NAVFAC
Naval Facilities Engineering Command

Off-Base Drinking Water Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG J18918-1

Naval Air Station Oceana
Virginia Beach, Virginia

July 2019

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

TestAmerica Job ID: 320-18918-1
Client Project/Site: NAS Oceana, VA - 9000 CTO-WE01

For:
CH2M Hill Constructors, Inc.
1100 NE Circle Blvd
Corvallis, Oregon 97330

Attn: Tiffany Hill

Authorized for release by:
5/31/2016 12:23:22 PM

Laura Turpen, Project Manager I
(916)374-4414
laura.turpen@testamericainc.com

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Definitions/Glossary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 320-18918-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: NAS Oceana, VA - 9000 CTO-WE01

Report Number: 320-18918-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 05/17/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.1 C.

PFC

Samples OF-RW83-0516 (320-18918-1) and OF-FB83-0516 (320-18918-2) were analyzed for PFC in accordance with PFC. The samples were prepared on 05/20/2016 and analyzed on 05/27/2016.

The level 1 standard from the ICAL is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5 amu, so detection of the analyte serves as verification that the assigned mass is within +/- 0.5 amu of the true value, which meets the DOD tune criterion. (ICV 320-111733/10)

Job ID: 320-18918-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: OF-RW83-0516 (320-18918-1), OF-FB83-0516 (320-18918-2) and (LCSD 320-110721/3-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 320-110721.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Client Sample ID: OF-RW83-0516 — Lab Sample ID: 320-18918-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.00095	J	0.0024	0.00084	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.0094	M	0.0039	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB83-0516 — Lab Sample ID: 320-18918-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: OF-RW83-0516

Lab Sample ID: 320-18918-1

Date Collected: 05/16/16 08:22

Matrix: Water

Date Received: 05/17/16 09:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorohexanesulfonic acid (PFHxS)	**0.00095**	**J**	0.0024	0.00084	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorooctanesulfonic acid (PFOS)	**0.0094**	**M**	0.0039	0.0012	ug/L		05/20/16 11:05	05/27/16 21:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*47*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C4 PFOS	*7*	*Q*	*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C5 PFNA	*64*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C4 PFOA	*74*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C4-PFHpA	*75*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*

Client Sample ID: OF-FB83-0516

Lab Sample ID: 320-18918-2

Date Collected: 05/16/16 08:15

Matrix: Water

Date Received: 05/17/16 09:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00078	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00073	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorononanoic acid (PFNA)	0.0019	U M	0.0024	0.00064	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0024	0.00085	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorooctanesulfonic acid (PFOS)	0.0029	U M	0.0039	0.0012	ug/L		05/20/16 11:05	05/27/16 22:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*84*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C4 PFOS	*24*	*Q*	*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C5 PFNA	*100*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C4 PFOA	*106*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C4-PFHpA	*96*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*

Isotope Dilution Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		3O2 PFHx	3C4 PFOS	3C5 PFNA	3C4 PFOA	3C4-PFHp			
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)			
320-18918-1	OF-RW83-0516	47	7 Q	64	74	75			
320-18918-2	OF-FB83-0516	84	24 Q	100	106	96			
LCS 320-110721/2-A	Lab Control Sample	101	126	91	92	95			
LCSD 320-110721/3-A	Lab Control Sample Dup	84	107	82	83	81			
MB 320-110721/1-A	Method Blank	107	127	97	105	97			

Surrogate Legend

18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C5 PFNA = 13C5 PFNA
13C4 PFOA = 13C4 PFOA
13C4-PFHpA = 13C4-PFHpA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-110721/1-A
Matrix: Water
Analysis Batch: 111733

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 110721

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U M	0.0040	0.0013	ug/L		05/20/16 11:05	05/27/16 17:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*107*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C4 PFOS	*127*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C5 PFNA	*97*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C4 PFOA	*105*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C4-PFHpA	*97*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*

Lab Sample ID: LCS 320-110721/2-A
Matrix: Water
Analysis Batch: 111733

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 110721

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0305		ug/L		76	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0326		ug/L		81	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0340		ug/L		85	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0273		ug/L		77	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0288	M	ug/L		79	60 - 140
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0261	M	ug/L		70	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
18O2 PFHxS	*101*		*25 - 150*
13C4 PFOS	*126*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
13C4 PFOA	*92*		*25 - 150*
13C4-PFHpA	*95*		*25 - 150*

Lab Sample ID: LCSD 320-110721/3-A
Matrix: Water
Analysis Batch: 111733

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 110721

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0318		ug/L		80	60 - 140	4	30
Perfluorooctanoic acid (PFOA)	0.0400	0.0305		ug/L		76	60 - 140	6	30
Perfluorononanoic acid (PFNA)	0.0400	0.0334		ug/L		84	60 - 140	2	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0291		ug/L		82	50 - 150	7	30
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0314	M	ug/L		86	60 - 140	9	30
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0284	M	ug/L		76	60 - 140	8	30

QC Sample Results

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
18O2 PFHxS	84		25 - 150
13C4 PFOS	107		25 - 150
13C5 PFNA	82		25 - 150
13C4 PFOA	83		25 - 150
13C4-PFHpA	81		25 - 150

QC Association Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

LCMS

Prep Batch: 110721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18918-1	OF-RW83-0516	Total/NA	Water	3535	
320-18918-2	OF-FB83-0516	Total/NA	Water	3535	
LCS 320-110721/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-110721/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-110721/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 111733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18918-1	OF-RW83-0516	Total/NA	Water	WS-LC-0025	110721
320-18918-2	OF-FB83-0516	Total/NA	Water	WS-LC-0025	110721
LCS 320-110721/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	110721
LCSD 320-110721/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	110721
MB 320-110721/1-A	Method Blank	Total/NA	Water	WS-LC-0025	110721

Lab Chronicle

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Client Sample ID: OF-RW83-0516

Lab Sample ID: 320-18918-1

Date Collected: 05/16/16 08:22

Matrix: Water

Date Received: 05/17/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			518.9 mL	1.0 mL	110721	05/20/16 11:05	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	518.9 mL	1.0 mL	111733	05/27/16 21:54	JRB	TAL SAC

Client Sample ID: OF-FB83-0516

Lab Sample ID: 320-18918-2

Date Collected: 05/16/16 08:15

Matrix: Water

Date Received: 05/17/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			514.7 mL	1.0 mL	110721	05/20/16 11:05	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	514.7 mL	1.0 mL	111733	05/27/16 22:15	JRB	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Oregon	NELAP	10	4040	01-29-17

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17
Oregon	NELAP	10	4025	01-09-17

Method Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-18918-1	OF-RW83-0516	Water	05/16/16 08:22	05/17/16 09:15
320-18918-2	OF-FB83-0516	Water	05/16/16 08:15	05/17/16 09:15

CTO-WE01

Chain of Custody Record

Temperature on Receipt 3.1°C

Drinking Water? Yes [X] No [ ]

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: CH2M HILL	Project Manager: Tiffany Hill	Date: 5-16-16	Chain of Custody Number: 286006
Address: 5701 Cleveland Street, Suite 200	Telephone Number (Area Code)/Fax Number	Lab Number	Page 1 of 1
City: Virginia Beach, VA / State: VA / Zip Code	Site Contact	Lab Contact: Laura Turpen	
Project Name and Location (State): Fentress PFC Sampling WE01	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed	Soil	Containers & Preservatives: Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: Select PFCs	Special Instructions/ Conditions of Receipt
OF-RW83-0516	5/16/16	~~8:15~~ 8:10		X			X						2	
OF-FB83-0516	5/16/16	8:15		X			X						2	

320-18918 Chain of Custody

Possible Hazard Identification
[ ] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal
[ ] Return To Client [ ] Disposal By Lab [ ] Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
[ ] 24 Hours [ ] 48 Hours [ ] 7 Days [X] 14 Days [ ] 21 Days [ ] Other _____

QC Requirements (Specify)

1. Relinquished By: Juliana Dean	Date: 5-16-16	Time: 10:30AM	1. Received By: CME 5/17	Date: 5/17/16	Time: 0915
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-18918-1

Login Number: 18918
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

Job Number: 320-18918-1

Job Description: NAS Oceana, VA - 9000 CTO-WE01

For:
CH2M Hill Constructors, Inc.
1100 NE Circle Blvd
Corvallis, OR 97330

Attention: Tiffany Hill

Approved for release.
Laura Turpen
Project Manager I
5/31/2016 12:25 PM

Laura Turpen, Project Manager I
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4414
laura.turpen@testamericainc.com
05/31/2016

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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Qualifiers

LCMS

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: NAS Oceana, VA - 9000 CTO-WE01

Report Number: 320-18918-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 05/17/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 3.1 C.

PFC

Samples OF-RW83-0516 (320-18918-1) and OF-FB83-0516 (320-18918-2) were analyzed for PFC in accordance with PFC. The samples were prepared on 05/20/2016 and analyzed on 05/27/2016.

The level 1 standard from the ICAL is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5 amu, so detection of the analyte serves as verification that the assigned mass is within +/- 0.5 amu of the true value, which meets the DOD tune criterion. (ICV 320-111733/10)

The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: OF-RW83-0516 (320-18918-1), OF-FB83-0516 (320-18918-2) and (LCSD 320-110721/3-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with analytical batch 320-110721.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Client Sample ID: OF-RW83-0516 — Lab Sample ID: 320-18918-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.00095	J	0.0024	0.00084	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.0094	M	0.0039	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB83-0516 — Lab Sample ID: 320-18918-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: OF-RW83-0516

Lab Sample ID: 320-18918-1

Date Collected: 05/16/16 08:22

Matrix: Water

Date Received: 05/17/16 09:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00088	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorohexanesulfonic acid (PFHxS)	**0.00095**	**J**	0.0024	0.00084	ug/L		05/20/16 11:05	05/27/16 21:54	1
Perfluorooctanesulfonic acid (PFOS)	**0.0094**	**M**	0.0039	0.0012	ug/L		05/20/16 11:05	05/27/16 21:54	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*47*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C4 PFOS	*7*	*Q*	*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C5 PFNA	*64*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C4 PFOA	*74*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*
13C4-PFHpA	*75*		*25 - 150*	*05/20/16 11:05*	*05/27/16 21:54*	*1*

Client Sample ID: OF-FB83-0516

Lab Sample ID: 320-18918-2

Date Collected: 05/16/16 08:15

Matrix: Water

Date Received: 05/17/16 09:15

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00078	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00073	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorononanoic acid (PFNA)	0.0019	U M	0.0024	0.00064	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0024	0.00085	ug/L		05/20/16 11:05	05/27/16 22:15	1
Perfluorooctanesulfonic acid (PFOS)	0.0029	U M	0.0039	0.0012	ug/L		05/20/16 11:05	05/27/16 22:15	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*84*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C4 PFOS	*24*	*Q*	*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C5 PFNA	*100*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C4 PFOA	*106*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*
13C4-PFHpA	*96*		*25 - 150*	*05/20/16 11:05*	*05/27/16 22:15*	*1*

Default Detection Limits

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	WS-LC-0025
Perfluoroheptanoic acid (PFHpA)	0.0025	0.00080	ug/L	WS-LC-0025
Perfluorohexanesulfonic acid (PFHxS)	0.0025	0.00087	ug/L	WS-LC-0025
Perfluorononanoic acid (PFNA)	0.0025	0.00065	ug/L	WS-LC-0025
Perfluorooctanesulfonic acid (PFOS)	0.0040	0.0013	ug/L	WS-LC-0025
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	WS-LC-0025

Isotope Dilution Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		3O2 PFHx	3C4 PFOS	3C5 PFNA	3C4 PFOA	3C4-PFHp			
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)			
320-18918-1	OF-RW83-0516	47	7 Q	64	74	75			
320-18918-2	OF-FB83-0516	84	24 Q	100	106	96			
LCS 320-110721/2-A	Lab Control Sample	101	126	91	92	95			
LCSD 320-110721/3-A	Lab Control Sample Dup	84	107	82	83	81			
MB 320-110721/1-A	Method Blank	107	127	97	105	97			

Surrogate Legend

18O2 PFHxS = 18O2 PFHxS
13C4 PFOS = 13C4 PFOS
13C5 PFNA = 13C5 PFNA
13C4 PFOA = 13C4 PFOA
13C4-PFHpA = 13C4-PFHpA

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-110721/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 111733 — **Prep Batch: 110721**

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		05/20/16 11:05	05/27/16 17:18	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U M	0.0040	0.0013	ug/L		05/20/16 11:05	05/27/16 17:18	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
18O2 PFHxS	*107*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C4 PFOS	*127*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C5 PFNA	*97*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C4 PFOA	*105*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*
13C4-PFHpA	*97*		*25 - 150*	*05/20/16 11:05*	*05/27/16 17:18*	*1*

Lab Sample ID: LCS 320-110721/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 111733 — **Prep Batch: 110721**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0305		ug/L		76	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0326		ug/L		81	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0340		ug/L		85	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0273		ug/L		77	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0288	M	ug/L		79	60 - 140
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0261	M	ug/L		70	60 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
18O2 PFHxS	*101*		*25 - 150*
13C4 PFOS	*126*		*25 - 150*
13C5 PFNA	*91*		*25 - 150*
13C4 PFOA	*92*		*25 - 150*
13C4-PFHpA	*95*		*25 - 150*

Lab Sample ID: LCSD 320-110721/3-A — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 111733 — **Prep Batch: 110721**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0318		ug/L		80	60 - 140	4	30
Perfluorooctanoic acid (PFOA)	0.0400	0.0305		ug/L		76	60 - 140	6	30
Perfluorononanoic acid (PFNA)	0.0400	0.0334		ug/L		84	60 - 140	2	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0291		ug/L		82	50 - 150	7	30
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0314	M	ug/L		86	60 - 140	9	30
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0284	M	ug/L		76	60 - 140	8	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
18O2 PFHxS	84		25 - 150
13C4 PFOS	107		25 - 150
13C5 PFNA	82		25 - 150
13C4 PFOA	83		25 - 150
13C4-PFHpA	81		25 - 150

LCMS

Prep Batch: 110721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18918-1	OF-RW83-0516	Total/NA	Water	3535	
320-18918-2	OF-FB83-0516	Total/NA	Water	3535	
LCS 320-110721/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-110721/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-110721/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 111733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18918-1	OF-RW83-0516	Total/NA	Water	WS-LC-0025	110721
320-18918-2	OF-FB83-0516	Total/NA	Water	WS-LC-0025	110721
LCS 320-110721/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	110721
LCSD 320-110721/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	110721
MB 320-110721/1-A	Method Blank	Total/NA	Water	WS-LC-0025	110721

Lab Chronicle

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Client Sample ID: OF-RW83-0516

Lab Sample ID: 320-18918-1

Date Collected: 05/16/16 08:22

Matrix: Water

Date Received: 05/17/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			110721	05/20/16 11:05	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111733	05/27/16 21:54	JRB	TAL SAC

Client Sample ID: OF-FB83-0516

Lab Sample ID: 320-18918-2

Date Collected: 05/16/16 08:15

Matrix: Water

Date Received: 05/17/16 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			110721	05/20/16 11:05	VPM	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111733	05/27/16 22:15	JRB	TAL SAC

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Certification Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2928-01	01-31-17
Oregon	NELAP	10	4040	01-29-17

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17
Oregon	NELAP	10	4025	01-09-17

Method Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Method	Method Description	Protocol	Laboratory
WS-LC-0025	Perfluorinated Hydrocarbons	TAL SOP	TAL SAC

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: CH2M Hill Constructors, Inc.
Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18918-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-18918-1	OF-RW83-0516	Water	05/16/16 08:22	05/17/16 09:15
320-18918-2	OF-FB83-0516	Water	05/16/16 08:15	05/17/16 09:15

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Instrument ID: A4 Analysis Batch Number: 111733

Lab Sample ID: MB 320-110721/1-A Client Sample ID:

Date Analyzed: 05/27/16 17:18 Lab File ID: 27MAY2016B4A_019.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.44	Isomers	barnettj	05/31/16 10:05

Lab Sample ID: LCS 320-110721/2-A Client Sample ID:

Date Analyzed: 05/27/16 17:39 Lab File ID: 27MAY2016B4A_020.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.40	Isomers	barnettj	05/29/16 13:39
Perfluorooctanesulfonic acid (PFOS)	11.44	Isomers	barnettj	05/29/16 13:39

Lab Sample ID: LCSD 320-110721/3-A Client Sample ID:

Date Analyzed: 05/27/16 18:00 Lab File ID: 27MAY2016B4A_021.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.40	Isomers	barnettj	05/29/16 13:40
Perfluorooctanesulfonic acid (PFOS)	11.45	Isomers	barnettj	05/29/16 13:40

Lab Sample ID: 320-18918-1 Client Sample ID: OF-RW83-0516

Date Analyzed: 05/27/16 21:54 Lab File ID: 27MAY2016B4A_025.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.41	Isomers	barnettj	05/31/16 10:09

LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Instrument ID: A4 Analysis Batch Number: 111733

Lab Sample ID: 320-18918-2 Client Sample ID: OF-FB83-0516

Date Analyzed: 05/27/16 22:15 Lab File ID: 27MAY2016B4A_026.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION TIME	MANUAL INTEGRATION		
		REASON	ANALYST	DATE
Perfluorooctanesulfonic acid (PFOS)	11.44	Missed Peak	barnettj	05/31/16 10:10
Perfluorononanoic acid (PFNA)	11.45	Baseline	barnettj	05/31/16 10:10

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00006	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00007	200 uL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00005	01/07/21	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00005	12/07/20	Wellington Laboratories, Lot M2PFTeDA1115			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00005	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00006	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00009	12/22/17	Wellington Laboratories, Lot M8FOSA1215I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
.LCMPFBA_00006	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
.LCMPFDA_00007	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
.LCMPFDoA_00006	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00008	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00006	10/23/20	Wellington Laboratories, Lot MPFHxS1015			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
.LCMPFNA_00005	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
.LCMPFOA_00010	01/22/21	Wellington Laboratories, Lot MPFOA0116			(Purchased Reagent)		13C4 PFOA	50 ug/mL
.LCMPFOS_00012	01/22/21	Wellington Laboratories, Lot MPFOS0116			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00007	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
LCPFC-L1_00018	06/29/16	12/30/15	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	25 uL	Perfluorobutyric acid	0.5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							Perfluorodecanoic acid	0.5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.473 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctandecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.478 ng/mL
							Perfluorooctane Sulfonamide	0.5 ng/mL
							Perfluoropentanoic acid	0.5 ng/mL
							Perfluorotetradecanoic acid	0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00018	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	50 uL	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	0.884 ng/mL
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid (PFHpA)	1 ng/mL
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.946 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.956 ng/mL
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00040	250 uL	Perfluorobutyric acid	5 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.73 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.78 ng/mL
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
							Perfluoroundecanoic acid	5 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL

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Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
..LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
...LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
...LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
...LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
...LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
...LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
...LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
...LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
...LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
...LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
...LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
...LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
...LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
...LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
...LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
...LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
...LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
...LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
...LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
...LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00018	08/11/16	03/02/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00029	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00041	100 uL	Perfluorobutyric acid	20 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.92 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.12 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00029	08/29/16	02/29/16	Methanol, Lot Baker 115491	10000 uL	LCM2PFHxDA_00003	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00007	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00006	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00007	200 uL	13C2 PFHxA	1 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxS_00004	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00004	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00008	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00010	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00007	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00006	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00007	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00004	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00008	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00010	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00041	08/11/16	02/11/16	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00017	08/11/16	03/02/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00029	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00041	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.3 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctandecanoic acid	50 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorooctanesulfonic acid (PFOS)	47.8 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00029	08/29/16	02/29/16	Methanol, Lot Baker 115491	10000 uL	LCM2PFHxDA_00003	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00007	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00006	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00007	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	200 uL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00004	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00008	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00010	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	200 uL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00007	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00006	08/19/20	Wellington Laboratories, Lot MPFDA0815			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00007	04/09/20	Wellington Laboratories, Lot MPFHxA0415			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00004	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00008	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00010	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00041	08/11/16	02/11/16	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	400 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	189.2 ng/mL
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	191.2 ng/mL
							Perfluorooctane Sulfonamide	200 ng/mL
							Perfluoropentanoic acid	200 ng/mL
							Perfluorotetradecanoic acid	200 ng/mL
							Perfluorotridecanoic acid	200 ng/mL
							Perfluoroundecanoic acid	200 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL

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SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP_00039	800 uL	Perfluorobutyric acid	400 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	353.6 ng/mL
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid (PFHpA)	400 ng/mL
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	378.4 ng/mL
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	382.4 ng/mL
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
							Perfluoroundecanoic acid	400 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA_00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00004	0.2 mL	13C2 PFDoA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFHxA_00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.2 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005	0.2 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00003	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00004	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00004	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00005	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00005	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
..LCPFBA_00003	03/05/18	Wellington Laboratories, Lot PFBA0313			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
..LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
..LCPFDA_00003	06/18/18	Wellington Laboratories, Lot PFDA0613			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
..LCPFDoA_00003	01/03/18	Wellington Laboratories, Lot PFDoA0113			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
..LCPFDSA_00001	09/13/18	Wellington Laboratories, Lot LPFDS0913			(Purchased Reagent)		Perfluorodecane Sulfonic acid	48.2 ug/mL
..LCPFHpA_00004	05/09/19	Wellington Laboratories, Lot PFHpA0514			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
..LCPFHpSA_00001	11/21/17	Wellington Laboratories, Lot LPFHpS1112			(Purchased Reagent)		Perfluoroheptanesulfonic Acid	47.6 ug/mL
..LCPFHxA_00003	05/09/19	Wellington Laboratories, Lot PFHxA0514			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
..LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
..LCPFHxSA_00001	05/09/19	Wellington Laboratories, Lot LPFHxS0514			(Purchased Reagent)		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
..LCPFNA_00004	05/09/19	Wellington Laboratories, Lot PFNA0514			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
..LCPFOA_00004	10/11/18	Wellington Laboratories, Lot PFOA1013			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
..LCPFODA_00004	04/25/17	Wellington Laboratories, Lot PFODA0807			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
..LCPFOS_00004	06/20/19	Wellington Laboratories, Lot LPFOS0614			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
..LCPFOSA_00005	07/31/18	Wellington Laboratories, Lot FOSA0714I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
..LCPFPeA_00003	01/03/18	Wellington Laboratories, Lot PFPeA0113			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
..LCPFTeDA_00003	06/19/18	Wellington Laboratories, Lot PFTeDA0613			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
..LCPFTrDA_00003	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
..LCPFUdA_00003	06/19/18	Wellington Laboratories, Lot PFUdA0613			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL
LCPFCIC_00016	06/16/16	12/22/15	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU_00023	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							18O2 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFACMXB_00008	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00023	06/21/16	12/21/15	Methanol, Lot Baker 115491	5 mL	LCM2PFHxDA_00002	0.1 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003	0.1 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003	0.1 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004	0.1 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006	0.1 mL	13C8 FOSA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
					LCMPFBA_00004	0.1 mL	13C4 PFBA	1 ug/mL
					LCMPFDA_00005	0.1 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA_00003	0.1 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00006	0.1 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004	0.1 mL	18O2 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.1 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007	0.1 mL	13C4 PFOA	1 ug/mL
					LCMPFOS_00009	0.1 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00004	0.1 mL	13C2 PFUnA	1 ug/mL
..LCM2PFHxDA_00002	11/29/17	Wellington Laboratories, Lot M2PFHxDA1112			(Purchased Reagent)		13C2-PFHxDA	50 ug/mL
..LCM2PFTeDA_00003	11/29/17	Wellington Laboratories, Lot M2PFTeDA1112			(Purchased Reagent)		13C2-PFTeDA	50 ug/mL
..LCM4PFHPA_00003	05/22/20	Wellington Laboratories, Lot M4PFHpA0515			(Purchased Reagent)		13C4-PFHpA	50 ug/mL
..LCM5PFPEA_00004	05/22/20	Wellington Laboratories, Lot M5PFPeA0515			(Purchased Reagent)		13C5-PFPeA	50 ug/mL
..LCM8FOSA_00006	12/15/16	Wellington Laboratories, Lot M8FOSA1214I			(Purchased Reagent)		13C8 FOSA	50 ug/mL
..LCMPFBA_00004	10/31/19	Wellington Laboratories, Lot MPFBA1014			(Purchased Reagent)		13C4 PFBA	50 ug/mL
..LCMPFDA_00005	04/13/19	Wellington Laboratories, Lot MPFDA0414			(Purchased Reagent)		13C2 PFDA	50 ug/mL
..LCMPFDoA_00003	07/17/19	Wellington Laboratories, Lot MPFDoA0714			(Purchased Reagent)		13C2 PFDoA	50 ug/mL
..LCMPFHxA_00006	04/13/19	Wellington Laboratories, Lot MPFHxA0414			(Purchased Reagent)		13C2 PFHxA	50 ug/mL
..LCMPFHxS_00004	07/25/18	Wellington Laboratories, Lot MPFHxS0713			(Purchased Reagent)		18O2 PFHxS	47.3 ug/mL
..LCMPFNA_00003	04/13/19	Wellington Laboratories, Lot MPFNA0414			(Purchased Reagent)		13C5 PFNA	50 ug/mL
..LCMPFOA_00007	04/10/20	Wellington Laboratories, Lot MPFOA0415			(Purchased Reagent)		13C4 PFOA	50 ug/mL
..LCMPFOS_00009	05/15/20	Wellington Laboratories, Lot MPFOS0515			(Purchased Reagent)		13C4 PFOS	47.8 ug/mL
..LCMPFUdA_00004	10/31/19	Wellington Laboratories, Lot MPFUdA1014			(Purchased Reagent)		13C2 PFUnA	50 ug/mL
.LCPFACMXB_00008	06/20/19	Wellington Laboratories, Lot PFACMXB0614			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCSP_00049	11/17/16	05/17/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00003	200 uL	Perfluorobutane Sulfonate	0.884 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005	200 uL	Perfluorodecane Sulfonate	0.964 ug/mL
							Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS_00008	200 uL	Perfluoroheptane Sulfonate	0.952 ug/mL
							Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001	200 uL	Perfluorohexane Sulfonate	0.91 ug/mL

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent		Analyte	Concentration
					Reagent ID	Volume Added		
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00005	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	200 uL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00005	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	200 uL	PFPeS (Perflouro-1-pentanesulfonate)	0.938 ug/mL
					LCPFTeDA_00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004	200 uL	Perfluoroundecanoic acid	1 ug/mL
.LCPFBA_00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Reagent)		Perfluorobutyric acid	50 ug/mL
.LCPFBS_00003	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19	Wellington Laboratories, Lot LPFBS1014			(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00004	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00004	01/30/20	Wellington Laboratories, Lot PFDoA0115			(Purchased Reagent)		Perfluorododecanoic acid	50 ug/mL
.LCPFDS_00005	07/02/20	Wellington Laboratories, Lot LPFDS0615			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00005	01/22/21	Wellington Laboratories, Lot PFHpA0116			(Purchased Reagent)		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS_00008	11/06/20	Wellington Laboratories, Lot LPFHpS1115			(Purchased Reagent)		Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00004	12/22/20	Wellington Laboratories, Lot PFHxA1215			(Purchased Reagent)		Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17	Wellington Laboratories, Lot PFHxDA0707			(Purchased Reagent)		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00001	07/03/20	Wellington Laboratories, Lot brPFHxSK0615			(Purchased Reagent)		Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00005	10/23/20	Wellington Laboratories, Lot PFNA1015			(Purchased Reagent)		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17	Wellington Laboratories, Lot LPFNS0712			(Purchased Reagent)		PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00005	11/06/20	Wellington Laboratories, Lot PFOA1115			(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00005	01/30/20	Wellington Laboratories, Lot PFODA0115			(Purchased Reagent)		Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS-br_00001	10/14/20	Wellington Laboratories, Lot brPFOSK1015			(Purchased Reagent)		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17	Wellington Laboratories, Lot FOSA0815I			(Purchased Reagent)		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00004	01/30/20	Wellington Laboratories, Lot PFPeA0115			(Purchased Reagent)		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17	Wellington Laboratories, Lot LPFPeS0712			(Purchased Reagent)		PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL
.LCPFTeDA_00004	12/09/20	Wellington Laboratories, Lot PFTeDA1215			(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA_00004	12/10/18	Wellington Laboratories, Lot PFTrDA1213			(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00004	08/19/20	Wellington Laboratories, Lot PFUdA0815			(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Reagent

LCM2PFHxDA_00002

Rec: 8/14/14 SKV

Scanned: 8/18/14 STV

318141
ID: LCM2PFHxDA_00002
Exp: 11/29/17 Prpd: SKV
13C2-PFHxDA at 50ug/mL

WELLINGTON LABORATORIES

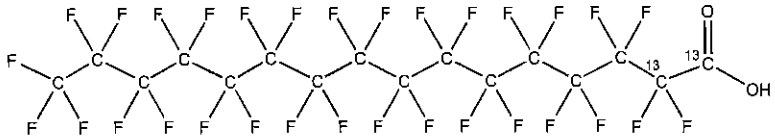
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFHxDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

LOT NUMBER: M2PFHxDA1112

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/10/2013 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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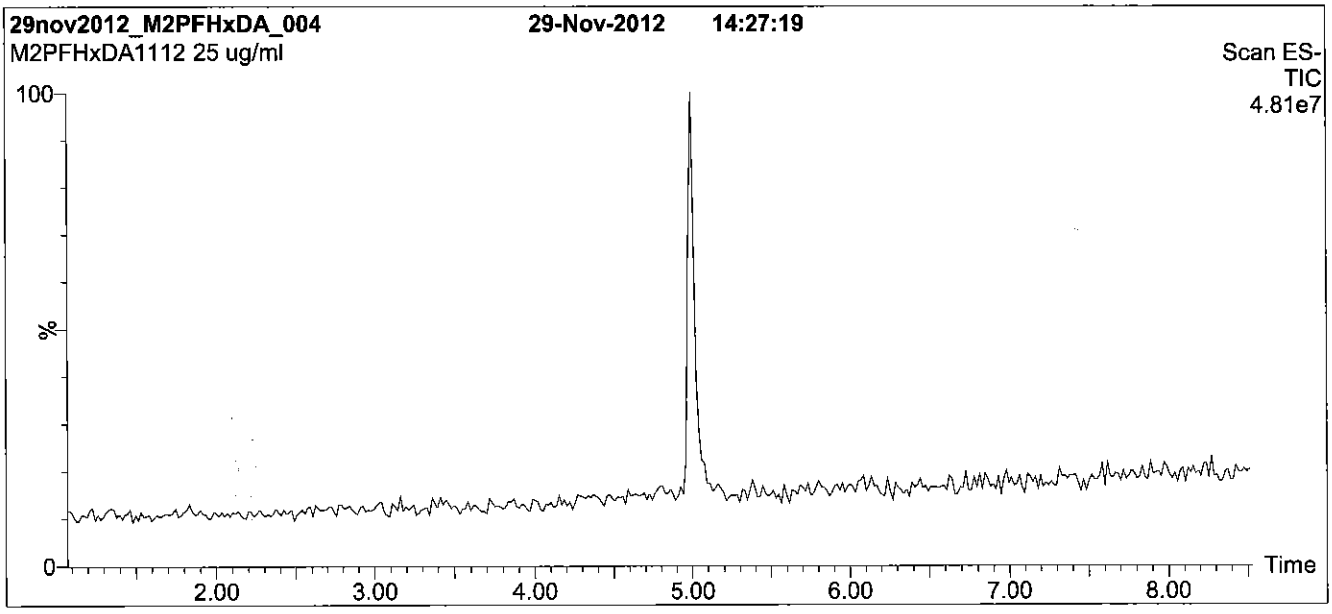
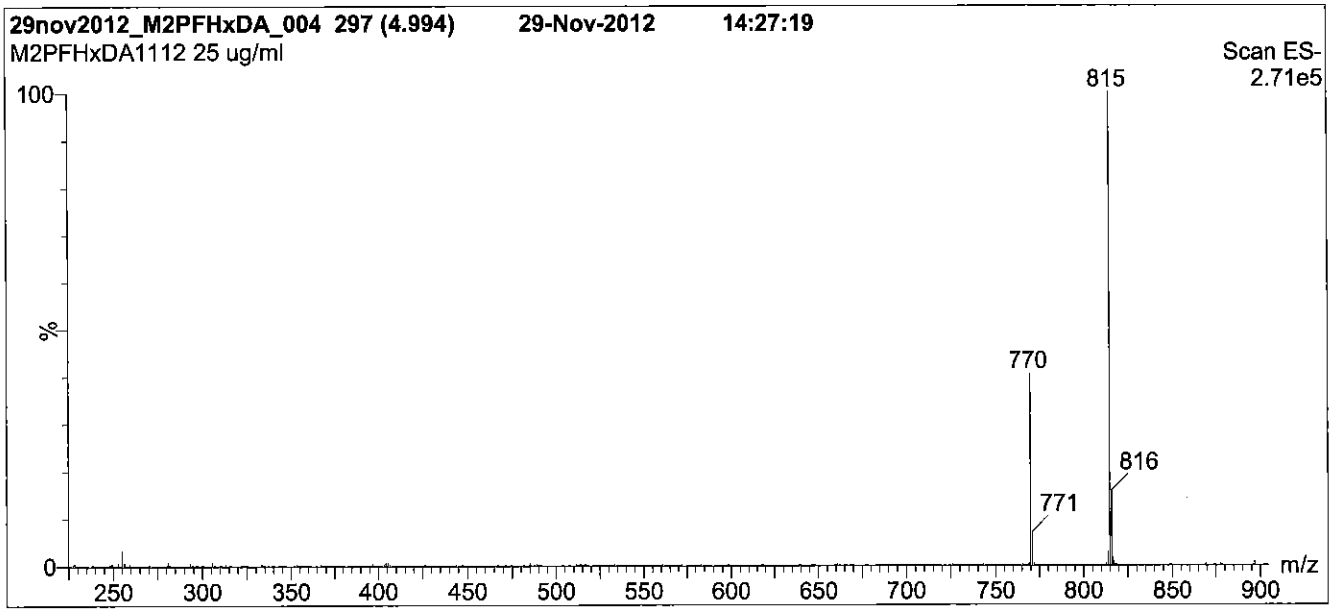
Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

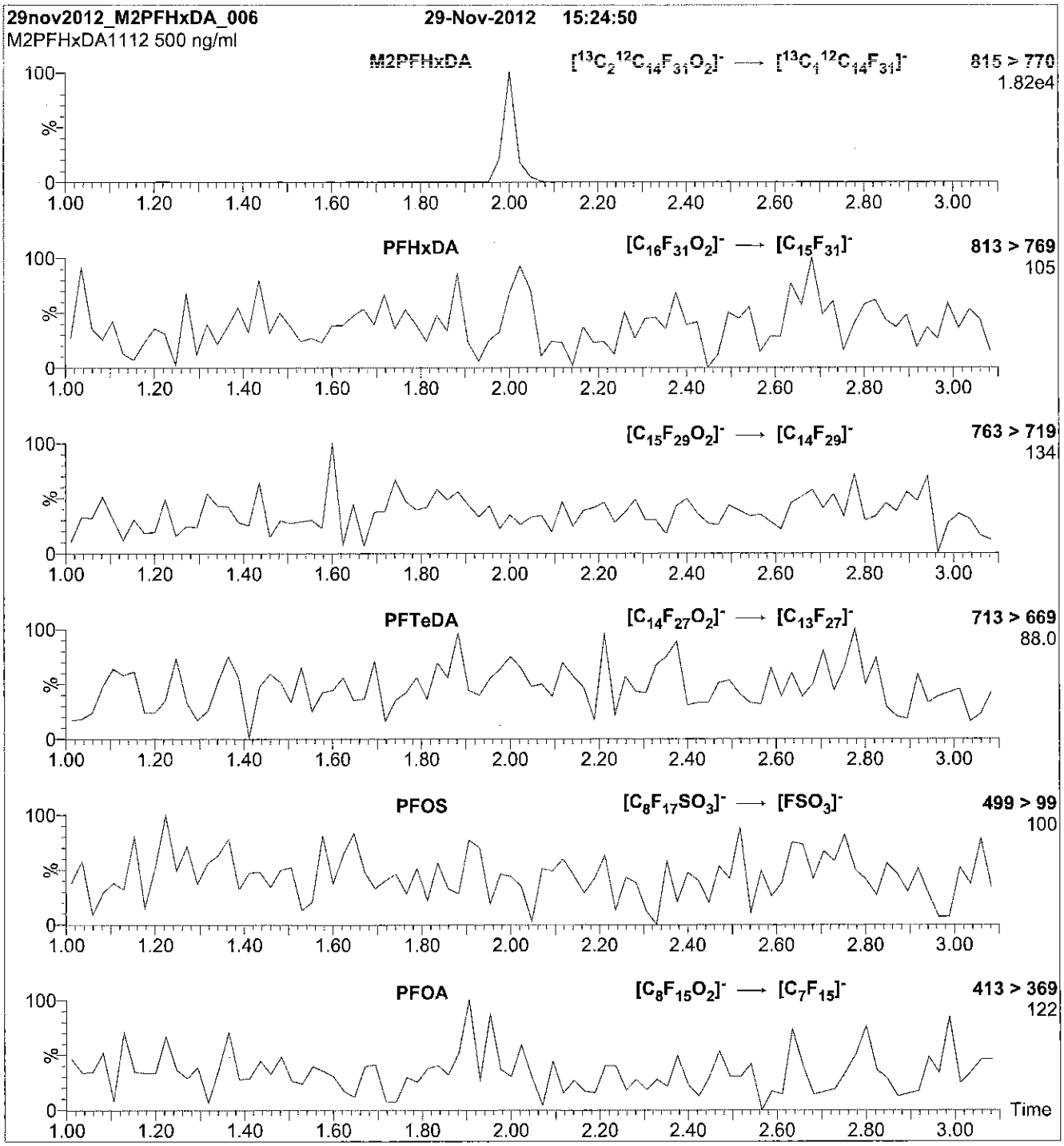
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCM2PFHxDA_00003

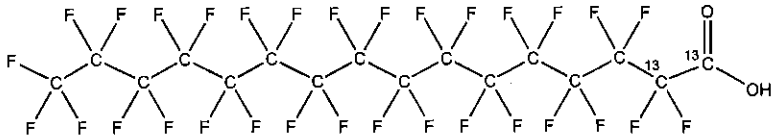
r: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2PFHxDA
LOT NUMBER: M2PFHxDA1112
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/01/2015 (mm/dd/yyyy)
B.G. Chittim

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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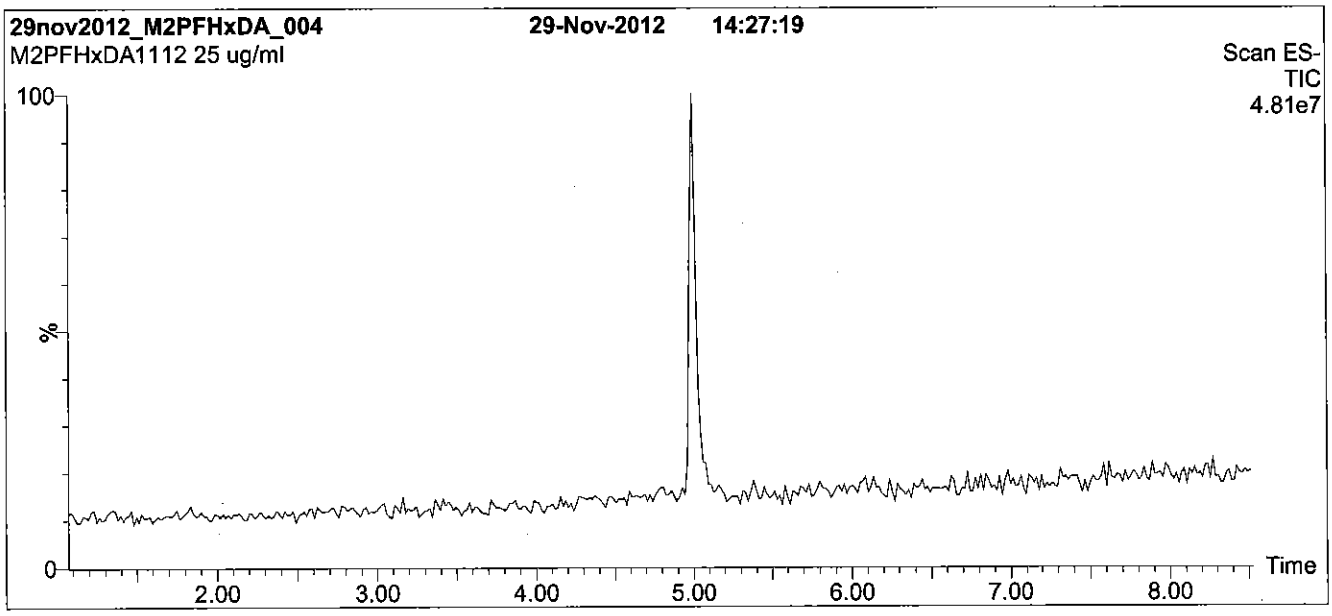

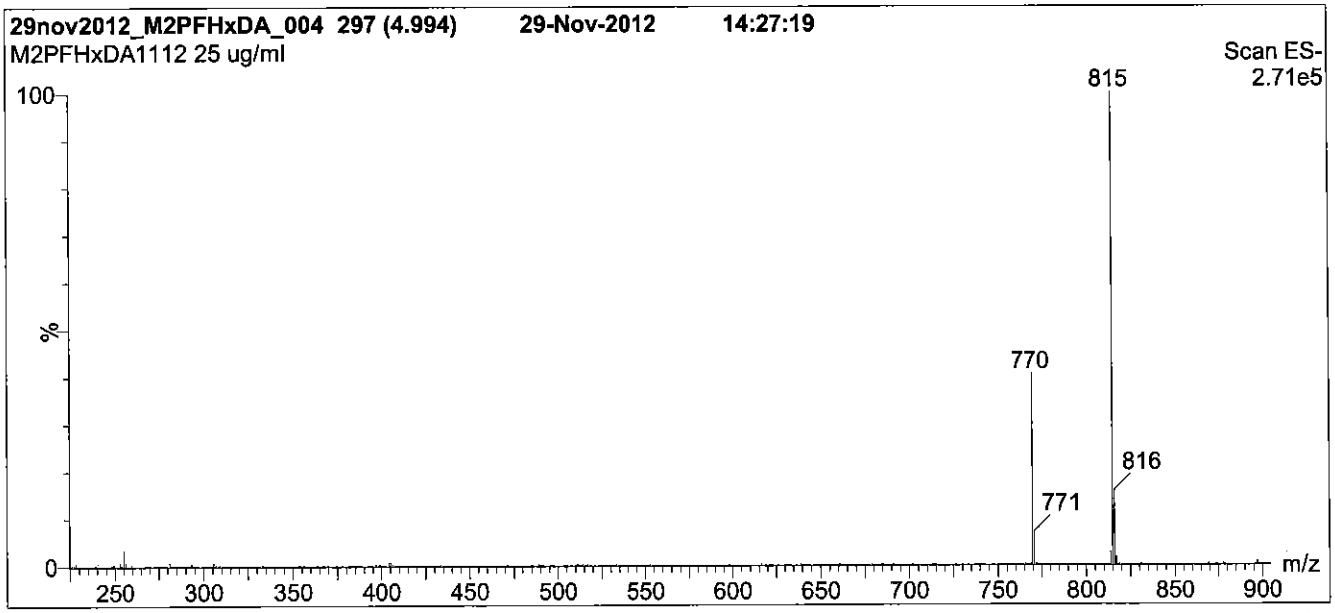

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
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Ramp to 100% organic over 7 min and hold for 1.5 min
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Time: 10 min

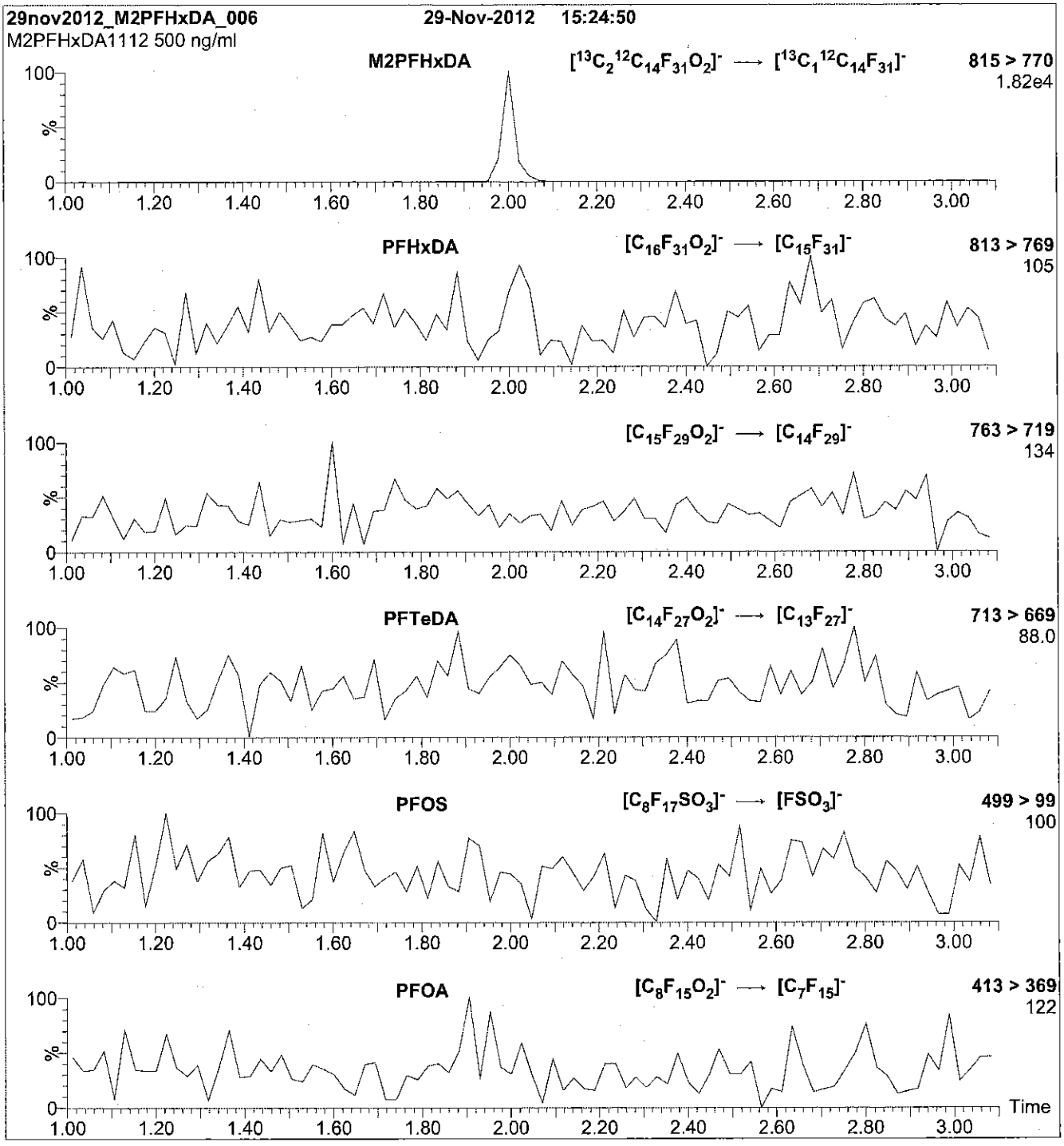
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

LCM2PFHxDA_00005

609709
ID: LCM2PFHxDA_00005
Exp: 01/07/21 Prpd: CBW
13C2-PFHxDA at 50ug/mL

R 4/7/16 CBW

WELLINGTON LABORATORIES

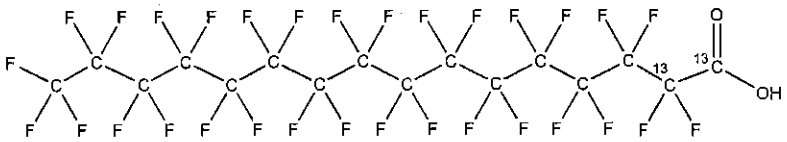
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFHxDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

LOT NUMBER: M2PFHxDA1112

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/07/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/07/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/11/2016 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

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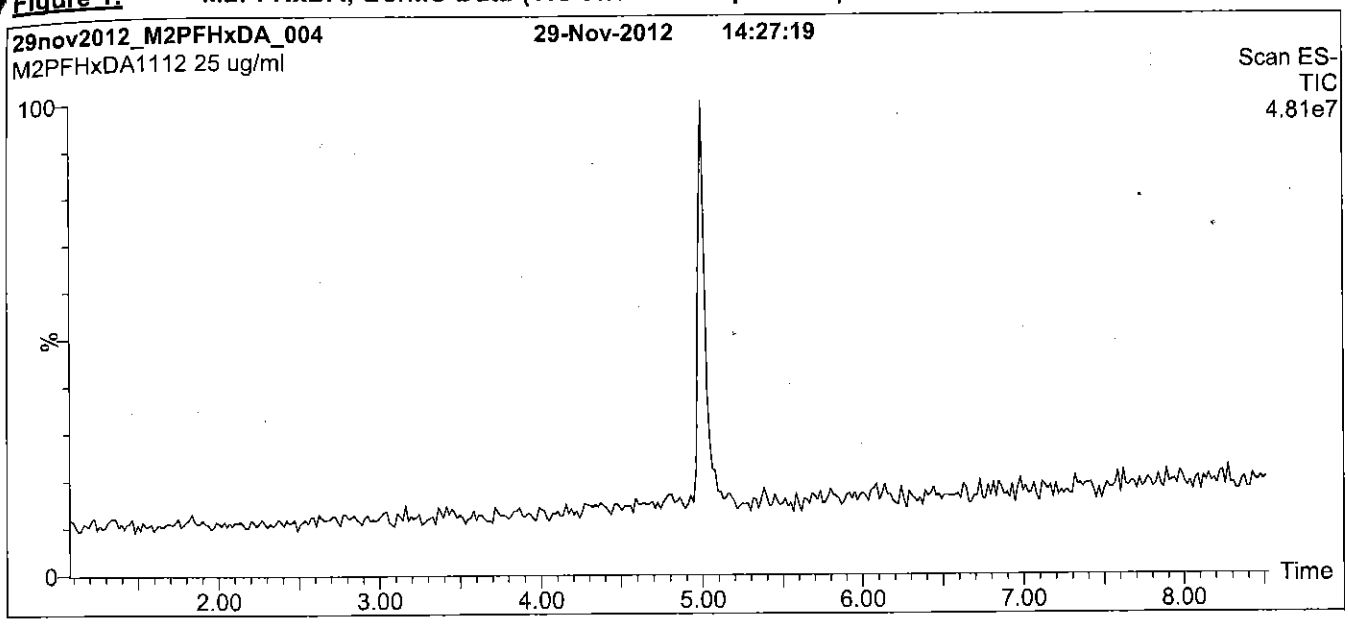

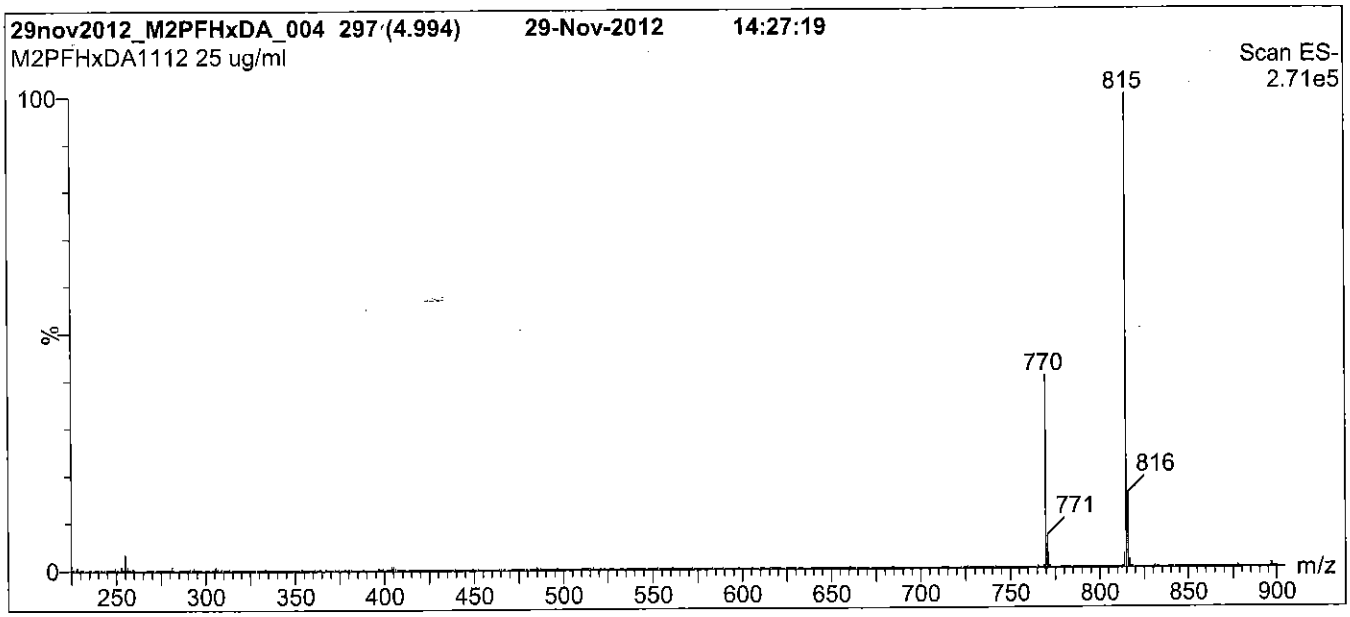

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Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

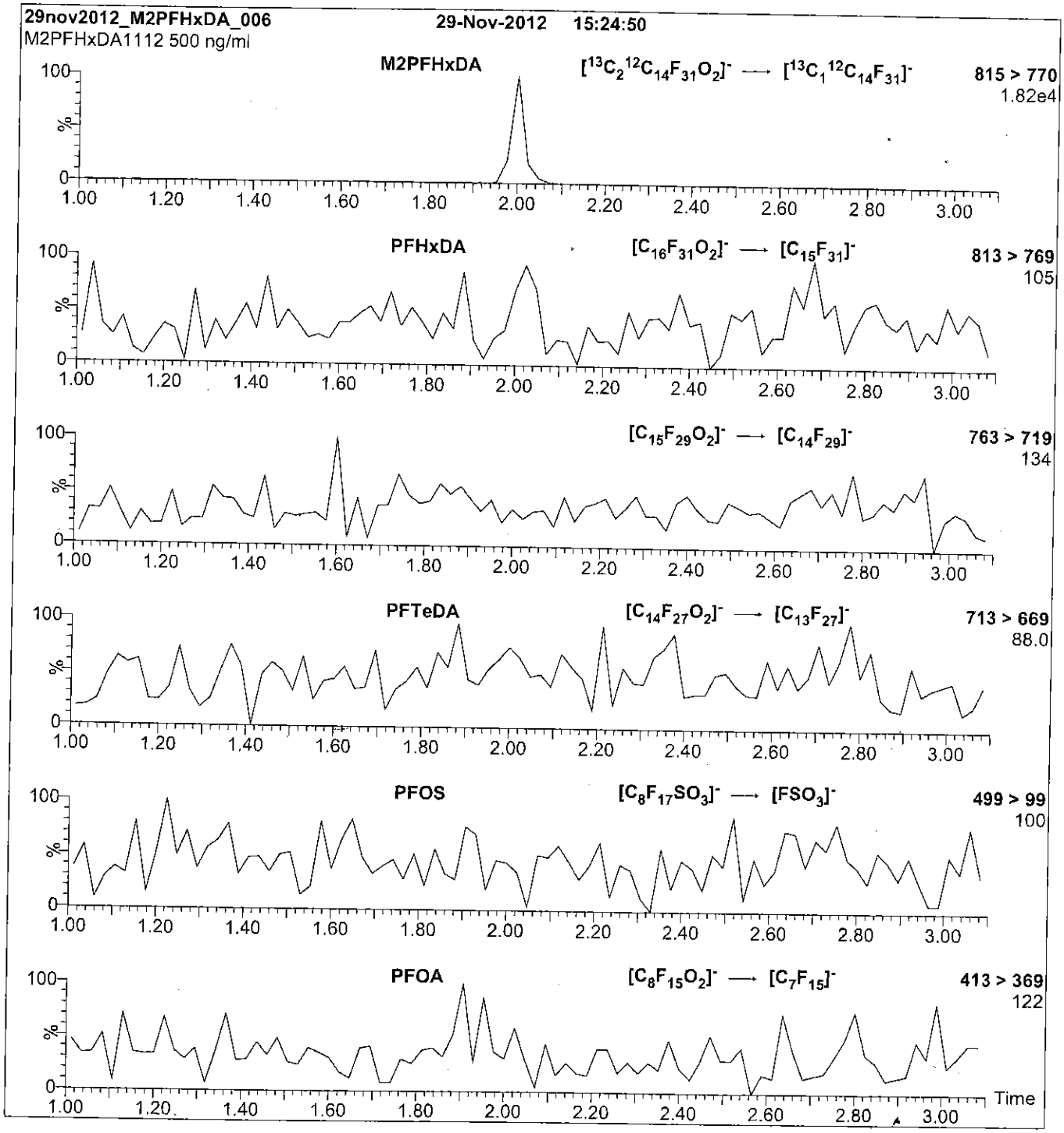
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFHxDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 15

Reagent

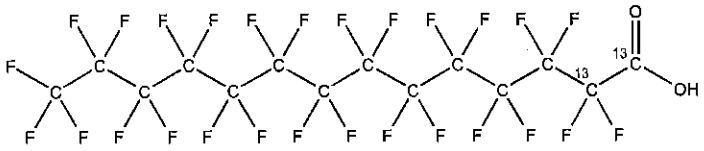
LCM2PFTeDA_00003

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1112
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



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LAST TESTED: (mm/dd/yyyy)	11/29/2012		
EXPIRY DATE: (mm/dd/yyyy)	11/29/2017		
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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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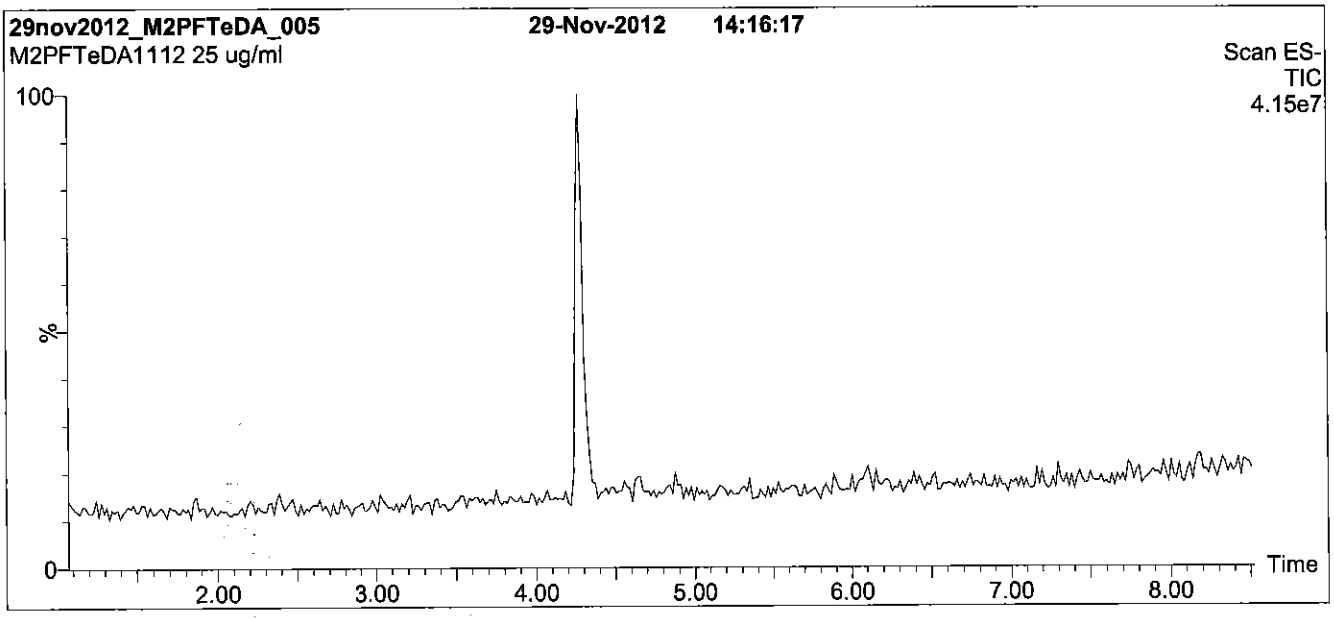
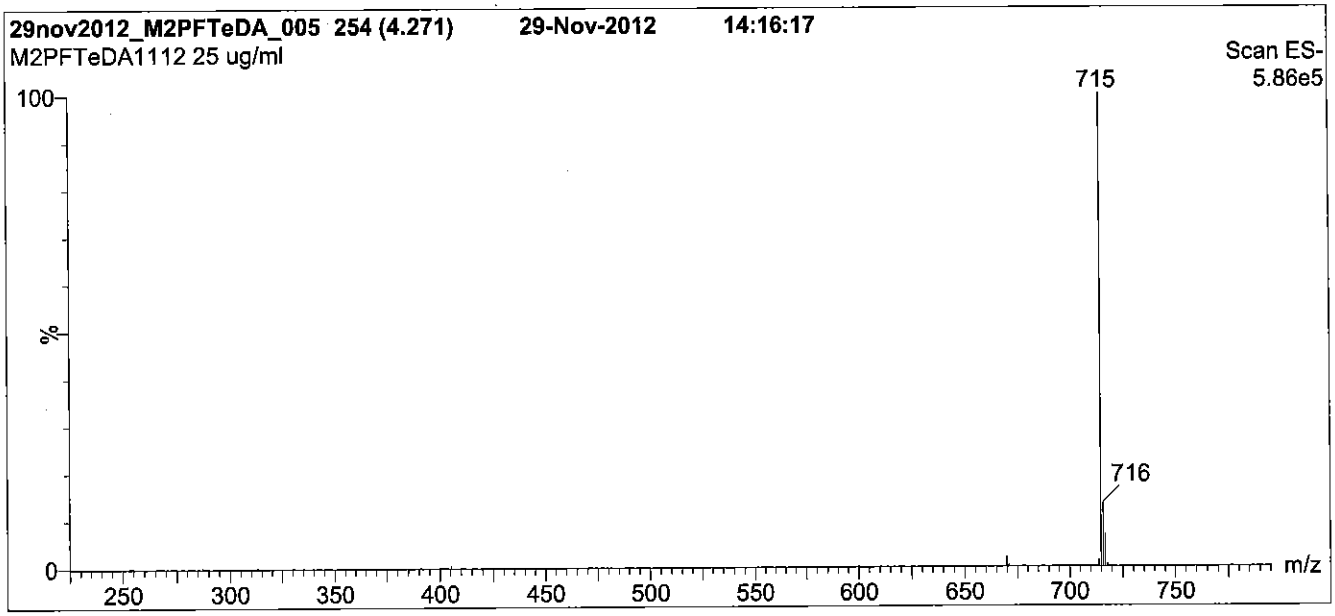
Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 100% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

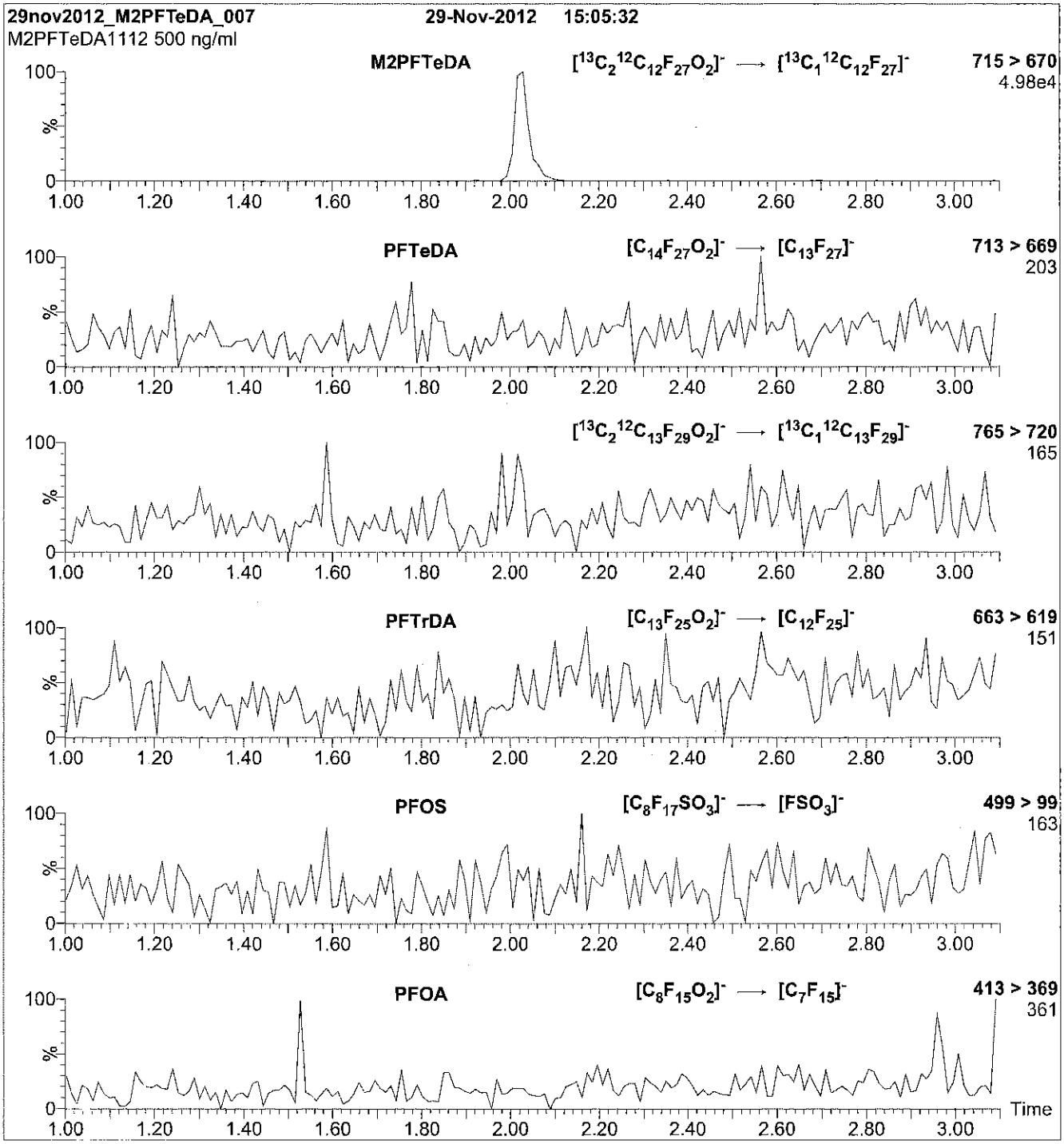
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1200 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 14

Reagent

LCM2PFTeDA_00005

R: 4/7/16 CBW

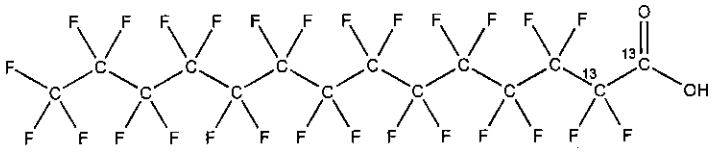
609710
ID: LCM2PFTeDA_00005
Exp: 12/07/20 Prpd: CBW
13C2-PFTeDA at 50ug/mL

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1115
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	12/07/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/07/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/08/2015 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA Testing Accreditation

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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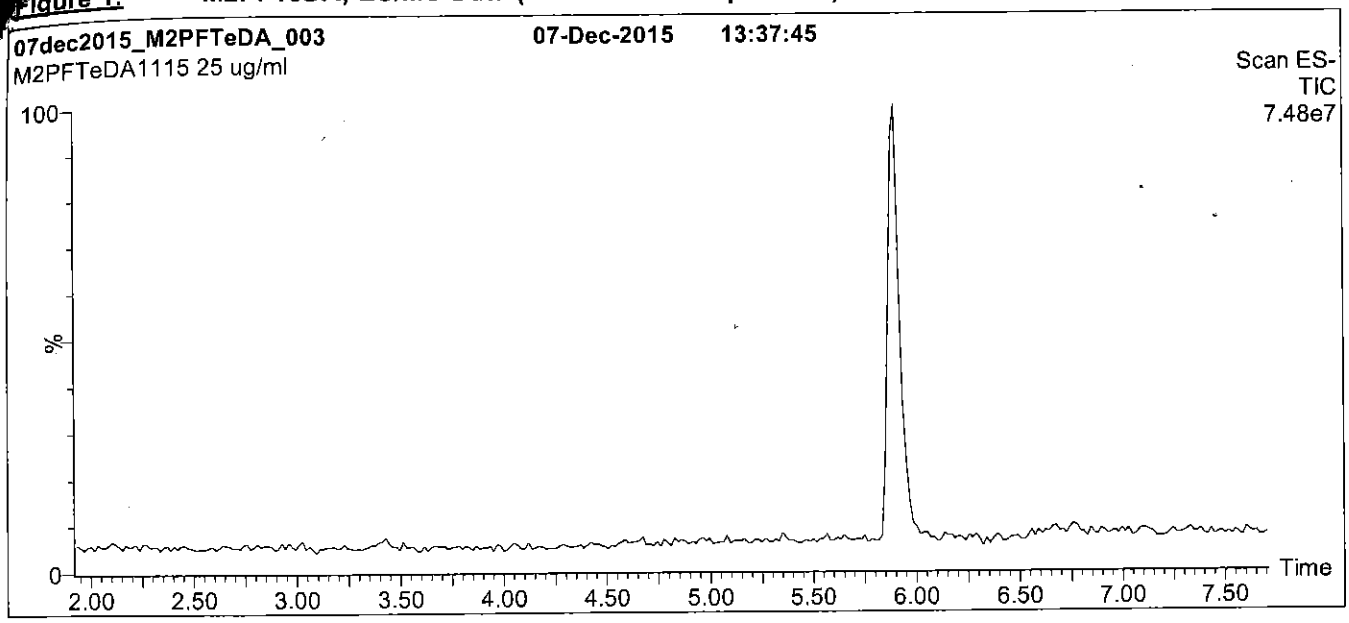

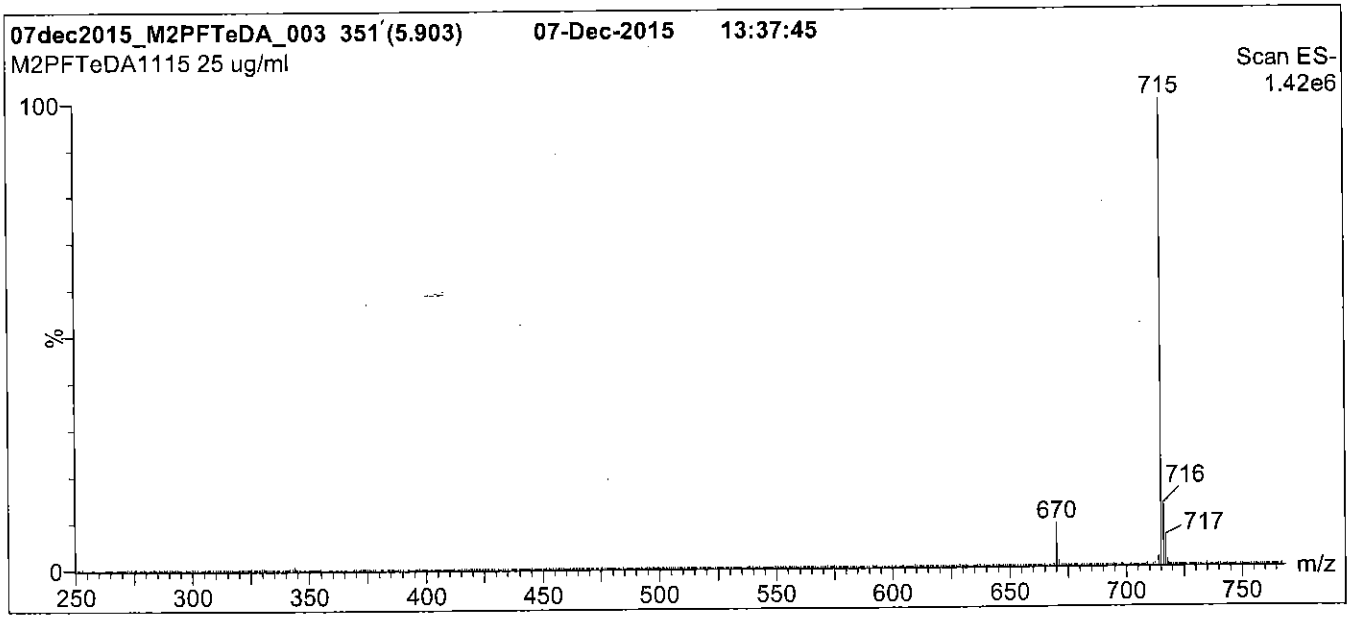

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LC: **Waters Acquity Ultra Performance LC**
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Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

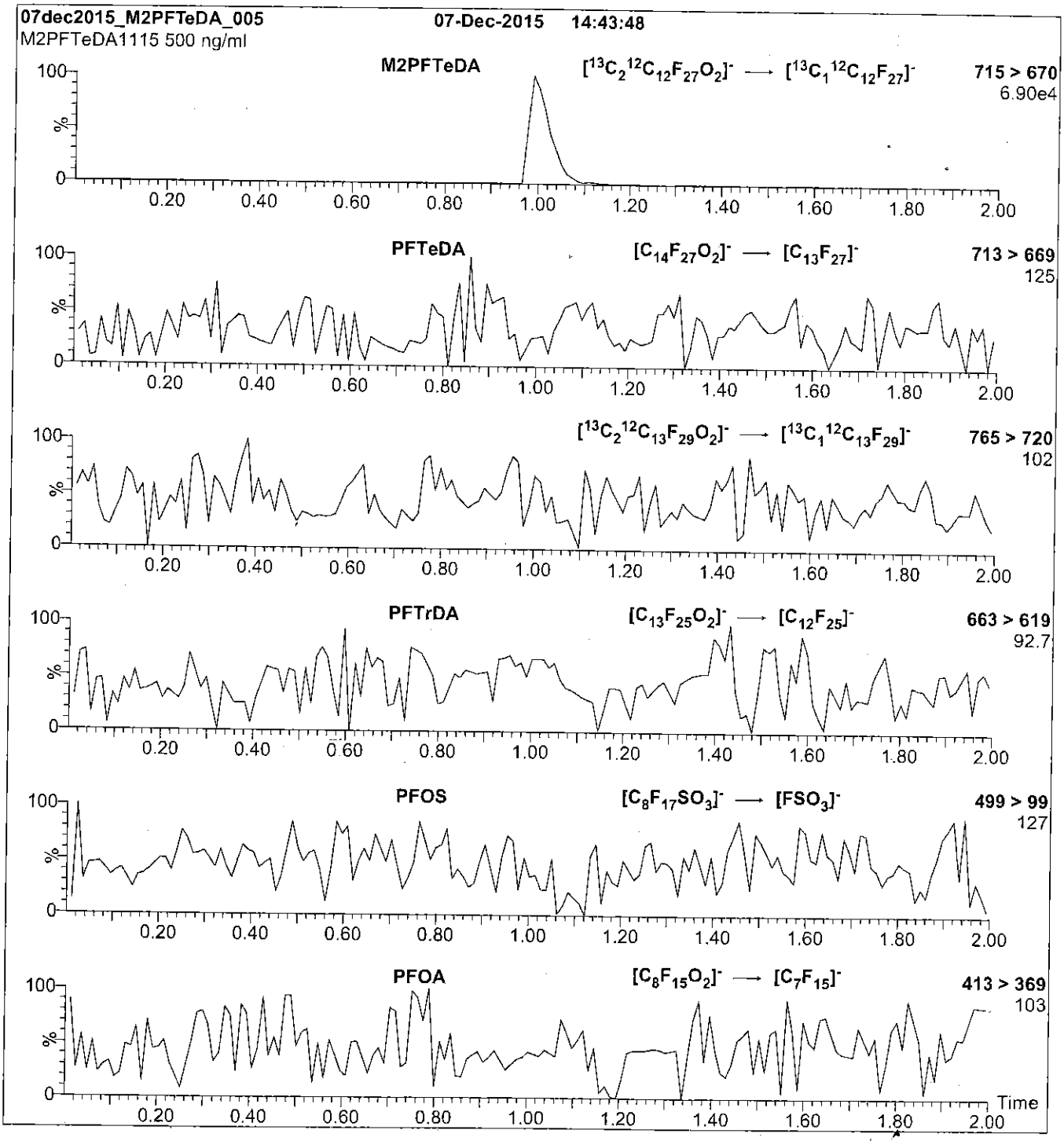
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M2PFTeDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 14

Reagent

LCM4PFHPA_00003

r: 11/10/15 SRV

WELLINGTON LABORATORIES

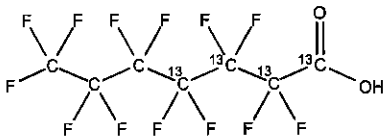
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_3HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/22/2015
EXPIRY DATE: (mm/dd/yyyy) 05/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 368.03
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/25/2015 (mm/dd/yyyy)

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO/IEC 17025 REFERENCE MATERIAL PRODUCER

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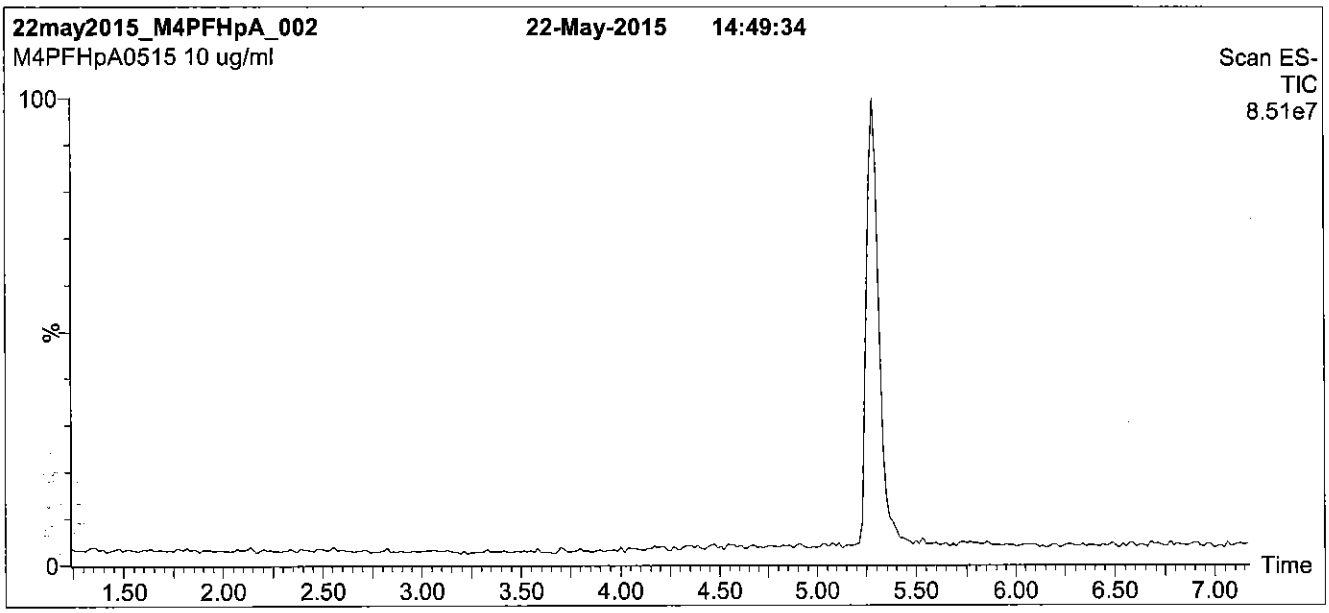
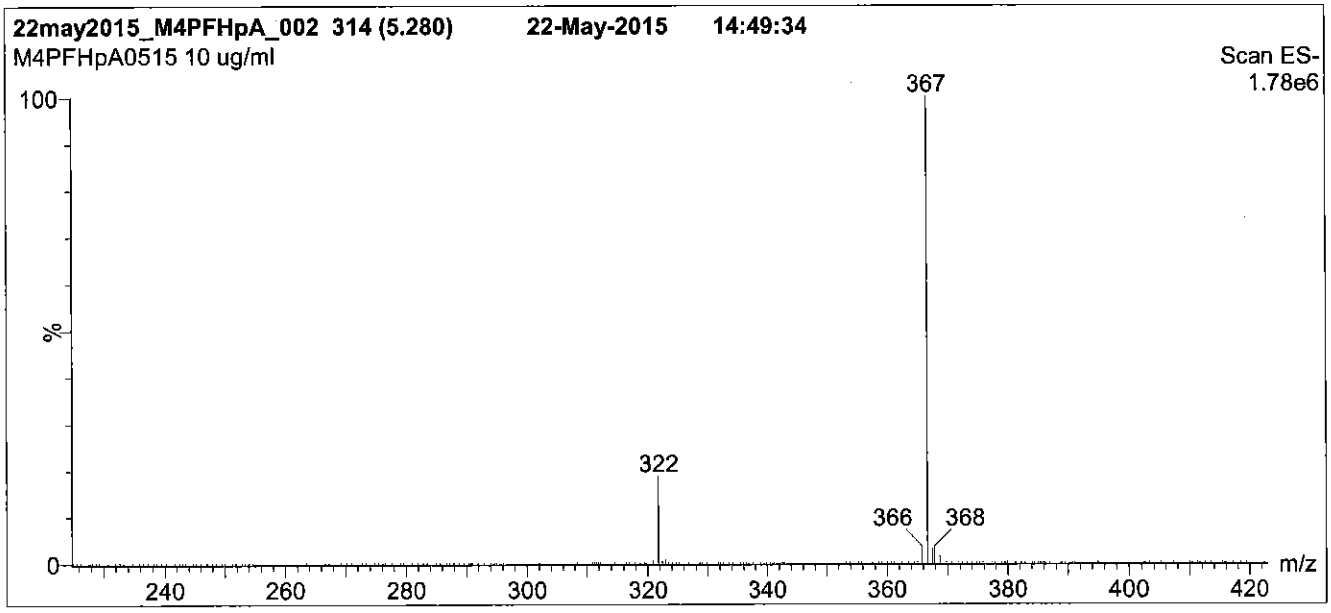
Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

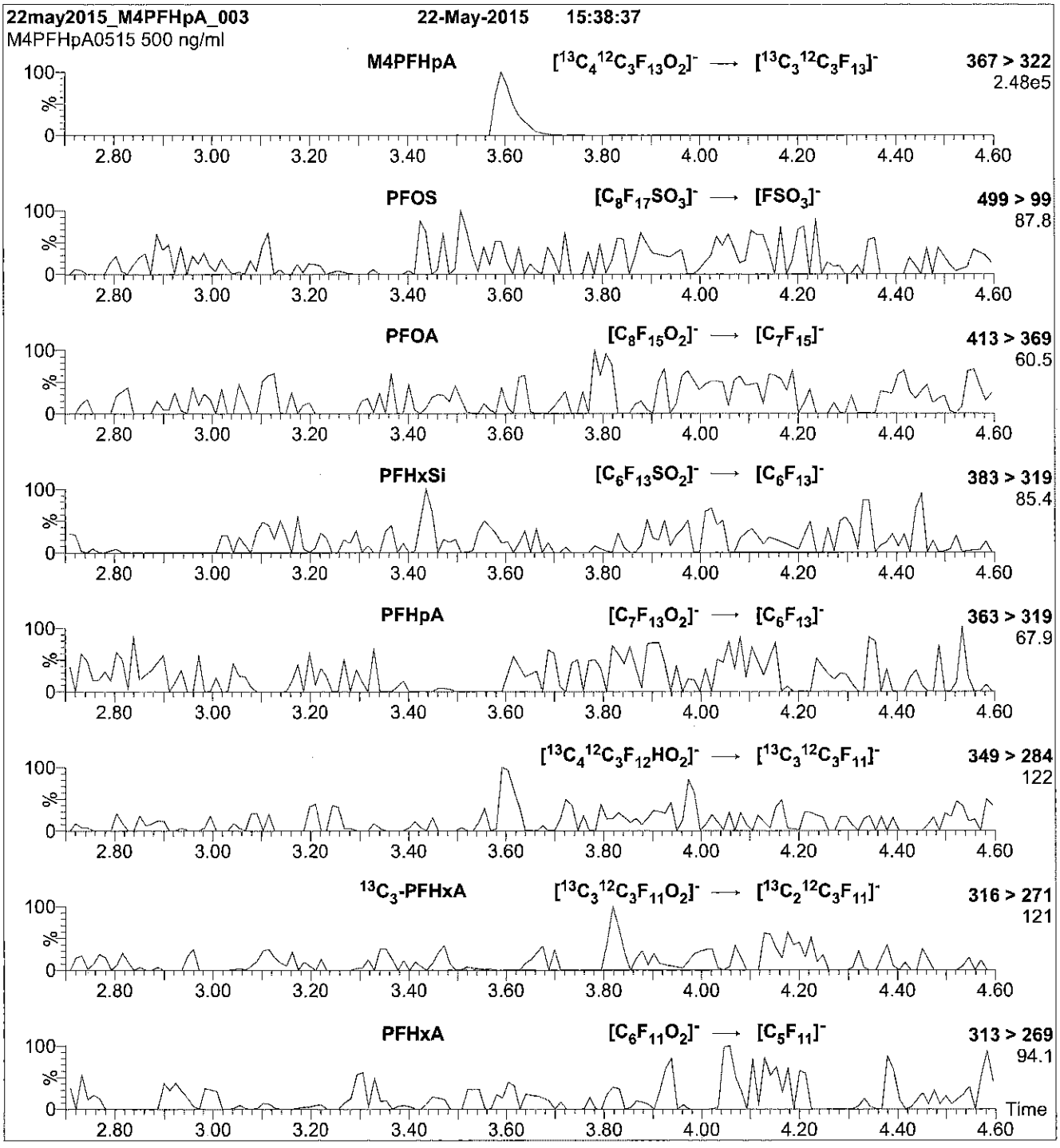
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM4PFHPA_00005

R 4/7/16 CBW

609711
ID: LCM4PFHPA_00005
Exp: 05/22/20 Prpd: CBW
13C4-Perfluoroheptanoic a

WELLINGTON LABORATORIES

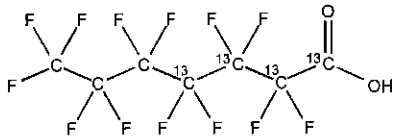
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M4PFHpA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid

LOT NUMBER: M4PFHpA0515

STRUCTURE:

CAS #: Not available



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CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/22/2015
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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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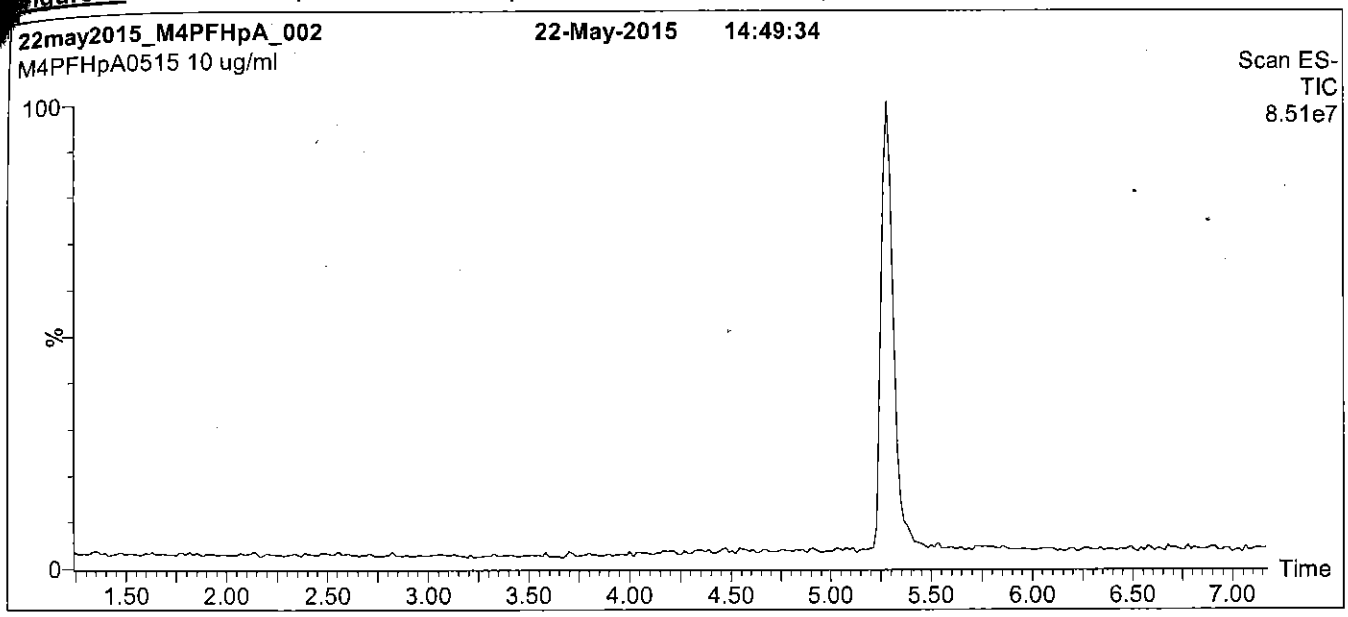
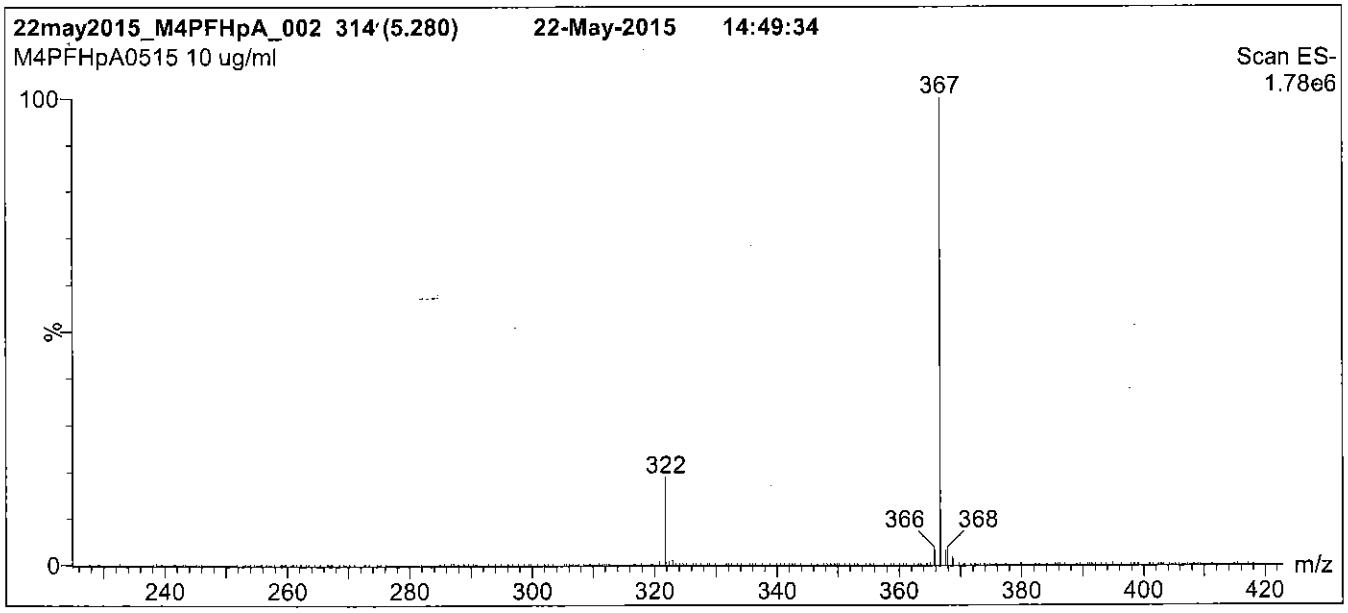




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

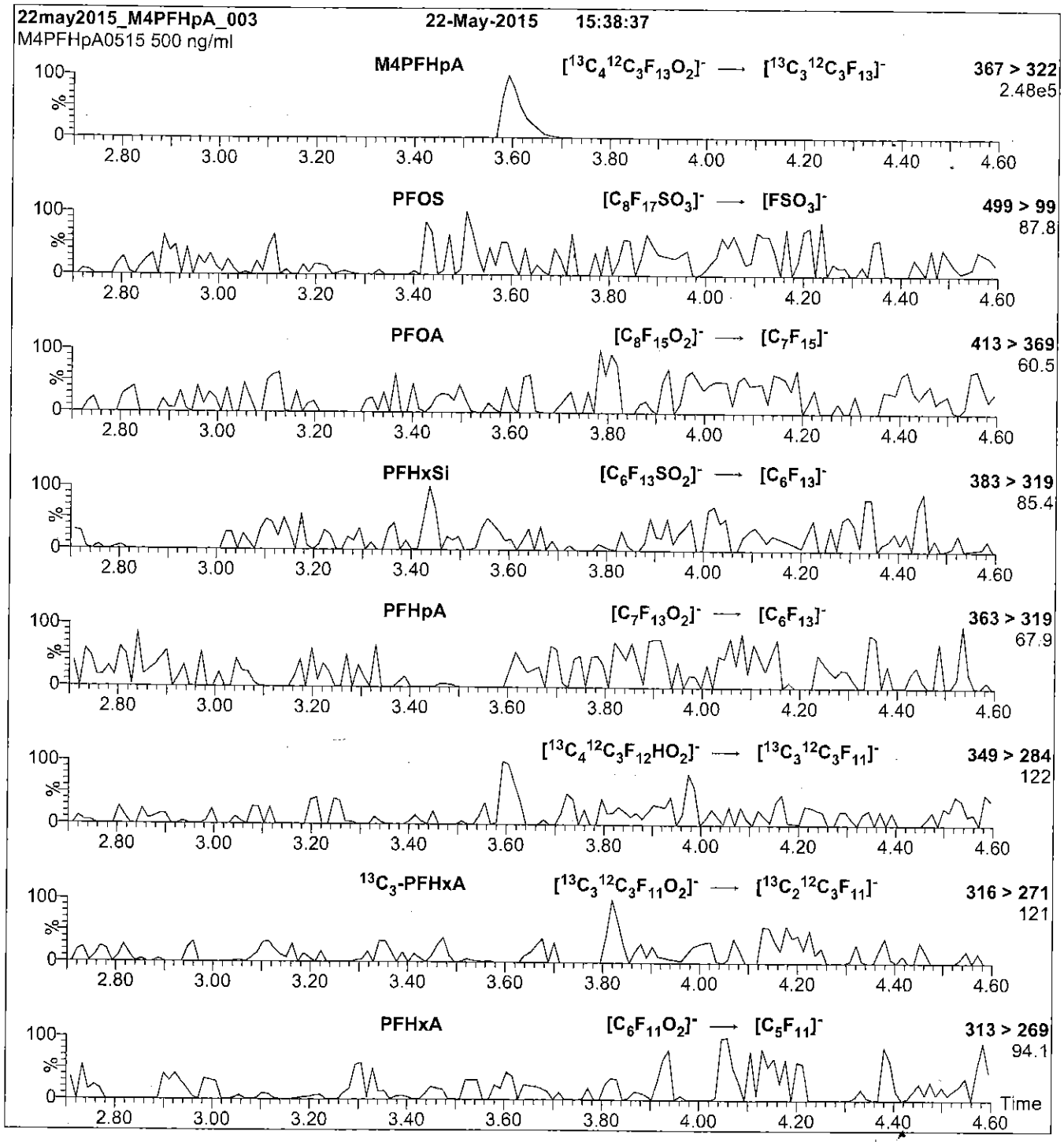
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 11

Reagent

LCM5PFPEA_00004

V1 11/10/15 SRA

WELLINGTON LABORATORIES

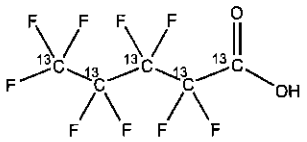
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M5PFPeA
COMPOUND: Perfluoro-n-[$^{13}C_5$]pentanoic acid

LOT NUMBER: M5PFPeA0515

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	05/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/25/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA Testing Accreditation No.: A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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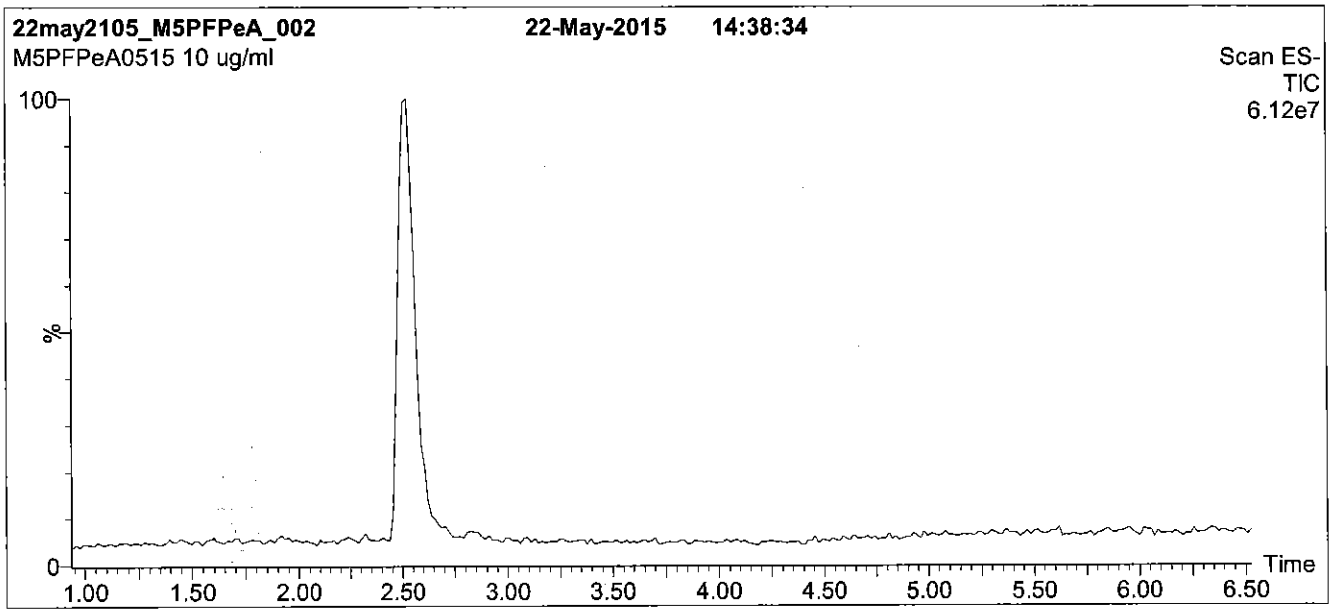
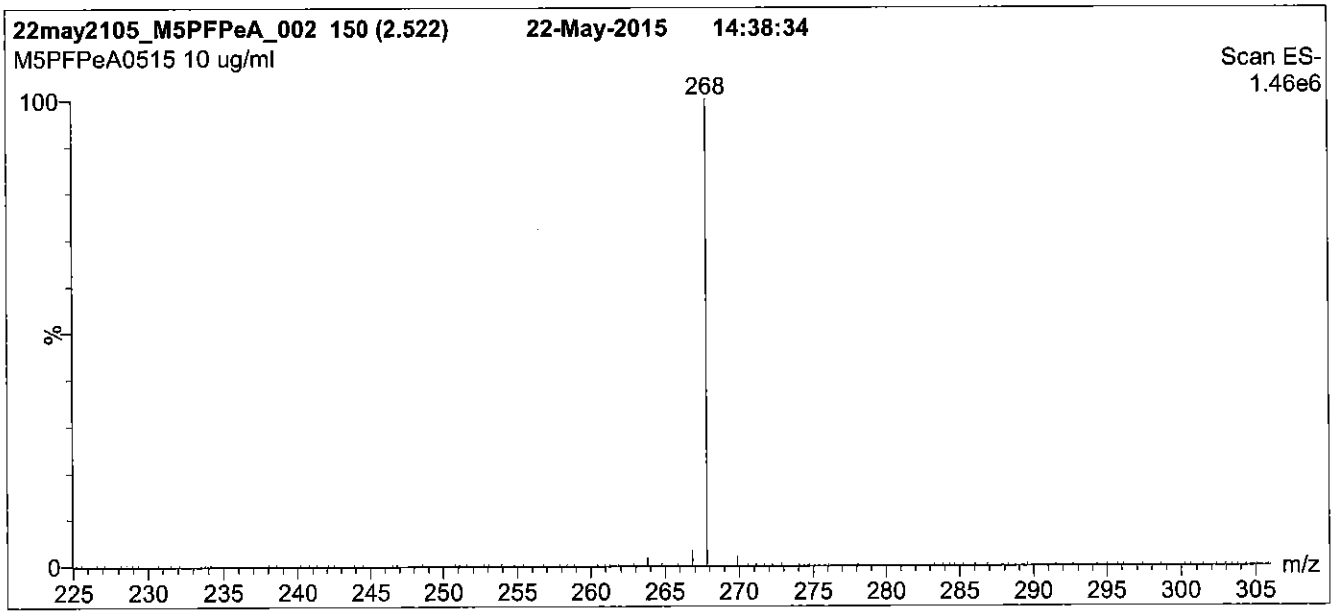
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

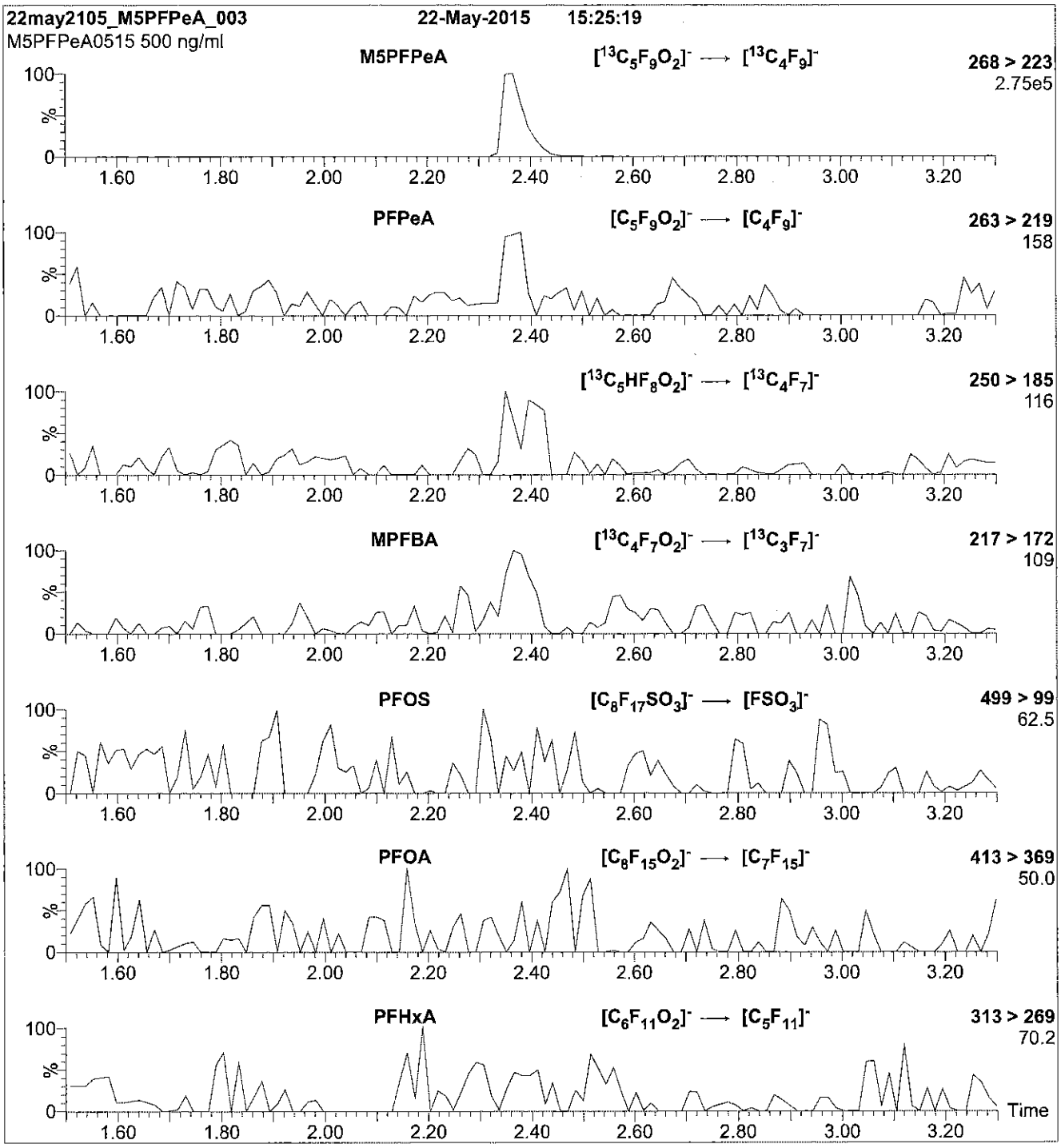
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCM5PFPEA_00006

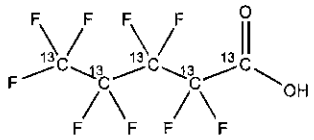
609706
ID: LCM5PFPEA_00006
Exp: 05/22/20 Prpd: CBW
13C5-Perfluoropentanoic a

R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFPeA	**LOT NUMBER:**	M5PFPeA0515
COMPOUND:	Perfluoro-n-[$^{13}C_5$]pentanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5HF_9O_2$	**MOLECULAR WEIGHT:**	269.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	05/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/22/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-pentanoic acid.

