE_MATRIC_DESC	COLLECT_DATE	CHEMICAL_NAME
MCAS YUMA	1601443	VCT-SP-01	OU 0000001 AREA 1	YUMA_MCAS	IN	MONITORING WELL	436268.456	607766.295	VCT-SP-01-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorooctanesulfonic Acid (PFOS)
MCAS YUMA	1601443	VCT-SP-01	OU 0000001 AREA 1	YUMA_MCAS	IN	MONITORING WELL	436268.456	607766.295	VCT-SP-01-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorooctanoic Acid (PFOA)
MCAS YUMA	1601443	VCT-SP-01	OU 0000001 AREA 1	YUMA_MCAS	IN	MONITORING WELL	436268.456	607766.295	VCT-SP-01-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorobutanesulfonic Acid (PFBS)
MCAS YUMA	1601443	VCT-SP-02	OU 0000001 AREA 1	YUMA_MCAS	SYSTEM	MONITORING WELL	436268.456	607766.295	VCT-SP-02-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorooctanesulfonic Acid (PFOS)
MCAS YUMA	1601443	VCT-SP-02	OU 0000001 AREA 1	YUMA_MCAS	SYSTEM	MONITORING WELL	436268.456	607766.295	VCT-SP-02-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorooctanoic Acid (PFOA)
MCAS YUMA	1601443	VCT-SP-02	OU 0000001 AREA 1	YUMA_MCAS	SYSTEM	MONITORING WELL	436268.456	607766.295	VCT-SP-02-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorobutanesulfonic Acid (PFBS)
MCAS YUMA	1601443	VCT-SP-03	OU 0000001 AREA 1	YUMA_MCAS	EF	MONITORING WELL	436268.456	607766.295	VCT-SP-03-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorooctanesulfonic Acid (PFOS)
MCAS YUMA	1601443	VCT-SP-03	OU 0000001 AREA 1	YUMA_MCAS	EF	MONITORING WELL	436268.456	607766.295	VCT-SP-03-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorooctanoic Acid (PFOA)
MCAS YUMA	1601443	VCT-SP-03	OU 0000001 AREA 1	YUMA_MCAS	EF	MONITORING WELL	436268.456	607766.295	VCT-SP-03-20161110	WG	GROUNDWATER	10-Nov-16	Perfluorobutanesulfonic Acid (PFBS)