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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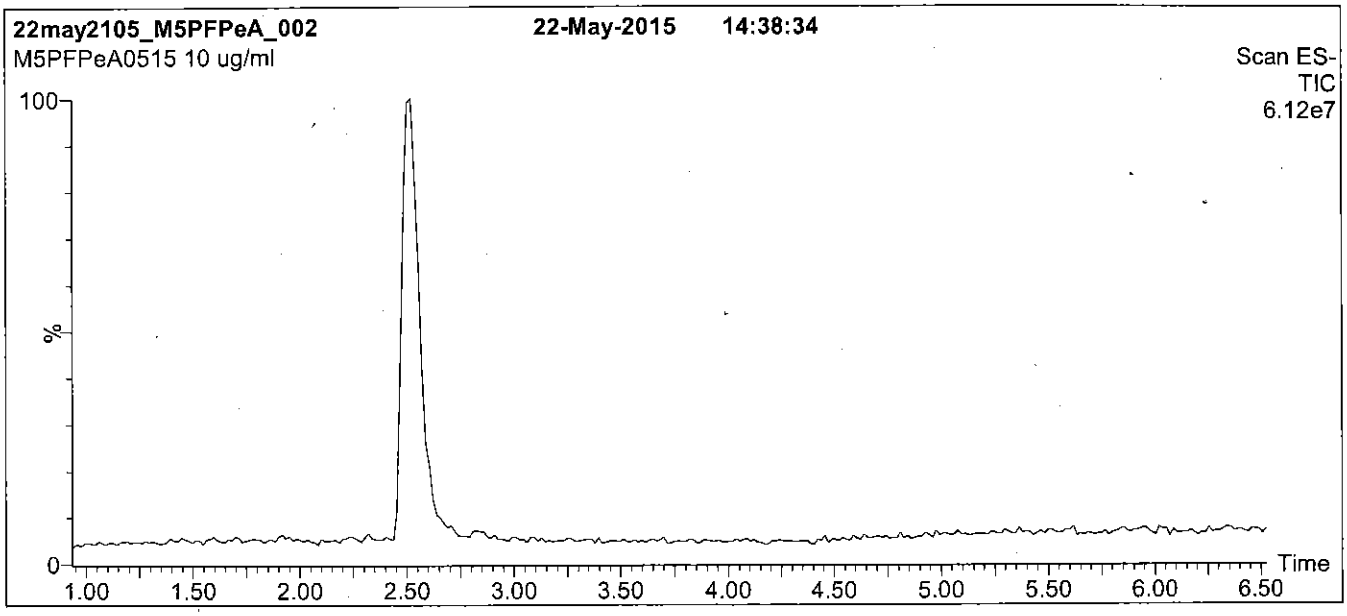
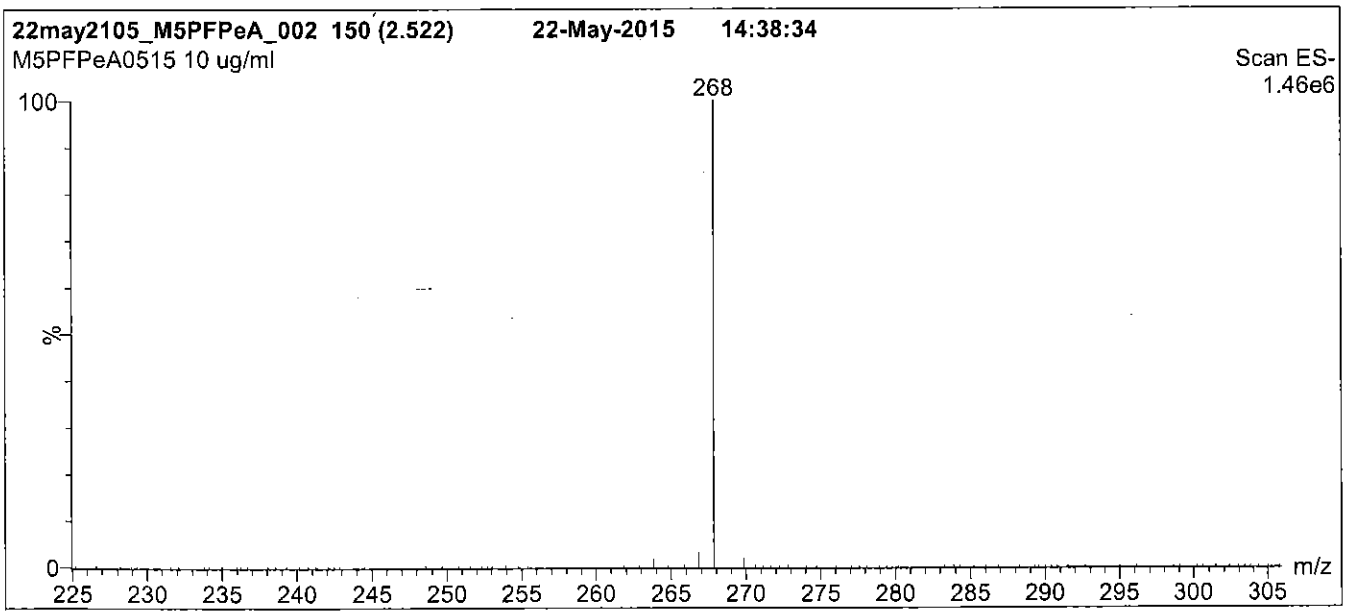
Figure 1: **M5PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

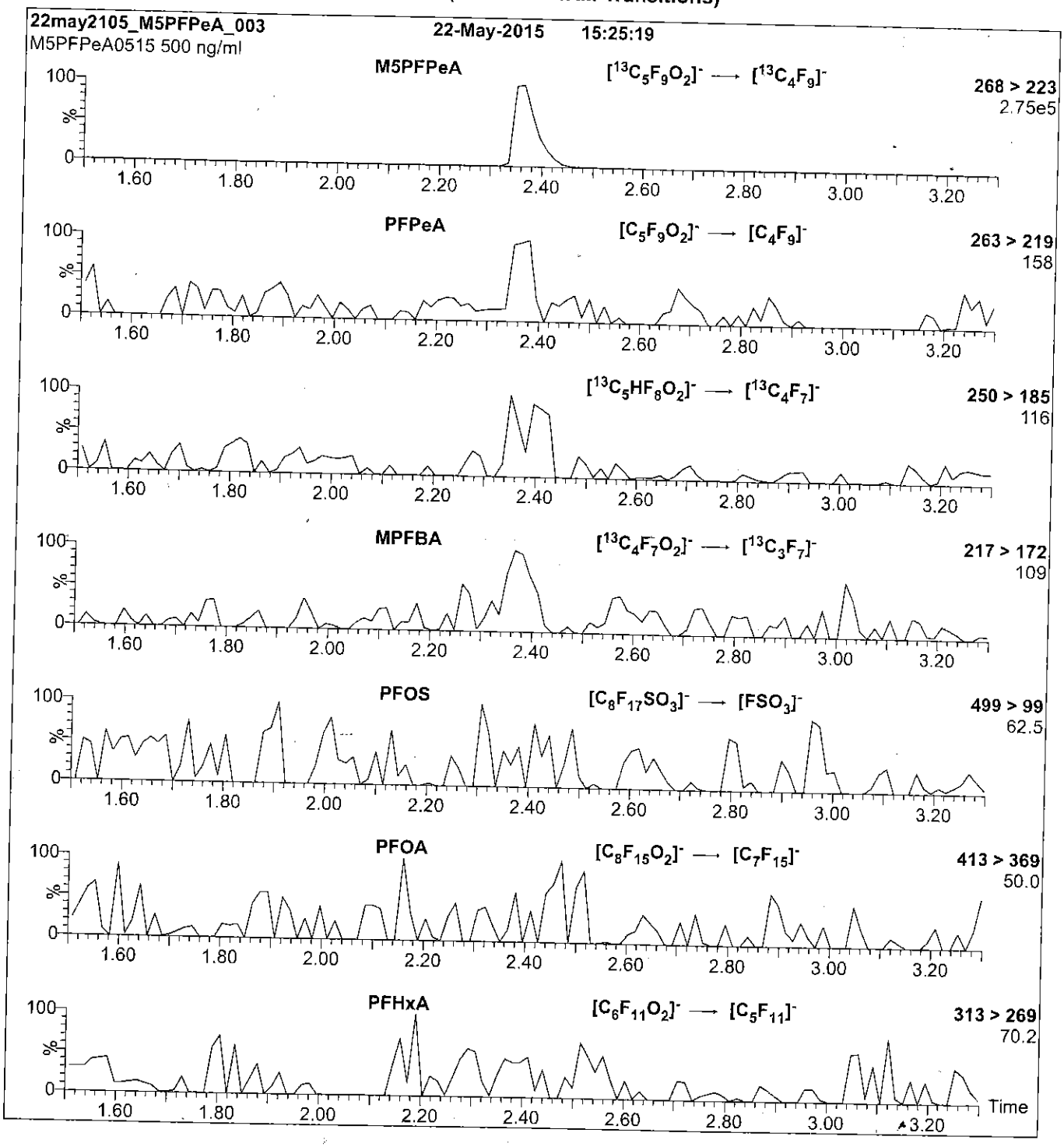
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml M5PFPeA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

LCM8FOSA_00006

Rec: 9/15/15 SV

WELLINGTON LABORATORIES

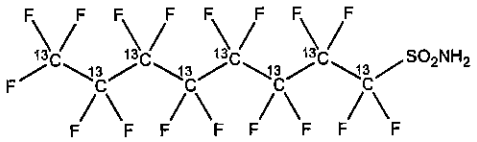
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1214I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	12/15/2016		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

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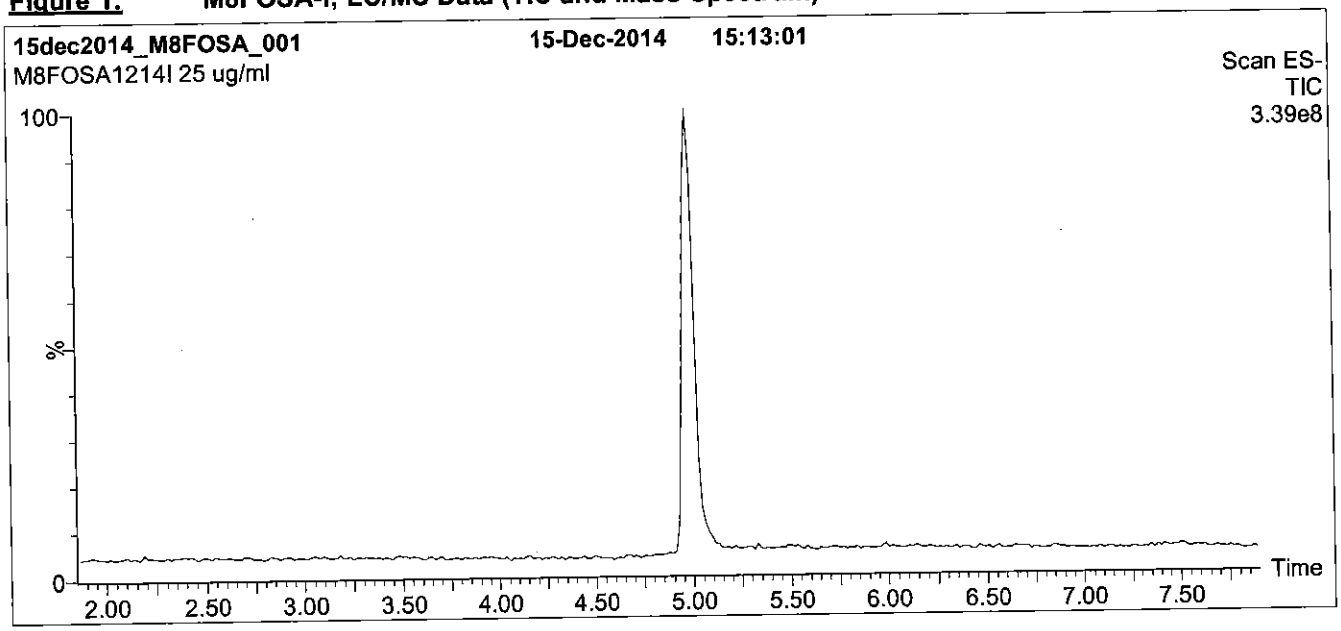
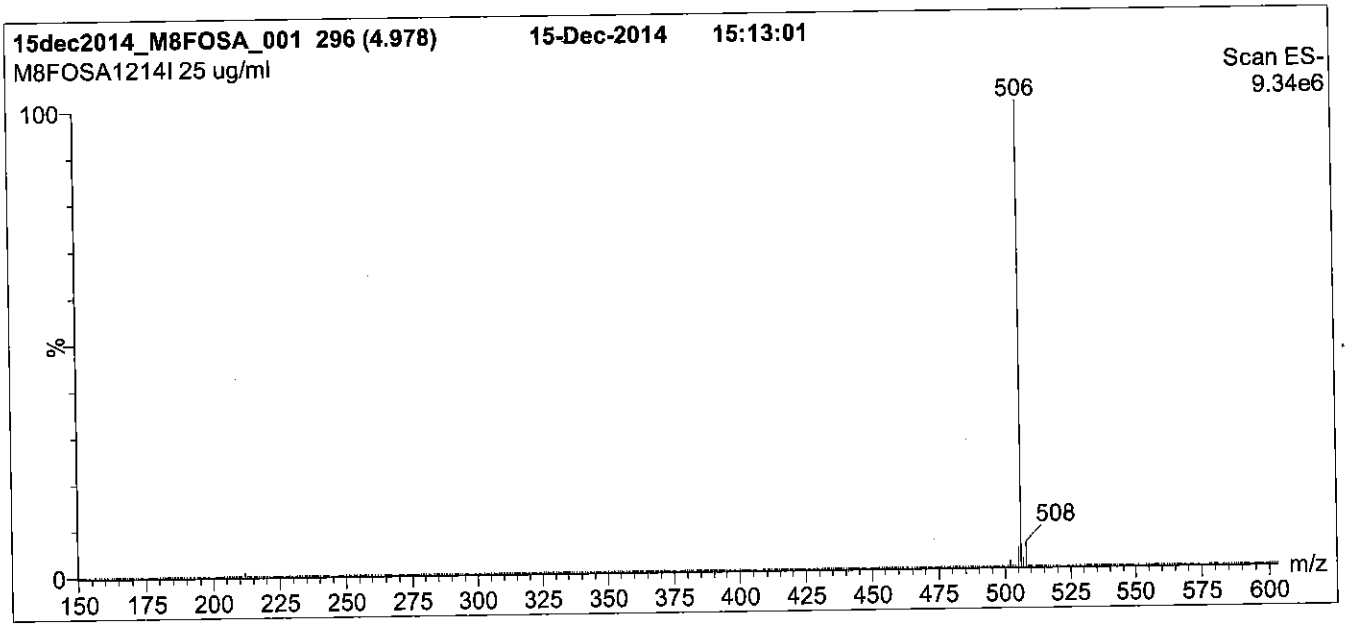
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





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MS: **Micromass Quattro *micro* API MS**

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

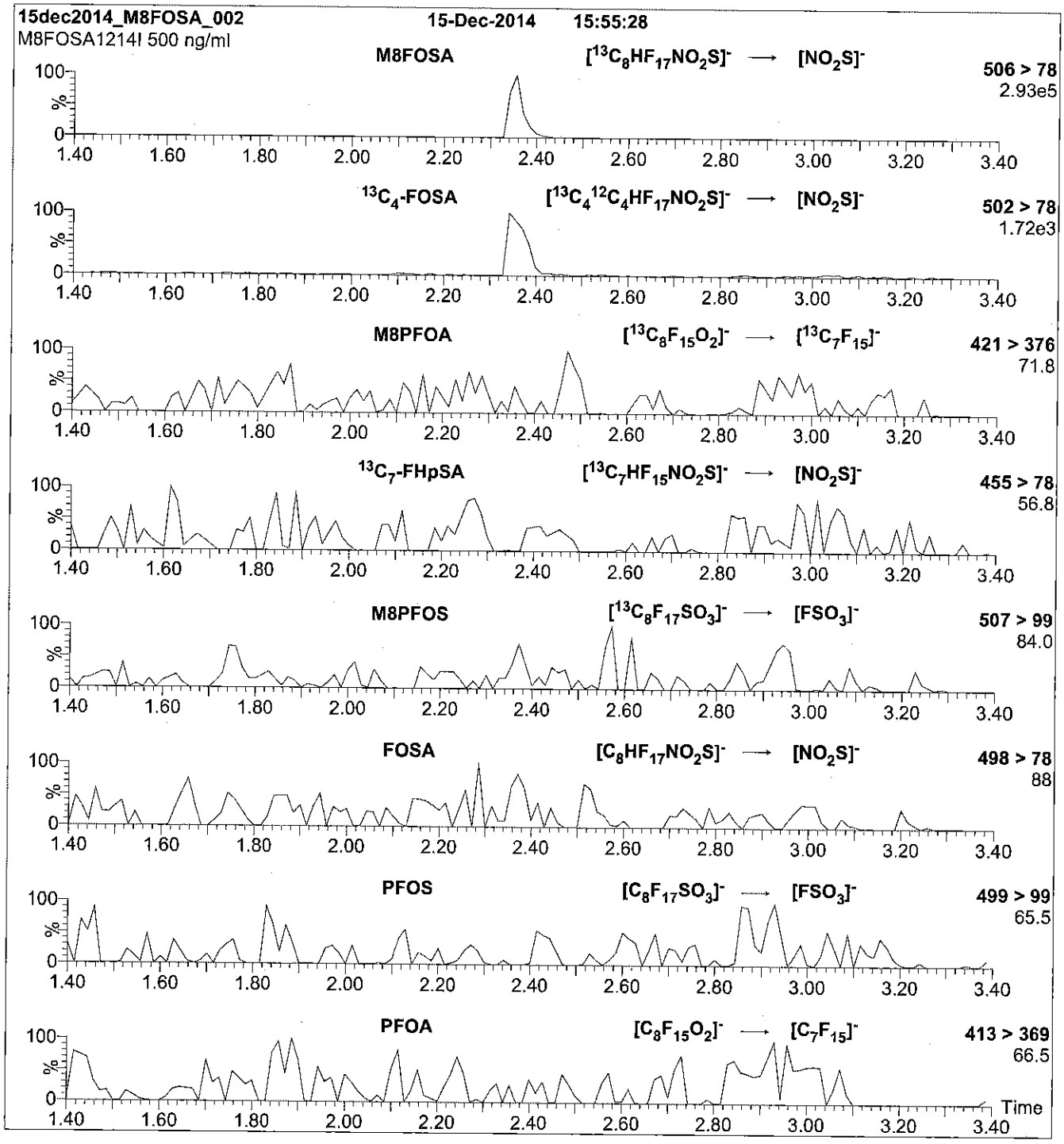
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 30

Reagent

LCM8FOSA_00007

572887
ID: LCM8FOSA_00007
Exp. 12/15/16 Prpd: CBW
13C8-Perfluorooctanesulfo

R: 1/25/16
S:

WELLINGTON LABORATORIES

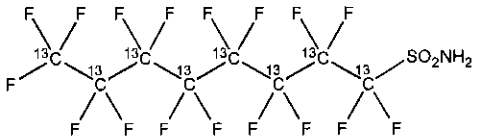
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1214I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/15/2014		
EXPIRY DATE: (mm/dd/yyyy)	12/15/2016		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2,...x_n$ on which it depends is:

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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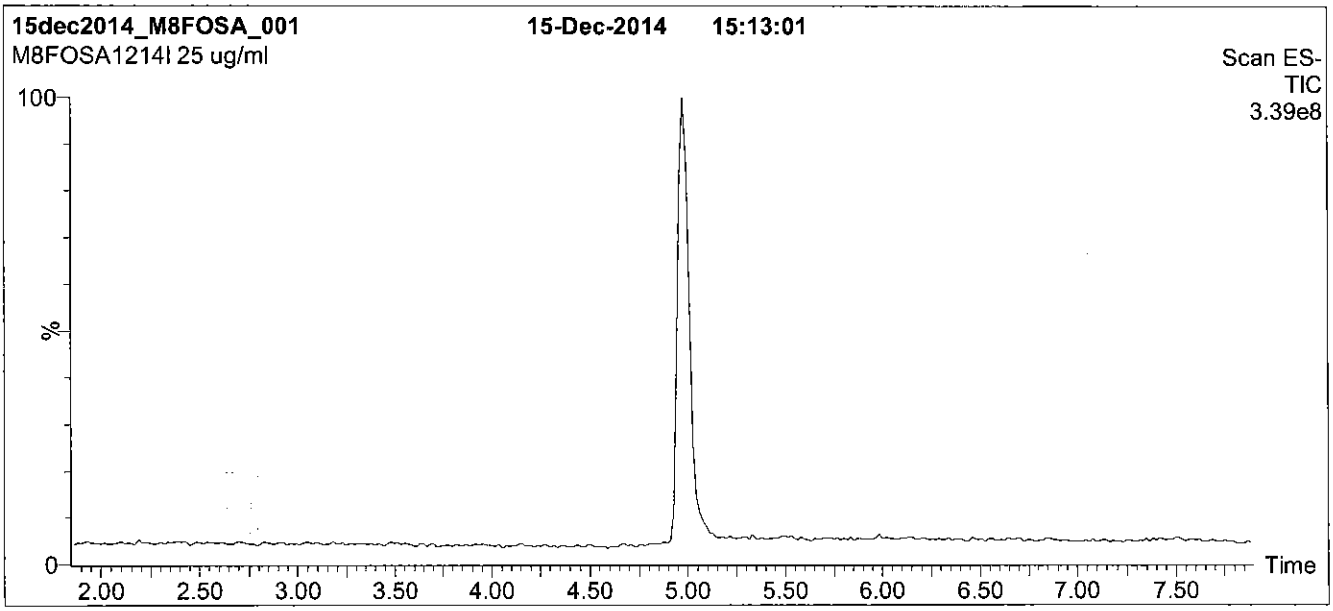
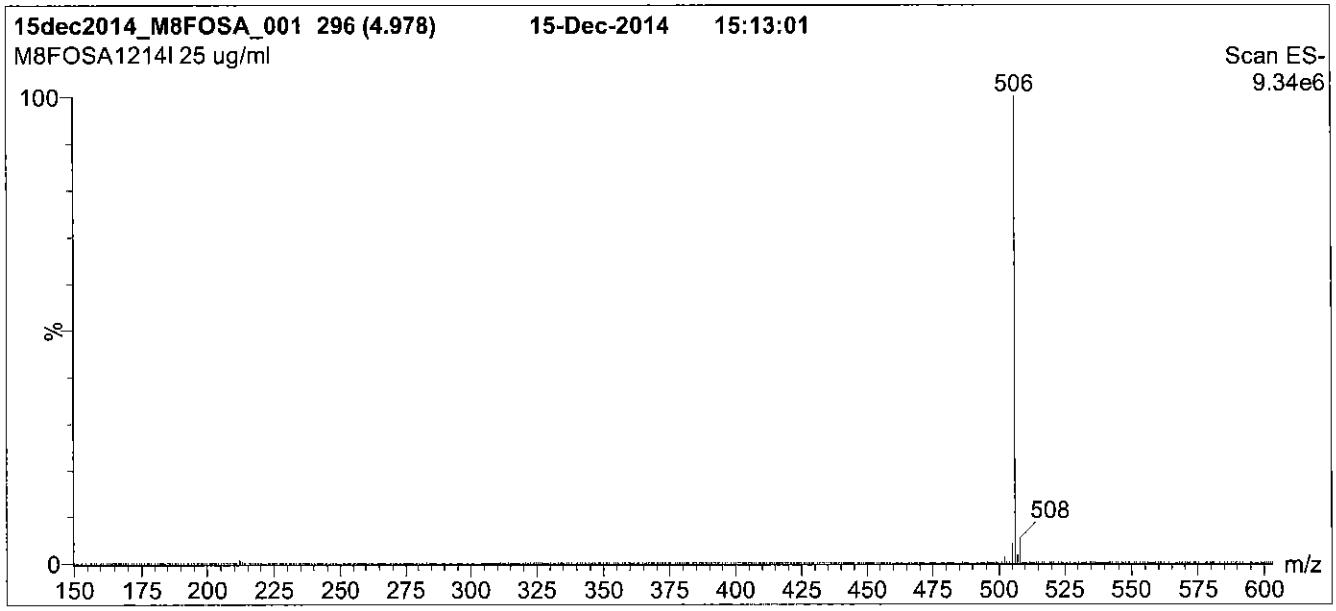
Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

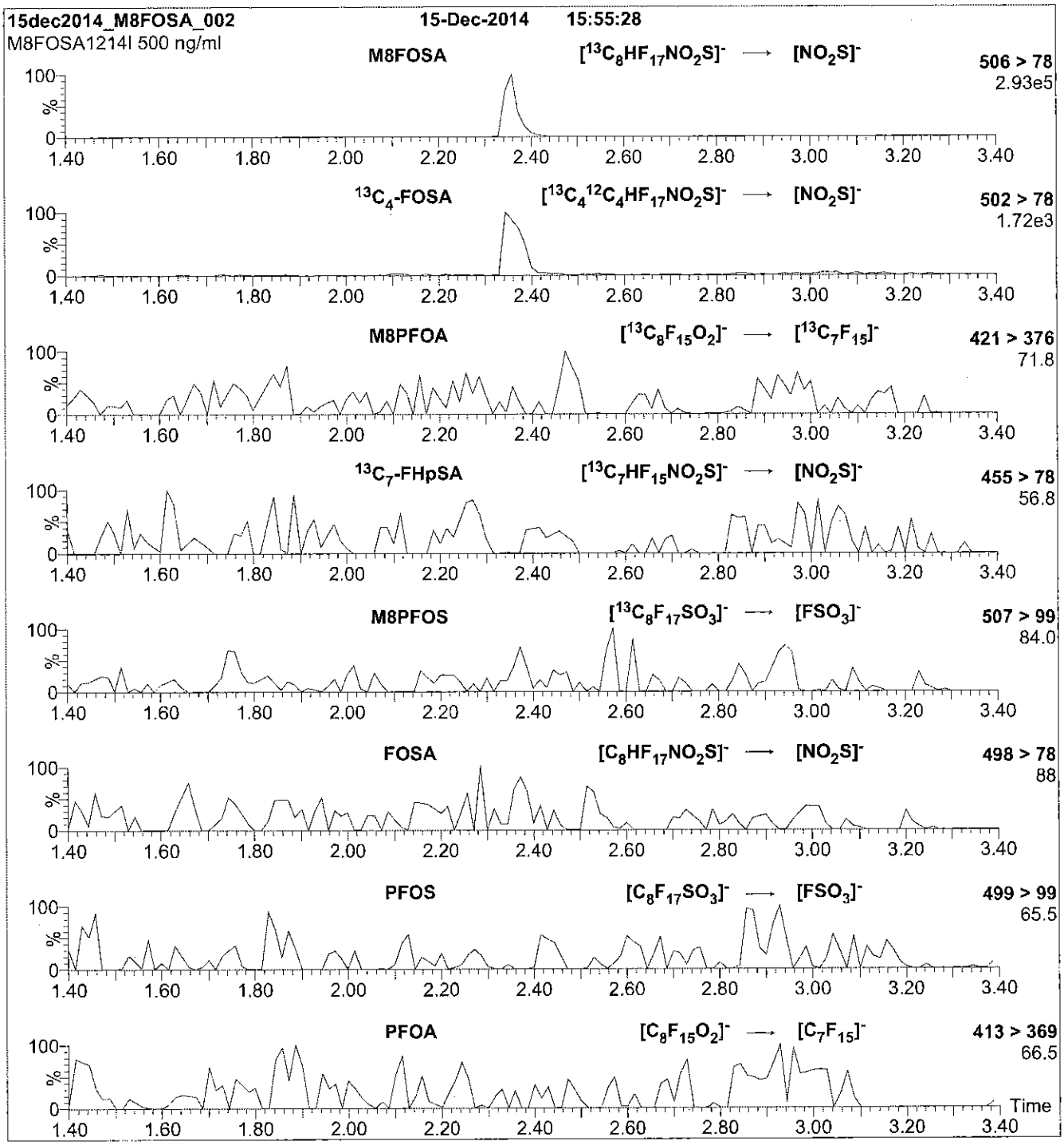
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 30

Reagent

LCM8FOSA_00009

609714
ID: LCM8FOSA_00009
Exp: 12/22/17 Prpd: CBW
13C8-Perfluorooctanesulfo

R=4/7/16 CBW

WELLINGTON LABORATORIES

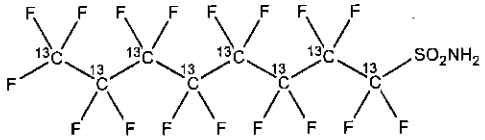
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1215I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	12/22/2015		
EXPIRY DATE: (mm/dd/yyyy)	12/22/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/14/2016 (mm/dd/yyyy)

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA Testing Accreditation Inc. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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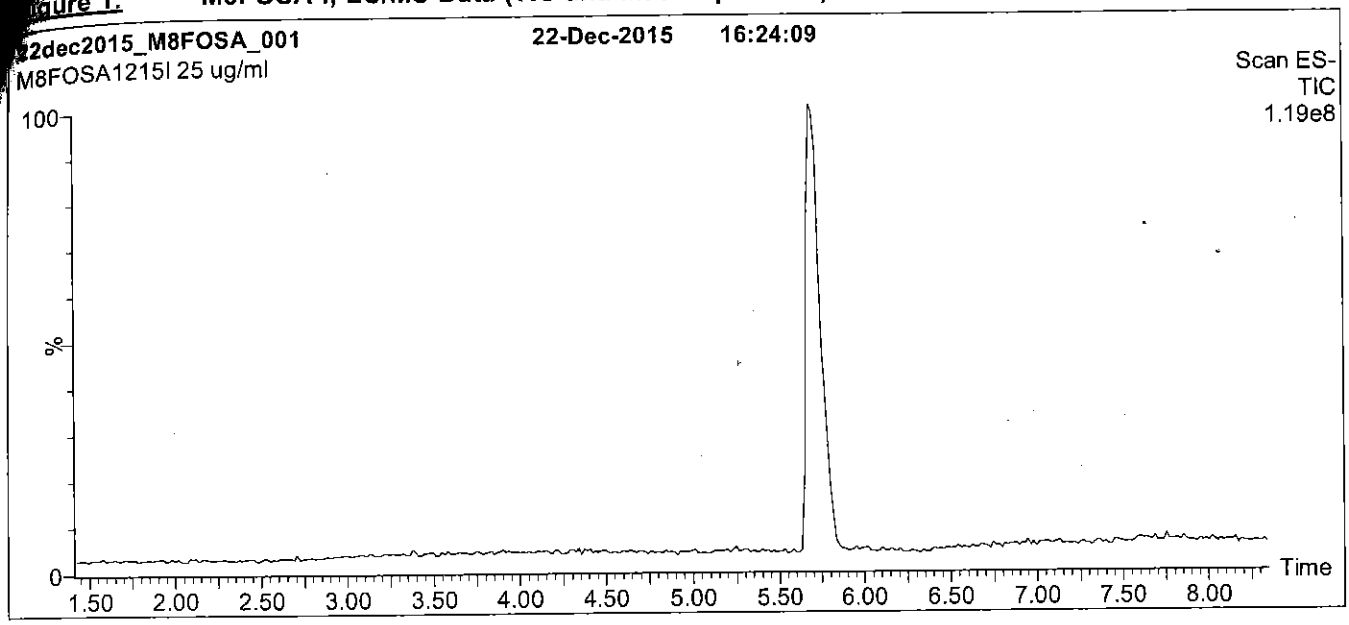
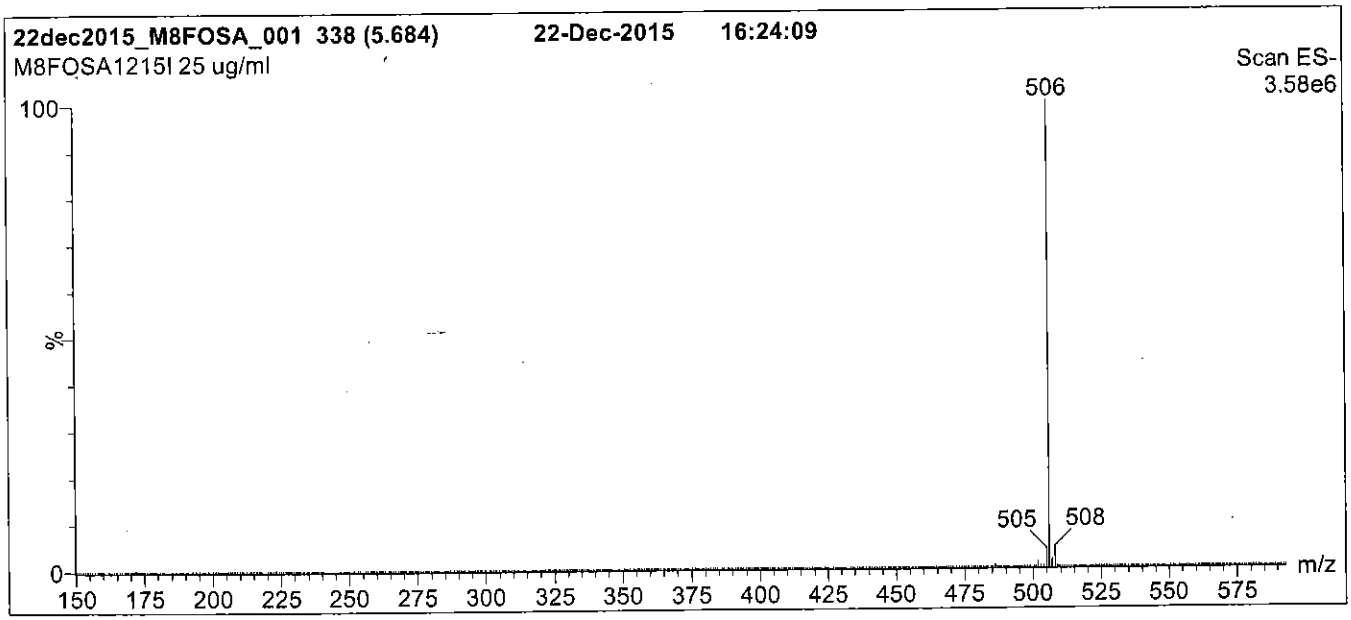
Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

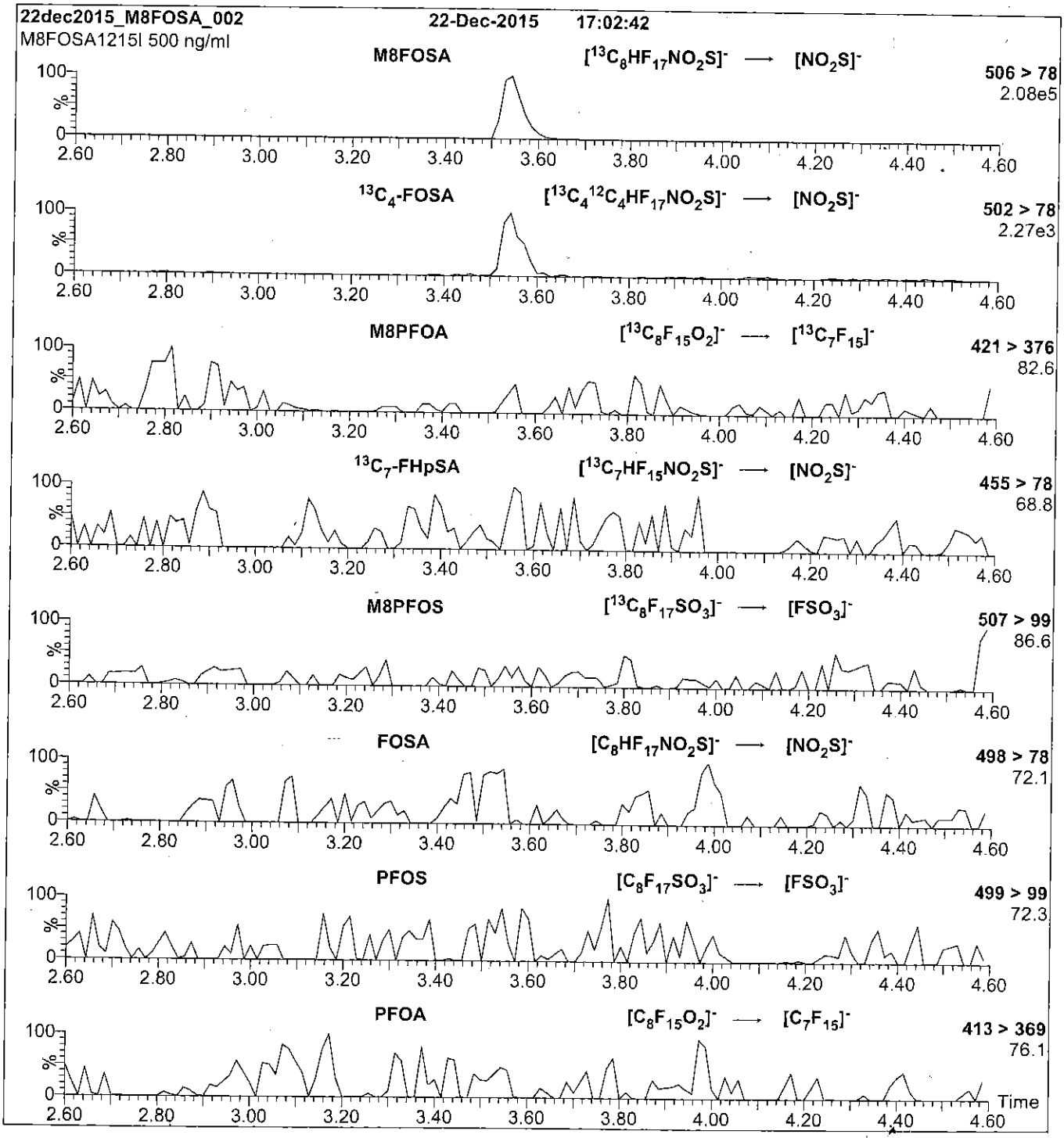
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

Reagent

LCMPFBA_00004

R: 12/9/15 SEJ

WELLINGTON LABORATORIES

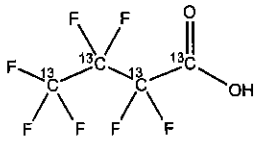
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFBA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid

LOT NUMBER: MPFBA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	10/31/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 03/31/2015 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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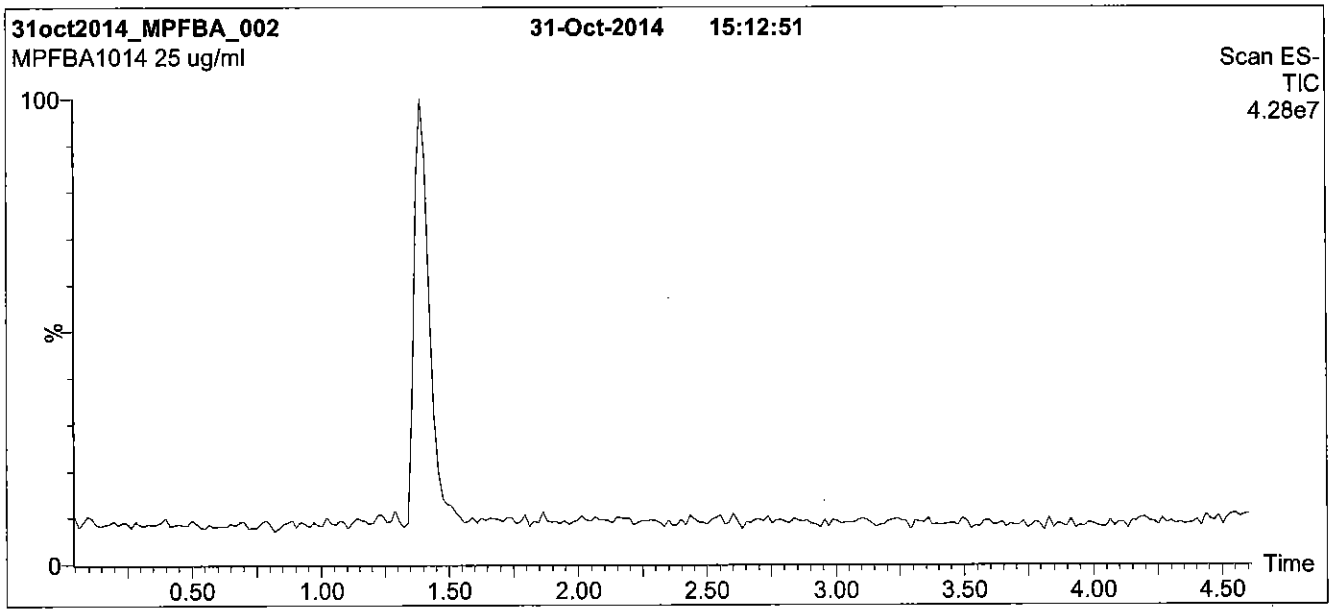
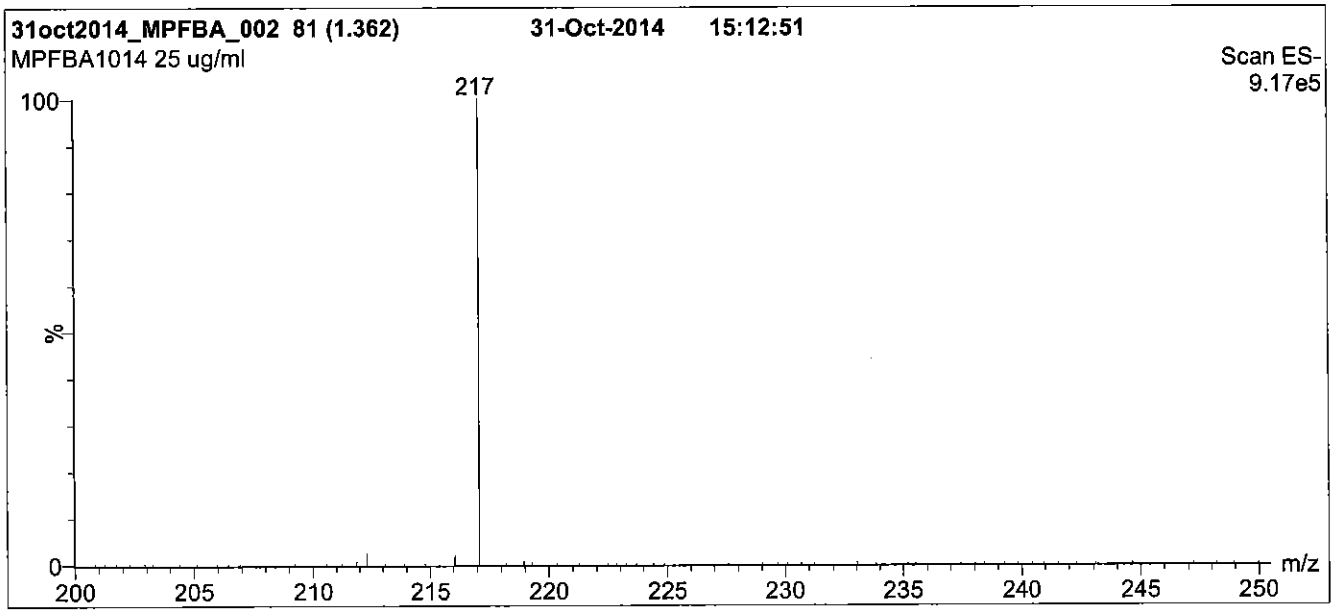
Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

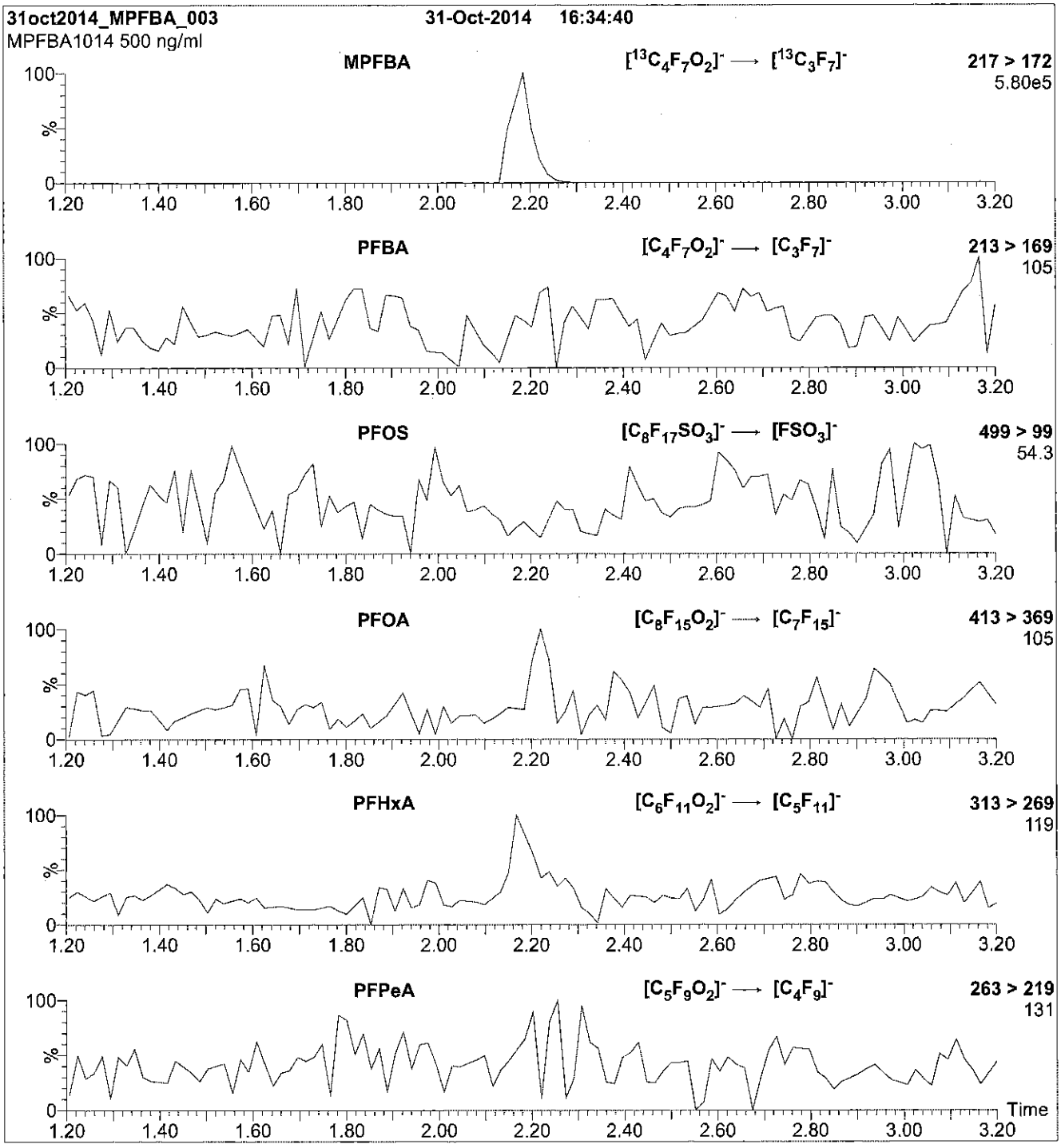
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

Reagent

LCMPFBA_00006

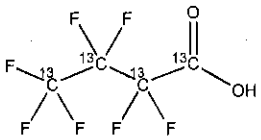
609707
ID: LCMPFBA_00006
Exp: 10/31/19 Prpd: CBW
13C4-Perfluorobutanoic ac

R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA1014
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99%^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	10/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	10/31/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ B.G. Chittim **Date:** 03/31/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

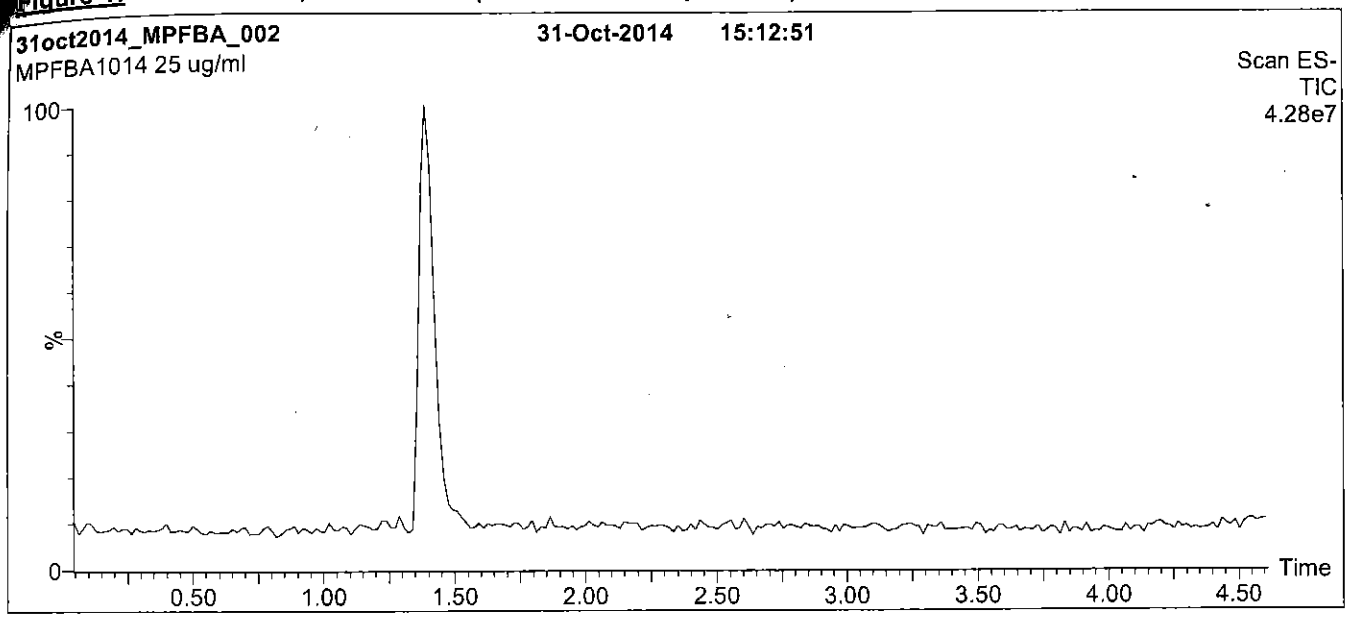
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

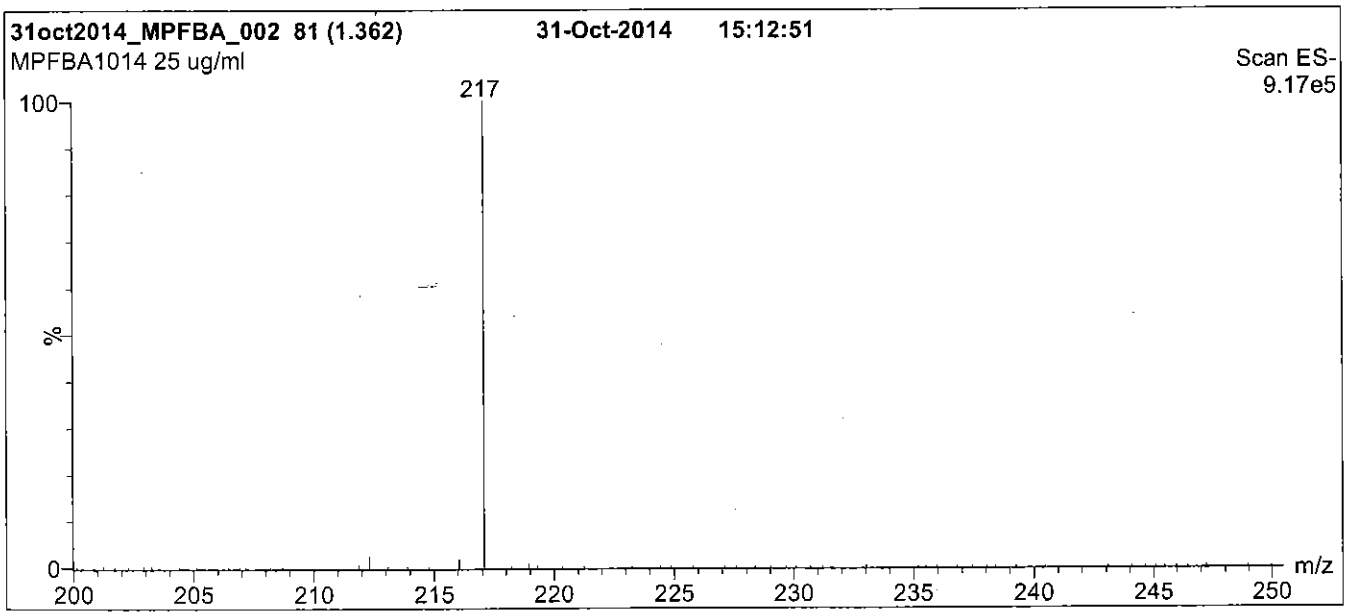
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

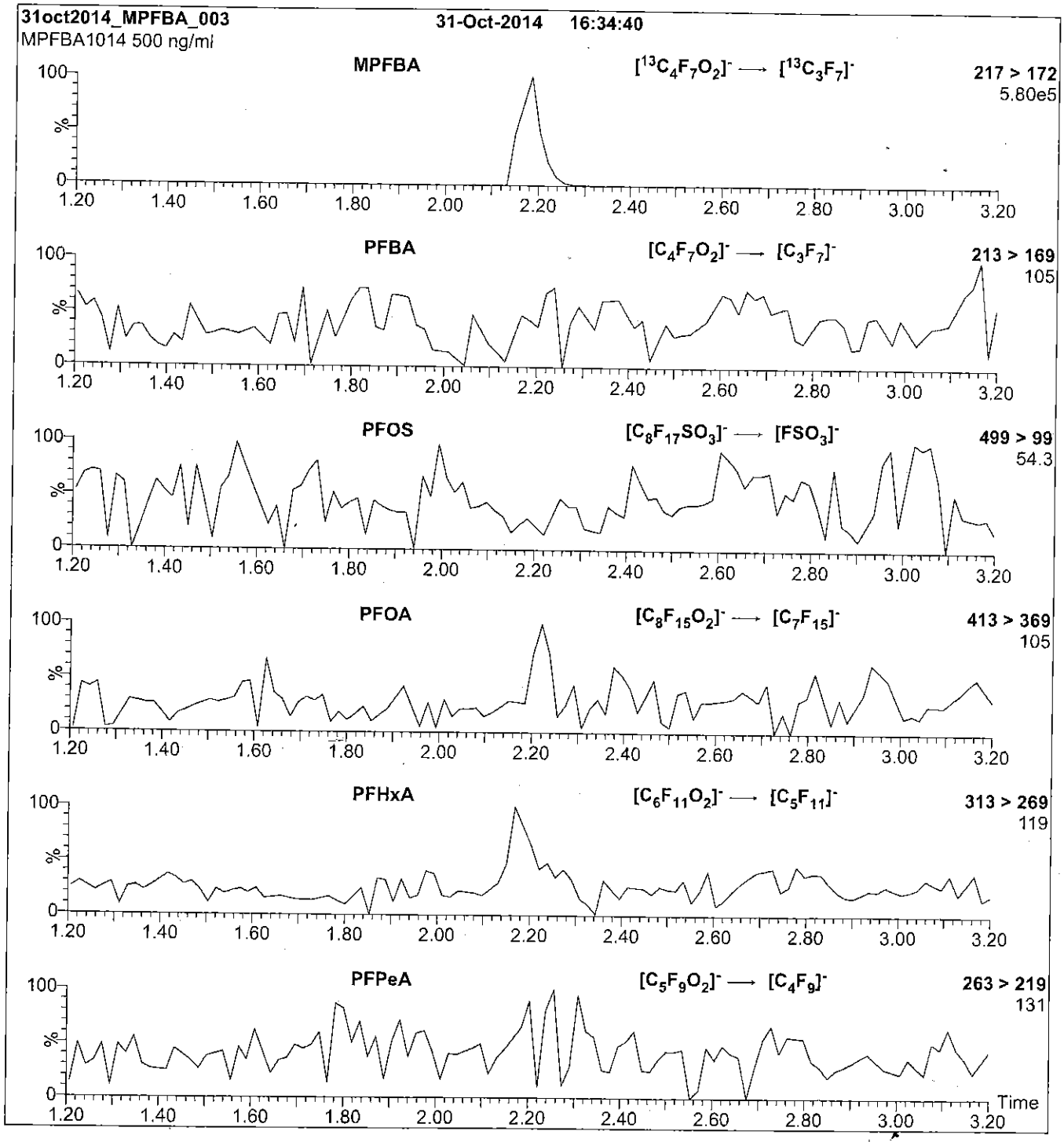
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

Reagent

LCMPFDA_00004

R: 10-20-2011 (was 2012)

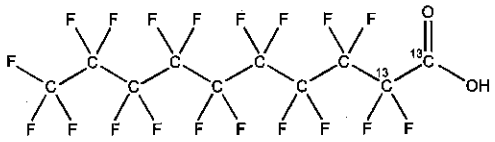
Rec. 10-20-2011

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

12LCMS0262
LCMPFDA_00001

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0411
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/07/2011		
EXPIRY DATE: (mm/dd/yyyy)	04/07/2014		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/19/2011 (mm/dd/yyyy)

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

INTENDED USE:

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

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

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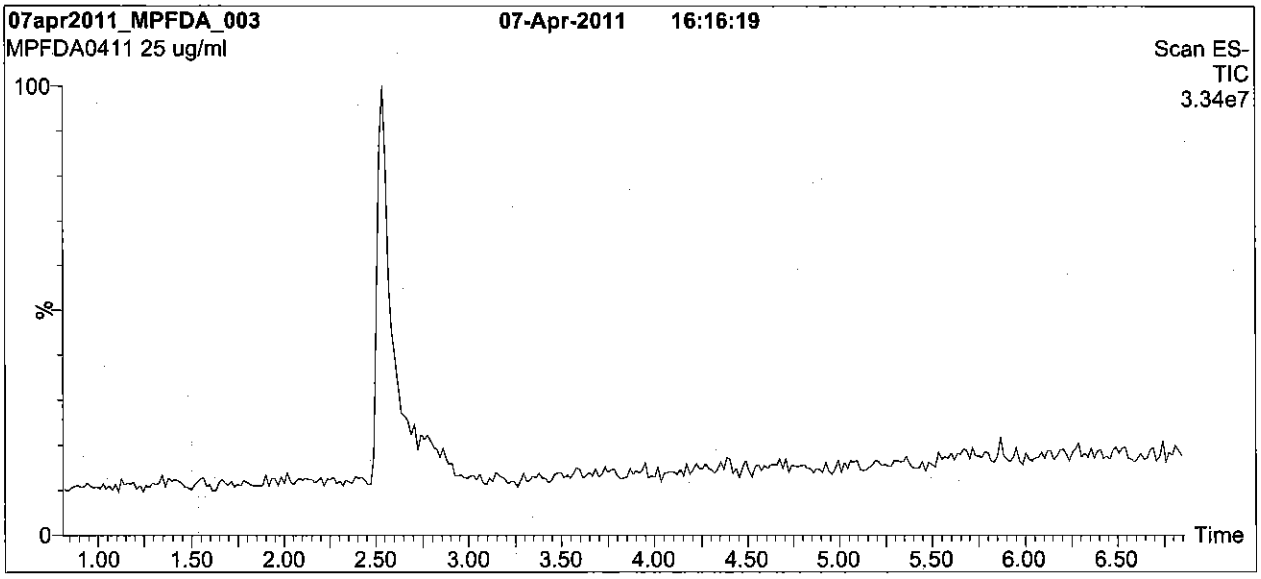
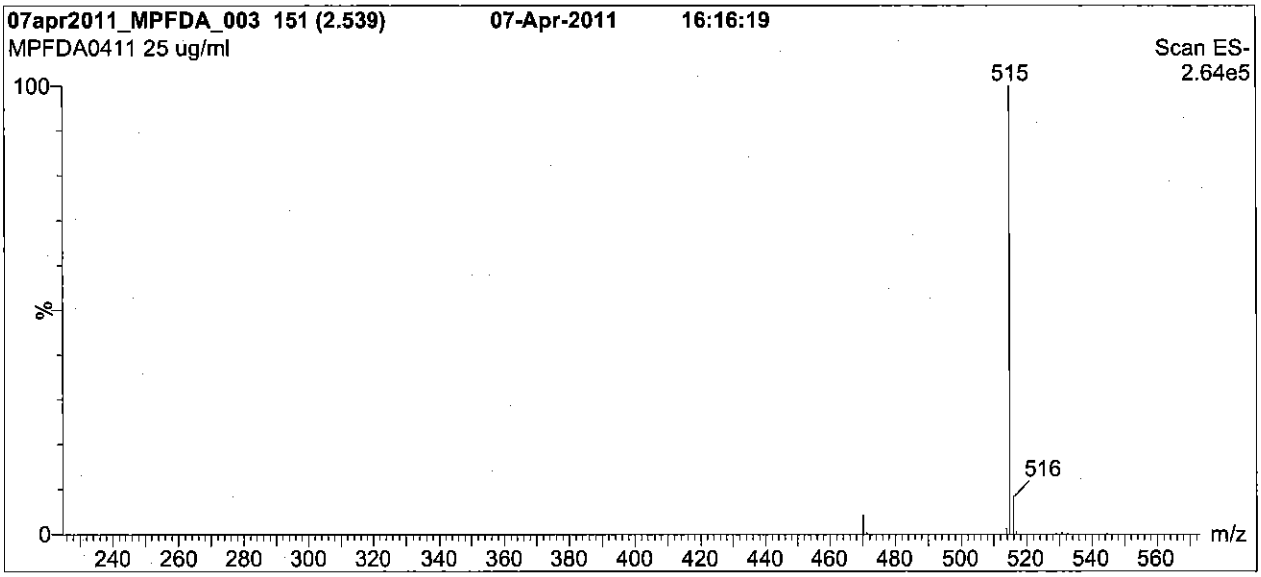
Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

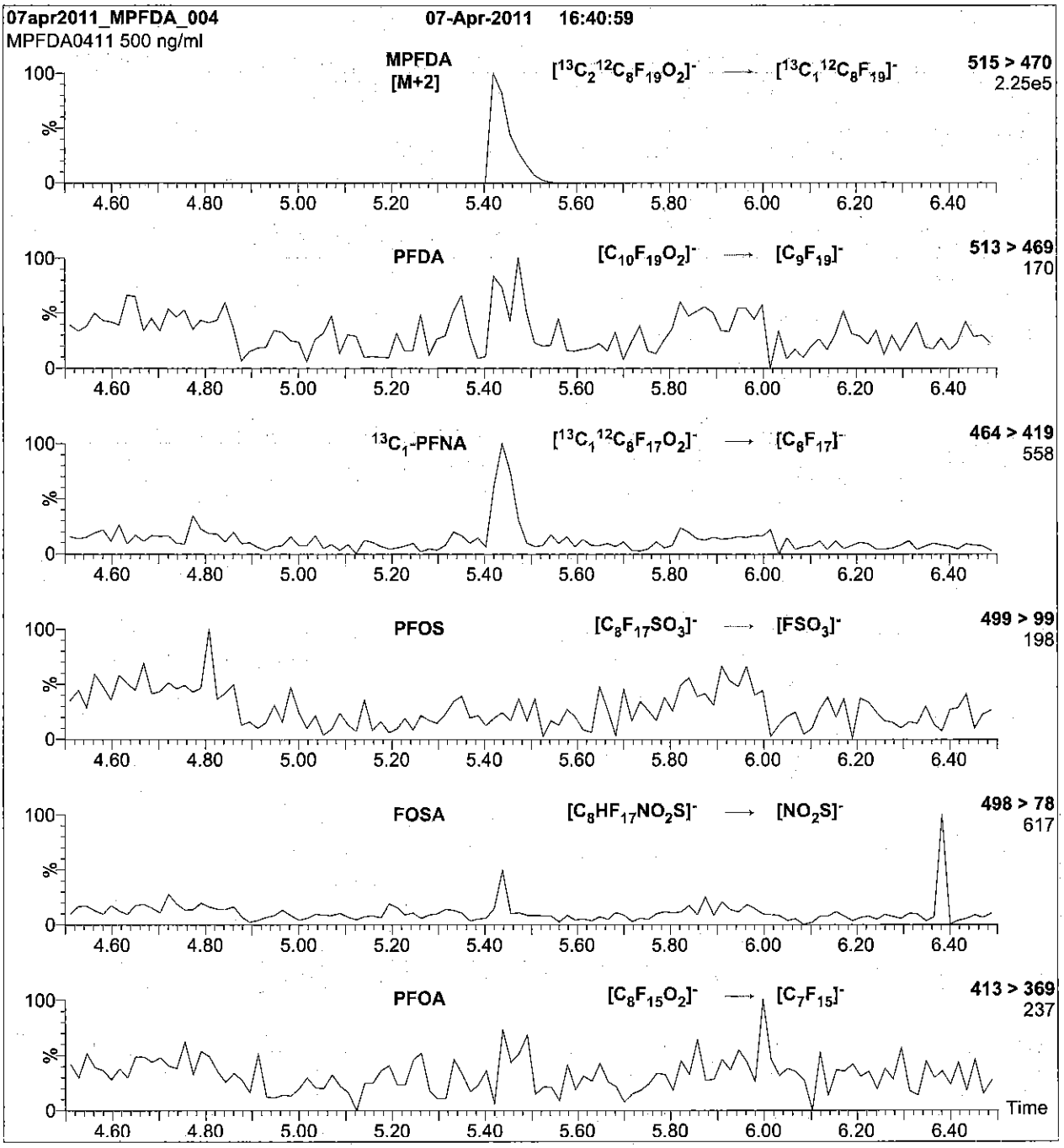
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)
Mobile phase:	Isocratic 70% (80:20 MeOH:ACN) / 30% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

Reagent

LCMPFDA_00005

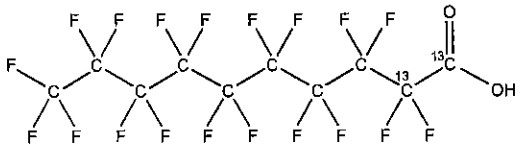
RL 4/15/15 SKV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0414
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/15/2014 (mm/dd/yyyy)
B.G. Chittim

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

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

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LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

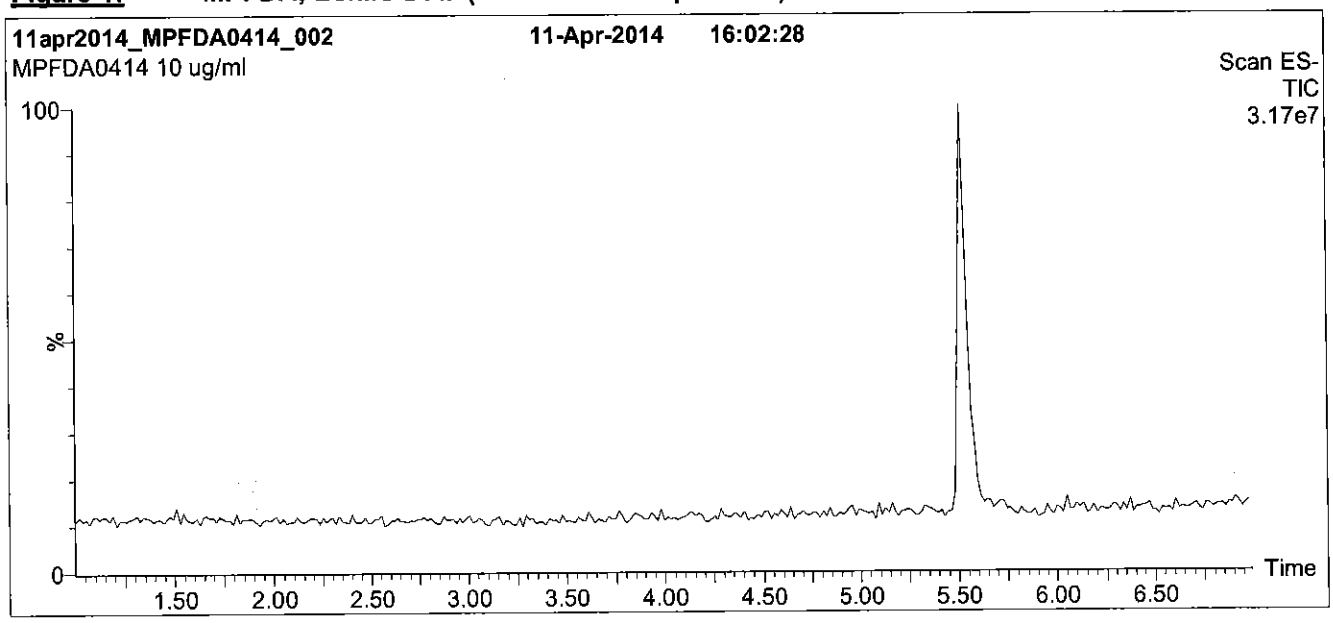
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

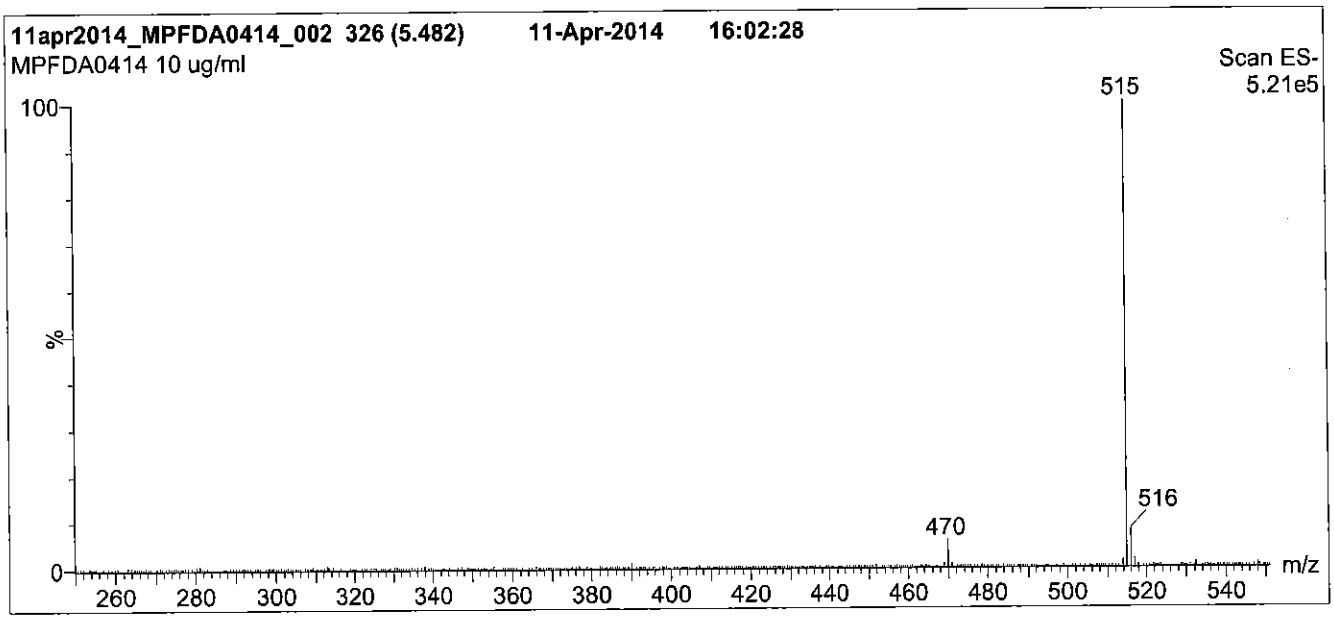
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

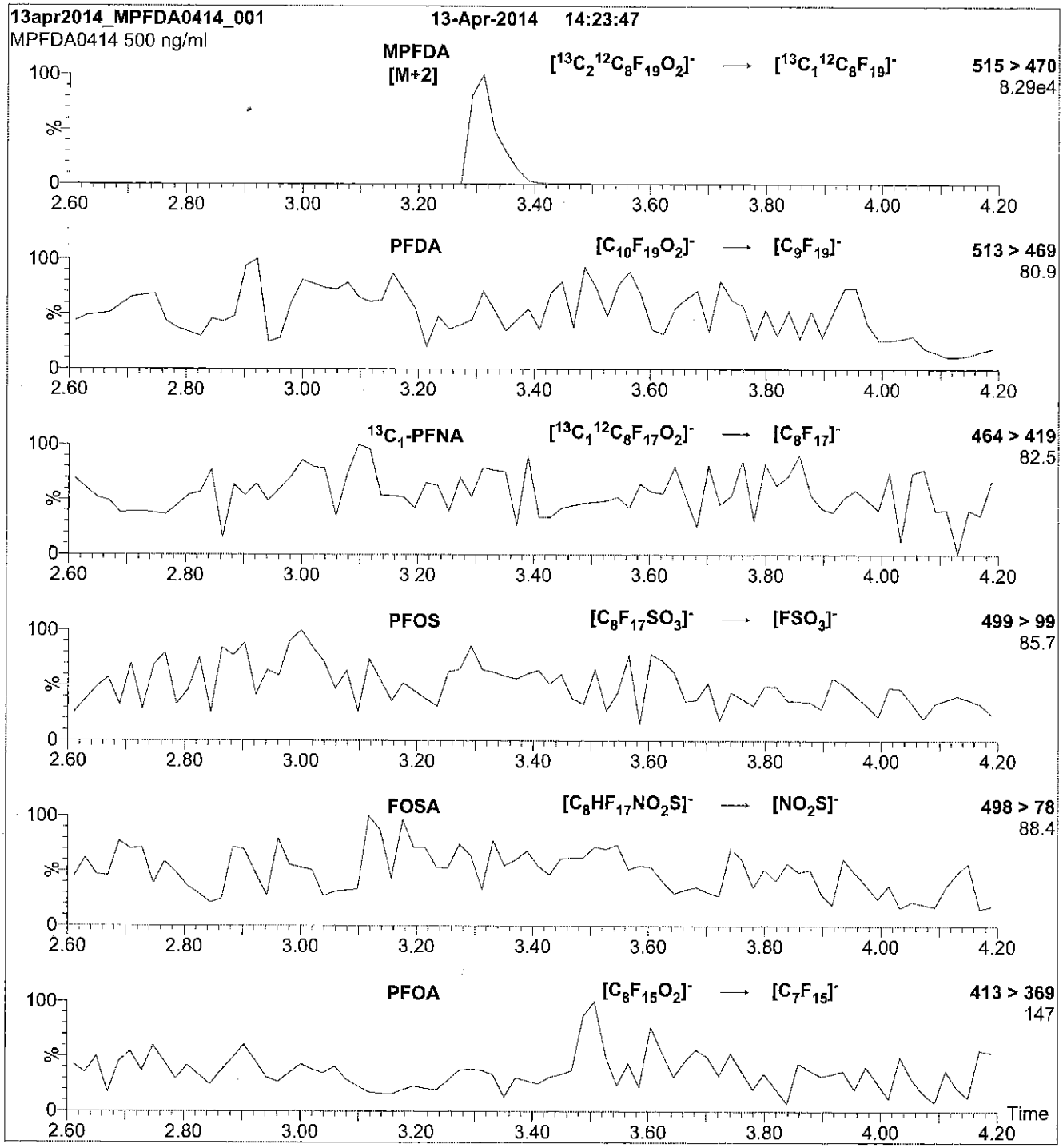
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

Reagent

LCMPFDA_00006

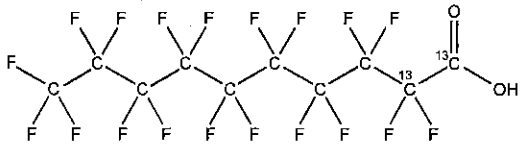
R: 2/25/16 CBW

587892
ID: LCMPFDA_00006
Exp:08/19/20 Prpd:CBW Opn:02/25/16
13C2-Perfluorinodecanoic a

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
LOT NUMBER: MPFDA0815
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
MOLECULAR WEIGHT: 516.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

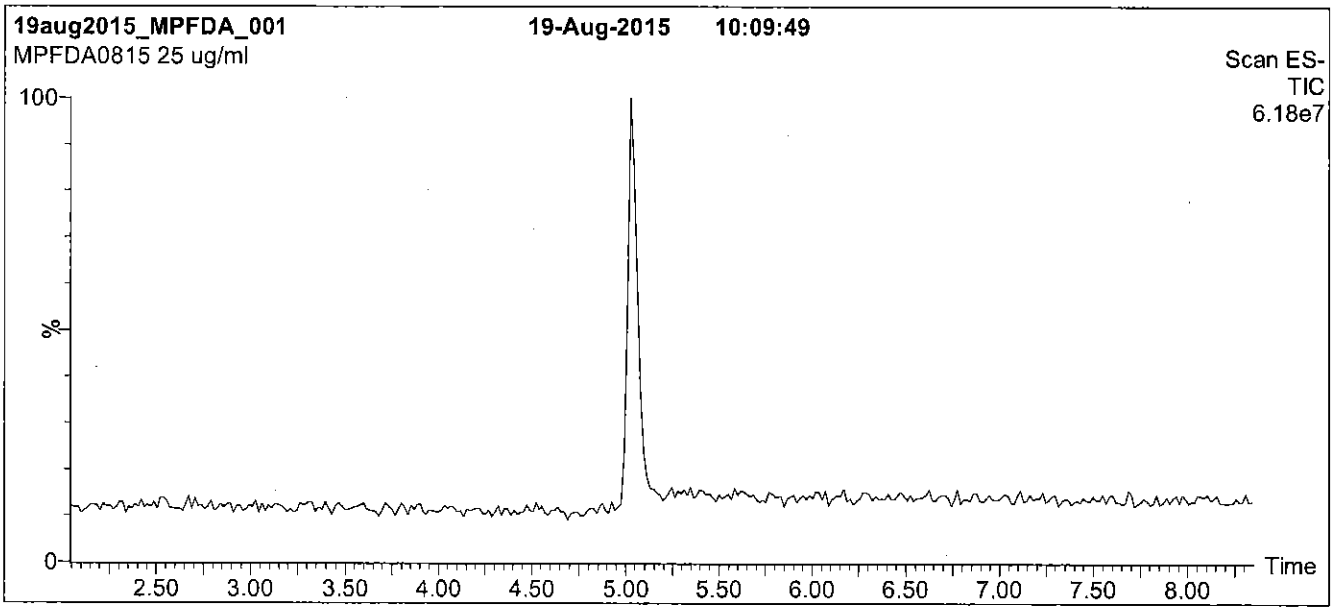
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

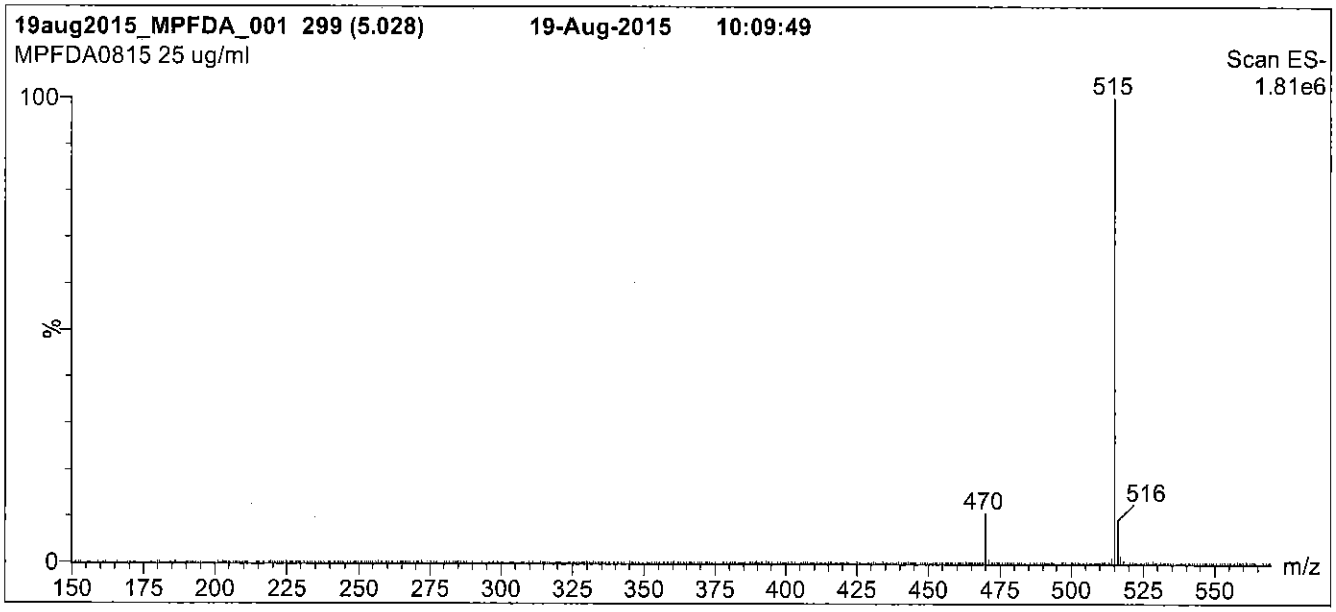
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

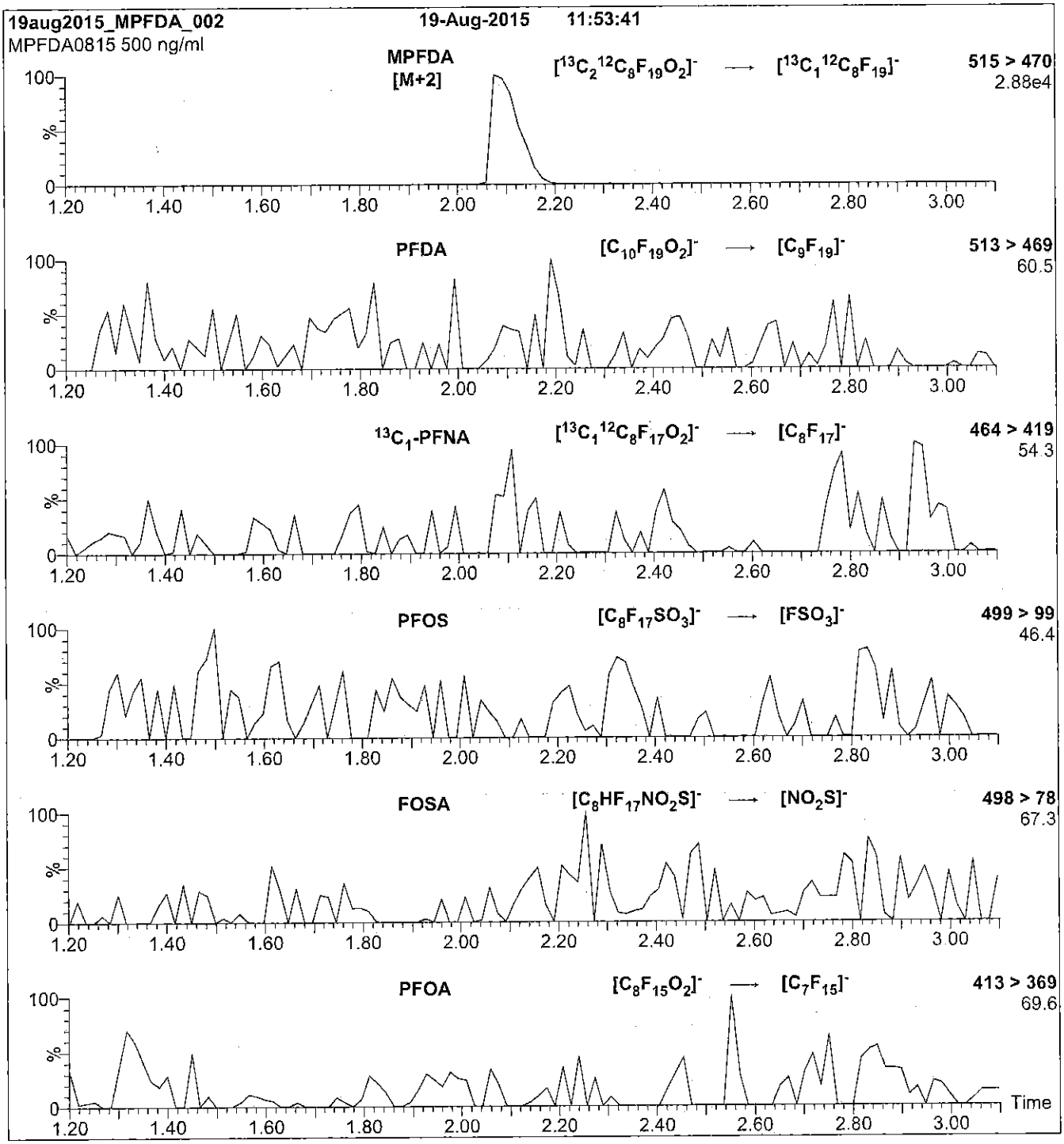
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFDA_00007

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

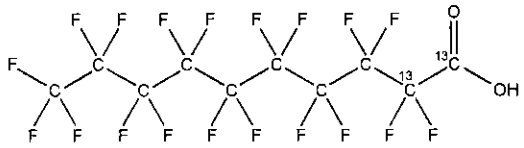
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid

LOT NUMBER: MPFDA0815

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{19}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 516.07
SOLVENT(S): Methanol
Water (<1%)

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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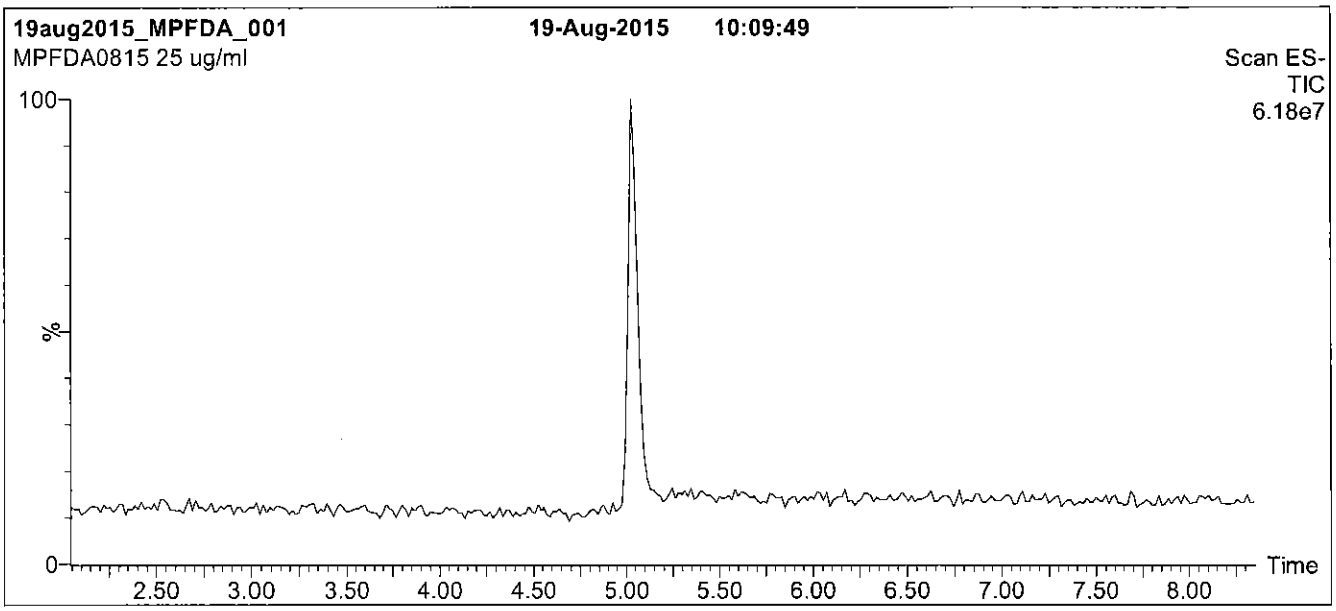
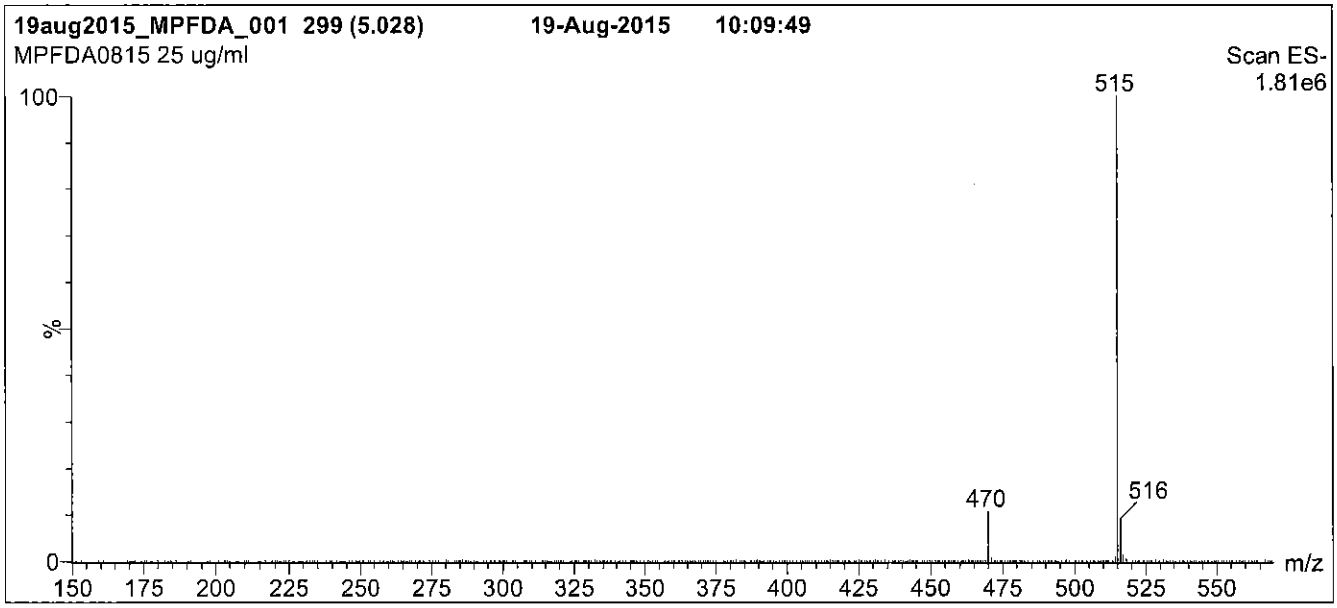




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

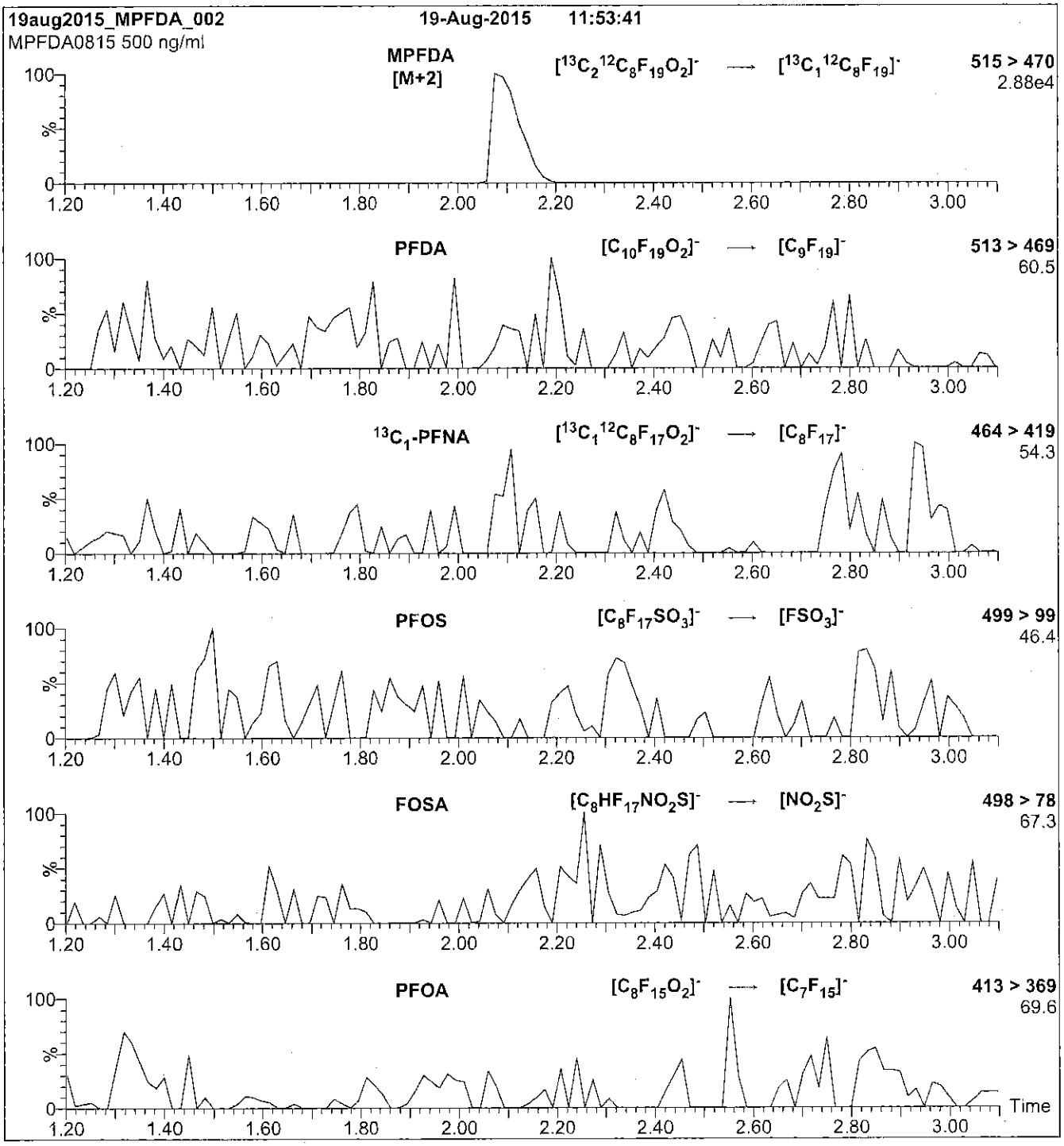
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00003

P. 2/11/15 SRV

WELLINGTON LABORATORIES

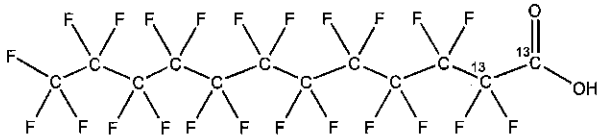
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0714

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/17/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/17/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/21/2014 (mm/dd/yyyy)
B.G. Chittim

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

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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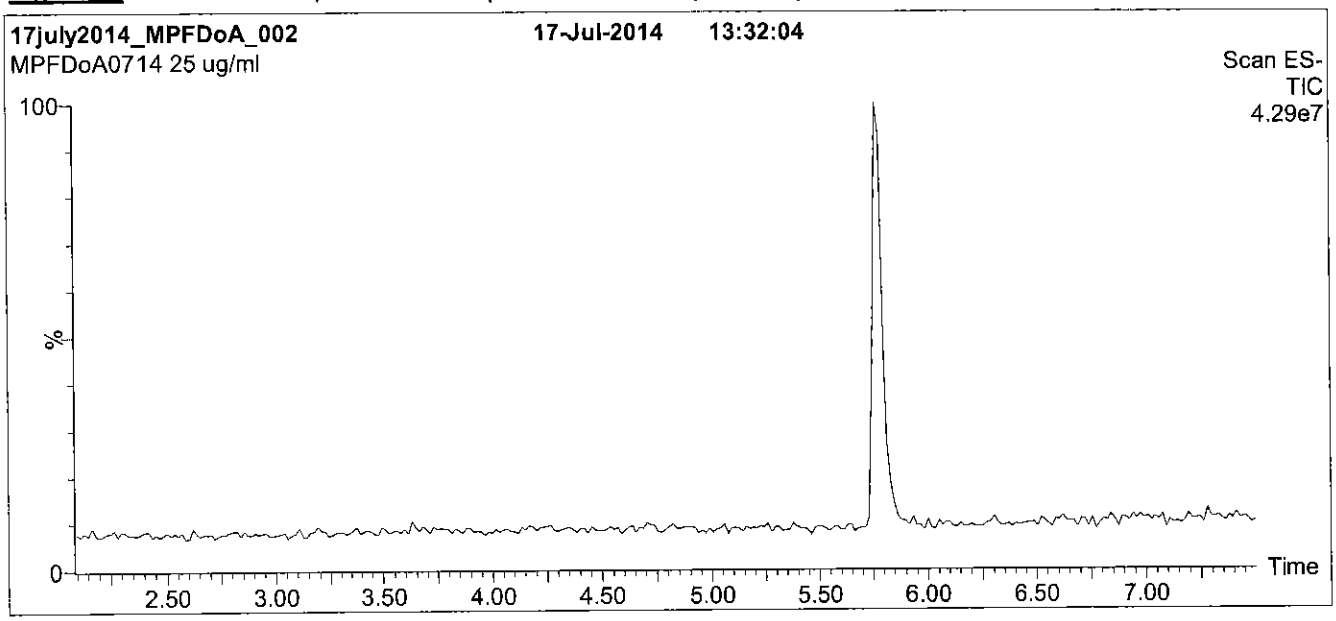
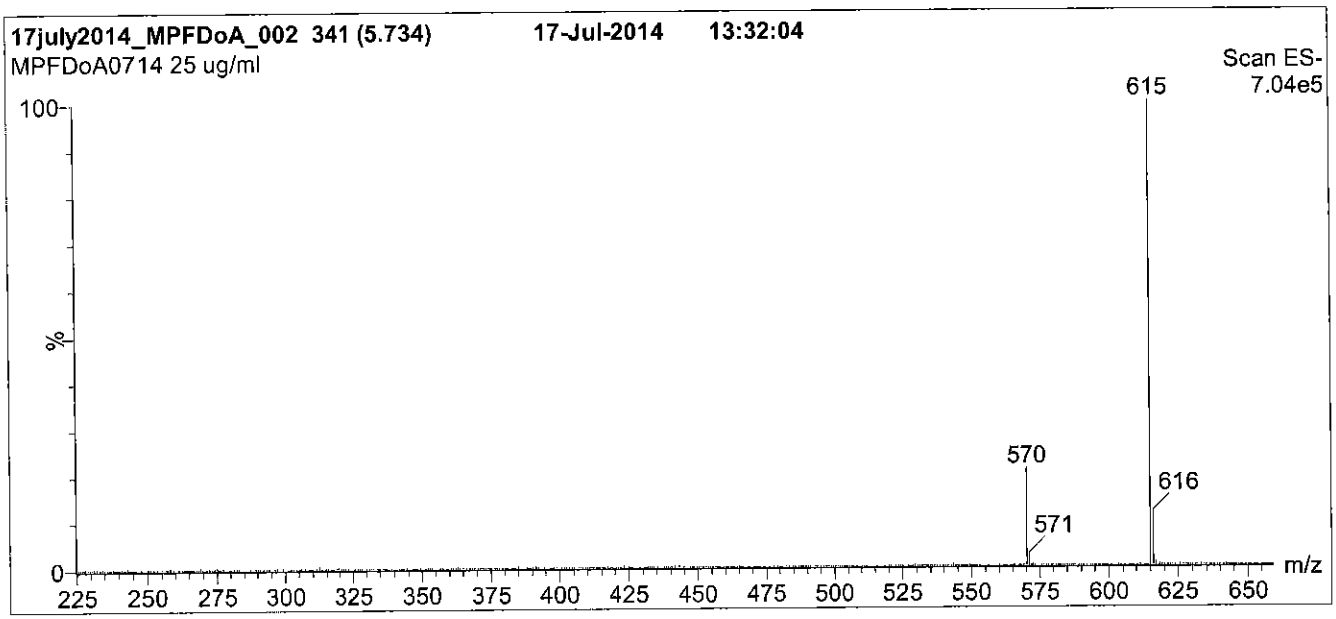
Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

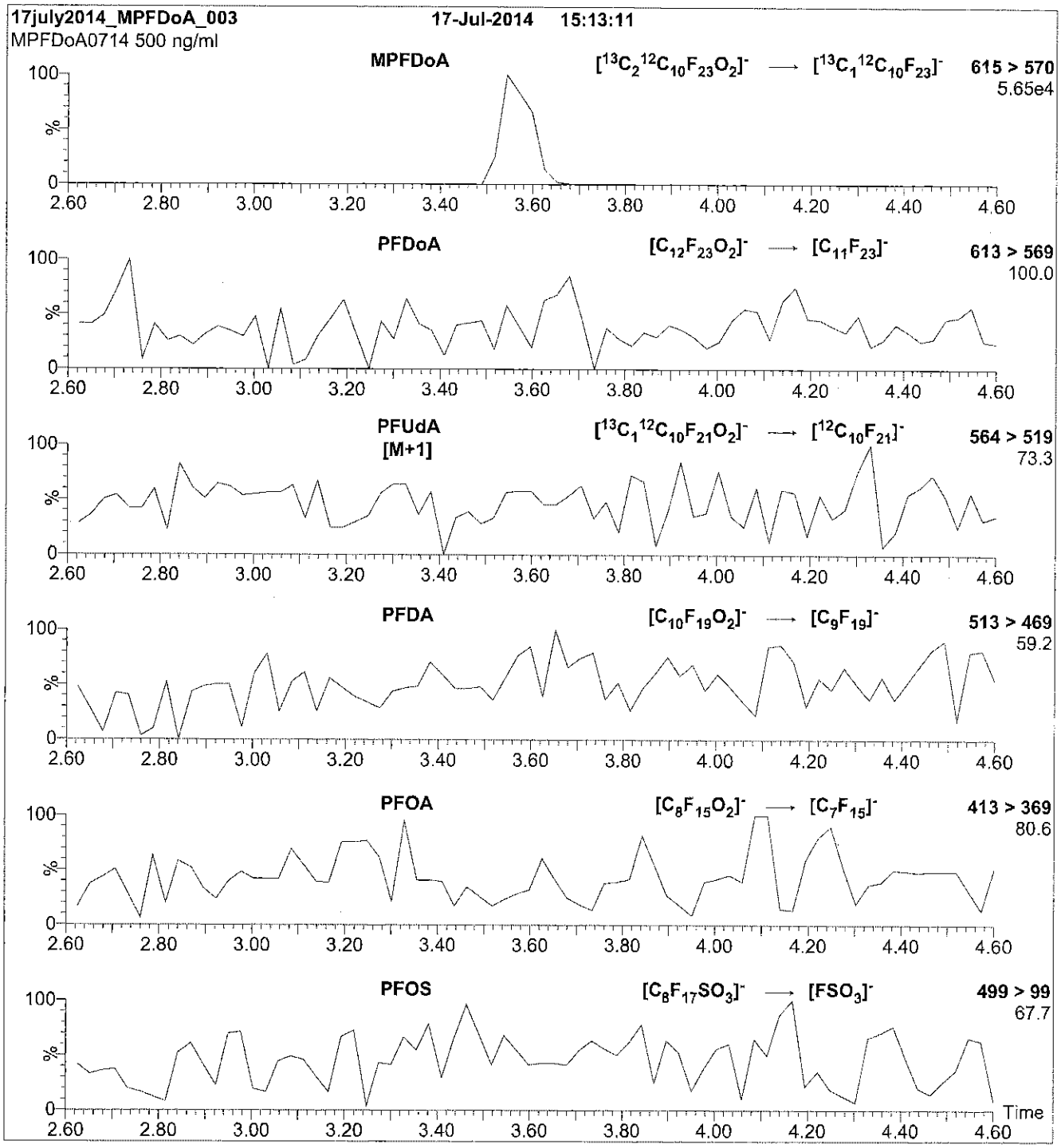
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFDoA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00004

V : 14/10/15 JKV

WELLINGTON LABORATORIES

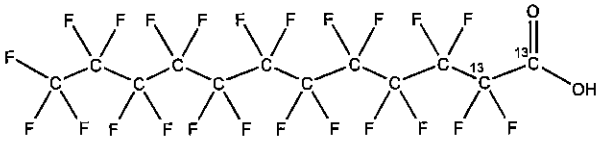
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0714

STRUCTURE:

CAS #: Not available



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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

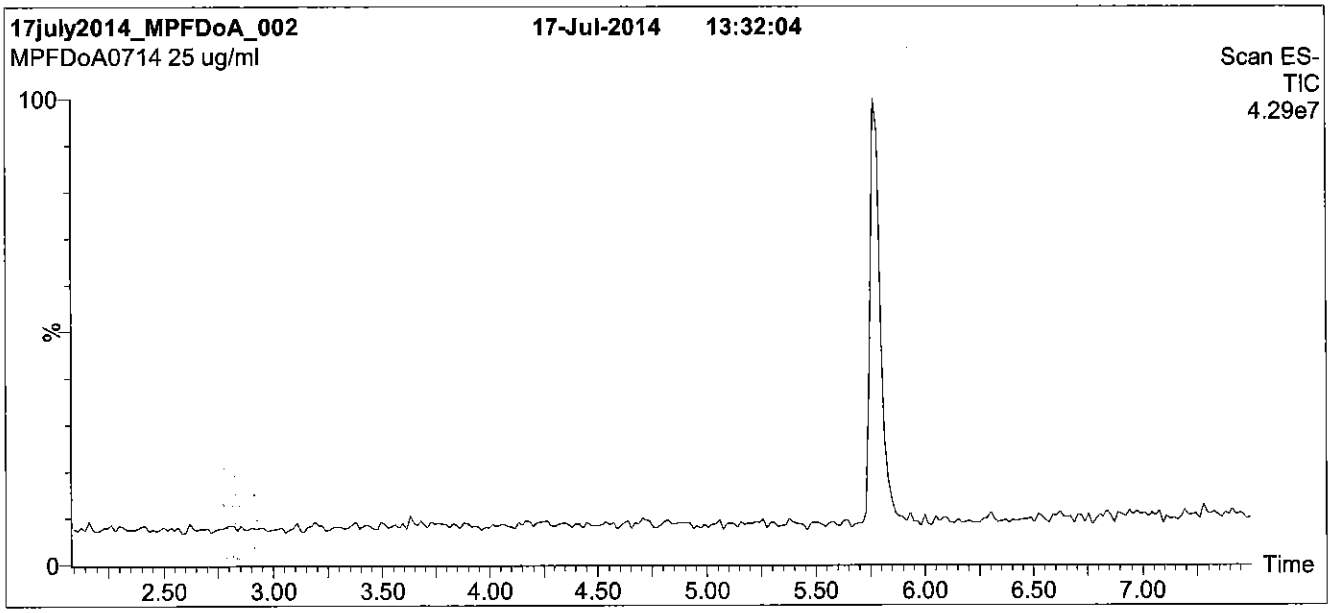
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

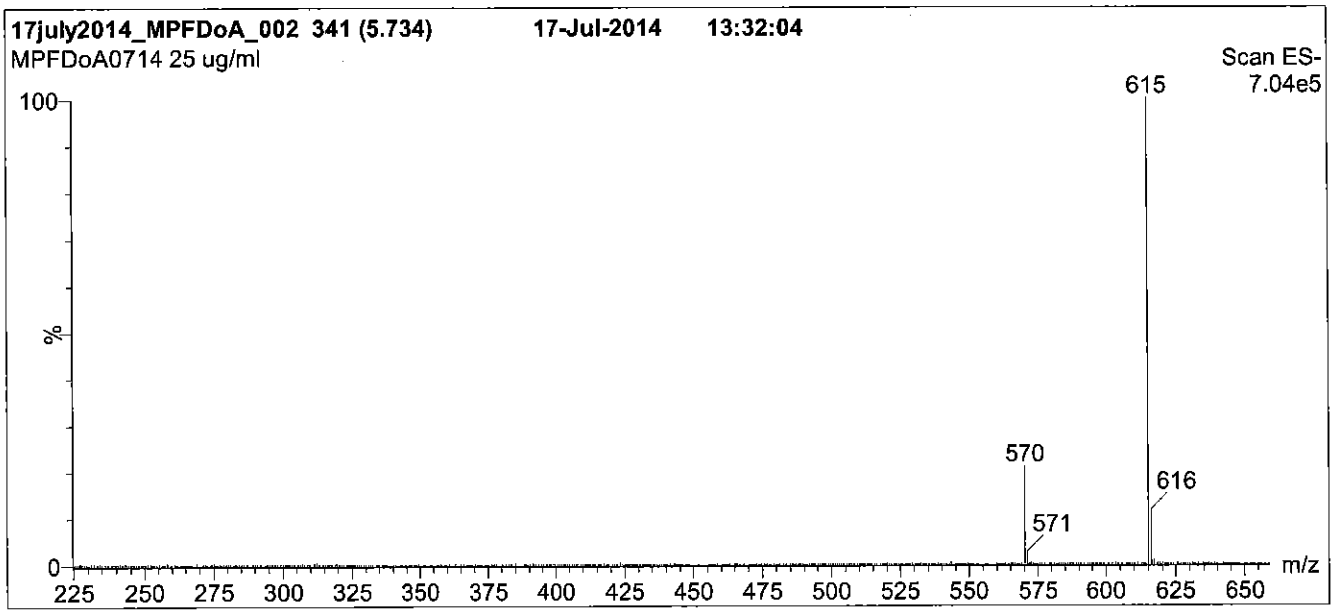
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

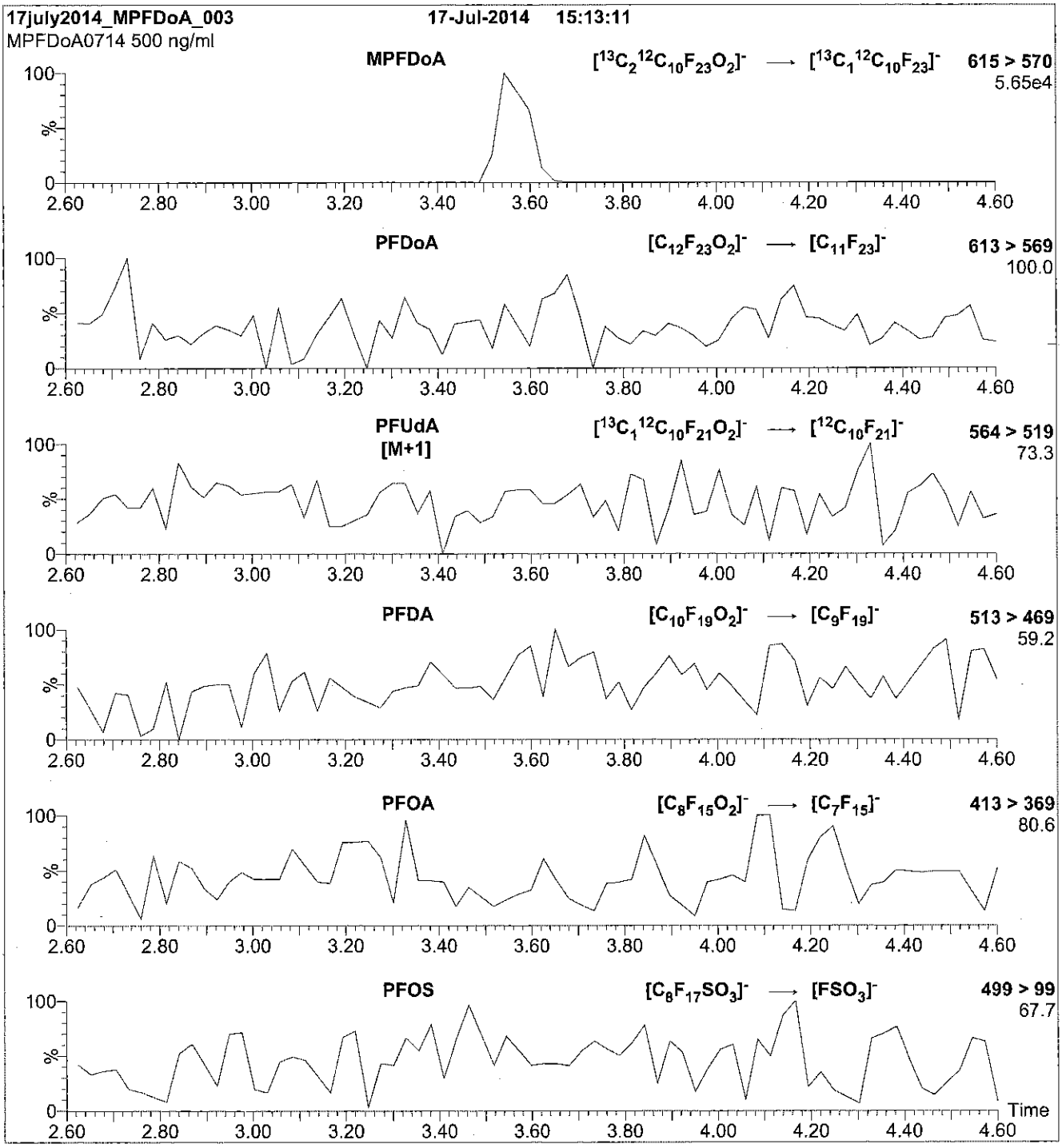
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 13

Reagent

LCMPFDoA_00006

609708
ID: LCMPFDoA_00006
Exp: 07/17/19 Prpd: CBW
13C2-Perfluorododecanoic

R: 4/7/16 CBW

WELLINGTON LABORATORIES

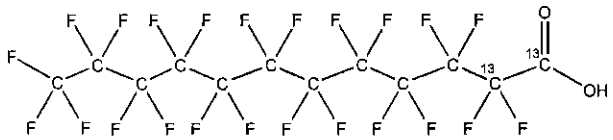
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0714

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/17/2014		
EXPIRY DATE: (mm/dd/yyyy)	07/17/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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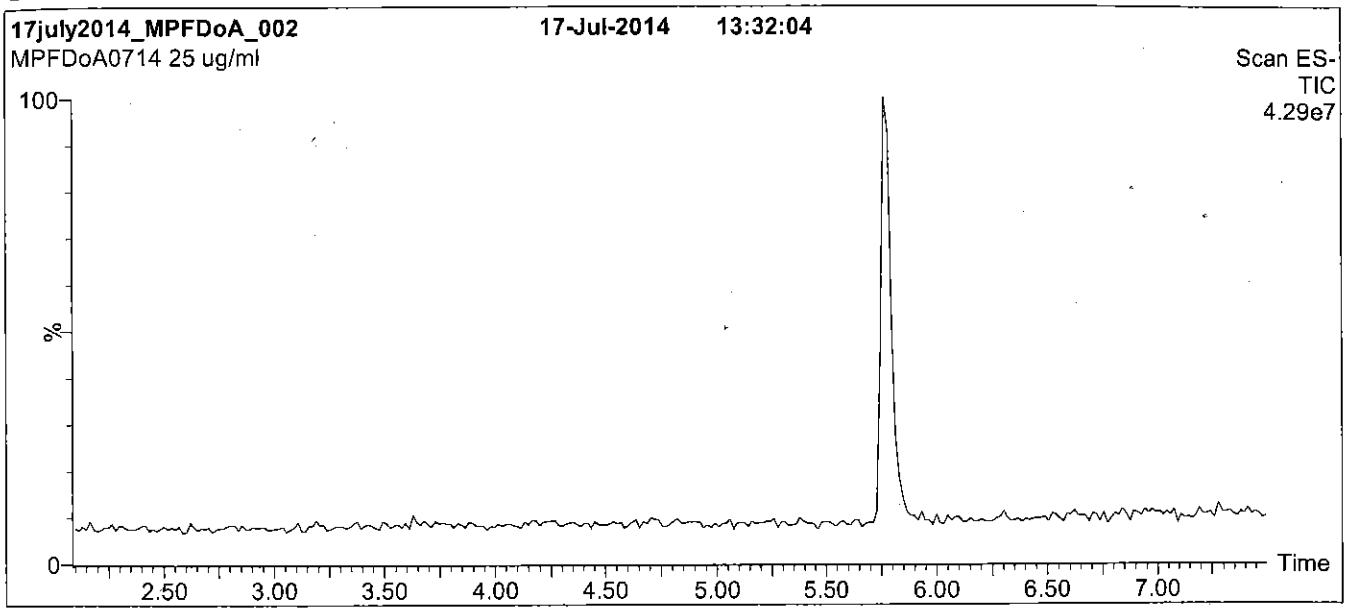
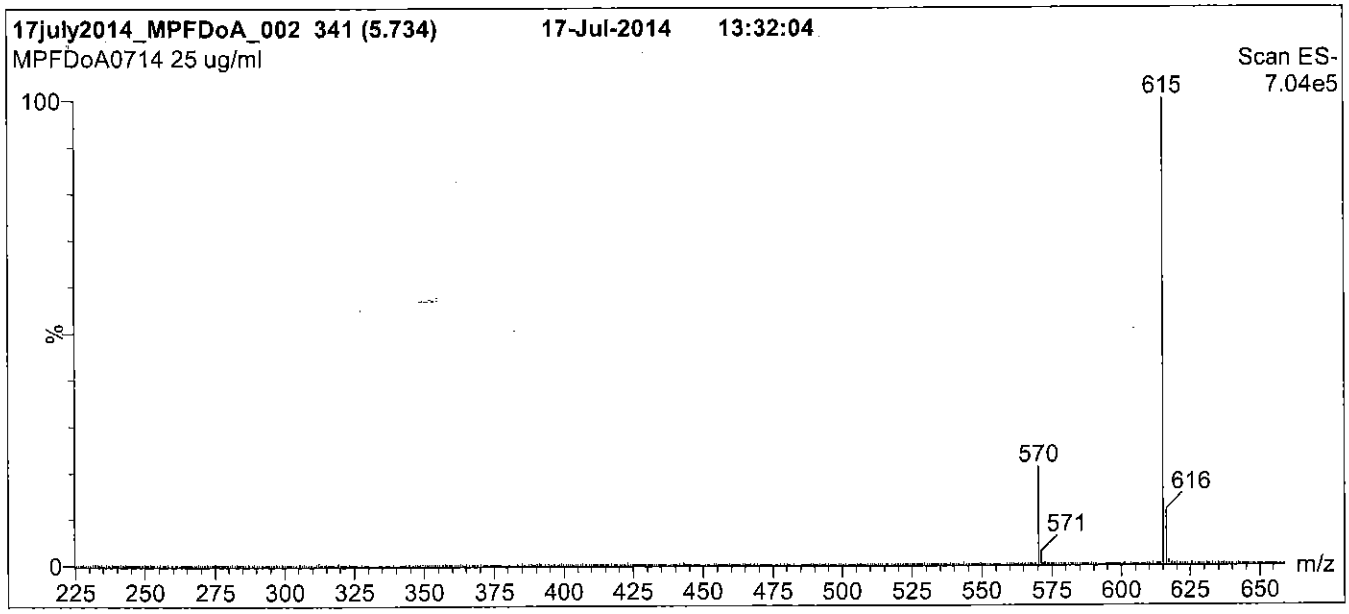




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

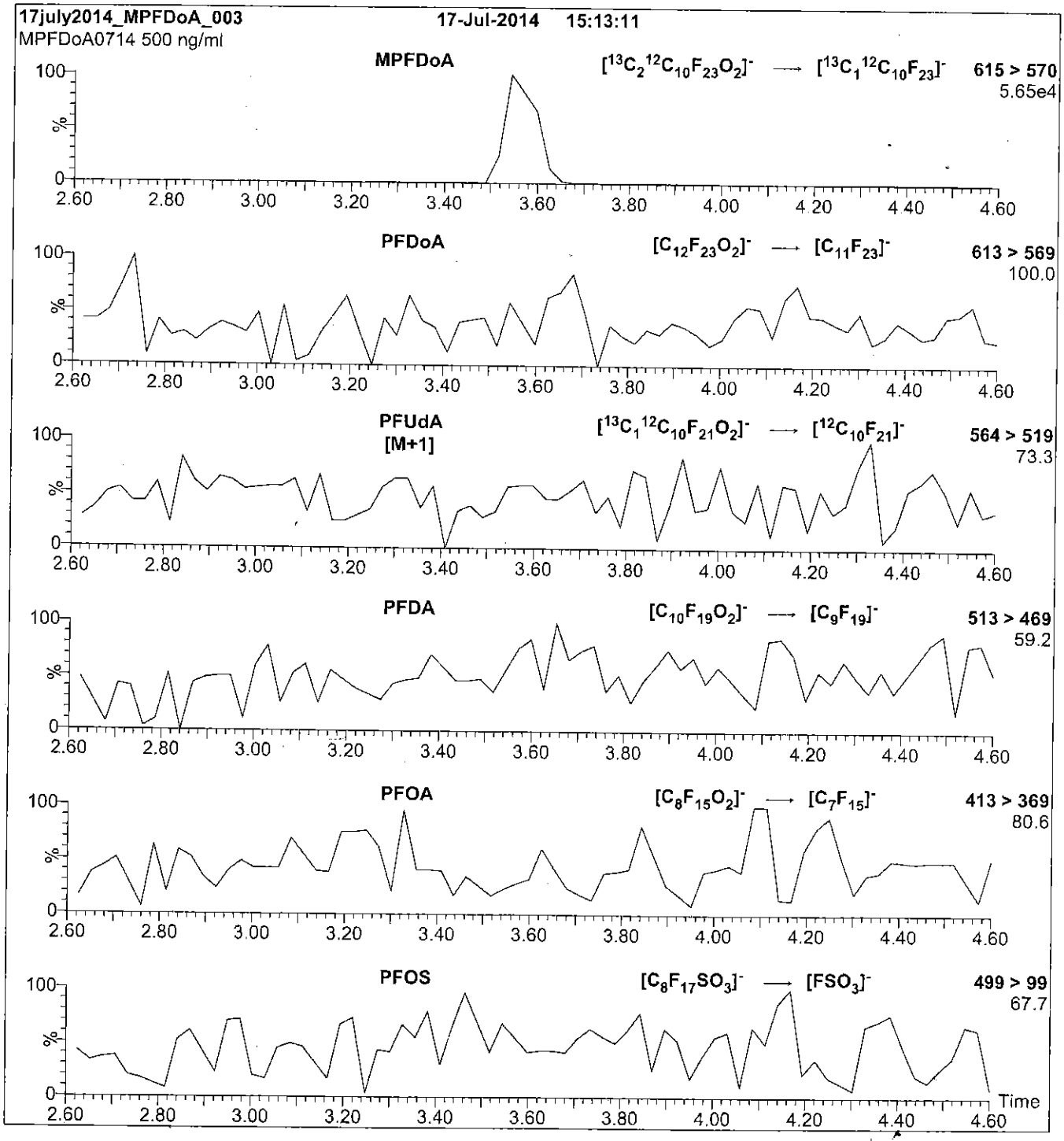
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Condltions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 13

Reagent

LCMPFHxA_00006

P: 4/15/15 SKV

WELLINGTON LABORATORIES

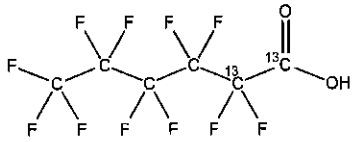
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

LOT NUMBER: MPFHxA0414

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 316.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/13/2014
EXPIRY DATE: (mm/dd/yyyy) 04/13/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/15/2014 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 0226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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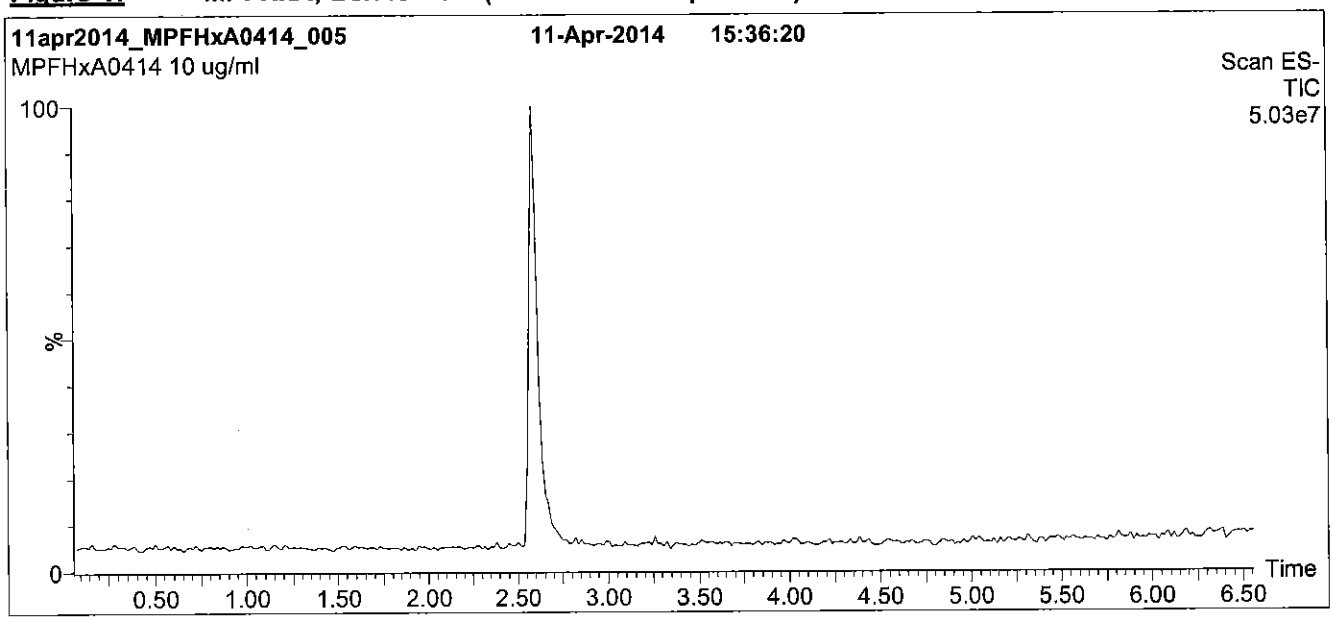
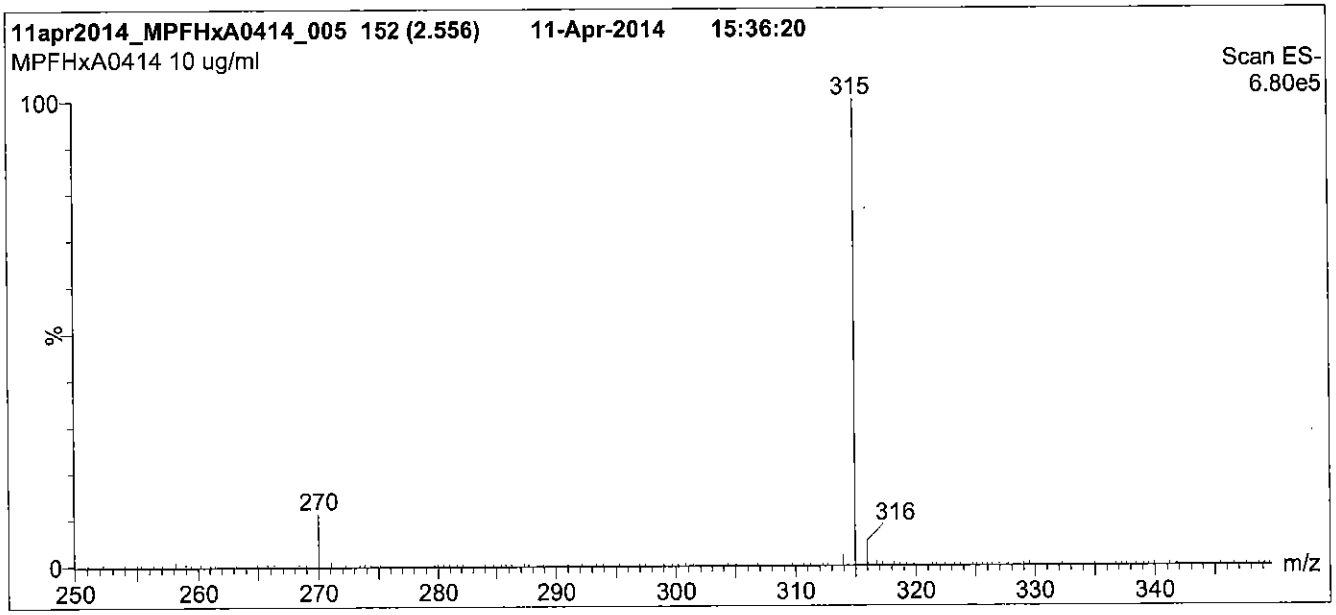
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

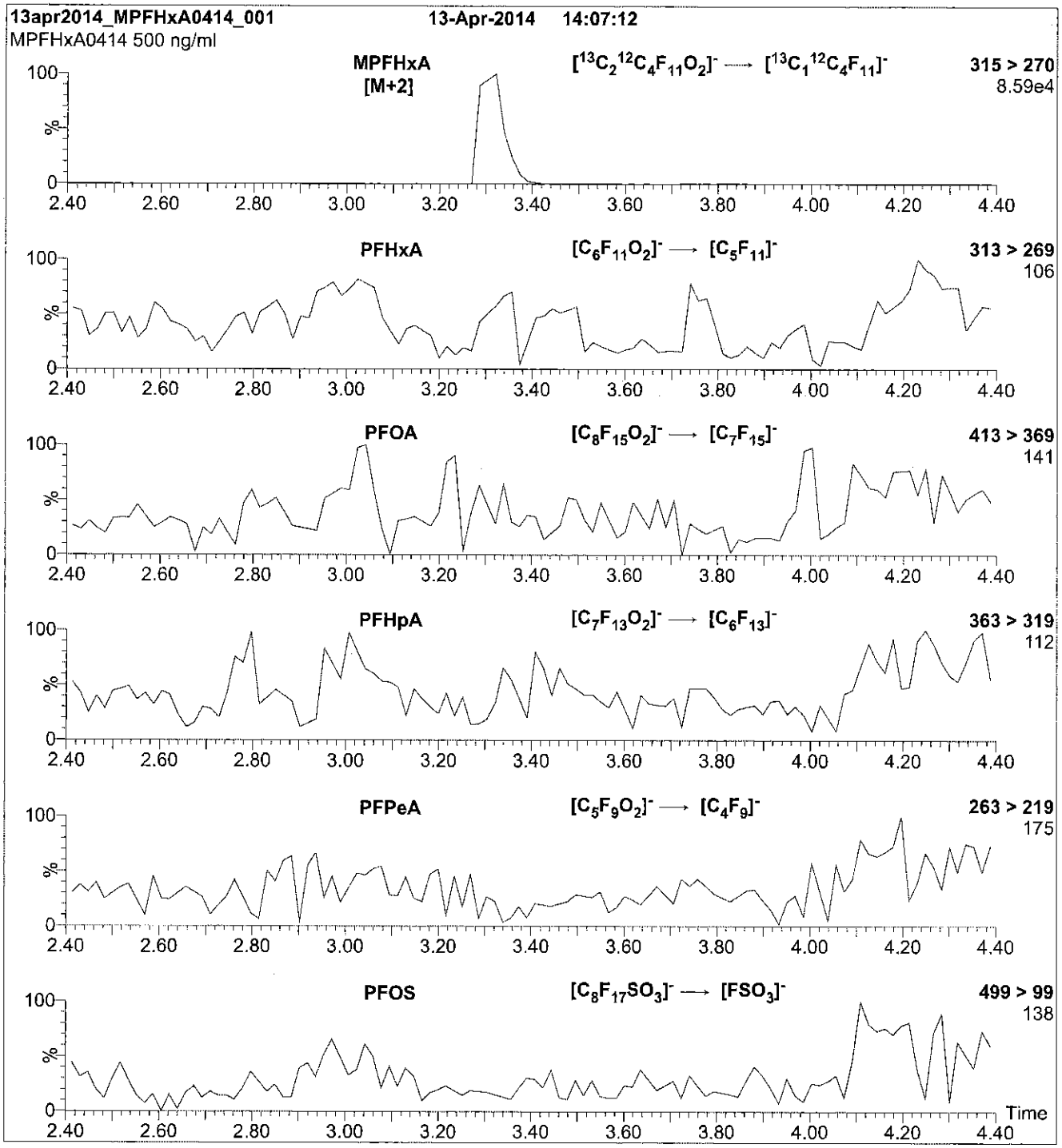
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxA_00007

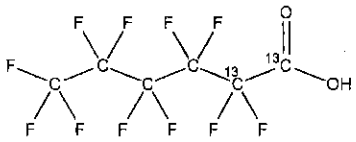
R: 2/25/16 CBW

587893
ID: LCMPFHxA_00007
Exp:04/09/20 Prpd:CBW Opn:02/25/16
13C2-Perfluorohexanoic ac

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
LOT NUMBER: MPFHxA0415
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_4HF_{11}O_2$
MOLECULAR WEIGHT: 316.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 04/09/2015
EXPIRY DATE: (mm/dd/yyyy) 04/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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Certified By: B.G. Chittim **Date:** 04/14/2015 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED

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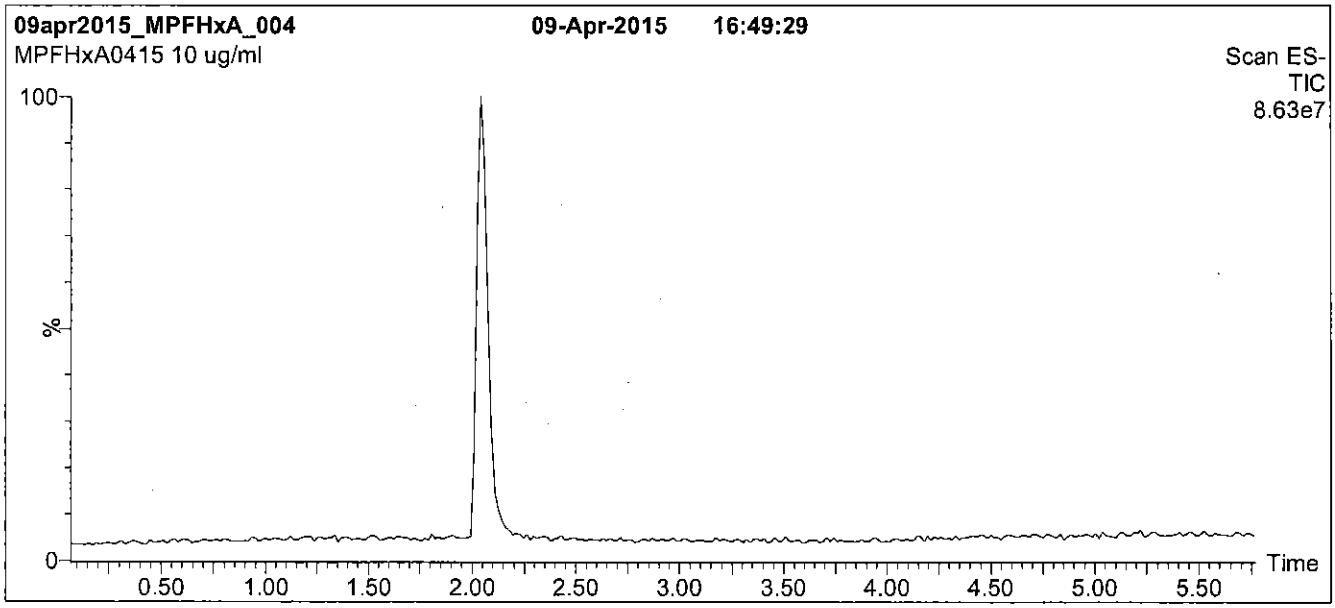
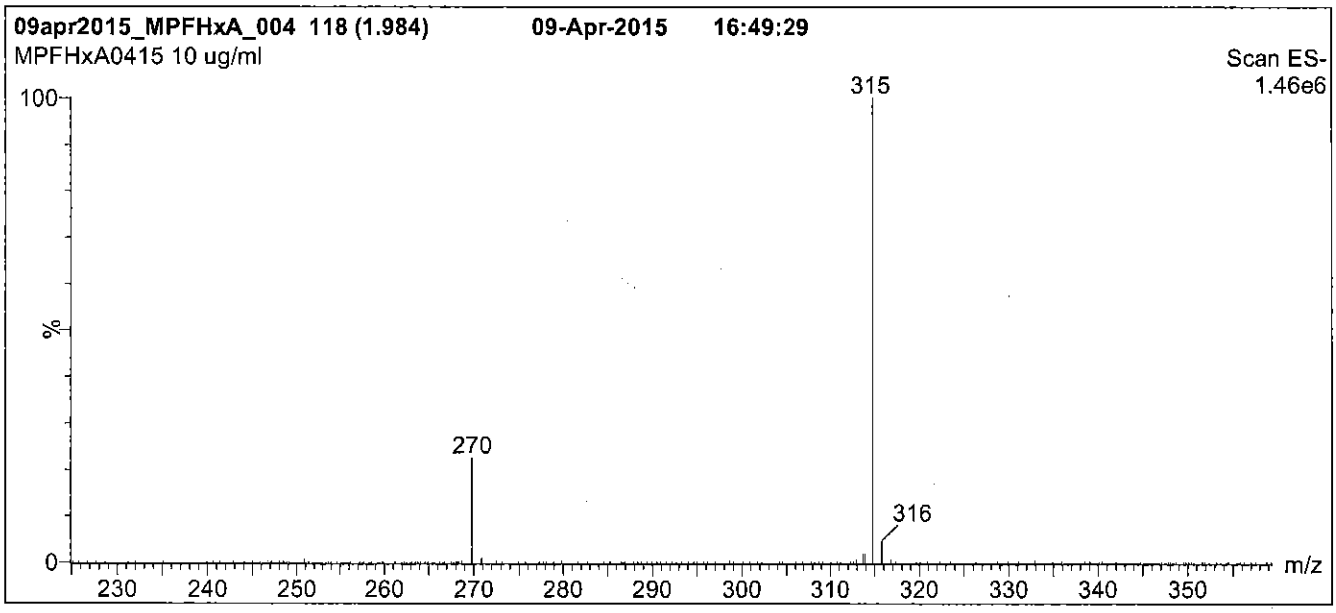
Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

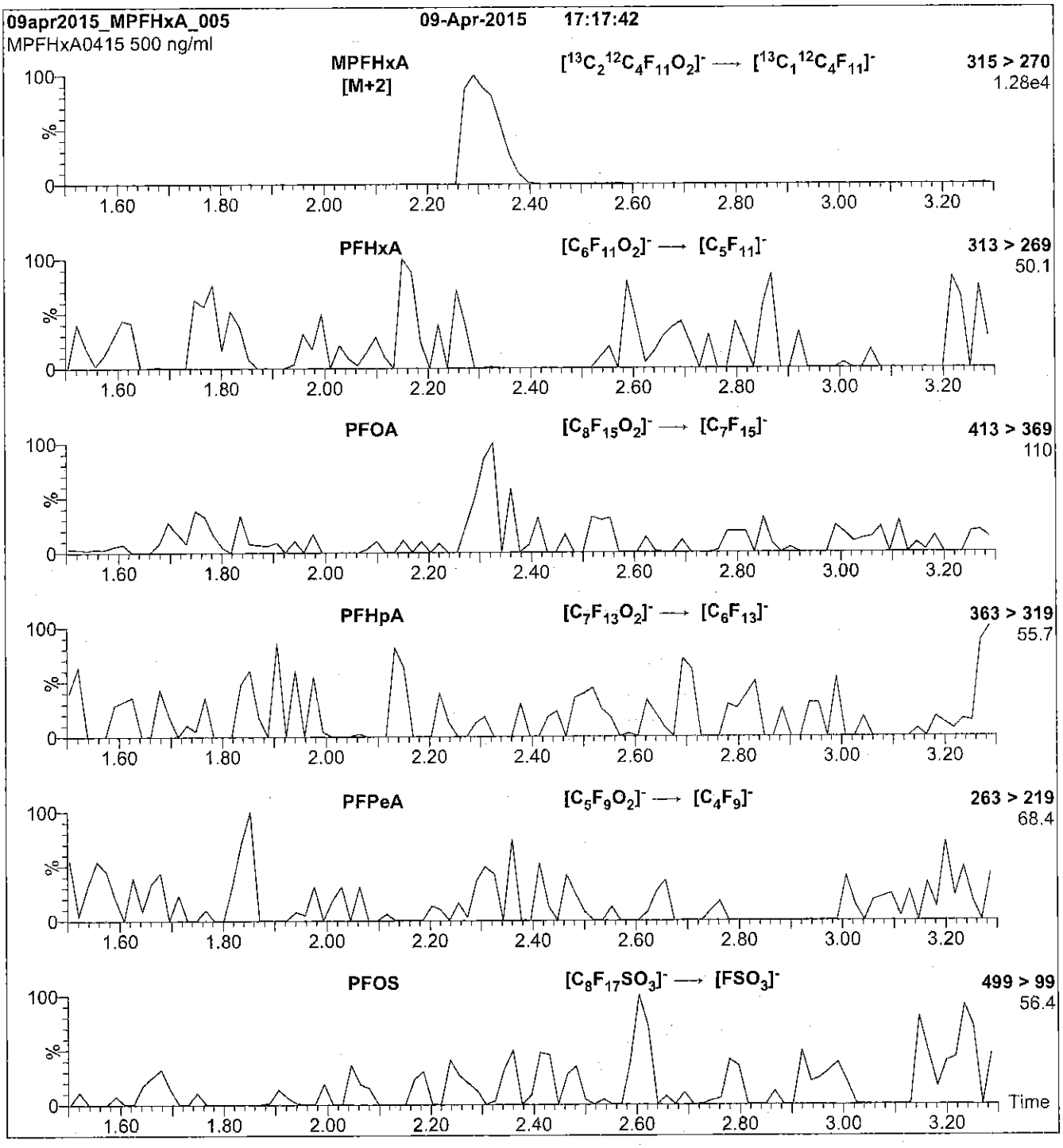
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 10

Reagent

LCMPFHxA_00008

Rec. 3/29/16 JRB ✓

WELLINGTON LABORATORIES

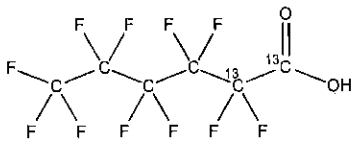
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

LOT NUMBER: MPFHxA0415

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	04/09/2015		
EXPIRY DATE: (mm/dd/yyyy)	04/09/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/14/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA Testing Accredited by A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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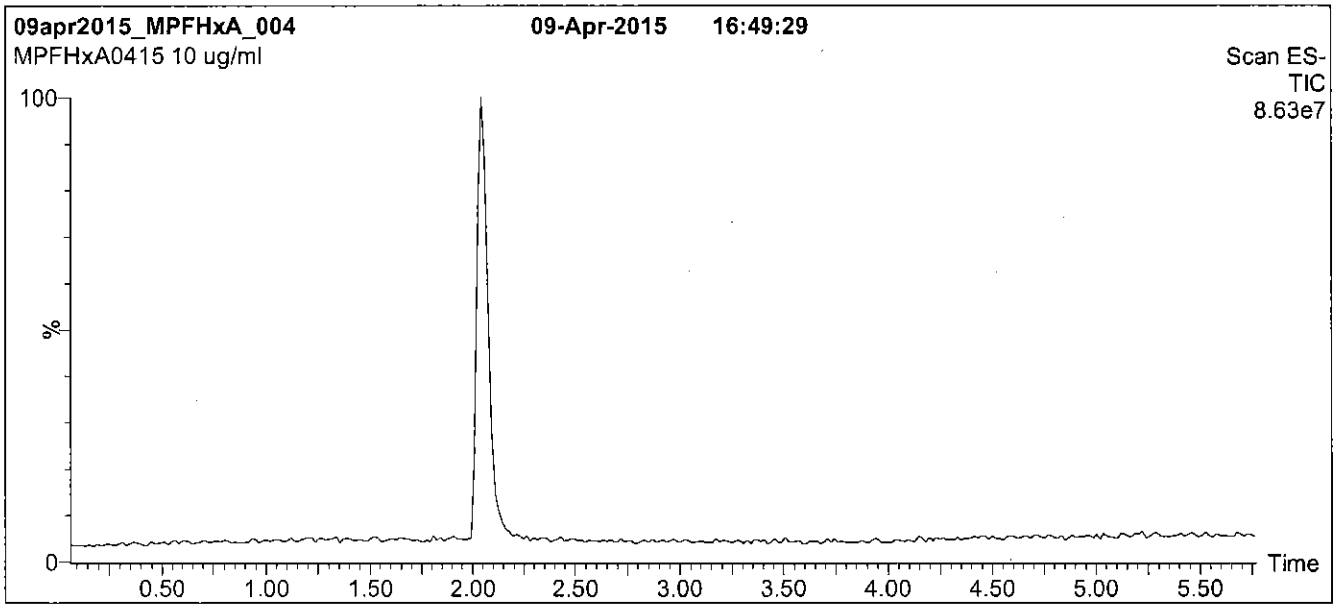

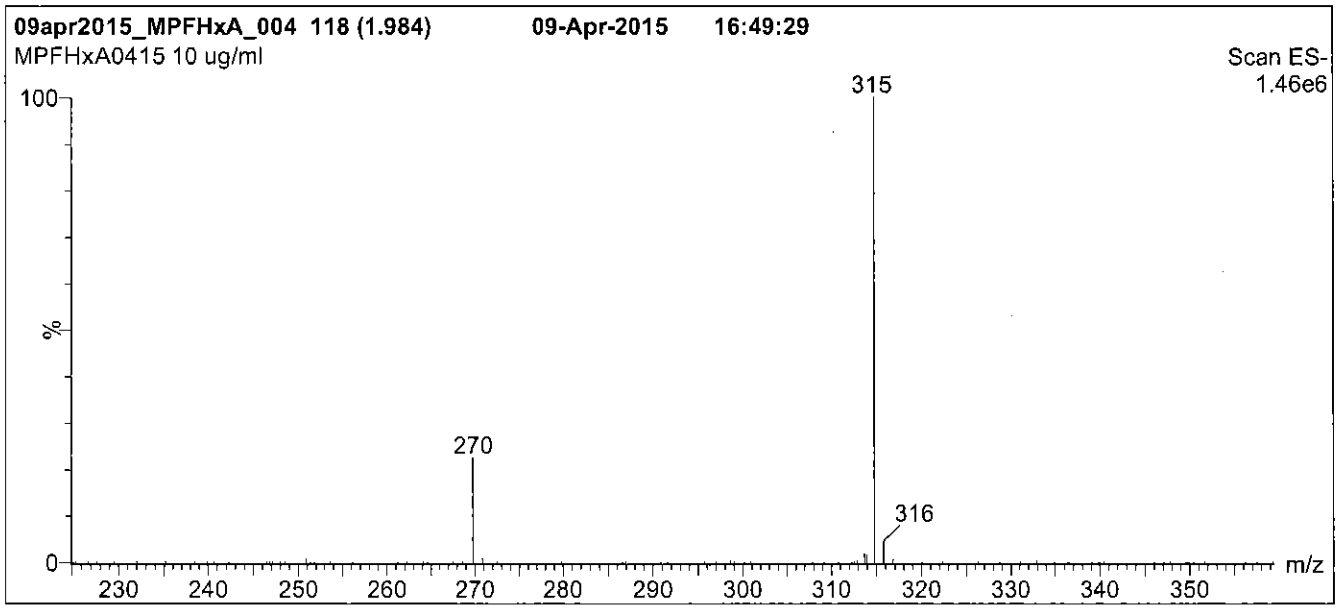

Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
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Cone Voltage (V) = 15.00
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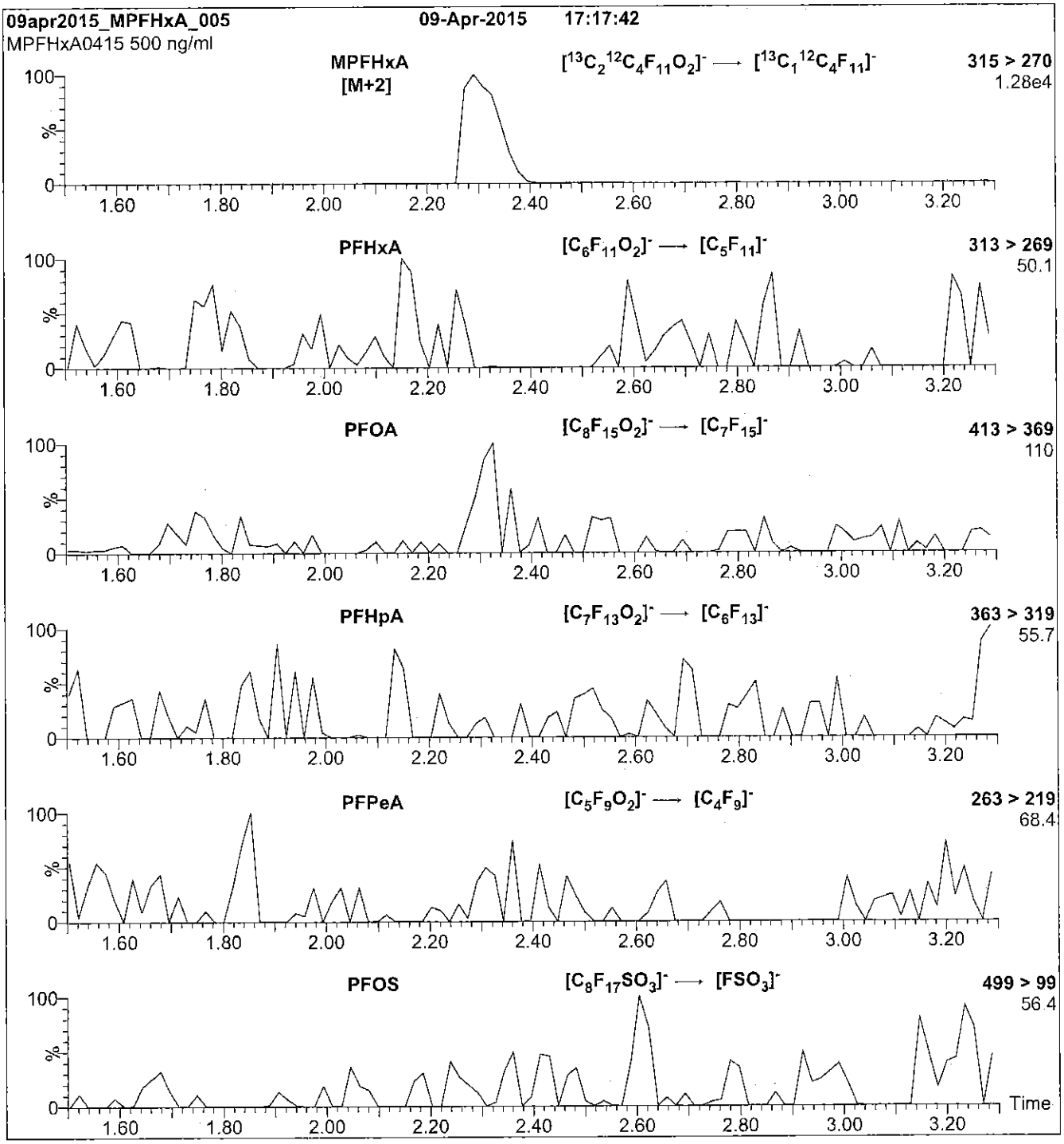
Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 10

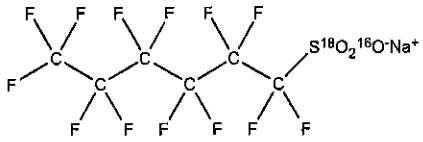
Reagent

LCMPFHxS_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFHxS	**LOT NUMBER:**	MPFHxS0713
COMPOUND:	Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (MPFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	07/25/2013		
EXPIRY DATE: (mm/dd/yyyy)	07/25/2018		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/30/2015 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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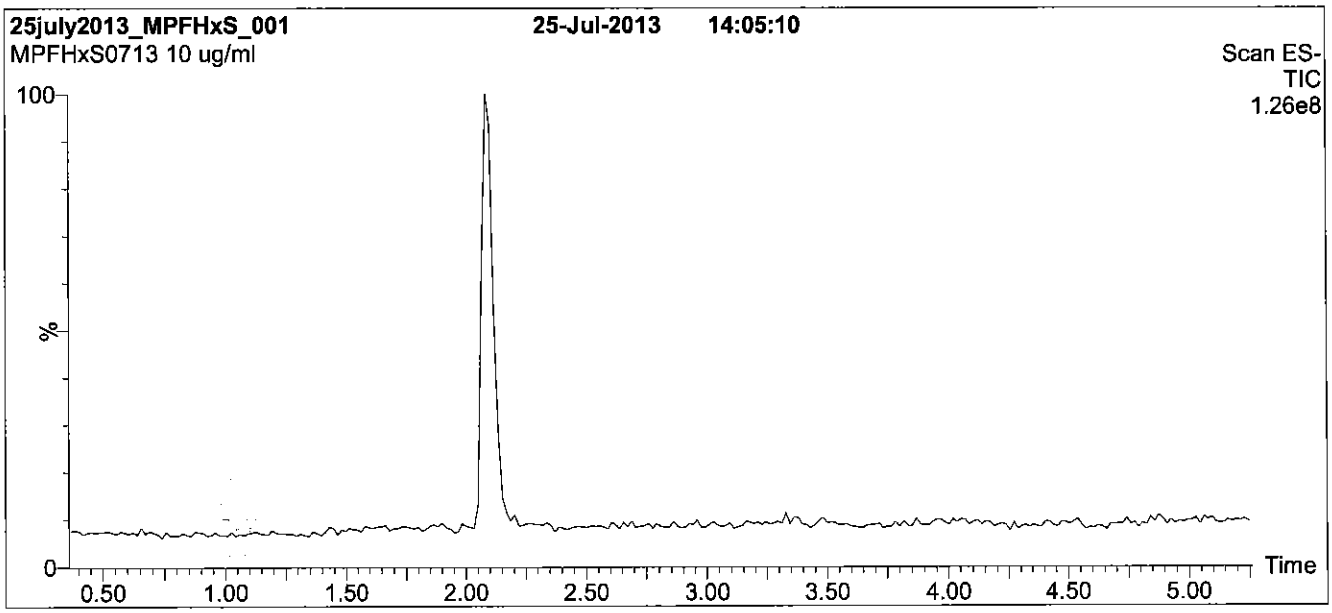

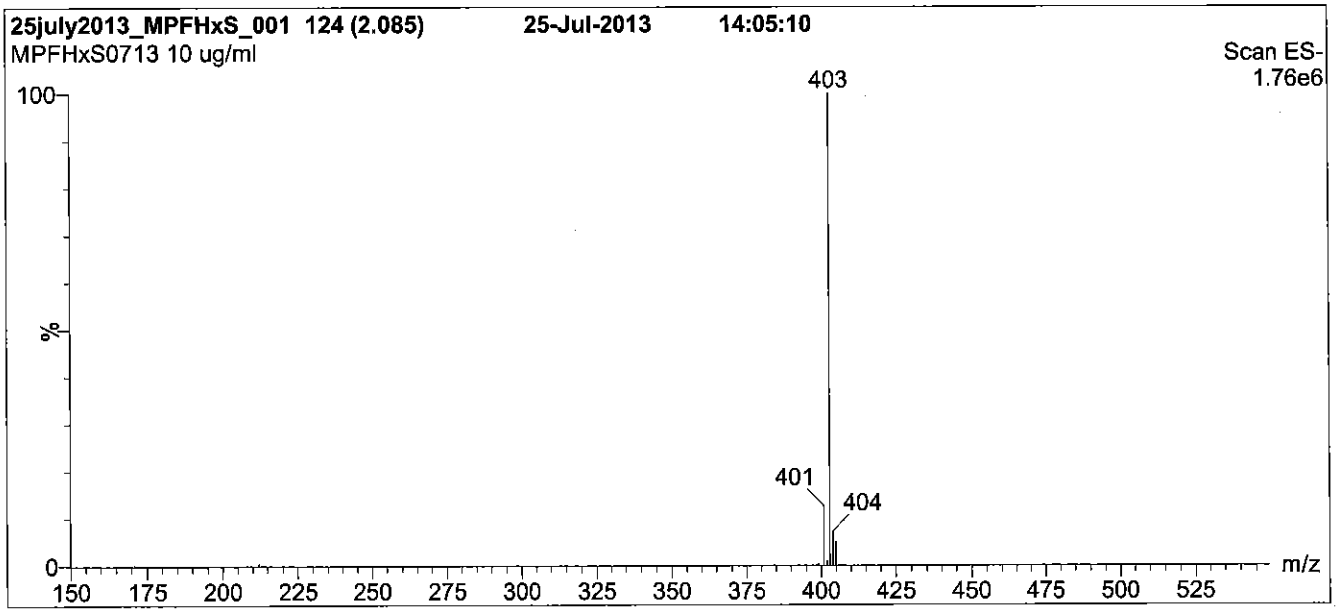

Conditions for Figure 1:

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MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

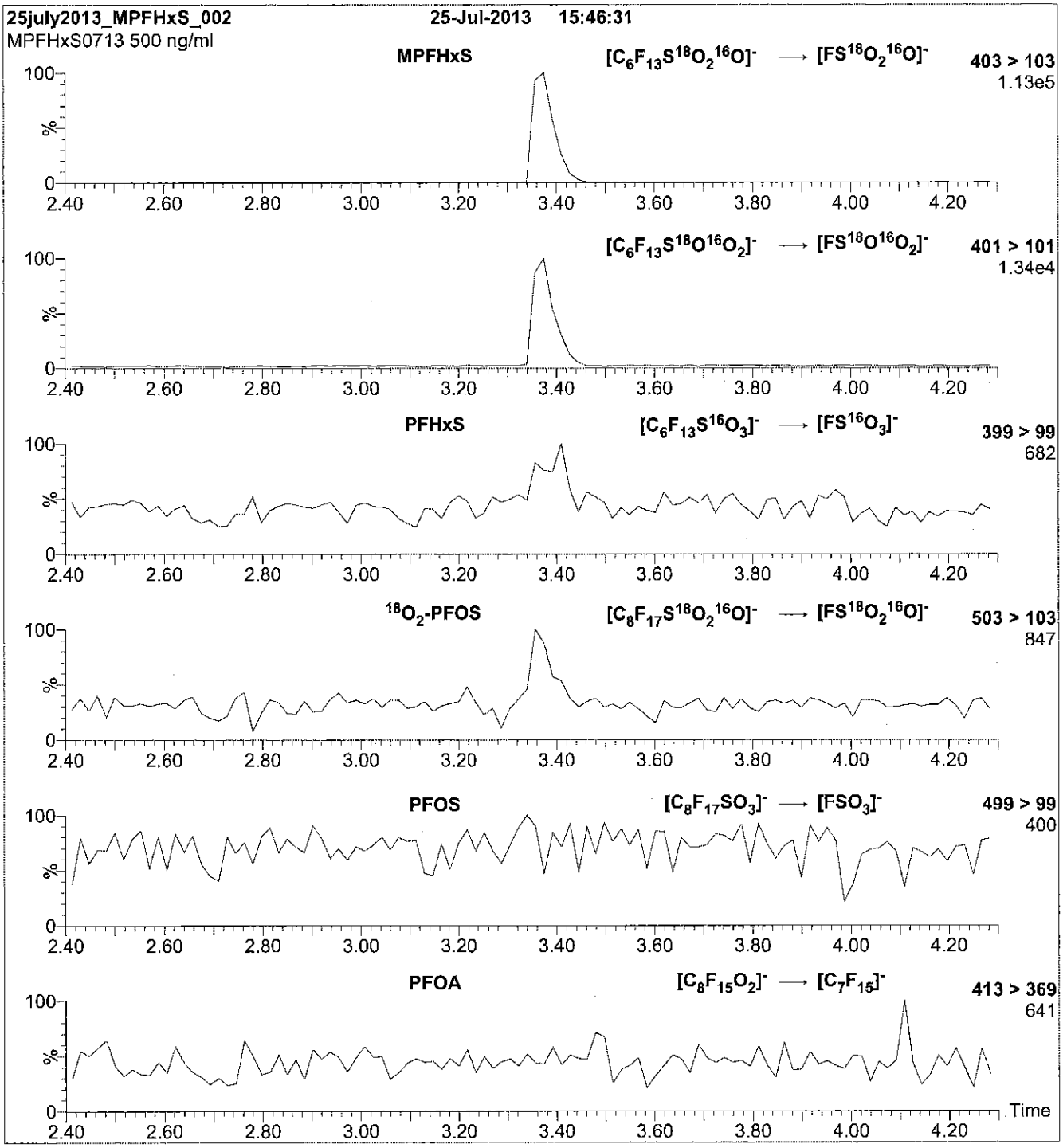
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 30

Reagent

LCMPFHxS_00006

609705
ID: LCMPFHxS_00006
Exp: 10/23/20 Prpd: CBW
18O2-Perfluorohexanesulfo

R: 4/7/16 CBW

WELLINGTON LABORATORIES

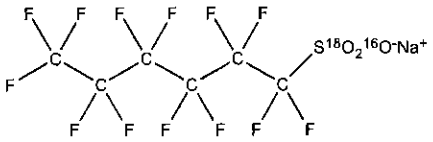
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxS
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

LOT NUMBER: MPFHxS1015

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$	**MOLECULAR WEIGHT:**	426.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
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CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	>94% ($^{18}O_2$)
LAST TESTED: (mm/dd/yyyy)	10/23/2015		
EXPIRY DATE: (mm/dd/yyyy)	10/23/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/28/2015 (mm/dd/yyyy)

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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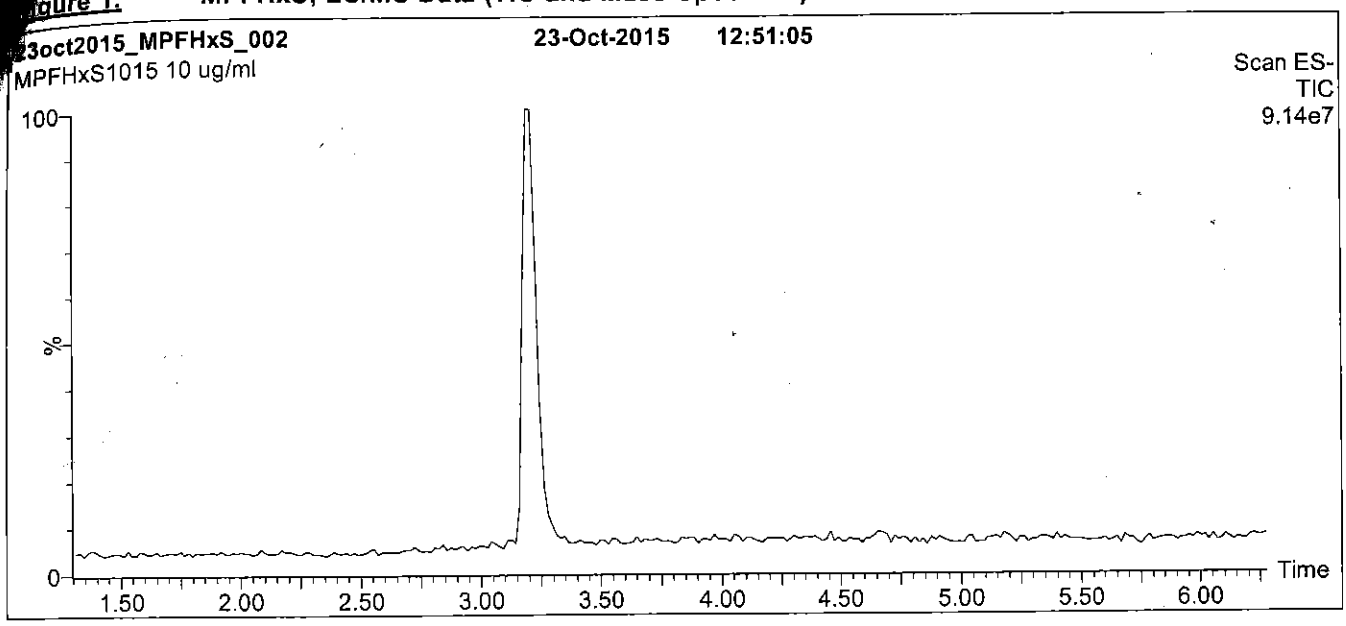
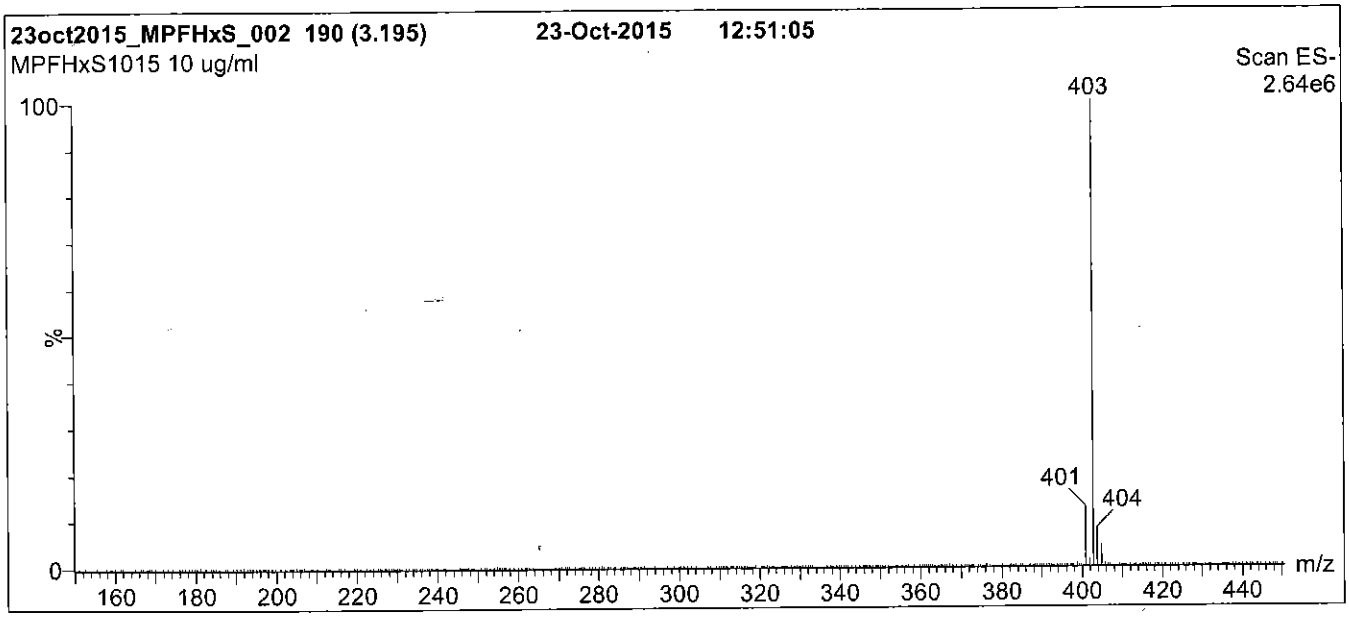
Figure 1: MPFHxS; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

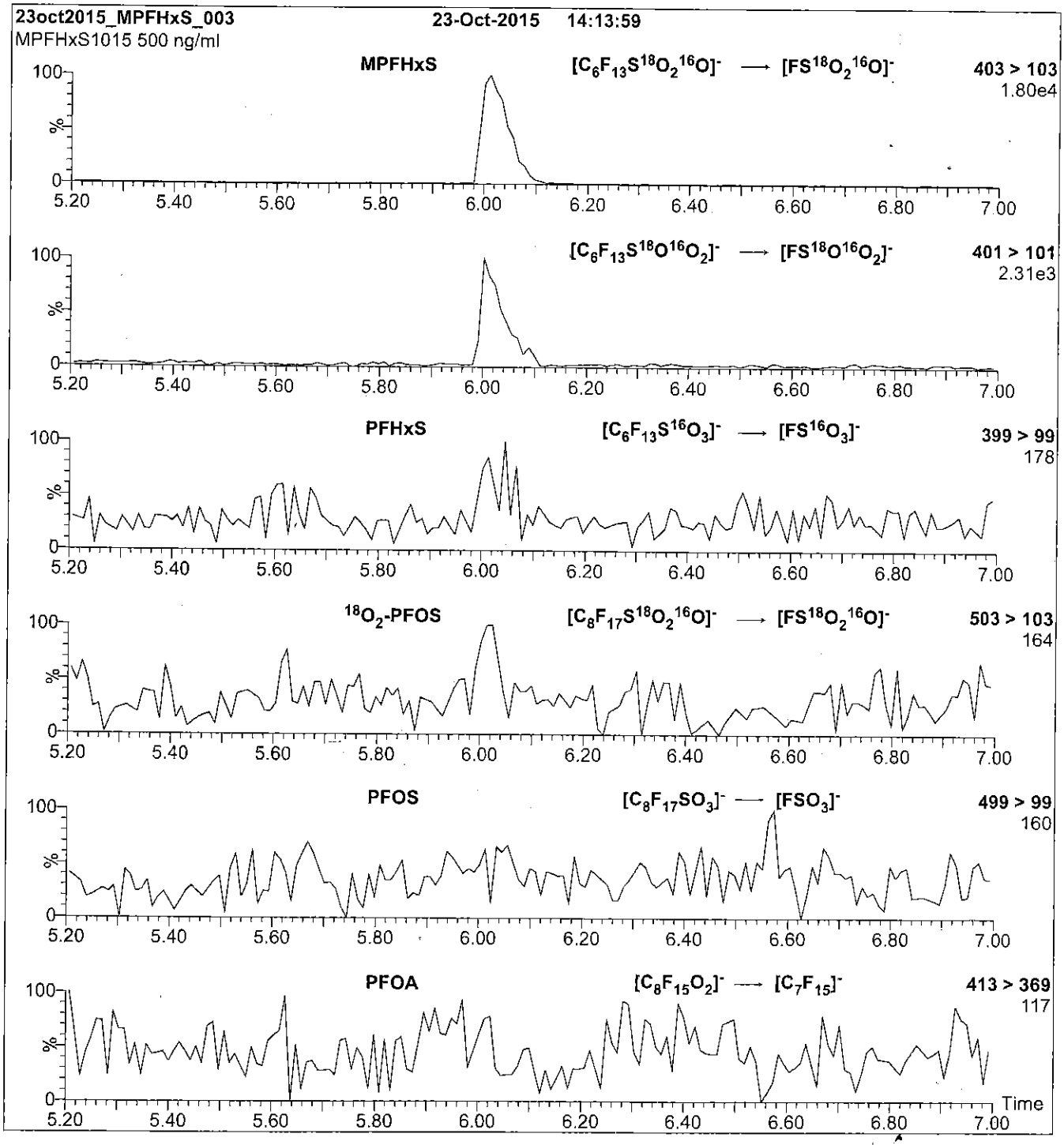
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

Reagent

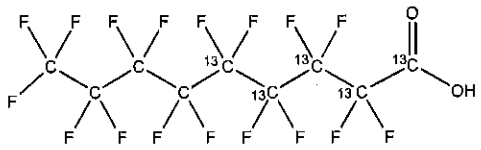
LCMPFNA_00003

V 2/11/15 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA0414
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	04/13/2014		
EXPIRY DATE: (mm/dd/yyyy)	04/13/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/13/2014 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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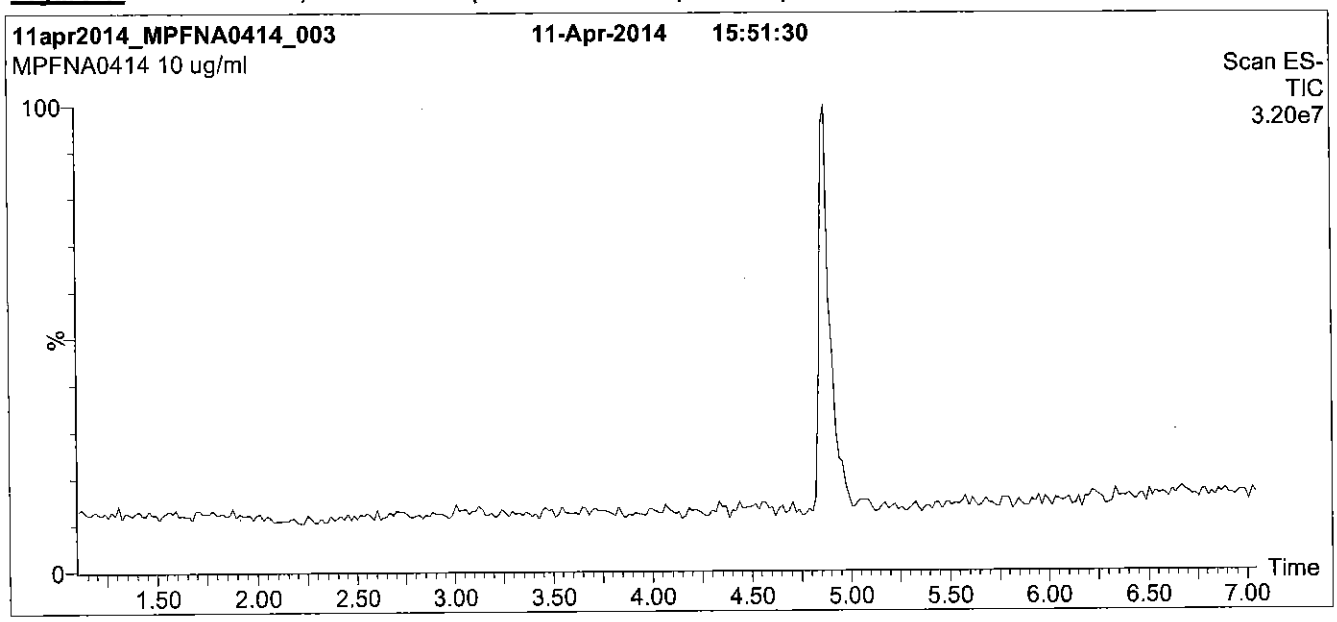
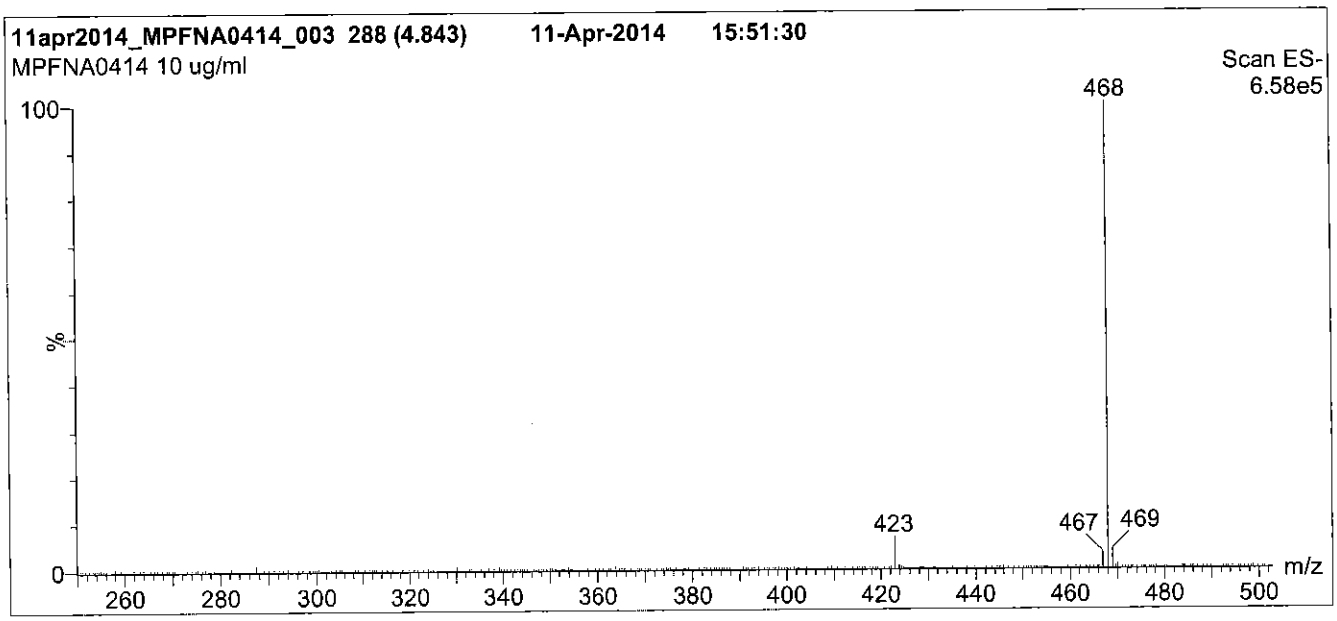




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

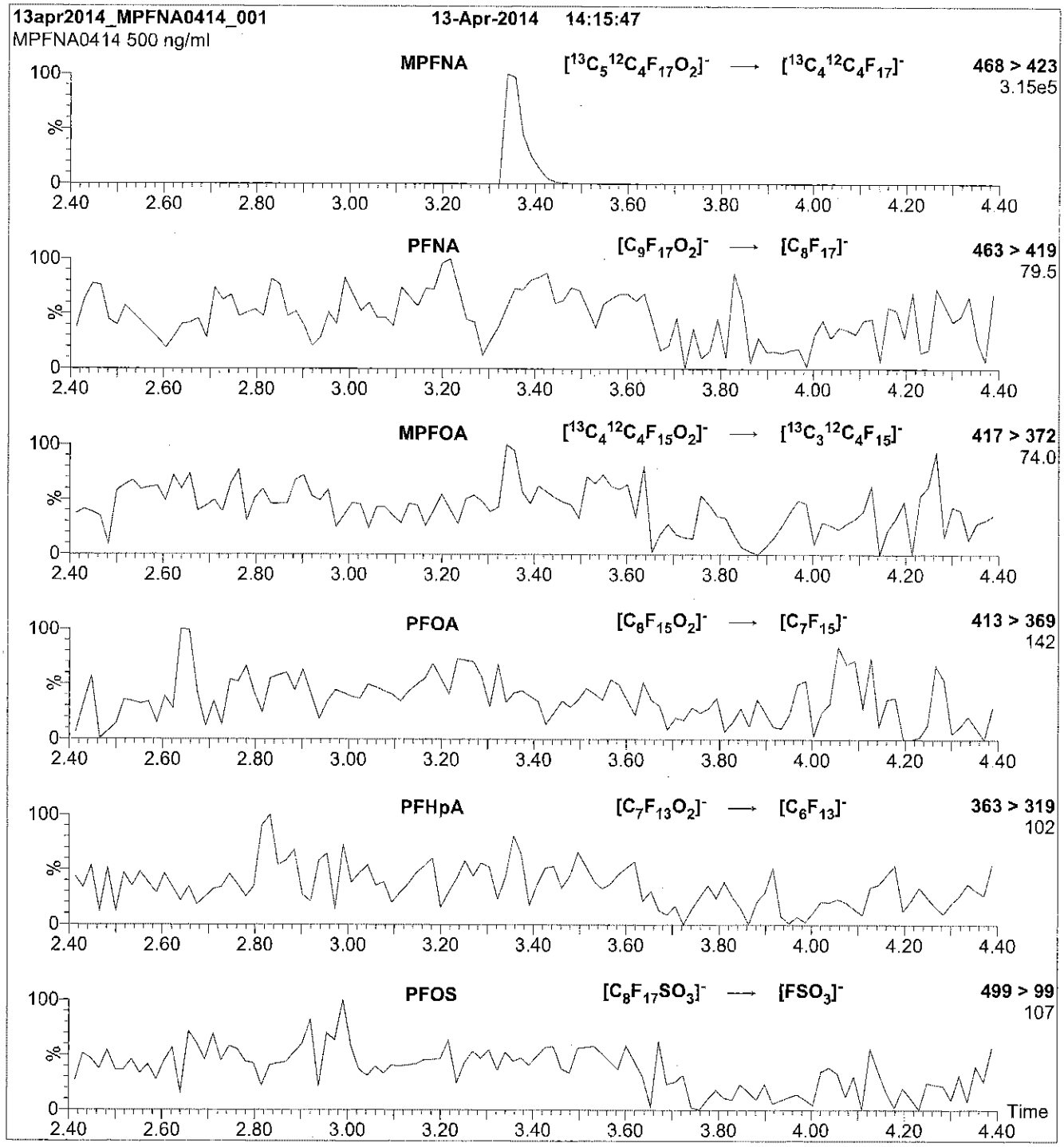
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFNA_00004

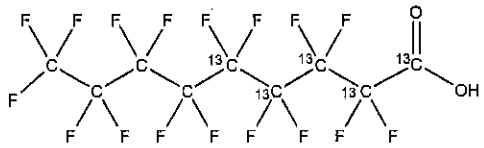
R: 2/25/16 CBW

587894
ID: LCMPFNA_00004
Exp:04/13/19 Prpd:CBW Opn:02/25/15
13C5-Perfluornonanoic aci

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFNA
LOT NUMBER: MPFNA0414
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4,5\text{-}^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	04/13/2014		
EXPIRY DATE: (mm/dd/yyyy)	04/13/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

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

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Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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CALA

ANAB ACCREDITED

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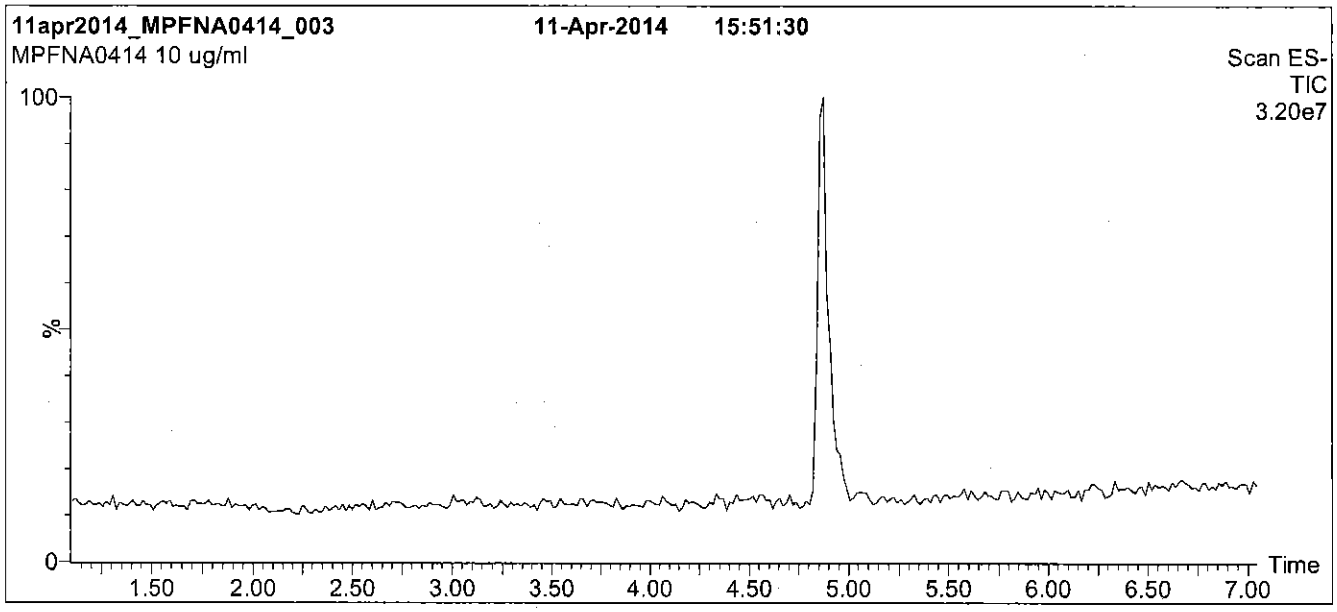

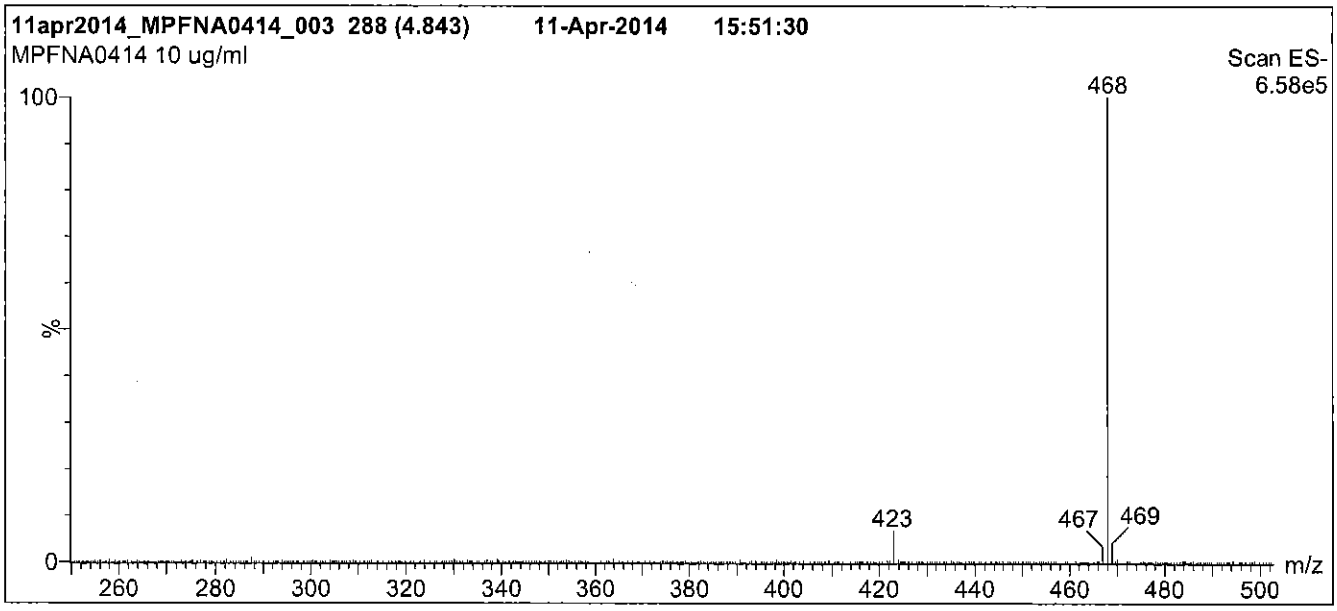

Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

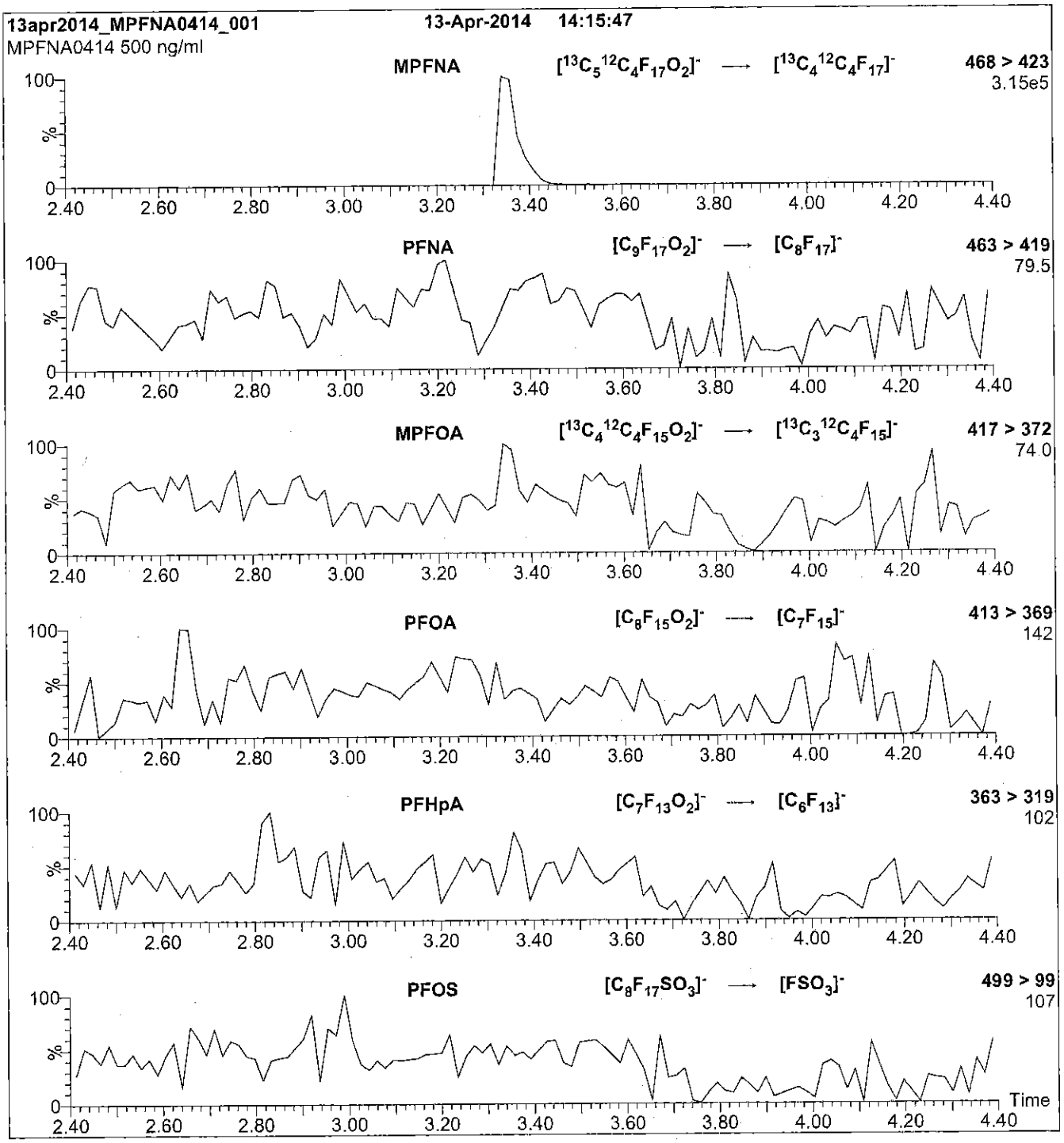
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml MPFNA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFNA_00005

WELLINGTON LABORATORIES

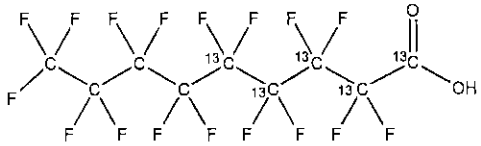
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFNA
COMPOUND: Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid

LOT NUMBER: MPFNA0414

STRUCTURE:

CAS #: Not available



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CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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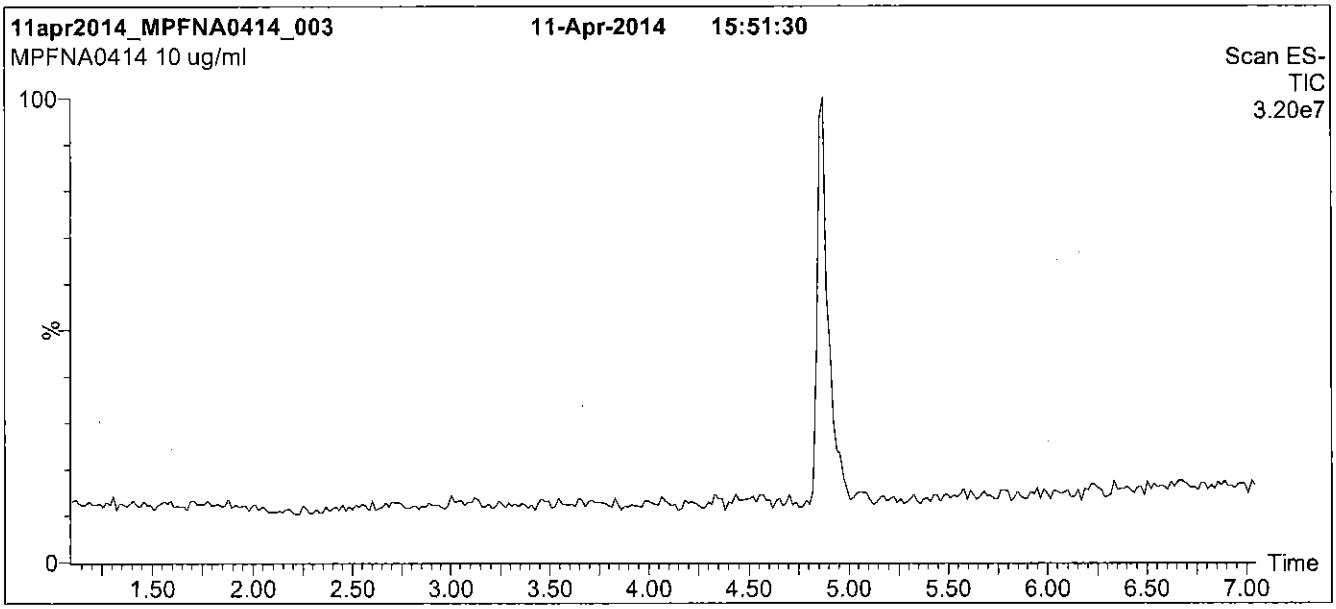

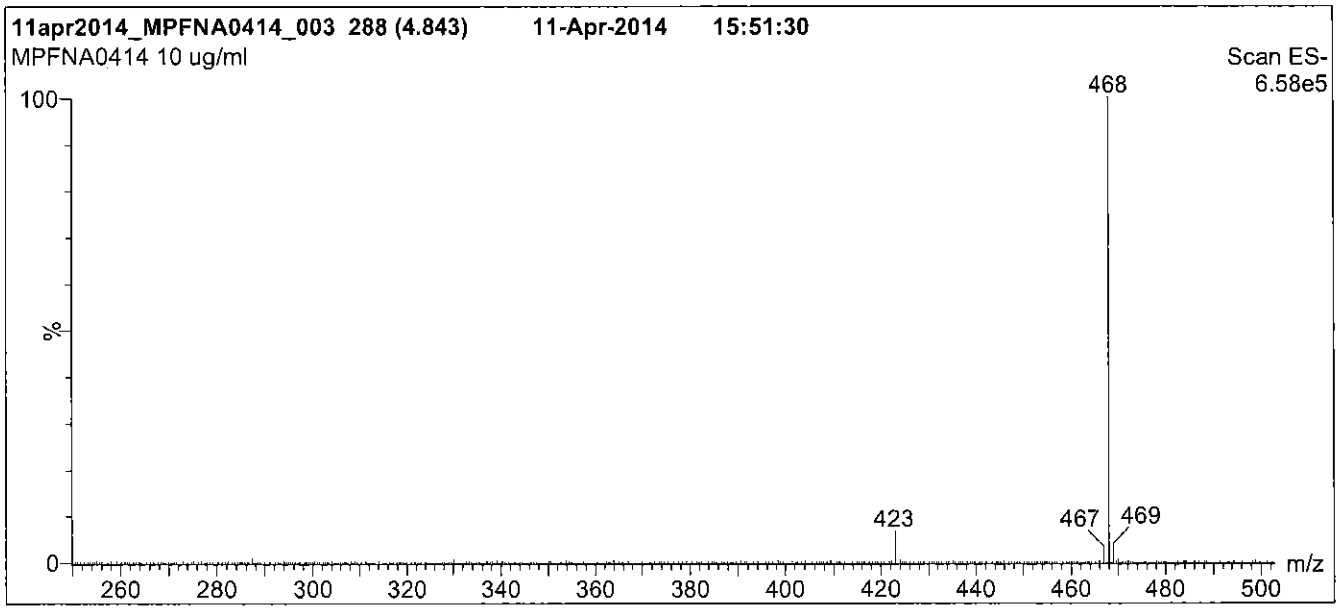

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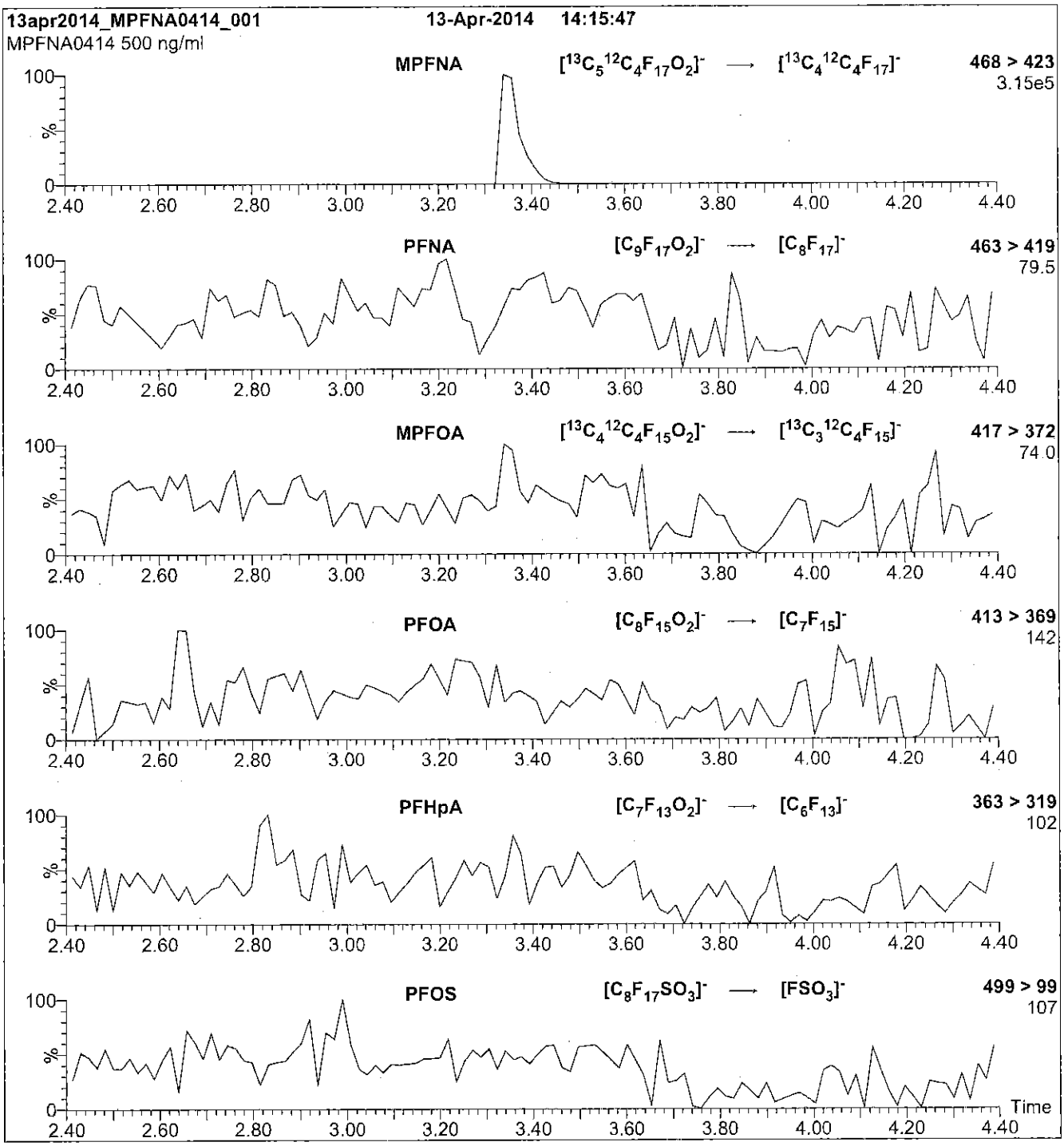
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00007

V: 9/15/15 BV

WELLINGTON LABORATORIES

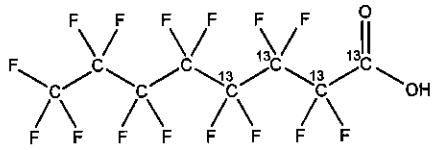
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

LOT NUMBER: MPFOA0415

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	04/10/2015		
EXPIRY DATE: (mm/dd/yyyy)	04/10/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/10/2015 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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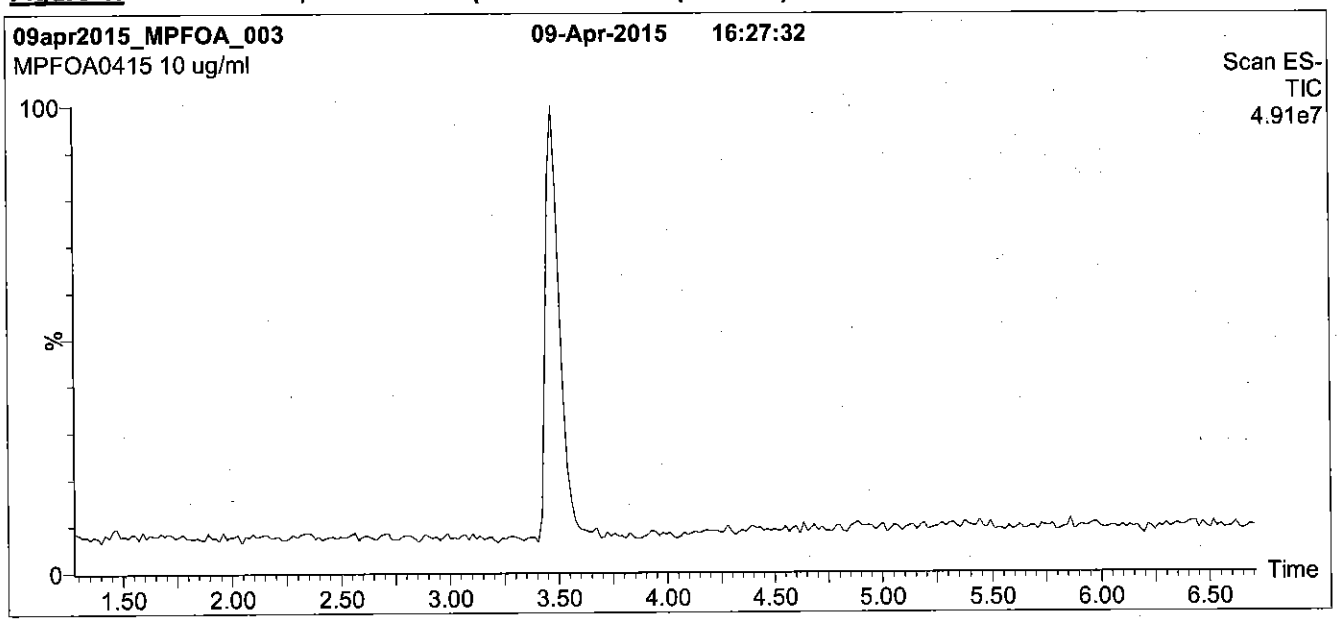
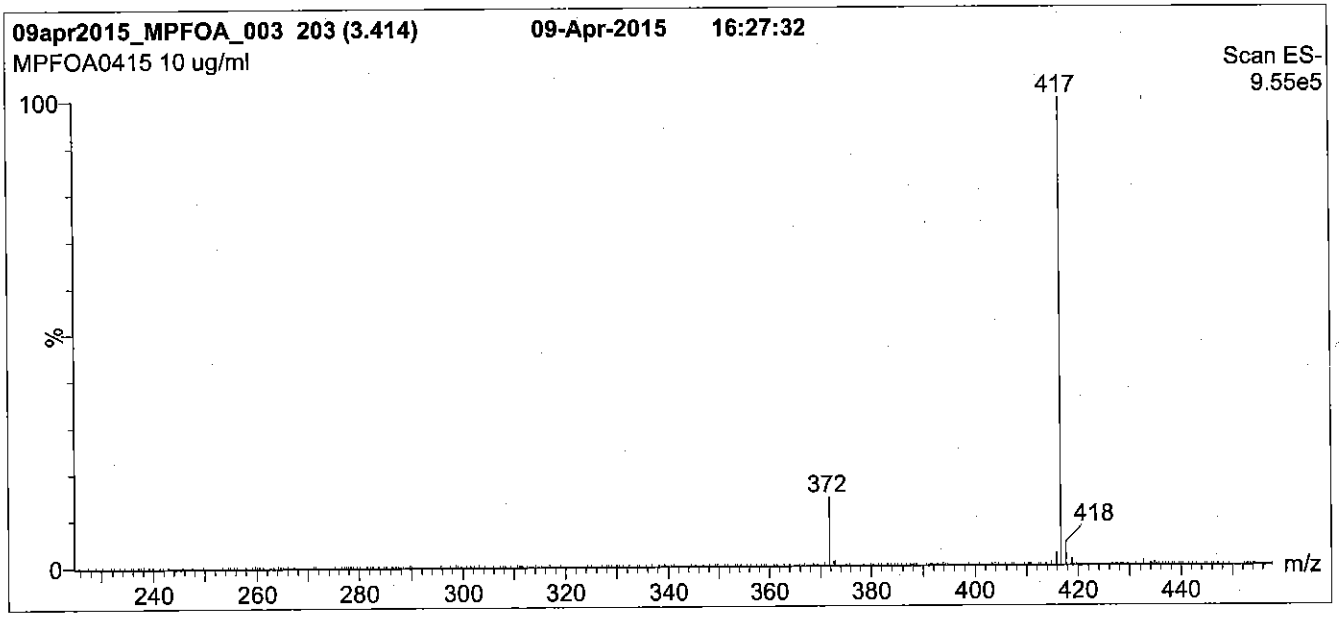
Figure 1: **MPFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

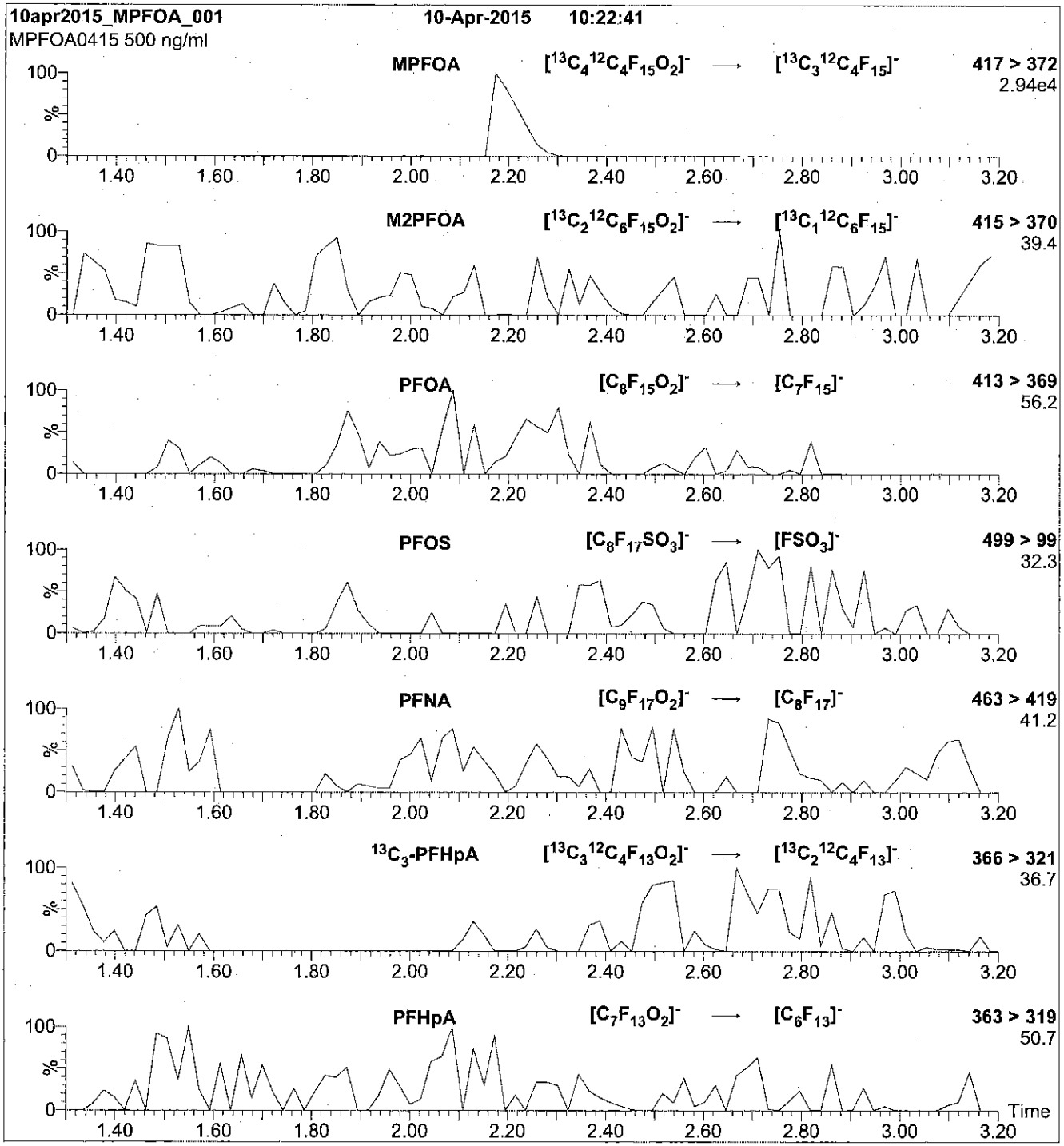
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00008

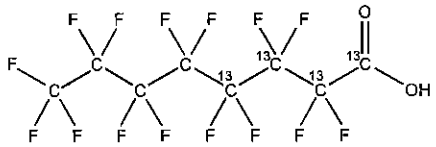
572885
ID: LCMPFOA_00008
Exp 04/10/20 Prpd: CBW
13C4-Perfluorooctanoic ac

R: 1/25/16
S:

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFOA
LOT NUMBER: MPFOA0415
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4HF_{15}O_2$	**MOLECULAR WEIGHT:**	418.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	04/10/2015		
EXPIRY DATE: (mm/dd/yyyy)	04/10/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

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Certified By: B.G. Chittim **Date:** 04/10/2015 (mm/dd/yyyy)

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

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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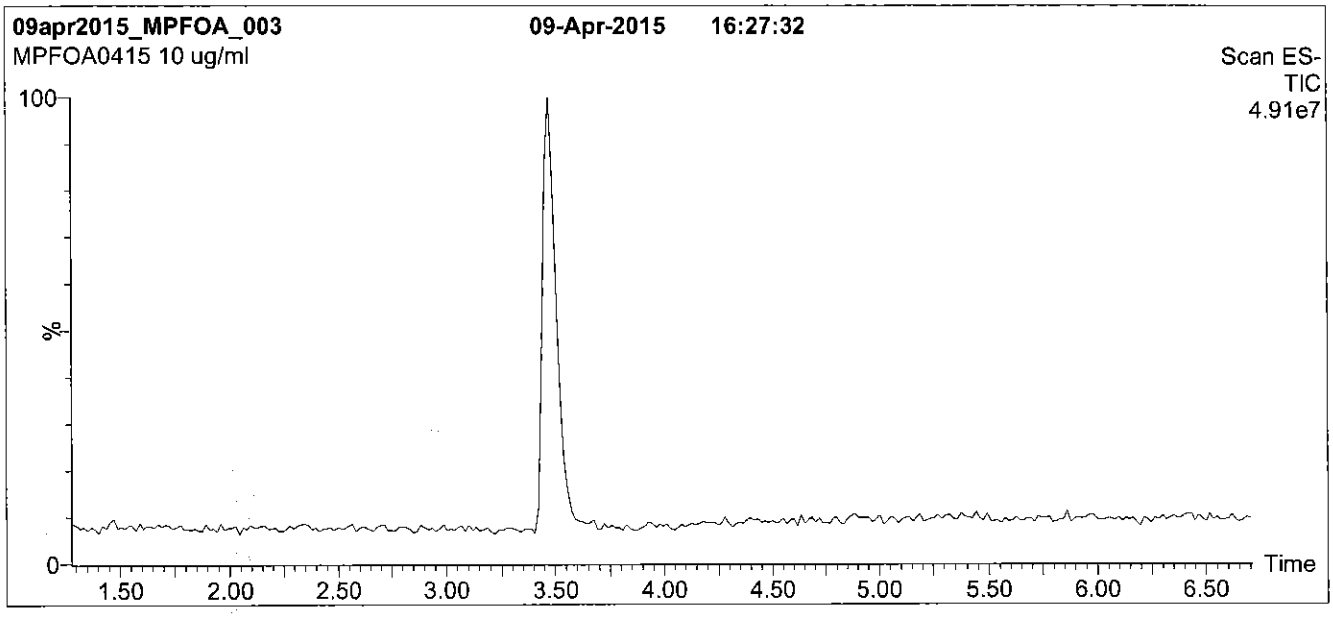
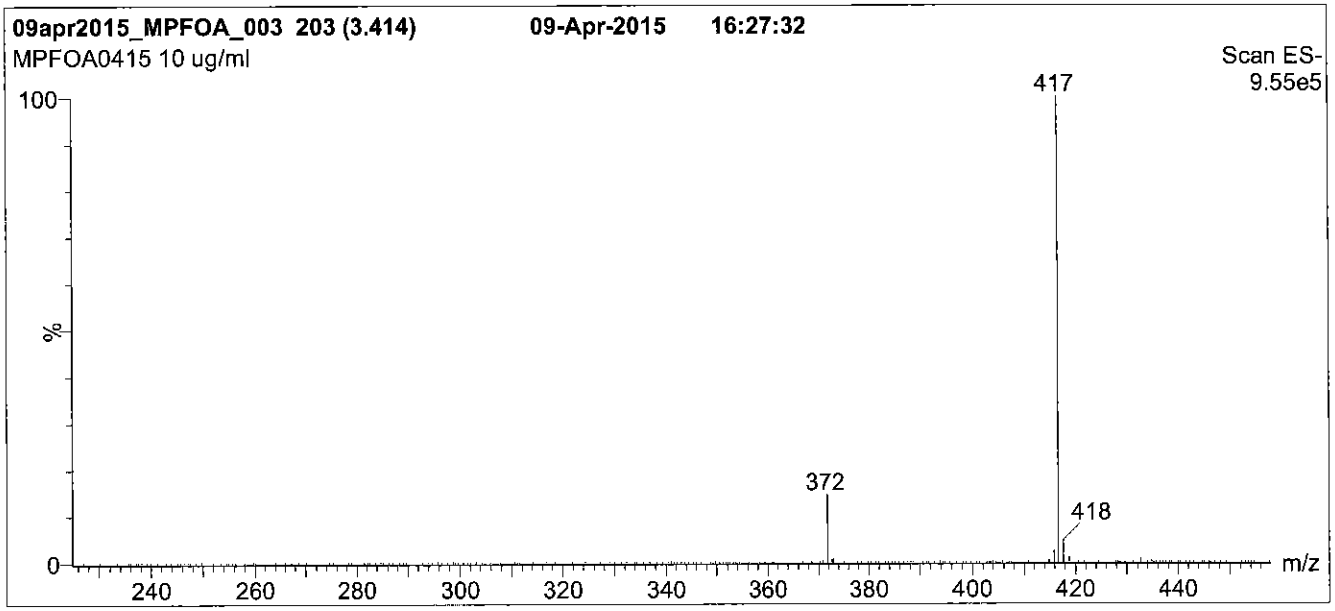




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

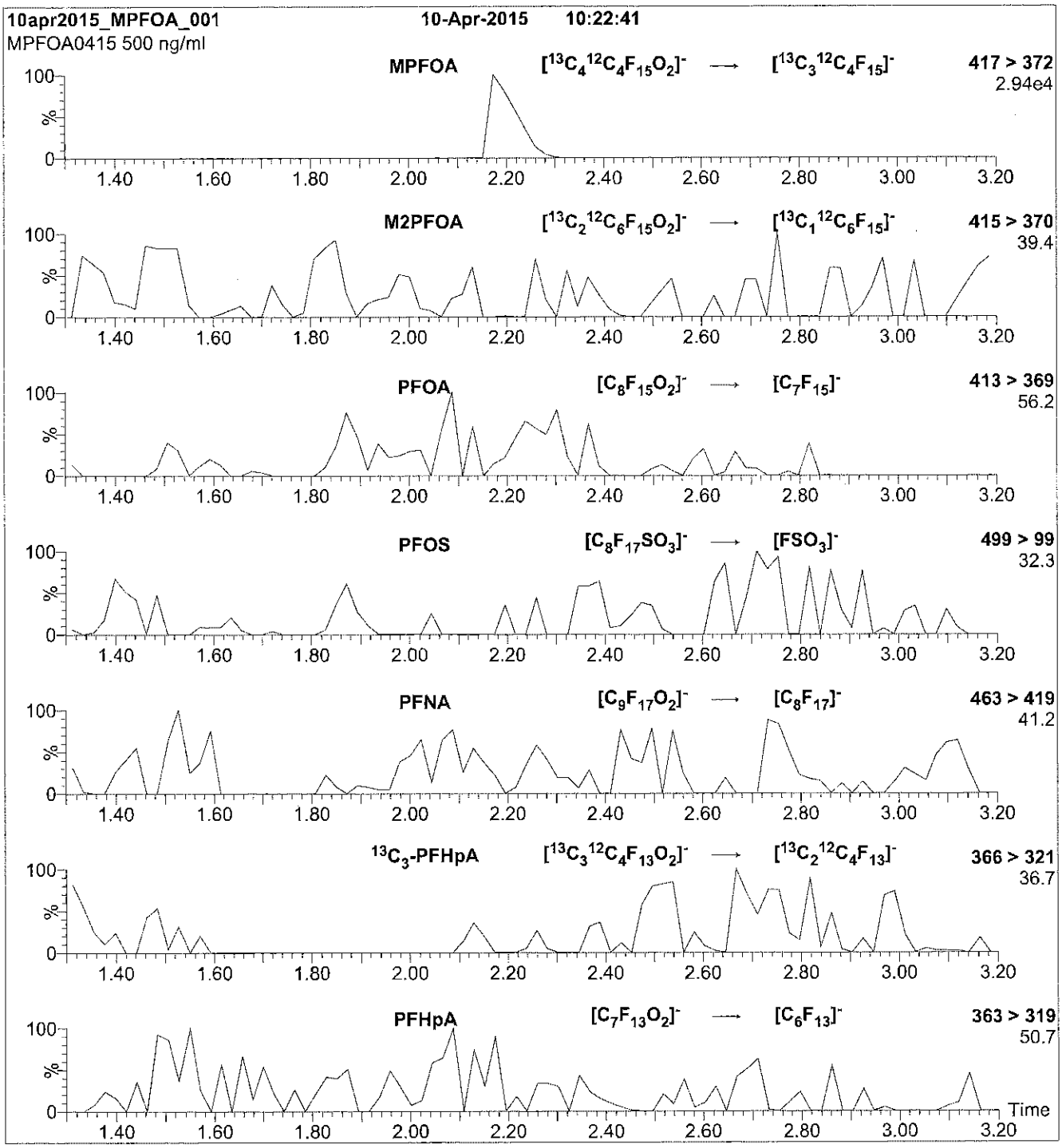
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCMPFOA_00010

609713
ID: LCMPFOA_00010
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanoic ac

R: 4/7/16 CBW

WELLINGTON LABORATORIES

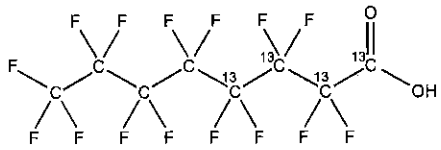
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOA
COMPOUND: Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid

LOT NUMBER: MPFOA0116

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_4{}^{12}C_4HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 418.04
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
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Certified By: B.G. Chittim **Date:** 02/01/2016 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED Reference Material Producer

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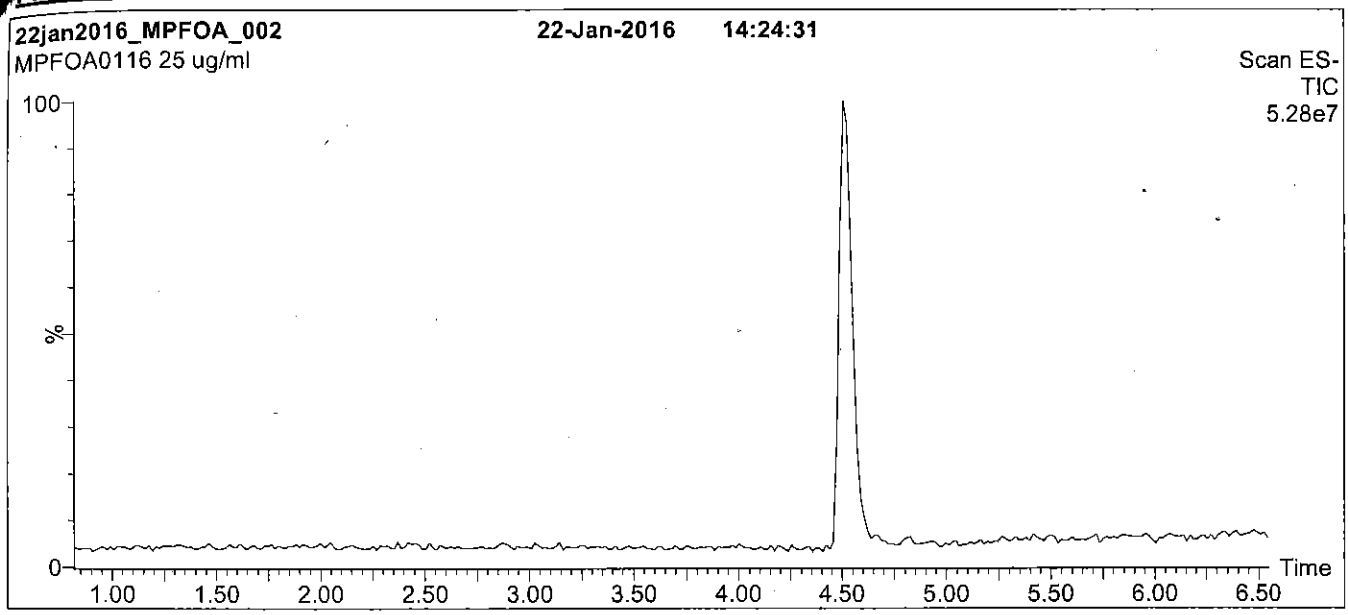

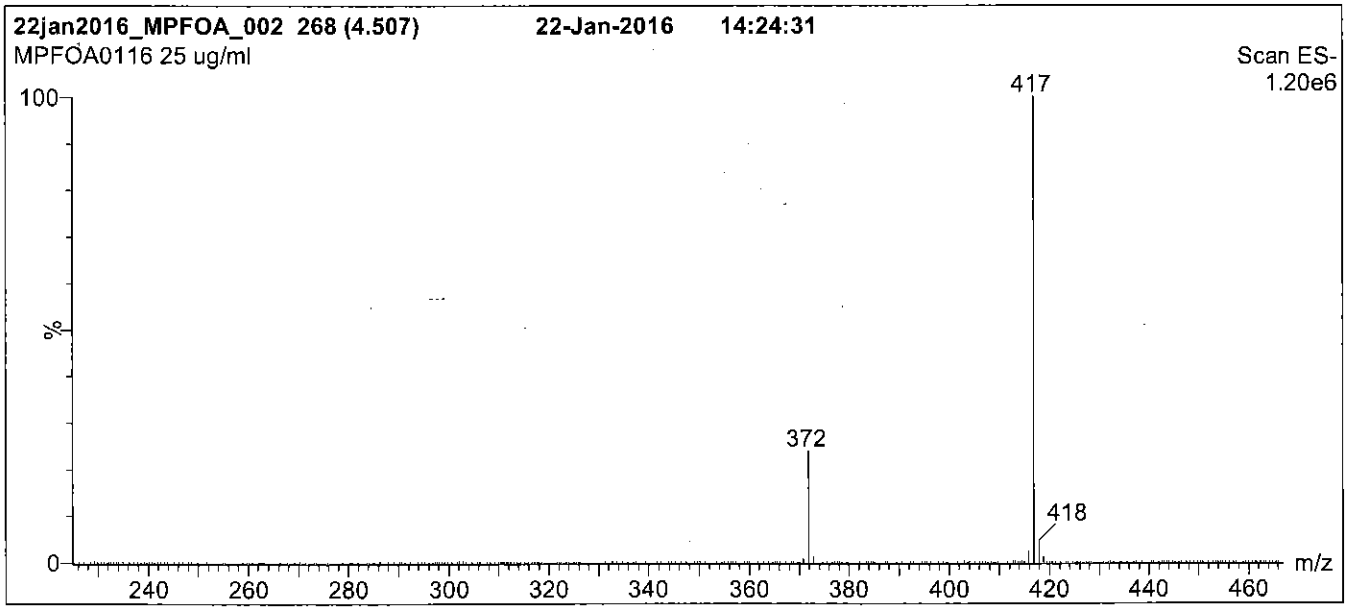

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MS: **Micromass Quattro *micro* API MS**

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

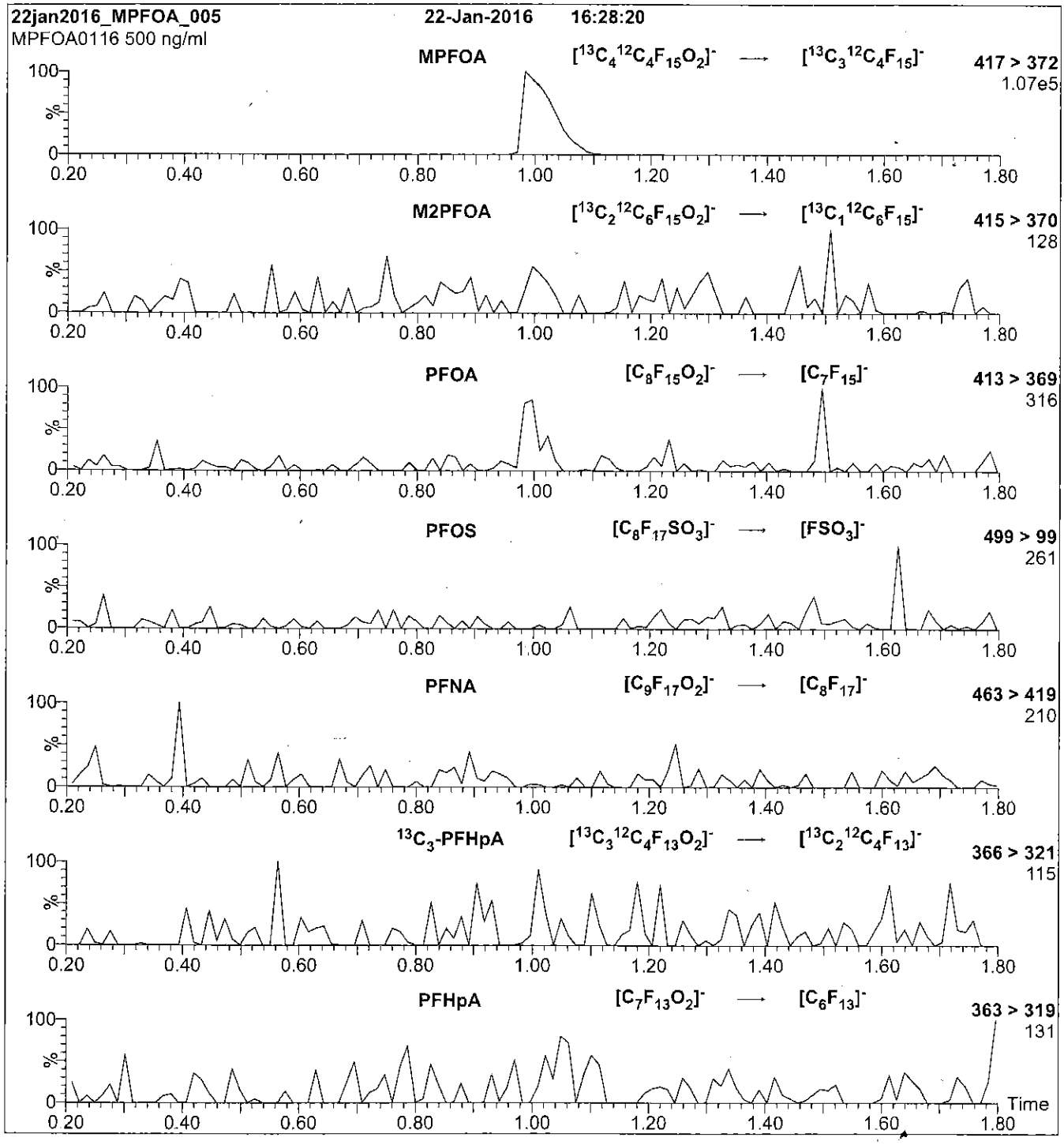
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Reagent

LCMPFOS_00009

V: 9/15/15 GV

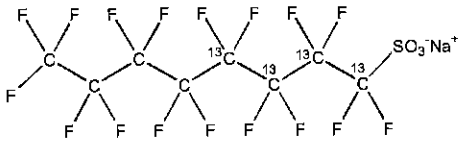
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0515

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/15/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/28/2015 (mm/dd/yyyy)

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

Form#:27, Issued 2004-11-10
Revision#:3, Revised 2015-03-24

INTENDED USE:

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

HAZARDS:

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

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

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UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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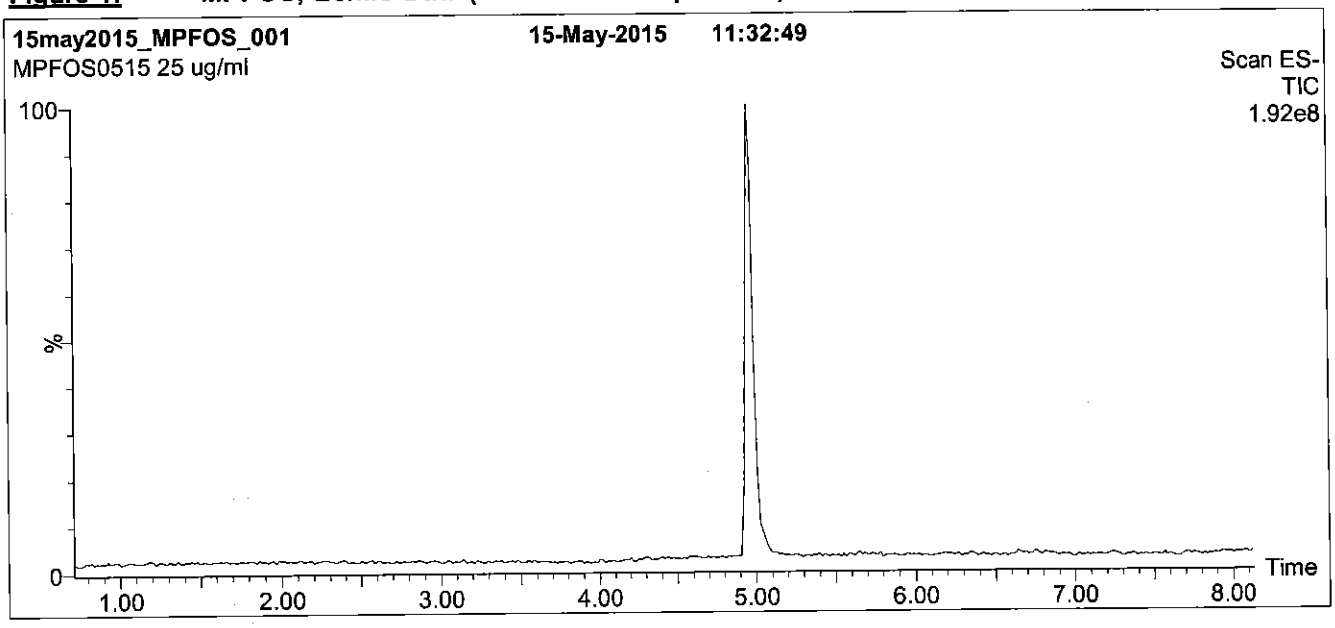
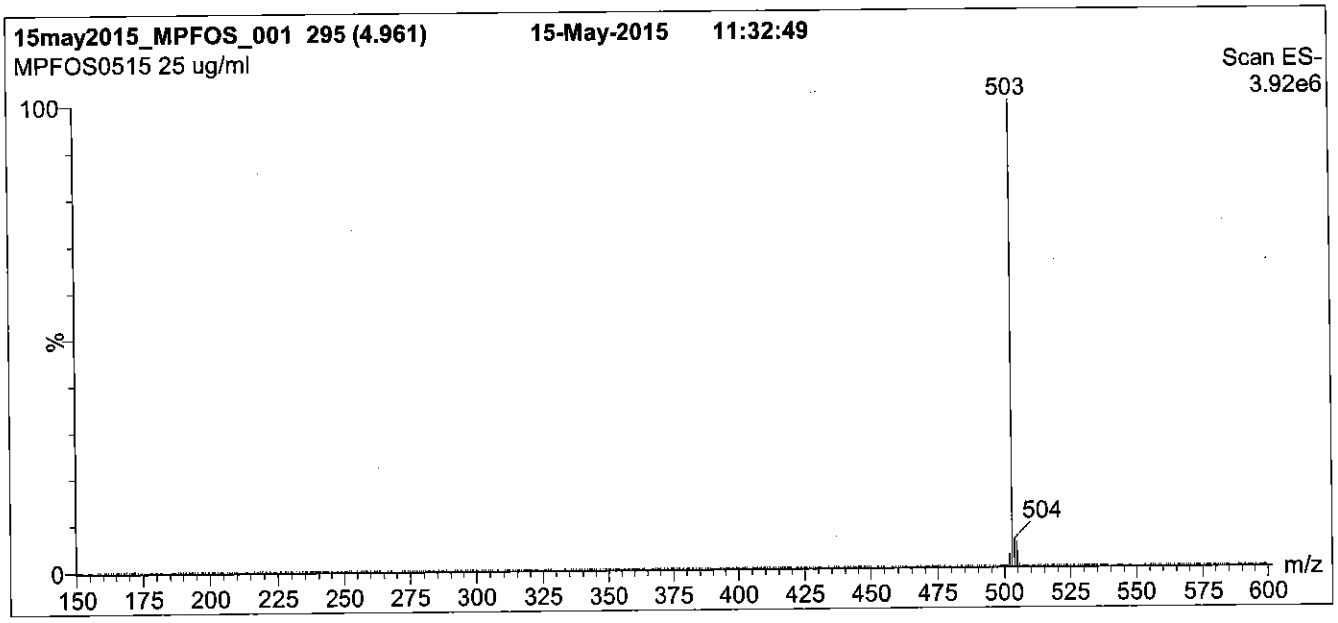
Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

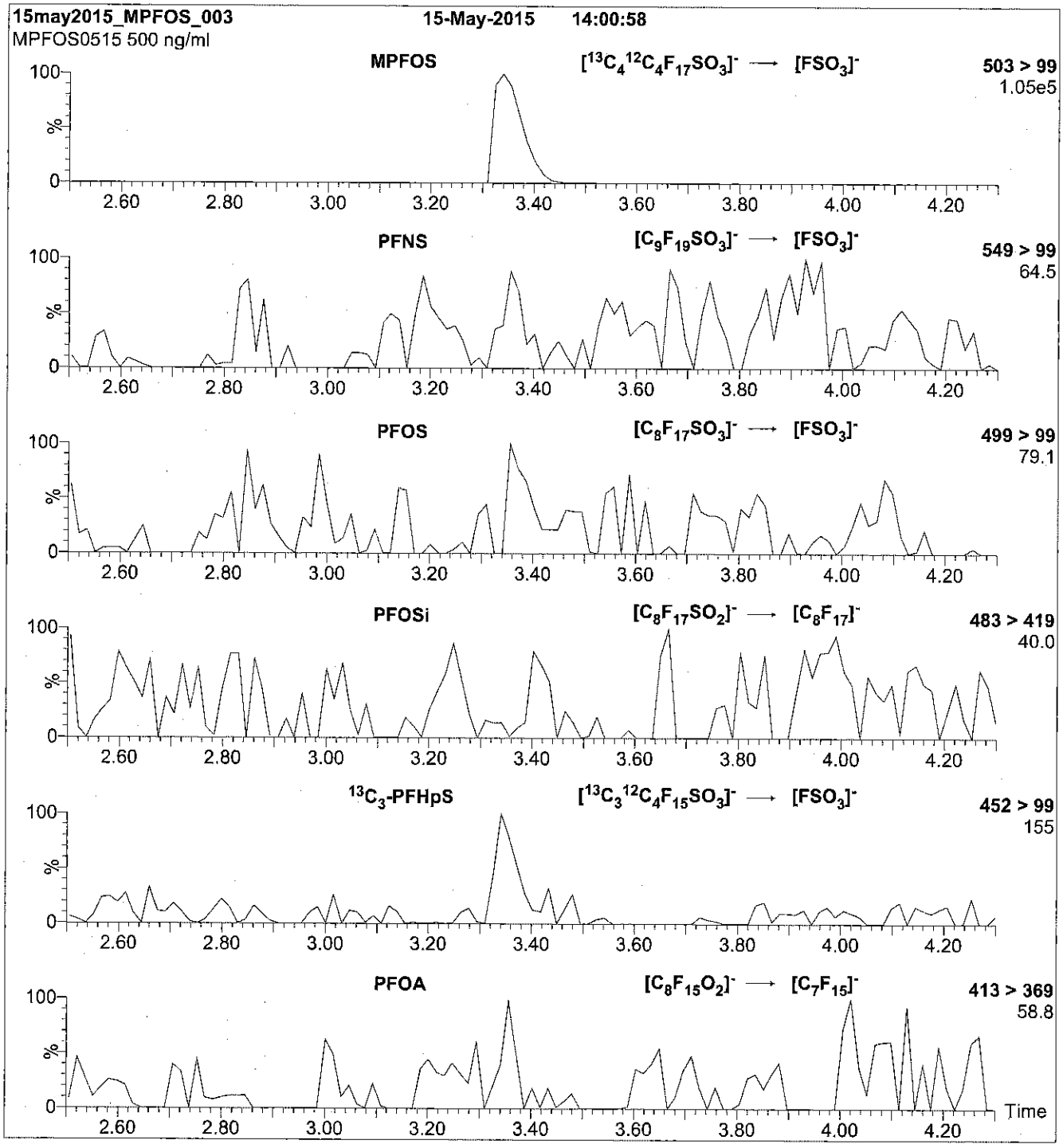
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00010

572886
ID: LCMPFOS_00010
Exp: 05/15/20 Prpd: CBW
13C4-Perfluorooctanesulfo

R: 1/25/16
S:

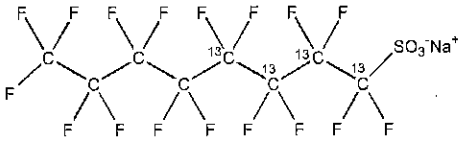
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0515

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/15/2015		
EXPIRY DATE: (mm/dd/yyyy)	05/15/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

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Certified By: B.G. Chittim **Date:** 05/28/2015 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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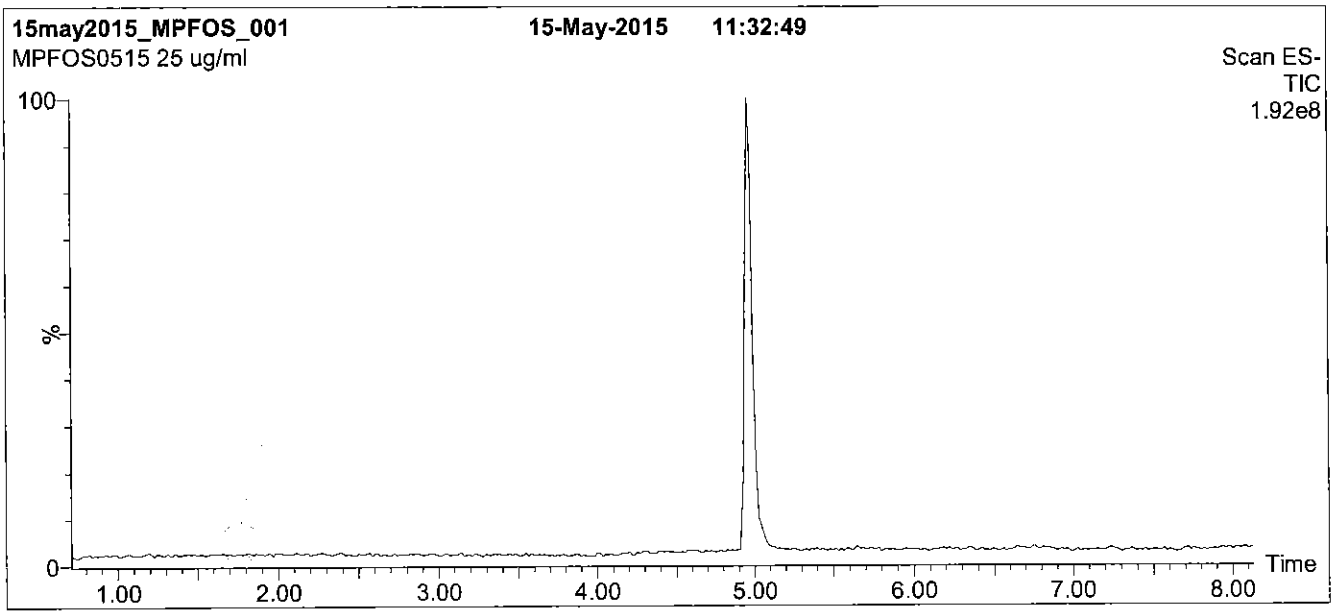
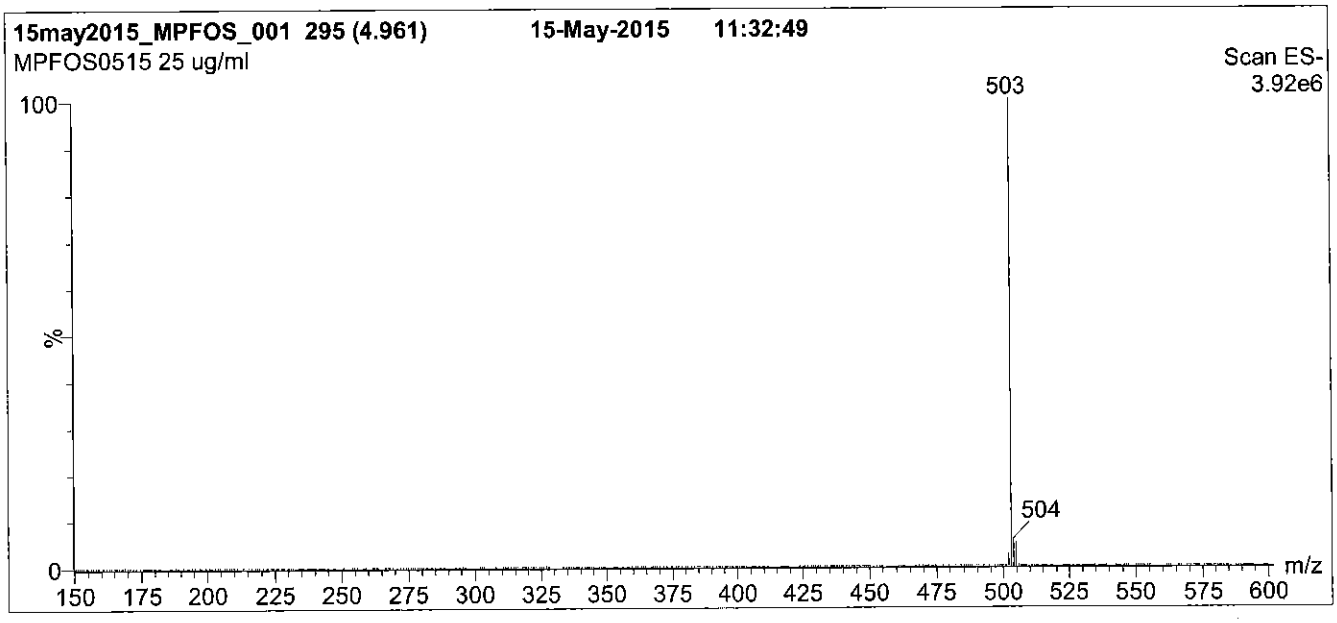




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

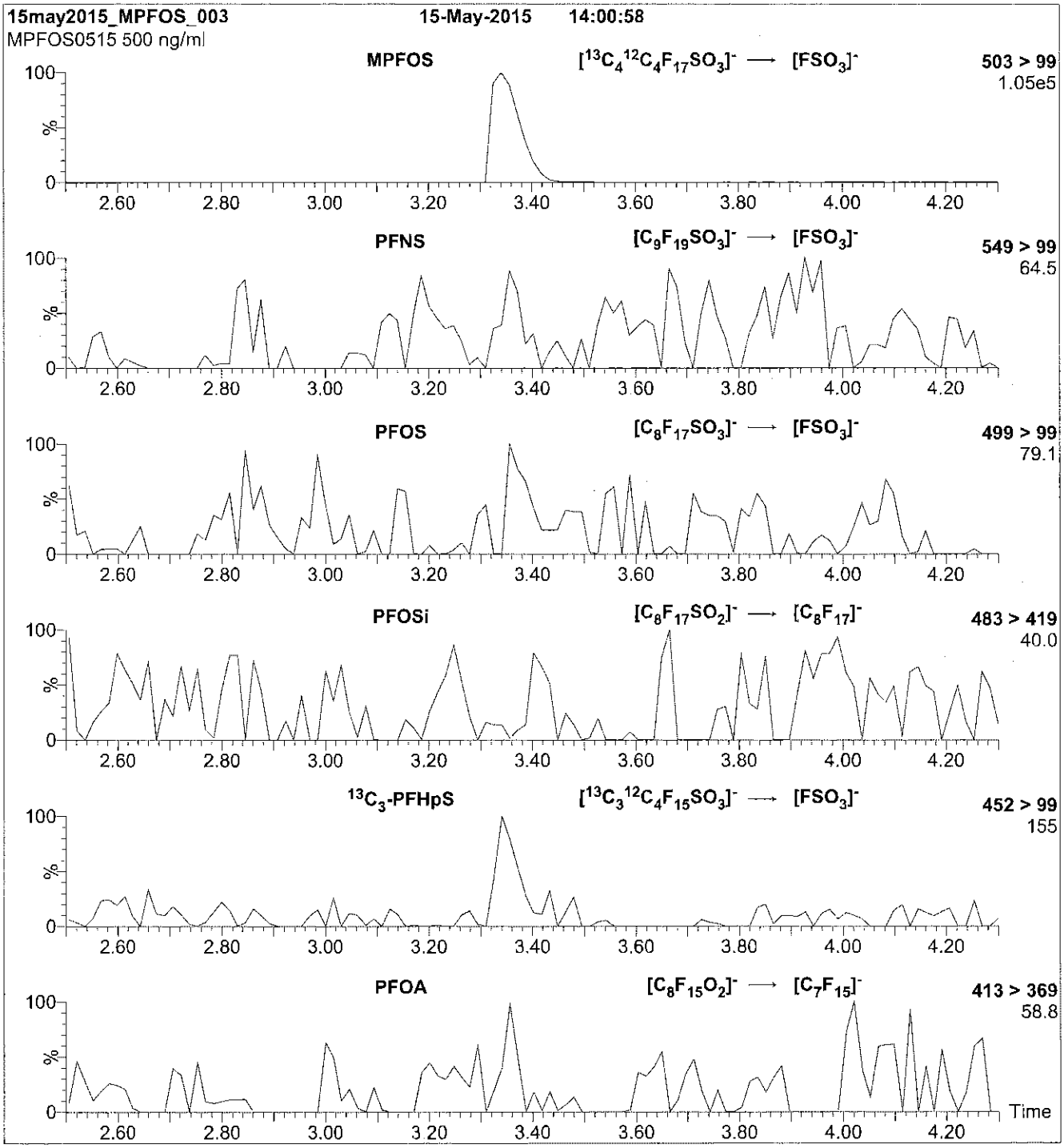
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 40

Reagent

LCMPFOS_00012

Rec. 3/29/16 JRB

605227
ID: LCMPFOS_00012
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

606228
ID: LCMPFOS_00013
Exp: 01/22/21 Prpd: CBW
13C4-Perfluorooctanesulfo

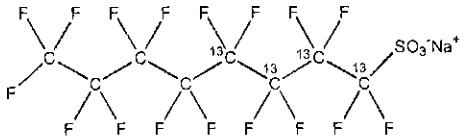
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS **LOT NUMBER:** MPFOS0116

COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
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CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4\text{-}^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	01/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	01/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

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Certified By: B.G. Chittim **Date:** 02/01/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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CALA Testing Accreditation

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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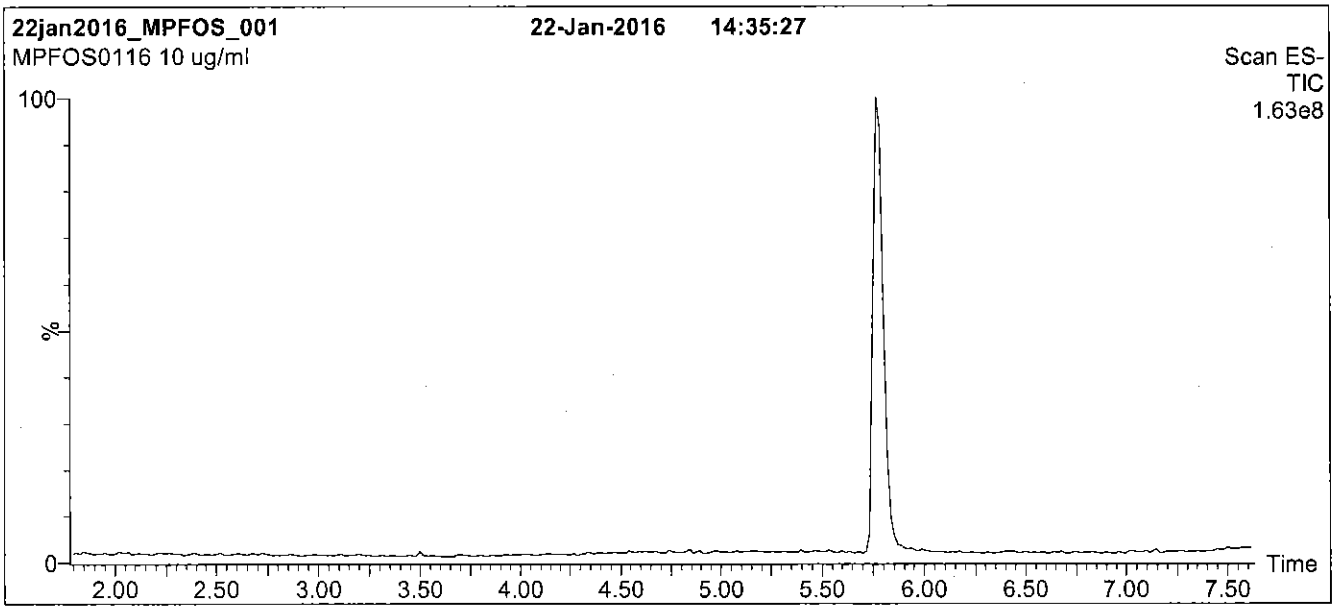
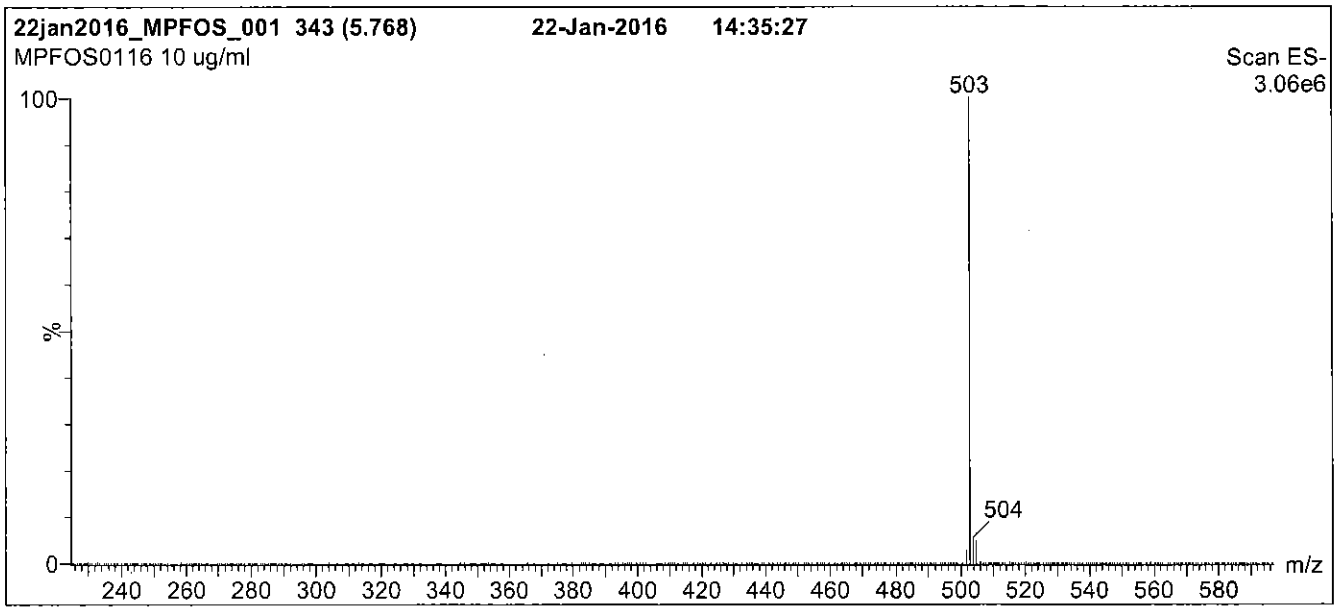




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

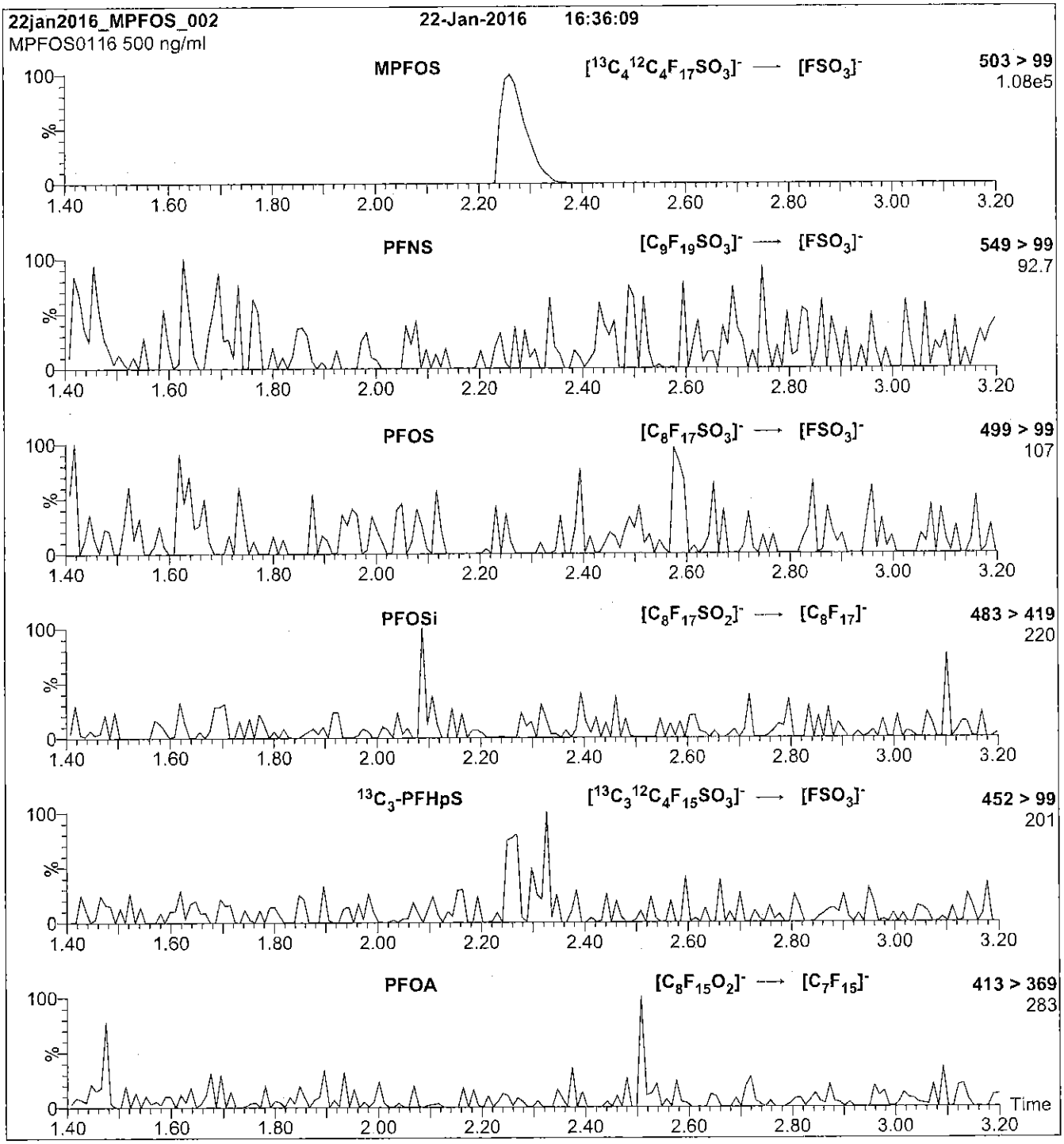
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 40

Reagent

LCMPFUdA_00004

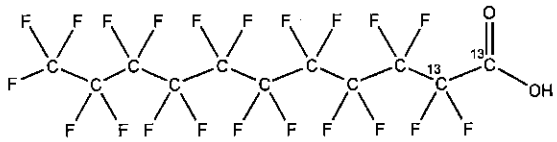
r: 4/15/15 SKU

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: MPFUdA
LOT NUMBER: MPFUdA1014
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
MOLECULAR WEIGHT: 566.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)
CHEMICAL PURITY: >98%
ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/03/2014 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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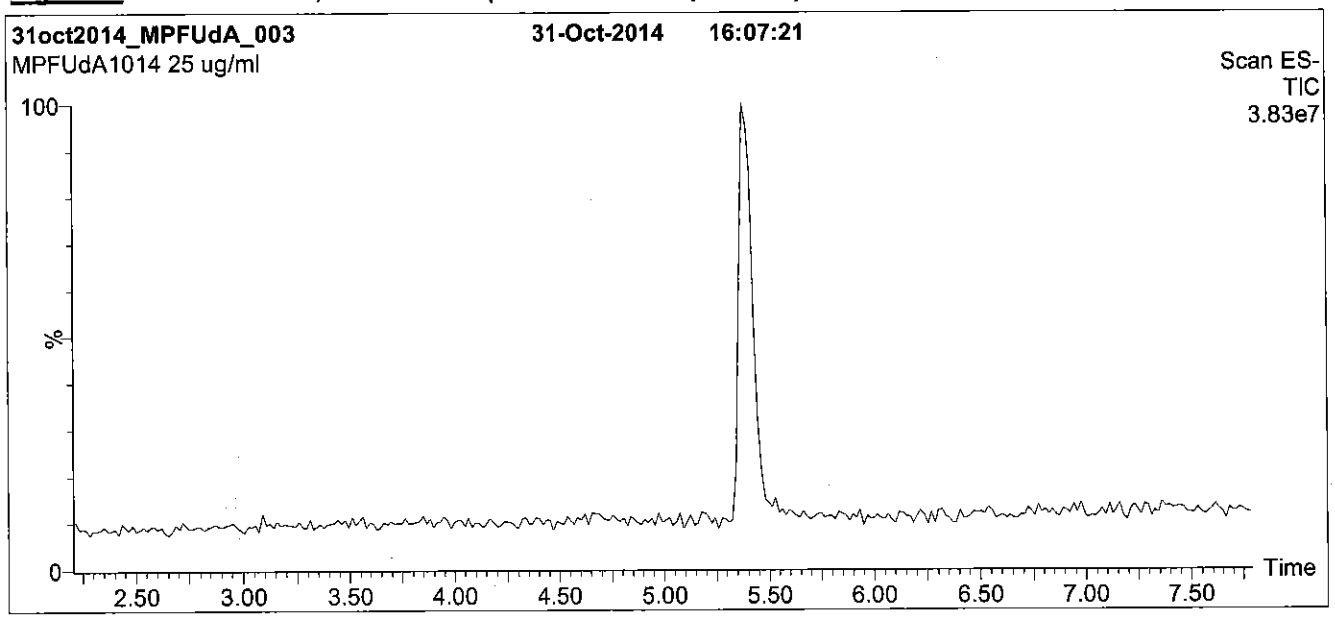
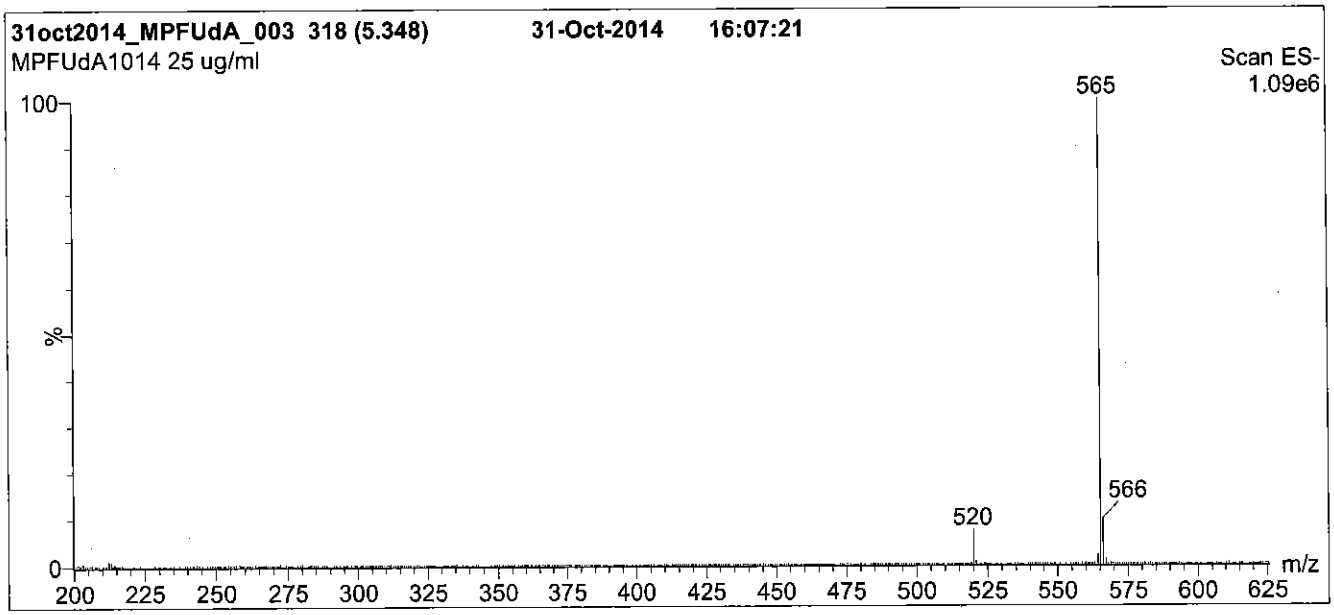
Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

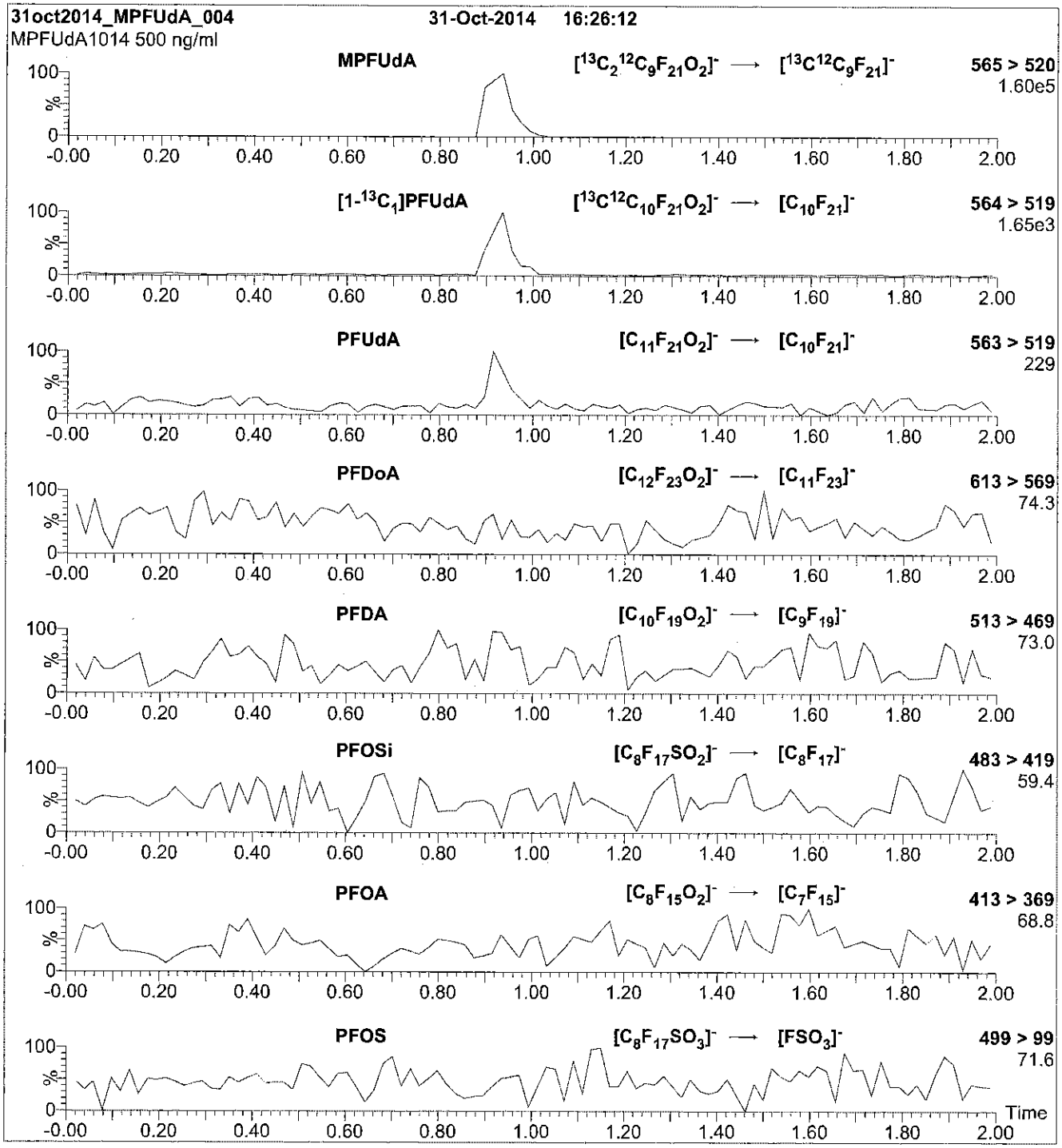
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCMPFUdA_00005

V: 12/9/15 SEV

WELLINGTON LABORATORIES

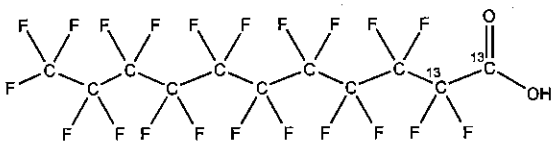
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_9HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

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Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
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Certified By: B.G. Chittim **Date:** 04/01/2015 (mm/dd/yyyy)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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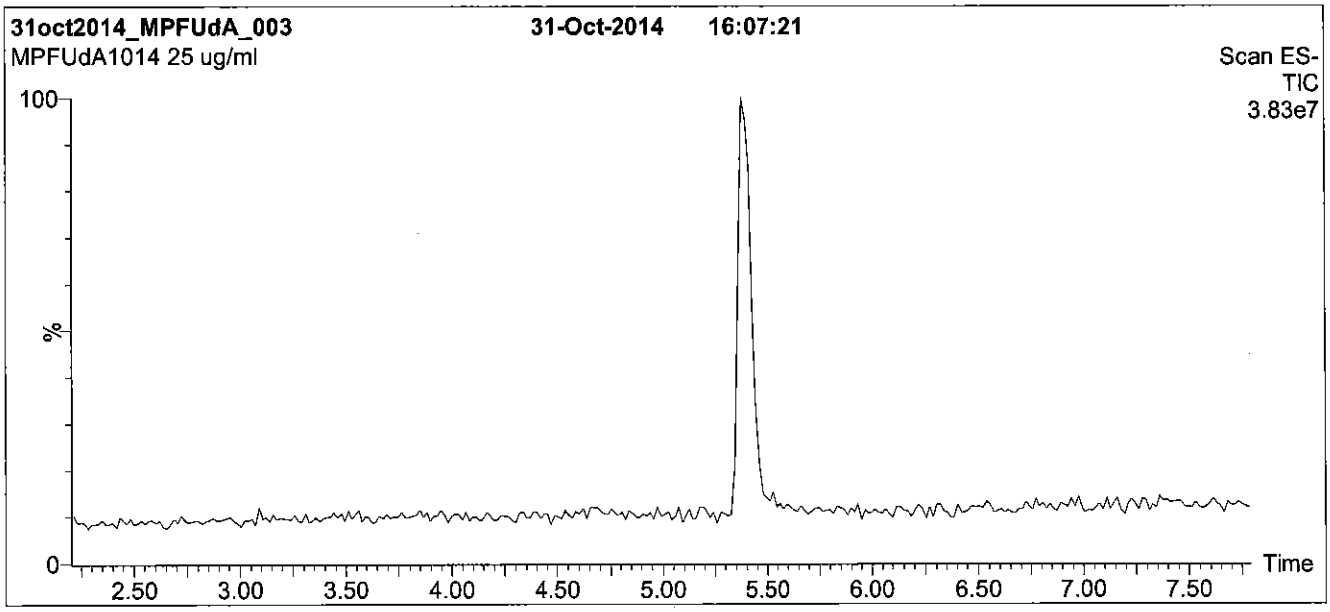
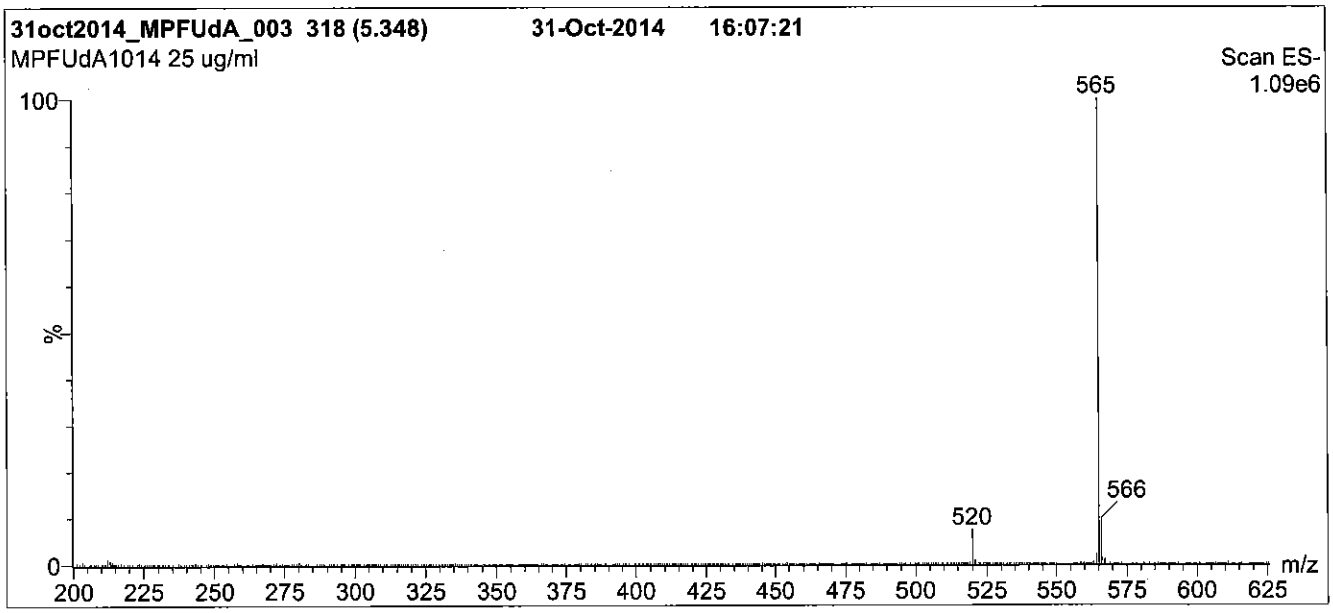




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

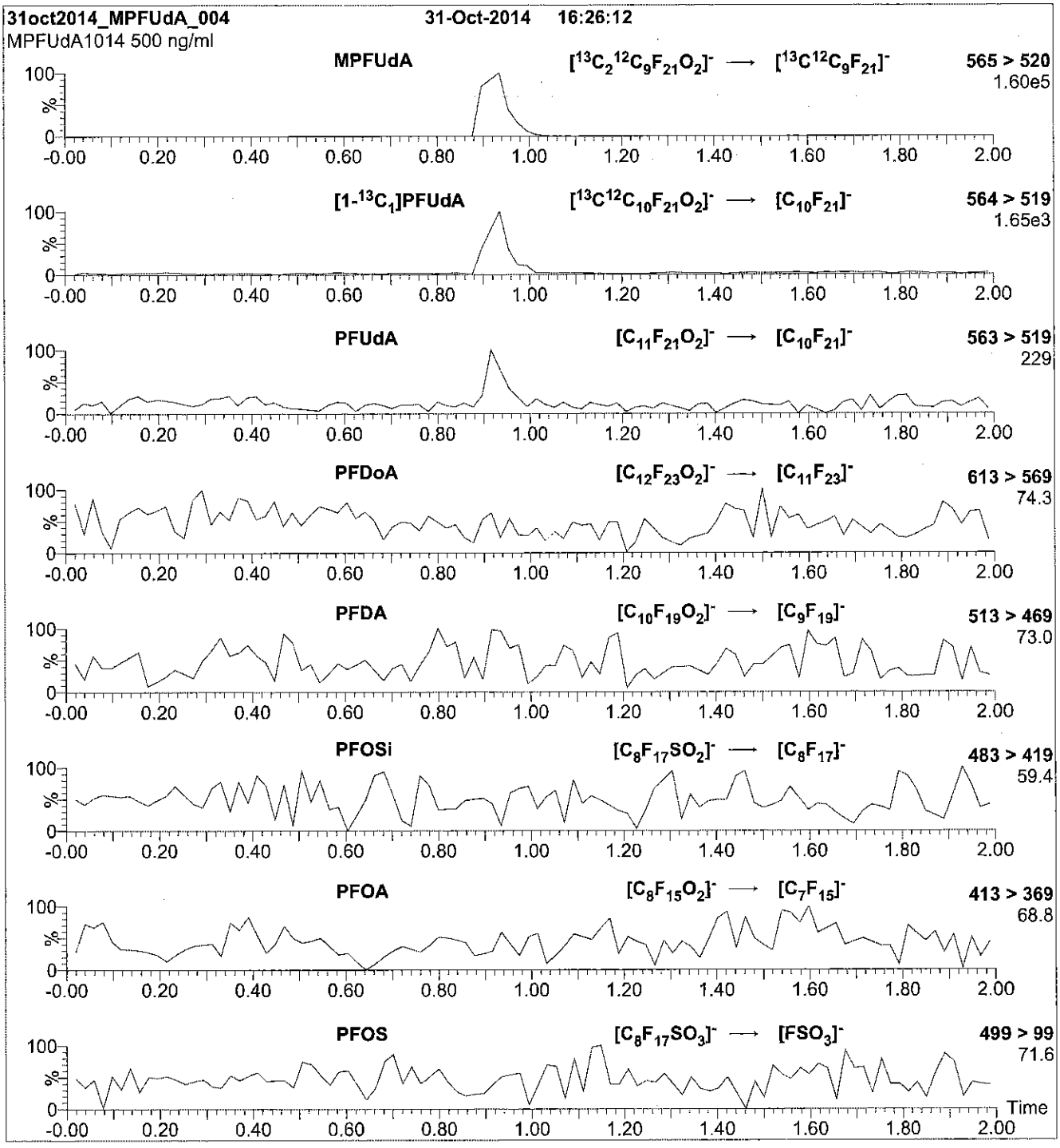
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCMPFUdA_00007

609704
ID: LCMPFUdA_00007
Exp: 10/31/19 Prpd: CBW
13C2-Perfluoroundecanoic

R: 4/7/16 CBW

WELLINGTON LABORATORIES

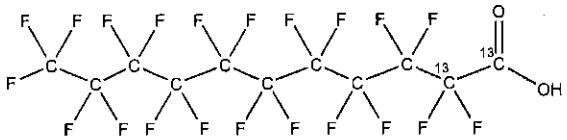
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFUdA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid

LOT NUMBER: MPFUdA1014

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_8HF_{21}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 566.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/31/2014
EXPIRY DATE: (mm/dd/yyyy) 10/31/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($1,2\text{-}^{13}C_2$)

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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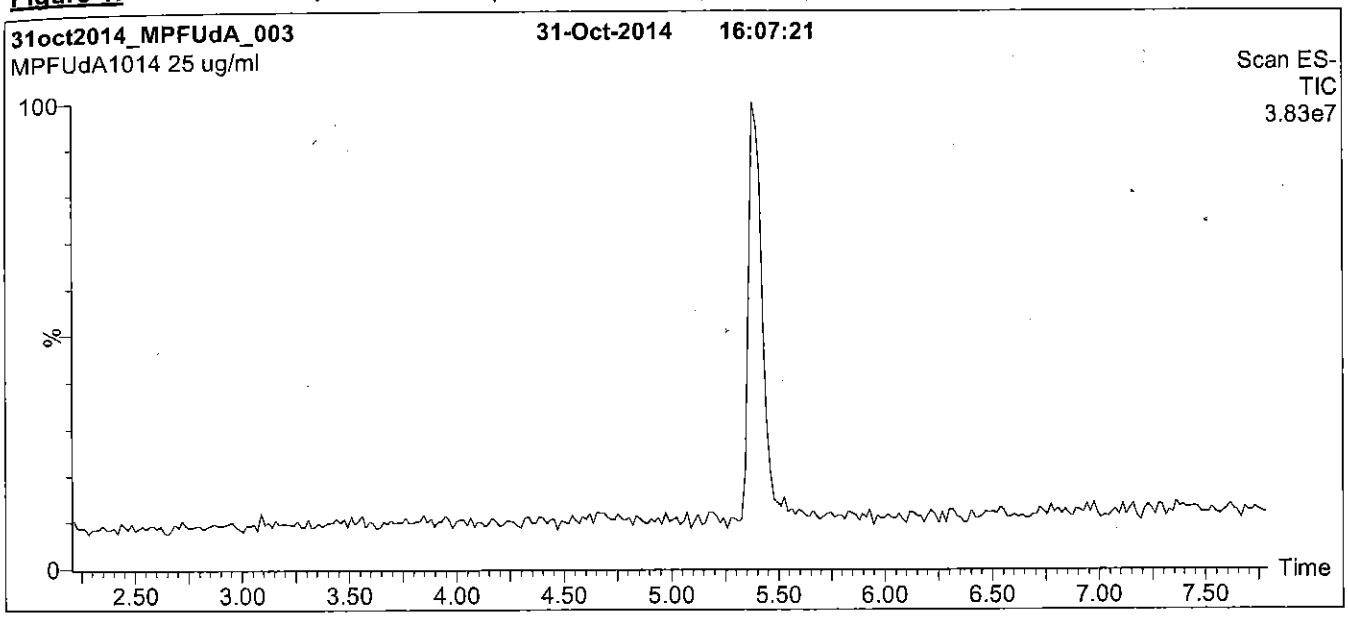

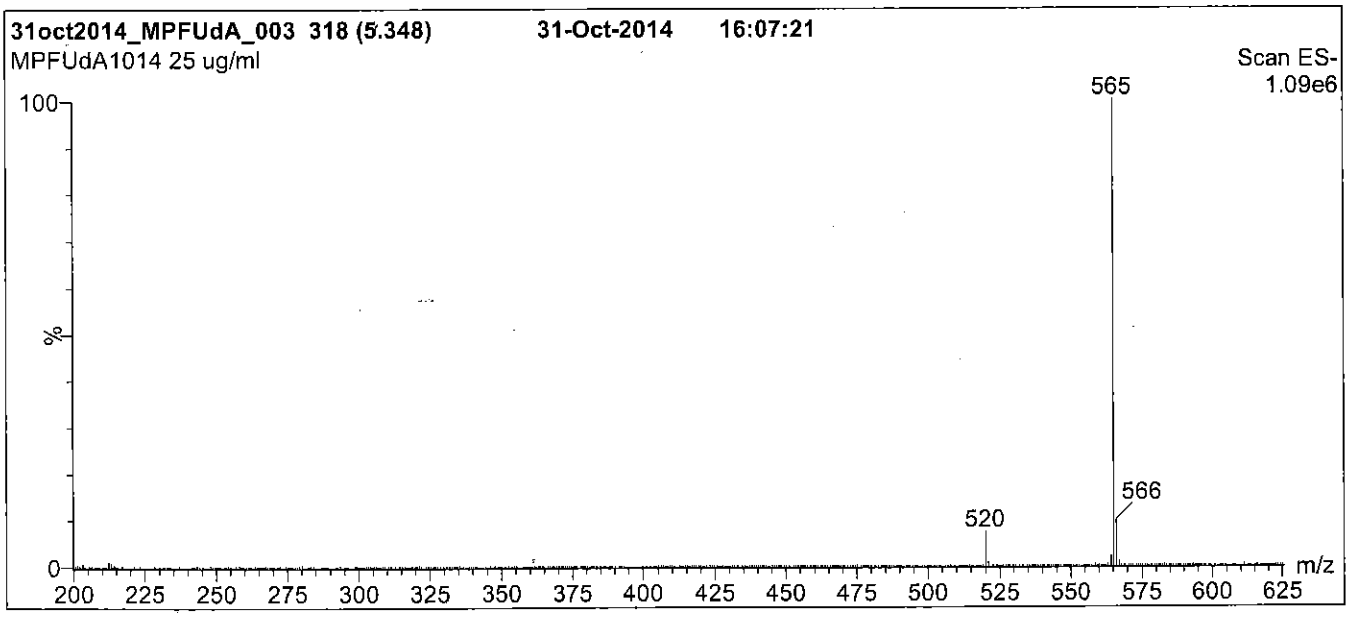

Conditions for Figure 1:

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

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Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
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Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

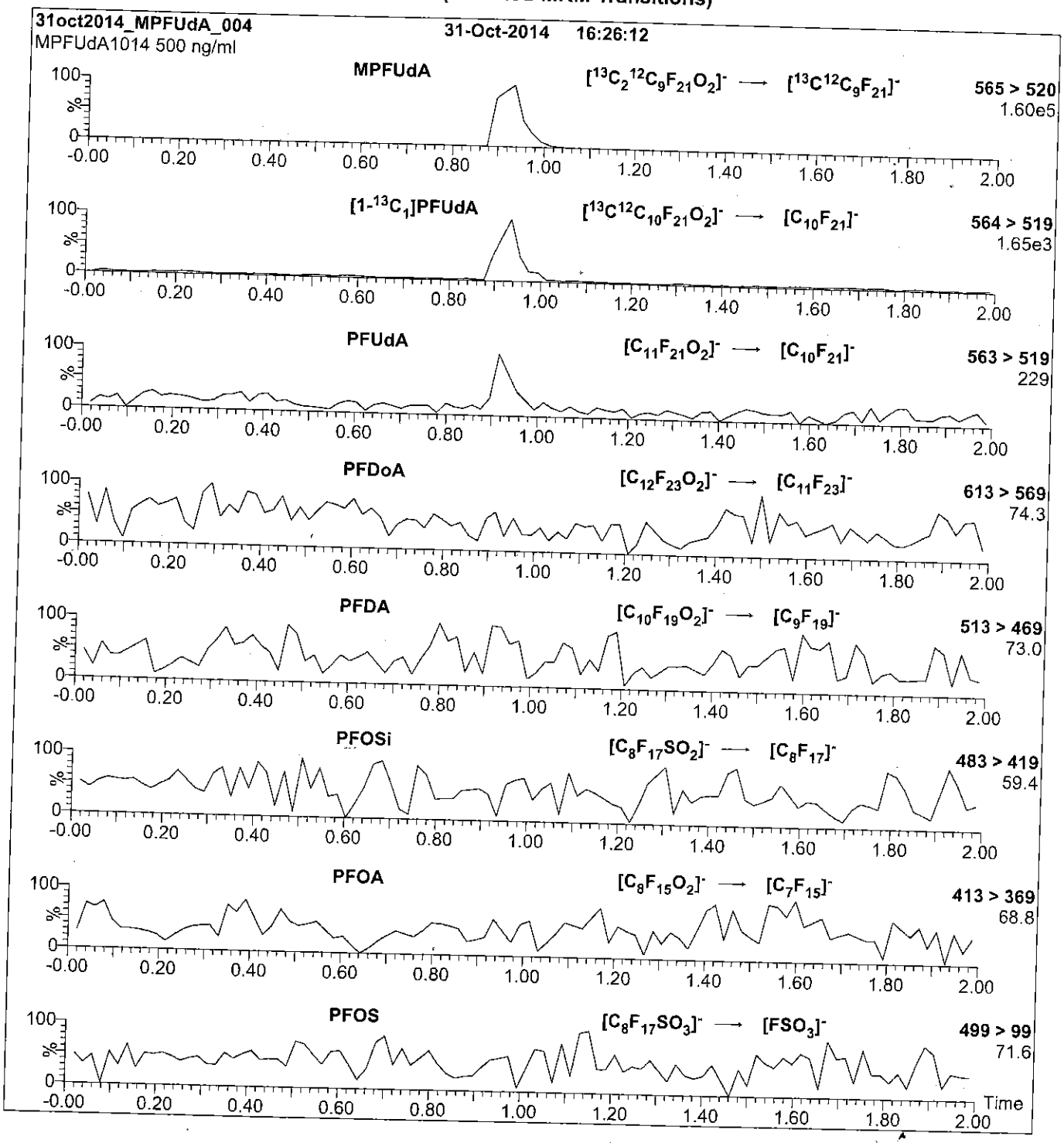
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (200 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



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Injection: Direct loop injection
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(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCPFBA_00003

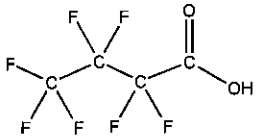
rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid
LOT NUMBER: PFBA0313

STRUCTURE:
CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
MOLECULAR WEIGHT: 214.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 03/05/2013
EXPIRY DATE: (mm/dd/yyyy) 03/05/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
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ADDITIONAL INFORMATION:

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- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

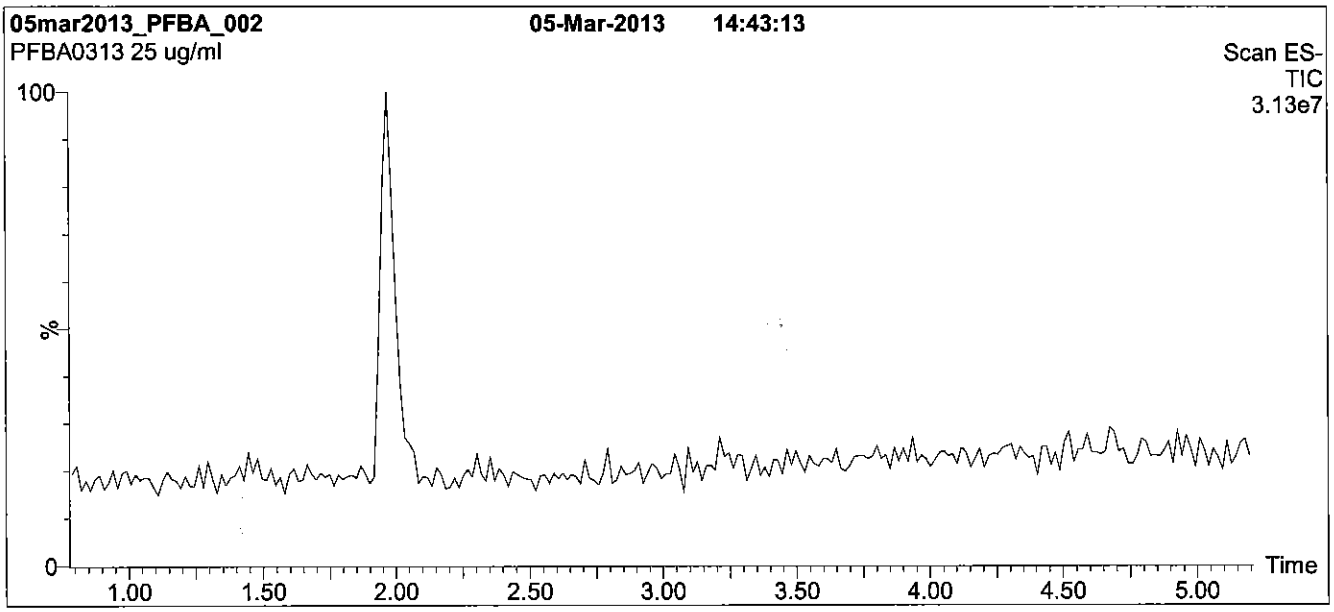
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

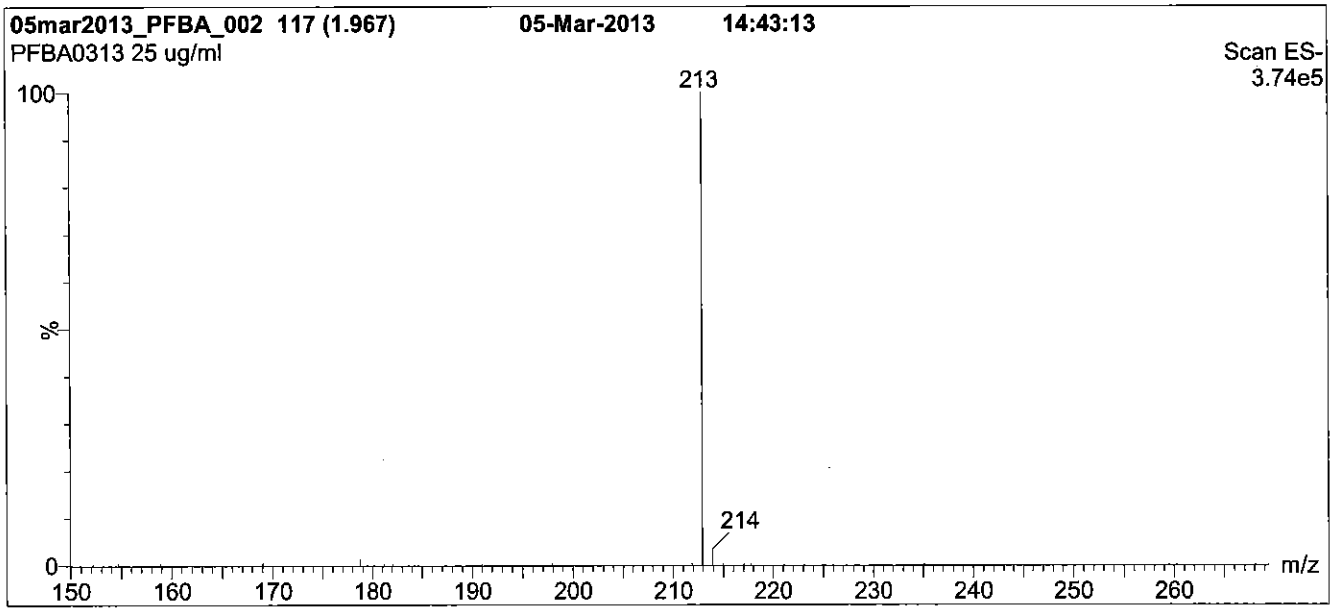
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 25% (80:20 MeOH:ACN) / 75% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

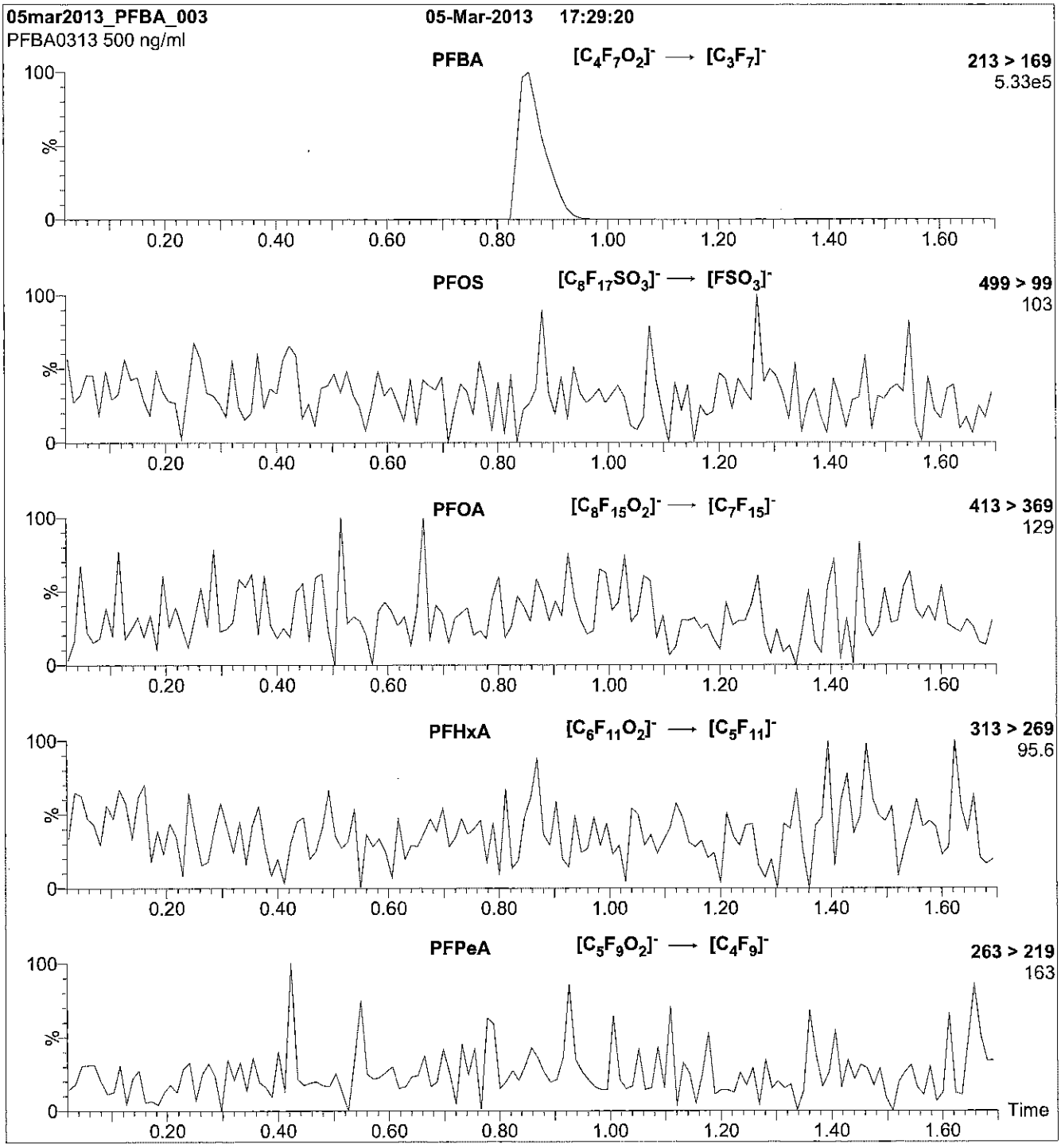
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3
Collision Energy (eV) = 10

Reagent

LCPFBA_00004

R: 2/25/16 CBW

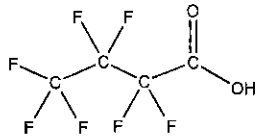
587895
ID: LCPFBA_00004
Exp: 01/30/20 Prpd: CBW
PF-n-butanoic acid

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFBA
COMPOUND: Perfluoro-n-butanoic acid
LOT NUMBER: PFBA0115

STRUCTURE:
CAS #: 375-22-4



MOLECULAR FORMULA: $C_4HF_7O_2$
MOLECULAR WEIGHT: 214.04
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

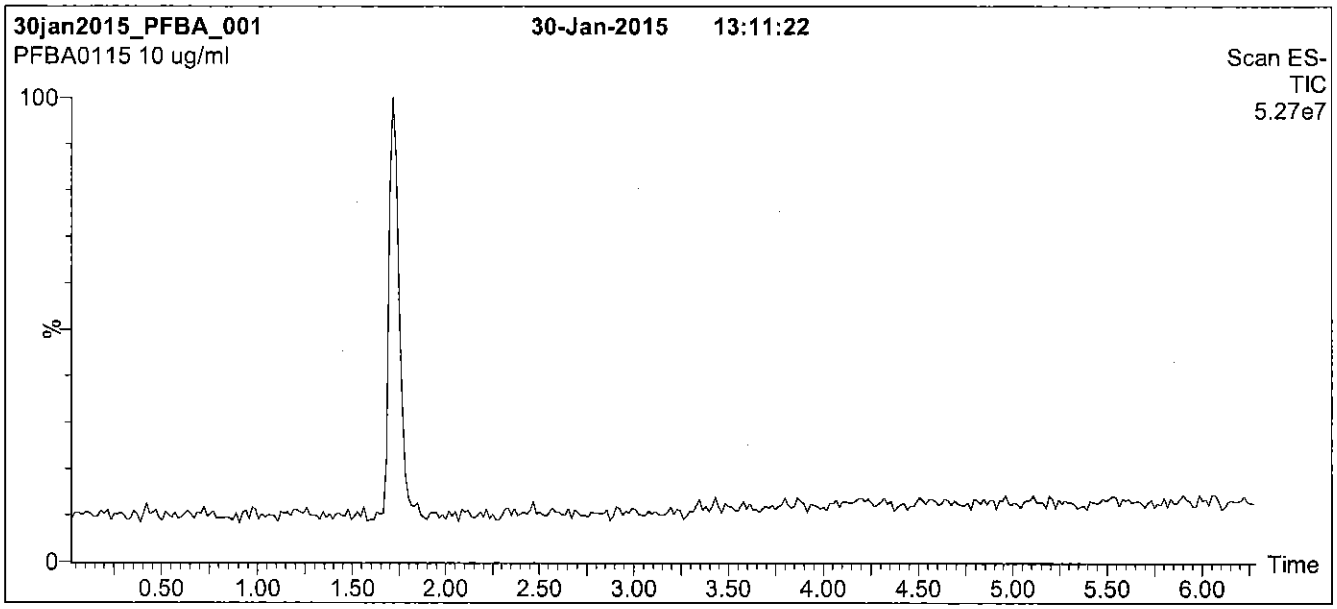
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

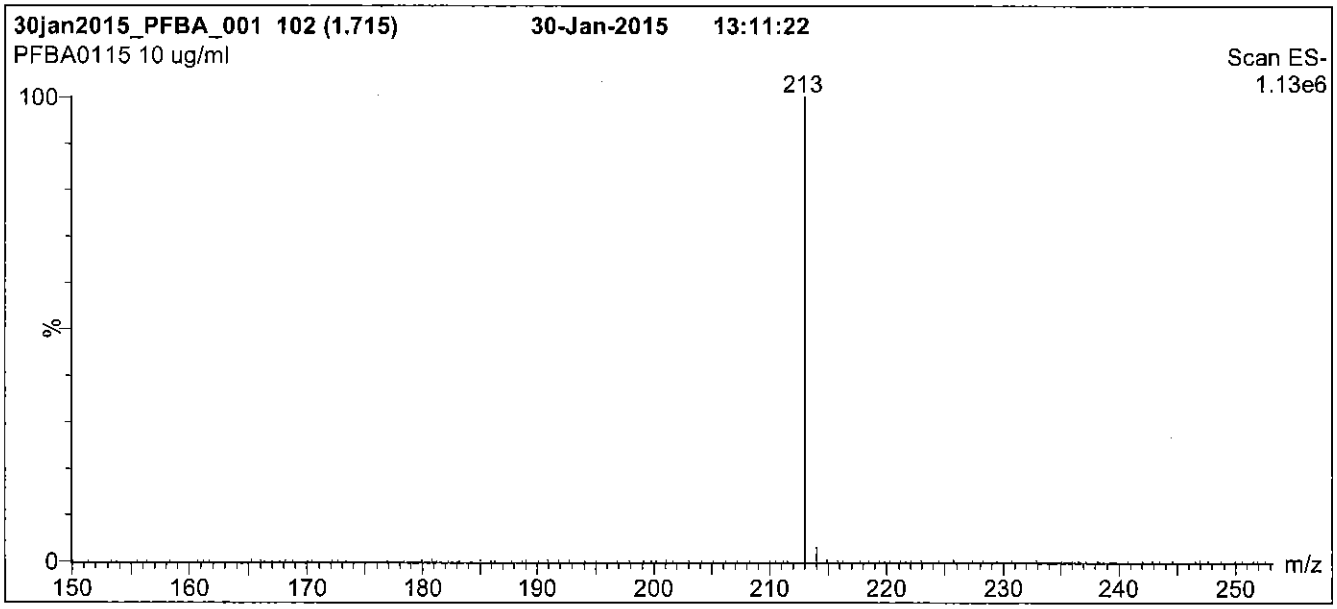
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

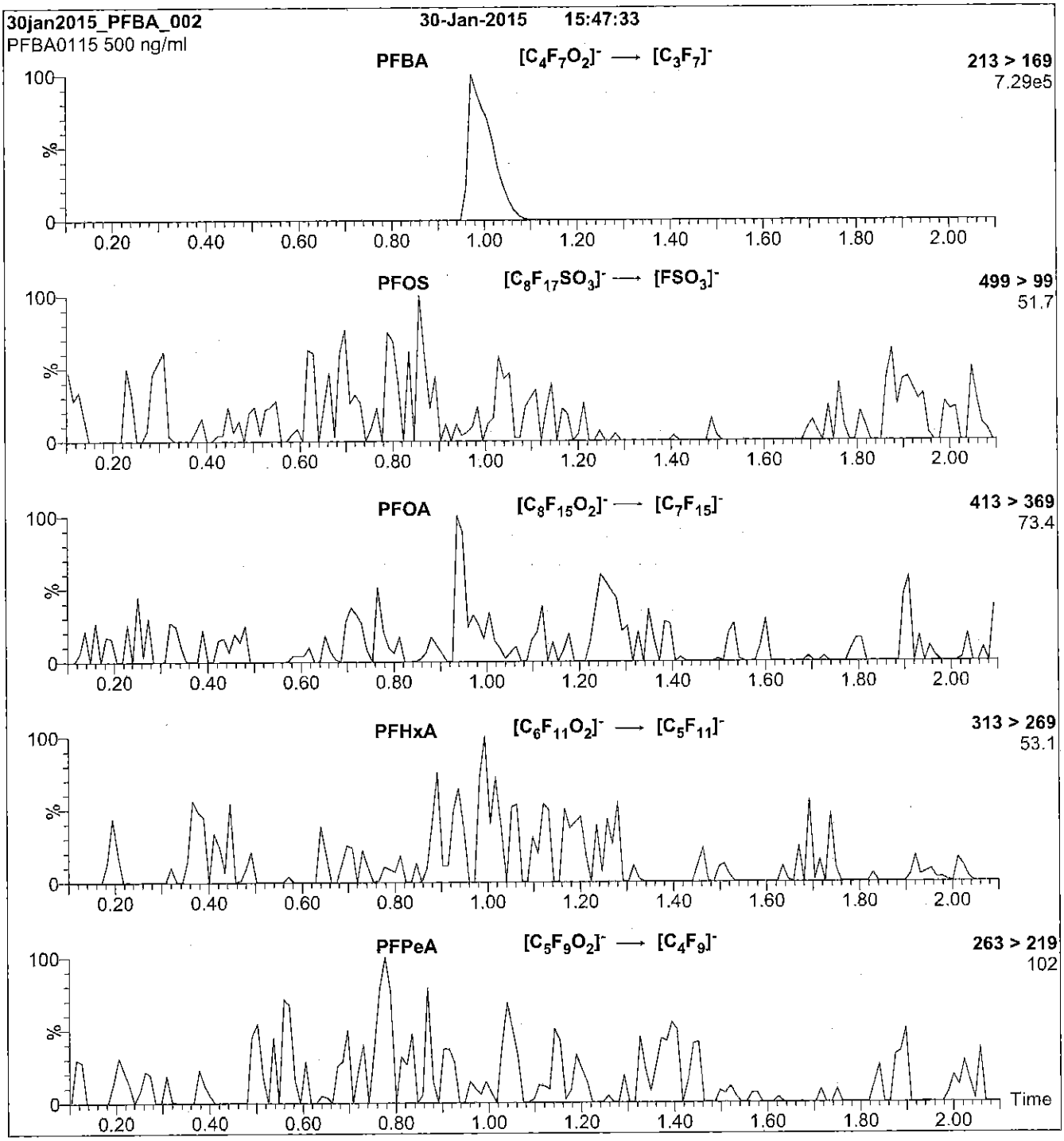
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 8.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 10

Reagent

LCPFBS_00003

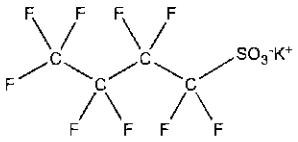
r. 2/11/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFBS
LOT NUMBER: LPFBS1014
COMPOUND: Potassium perfluoro-1-butanesulfonate

STRUCTURE:
CAS #: 29420-49-3



MOLECULAR FORMULA: $C_4F_9SO_3K$
MOLECULAR WEIGHT: 338.19
CONCENTRATION: 50.0 ± 2.5 µg/ml (K salt)
44.2 ± 2.2 µg/ml (PFBS anion)
SOLVENT(S): Methanol
CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/09/2014
EXPIRY DATE: (mm/dd/yyyy) 10/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/17/2014 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

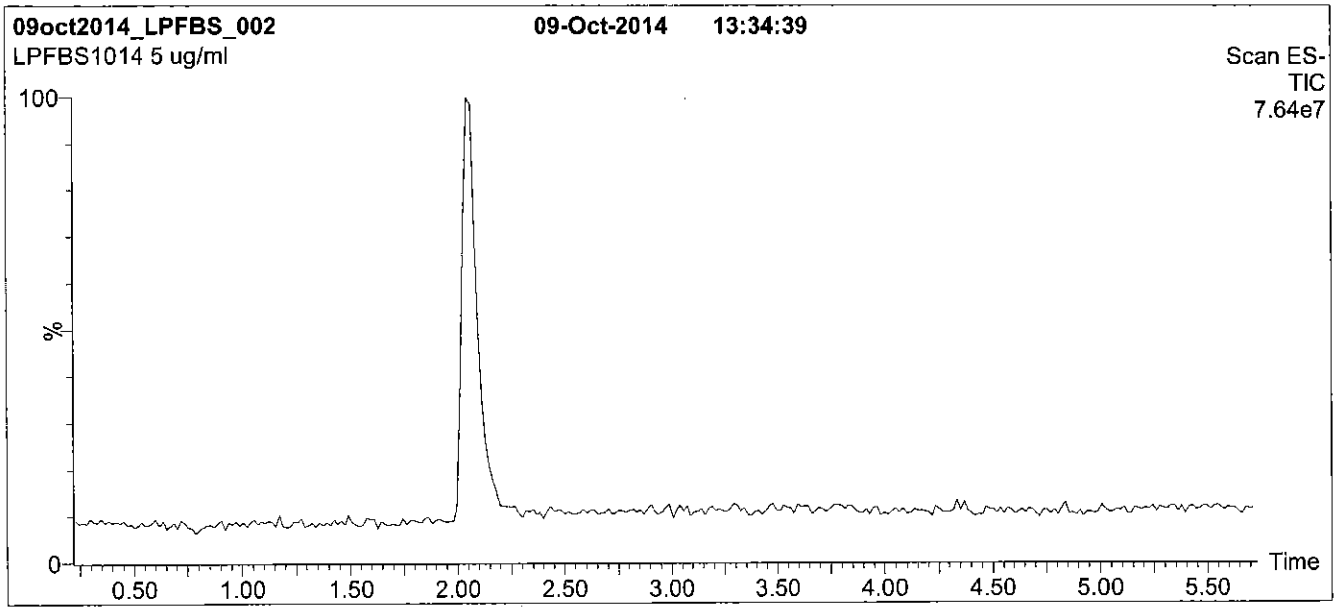
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

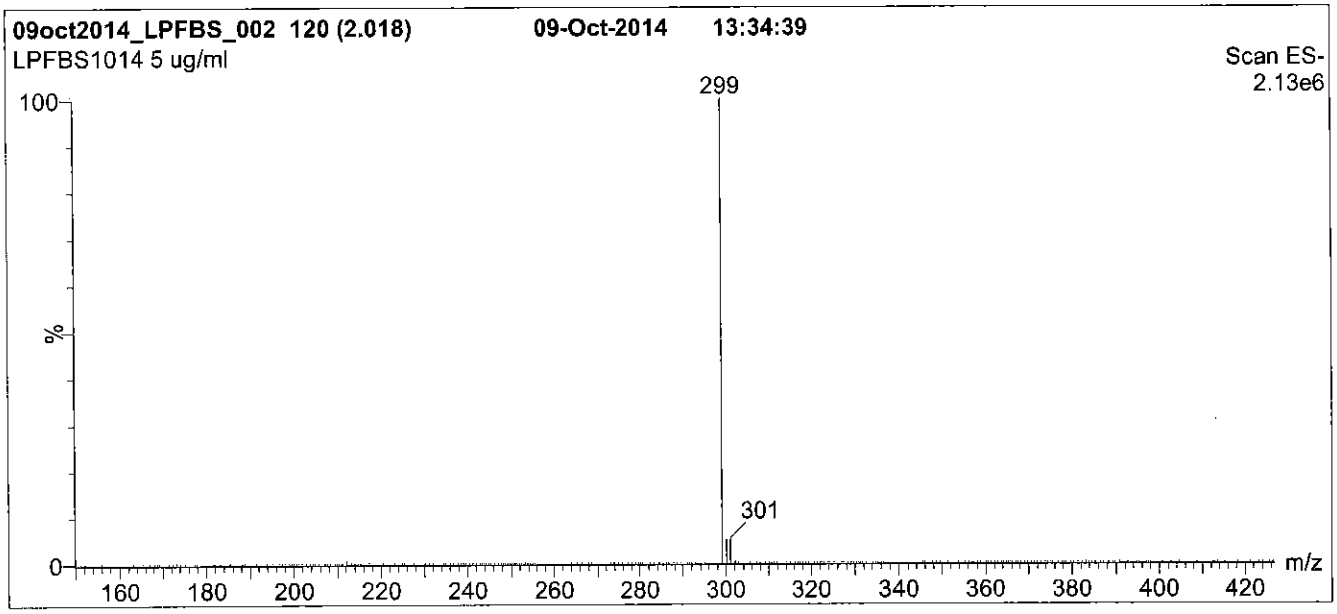
CALA Testing Accreditation No: A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

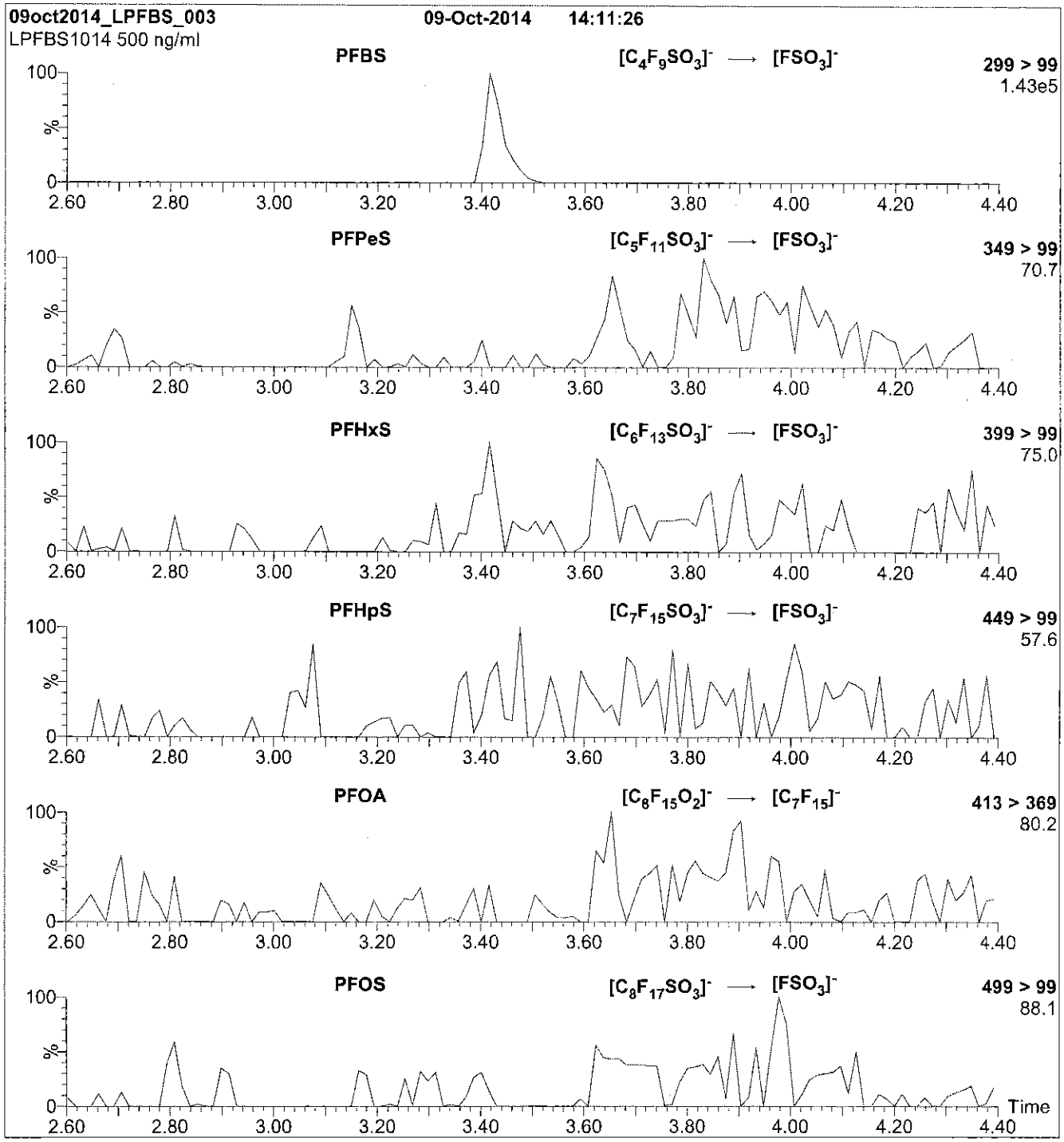
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml L-PFBS)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

Reagent

LCPFDA_00003

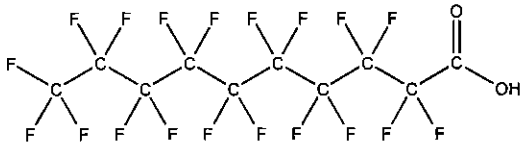
rec 7/16/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA0613

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.4% PFNA and ~ 0.1% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

QUALITY MANAGEMENT:

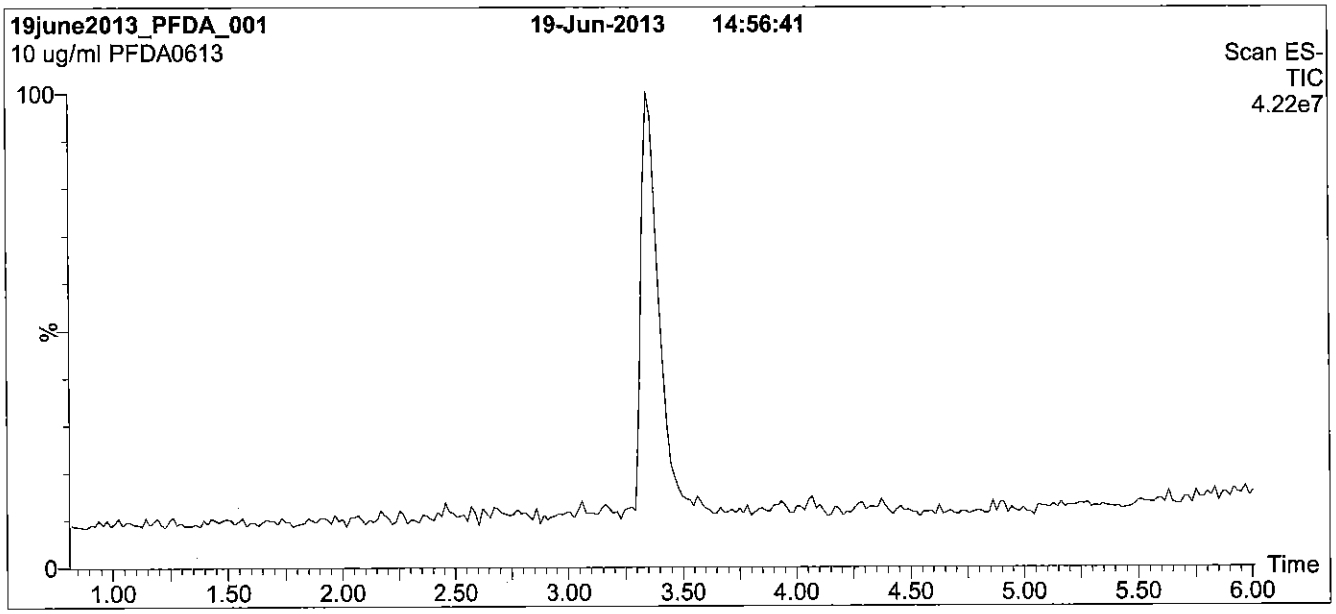
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

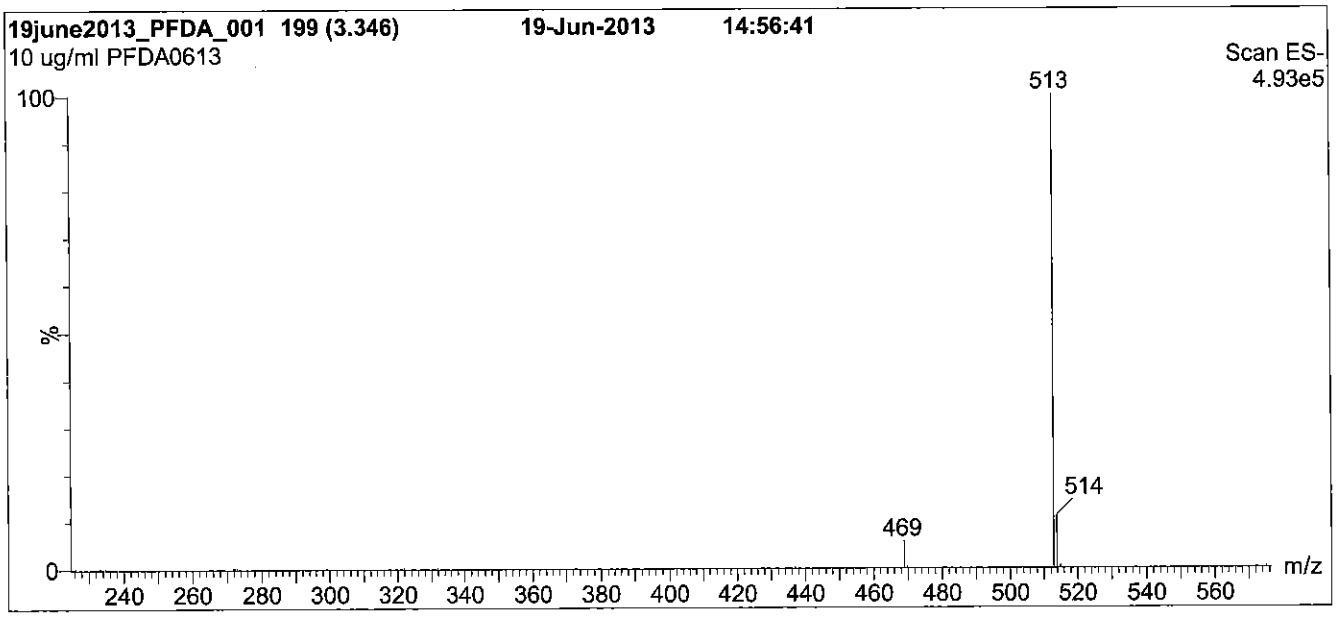
CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

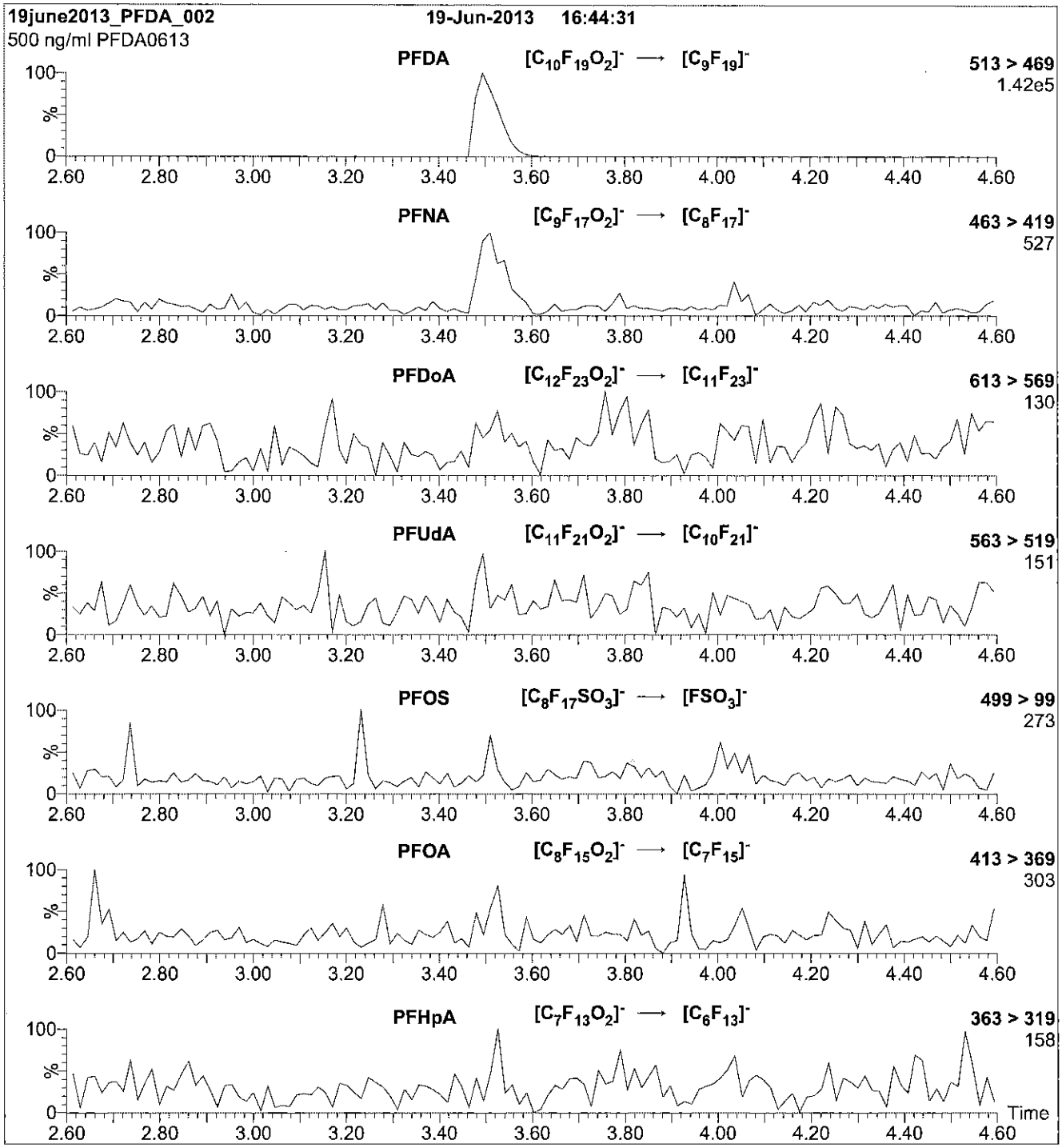
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 13

Reagent

LCPFDA_00004

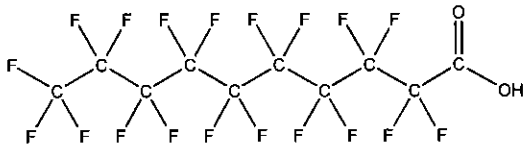
rec: 12/30/15 cw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDA
LOT NUMBER: PFDA0615
COMPOUND: Perfluoro-n-decanoic acid

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/02/2015
EXPIRY DATE: (mm/dd/yyyy) 07/02/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/24/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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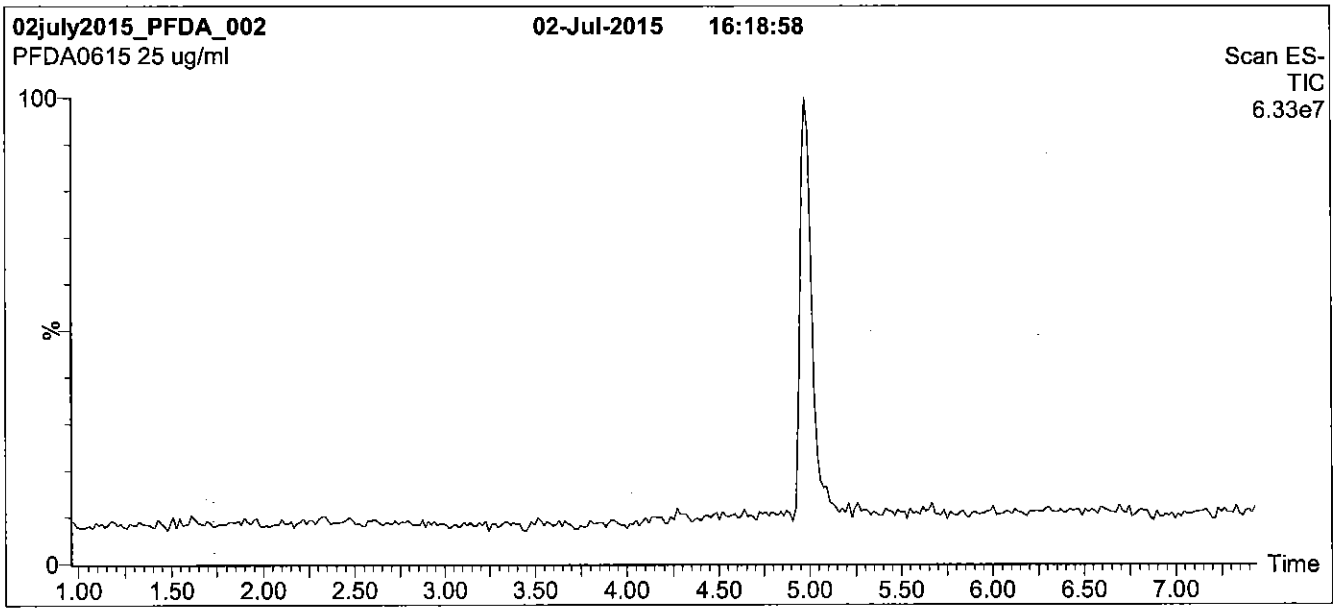
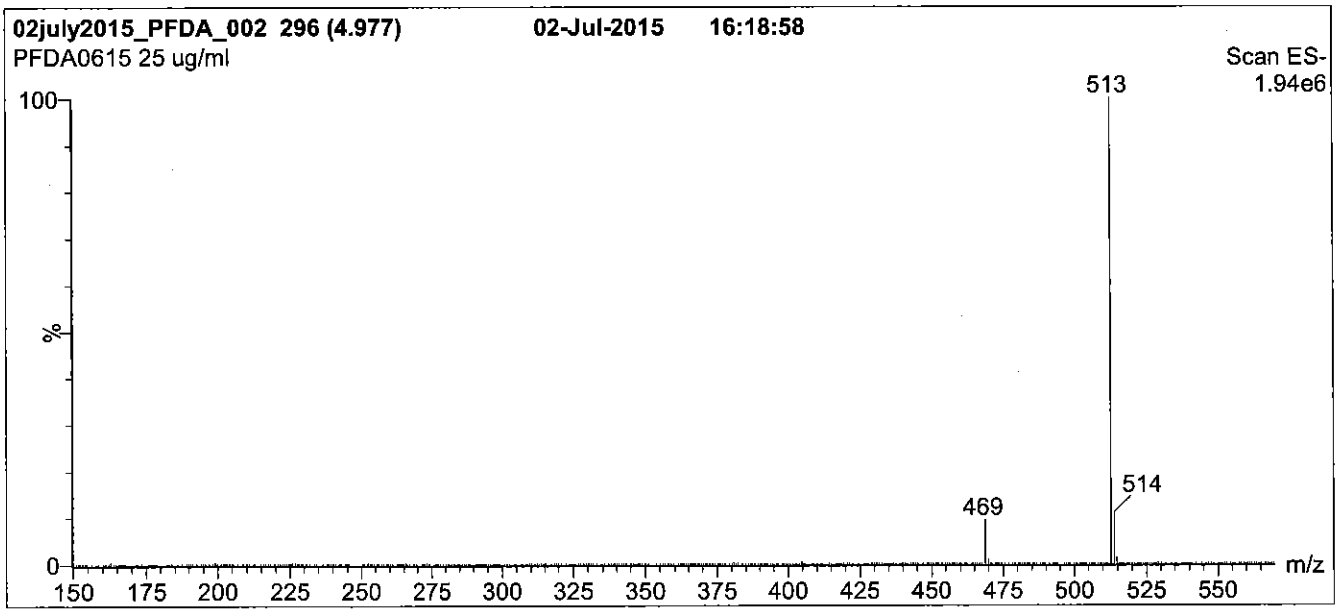
Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

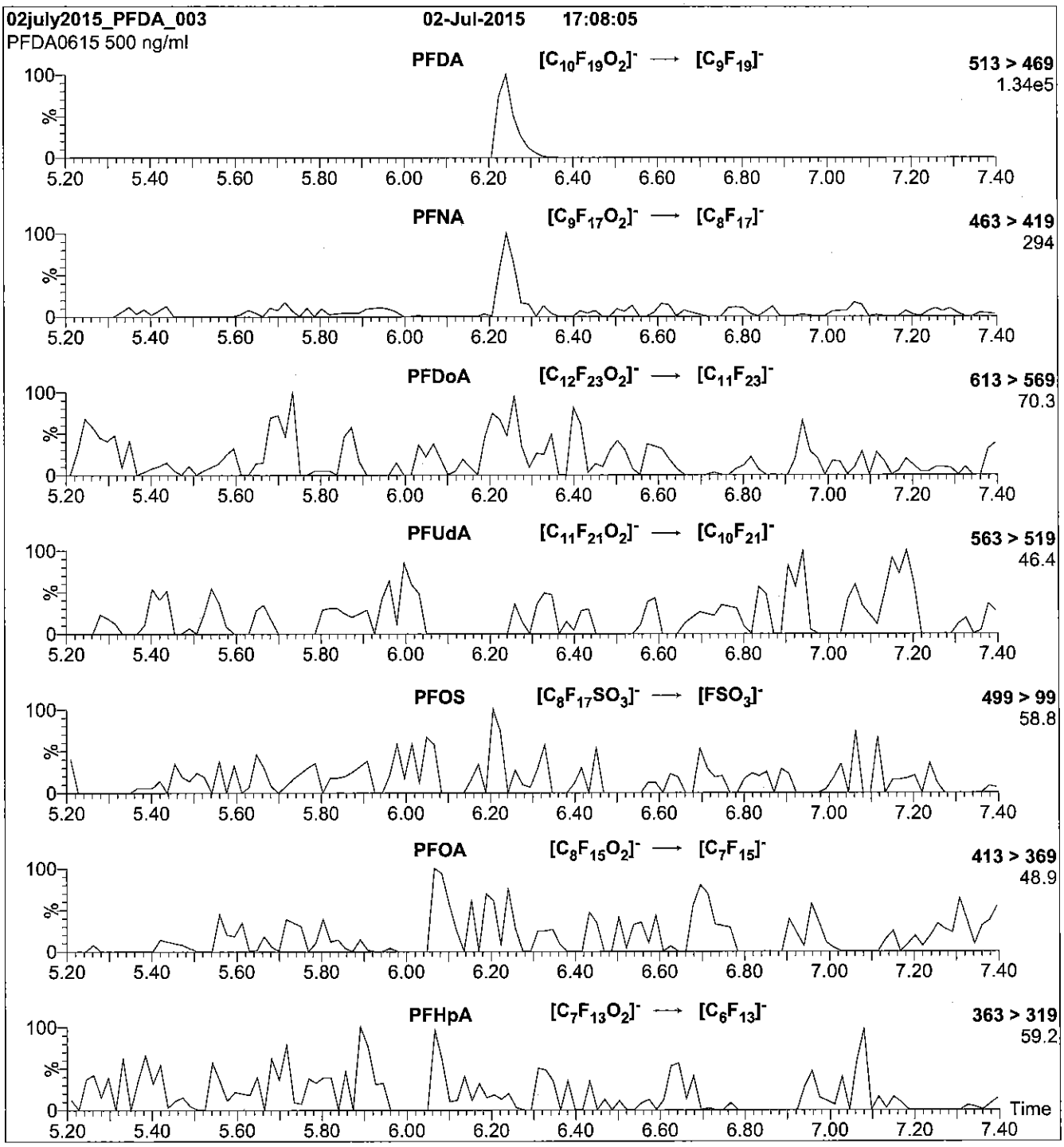
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.62e-3
Collision Energy (eV) = 13

Reagent

LCPFDoA_00003

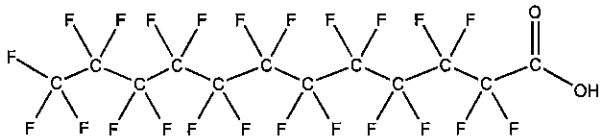
Rec 7/14/15

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDoA
LOT NUMBER: PFDoA0113
COMPOUND: Perfluoro-n-dodecanoic acid

STRUCTURE:
CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
MOLECULAR WEIGHT: 614.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/03/2013
EXPIRY DATE: (mm/dd/yyyy) 01/03/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

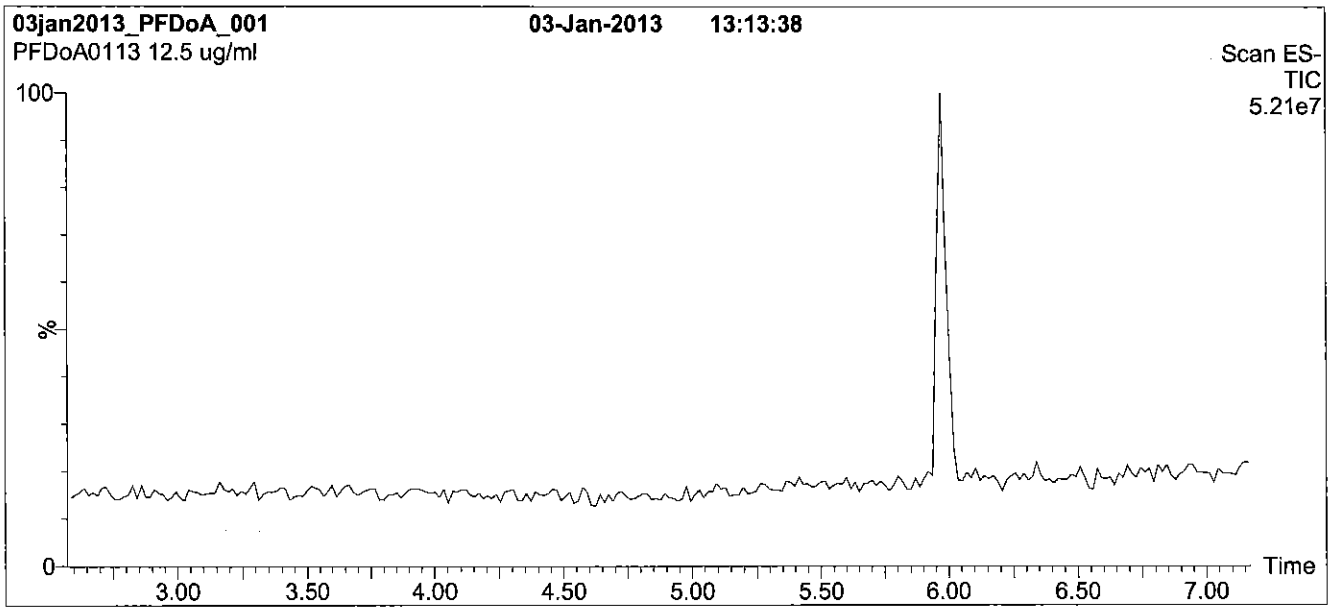
- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

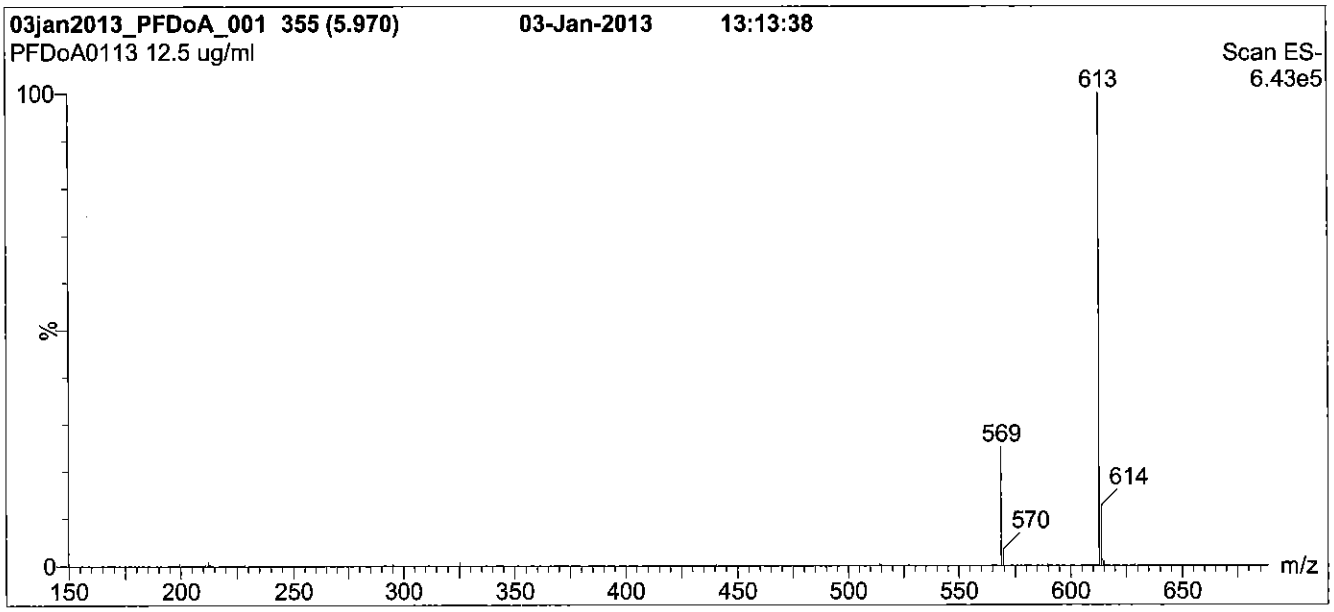
FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/01/2013 (mm/dd/yyyy)

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

Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min.
Return to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Reagent

LCPFDoA_00004

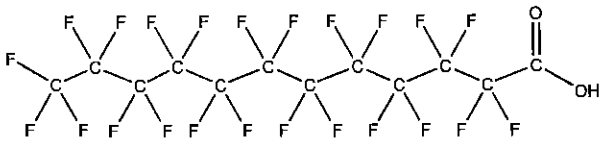
Rec: 12/30/15 cw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid
LOT NUMBER: PFDoA0115

STRUCTURE:
CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml
MOLECULAR WEIGHT: 614.10
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

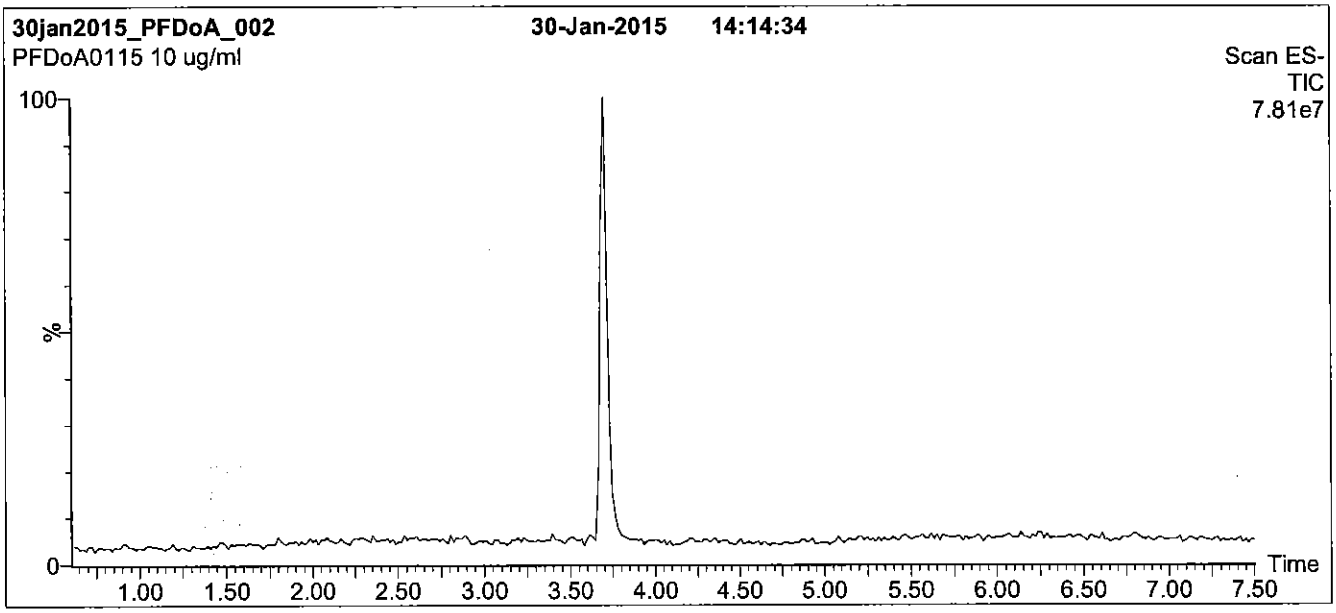
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

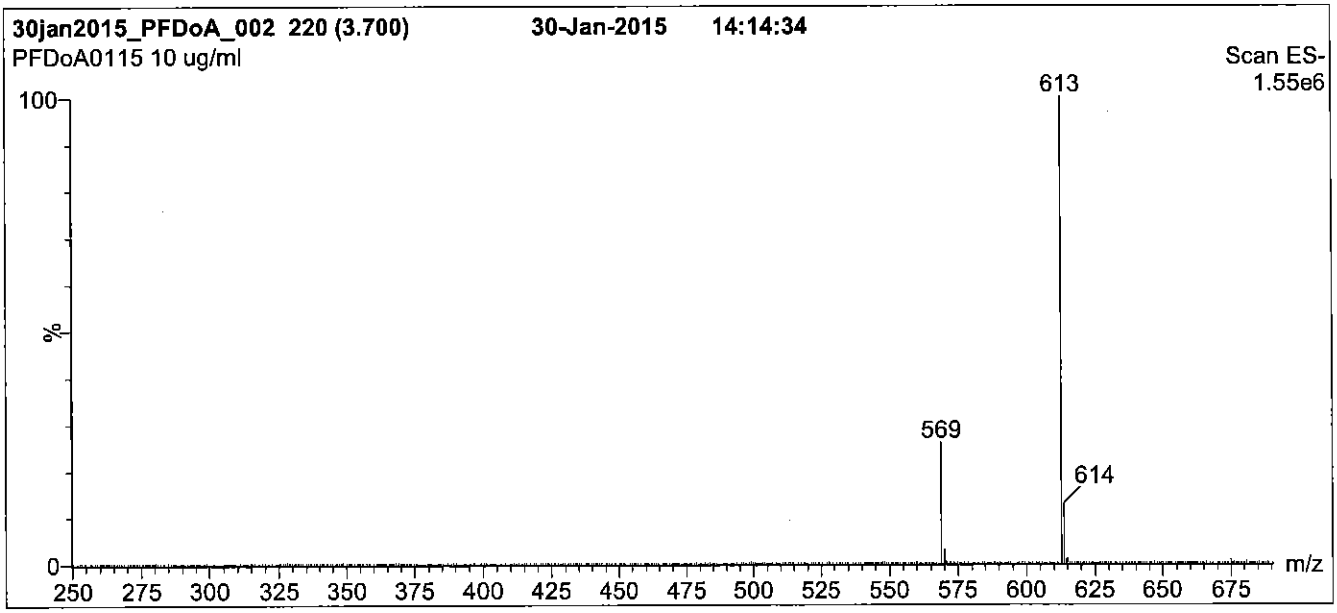
CALA Testing Accredited ISO/IEC 17025 A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

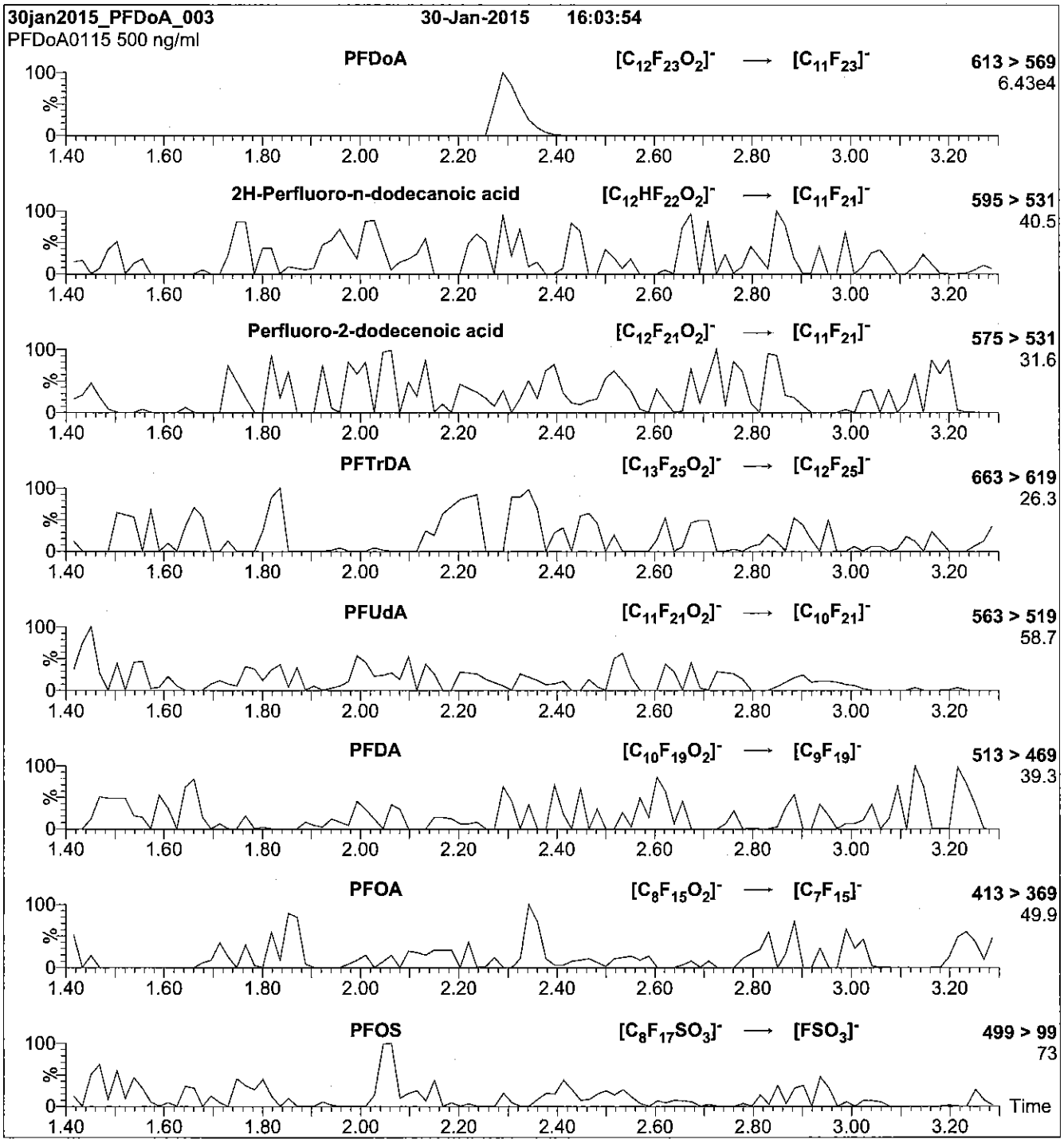
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 13

Reagent

LCPFDS_00005

Rec. 3/29/16 JRB

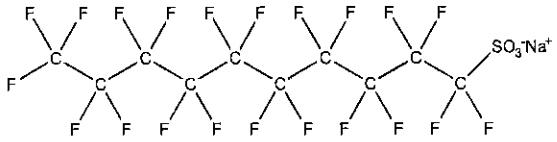
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS0615
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #: 2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	07/02/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/07/2015 (mm/dd/yyyy)

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

INTENDED USE:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

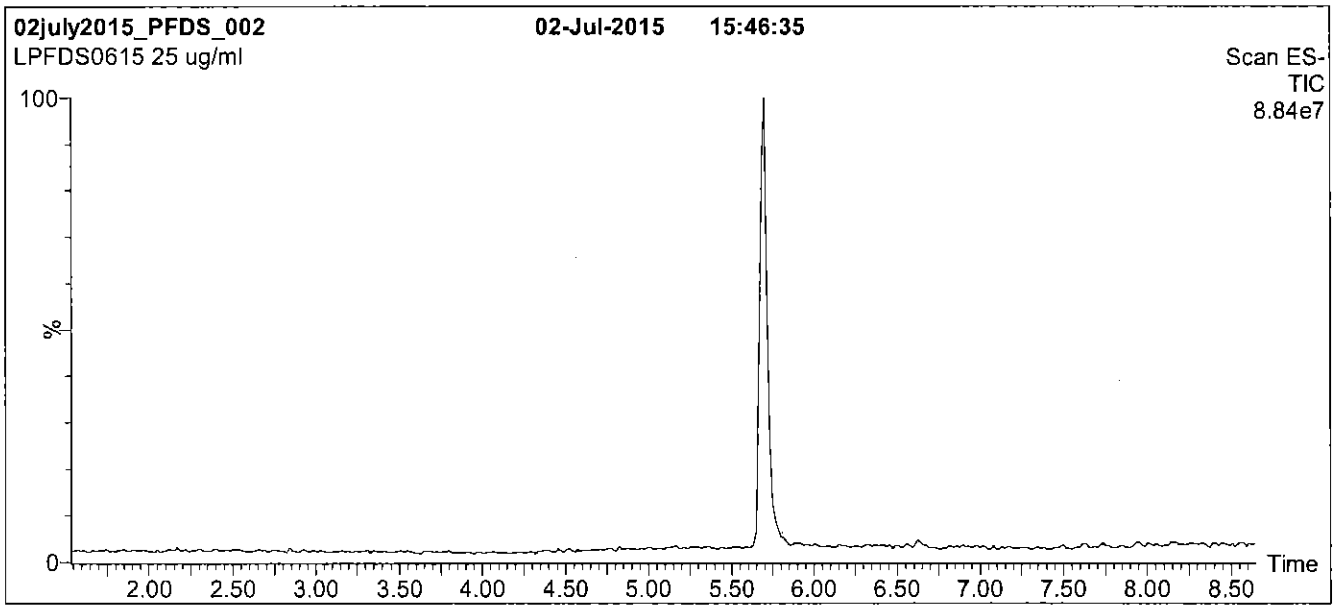
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

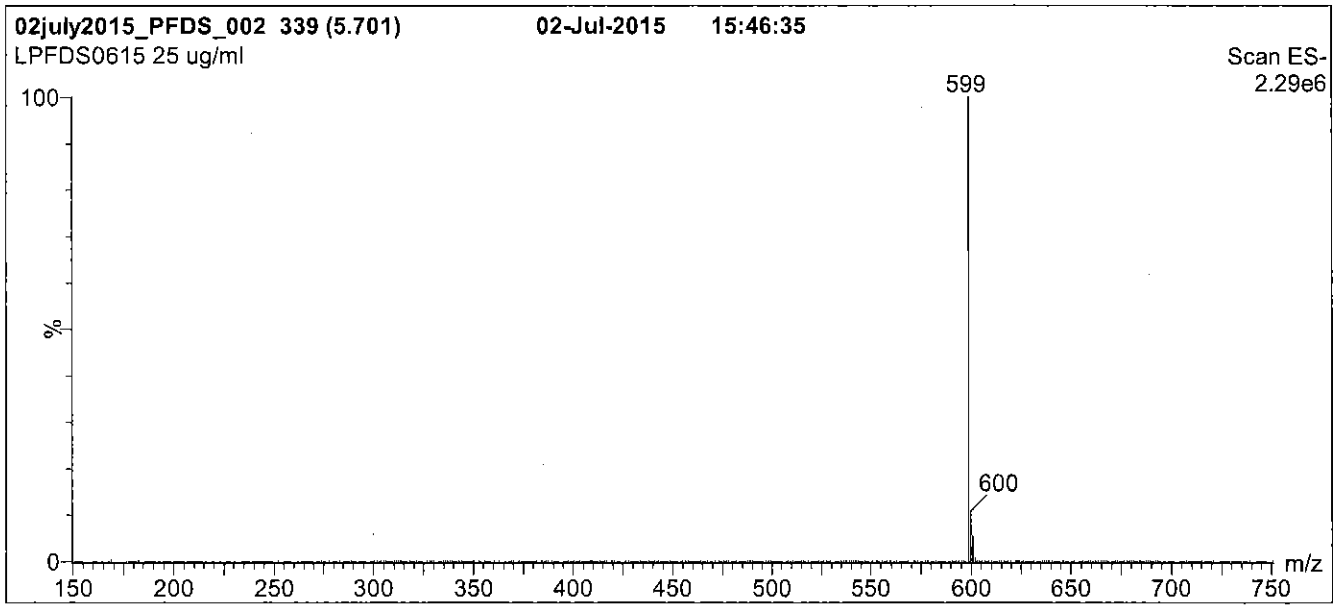
CALA

ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

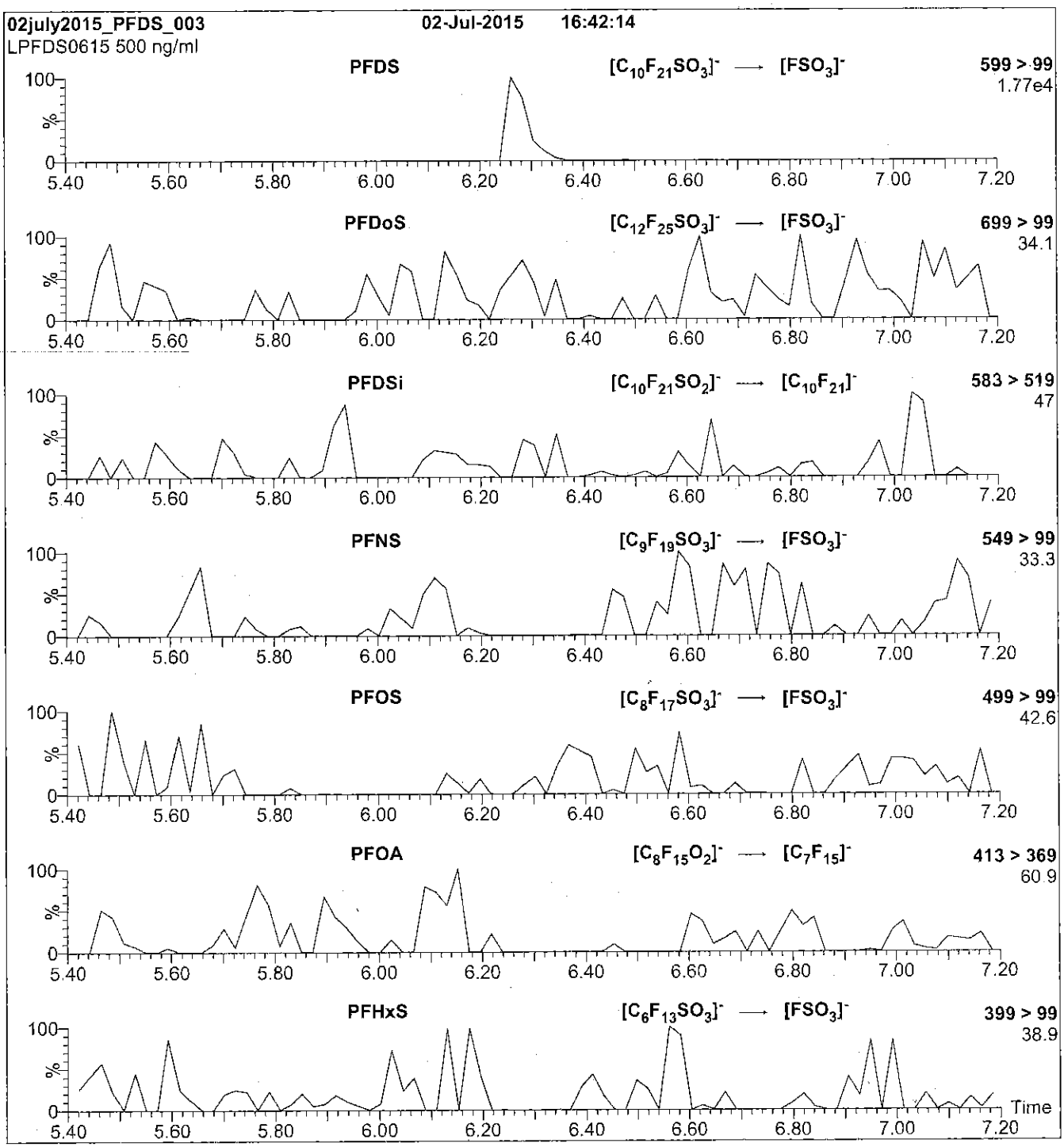
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 50

Reagent

LCPFHpA_00004

WELLINGTON LABORATORIES

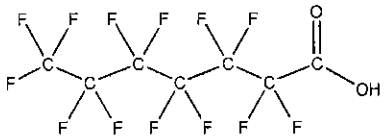
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0514

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/22/2014 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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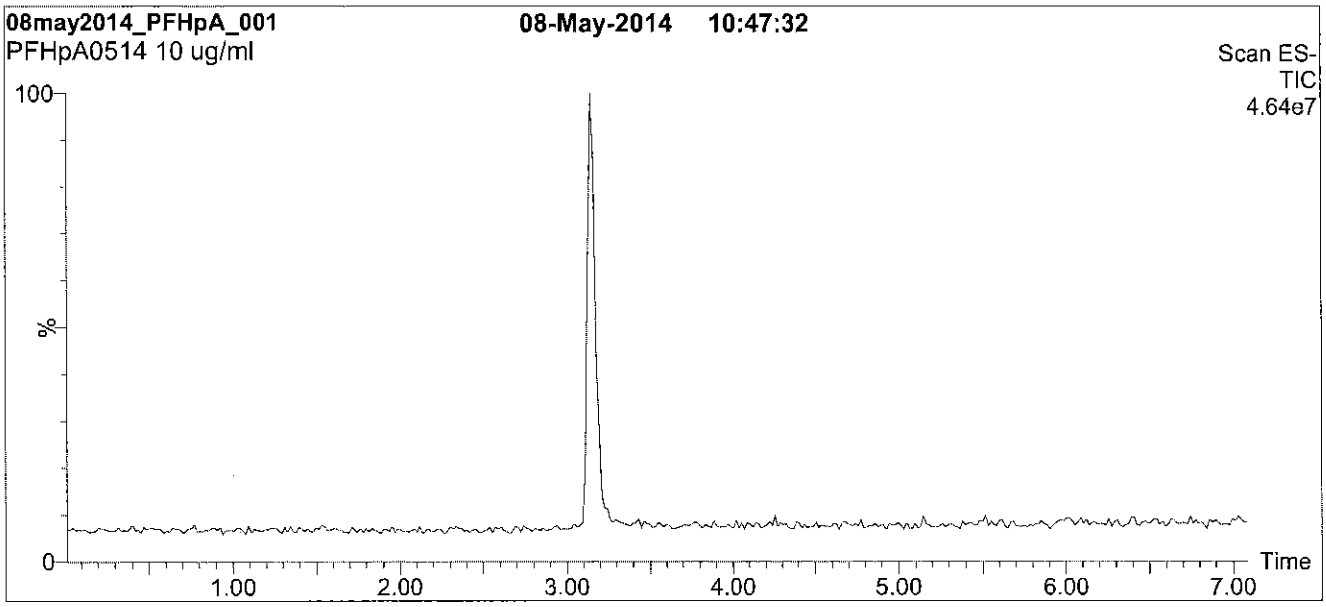
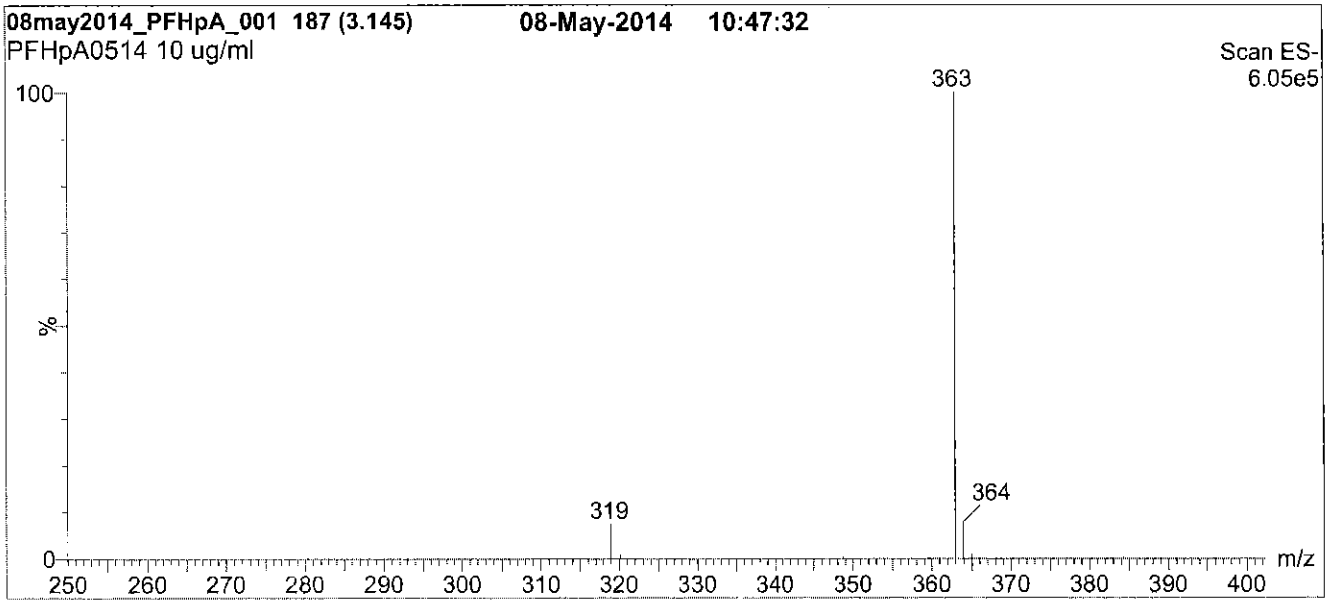
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

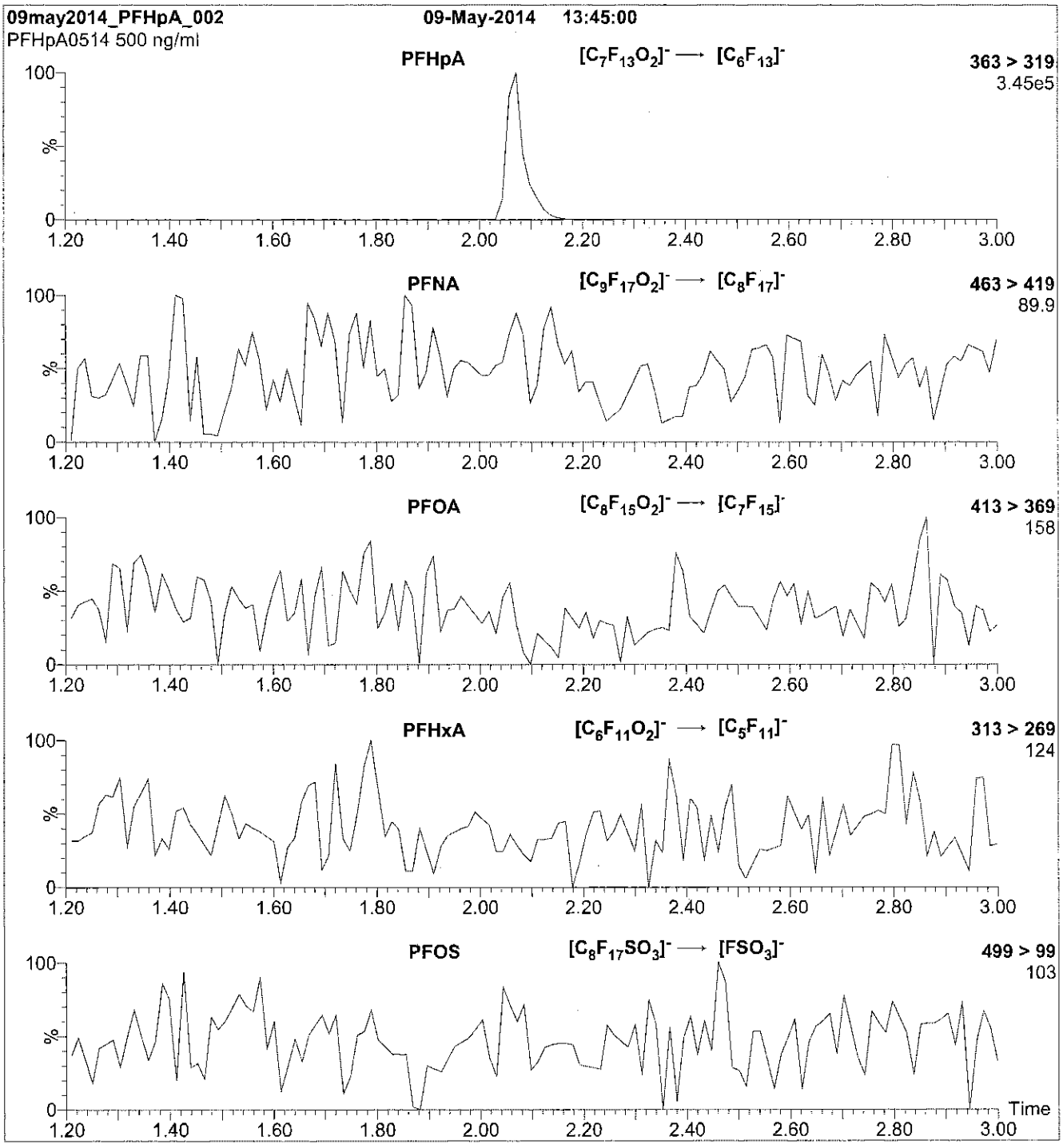
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 11

Reagent

LCPFHpA_00005

609699
ID: LCPFHpA_00005
Exp: 01/22/21 Prpd: CBW
PF-n-heptanoic acid

R: 4/7/16 CBW

WELLINGTON LABORATORIES

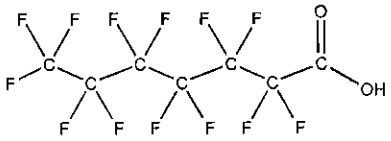
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHpA
COMPOUND: Perfluoro-n-heptanoic acid

LOT NUMBER: PFHpA0116

STRUCTURE:

CAS #: 375-85-9



MOLECULAR FORMULA: $C_7HF_{13}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 364.06
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/22/2016
EXPIRY DATE: (mm/dd/yyyy) 01/22/2021
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 02/02/2016 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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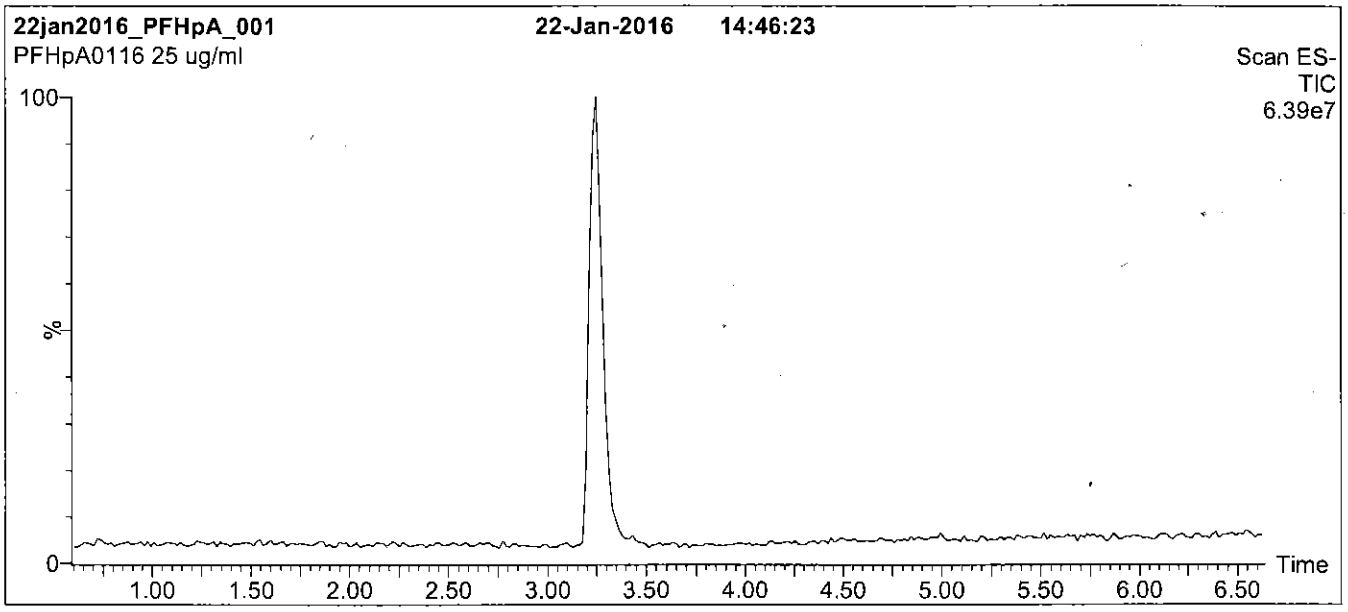
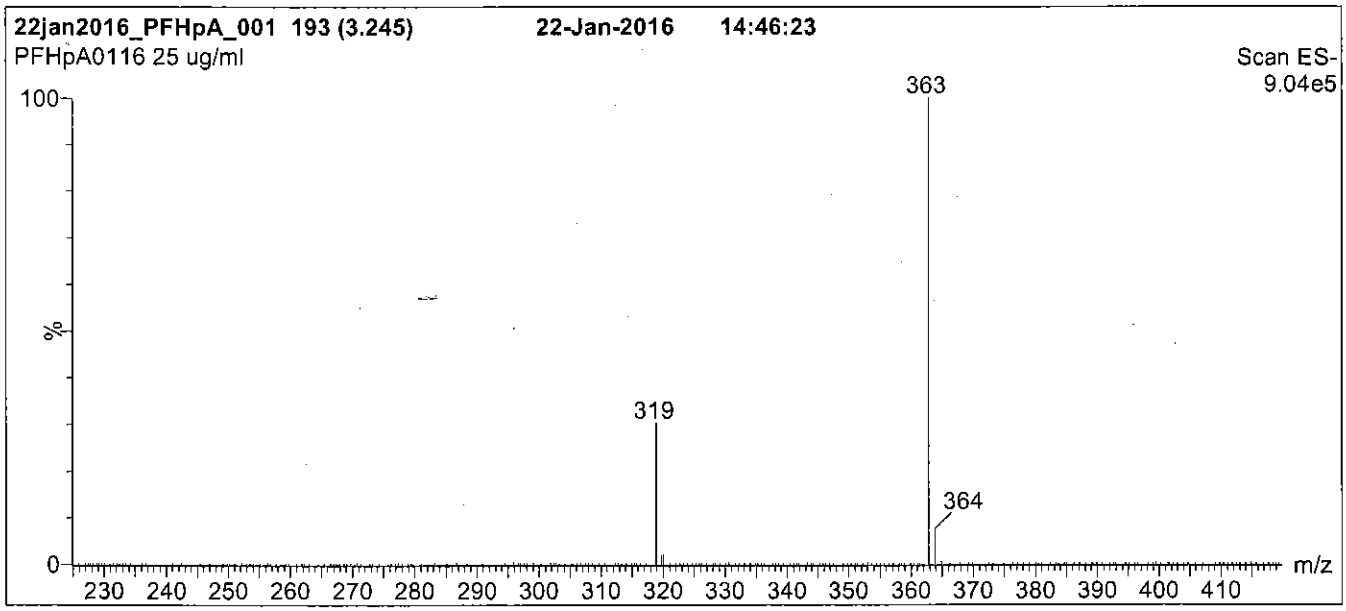
Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

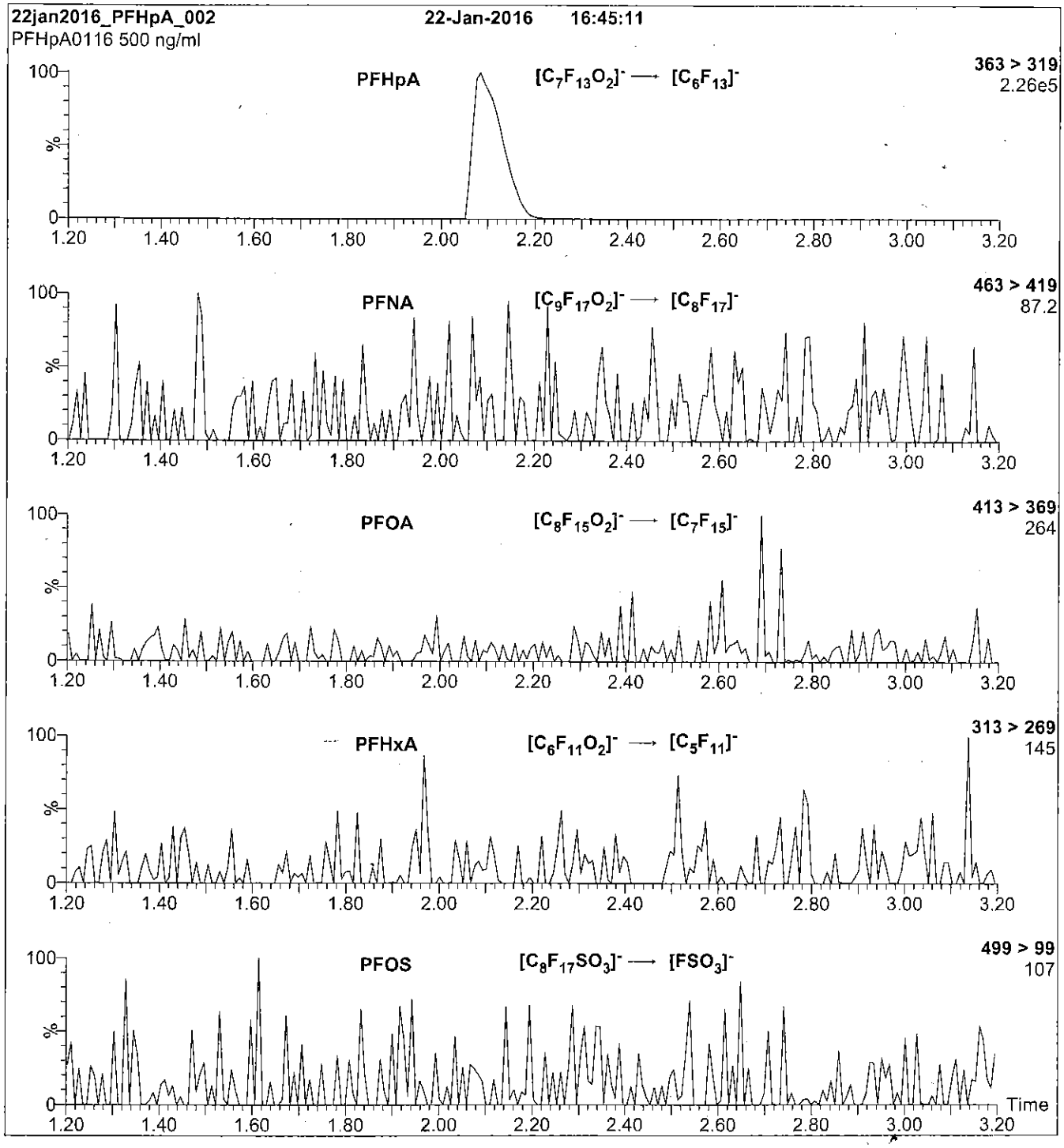
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

Reagent

LCPFHxA_00003

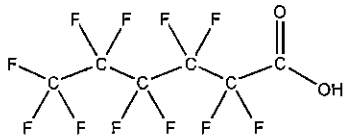
V: 2/11/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid
LOT NUMBER: PFHxA0514

STRUCTURE:
CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
MOLECULAR WEIGHT: 314.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

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Certified By: B.G. Chittim **Date:** 05/22/2014 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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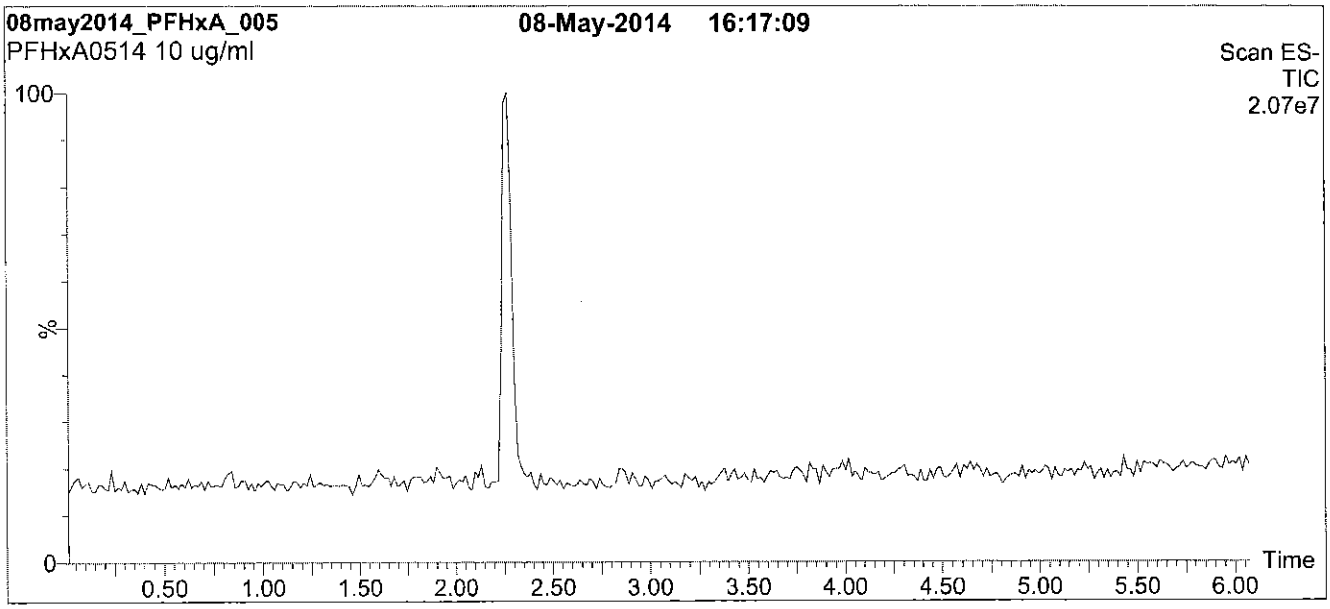
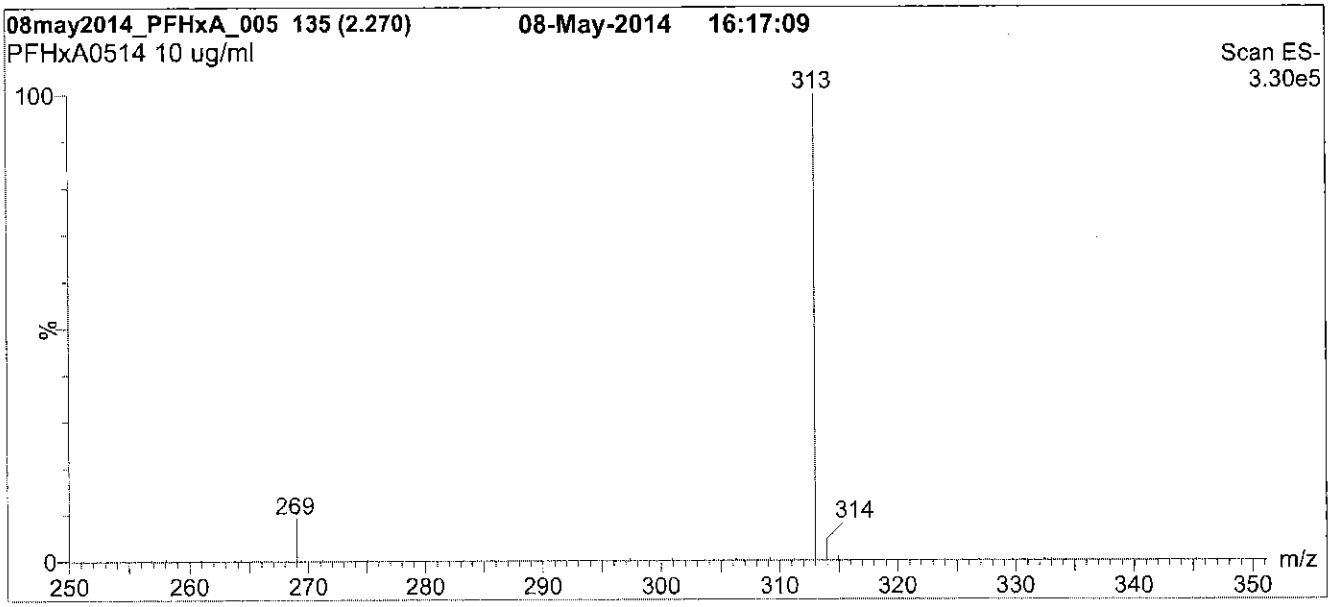
Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

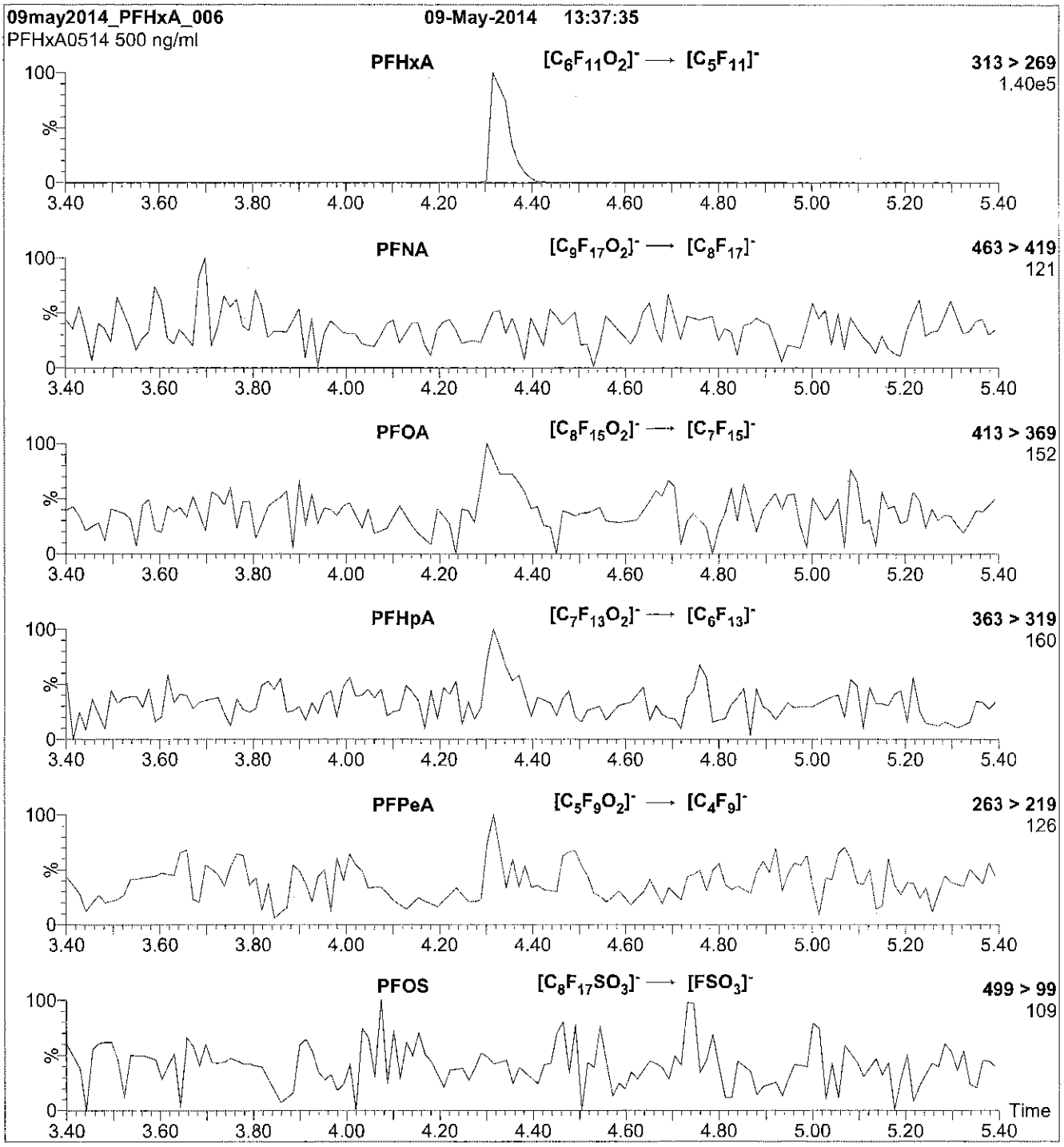
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFHxA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 10

Reagent

LCPFHxA_00004

609702
ID: LCPFHxA_00004
Exp: 12/22/20 Prpd: CBW
PF-n-hexanoic acid

R: 4/7/16 CBW

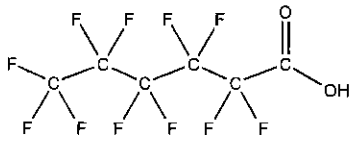
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxA
LOT NUMBER: PFHxA1215
COMPOUND: Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
MOLECULAR WEIGHT: 314.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/22/2015
EXPIRY DATE: (mm/dd/yyyy) 12/22/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/23/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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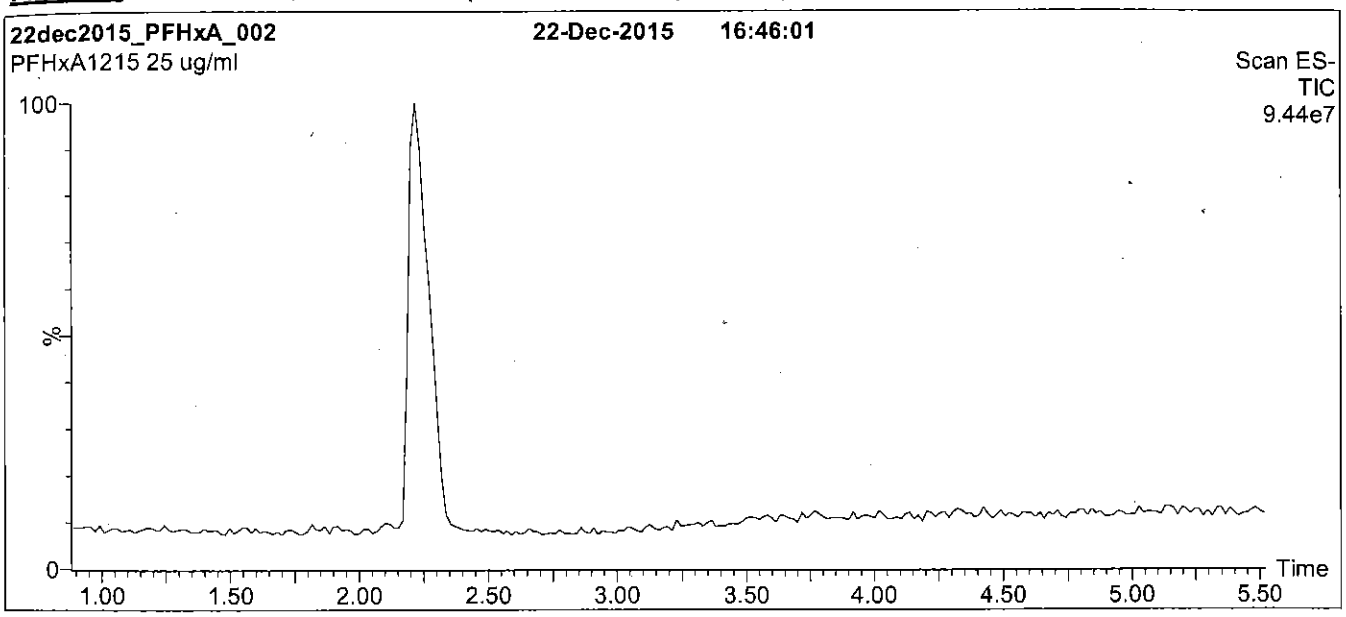

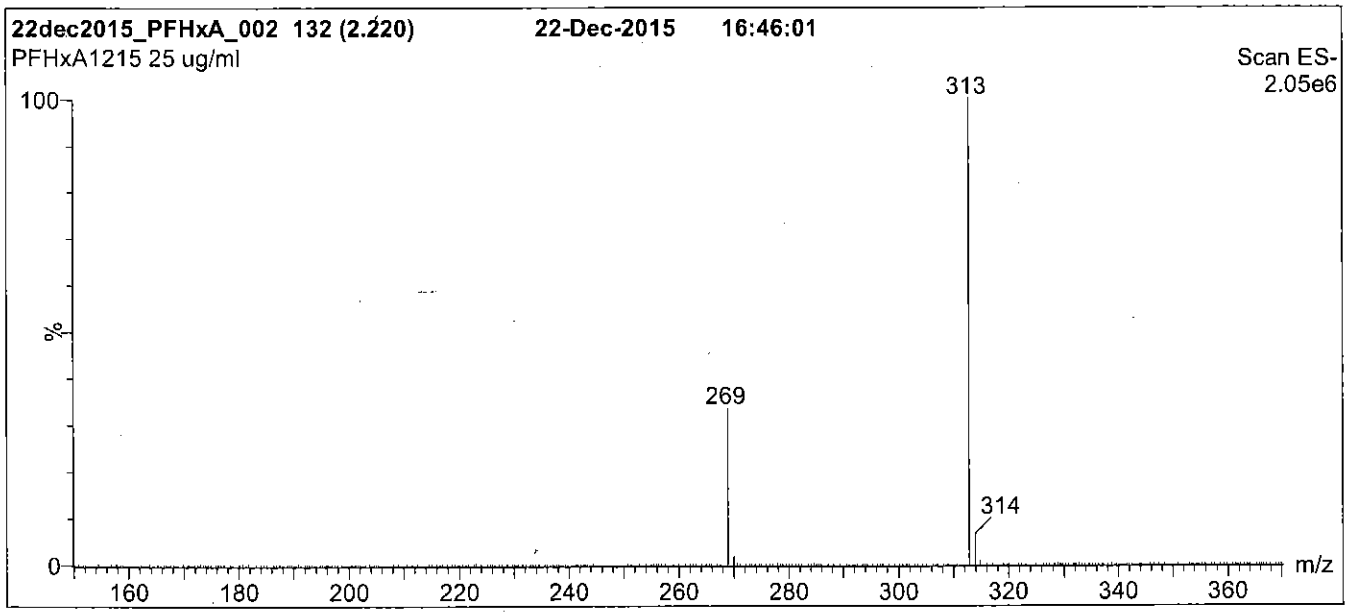

Conditions for Figure 1:

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Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

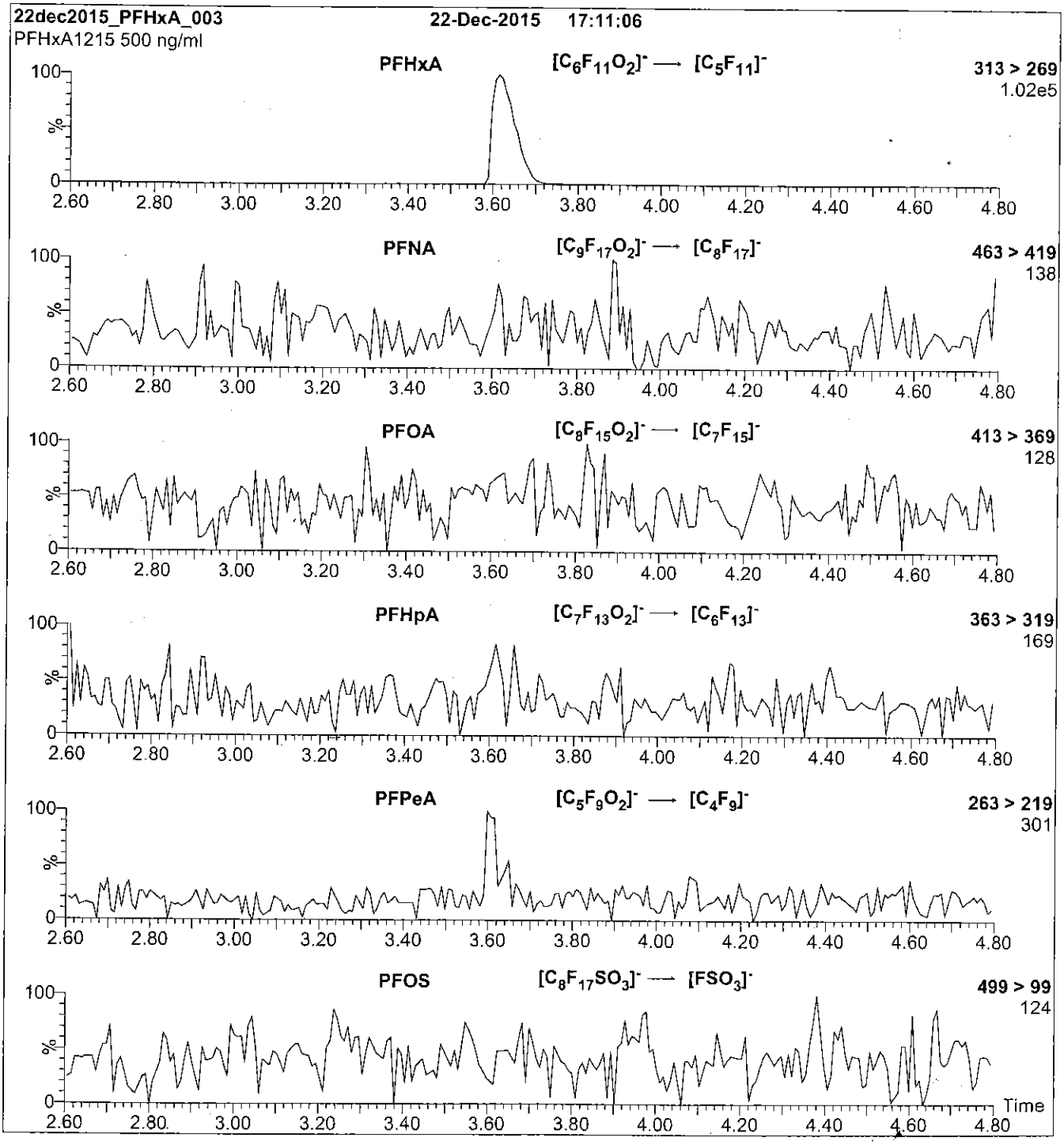
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 10

Reagent

LCPFHxS-br_00001

P: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0615
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	06/29/2015
LAST TESTED: (mm/dd/yyyy)	07/03/2015
EXPIRY DATE: (mm/dd/yyyy)	07/03/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

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The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2,...x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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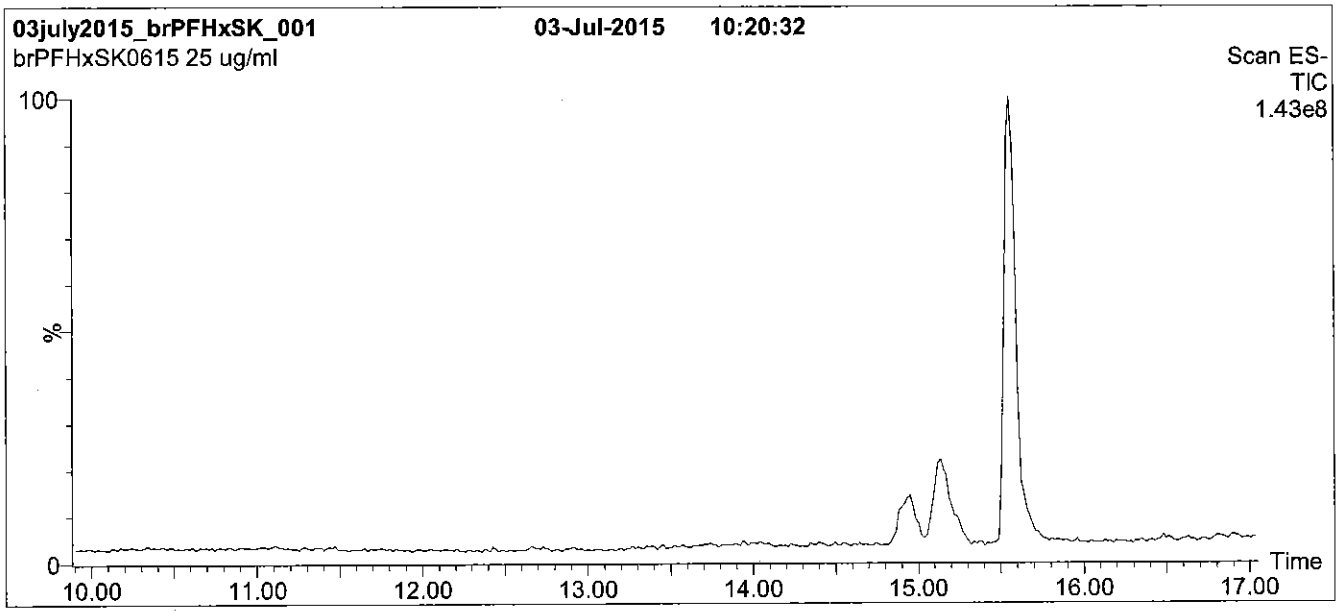
Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

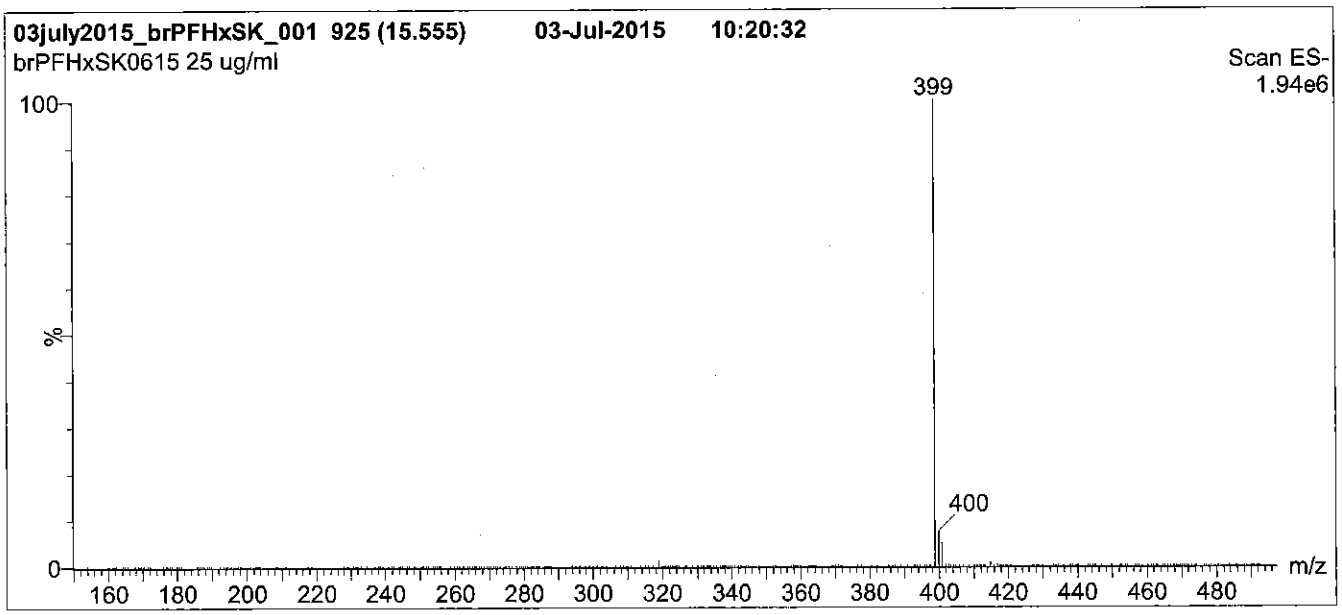
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

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

Certified By: _____ **Date:** 07/15/2015
B.G. Chittim (mm/dd/yyyy)

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

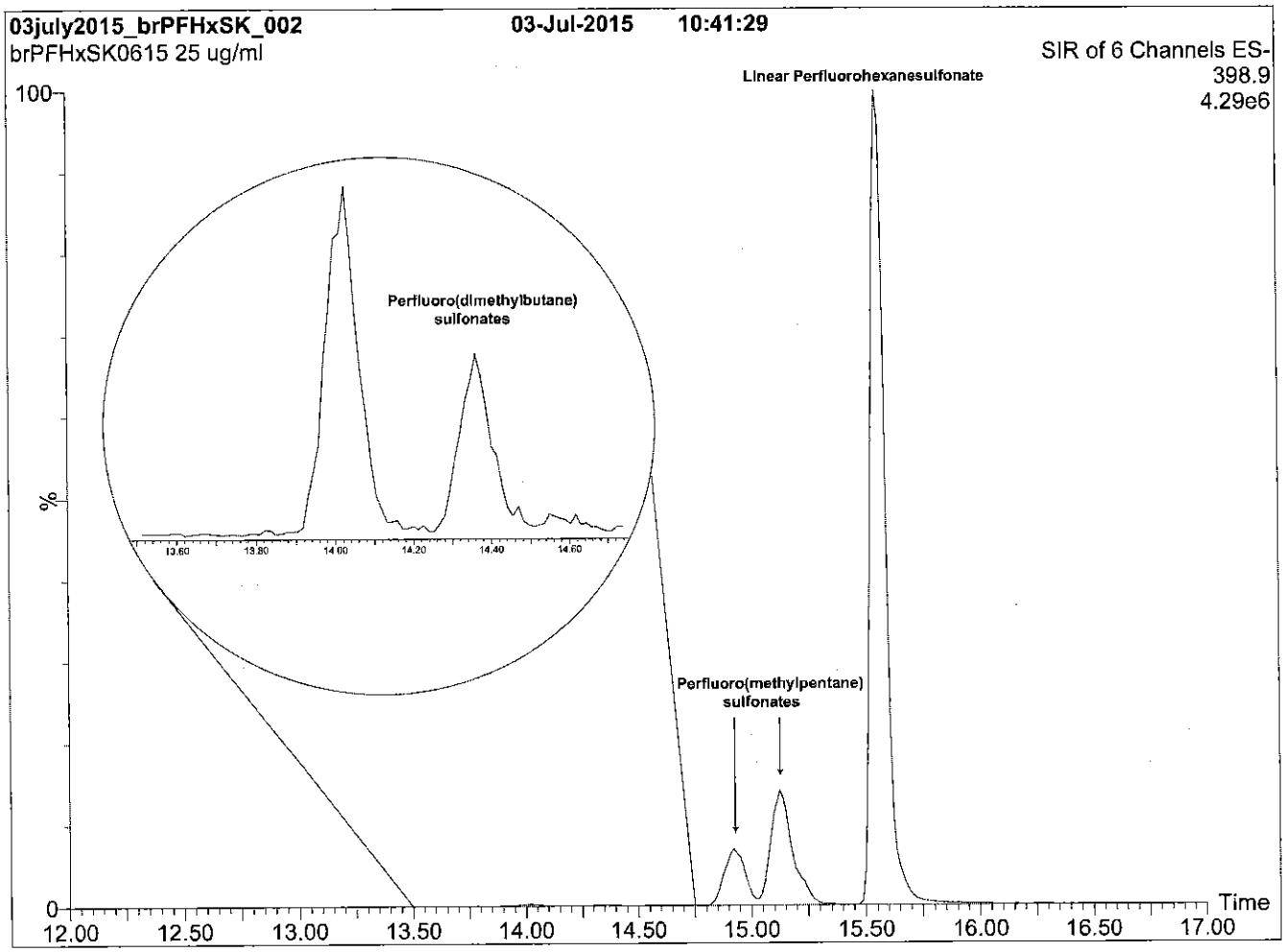
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFHxSK; LC/MS Data**



Conditions for Figure 2:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to
90% organic over 3 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 20 min

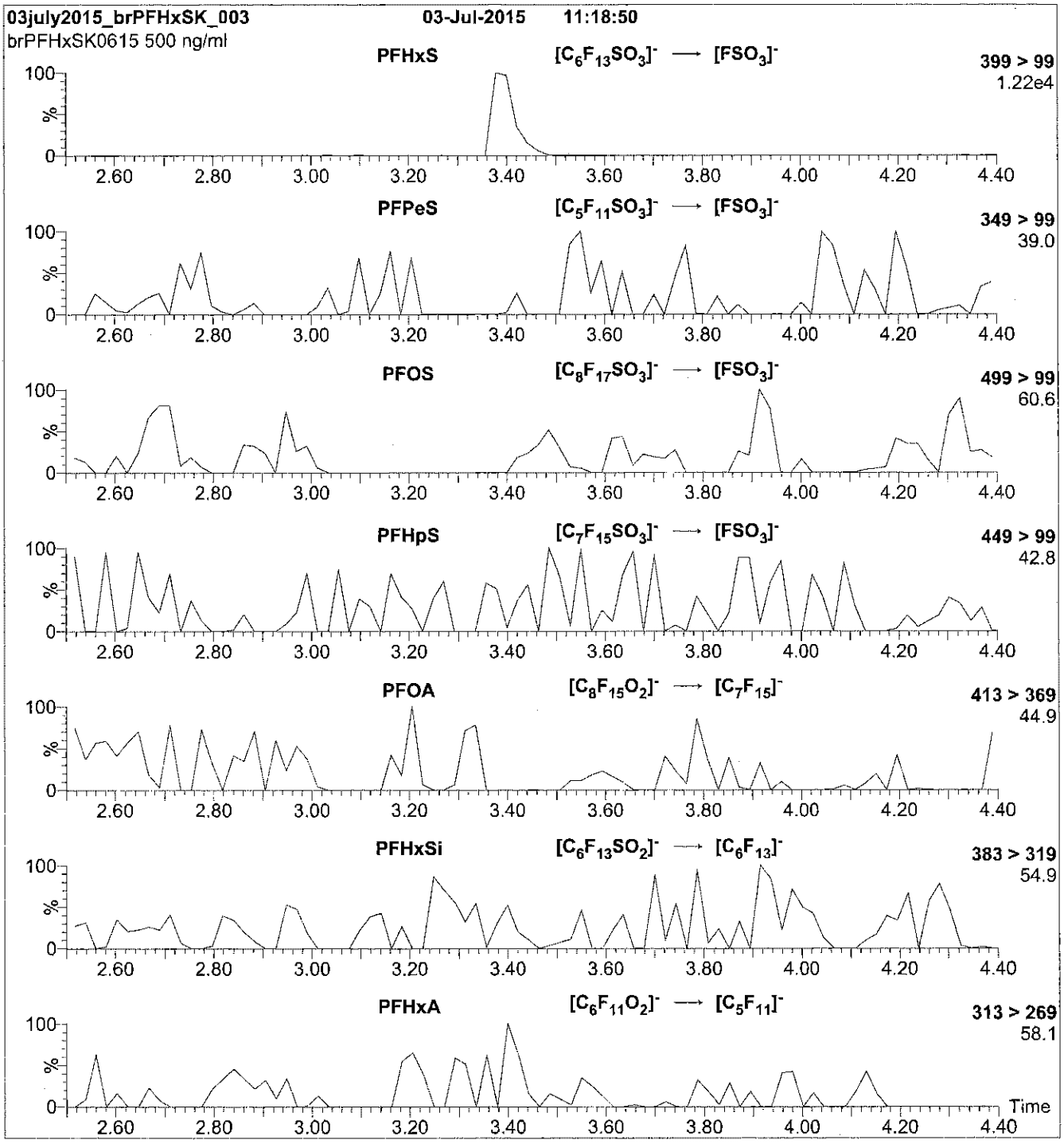
Flow: 300 µl/min

MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFNA_00004

P: 3/27/15 sv

S:

WELLINGTON LABORATORIES

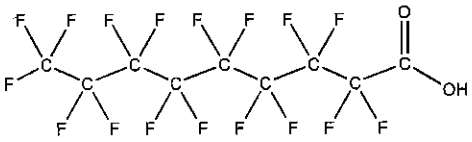
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA0514

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 05/09/2014
EXPIRY DATE: (mm/dd/yyyy) 05/09/2019
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 05/22/2014 (mm/dd/yyyy)

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

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

QUALITY MANAGEMENT:

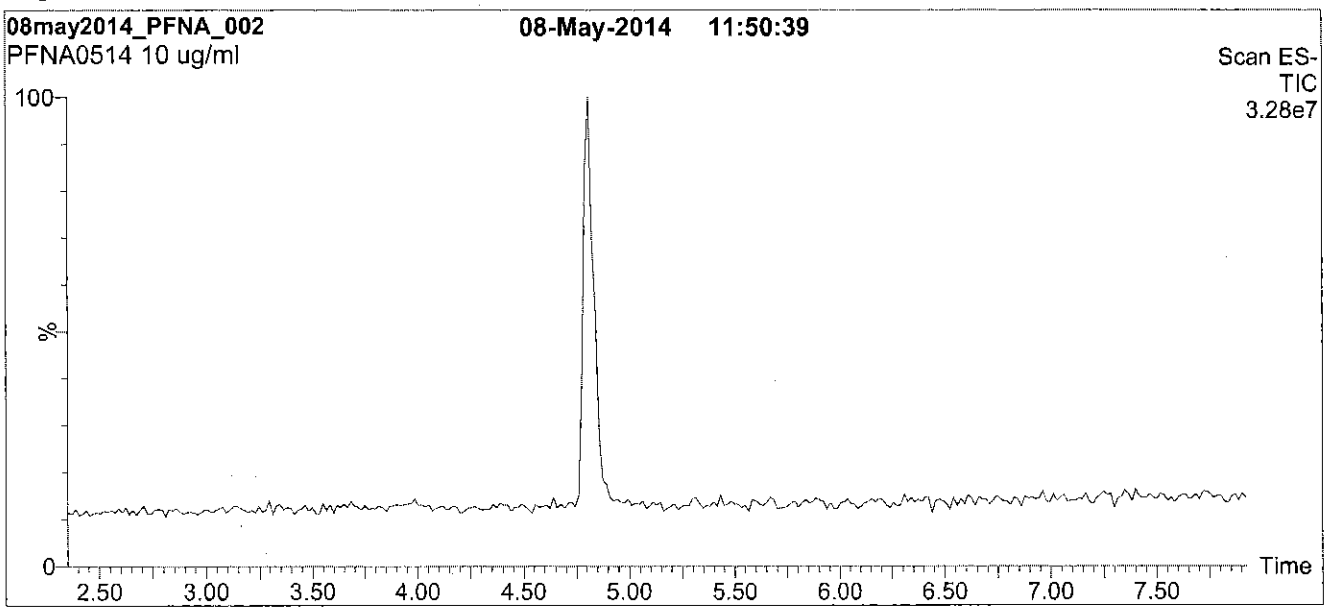
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

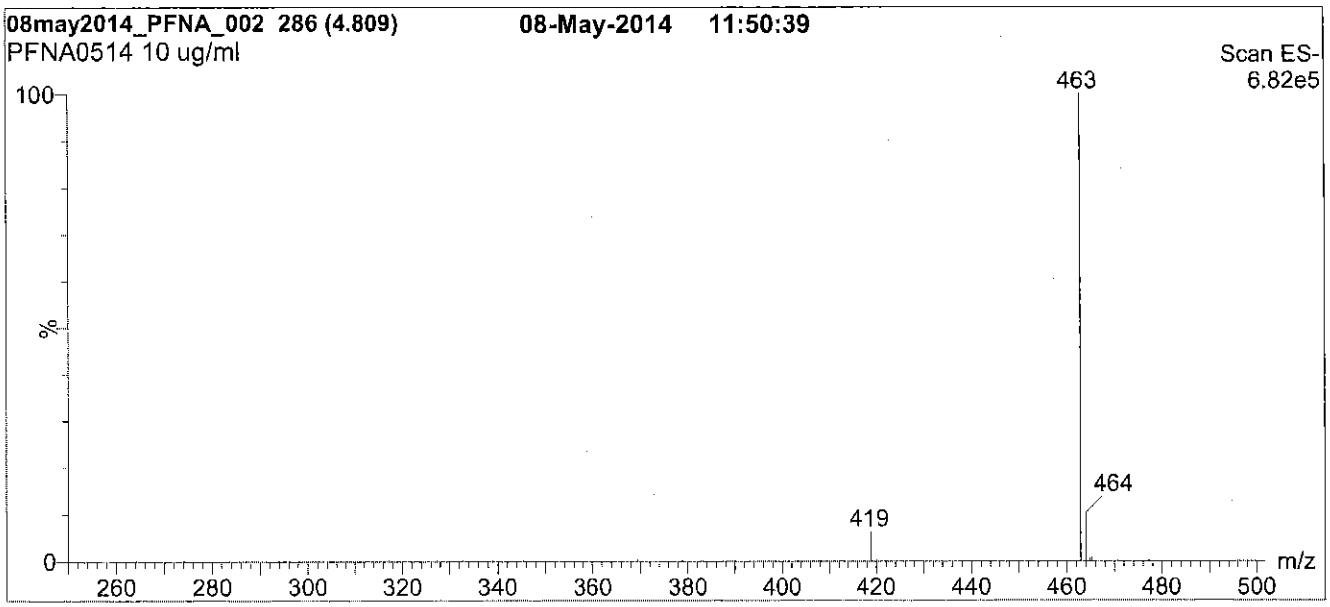
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

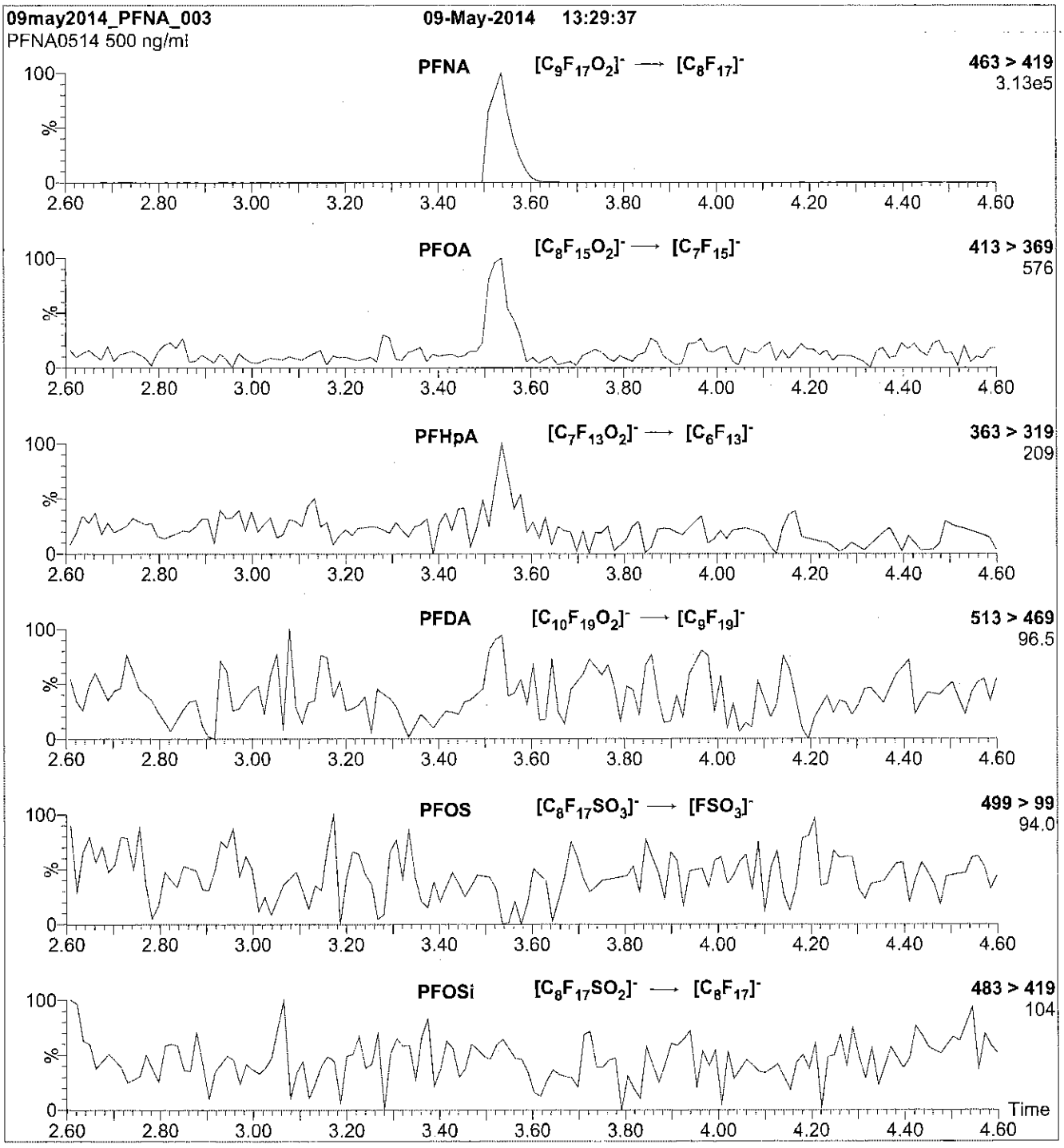
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 11

Reagent

LCPFNA_00005

609703
ID: LCPFNA_00005
Exp: 10/23/20 Prpd: CBW
PF-n-nonanoic acid

R 4/7/16 CBW

WELLINGTON LABORATORIES

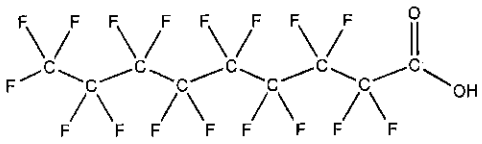
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid

LOT NUMBER: PFNA1015

STRUCTURE:

CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 464.08
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/23/2015
EXPIRY DATE: (mm/dd/yyyy) 10/23/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/30/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

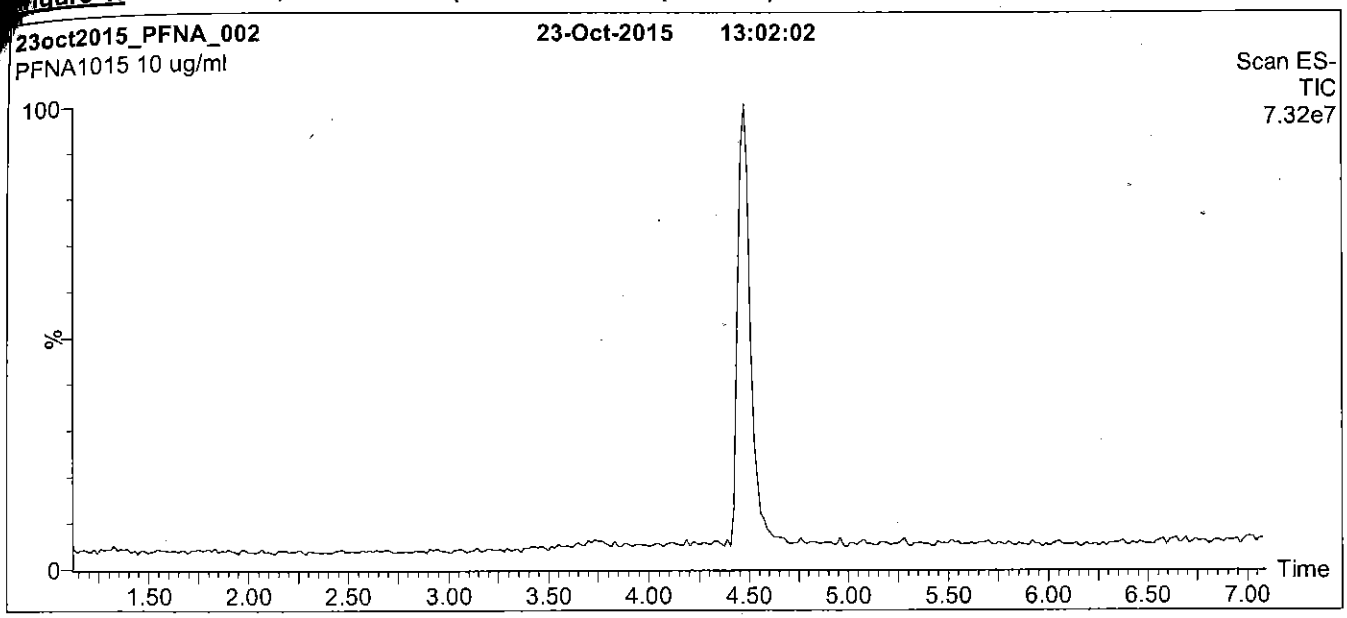
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

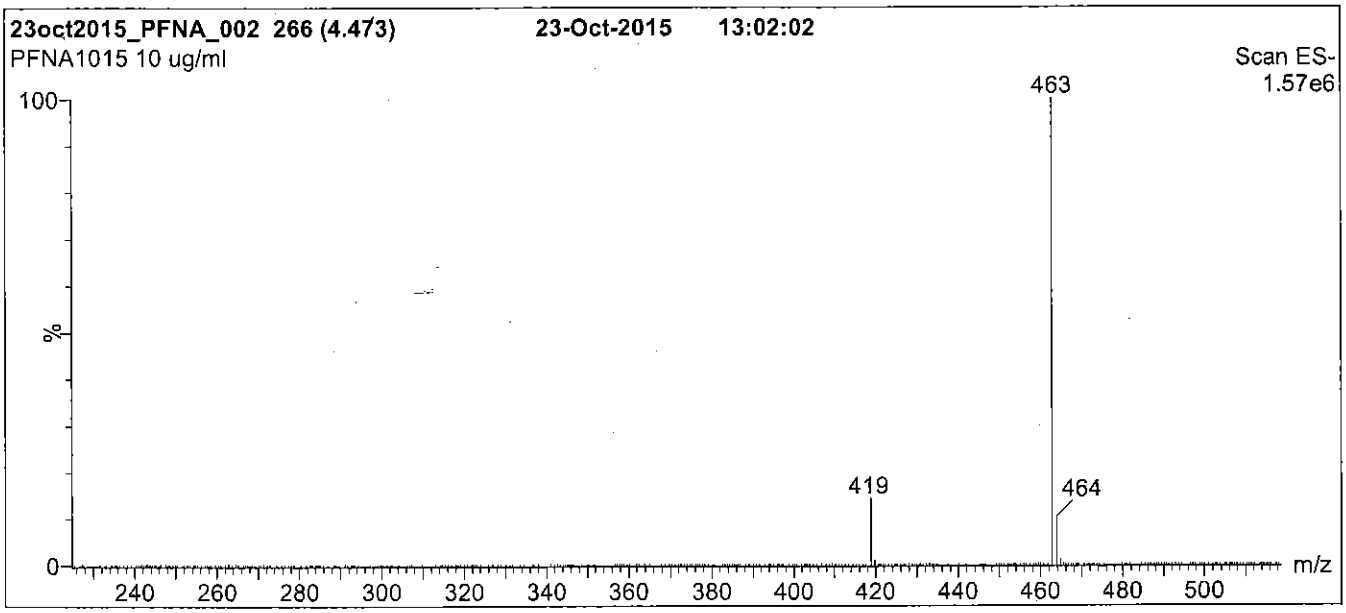
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: PFNA; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

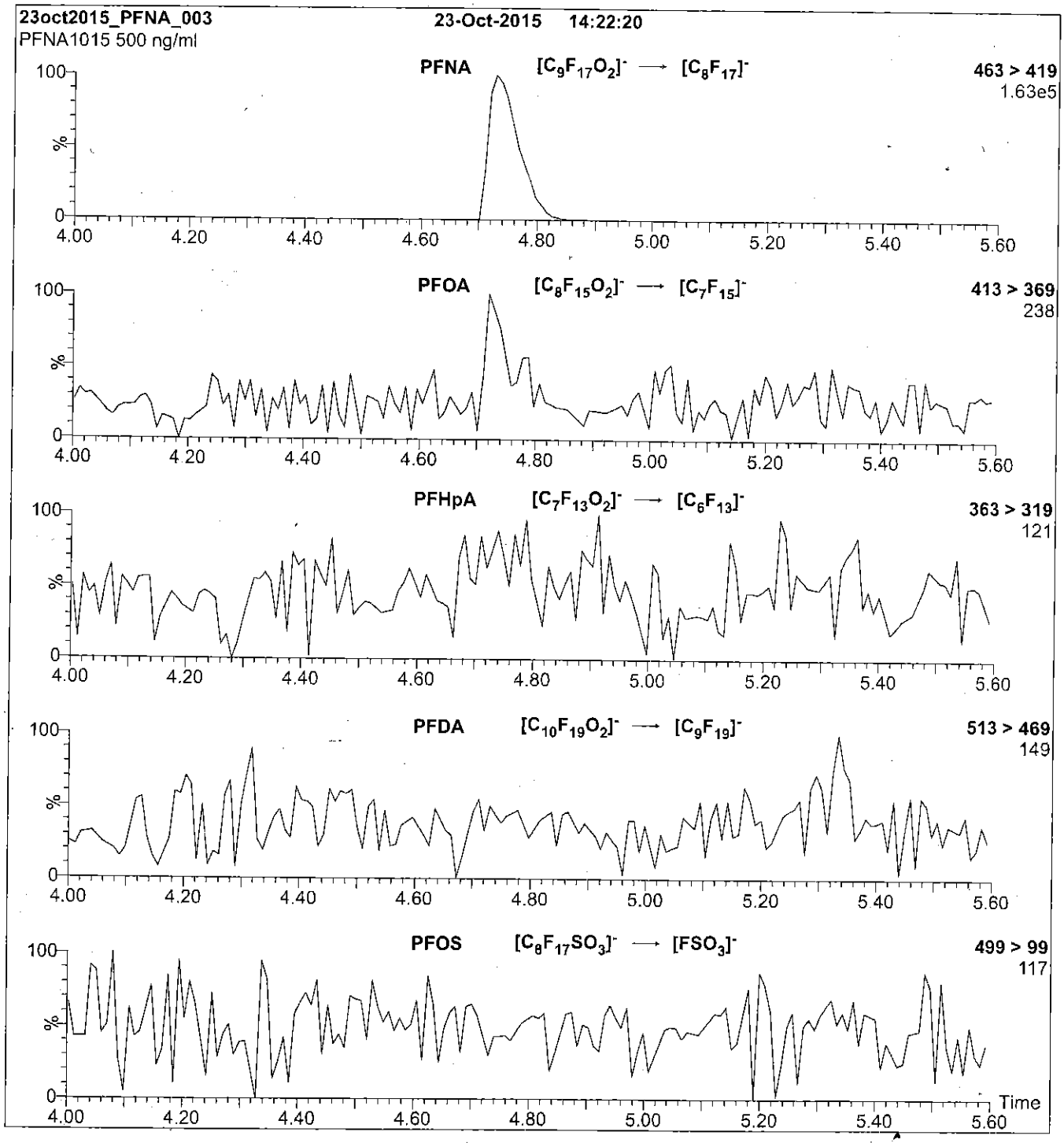
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFNA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

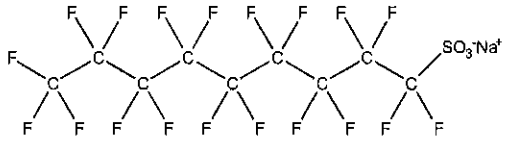
LCPFNS_00002

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFNS
LOT NUMBER: LPFNS0712
COMPOUND: Sodium perfluoro-1-nonanesulfonate

STRUCTURE:
CAS #: 98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/15/2013 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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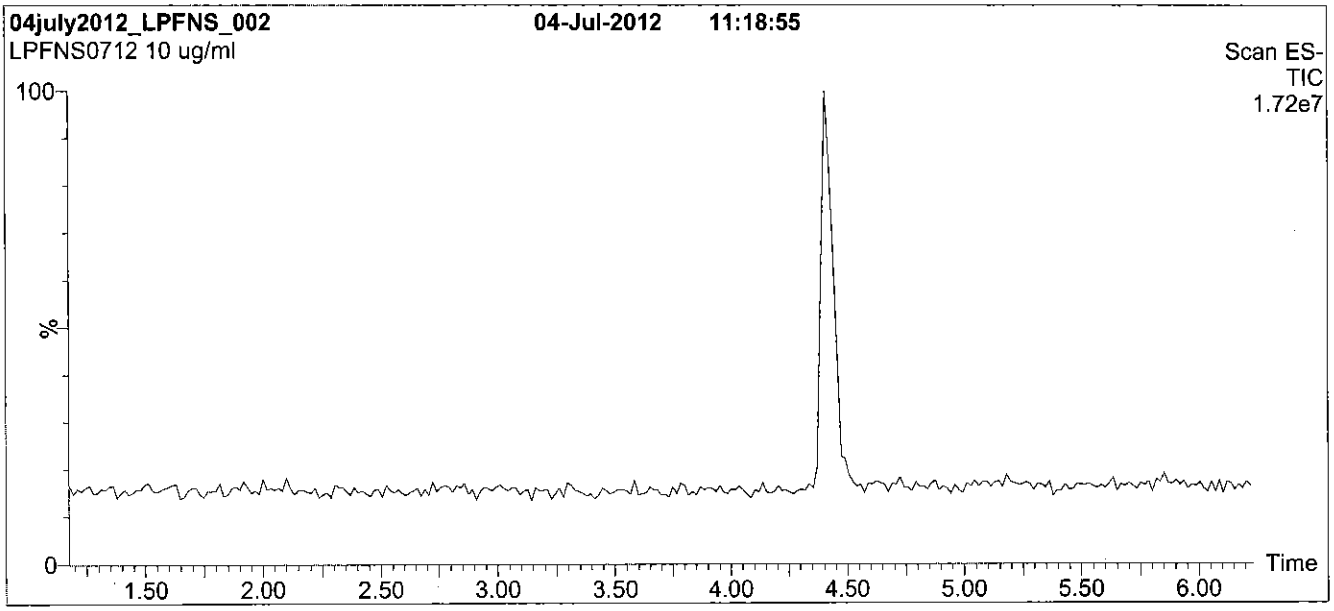
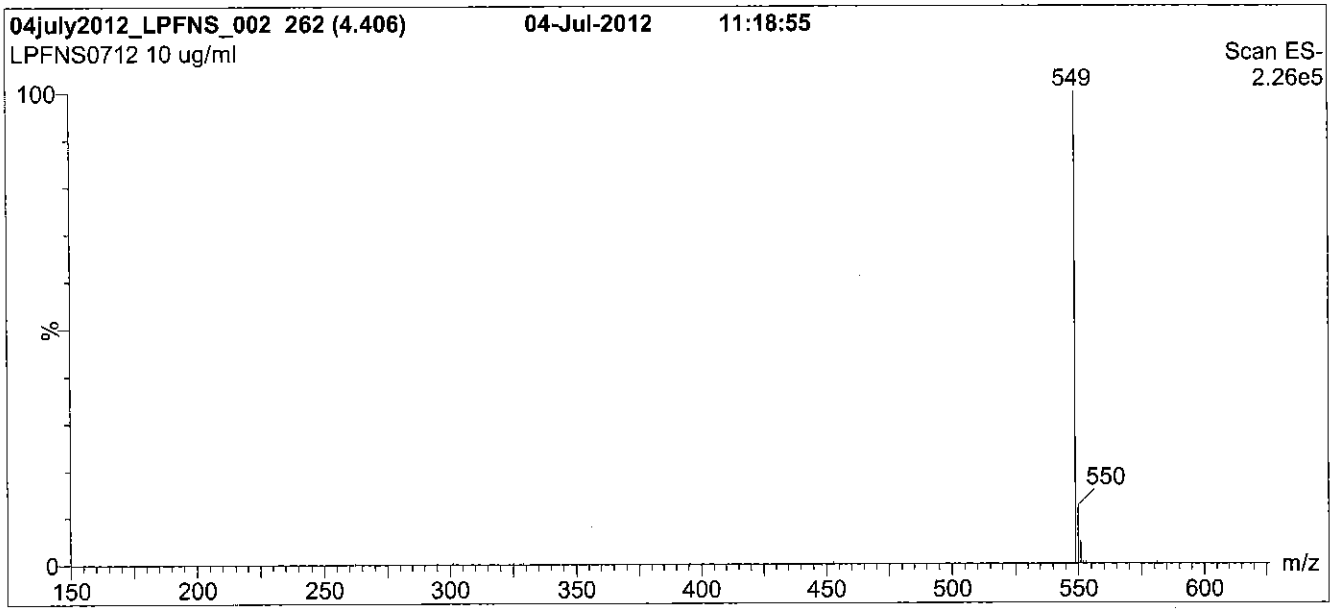
Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

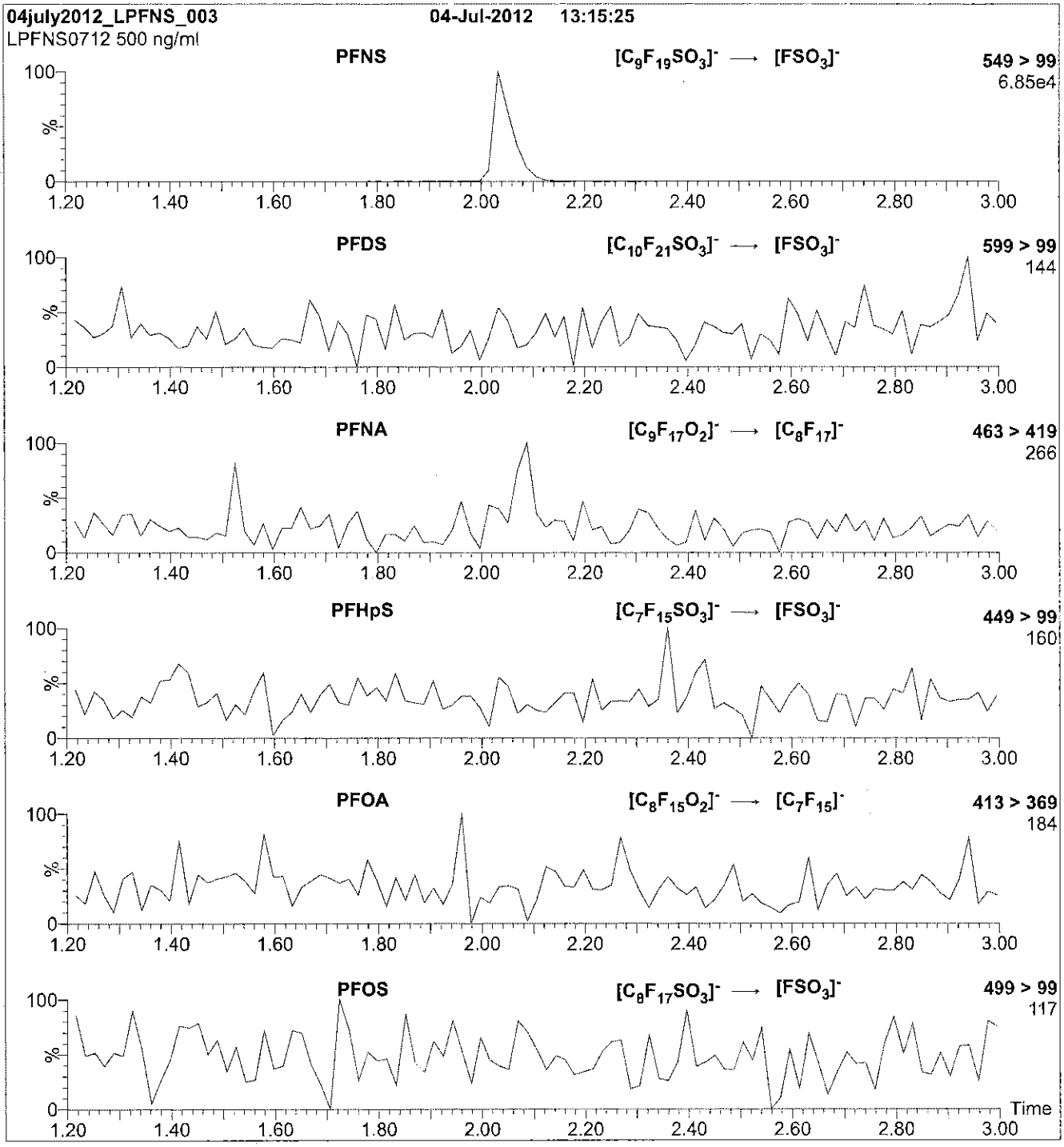
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 45

Reagent

LCPFOA_00004

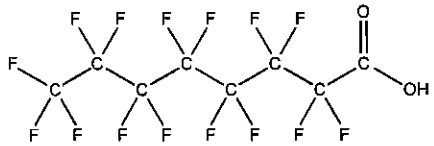
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid
LOT NUMBER: PFOA1013

STRUCTURE:
CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
MOLECULAR WEIGHT: 414.07
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/11/2013
EXPIRY DATE: (mm/dd/yyyy) 10/11/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 10/18/2013 (mm/dd/yyyy)

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

INTENDED USE:

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HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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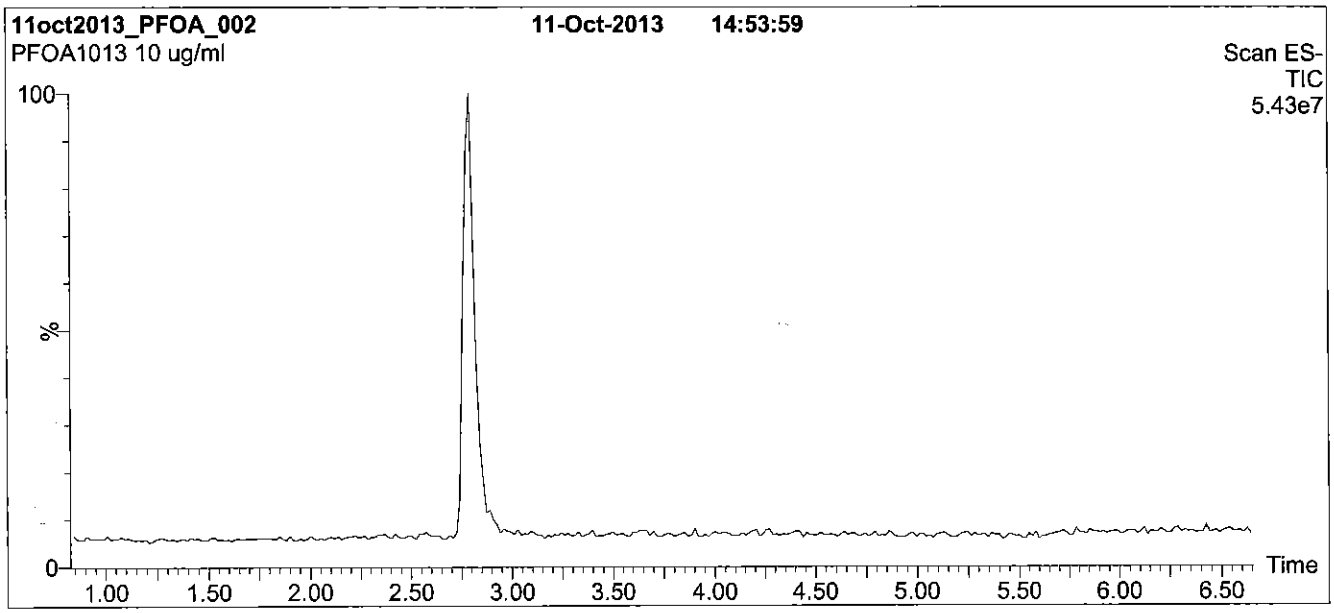
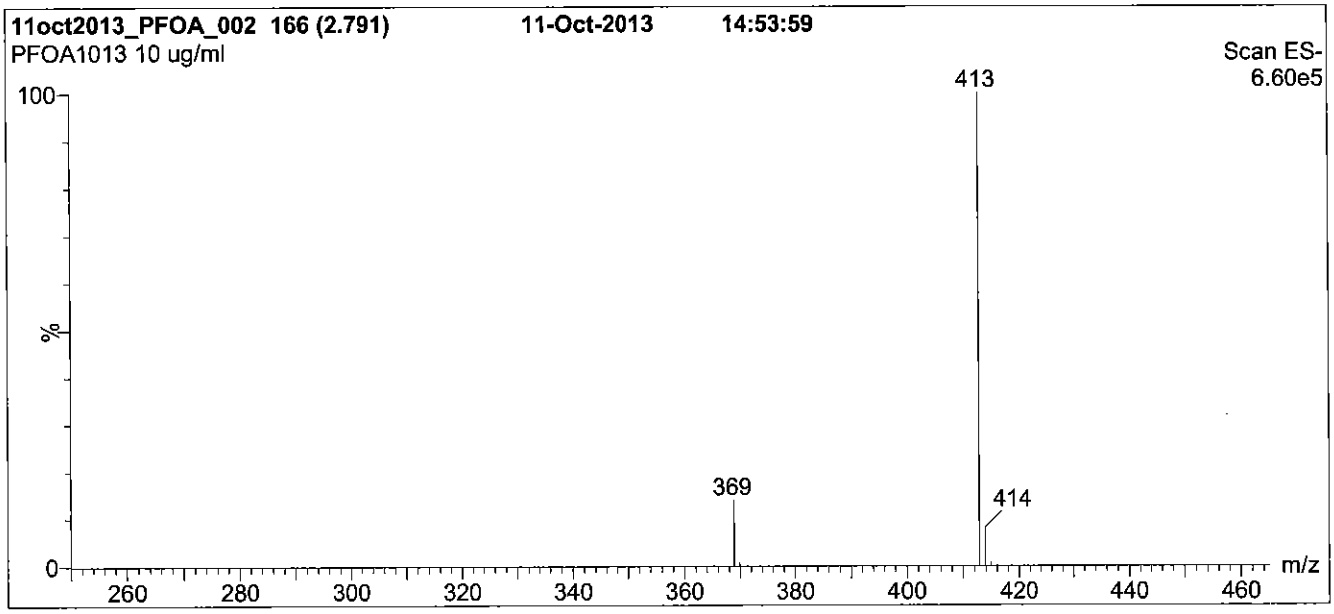
Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for
1 min before returning to initial conditions in 0.5 min.
Time: 10 min

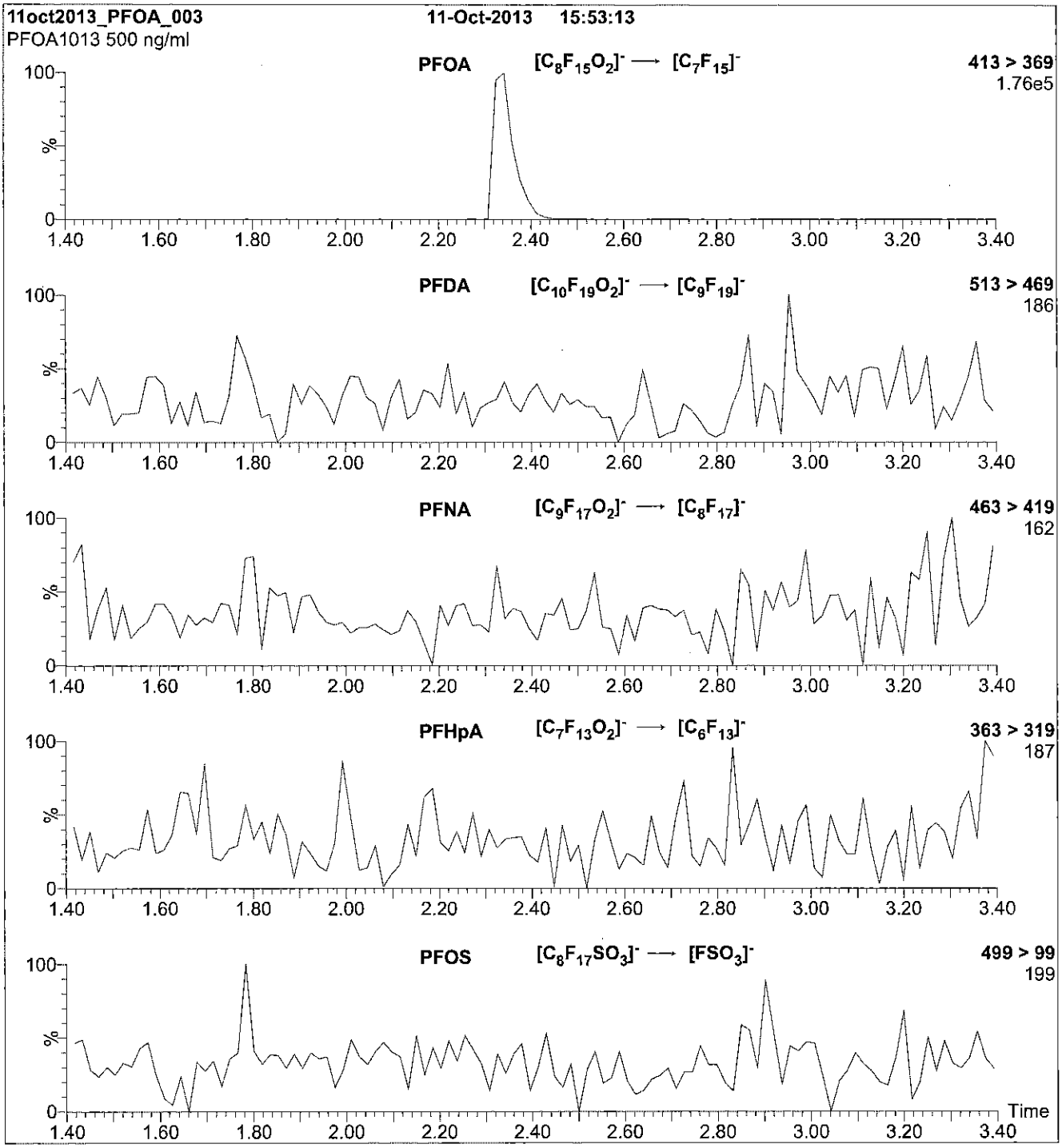
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection:	Direct loop injection 10 µl (500 ng/ml PFOA)
Mobile phase:	Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O (both with 10 mM NH_4OAc buffer)
Flow:	300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

Reagent

LCPFOA_00005

Rec 4/30/15 CW

WELLINGTON LABORATORIES

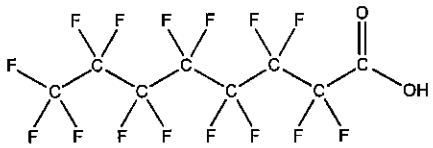
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA1115

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 11/06/2015
EXPIRY DATE: (mm/dd/yyyy) 11/06/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 11/11/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

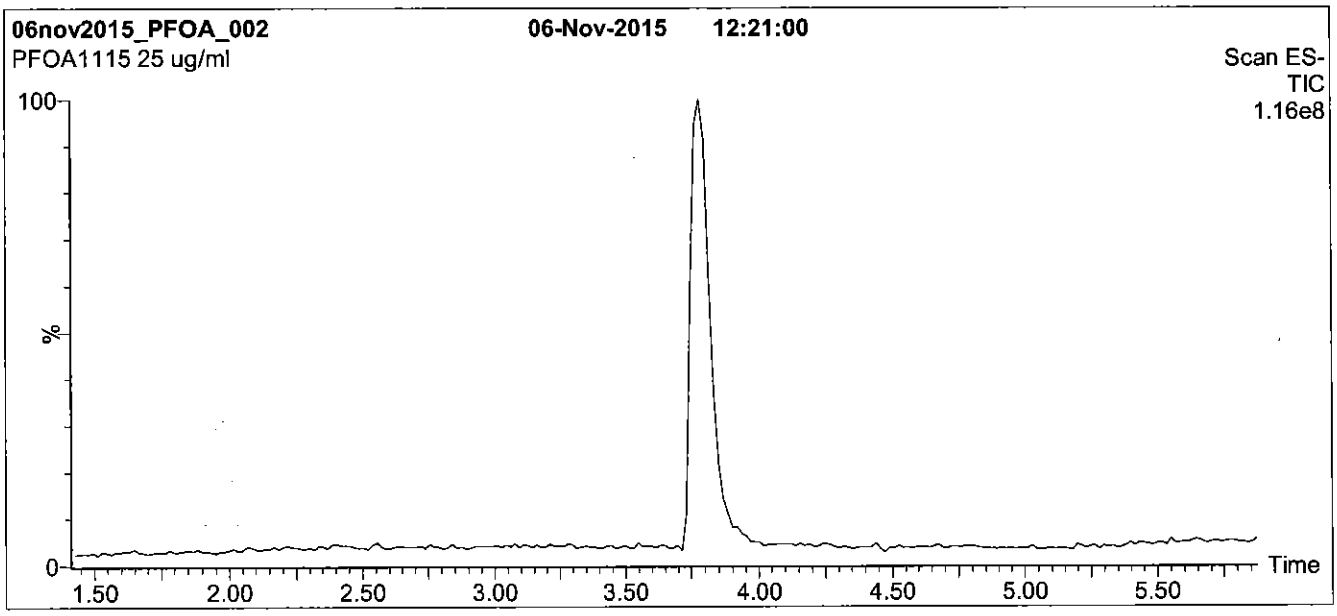
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

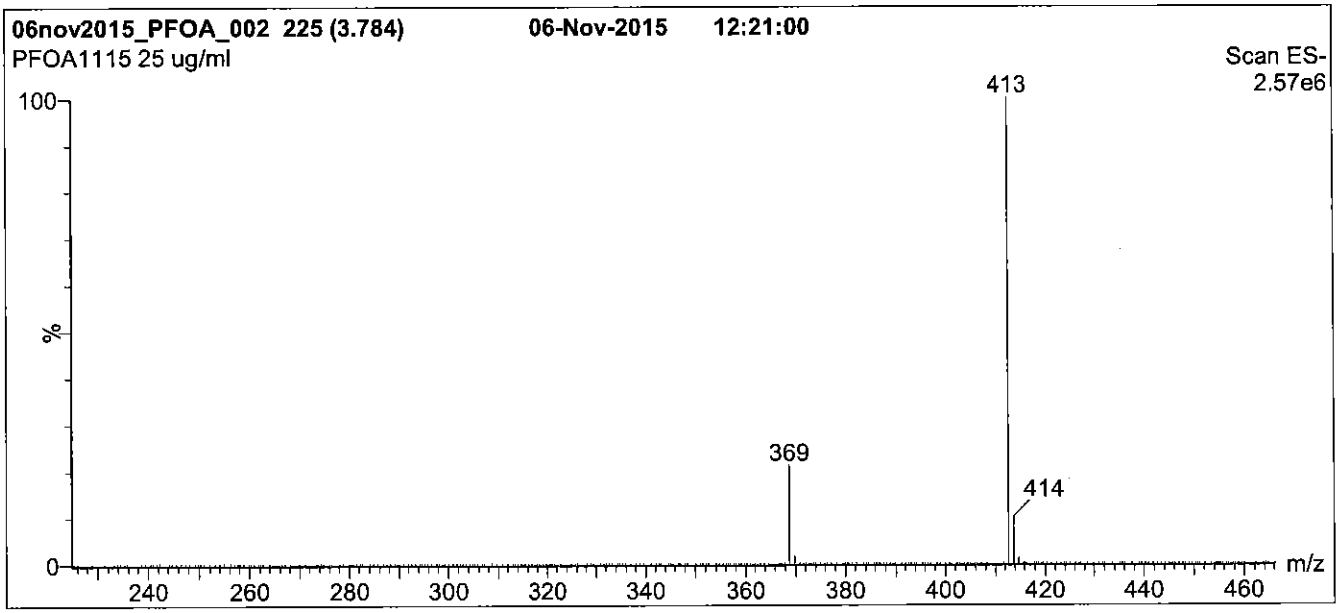
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17025 ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

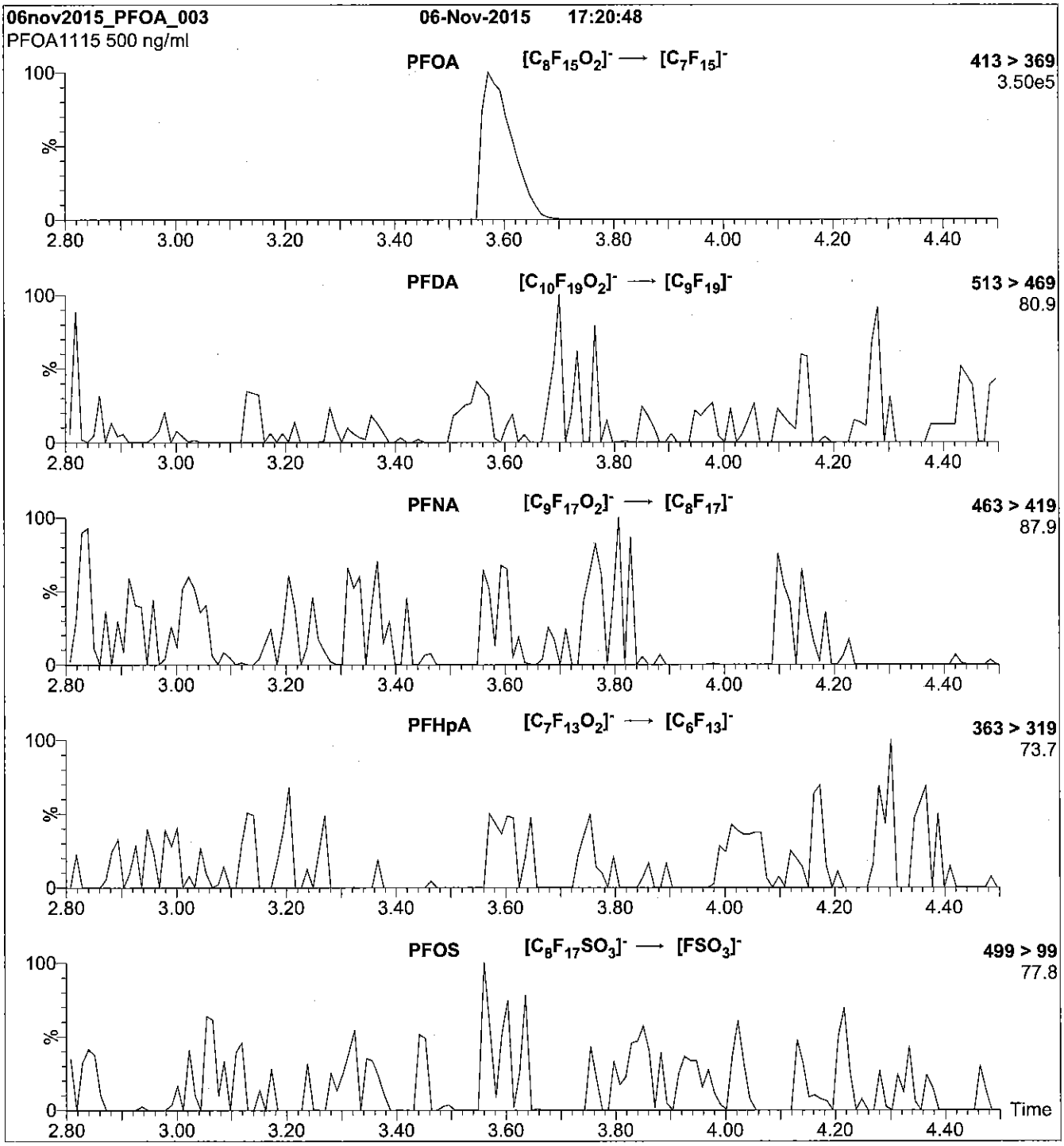
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 10

Reagent

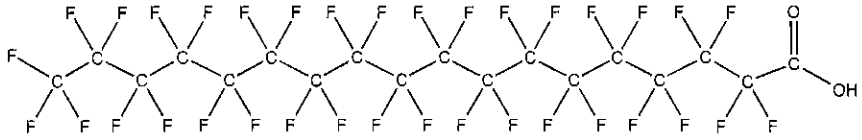
LCPFODA_00004

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0807

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.15
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (4%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/25/2014
EXPIRY DATE: (mm/dd/yyyy) 04/25/2017
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 04/28/2014 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

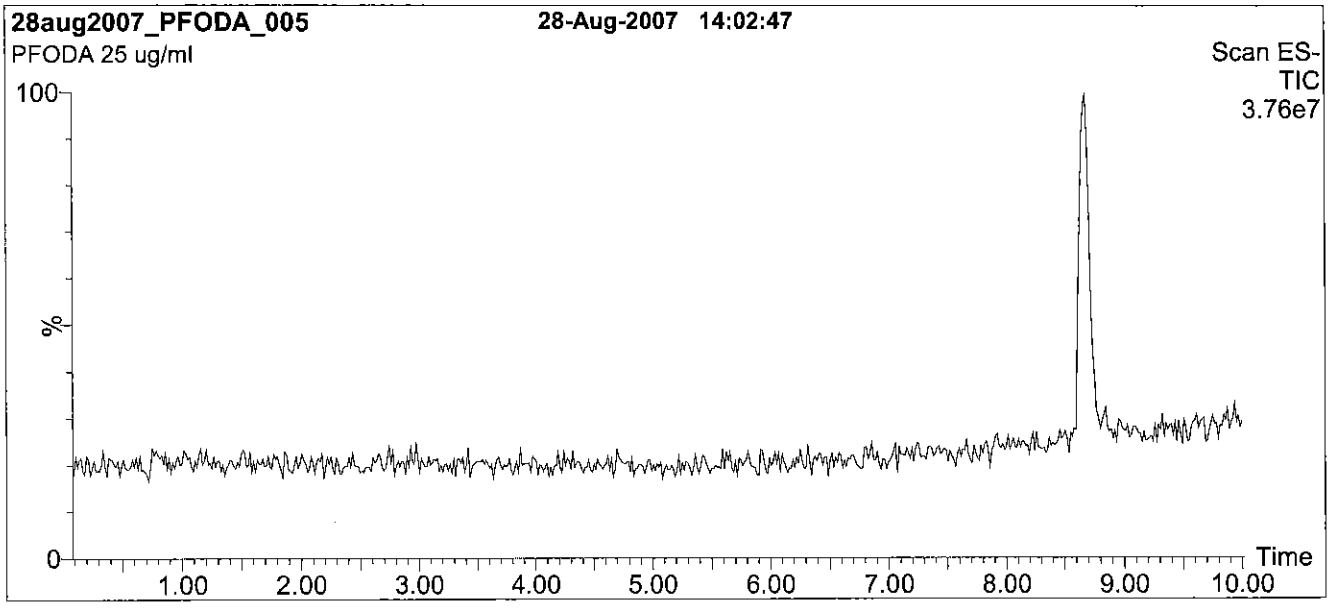
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

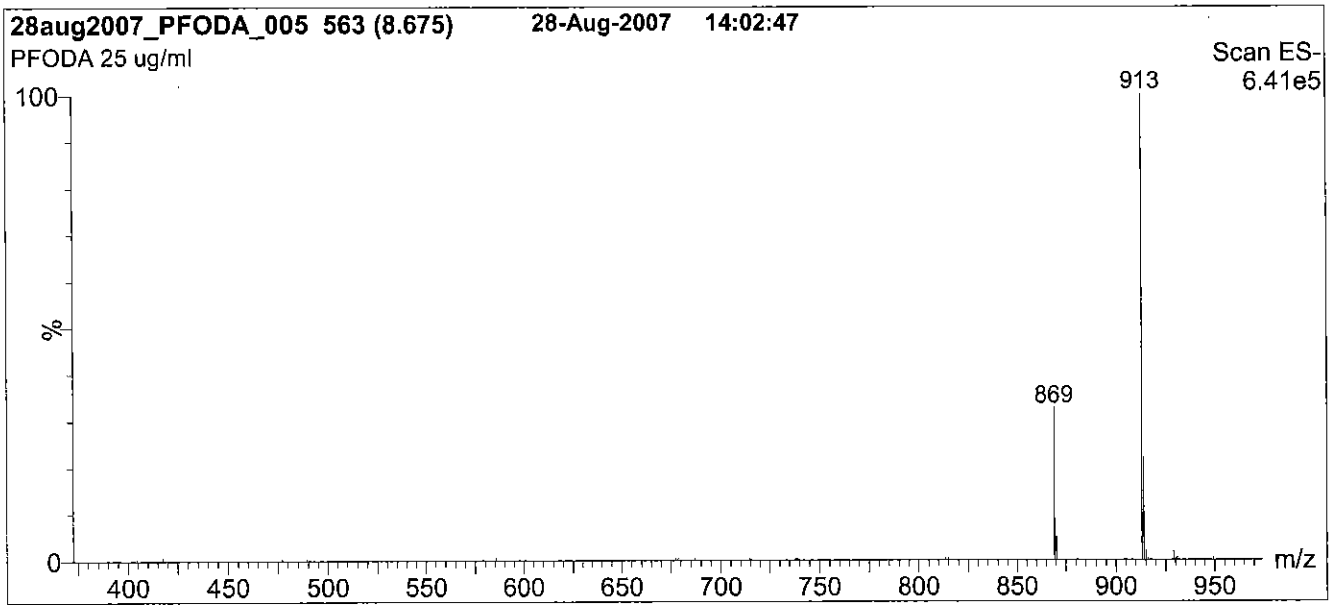
CALA Testing Accredited Mobile No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 75% (80:20 MeOH:ACN) / 25% H_2O
(both with 10 mM NH_4OAc buffer)
Hold 5 min. Ramp to 100% organic over 6 min.
Hold 3 min before returning to initial conditions.
Time: 16 min

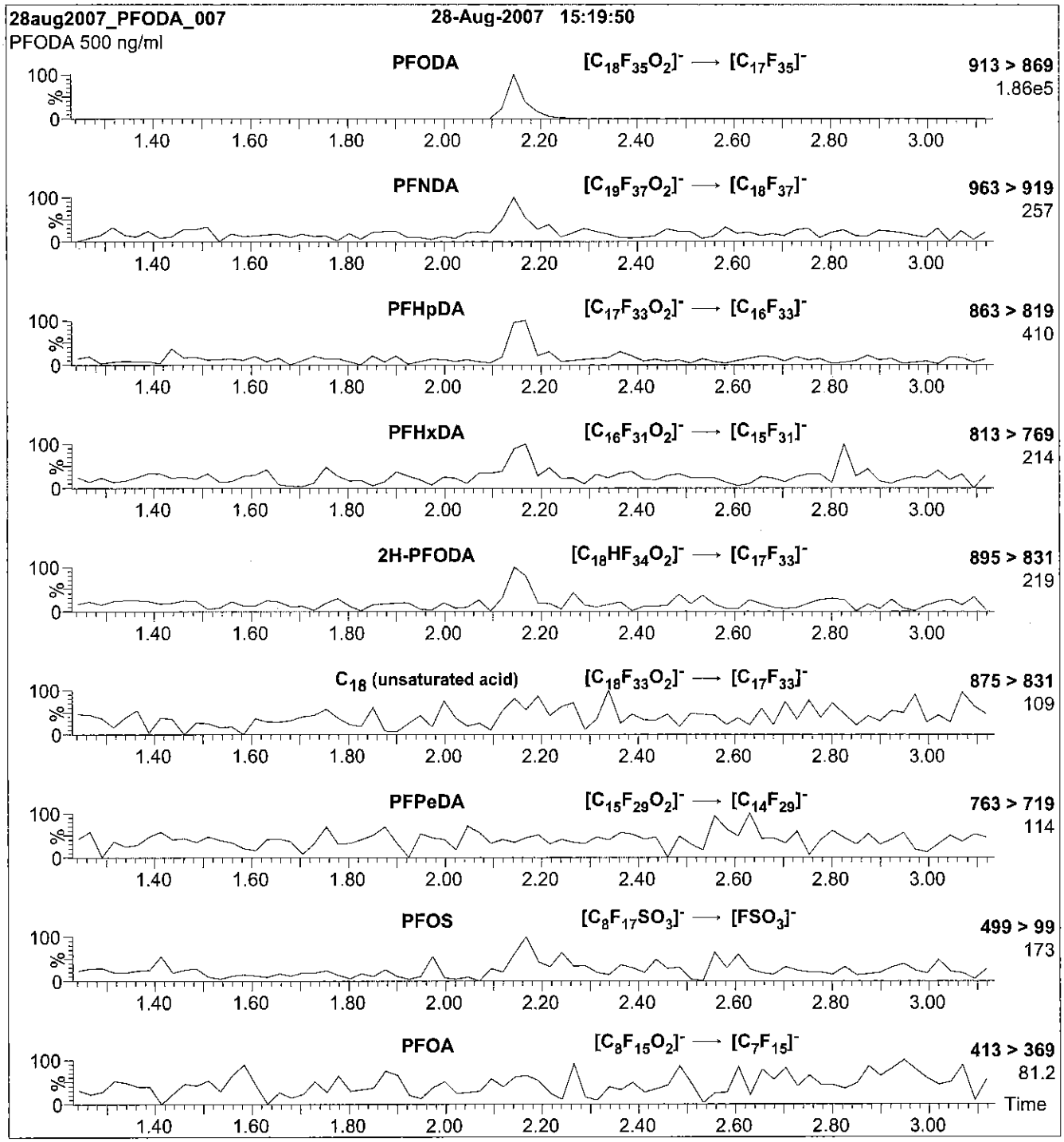
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 1100 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 75% (80:20 MeOH:ACN) / 25% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 15

Reagent

LCPFODA_00005

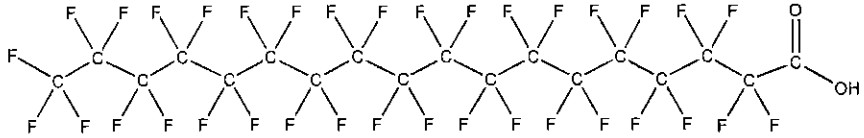
Rec. 3/29/16 JRB

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0115

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/30/2015
EXPIRY DATE: (mm/dd/yyyy) 01/30/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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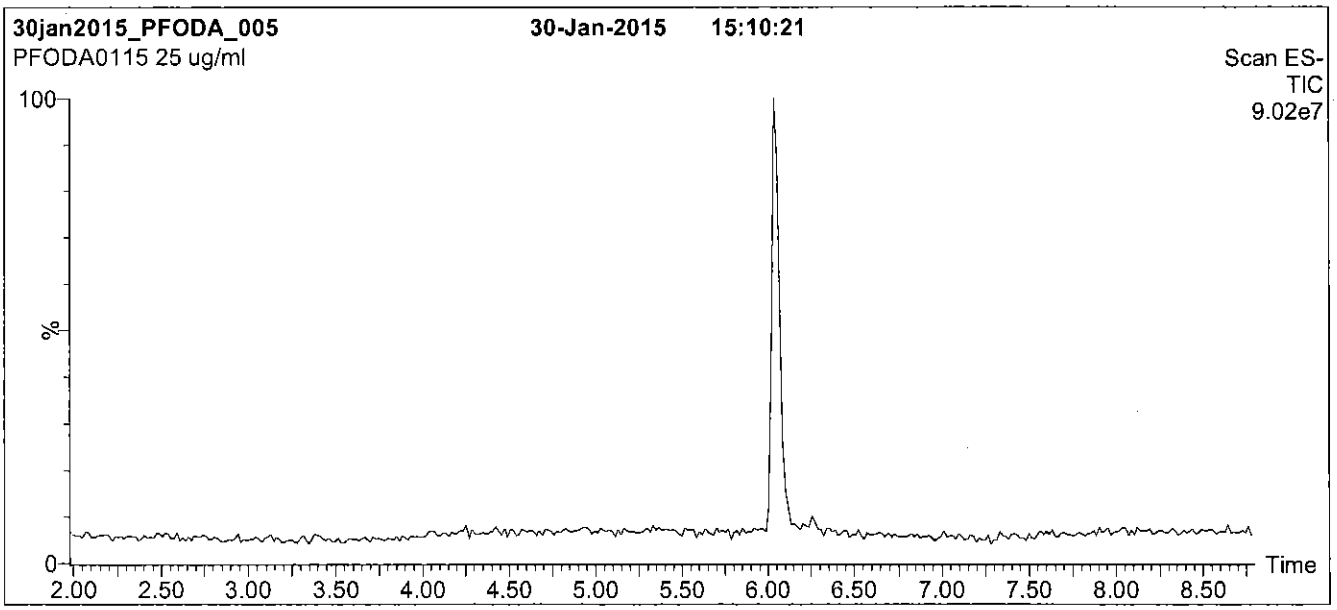
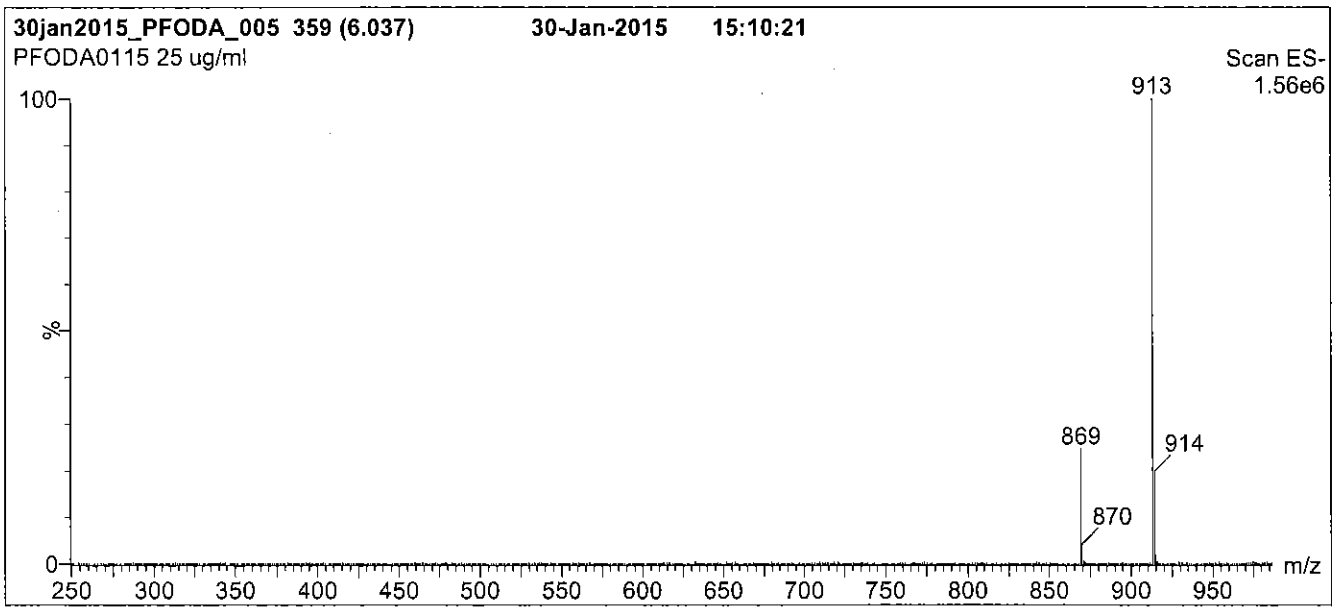
Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

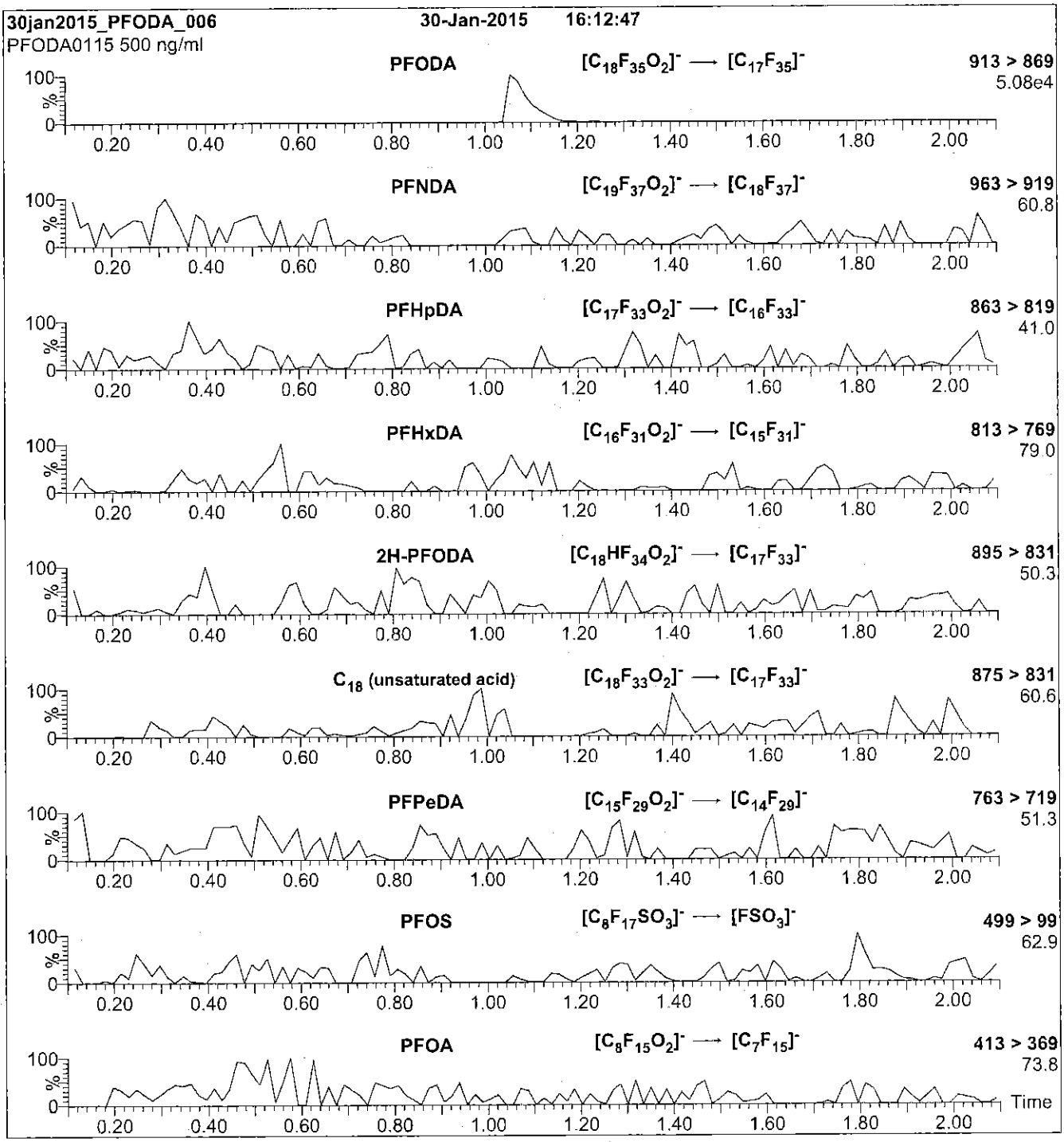
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

Reagent

LCPFOS-br_00001

P: 12/9/15 SW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-PFOSK

**Potassium Perfluorooctanesulfonate
Solution/Mixture of Linear and
Branched Isomers**

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK1015
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	10/13/2015
LAST TESTED: (mm/dd/yyyy)	10/14/2015
EXPIRY DATE: (mm/dd/yyyy)	10/14/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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

CALA Testing Accreditation No. A1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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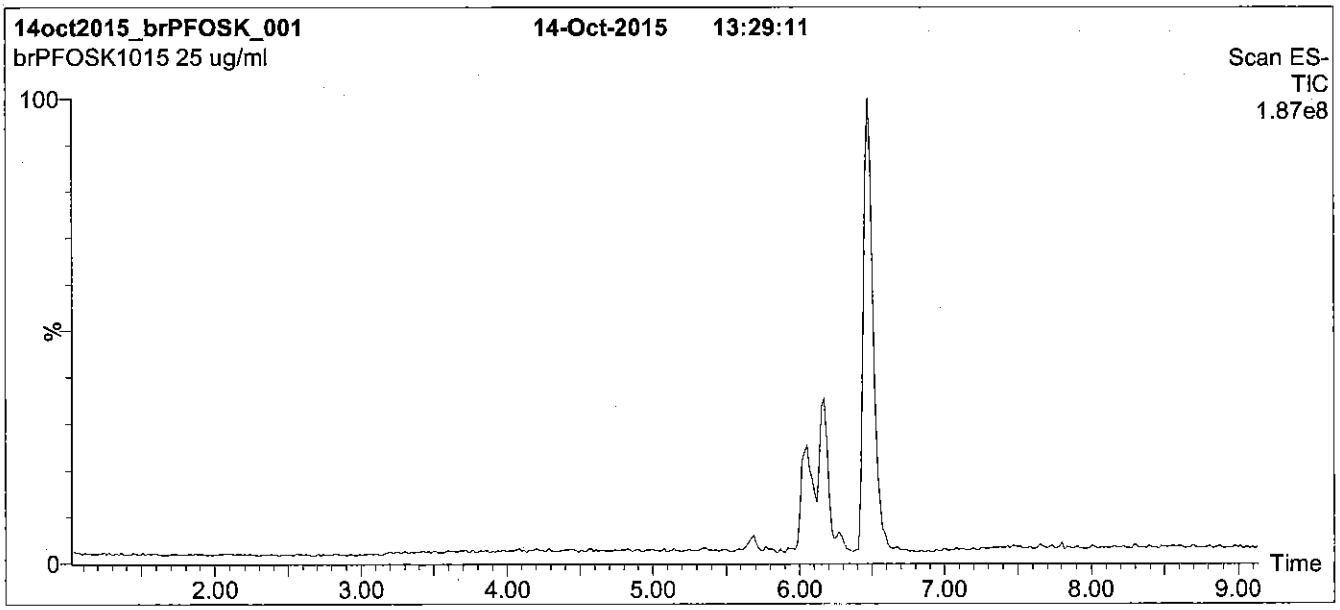
Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

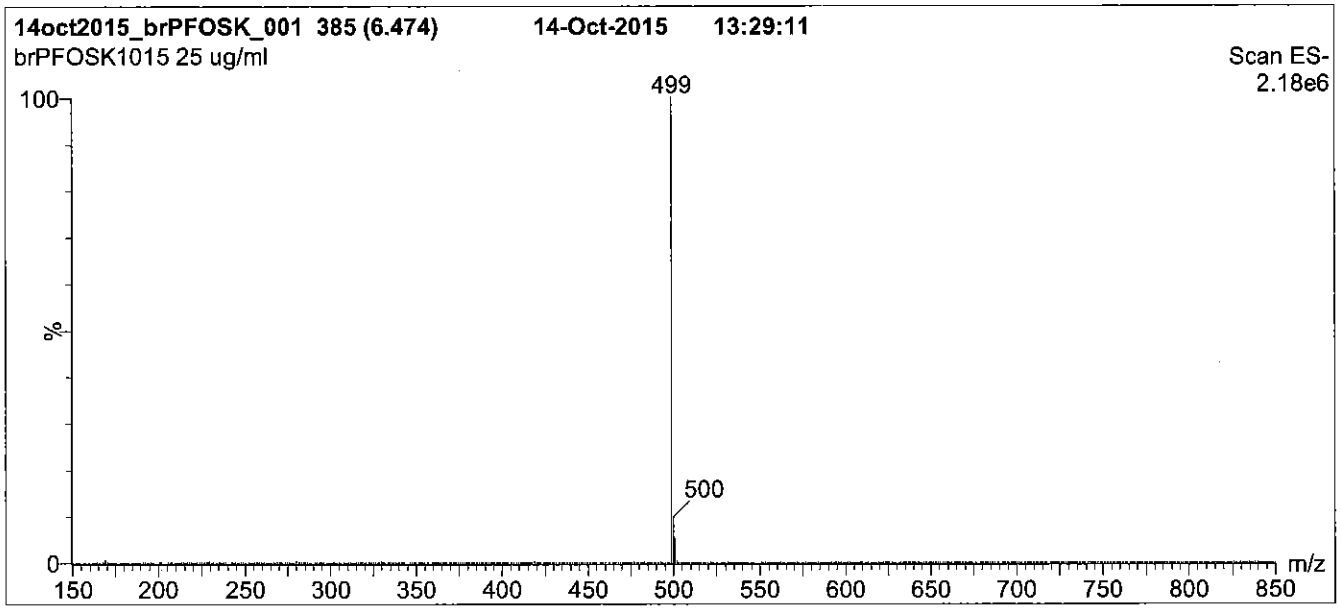
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2-C(CF_3)_2-CF_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF(CF_3)-CF_2CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3-CF(CF_3)-CF_2-CF(CF_3)-CF_2CF_2SO_3^-K^+$	0.07

* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: _____ **Date:** 10/15/2015
(mm/dd/yyyy)
B.G. Chittim

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

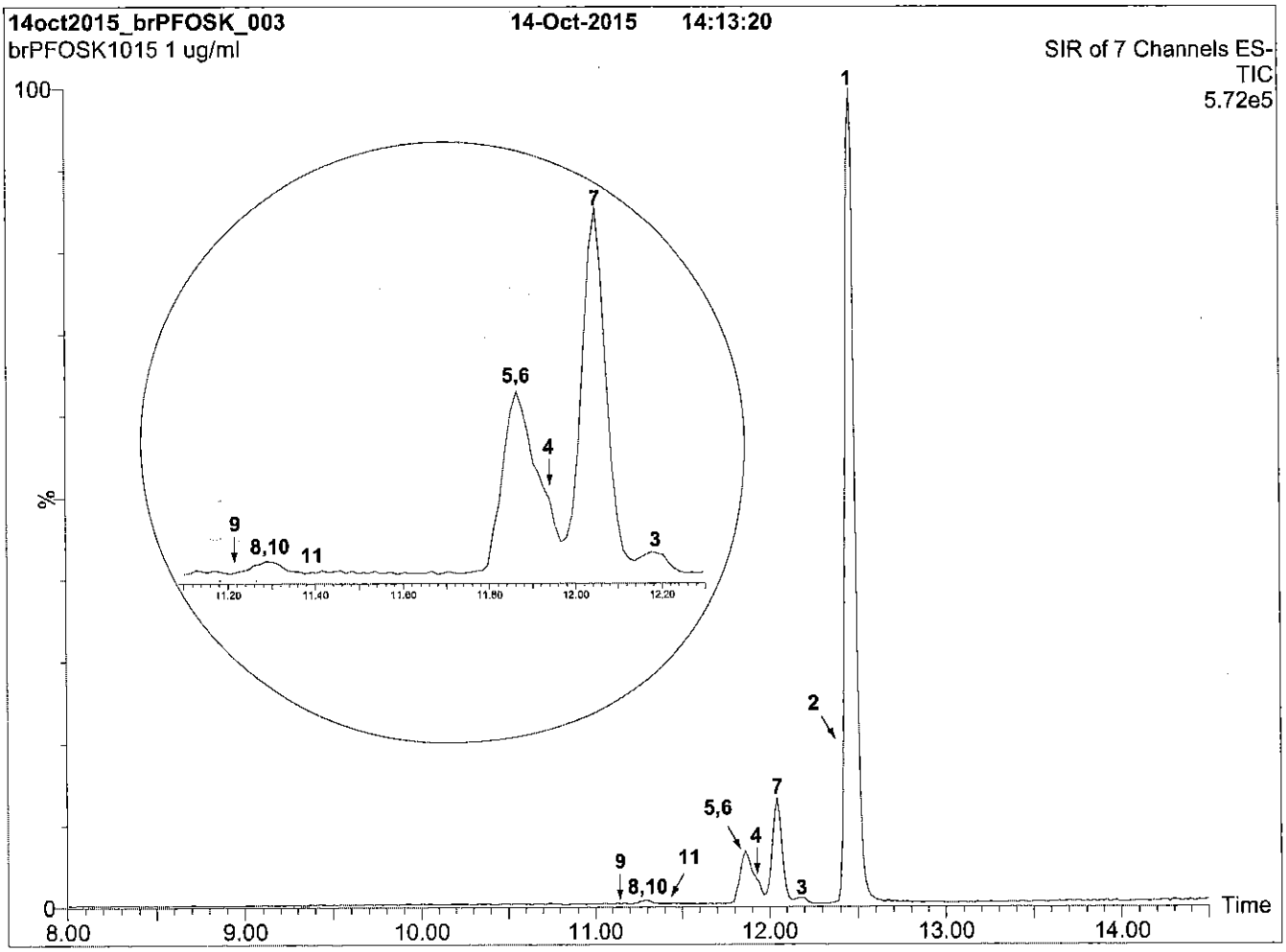
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

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

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

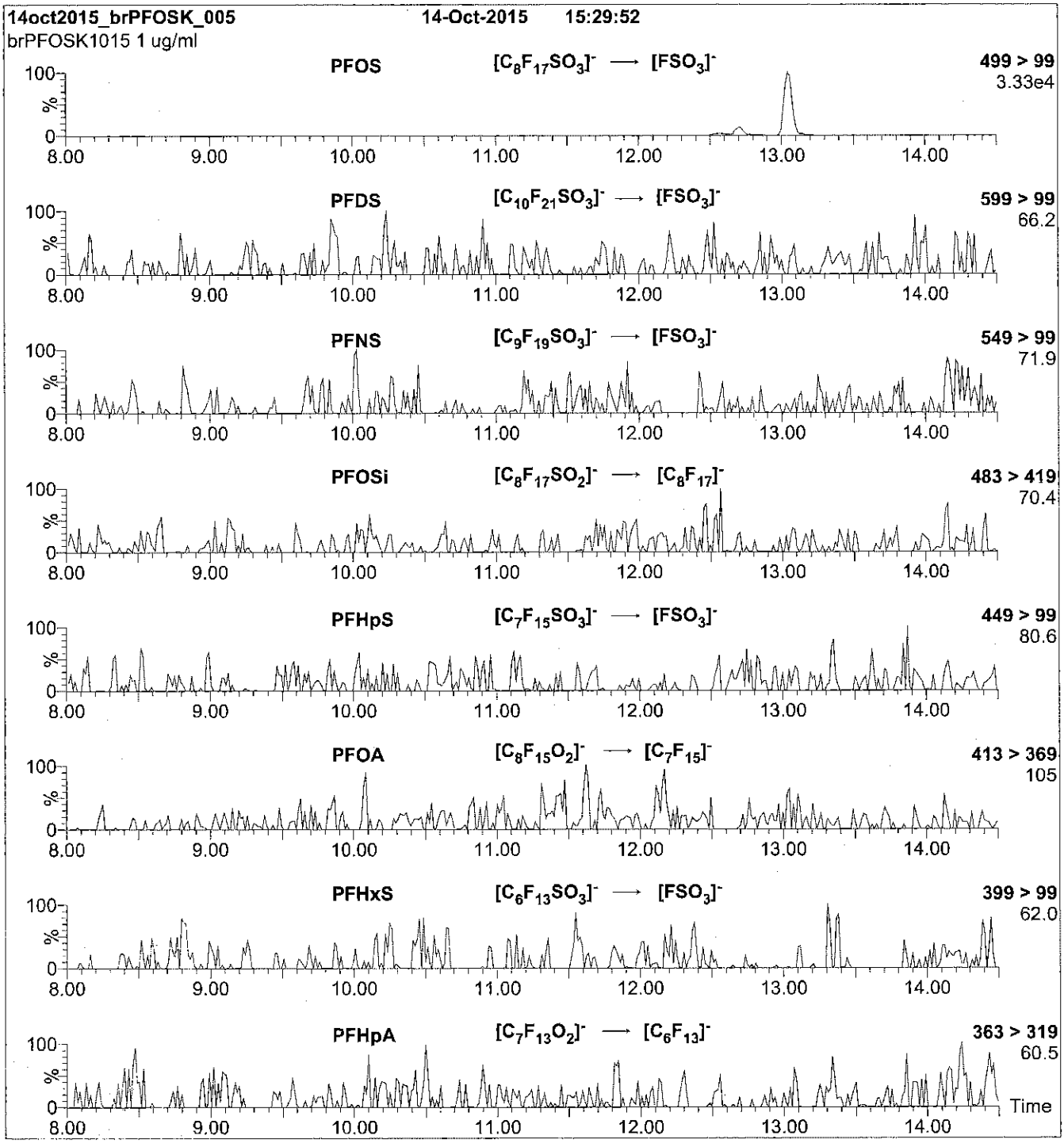
Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Condltions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.06e-3
Collision Energy (eV) = 11-50 (variable)

Reagent

LCPFOS_00004

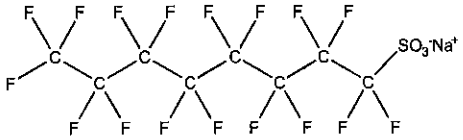
C 3/17/15 SV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: L-PFOS
LOT NUMBER: LPFOS0614
COMPOUND: Sodium perfluoro-1-octanesulfonate

STRUCTURE:



CAS #: 4021-47-0

MOLECULAR FORMULA:	$C_8F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	522.11
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (PFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/20/2014		
EXPIRY DATE: (mm/dd/yyyy)	06/20/2019		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 10/27/2014 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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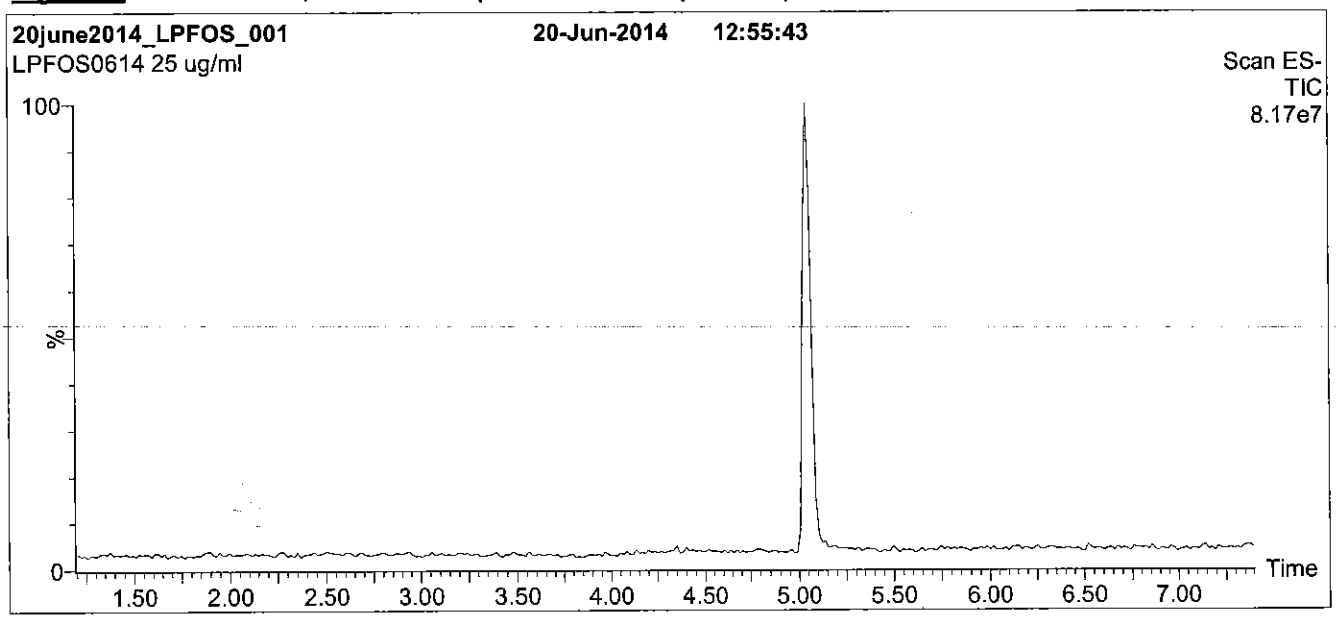
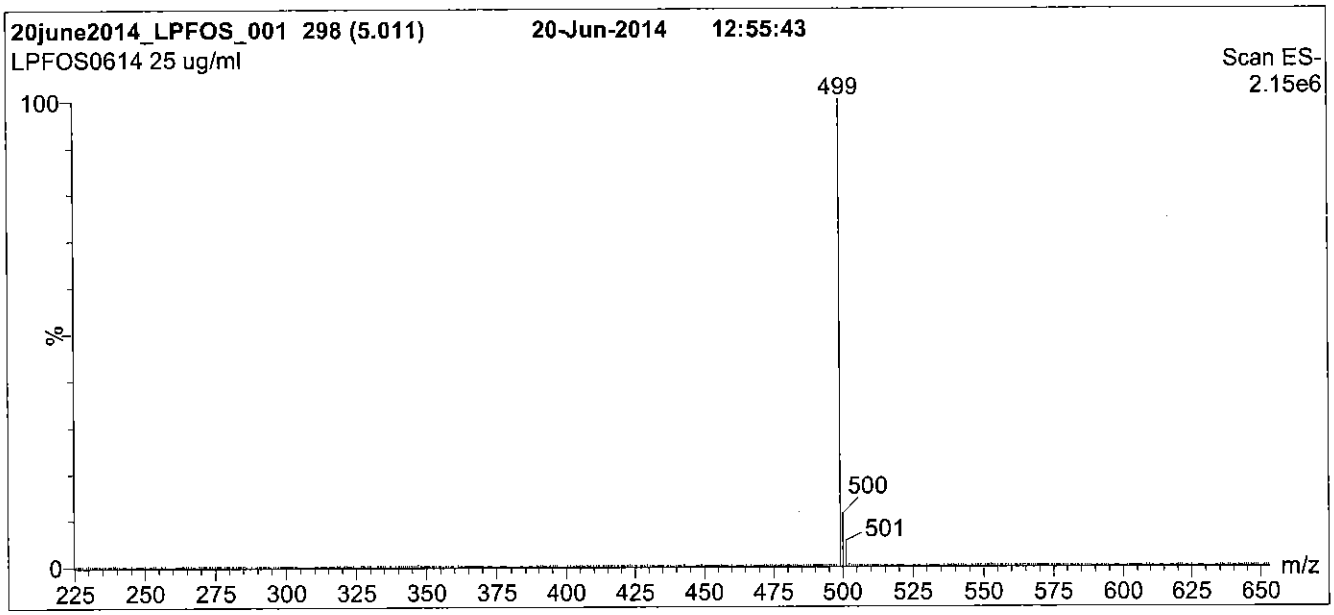




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

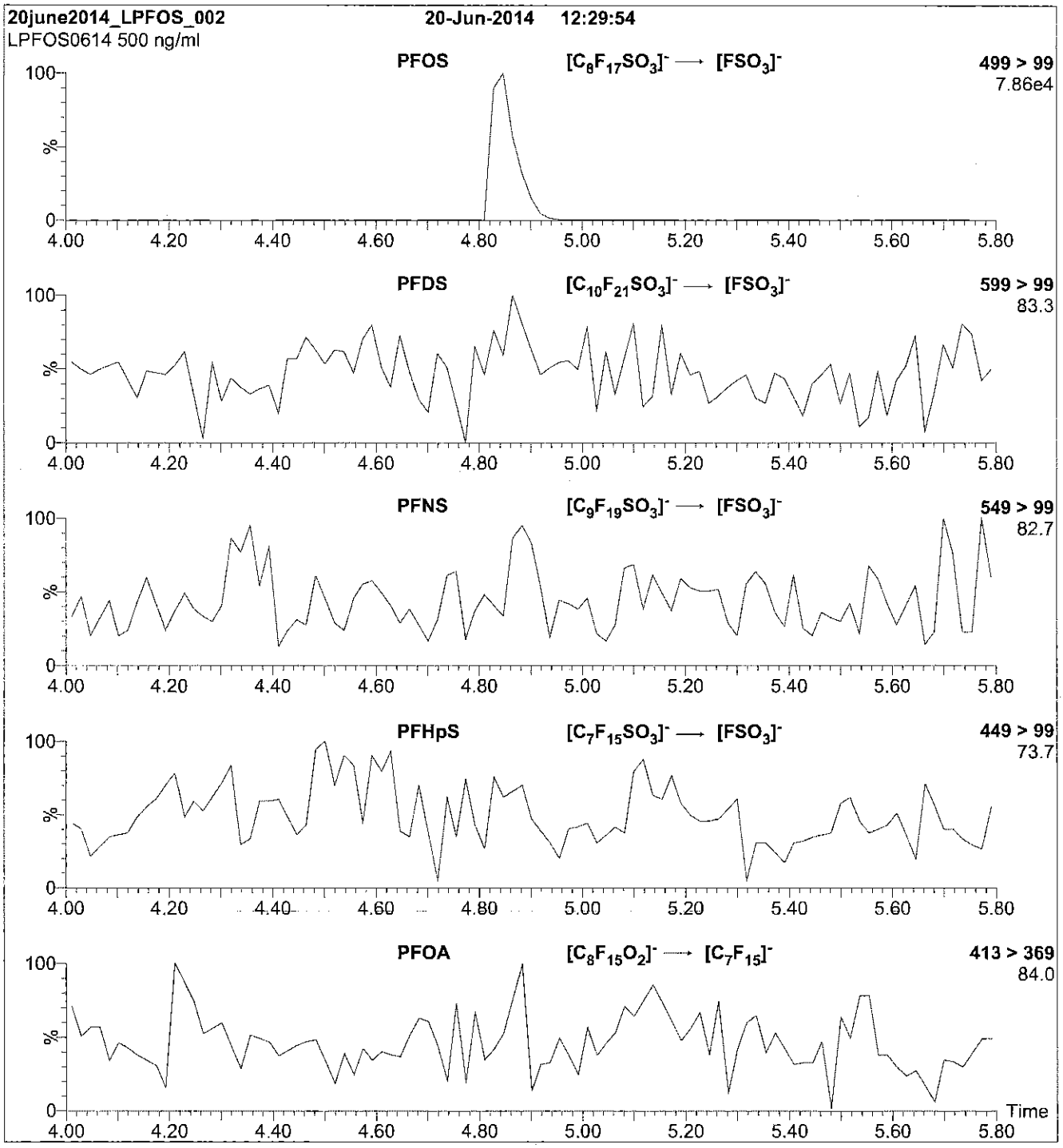
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 40

Reagent

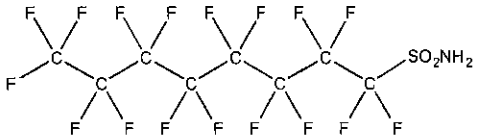
LCPFOSA_00005

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0714I

STRUCTURE:
CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/31/2014		
EXPIRY DATE: (mm/dd/yyyy)	Stability studies ongoing		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Certified By: B.G. Chittim **Date:** 08/05/2014 (mm/dd/yyyy)

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CALA Testing Accreditation No. A1226

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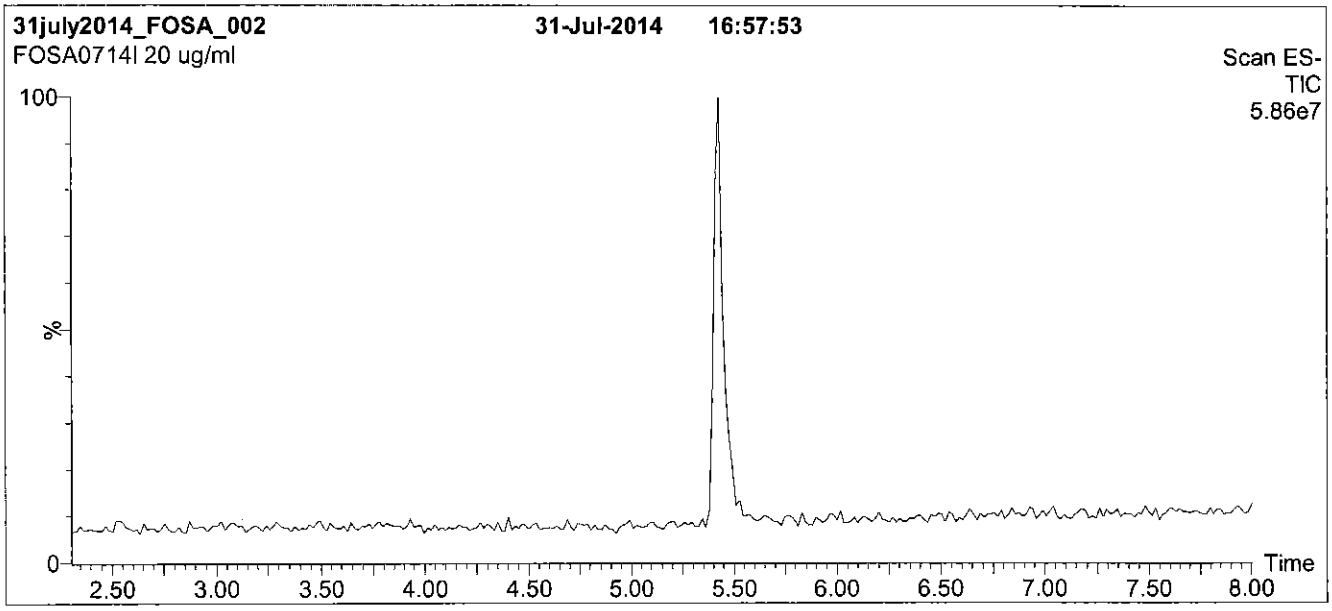
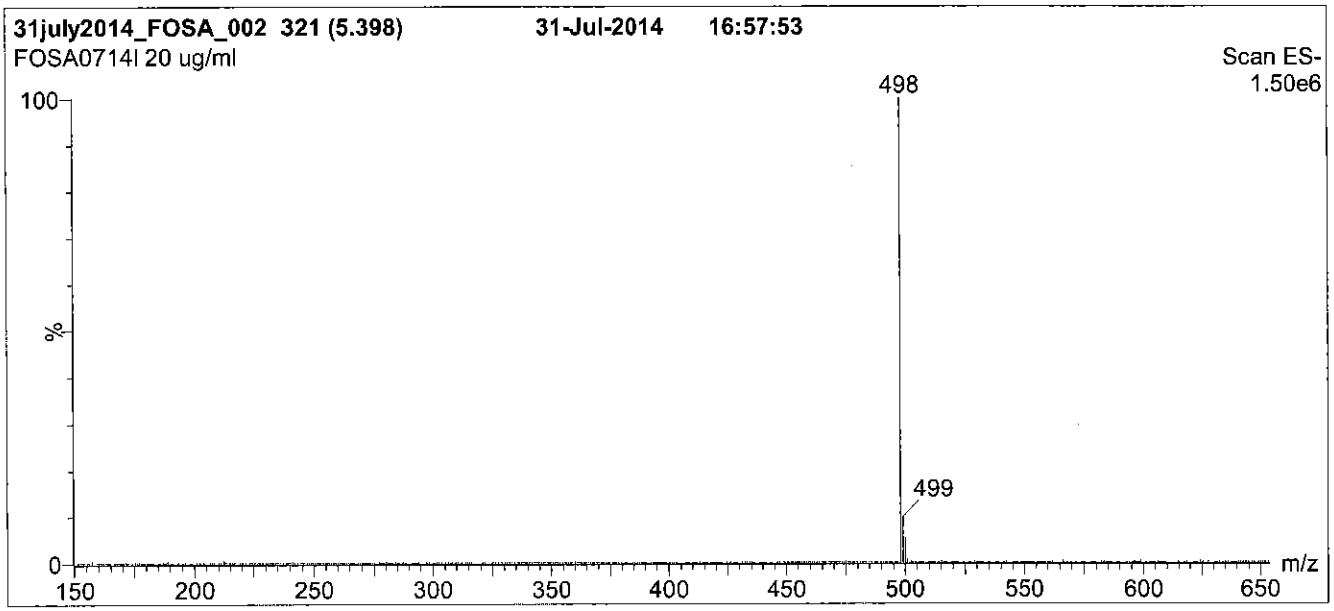
Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

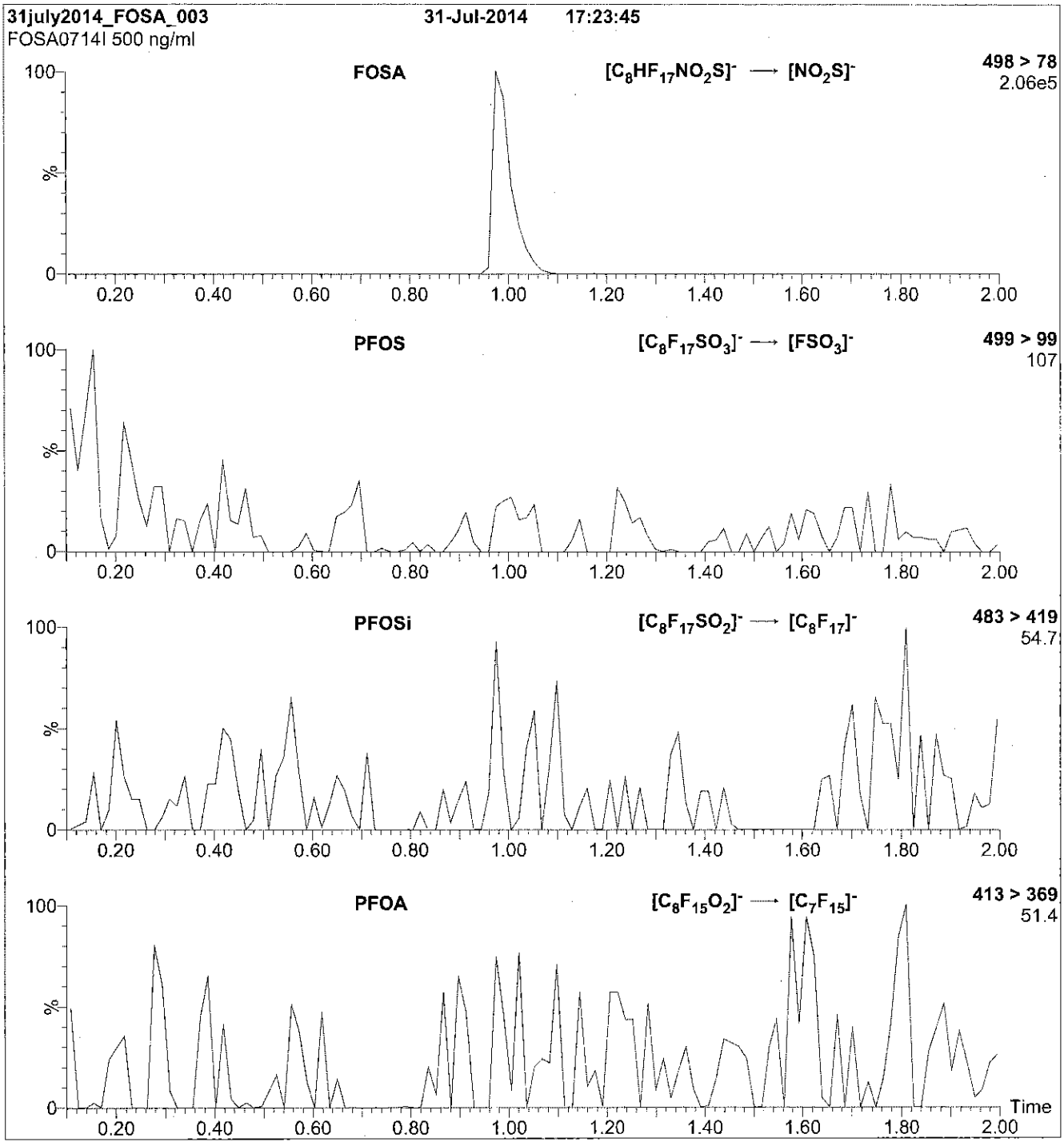
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 950 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 30

Reagent

LCPFOSA_00006

Rec 12/30/15 CW

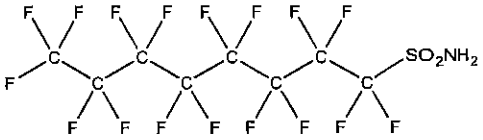
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide
LOT NUMBER: FOSA0815I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/02/2015		
EXPIRY DATE: (mm/dd/yyyy)	09/02/2017		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 09/11/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

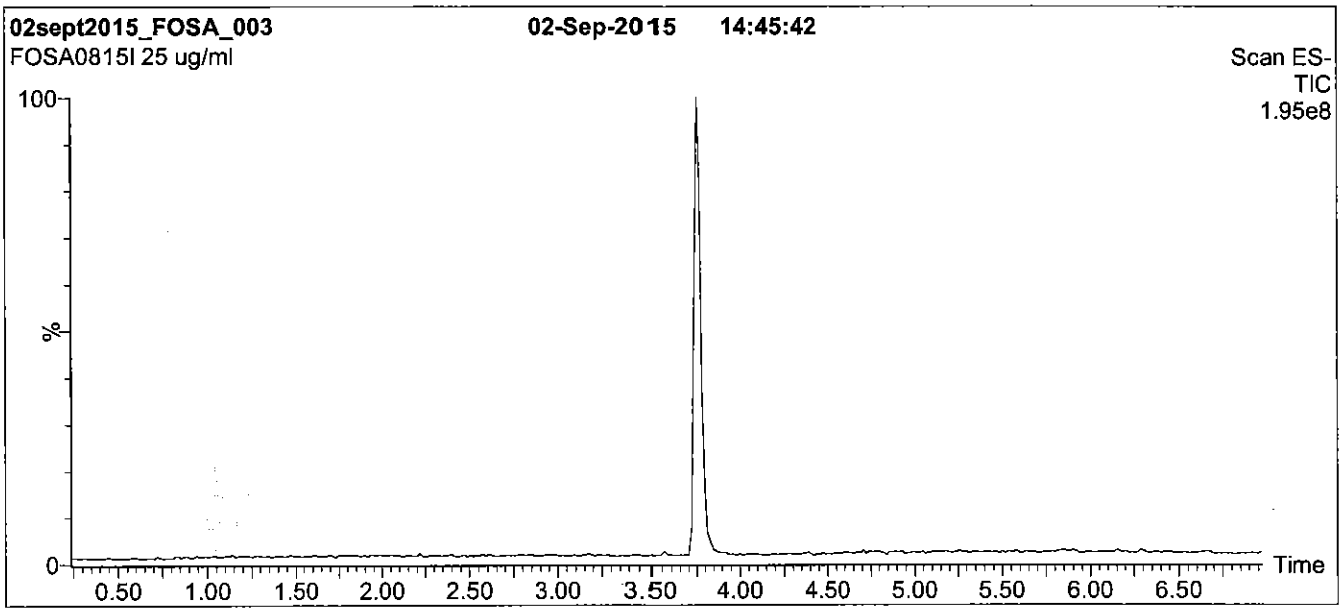
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

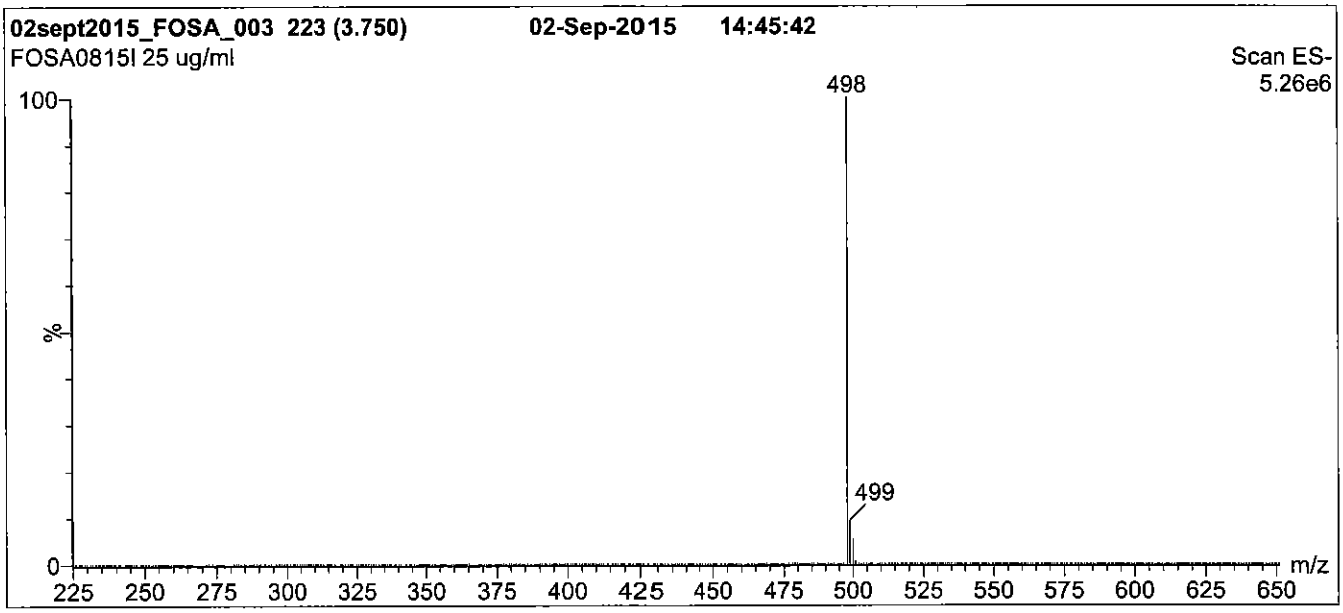
CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

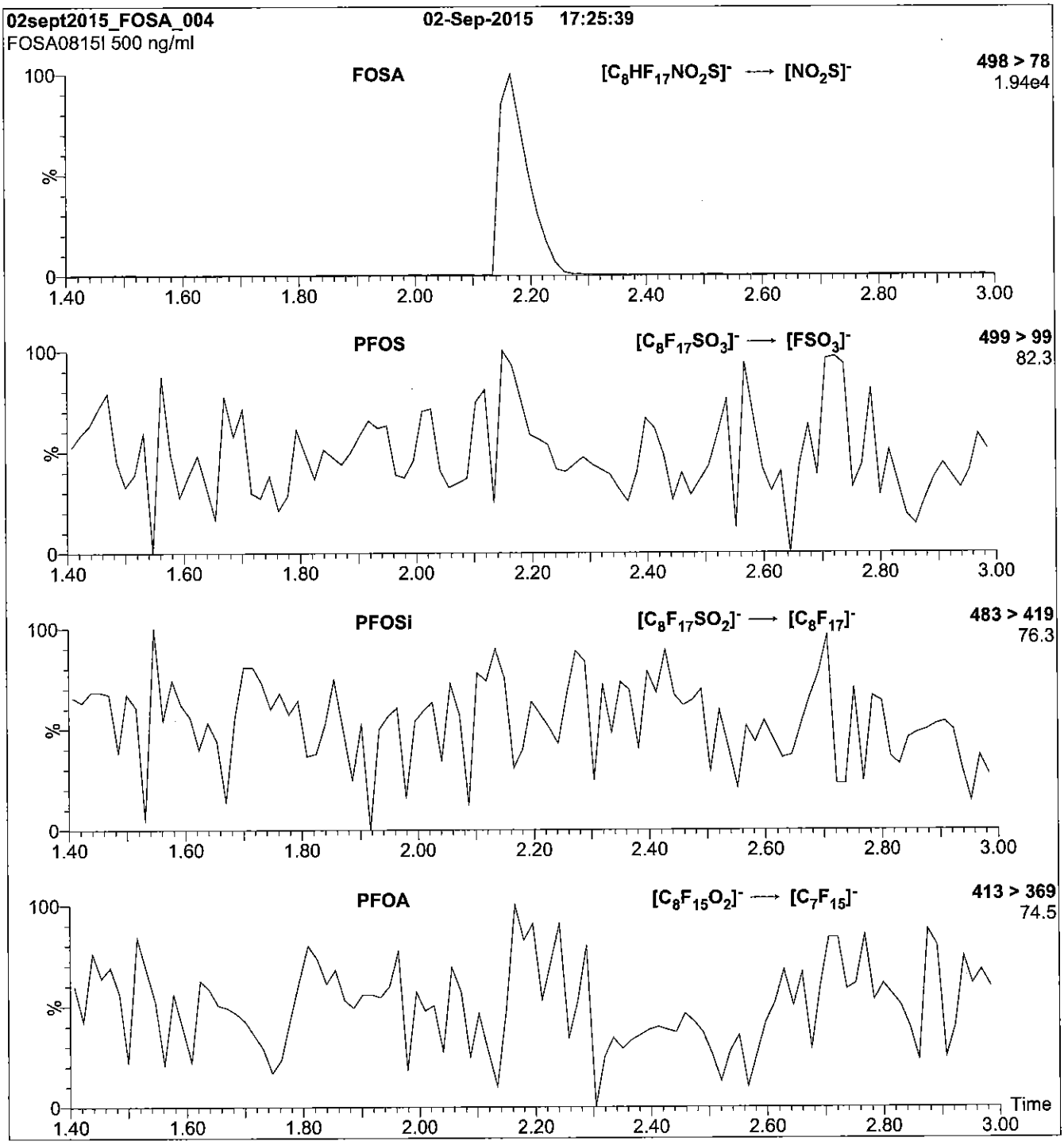
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.54e-3
Collision Energy (eV) = 30

Reagent

LCPFPeA_00003

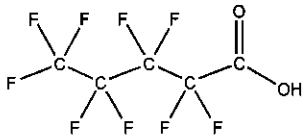
Rec 7/15/14

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFPeA
COMPOUND: Perfluoro-n-pentanoic acid
LOT NUMBER: PFPeA0113

STRUCTURE:
CAS #: 2706-90-3



MOLECULAR FORMULA: $C_5HF_9O_2$
MOLECULAR WEIGHT: 264.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 01/03/2013
EXPIRY DATE: (mm/dd/yyyy) 01/03/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 01/14/2013 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

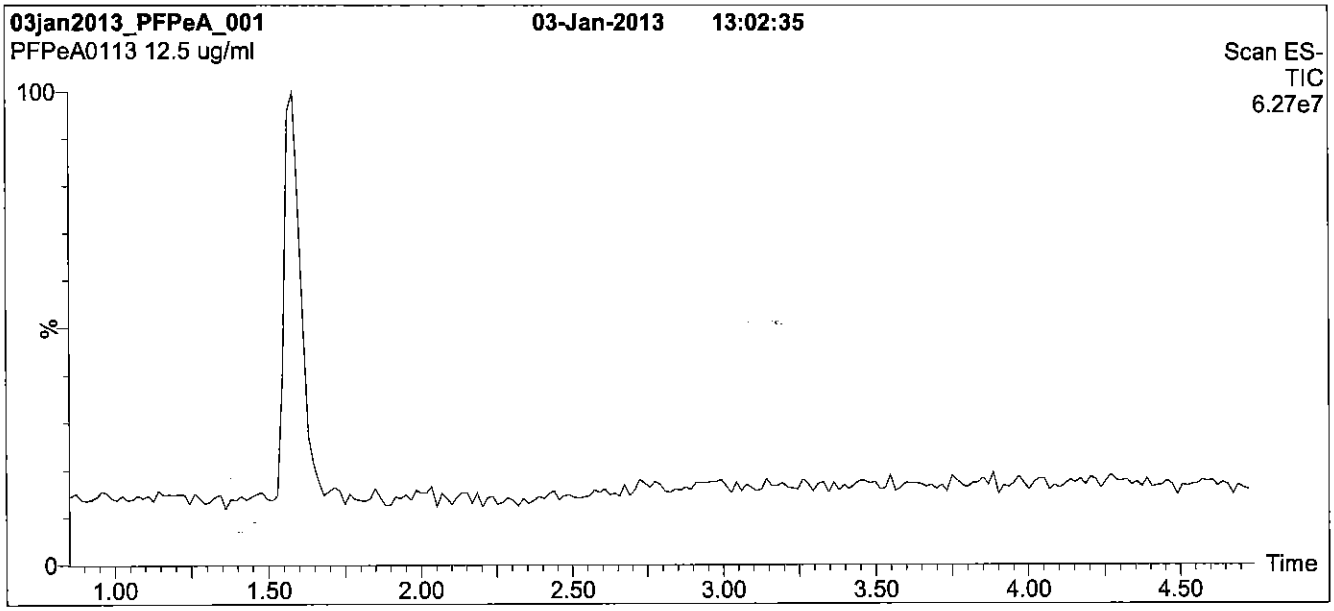
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

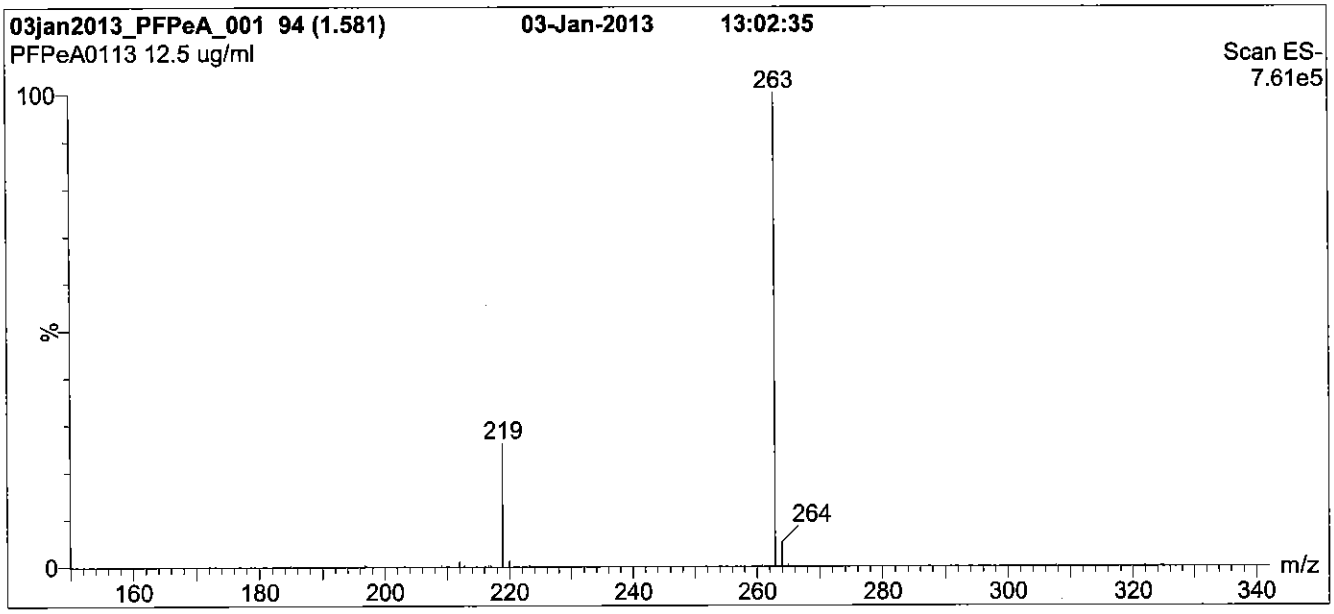
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

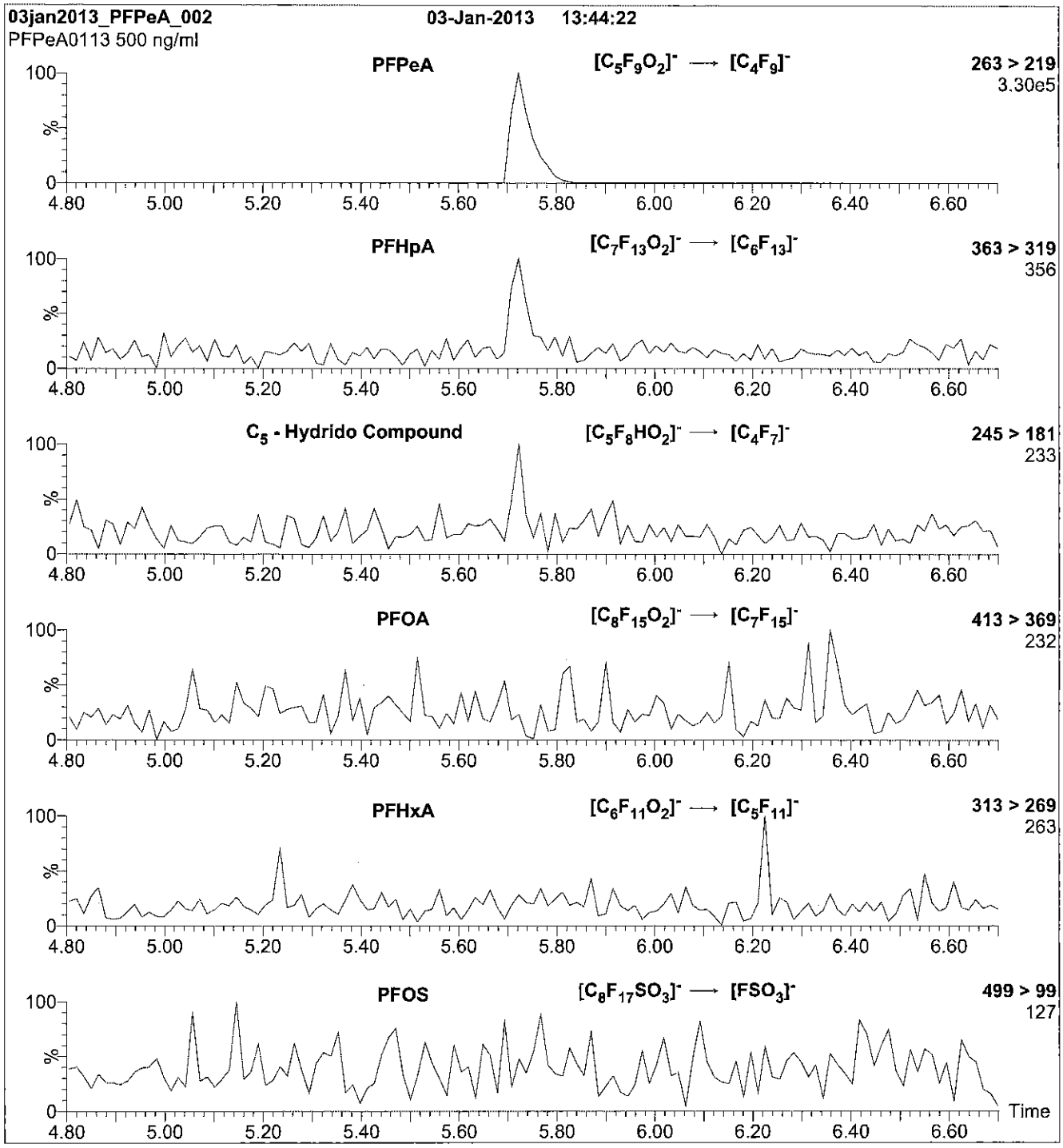
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 70% (80:20 MeOH:ACN) / 30% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

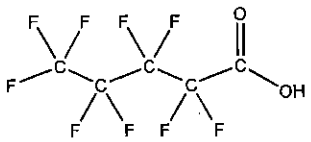
LCPFPeA_00004

Rec: 12/30/15 aw

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0115
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/30/2015		
EXPIRY DATE: (mm/dd/yyyy)	01/30/2020		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/26/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

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

QUALITY MANAGEMENT:

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CALA Testing Accreditation No. 1226

ANAB ACCREDITED ISO 17025 REFERENCE MATERIAL PRODUCER

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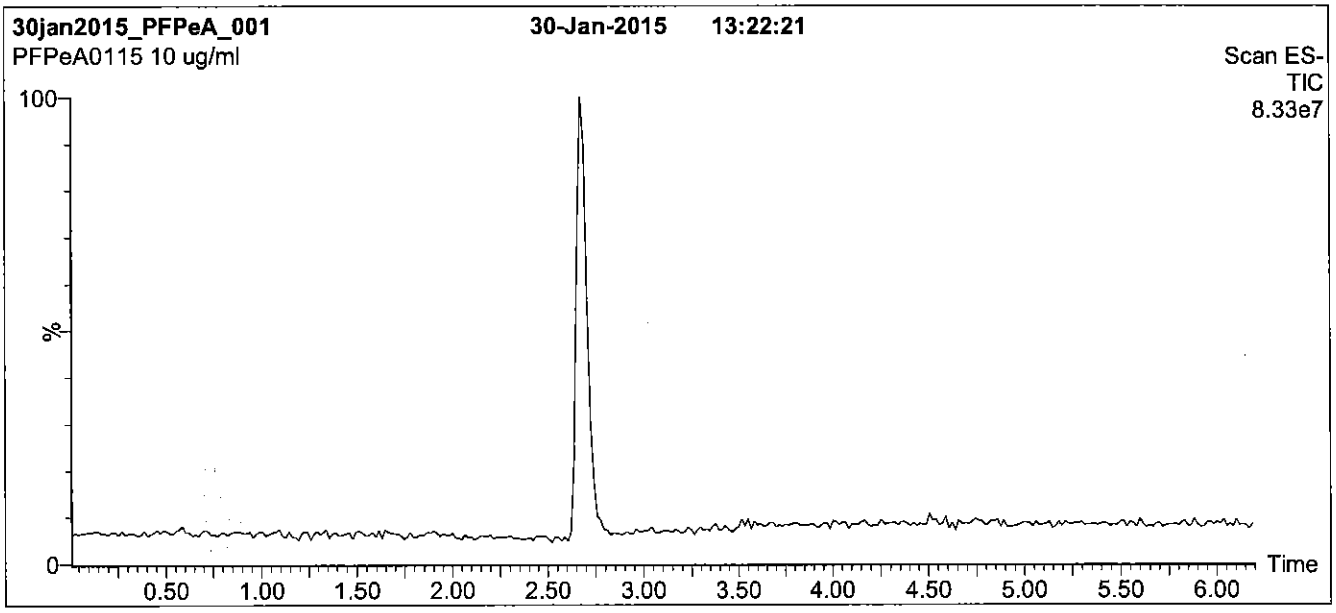
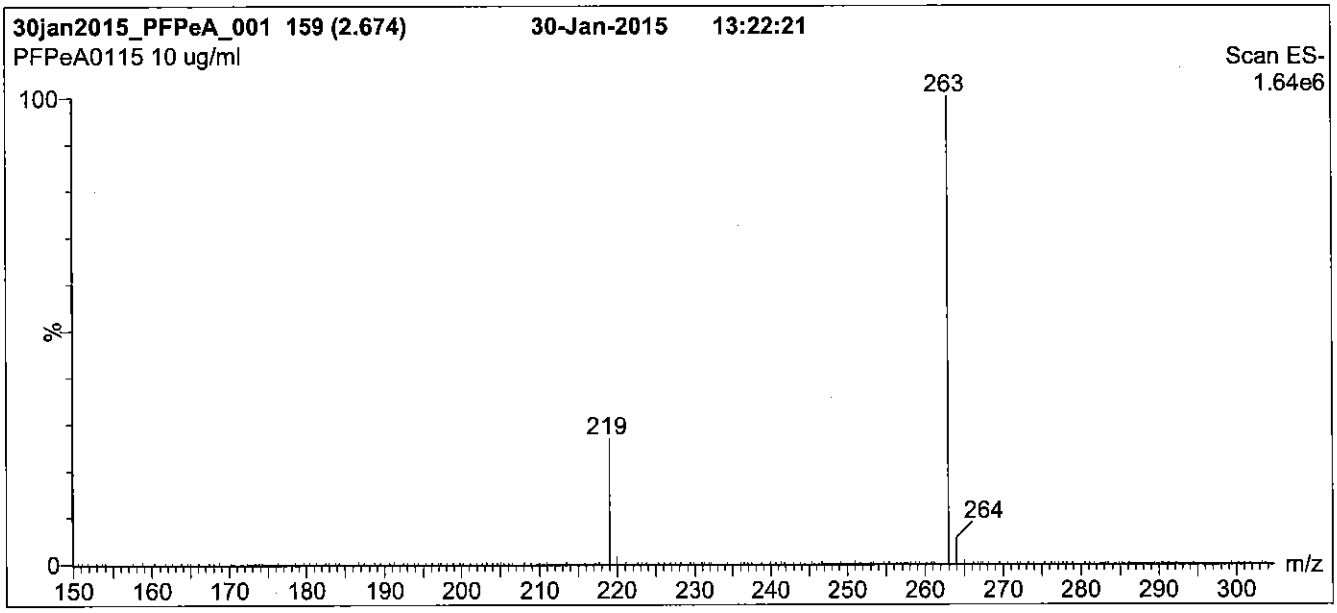
Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

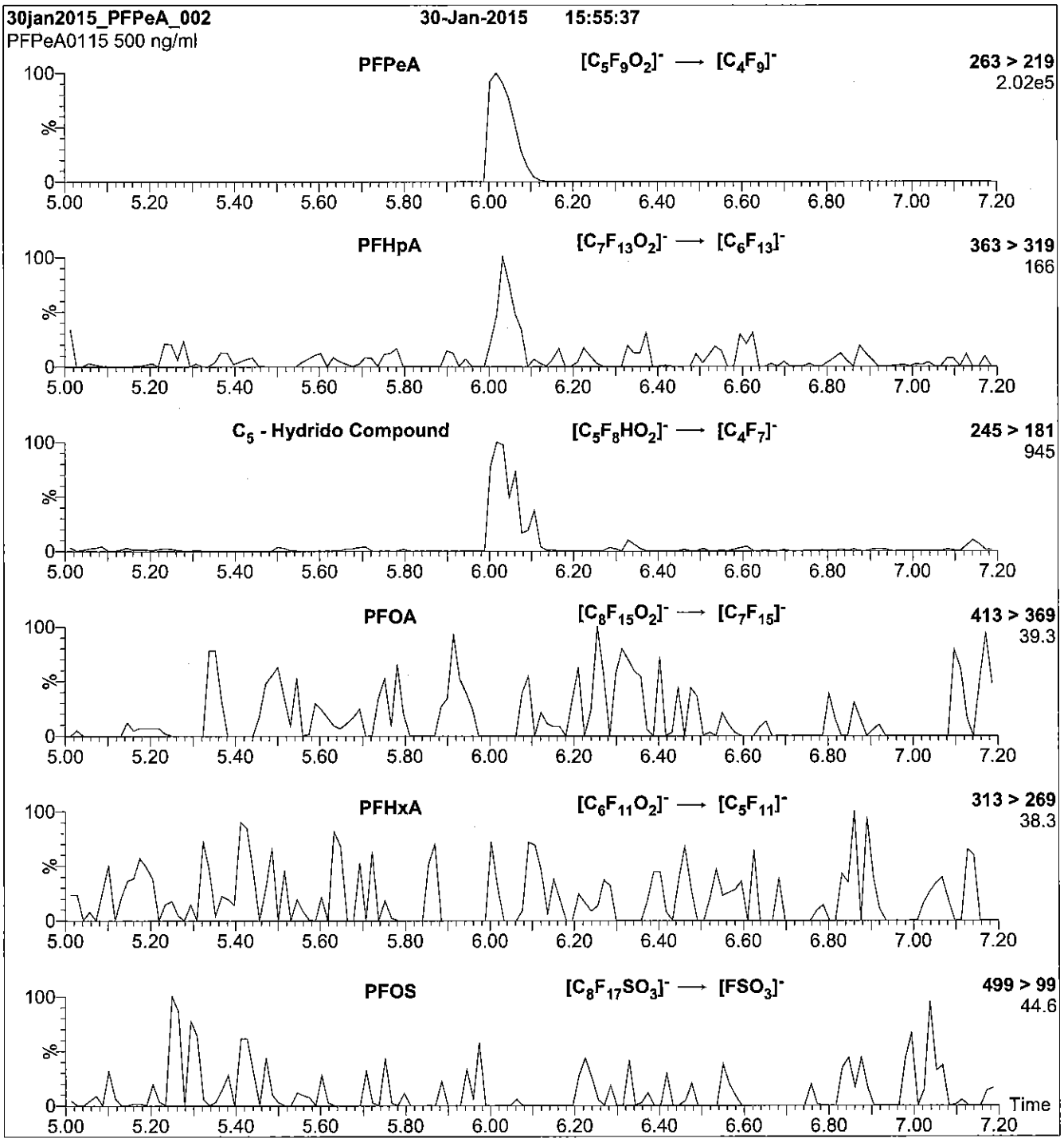
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 9

Reagent

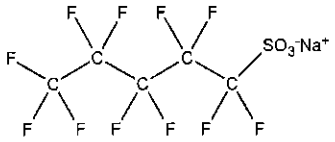
LCPFPeS_00002

R 24hrs w

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFPeS
COMPOUND: Sodium perfluoro-1-pentanesulfonate
LOT NUMBER: LPFPeS0712
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$C_5F_{11}SO_3Na$	**MOLECULAR WEIGHT:**	372.09
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.9 ± 2.3 µg/ml (PFPeS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/04/2012		
EXPIRY DATE: (mm/dd/yyyy)	07/04/2017		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/15/2013 (mm/dd/yyyy)
B.G. Chittim

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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Where possible, all of our products are synthesized using single-product, unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, x-ray crystallography and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external, ISO/IEC 17025:2005 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

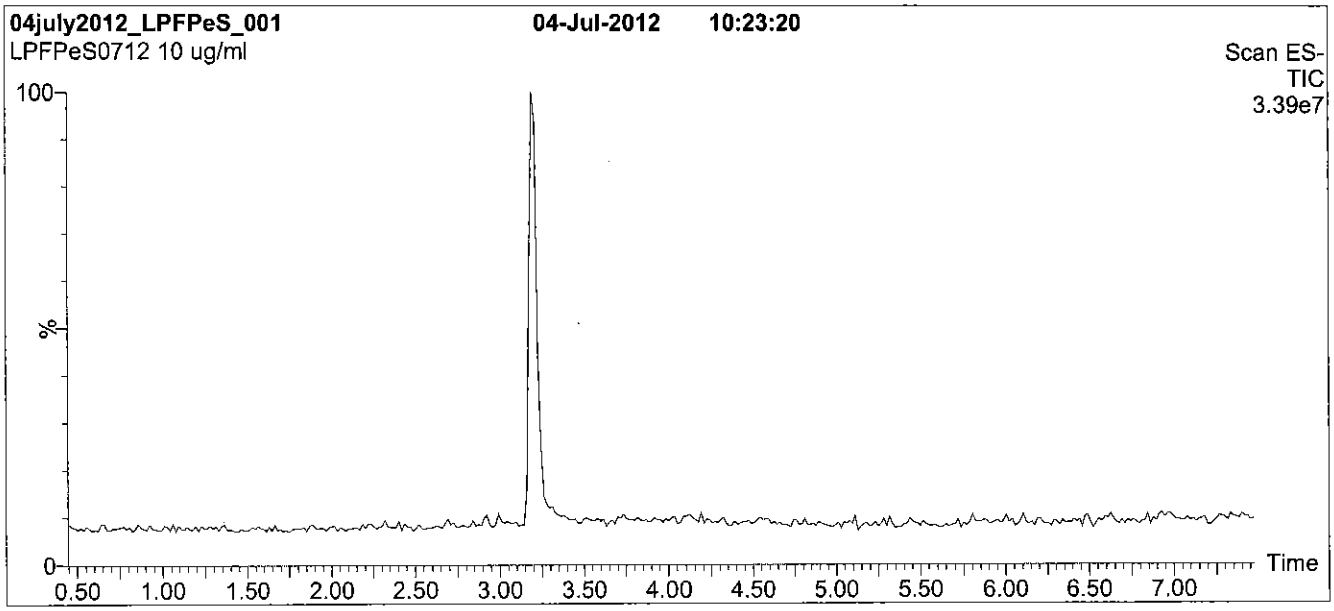
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

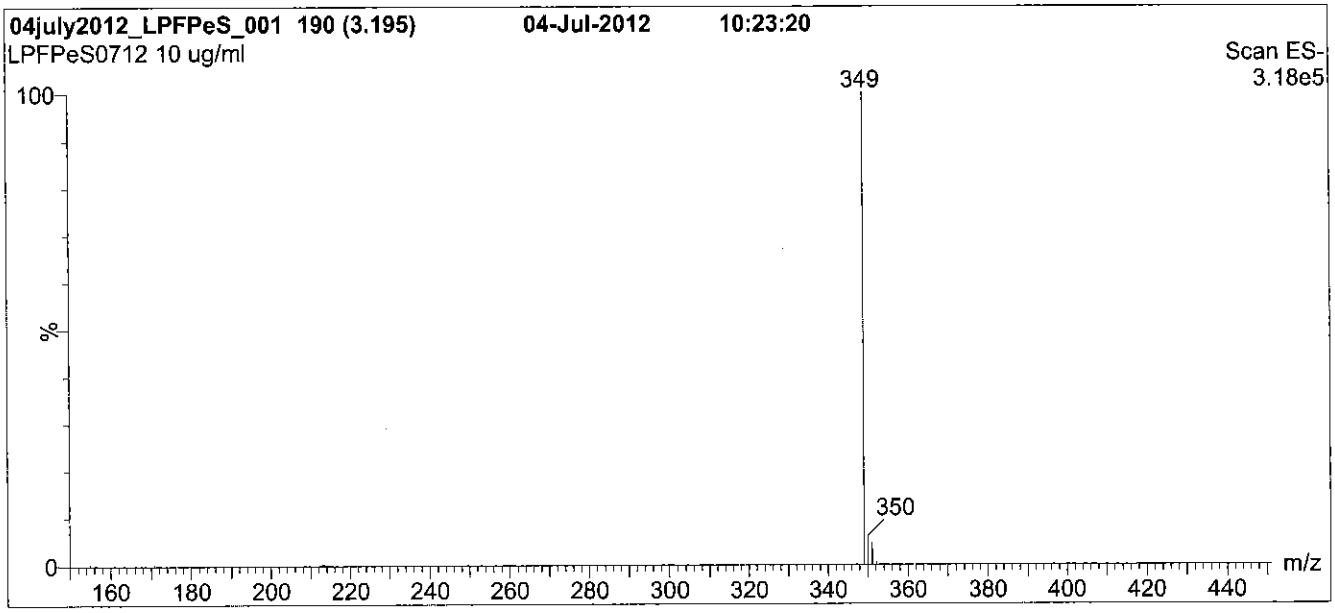
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions over 0.5 min.
Time: 10 min

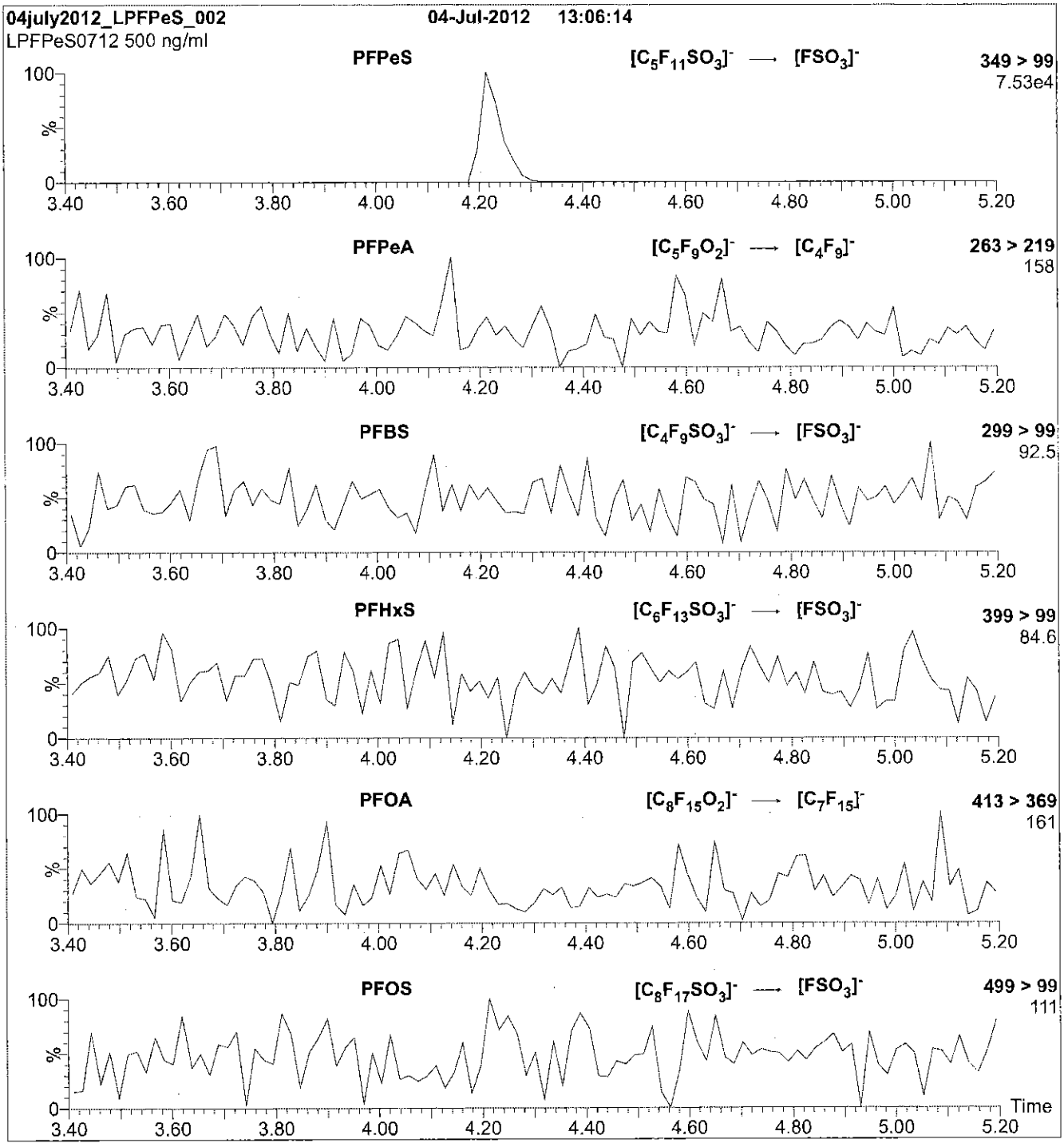
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3
Collision Energy (eV) = 30

Reagent

LCPFTeDA_00003

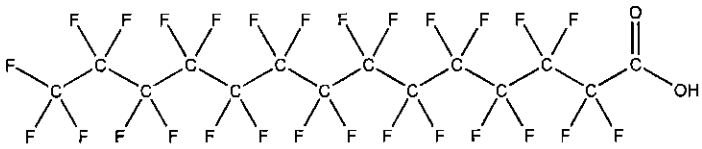
V: 2/11/15 SRV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
LOT NUMBER: PFTeDA0613
COMPOUND: Perfluoro-n-tetradecanoic acid

STRUCTURE:
CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/17/2013 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accredited Laboratory No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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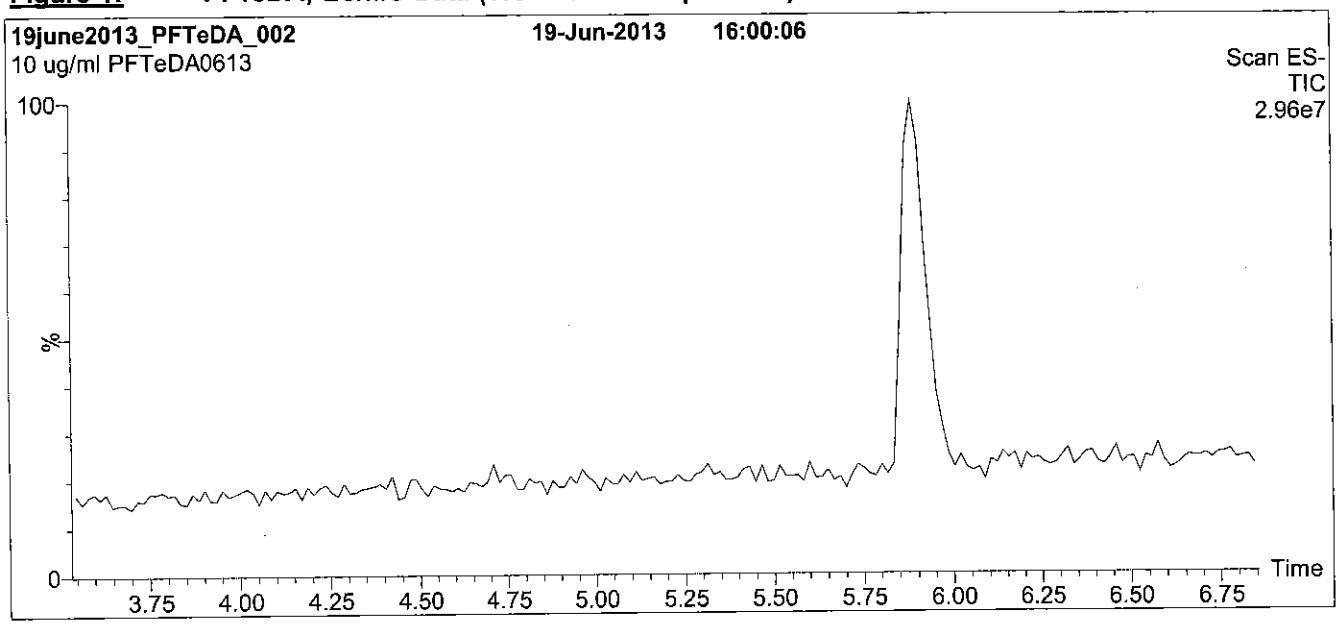
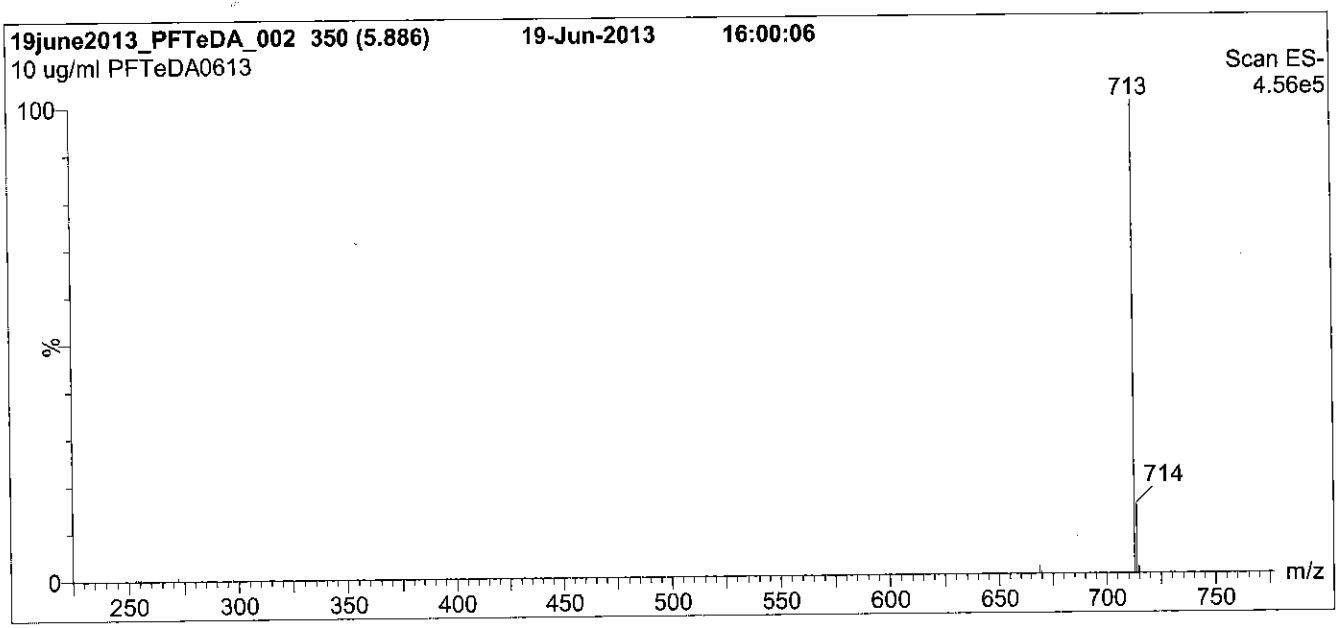
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.50 min.
Time: 10 min

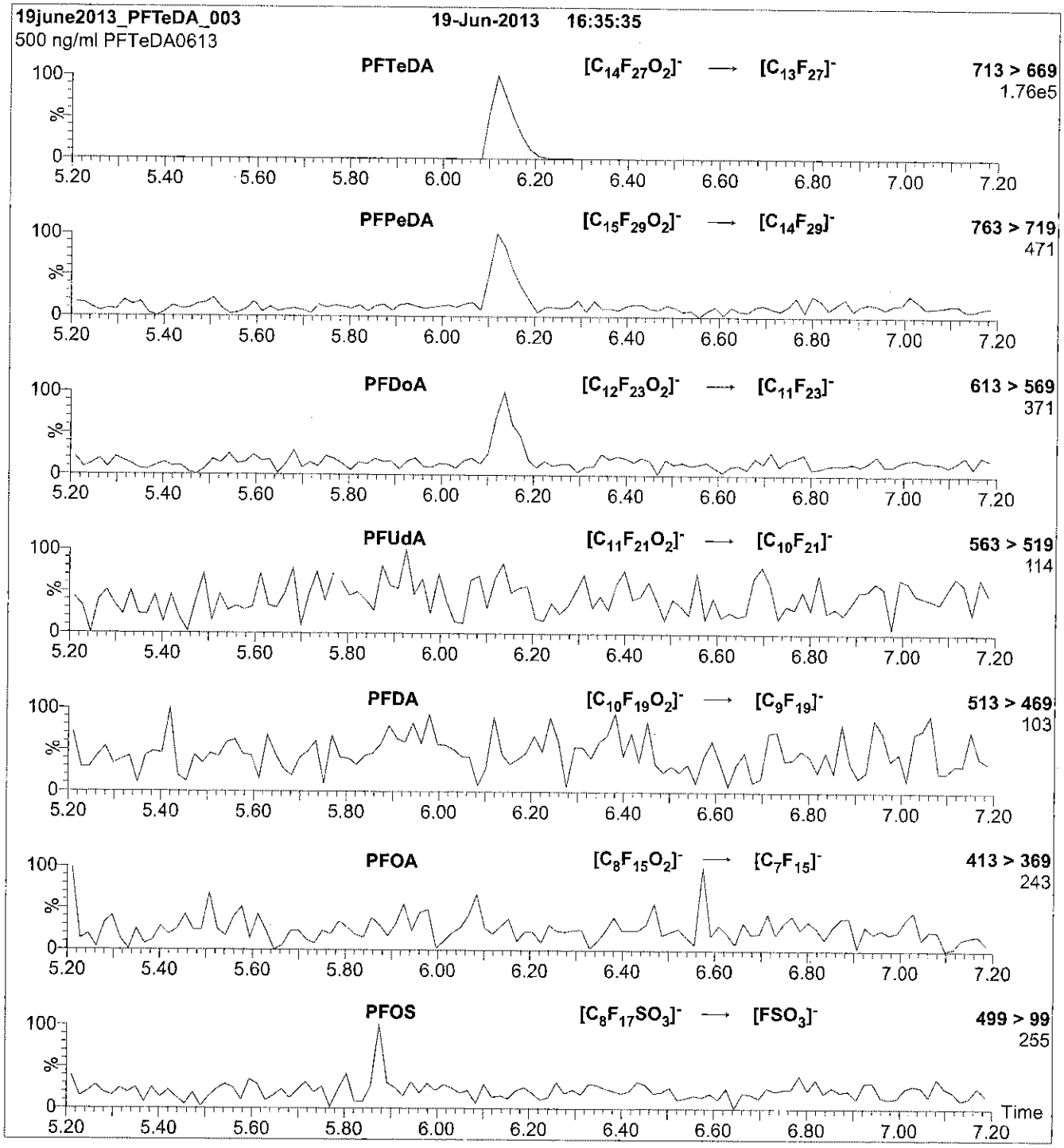
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 14

Reagent

LCPFTeDA_00004

609696
ID: LCPFTeDA_00004
Exp: 12/09/20 Prpd: CBW
PF-n-tetradecanoic acid

R: 4/7/16 CBW

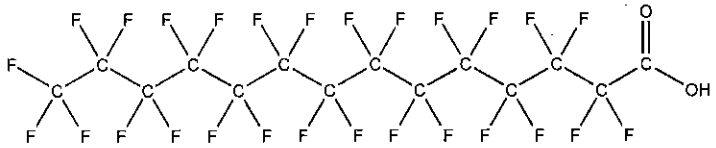
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTeDA
COMPOUND: Perfluoro-n-tetradecanoic acid
LOT NUMBER: PFTeDA1215

STRUCTURE:

CAS #: 376-06-7



MOLECULAR FORMULA: $C_{14}HF_{27}O_2$
MOLECULAR WEIGHT: 714.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/09/2015
EXPIRY DATE: (mm/dd/yyyy) 12/09/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/09/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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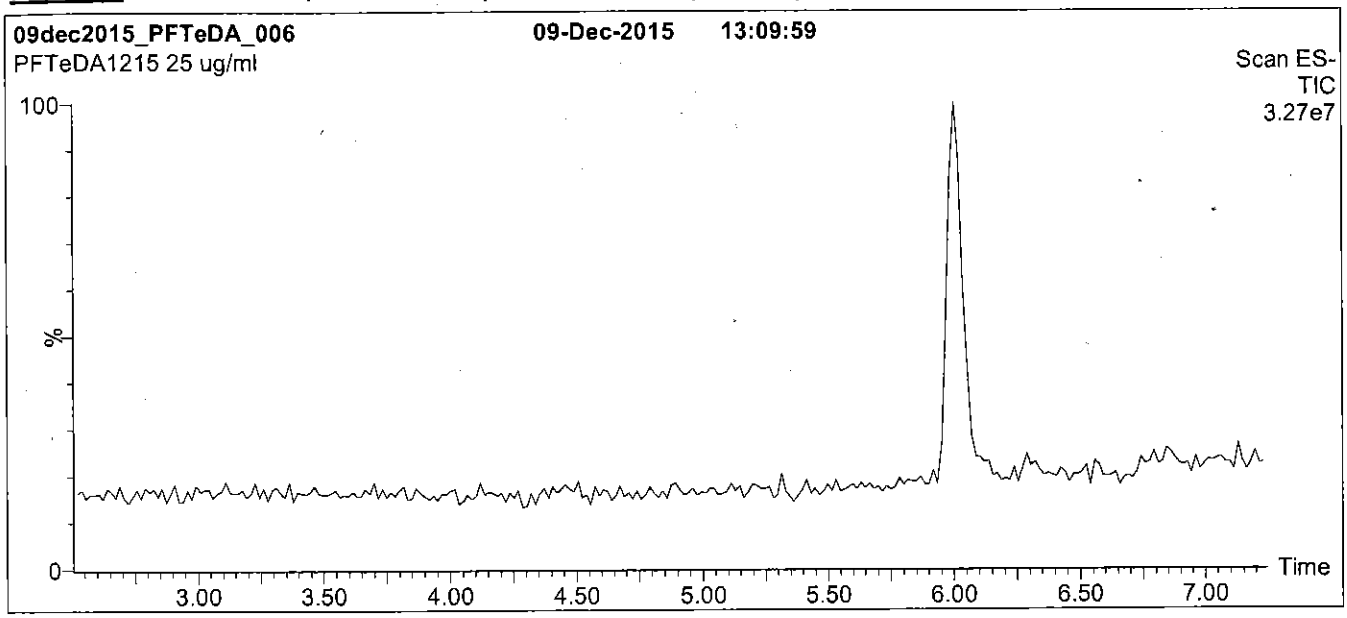
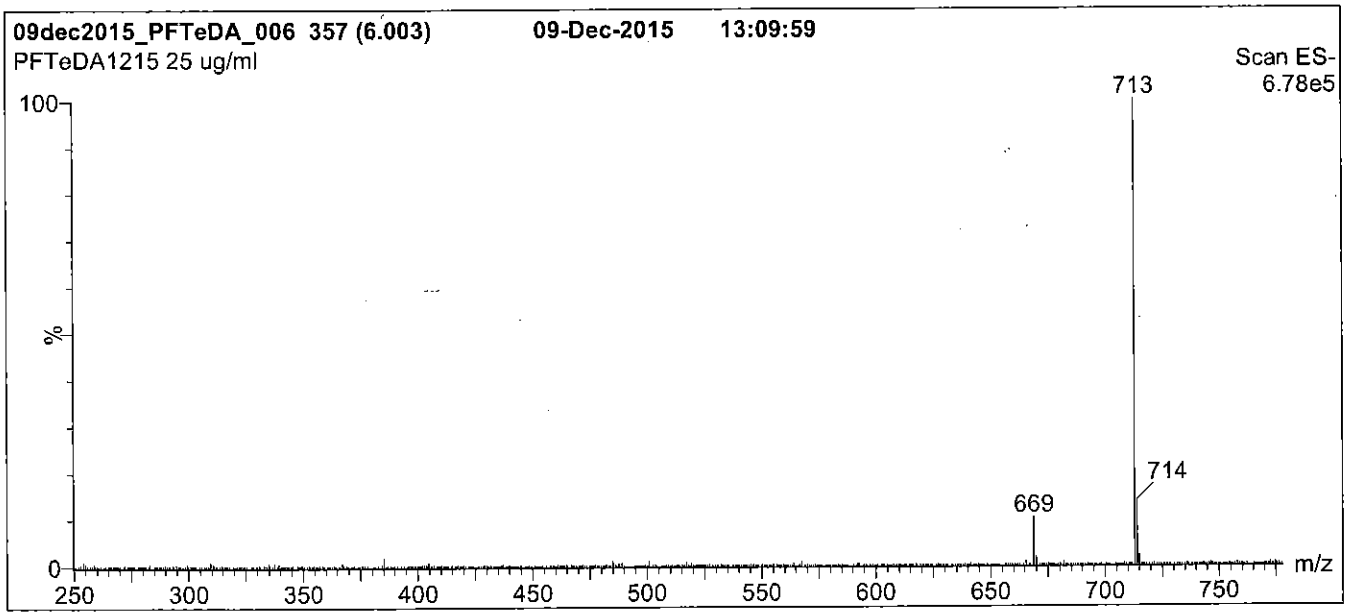
Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

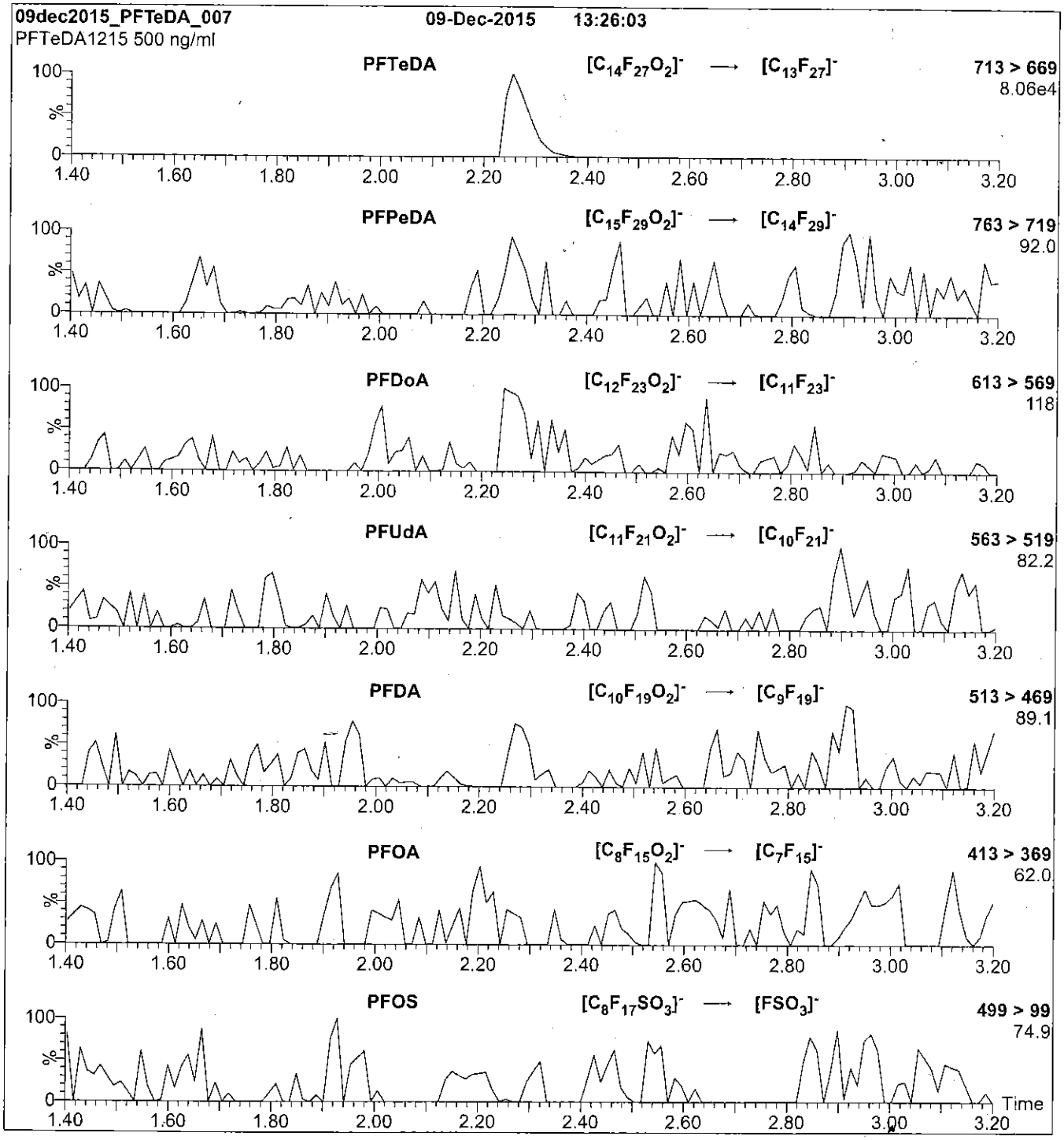
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 14

Reagent

LCPFTrDA_00003

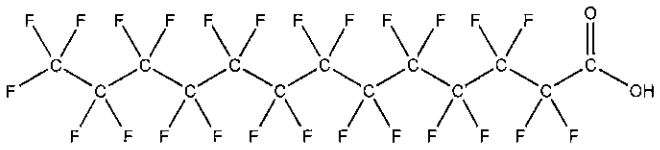
V. 2/11/15 CTN

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
LOT NUMBER: PFTrDA1213
COMPOUND: Perfluoro-n-tridecanoic acid

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/11/2013 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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where x is expressed as a relative standard uncertainty of the individual parameter.

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

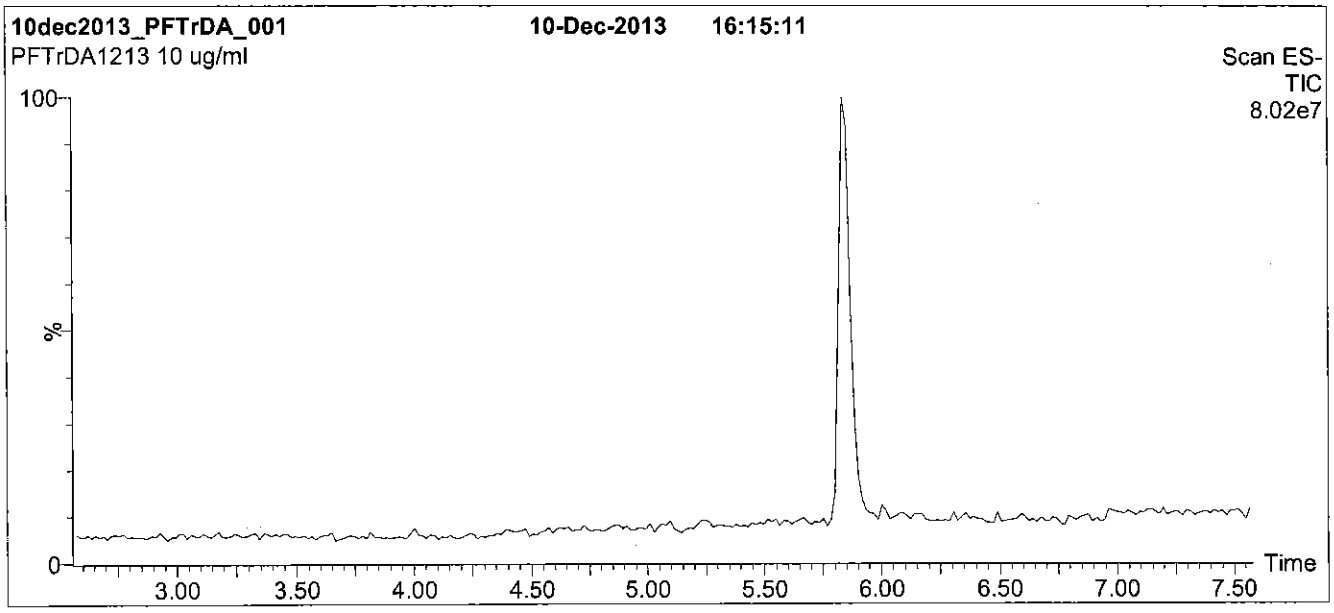
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

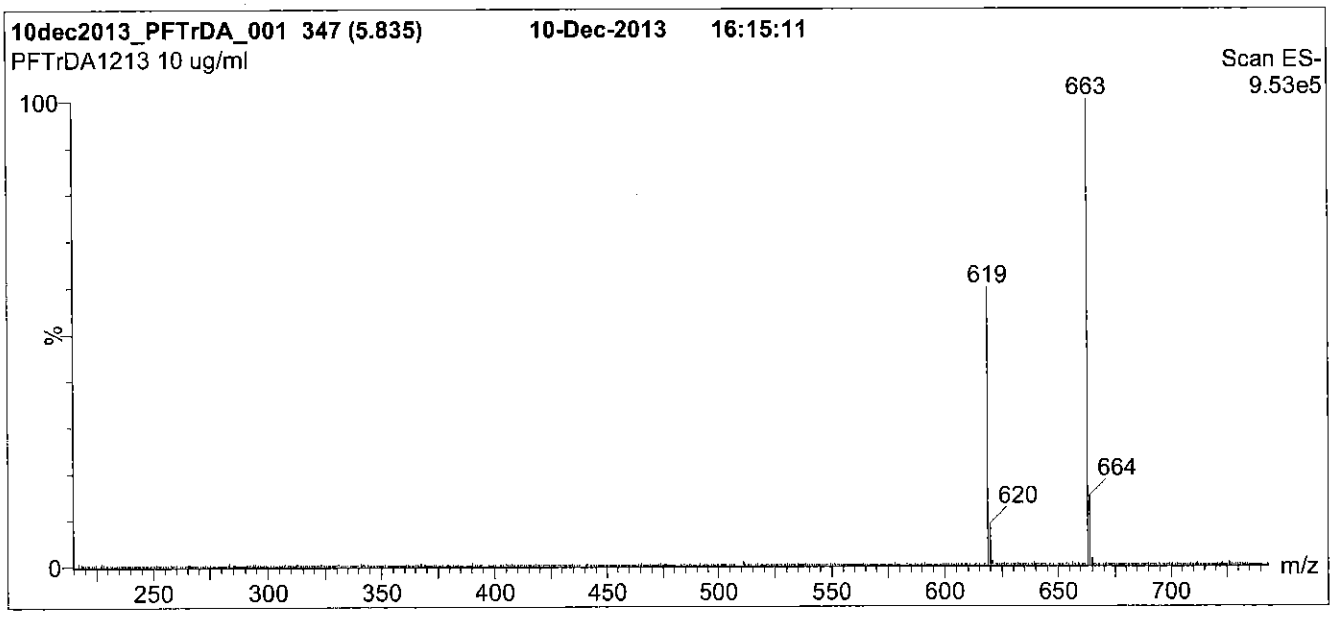
CALA Testing Accreditation No. A 1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

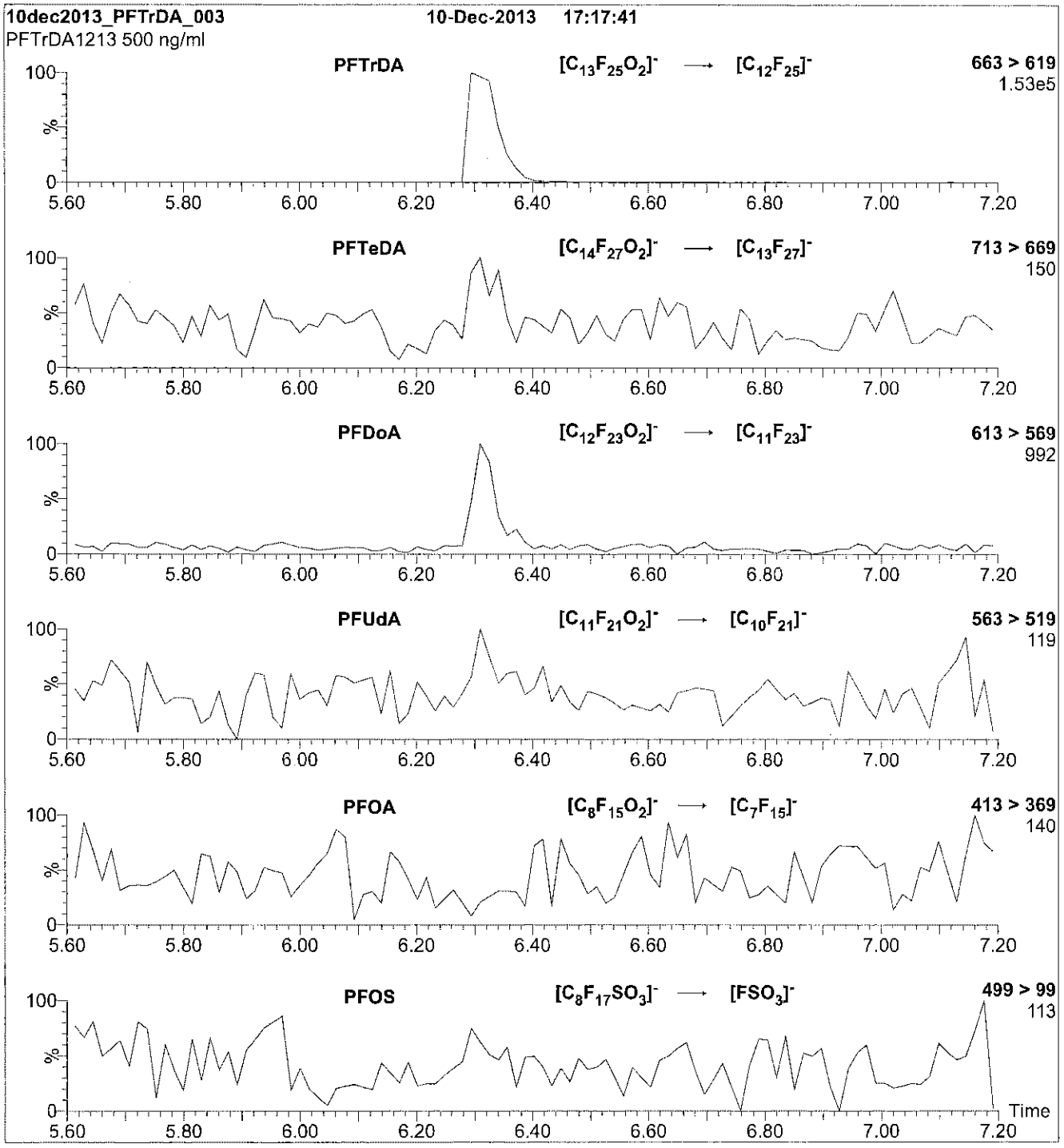
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFTrDA_00004

609697
ID: LCPFTrDA_00004
Exp: 12/10/18 Prpd: CBW
PF-n-tridecanoic acid

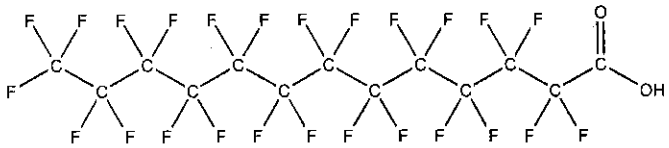
R: 4/7/16 CBW

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFTrDA
COMPOUND: Perfluoro-n-tridecanoic acid
LOT NUMBER: PFTrDA1213

STRUCTURE:
CAS #: 72629-94-8



MOLECULAR FORMULA: $C_{13}HF_{25}O_2$
MOLECULAR WEIGHT: 664.11
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/10/2013
EXPIRY DATE: (mm/dd/yyyy) 12/10/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$); ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 03/25/2015 (mm/dd/yyyy)

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

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Member Accreditation No. A1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

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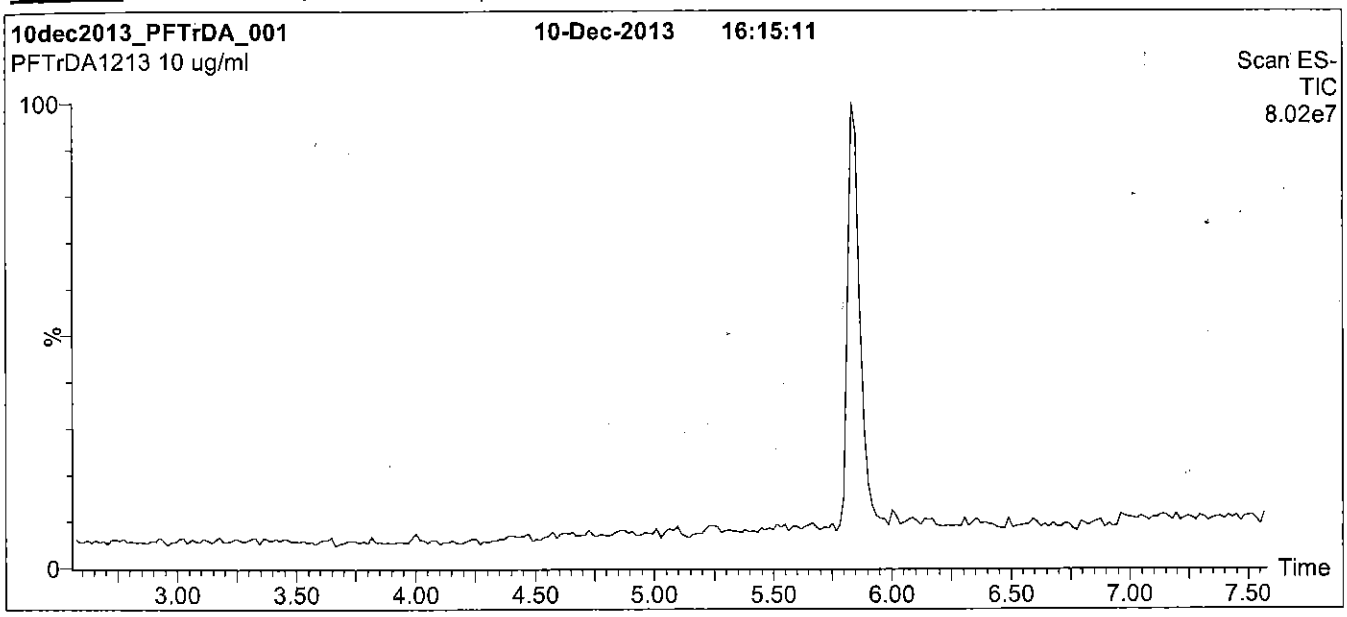
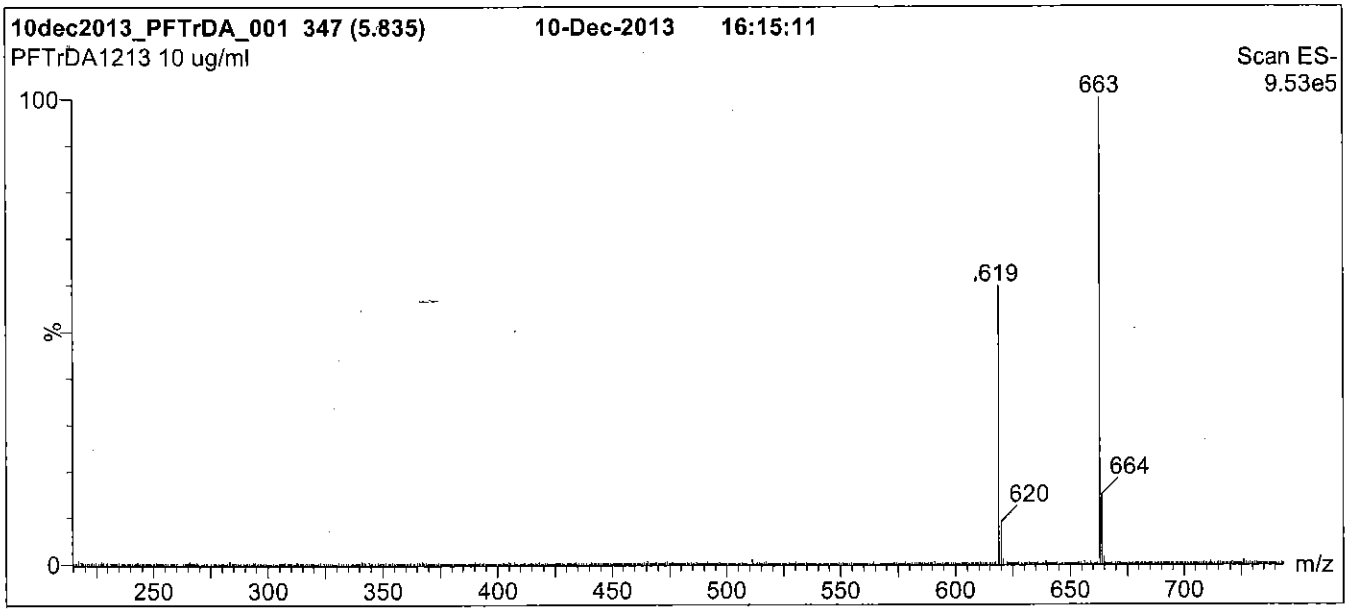




Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

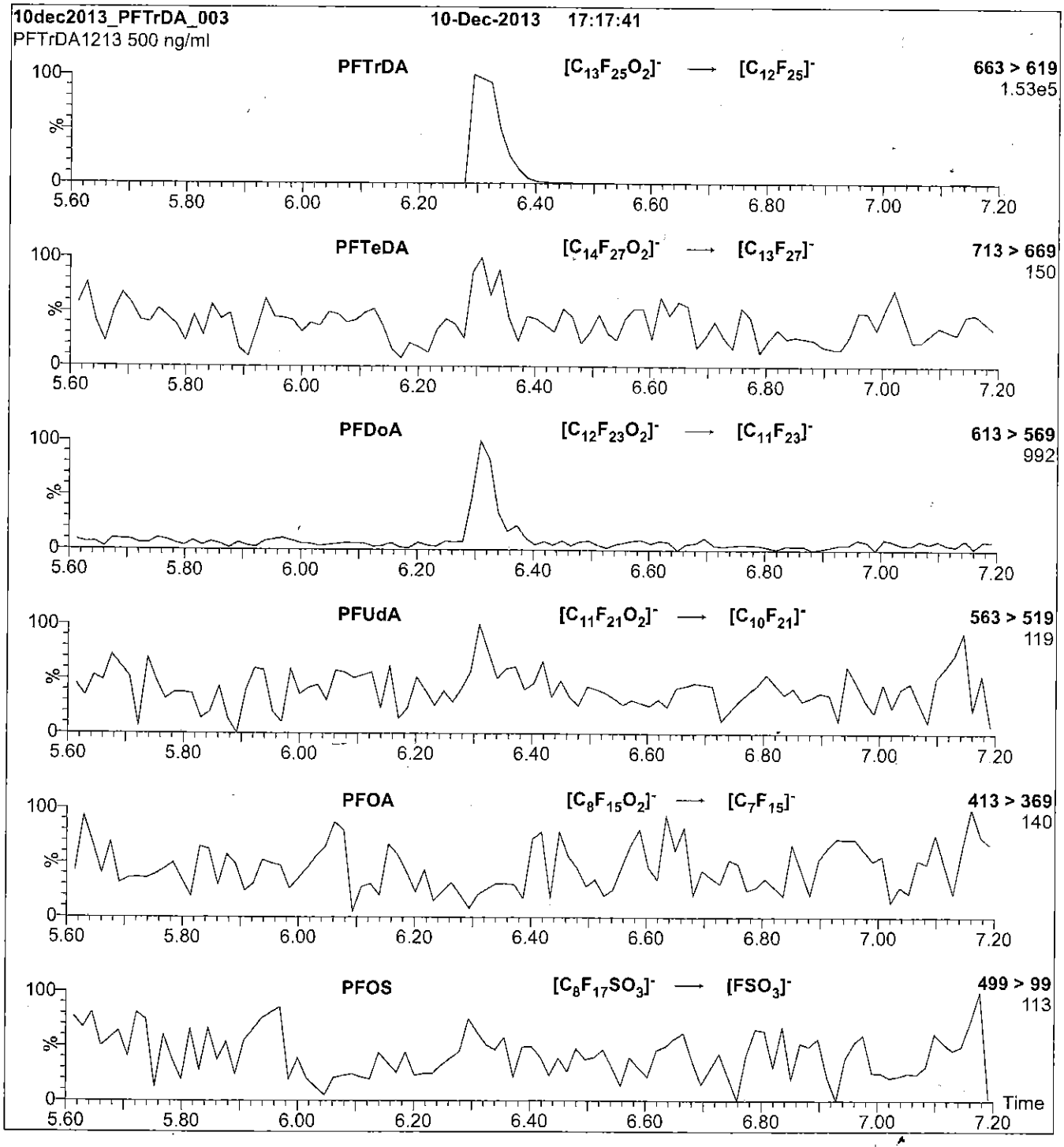
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (215 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

Reagent

LCPFUdA_00003

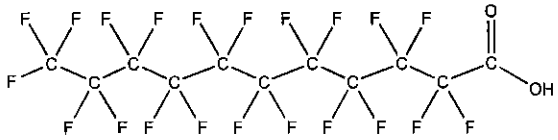
R. 2/11/15 SFV

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
COMPOUND: Perfluoro-n-undecanoic acid
LOT NUMBER: PFUdA0613

STRUCTURE:
CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 06/19/2013
EXPIRY DATE: (mm/dd/yyyy) 06/19/2018
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 07/03/2013 (mm/dd/yyyy)

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

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS and/or LC/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA Testing Accreditation No. A1226

ACLASS ACCREDITED REFERENCE MATERIAL PRODUCER

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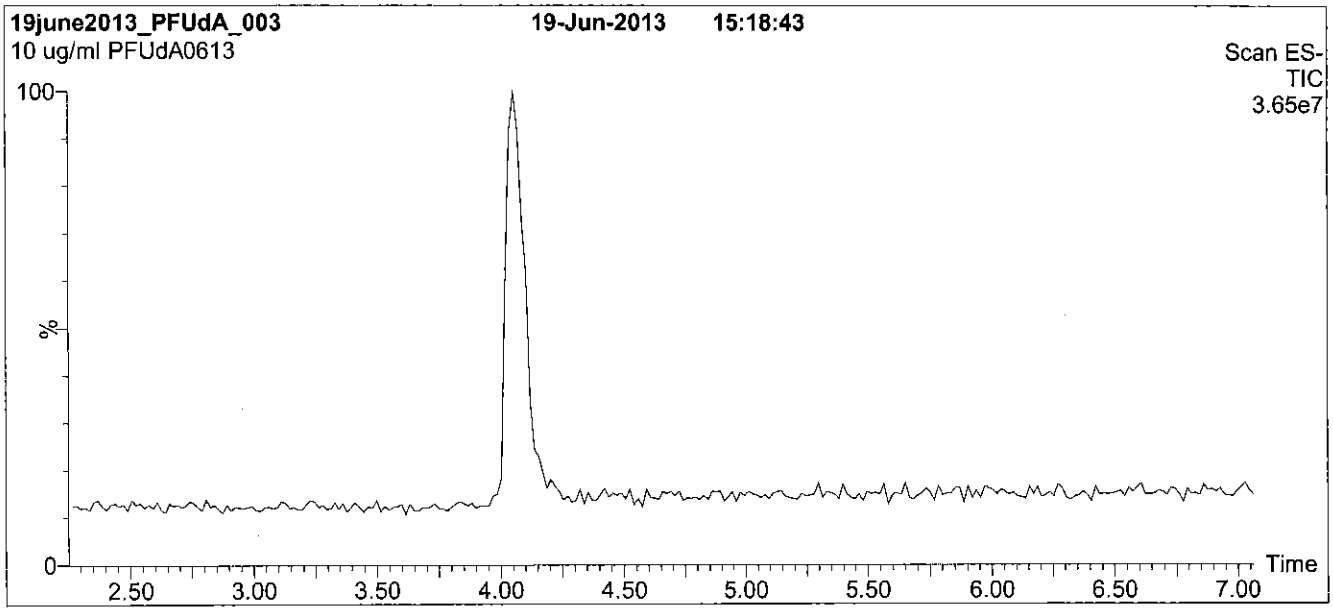
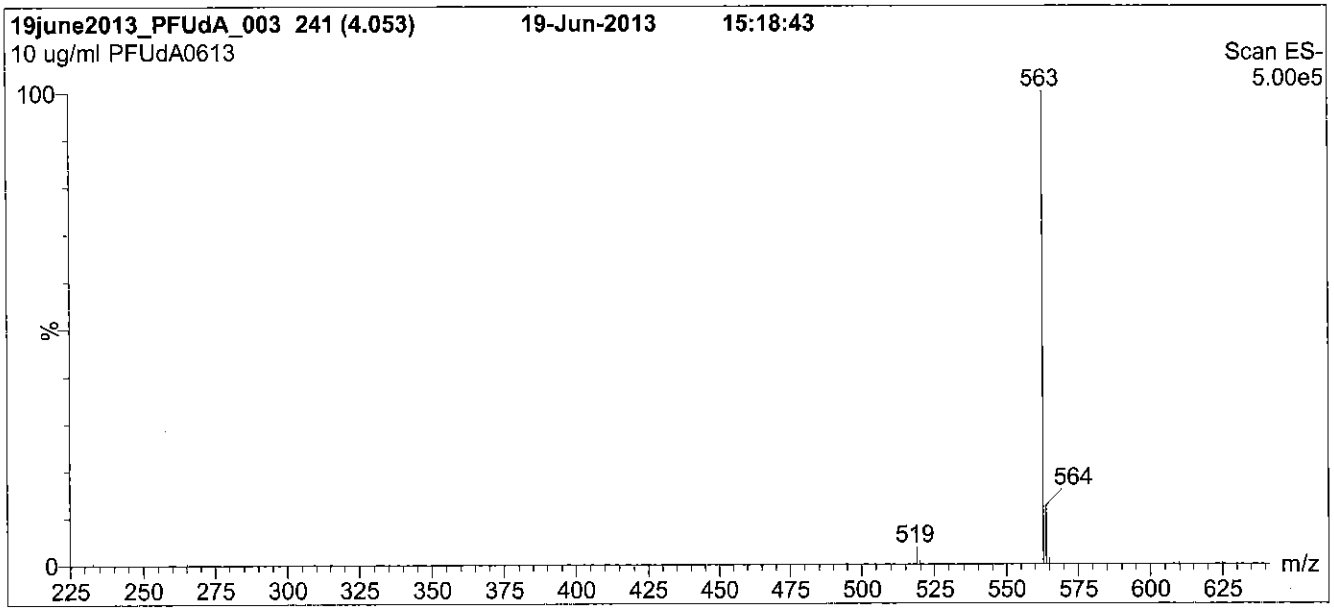
Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

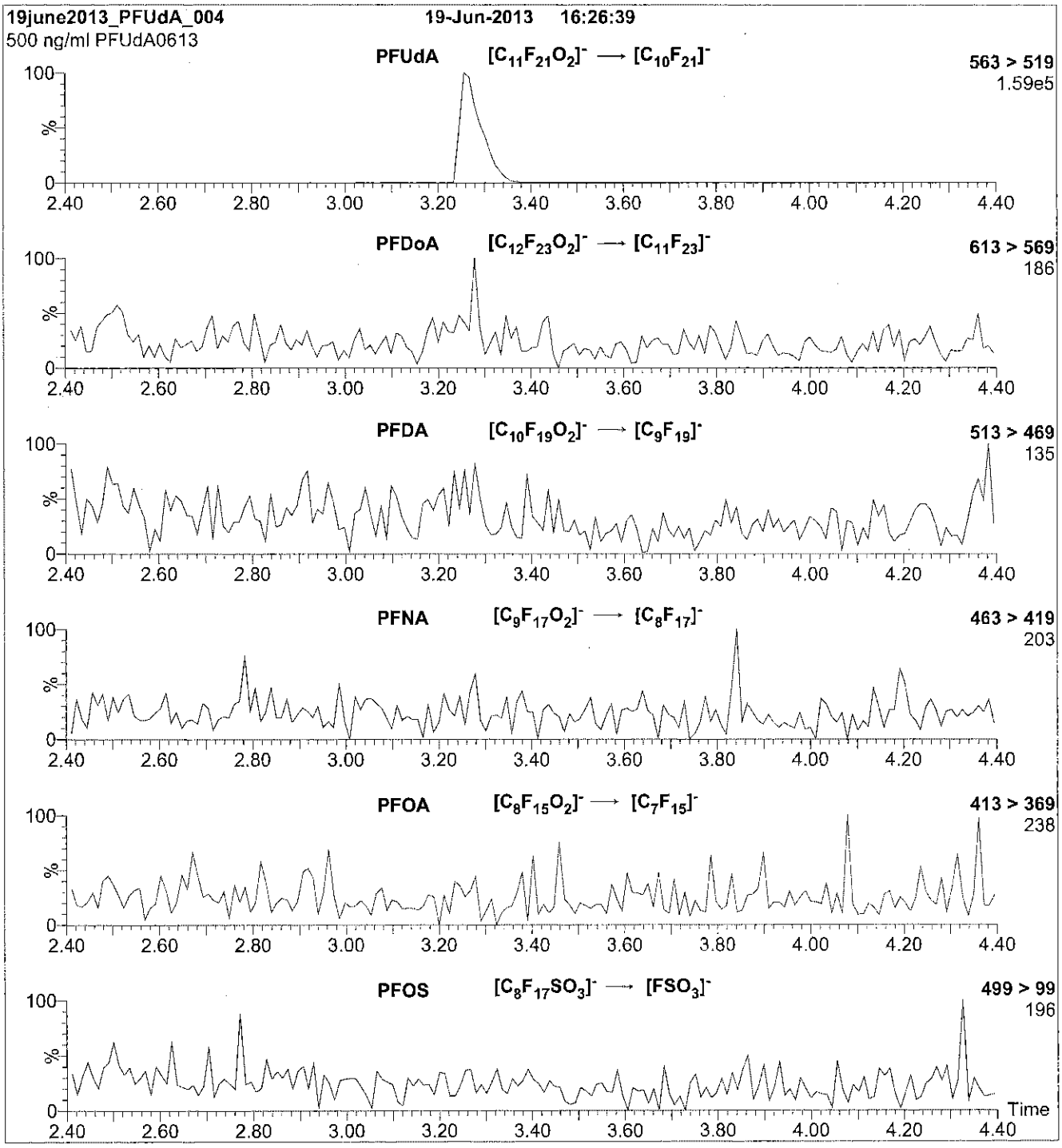
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

Reagent

LCPFUdA_00004

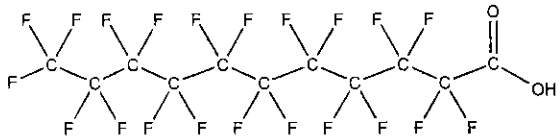
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFUdA
LOT NUMBER: PFUdA0815
COMPOUND: Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #: 2058-94-8



MOLECULAR FORMULA: $C_{11}HF_{21}O_2$
MOLECULAR WEIGHT: 564.09
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 08/19/2015
EXPIRY DATE: (mm/dd/yyyy) 08/19/2020
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 08/21/2015 (mm/dd/yyyy)

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

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CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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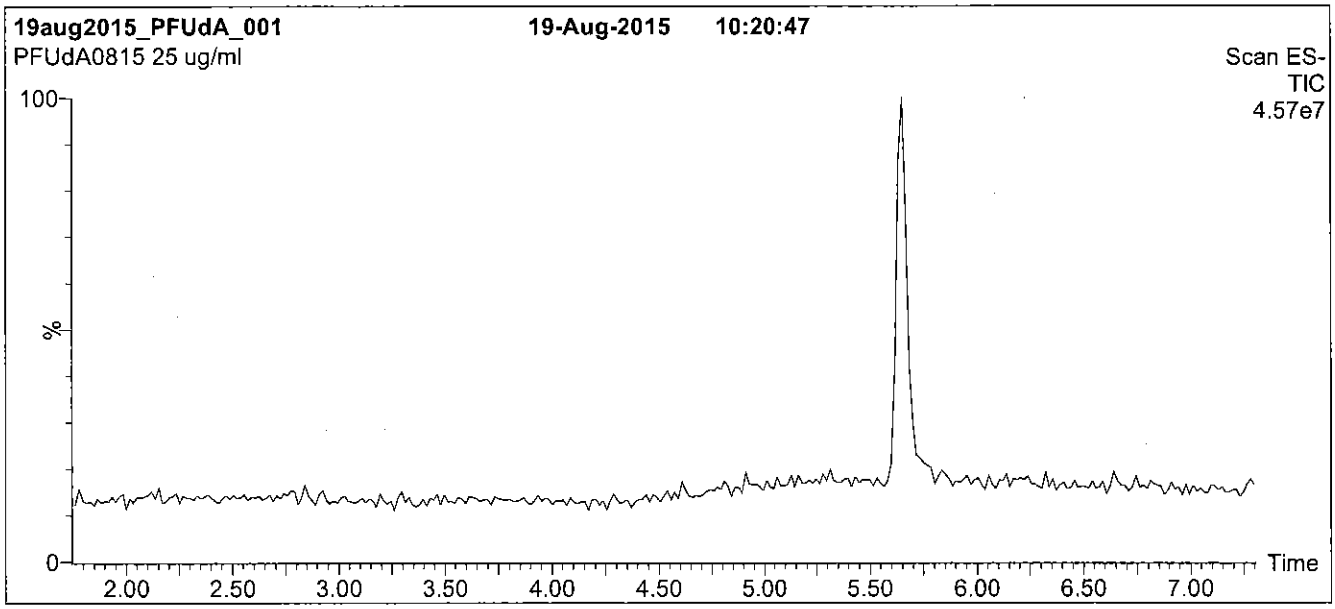
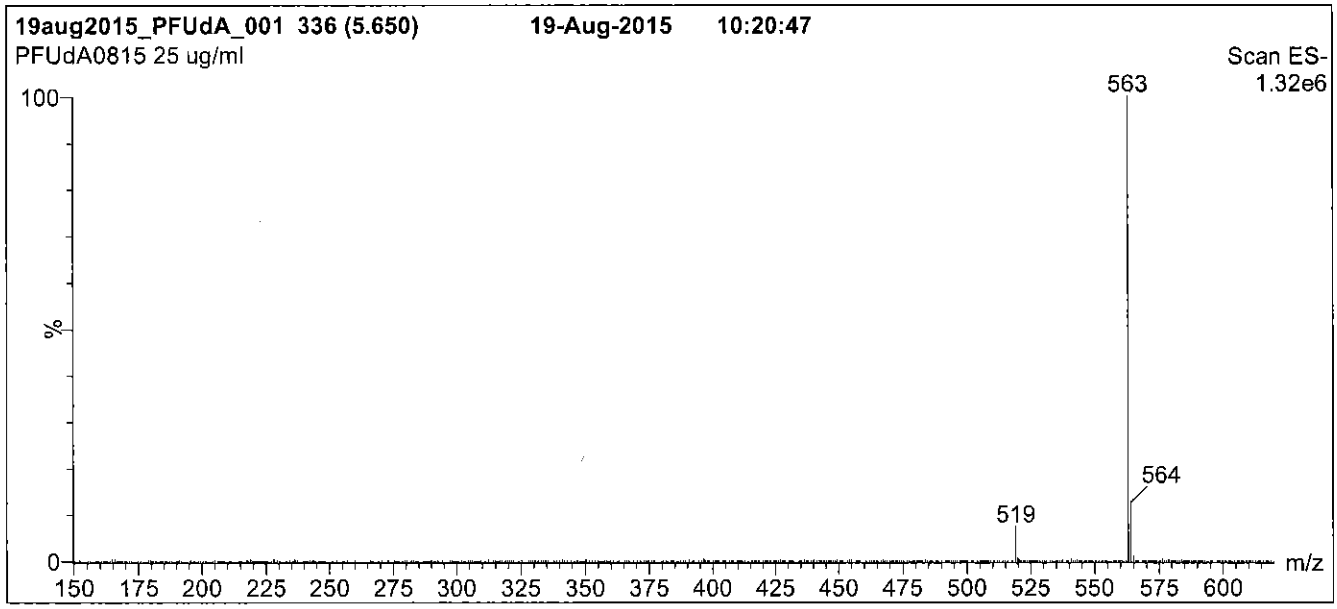
Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

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

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

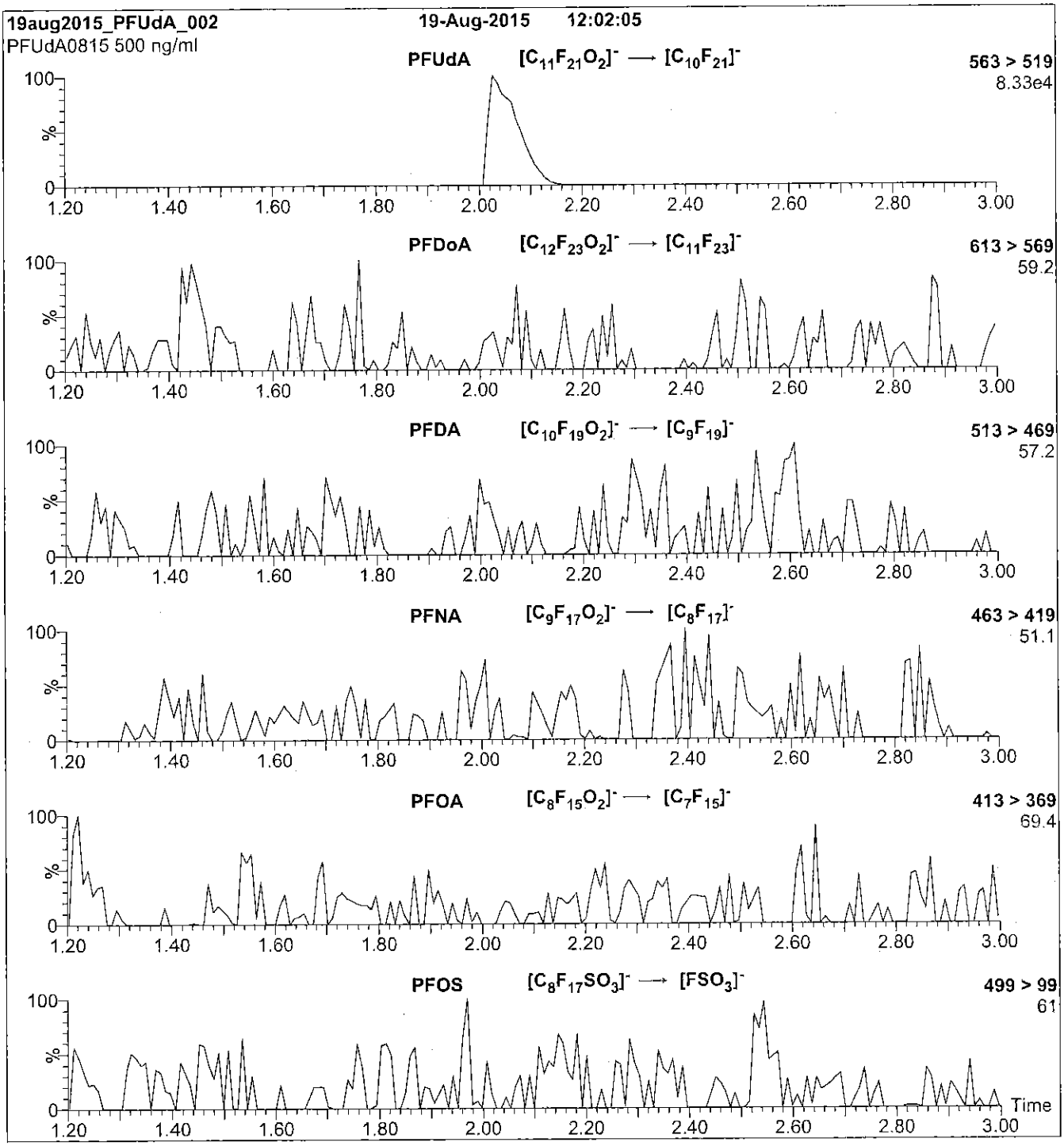
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11

Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA #
OF-RW83-0516	320-18918-1	75	47	74	7 Q	64
OF-FB83-0516	320-18918-2	96	84	106	24 Q	100
	MB 320-110721/1-A	97	107	105	127	97
	LCS 320-110721/2-A	95	101	92	126	91
	LCSD 320-110721/3-A	81	84	83	107	82

	QC LIMITS
13CHpA = 13C4-PFHpA	25-150
PFHxS = 18O2 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

Column to be used to flag recovery values

FORM II WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 27MAY2016B4A_020.d

Lab ID: LCS 320-110721/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0305	76	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0326	81	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0340	85	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0273	77	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0288	79	60-140	M
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0261	70	60-140	M
18O2 PFHxS	0.0946	0.0957	101	25-150	
13C4 PFOS	0.0956	0.120	126	25-150	
13C5 PFNA	0.100	0.0911	91	25-150	
13C4 PFOA	0.100	0.0920	92	25-150	
13C4-PFHpA	0.100	0.0954	95	25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 27MAY2016B4A_021.d

Lab ID: LCSD 320-110721/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0318	80	4	30	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0305	76	6	30	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0334	84	2	30	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0291	82	7	30	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0314	86	9	30	60-140	M
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0284	76	8	30	60-140	M
18O2 PFHxS	0.0946	0.0794	84			25-150	
13C4 PFOS	0.0956	0.102	107			25-150	
13C5 PFNA	0.100	0.0815	82			25-150	
13C4 PFOA	0.100	0.0828	83			25-150	
13C4-PFHpA	0.100	0.0812	81			25-150	

Column to be used to flag recovery and RPD values

FORM III WS-LC-0025

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Lab File ID: 27MAY2016B4A_019.d Lab Sample ID: MB 320-110721/1-A

Matrix: Water Date Extracted: 05/20/2016 11:05

Instrument ID: A4 Date Analyzed: 05/27/2016 17:18

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-110721/2-A	27MAY2016B4A_020.d	05/27/2016 17:39
	LCSD 320-110721/3-A	27MAY2016B4A_021.d	05/27/2016 18:00
OF-RW83-0516	320-18918-1	27MAY2016B4A_025.d	05/27/2016 21:54
OF-FB83-0516	320-18918-2	27MAY2016B4A_026.d	05/27/2016 22:15

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-18918-1

SDG No.:

Client Sample ID: OF-RW83-0516 | Lab Sample ID: 320-18918-1

Matrix: Water | Lab File ID: 27MAY2016B4A_025.d

Analysis Method: WS-LC-0025 | Date Collected: 05/16/2016 08:22

Extraction Method: 3535 | Date Extracted: 05/20/2016 11:05

Sample wt/vol: 518.9(mL) | Date Analyzed: 05/27/2016 21:54

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 111733 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00077
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.0019	0.00072
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00063
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00088
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00095	J	0.0024	0.0019	0.00084
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0094	M	0.0039	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	47		25-150
STL00991	13C4 PFOS	7	Q	25-150
STL00995	13C5 PFNA	64		25-150
STL00990	13C4 PFOA	74		25-150
STL01892	13C4-PFHpA	75		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_025.d
Lims ID: 320-18918-A-1-A
Client ID: OF-RW83-0516
Sample Type: Client
Inject. Date: 27-May-2016 21:54:22 ALS Bottle#: 31 Worklist Smp#: 25
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-18918-a-1-a
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 10:41:00 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 10:09:04

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFHpA										
366.6 > 321.6	9.333	9.366	-0.033		3158826	37.6		75.2	6625	
D 11 18O2 PFHxS										
402.5 > 83.6	9.365	9.399	-0.034		673981	22.2		47.0	563	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.357	9.401	-0.044	1.000	11001	0.4905				
D 12 13C4 PFOA										
416.5 > 371.6	10.451	10.483	-0.032		3531018	36.8		73.7	5211	
D 16 13C4 PFOS										
502.4 > 79.7	11.414	11.441	-0.027		19872	3.18		6.7	40.2	
15 Perfluorooctane sulfonic acid										M
498.3 > 79.2	11.414	11.443	-0.029	1.000	24077	4.88			20.6	M
498.3 > 98.2	11.405	11.443	-0.038	0.999	12299		1.96(0.00-0.00)		7.1	M
D 17 13C5 PFNA										
467.5 > 422.6	11.434	11.462	-0.028		2598360	32.0		63.9	2997	

QC Flag Legend

Review Flags
M - Manually Integrated

Report Date: 31-May-2016 10:42:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_025.d

Injection Date: 27-May-2016 21:54:22 Instrument ID: A4

Lims ID: 320-18918-A-1-A Lab Sample ID: 320-18918-1

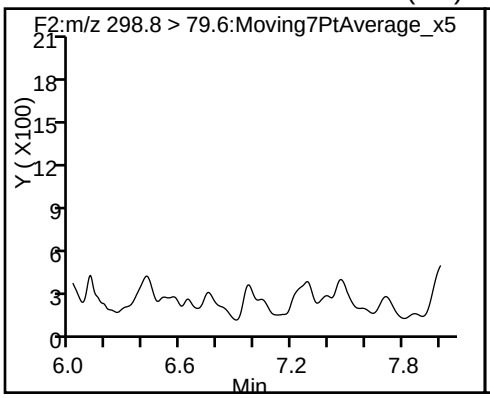
Client ID: OF-RW83-0516

Operator ID: JRB ALS Bottle#: 31 Worklist Smp#: 25

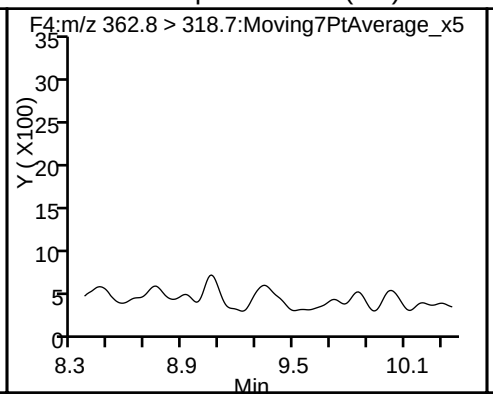
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

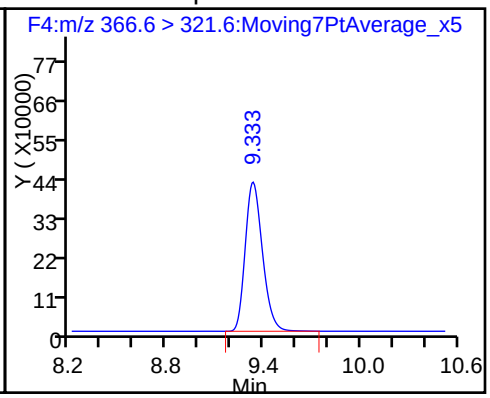
51 Perfluorobutanesulfonic acid (ND)



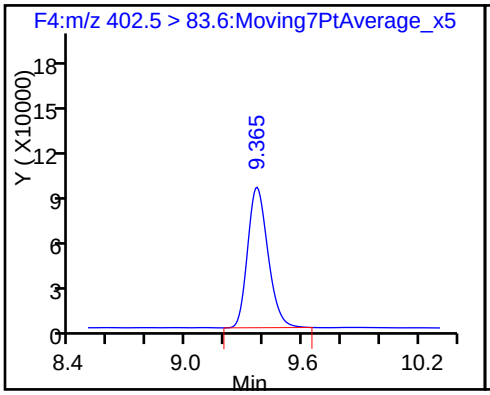
9 Perfluoroheptanoic acid (ND)



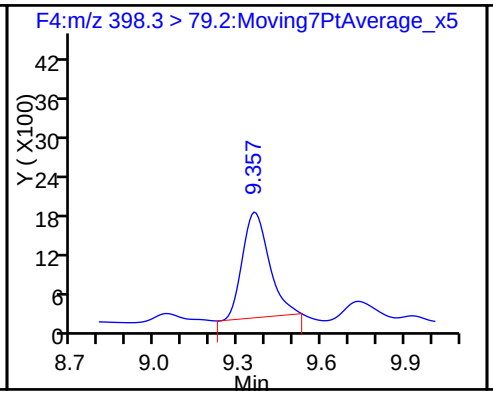
D 8 13C4-PFHpA



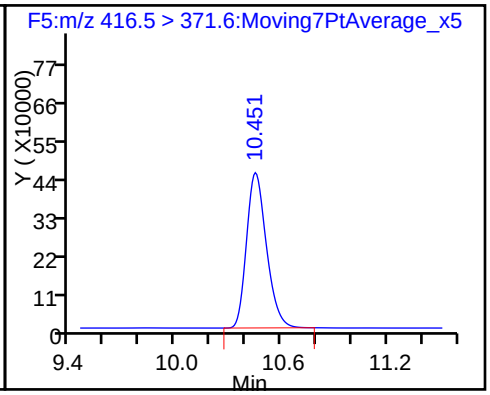
D 11 18O2 PFHxS



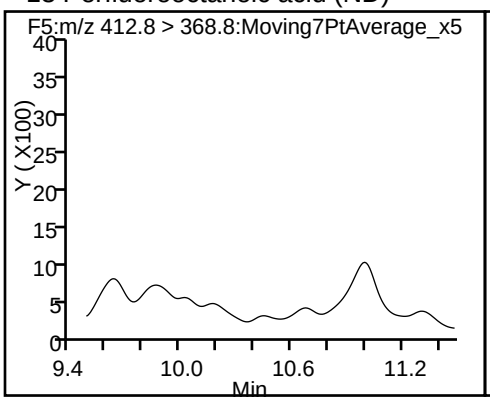
58 Perfluorohexanesulfonic acid



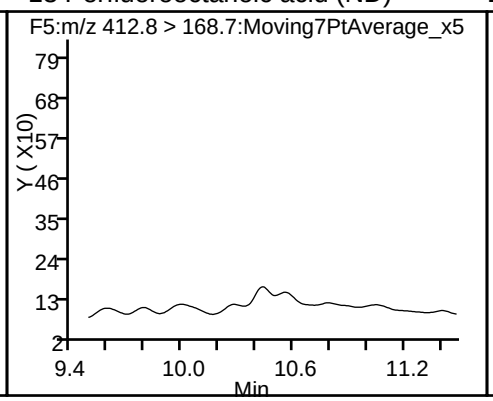
D 12 13C4 PFOA



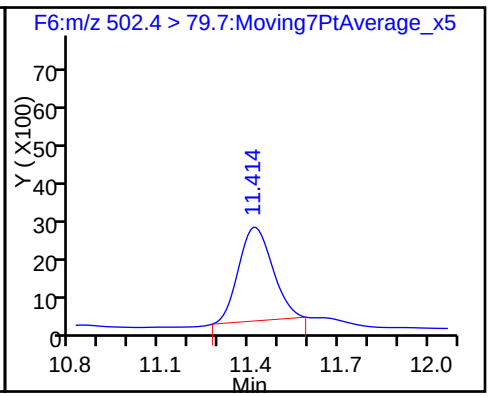
13 Perfluorooctanoic acid (ND)



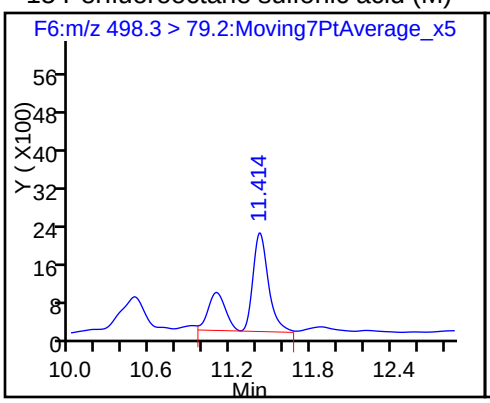
13 Perfluorooctanoic acid (ND)



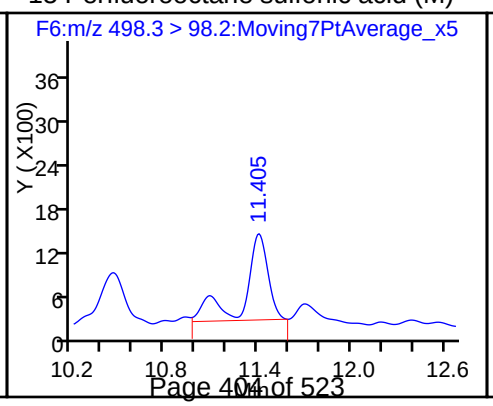
D 16 13C4 PFOS



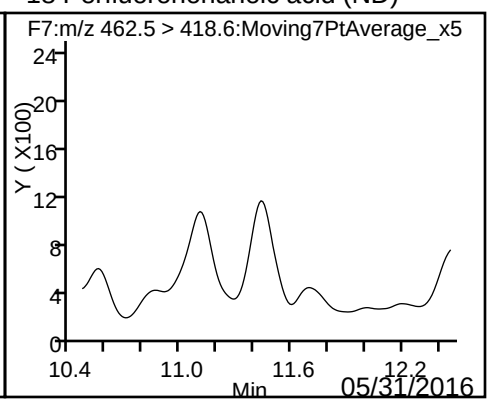
15 Perfluorooctane sulfonic acid (M)



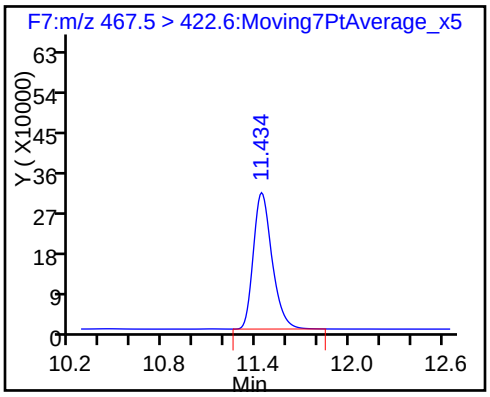
15 Perfluorooctane sulfonic acid (M)



18 Perfluorononanoic acid (ND)



D 17 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

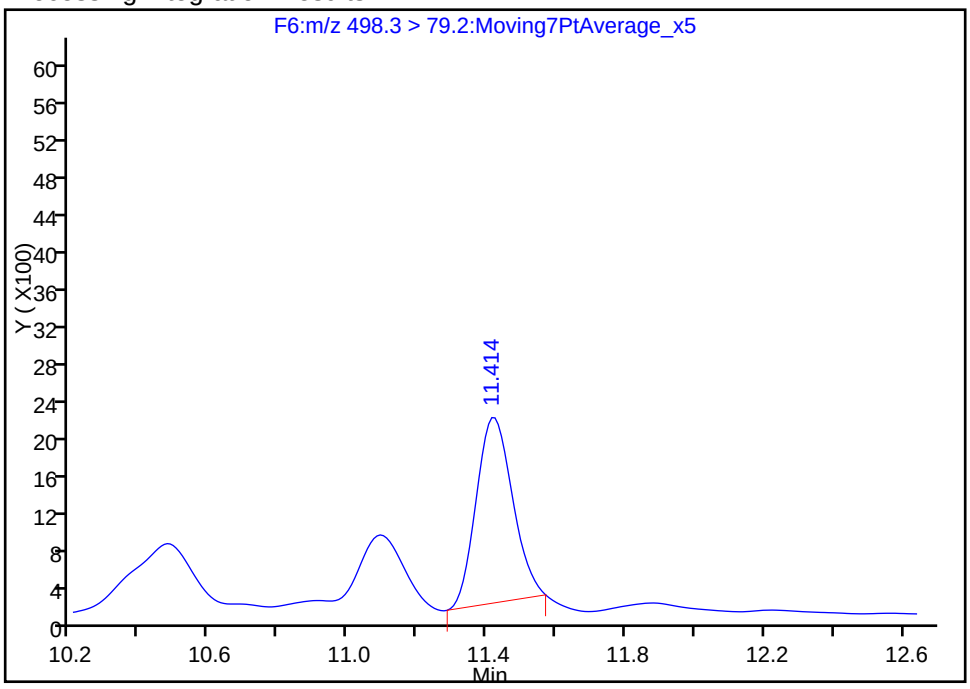
Data File:	\\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_025.d				
Injection Date:	27-May-2016 21:54:22	Instrument ID:	A4		
Lims ID:	320-18918-A-1-A	Lab Sample ID:	320-18918-1		
Client ID:	OF-RW83-0516				
Operator ID:	JRB	ALS Bottle#:	31	Worklist Smp#:	25
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

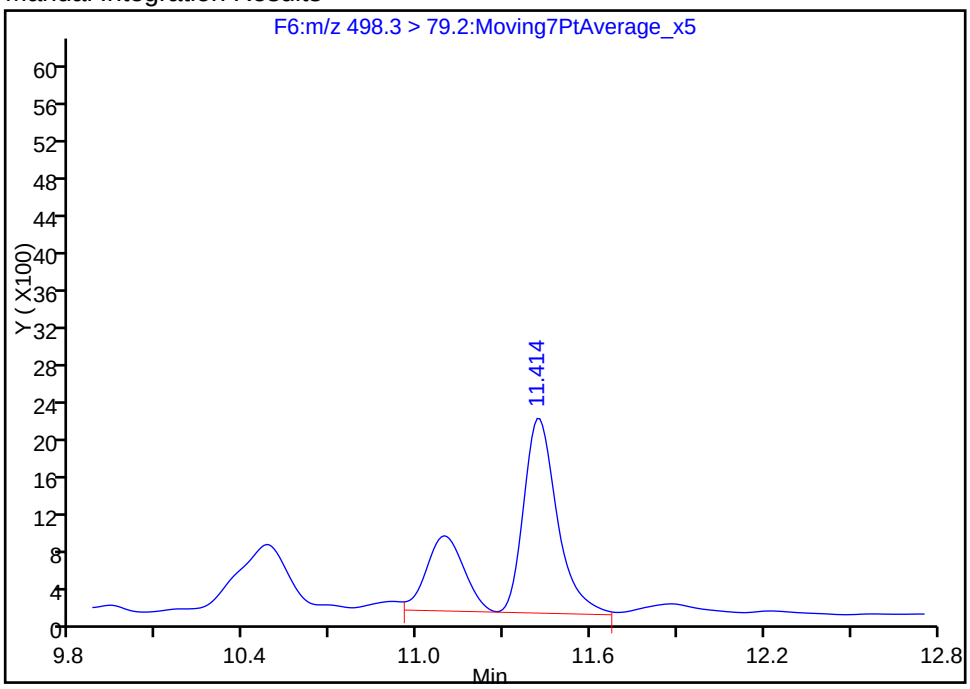
Processing Integration Results

RT: 11.41
Area: 14482
Amount: 2.968716
Amount Units: ng/ml



Manual Integration Results

RT: 11.41
Area: 24077
Amount: 4.878344
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:09:04

Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_025.d

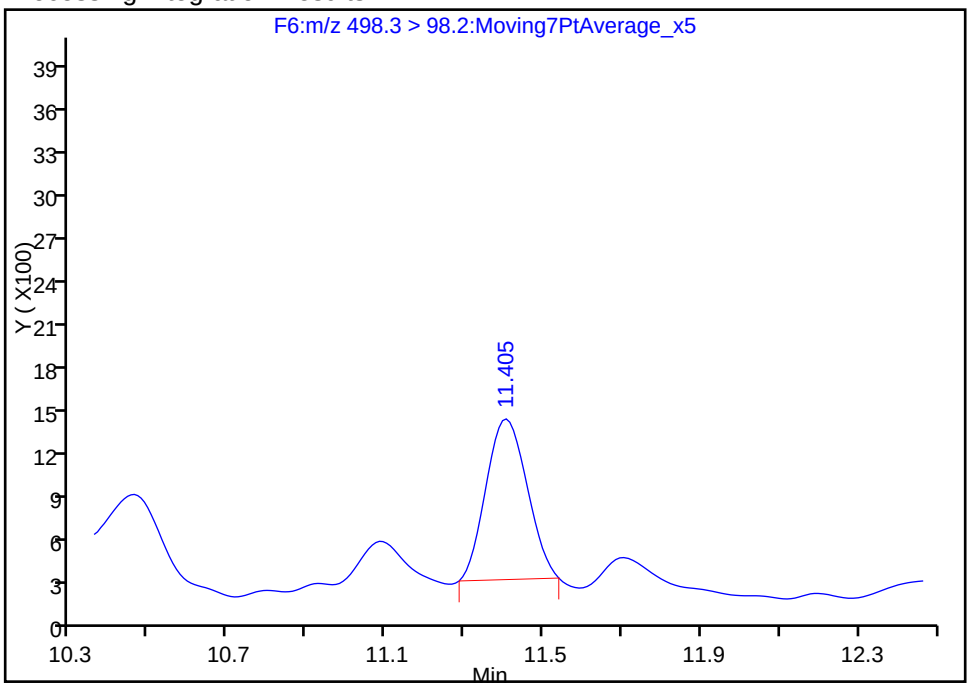
Injection Date:	27-May-2016 21:54:22	Instrument ID:	A4		
Lims ID:	320-18918-A-1-A	Lab Sample ID:	320-18918-1		
Client ID:	OF-RW83-0516				
Operator ID:	JRB	ALS Bottle#:	31	Worklist Smp#:	25
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

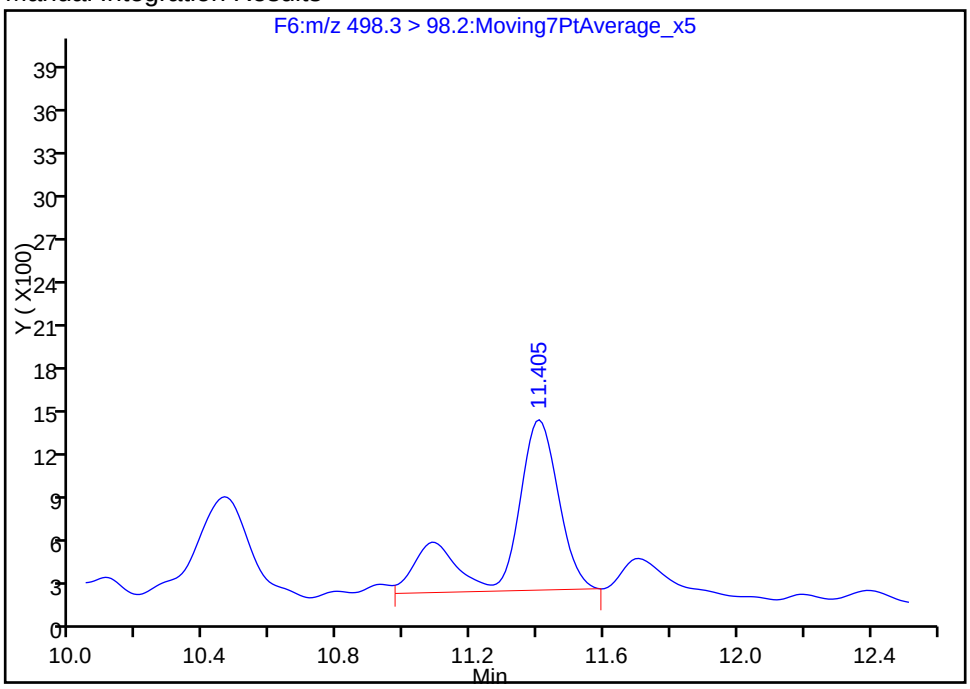
Processing Integration Results

RT: 11.41
Area: 8032
Amount: 2.968716
Amount Units: ng/ml



Manual Integration Results

RT: 11.41
Area: 12299
Amount: 4.878344
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:09:04

Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-18918-1

SDG No.:

Client Sample ID: OF-FB83-0516 | Lab Sample ID: 320-18918-2

Matrix: Water | Lab File ID: 27MAY2016B4A_026.d

Analysis Method: WS-LC-0025 | Date Collected: 05/16/2016 08:15

Extraction Method: 3535 | Date Extracted: 05/20/2016 11:05

Sample wt/vol: 514.7(mL) | Date Analyzed: 05/27/2016 22:15

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 111733 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00078
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.0019	0.00073
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U M	0.0024	0.0019	0.00064
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00089
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019	U	0.0024	0.0019	0.00085
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0029	U M	0.0039	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	84		25-150
STL00991	13C4 PFOS	24	Q	25-150
STL00995	13C5 PFNA	100		25-150
STL00990	13C4 PFOA	106		25-150
STL01892	13C4-PFHpA	96		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_026.d
Lims ID: 320-18918-A-2-A
Client ID: OF-FB83-0516
Sample Type: Client
Inject. Date: 27-May-2016 22:15:04 ALS Bottle#: 32 Worklist Smp#: 26
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: 320-18918-a-2-a
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 10:41:00 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 10:10:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4041583	48.1		96.3	7762	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1199777	39.6		83.6	3666	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.388	9.401	-0.013	1.000	8086	0.2025				
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		5103308	53.2		106	8903	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.474	10.485	-0.011	1.000	3201	0.1471			11.2	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		71074	11.4		23.8	207	
15 Perfluorooctane sulfonic acid										M
498.3 > 79.2	11.440	11.443	-0.003	1.000	5533	0.3944			13.9	M
498.3 > 98.2	11.440	11.443	-0.003	1.000	4056		1.36(0.00-0.00)		12.3	M
18 Perfluorononanoic acid										M
462.5 > 418.6	11.450	11.462	-0.012	1.000	6468	0.1019			18.1	M
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		4080319	50.2		100	7128	

QC Flag Legend

Review Flags
M - Manually Integrated

Report Date: 31-May-2016 10:42:04 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_026.d

Injection Date: 27-May-2016 22:15:04 Instrument ID: A4

Lims ID: 320-18918-A-2-A Lab Sample ID: 320-18918-2

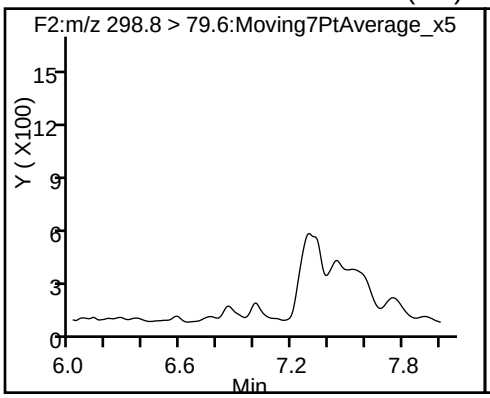
Client ID: OF-FB83-0516

Operator ID: JRB ALS Bottle#: 32 Worklist Smp#: 26

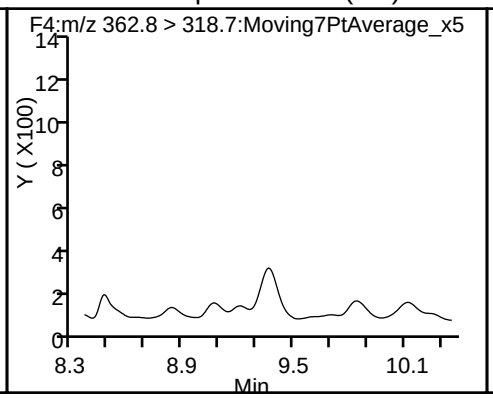
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

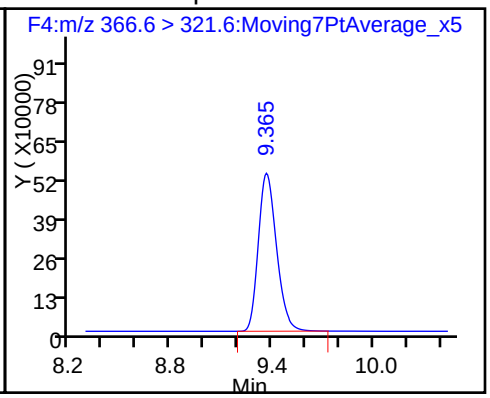
51 Perfluorobutanesulfonic acid (ND)



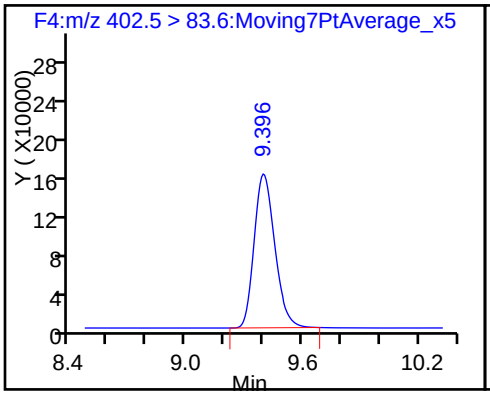
9 Perfluoroheptanoic acid (ND)



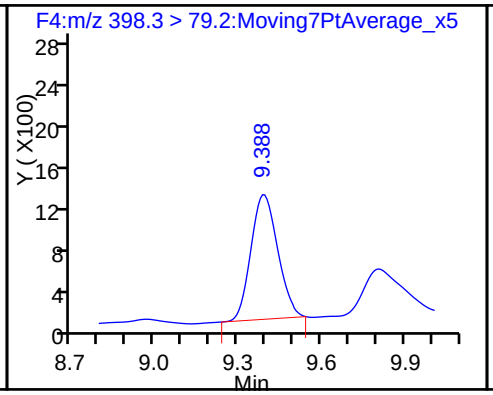
D 8 13C4-PFHpA



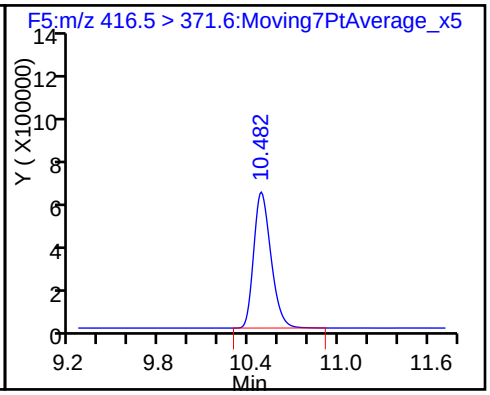
D 11 18O2 PFHxS



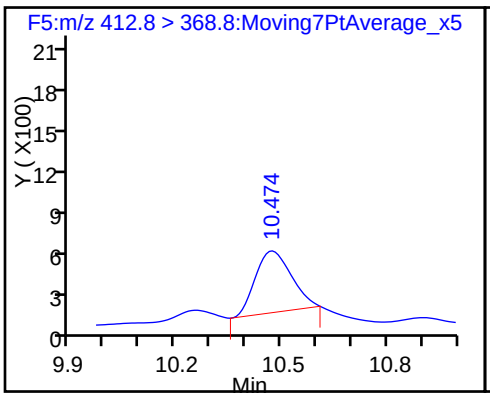
58 Perfluorohexanesulfonic acid



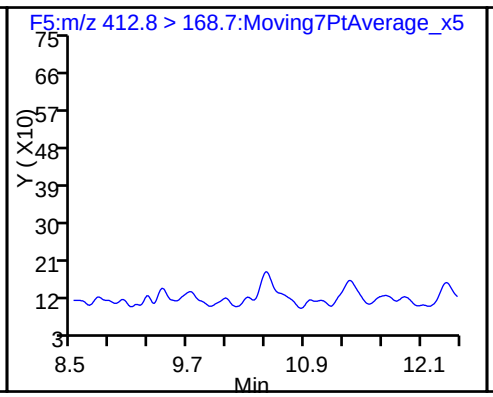
D 12 13C4 PFOA



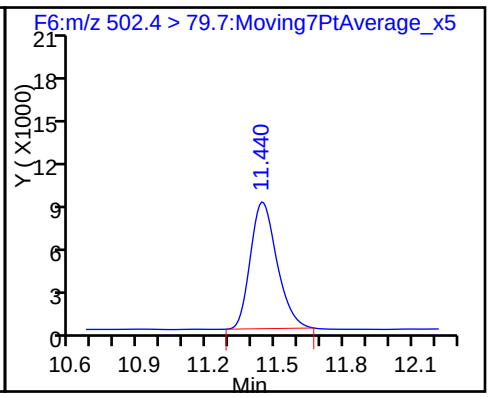
13 Perfluorooctanoic acid



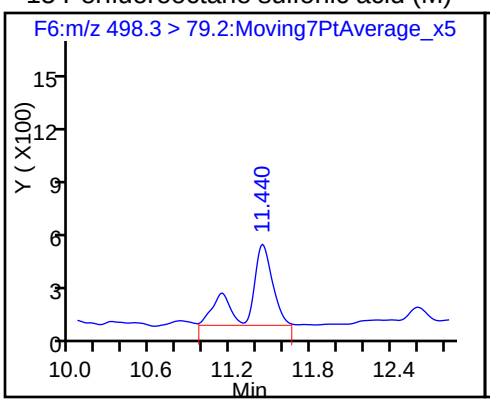
13 Perfluorooctanoic acid



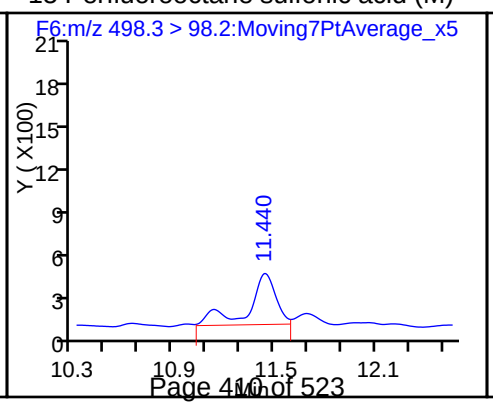
D 16 13C4 PFOS



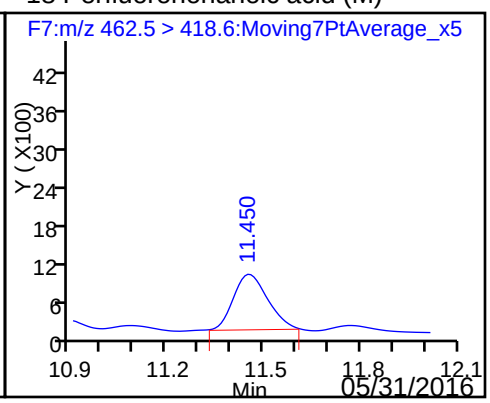
15 Perfluorooctane sulfonic acid (M)



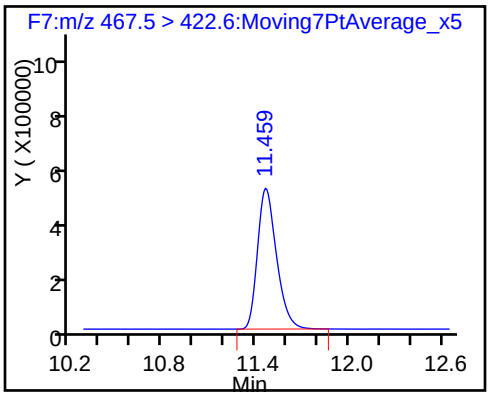
15 Perfluorooctane sulfonic acid (M)



18 Perfluorononanoic acid (M)



D 17 13C5 PFNA



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

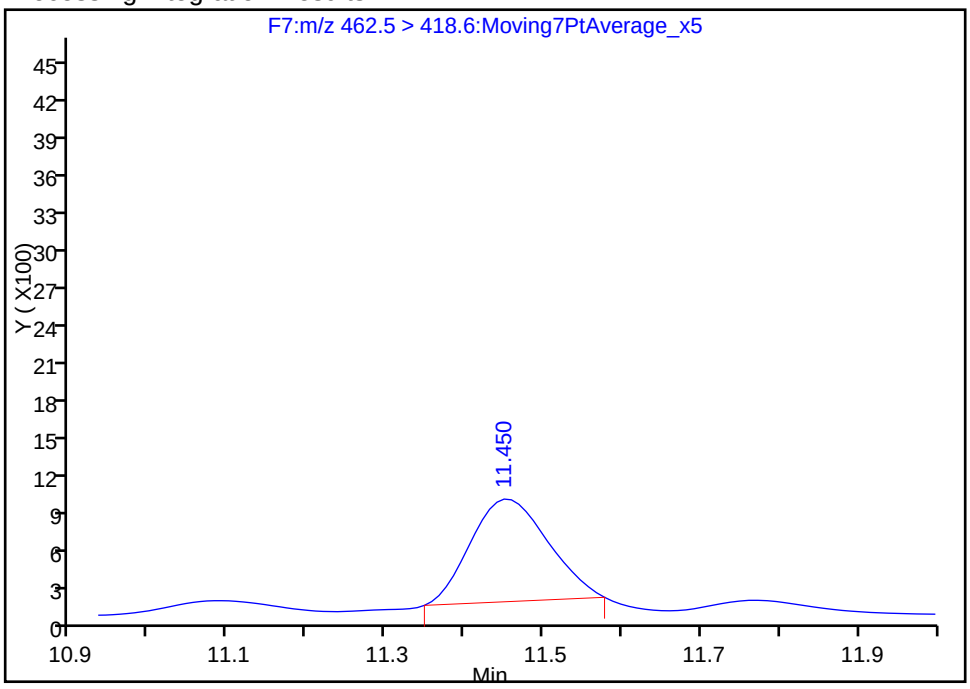
Data File:	\\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_026.d				
Injection Date:	27-May-2016 22:15:04	Instrument ID:	A4		
Lims ID:	320-18918-A-2-A	Lab Sample ID:	320-18918-2		
Client ID:	OF-FB83-0516				
Operator ID:	JRB	ALS Bottle#:	32	Worklist Smp#:	26
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	F7:MRM		

18 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

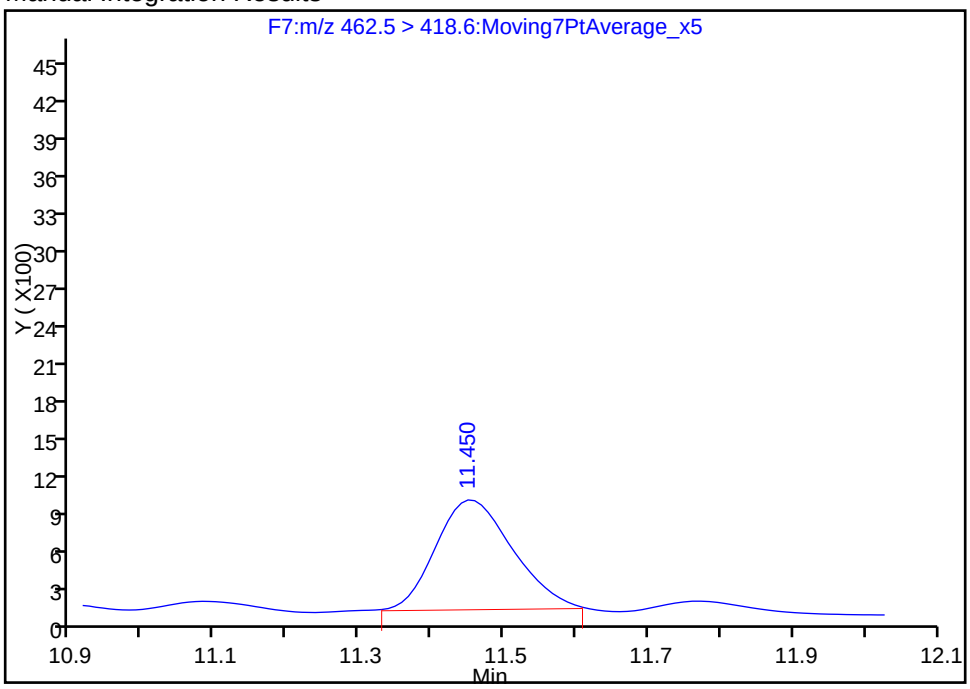
Processing Integration Results

RT: 11.45
Area: 5550
Amount: 0.093085
Amount Units: ng/ml



Manual Integration Results

RT: 11.45
Area: 6468
Amount: 0.101949
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:10:22

Audit Action: Manually Integrated Audit Reason: Baseline

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File:	\\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_026.d				
Injection Date:	27-May-2016 22:15:04	Instrument ID:	A4		
Lims ID:	320-18918-A-2-A	Lab Sample ID:	320-18918-2		
Client ID:	OF-FB83-0516				
Operator ID:	JRB	ALS Bottle#:	32	Worklist Smp#:	26
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	F6:MRM		

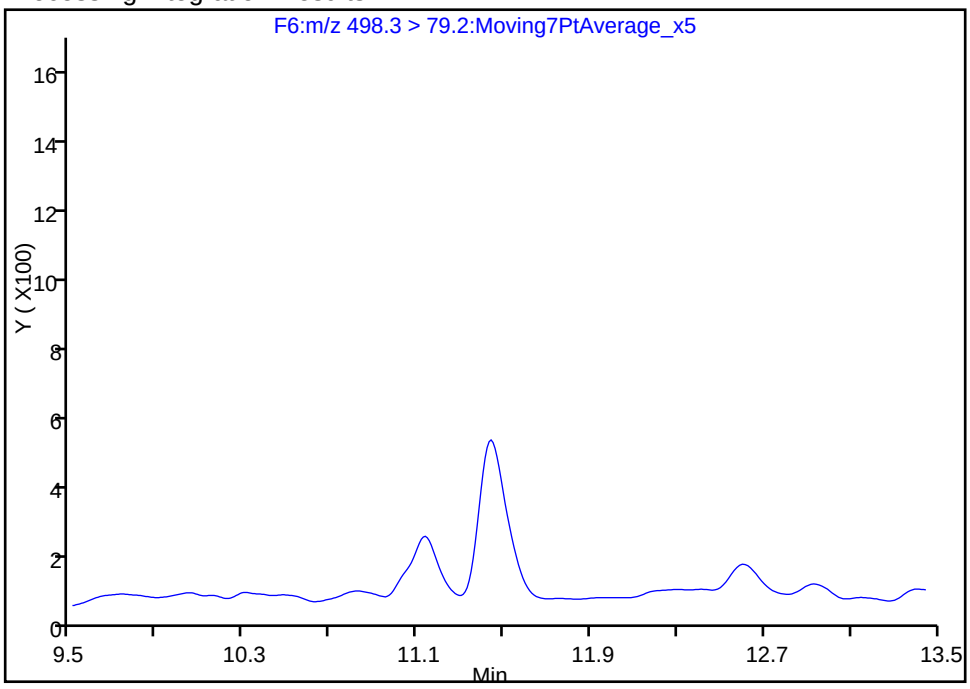
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

Processing Integration Results

Not Detected

Expected RT: 11.44



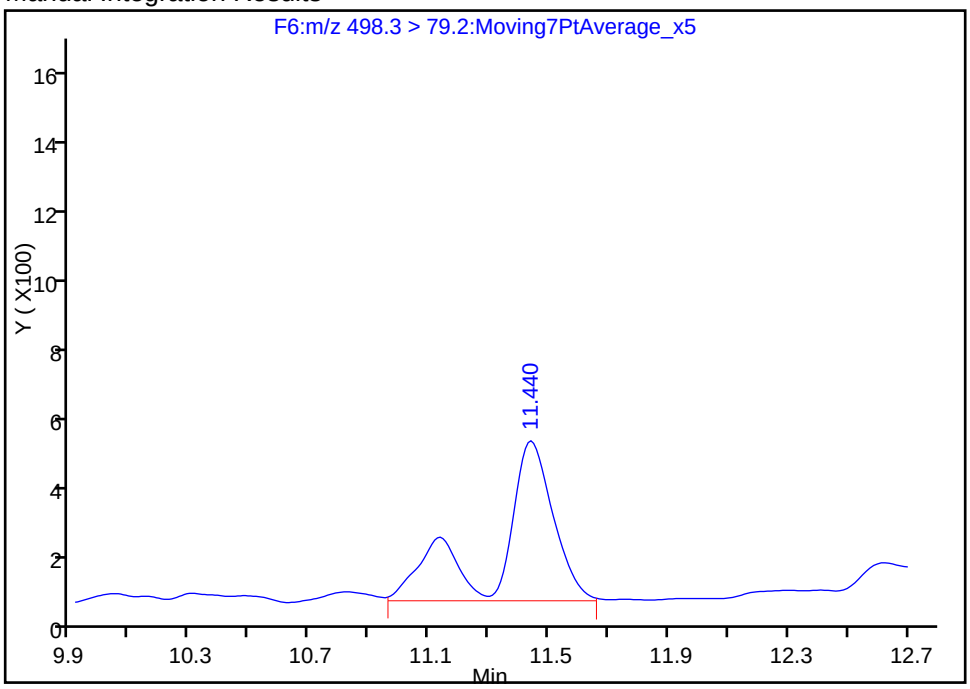
Manual Integration Results

RT: 11.44

Area: 5533

Amount: 0.394351

Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:10:22

Audit Action: Manually Integrated Audit Reason: Missed Peak

TestAmerica Sacramento

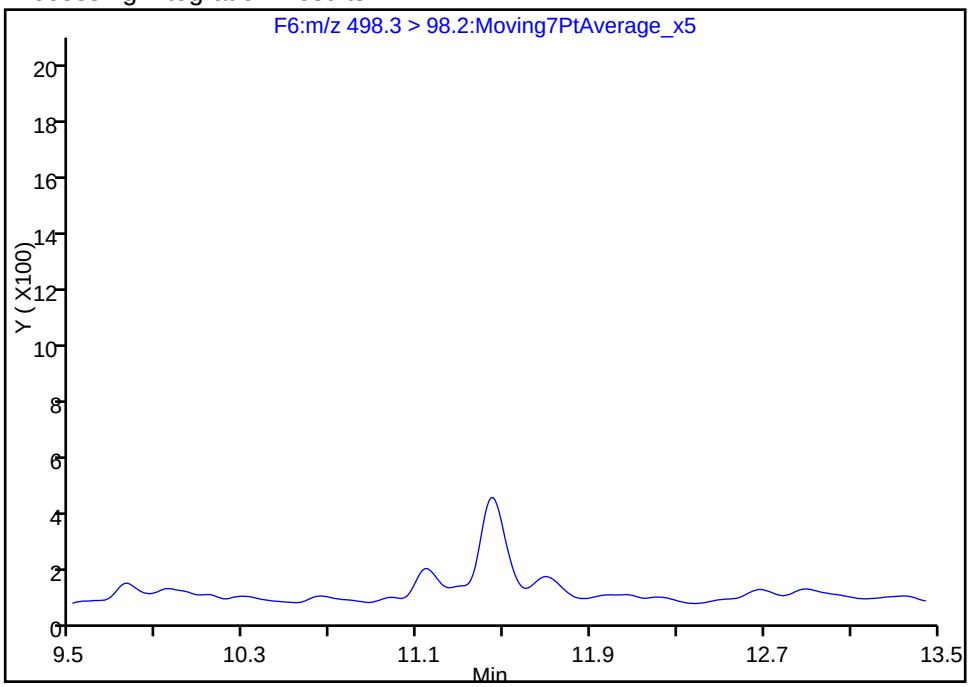
Data File:	\\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_026.d				
Injection Date:	27-May-2016 22:15:04	Instrument ID:	A4		
Lims ID:	320-18918-A-2-A	Lab Sample ID:	320-18918-2		
Client ID:	OF-FB83-0516				
Operator ID:	JRB	ALS Bottle#:	32	Worklist Smp#:	26
Injection Vol:	15.0 ul	Dil. Factor:	1.0000		
Method:	PFAC_A4	Limit Group:	LC PFC_DOD ICAL		
Column:		Detector	F6:MRM		

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

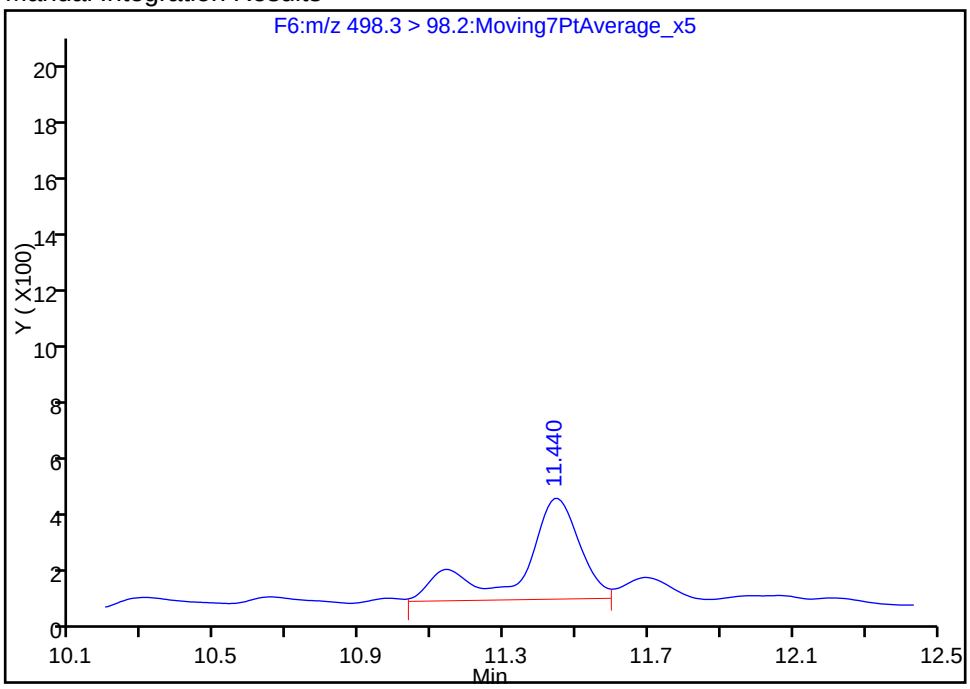
Not Detected
Expected RT: 11.44

Processing Integration Results



Manual Integration Results

RT: 11.44
Area: 4056
Amount: 0.394351
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:10:22
Audit Action: Manually Integrated Audit Reason: Missed Peak

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1 Analy Batch No.: 111733

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/27/2016 11:17 Calibration End Date: 05/27/2016 13:24 Calibration ID: 21794

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111733/2	27MAY2016B4A_002.d
Level 2	STD 320-111733/3	27MAY2016B4A_003.d
Level 3	STD 320-111733/4	27MAY2016B4A_004.d
Level 4	STD 320-111733/5	27MAY2016B4A_005.d
Level 5	STD 320-111733/6	27MAY2016B4A_006.d
Level 6	STD 320-111733/7	27MAY2016B4A_007.d
Level 7	STD 320-111733/8	27MAY2016B4A_008.d

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7				RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	5.797	5.791	5.791	5.791	5.791	5.794	5.791				5.542 - 6.042	5.792
Perfluoropentanoic acid (PFPeA)	6.899	6.899	6.895	6.895	6.895	6.890	6.895				6.645 - 7.145	6.895
Perfluorobutanesulfonic acid (PFBS)	7.024	7.014	7.005	7.005	7.010	7.010	7.005				6.761 - 7.261	7.010
Perfluorohexanoic acid (PFHxA)	8.138	8.144	8.144	8.138	8.144	8.138	8.133				7.890 - 8.390	8.140
Perfluoroheptanoic acid (PFHpA)	+++++	9.365	9.365	9.365	9.365	9.365	9.365				9.115 - 9.615	9.365
Perfluorohexanesulfonic acid (PFHxS)	9.404	9.404	9.396	9.396	9.404	9.404	9.404				9.151 - 9.651	9.402
Perfluoroheptanesulfonic Acid (PFHpS)	10.491	10.491	10.482	10.482	10.482	10.485	10.482				10.235 - 10.735	10.485
Perfluorooctanoic acid (PFOA)	10.491	10.491	10.482	10.482	10.482	10.485	10.482				10.235 - 10.735	10.485
Perfluorooctanesulfonic acid (PFOS)	11.449	11.449	11.440	11.440	11.440	11.442	11.440				11.193 - 11.693	11.443
Perfluorononanoic acid (PFNA)	11.459	11.469	11.459	11.459	11.469	11.462	11.459				11.212 - 11.712	11.462
Perfluorodecanoic acid (PFDA)	12.298	12.298	12.298	12.298	12.298	12.302	12.298				12.049 - 12.549	12.299
Perfluorooctane Sulfonamide (FOSA)	12.884	12.871	12.871	12.871	12.871	12.875	12.871				12.623 - 13.123	12.873
Perfluorodecanesulfonic acid (PFDS)	12.961	12.974	12.974	12.961	12.974	12.965	12.974				12.719 - 13.219	12.969
Perfluoroundecanoic acid (PFUnA)	13.020	13.020	13.020	13.020	13.020	13.024	13.020				12.771 - 13.271	13.021
Perfluorododecanoic acid (PFDoA)	13.626	13.627	13.627	13.626	13.626	13.620	13.626				13.376 - 13.876	13.625
Perfluorotridecanoic Acid (PFTriA)	14.140	14.140	14.130	14.140	14.140	14.134	14.140				13.888 - 14.388	14.138
Perfluorotetradecanoic acid (PFTeA)	14.579	14.579	14.579	14.579	14.579	14.574	14.570				14.327 - 14.827	14.577
Perfluoro-n-hexadecanoic acid (PFHxDA)	15.234	15.234	15.234	15.234	15.234	15.237	15.234				14.985 - 15.485	15.234
Perfluoro-n-octandecanoic acid (PFODA)	15.575	15.575	15.575	15.575	15.575	15.578	15.575				15.325 - 15.825	15.575
13C4 PFBA	5.791	5.794	5.787	5.791	5.791	5.791	5.787				5.540 - 6.040	5.790
13C5-PFPeA	6.890	6.895	6.895	6.890	6.895	6.890	6.890				6.642 - 7.142	6.892
13C2 PFHxA	8.138	8.144	8.138	8.138	8.138	8.138	8.133				7.888 - 8.388	8.138
13C4-PFHpA	9.372	9.372	9.365	9.365	9.365	9.365	9.357				9.116 - 9.616	9.366
18O2 PFHxS	9.404	9.404	9.396	9.396	9.396	9.396	9.404				9.149 - 9.649	9.399
13C4 PFOA	10.482	10.482	10.482	10.482	10.482	10.485	10.482				10.233 - 10.733	10.482
13C4 PFOS	11.449	11.440	11.440	11.440	11.440	11.442	11.440				11.191 - 11.691	11.442
13C5 PFNA	11.469	11.469	11.459	11.459	11.459	11.462	11.459				11.212 - 11.712	11.462
13C2 PFDA	12.298	12.298	12.298	12.298	12.298	12.302	12.298				12.049 - 12.549	12.299
13C8 FOSA	12.871	12.871	12.871	12.871	12.871	12.875	12.871				12.621 - 13.121	12.872
13C2 PFUnA	13.020	13.020	13.020	13.020	13.020	13.024	13.020				12.771 - 13.271	13.021
13C2 PFDoA	13.626	13.627	13.627	13.626	13.626	13.620	13.626				13.376 - 13.876	13.625
13C2-PFTeDA	14.579	14.579	14.579	14.579	14.579	14.574	14.579				14.329 - 14.829	14.578
13C2-PFHxDA	15.234	15.234	15.234	15.234	15.234	15.237	15.234				14.985 - 15.485	15.234

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1 Analy Batch No.: 111733

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/27/2016 11:17 Calibration End Date: 05/27/2016 13:24 Calibration ID: 21794

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111733/2	27MAY2016B4A_002.d
Level 2	STD 320-111733/3	27MAY2016B4A_003.d
Level 3	STD 320-111733/4	27MAY2016B4A_004.d
Level 4	STD 320-111733/5	27MAY2016B4A_005.d
Level 5	STD 320-111733/6	27MAY2016B4A_006.d
Level 6	STD 320-111733/7	27MAY2016B4A_007.d
Level 7	STD 320-111733/8	27MAY2016B4A_008.d

ANALYTE	CF				CURVE TYPE	COEFFICIENT			#	MIN CF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4		B	M1	M2								
13C4 PFBA	122307 88914	118458 82594	122043 67111	122607	Ave		103433.463				22.5		50.0			
13C5-PFPeA	87834 65054	88862 60926	90292 49690	88307	Ave		75852.0829				22.2		50.0			
13C2 PFHxA	112782 86160	112072 71847	112613 60209	99440	Ave		93589.0229				22.9		50.0			
13C4-PFHpA	100884 84755	99034 65681	96339 52680	88445	Ave		83974.1286				21.7		50.0			
18O2 PFHxS	38330 30970	36244 22079	35530 17168	31964	Ave		30326.4452				25.9		50.0			
13C4 PFOA	120571 95011	120096 66703	113795 58013	96669	Ave		95836.9257				26.3		50.0			
13C4 PFOS	7637.4 6162.0	7795.1 4381.9	7876.9 3517.0	6369.6	Ave		6248.57143				27.7		50.0			
13C5 PFNA	95941 82537	95948 61401	96557 52872	83829	Ave		81298.0714				21.7		50.0			
13C2 PFDA	126977 98638	121863 77257	123356 68153	105046	Ave		103041.294				22.6		50.0			
13C8 FOSA	106795 96772	108930 78251	108843 68041	96734	Ave		94909.4200				16.9		50.0			
13C2 PFUnA	128164 109830	124879 82693	127974 72650	113351	Ave		108505.803				20.6		50.0			
13C2 PFDoA	126911 112831	132398 88968	124286 76848	116438	Ave		111239.746				18.6		50.0			
13C2-PFTeDA	86075 76846	85027 67184	89188 57696	82069	Ave		77726.4371				14.7		50.0			
13C2-PFHxDA	33736 28399	34182 25965	33606 21136	31233	Ave		29751.1229				16.4		50.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

FORM VI

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1 Analy Batch No.: 111733

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/27/2016 11:17 Calibration End Date: 05/27/2016 13:24 Calibration ID: 21794

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		B	M1	M2								
Perfluorobutanoic acid (PFBA)	65522 56359	79038 46329	82380	74651	60800	AveID		0.6490				8.8		35.0			
Perfluoropentanoic acid (PFPeA)	51010 28041	49163 23320	43069	38026	31761	AveID		0.4942				10.8		35.0			
Perfluorobutanesulfonic acid (PFBS)	27425 15501	25102 12585	24298	20519	17010	L2ID	0.0251	0.6607							0.9910		0.9900
Perfluorohexanoic acid (PFHxA)	67250 33501	58420 27922	57894	41486	41258	L1ID	0.0637	0.4641							1.0000		0.9900
Perfluoroheptanoic acid (PFHpA)	+++++ 33003	67952 27317	50342	40522	45343	AveID		0.5371				14.5		35.0			
Perfluorohexanesulfonic acid (PFHxS)	65531 35505	59249 27721	52571	43254	50120	AveID		1.5740				7.5		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	49246 32706	54930 27101	64201	48800	50676	L2ID	-0.678	7.8620							0.9980		0.9900
Perfluorooctanoic acid (PFOA)	51236 31609	47860 26247	53369	40862	42247	L1ID	-0.036	0.4577							0.9990		0.9900
Perfluorooctanesulfonic acid (PFOS)	82199 53102	88417 42560	89165	71708	74665	L1ID	-1.045	12.086							1.0000		0.9900
Perfluorononanoic acid (PFNA)	103188 75899	135842 68236	118695	98608	106986	L2ID	-0.050	1.2692							0.9930		0.9900
Perfluorodecanoic acid (PFDA)	115172 86500	137110 72650	136484	109503	114180	AveID		1.0749				7.8		35.0			
Perfluorooctane Sulfonamide (FOSA)	89732 83504	115881 74646	121324	101379	111037	AveID		1.0540				9.5		35.0			
Perfluorodecanesulfonic acid (PFDS)	23757 15730	28387 12155	35716	25207	24030	AveID		3.7414				12.0		50.0			
Perfluoroundecanoic acid (PFUnA)	141984 96215	155280 80772	153552	125553	129956	AveID		1.1596				4.6		35.0			
Perfluorododecanoic acid (PFDoA)	112984 84187	112952 72339	121702	96050	110750	AveID		0.9167				6.7		35.0			
Perfluorotridecanoic Acid (PFTriA)	79968 66960	96792 53270	107640	77966	83193	AveID		1.0324				10.8		50.0			
Perfluorotetradecanoic acid (PFTeA)	77696 31907	50651 27285	47012	35516	38030	AveID		0.5573				28.8		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	238502 70660	166963 58772	115123	82757	86042	L2ID	2.1338	2.7954							0.9960		0.9900
Perfluoro-n-octandecanoic acid (PFODA)	70620 57025	70399 49504	71507	67811	68007	AveID		2.1978				5.7		50.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1 Analy Batch No.: 111733

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/27/2016 11:17 Calibration End Date: 05/27/2016 13:24 Calibration ID: 21794

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111733/2	27MAY2016B4A_002.d
Level 2	STD 320-111733/3	27MAY2016B4A_003.d
Level 3	STD 320-111733/4	27MAY2016B4A_004.d
Level 4	STD 320-111733/5	27MAY2016B4A_005.d
Level 5	STD 320-111733/6	27MAY2016B4A_006.d
Level 6	STD 320-111733/7	27MAY2016B4A_007.d
Level 7	STD 320-111733/8	27MAY2016B4A_008.d

ANALYTE	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
		LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
13C4 PFBA	Ave	6115372 4129683	5922896 3355560	6102158	6130329	4445714	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	4391700 3046275	4443078 2484518	4514607	4415347	3252704	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	5639104 3592360	5603613 3010443	5630648	4971985	4308005	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	5044178 3284058	4951706 2634013	4816964	4422269	4237757	50.0 50.0	50.0 50.0	50.0	50.0	50.0
18O2 PFHxS	Ave	1812994 1044335	1714340 812066	1680553	1511920	1464878	47.3 47.3	47.3 47.3	47.3	47.3	47.3
13C4 PFOA	Ave	6028555 3335155	6004812 2900631	5689738	4833468	4750565	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C4 PFOS	Ave	365070 209455	372607 168111	376516	304468	294545	47.8 47.8	47.8 47.8	47.8	47.8	47.8
13C5 PFNA	Ave	4797041 3070065	4797422 2643621	4827839	4191465	4126872	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDA	Ave	6348829 3862828	6093155 3407629	6167778	5252314	4931920	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C8 FOSA	Ave	5339736 3912535	5446523 3402041	5442155	4836707	4838600	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	6408182 4134664	6243971 3632488	6398716	5667533	5491477	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	6345542 4448387	6619880 3842375	6214302	5821892	5641533	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	4303766 3359201	4251362 2884794	4459397	4103454	3842279	50.0 50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFHxDA	Ave	1686815 1298274	1709081 1056796	1680316	1561650	1419961	50.0 50.0	50.0 50.0	50.0	50.0	50.0

Curve Type Legend:
Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1 Analy Batch No.: 111733

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/27/2016 11:17 Calibration End Date: 05/27/2016 13:24 Calibration ID: 21794

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111733/2	27MAY2016B4A_002.d
Level 2	STD 320-111733/3	27MAY2016B4A_003.d
Level 3	STD 320-111733/4	27MAY2016B4A_004.d
Level 4	STD 320-111733/5	27MAY2016B4A_005.d
Level 5	STD 320-111733/6	27MAY2016B4A_006.d
Level 6	STD 320-111733/7	27MAY2016B4A_007.d
Level 7	STD 320-111733/8	27MAY2016B4A_008.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorobutanoic acid (PFBA)		AveID	32761 11271766	79038 18531497	411899	1493014	3040022	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoropentanoic acid (PFPeA)		AveID	25505 5608119	49163 9327831	215346	760519	1588028	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorobutanesulfonic acid (PFBS)		L2ID	12122 2740499	22190 4450007	107395	362783	751821	0.442 177	0.884 354	4.42	17.7	44.2
Perfluorohexanoic acid (PFHxA)		L1ID	33625 6700227	58420 11168800	289472	829722	2062892	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoroheptanoic acid (PFHpA)		AveID	+++++ 6600504	67952 10926693	251708	810433	2267149	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluorohexanesulfonic acid (PFHxS)		AveID	30996 6717467	56050 10489666	248660	818371	2370680	0.473 189	0.946 378	4.73	18.9	47.3
Perfluoroheptanesulfonic Acid (PFHpS)		L2ID	23441 6227195	52293 10320043	305599	929146	2412173	0.476 190	0.952 381	4.76	19.0	47.6
Perfluorooctanoic acid (PFOA)		L1ID	25618 6321774	47860 10498872	266844	817233	2112373	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorooctanesulfonic acid (PFOS)		L1ID	39291 10153061	84527 16274880	426209	1371052	3568981	0.478 191	0.956 382	4.78	19.1	47.8
Perfluorononanoic acid (PFNA)		L2ID	51594 15179720	135842 27294533	593475	1972169	5349285	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorodecanoic acid (PFDA)		AveID	57586 17300091	137110 29059913	682419	2190054	5708999	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorooctane Sulfonamide (FOSA)		AveID	44866 16700878	115881 29858502	606618	2027572	5551847	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	11451 3032821	27365 4687057	172152	485982	1158252	0.482 193	0.964 386	4.82	19.3	48.2
Perfluoroundecanoic acid (PFUnA)		AveID	70992 19242949	155280 32308856	767762	2511061	6497810	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorododecanoic acid (PFDoA)		AveID	56492 16837391	112952 28935429	608510	1920992	5537515	0.500 200	1.00 400	5.00	20.0	50.0

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1 Analy Batch No.: 111733

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/27/2016 11:17 Calibration End Date: 05/27/2016 13:24 Calibration ID: 21794

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorotridecanoic Acid (PFTriA)		AveID	39984 13391959	96792 21307860	538198	1559315	4159657	0.500 200	1.00 400	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	38848 6381395	50651 10914055	235060	710312	1901507	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	119251 14132019	166963 23508759	575613	1655130	4302103	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	35310 11405069	70399 19801766	357536	1356212	3400331	0.500 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution
L1ID = Linear 1/conc IsoDil
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_002.d
Lims ID: Std L1
Client ID:
Sample Type: IC Calib Level: 1
Inject. Date: 27-May-2016 11:17:01 ALS Bottle#: 10 Worklist Smp#: 2
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L1
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:49:58 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 27-May-2016 14:03:51

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.791	5.790	0.001		6115372	59.1		118	20681	
2 Perfluorobutyric acid										
212.7 > 168.6	5.797	5.792	0.005	1.000	32761	0.4127		82.5	113	
D 3 13C5-PFPeA										
267.6 > 222.7	6.890	6.892	-0.002		4391700	57.9		116	11555	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.899	6.895	0.004	1.000	25505	0.5876		118	11.1	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.024	7.011	0.013	1.000	12122	NC			26.4	
298.8 > 98.6	7.014	7.011	0.003	0.999	7477		1.62(0.00-0.00)		21.4	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.024	7.011	0.013	1.000	12122	0.4406		99.7		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		5639104	60.3		121	11489	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	33625	0.5051		101	154	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	26504	0.4891		97.8	113	
D 8 13C4-PFHpA										
366.6 > 321.6	9.372	9.366	0.006		5044178	60.1		120	9387	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		1812994	59.8		126	3359	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	30996	0.5138		109		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	30996	NC			73.8	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		6028555	62.9		126	8659	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.491	10.485	0.006	1.000	25618	0.5428		109	45.3	
412.8 > 168.7	10.482	10.485	-0.003	0.999	9443		2.71(0.00-0.00)	109	43.6	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.491	10.485	0.006	1.000	23441	0.4766		100		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.491	10.485	0.006	1.000	23441	NC			101	
D 16 13C4 PFOS										
502.4 > 79.7	11.449	11.441	0.008		365070	58.4		122	1441	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.449	11.443	0.006	1.000	39291	0.5121		107	157	
498.3 > 98.2	11.440	11.443	-0.003	0.999	23532		1.67(0.00-0.00)	107	73.0	
18 Perfluorononanoic acid										
462.5 > 418.6	11.459	11.462	-0.003	1.000	51594	0.4632		92.6	97.8	
D 17 13C5 PFNA										
467.5 > 422.6	11.469	11.462	0.007		4797041	59.0		118	8091	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		6348829	61.6		123	8474	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	57586	0.4219		84.4	173	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		5339736	56.3		113	4679	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.884	12.873	0.011	1.000	44866	0.3986		79.7	174	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.961	12.969	-0.008	1.000	11451	NC			43.4	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.961	12.969	-0.008	1.000	11451	0.4007		83.1		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	70992	0.4777		95.5	118	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		6408182	59.1		118	5833	
D 28 13C2 PFDoA										
614.4 > 569.4	13.626	13.626	0.0		6345542	57.0		114	4500	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.626	13.626	0.0	1.000	56492	0.4856		97.1	21.1	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	39984	0.4499		90.0	15.6	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	38848	0.8099		162	20.5	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		4303766	55.4		111	4184	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1686815	56.7		113	3330	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	119251	0.5012		100	21.2	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	35310	0.4762		95.2	53.5	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00018 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:49:59 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_002.d

Injection Date: 27-May-2016 11:17:01 Instrument ID: A4

Lims ID: Std L1

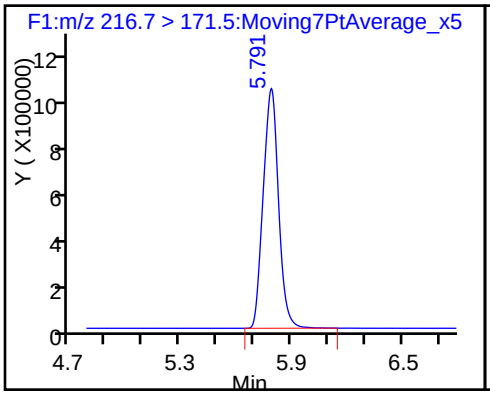
Client ID:

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 2

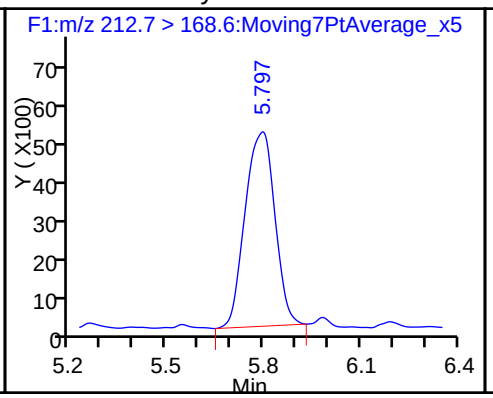
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

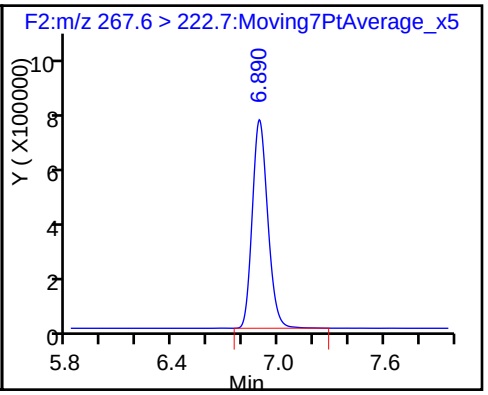
D 1 13C4 PFBA



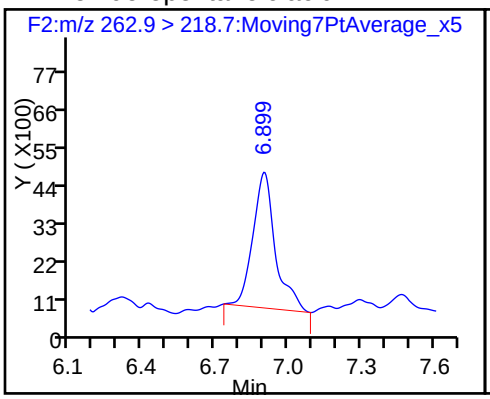
2 Perfluorobutyric acid



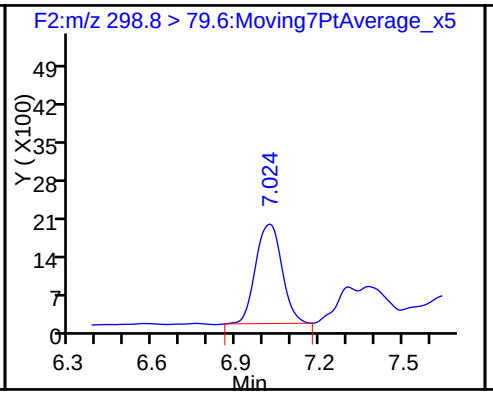
D 3 13C5-PFPeA



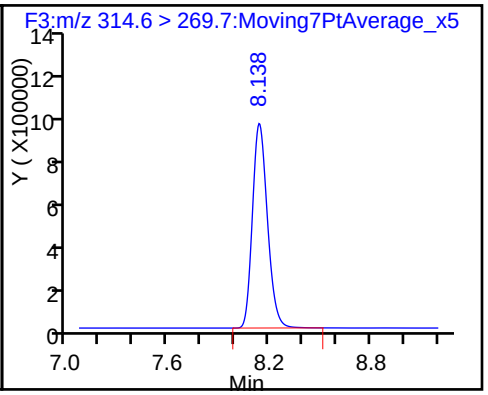
4 Perfluoropentanoic acid



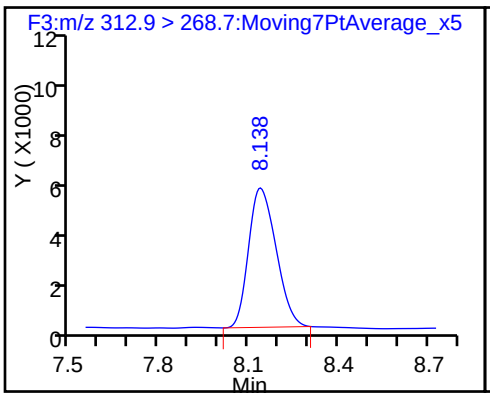
51 Perfluorobutanesulfonic acid



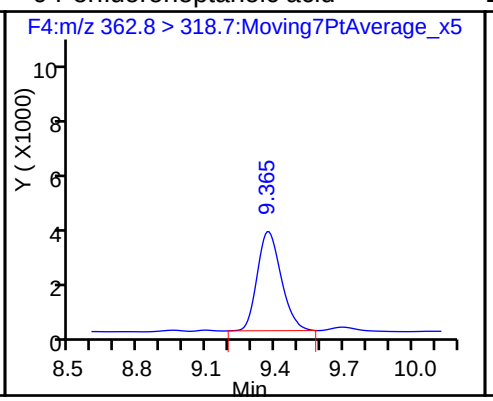
D 6 13C2 PFHxA



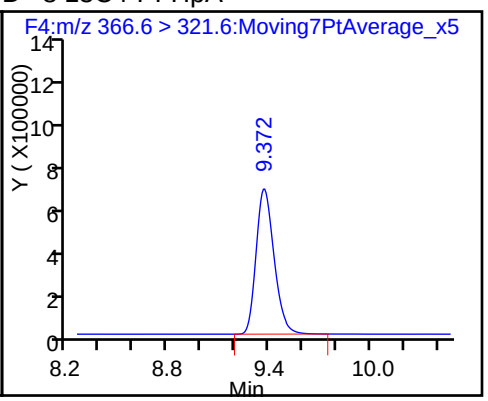
7 Perfluorohexanoic acid



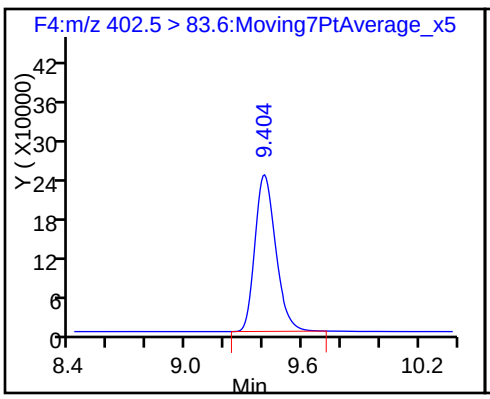
9 Perfluoroheptanoic acid



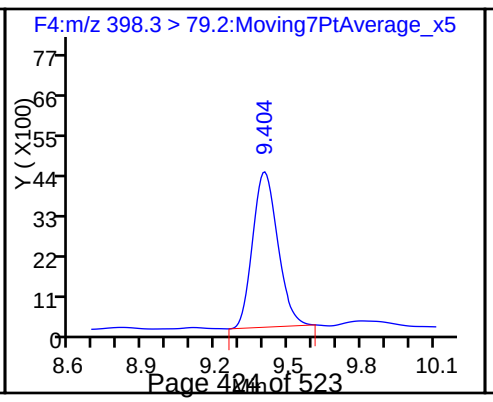
D 8 13C4-PFHpA



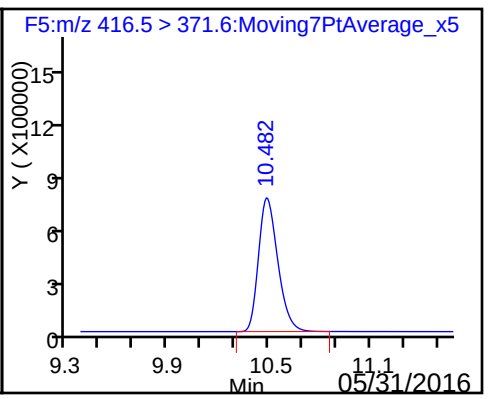
D 11 18O2 PFHxS



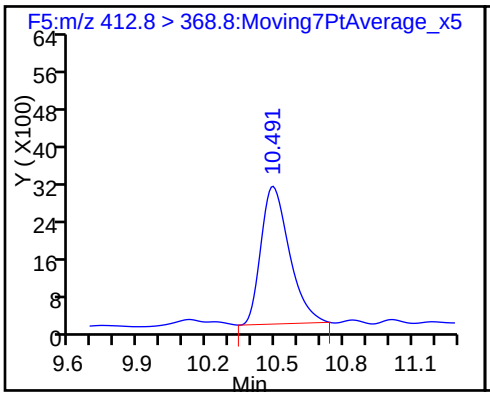
58 Perfluorohexanesulfonic acid



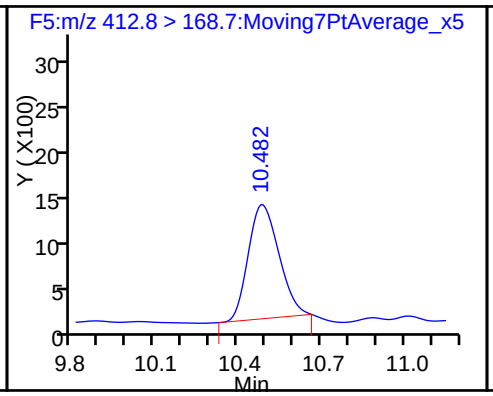
D 12 13C4 PFOA



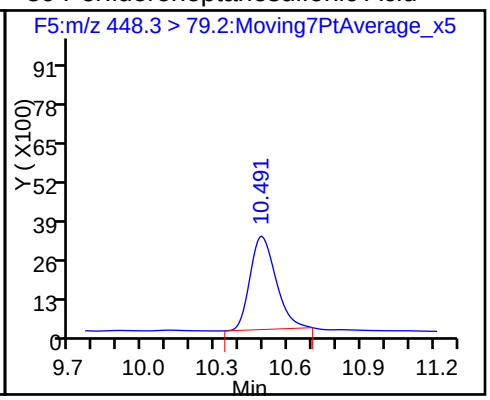
13 Perfluorooctanoic acid



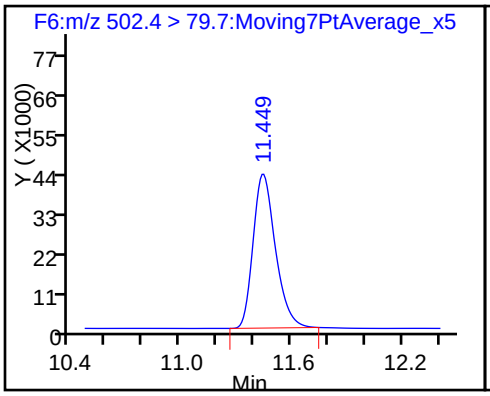
13 Perfluorooctanoic acid



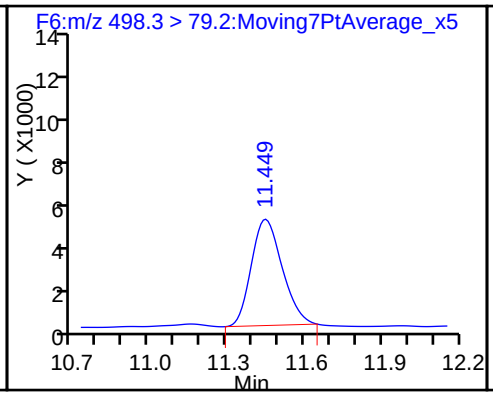
39 Perfluoroheptanesulfonic Acid



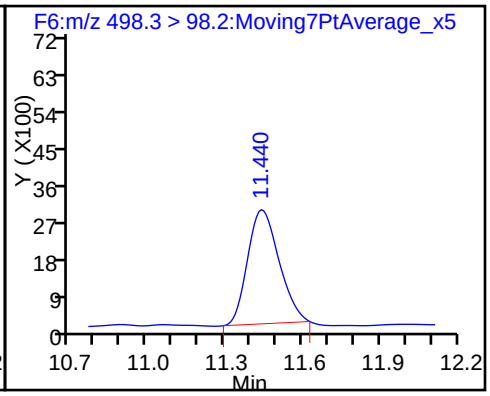
D 16 13C4 PFOS



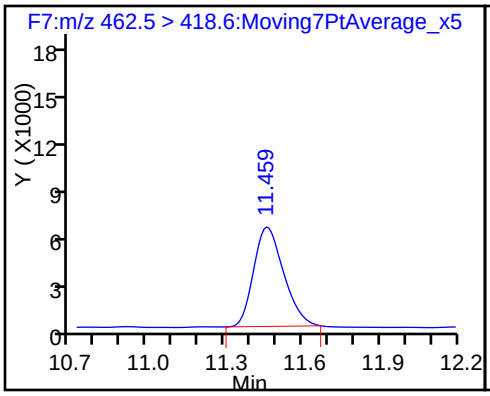
15 Perfluorooctane sulfonic acid



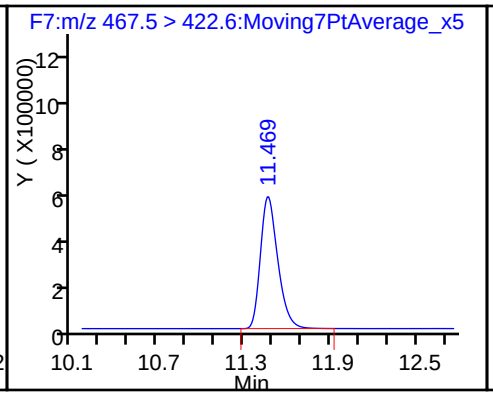
15 Perfluorooctane sulfonic acid



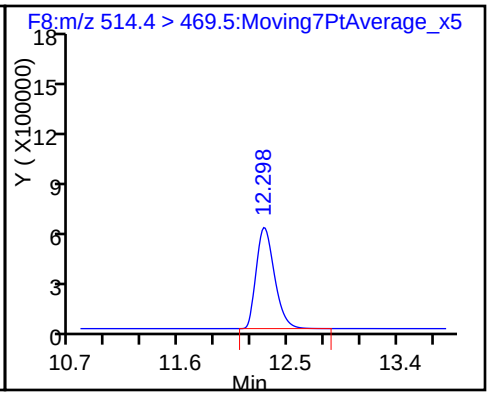
18 Perfluorononanoic acid



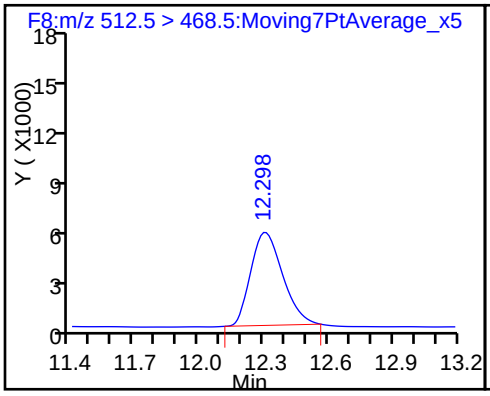
D 17 13C5 PFNA



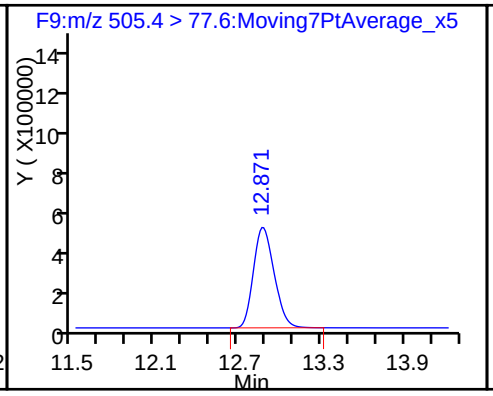
D 19 13C2 PFDA



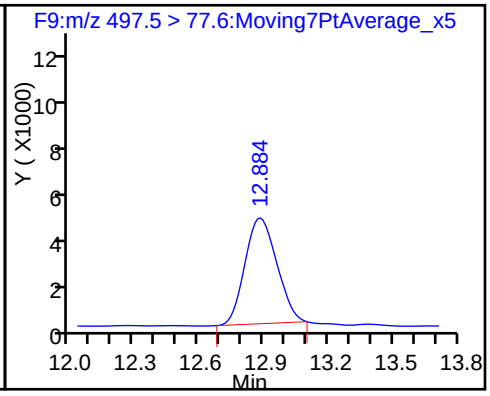
20 Perfluorodecanoic acid



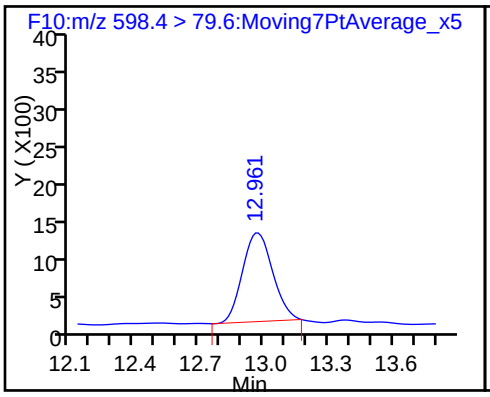
D 23 13C8 FOSA



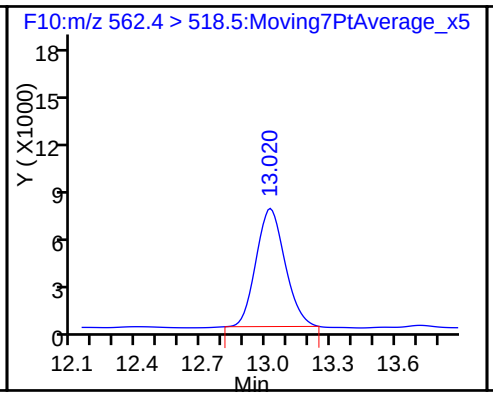
24 Perfluorooctane Sulfonamide



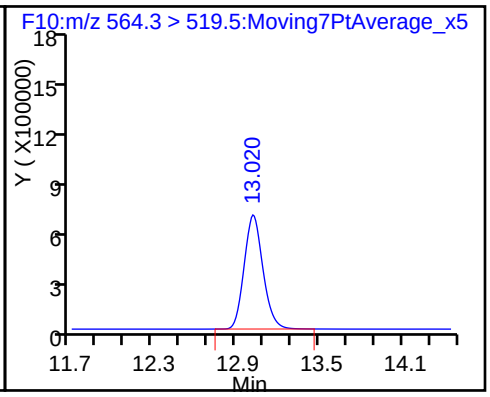
49 Perfluorodecane Sulfonic acid



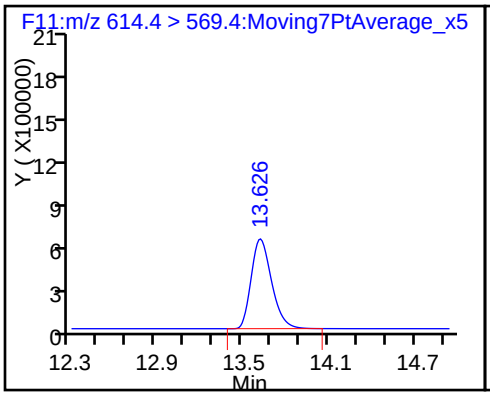
27 Perfluoroundecanoic acid



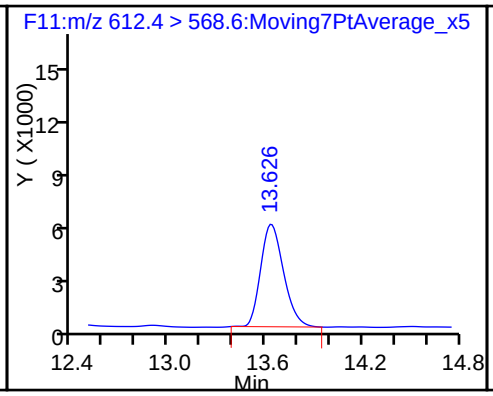
D 26 13C2 PFUnA



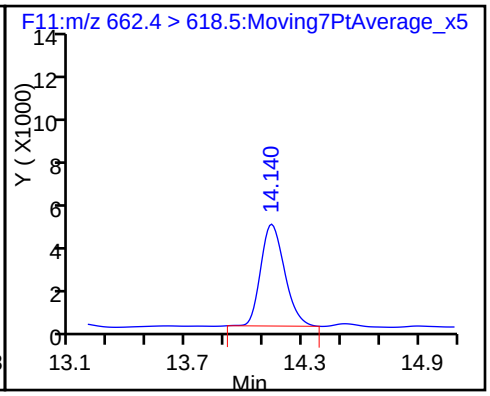
D 28 13C2 PFDoA



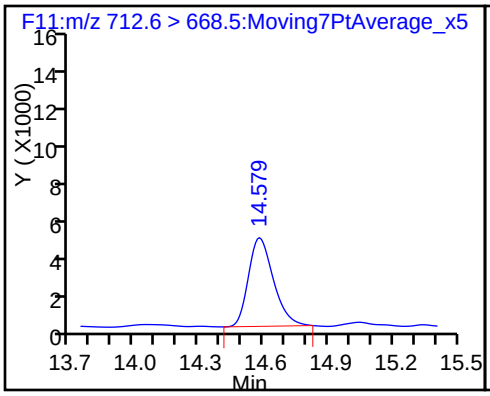
29 Perfluorododecanoic acid



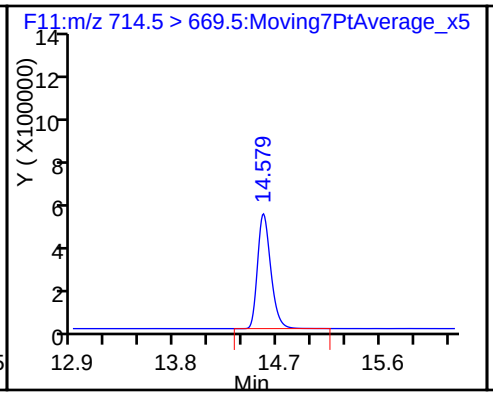
30 Perfluorotridecanoic acid



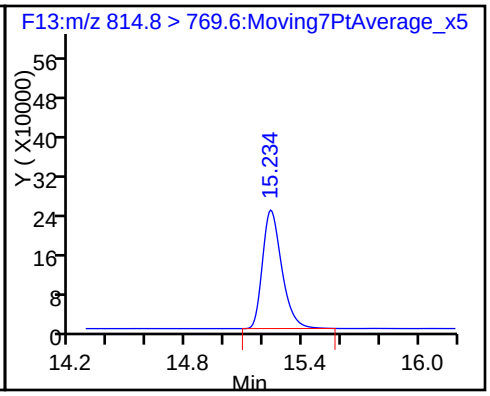
32 Perfluorotetradecanoic acid



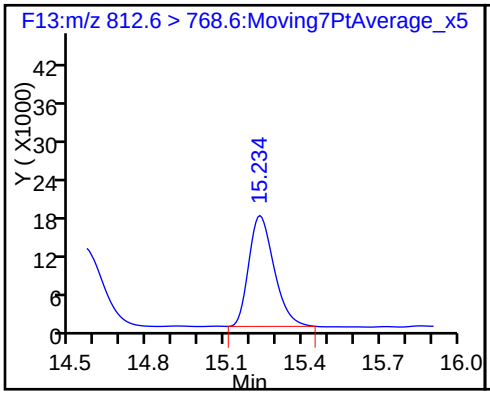
D 33 13C2-PFTeDA



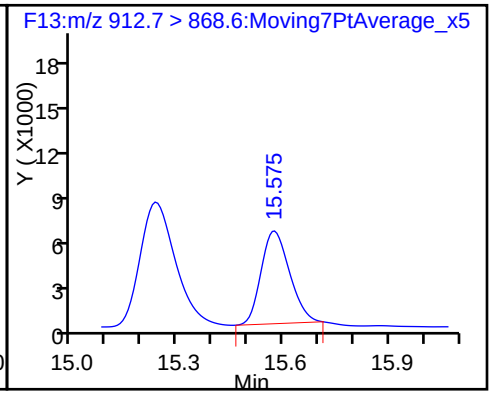
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_003.d
Lims ID: Std L2
Client ID:
Sample Type: IC Calib Level: 2
Inject. Date: 27-May-2016 11:38:10 ALS Bottle#: 11 Worklist Smp#: 3
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L2
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:50:12 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 27-May-2016 14:08:02

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.794	5.790	0.004		5922896	57.3		115	14014	
2 Perfluorobutyric acid										
212.7 > 168.6	5.791	5.792	-0.001	1.000	79038	1.03		103	268	
D 3 13C5-PFPeA										
267.6 > 222.7	6.895	6.892	0.003		4443078	58.6		117	11183	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.899	6.895	0.004	1.000	49163	1.12		112	15.9	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.014	7.011	0.003	1.000	22190	NC			51.2	
298.8 > 98.6	7.005	7.011	-0.006	0.999	14858		1.49(0.00-0.00)		41.6	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.014	7.011	0.003	1.000	22190	0.8886		101		
D 6 13C2 PFHxA										
314.6 > 269.7	8.144	8.138	0.006		5603613	59.9		120	9795	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.144	8.140	0.004	1.000	58420	0.9858		98.6	298	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	67952	1.28		128	253	
D 8 13C4-PFHpA										
366.6 > 321.6	9.372	9.366	0.006		4951706	59.0		118	7163	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		1714340	56.5		120	4479	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	56050	0.9825		104		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	56050	NC			121	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		6004812	62.7		125	8251	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.491	10.485	0.006	1.000	47860	0.9492		94.9	109	
412.8 > 168.7	10.482	10.485	-0.003	0.999	16962		2.82(0.00-0.00)	94.9	93.0	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.491	10.485	0.006	1.000	52293	0.9395		98.7		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.491	10.485	0.006	1.000	52293	NC			315	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		372607	59.6		125	1761	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.449	11.443	0.006	1.000	84527	0.9837		103	187	
498.3 > 98.2	11.449	11.443	0.006	1.000	55334		1.53(0.00-0.00)	103	169	
18 Perfluorononanoic acid										
462.5 > 418.6	11.469	11.462	0.007	1.000	135842	1.16		116	277	
D 17 13C5 PFNA										
467.5 > 422.6	11.469	11.462	0.007		4797422	59.0		118	6793	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		6093155	59.1		118	5984	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	137110	1.05		105	347	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		5446523	57.4		115	3669	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	115881	1.01		101	485	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	27365	NC			88.5	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	27365	0.9383		97.3		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	155280	1.07		107	280	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		6243971	57.5		115	5308	
D 28 13C2 PFDoA										
614.4 > 569.4	13.627	13.626	0.001		6619880	59.5		119	4617	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.627	13.626	0.001	1.000	112952	0.9307		93.1	44.2	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	96792	1.10		110	45.0	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	50651	1.07		107	32.4	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		4251362	54.7		109	3386	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1709081	57.4		115	3894	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	166963	0.9840		98.4	29.0	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	70399	0.9371		93.7	85.8	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00018 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:50:14 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_003.d

Injection Date: 27-May-2016 11:38:10 Instrument ID: A4

Lims ID: Std L2

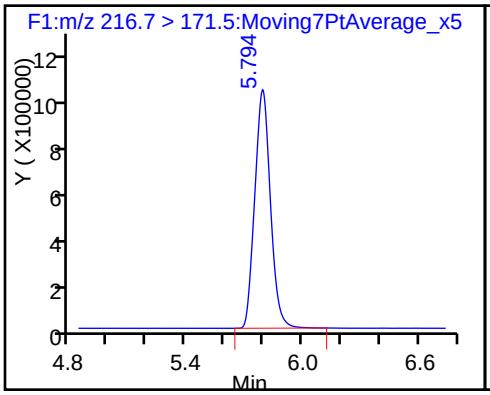
Client ID:

Operator ID: JRB ALS Bottle#: 11 Worklist Smp#: 3

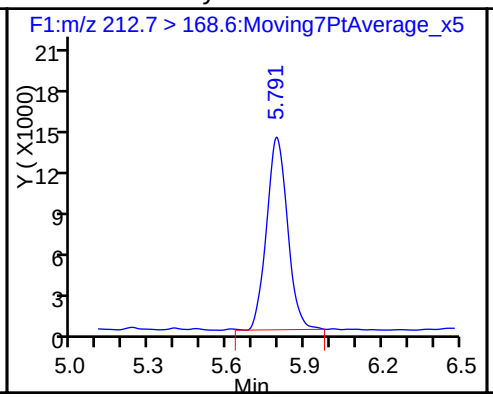
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

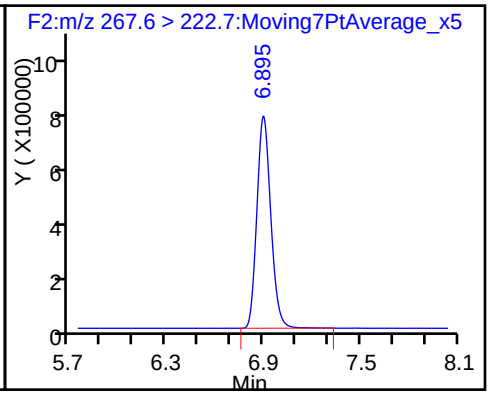
D 1 13C4 PFBA



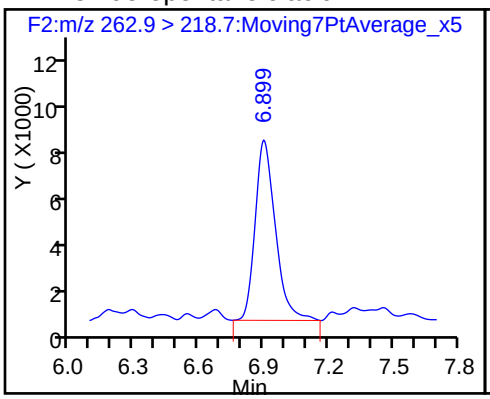
2 Perfluorobutyric acid



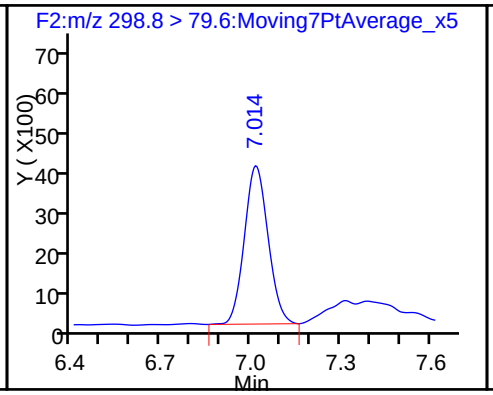
D 3 13C5-PFPeA



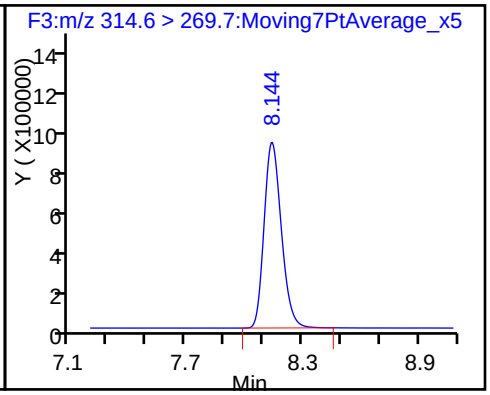
4 Perfluoropentanoic acid



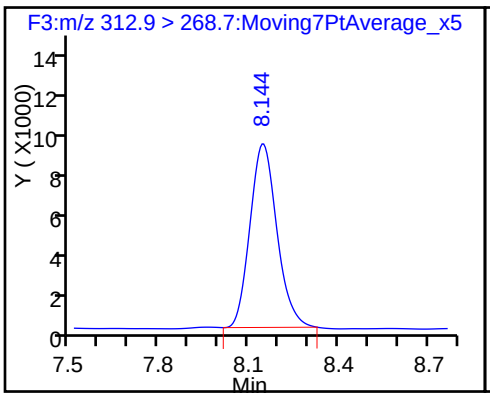
51 Perfluorobutanesulfonic acid



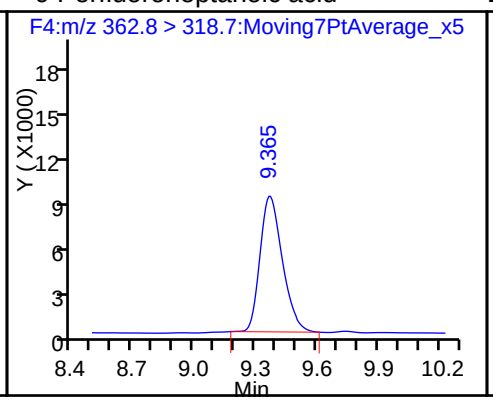
D 6 13C2 PFHxA



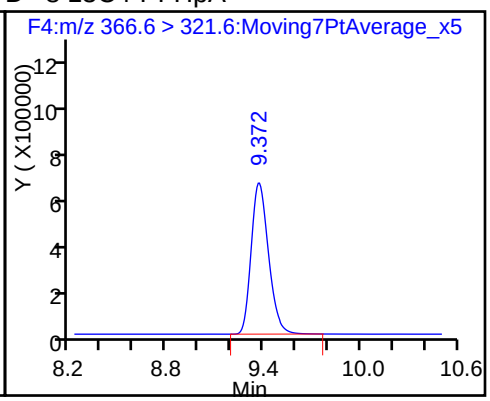
7 Perfluorohexanoic acid



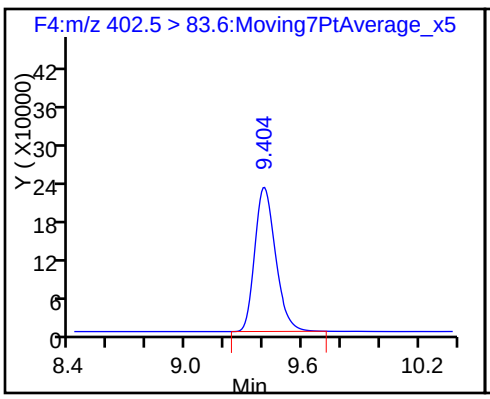
9 Perfluoroheptanoic acid



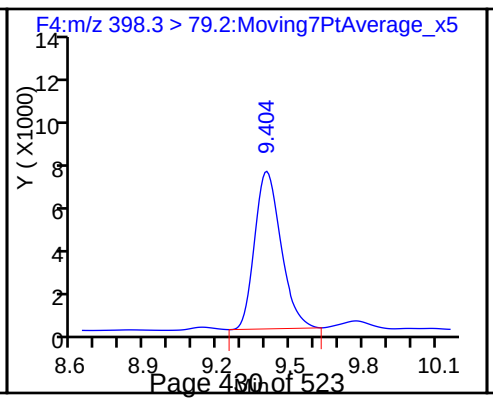
D 8 13C4-PFHpA



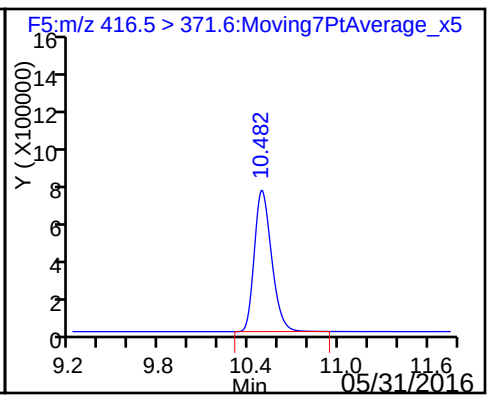
D 11 18O2 PFHxS



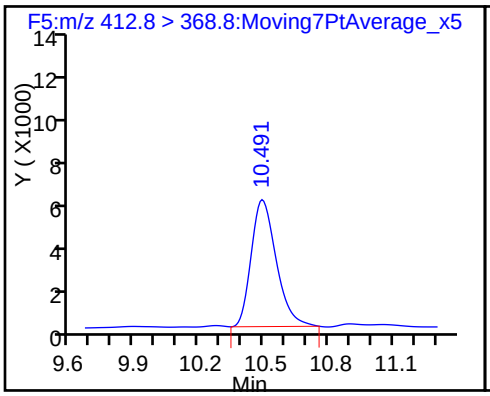
58 Perfluorohexanesulfonic acid



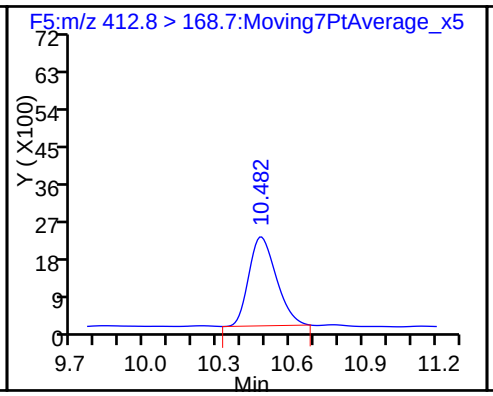
D 12 13C4 PFOA



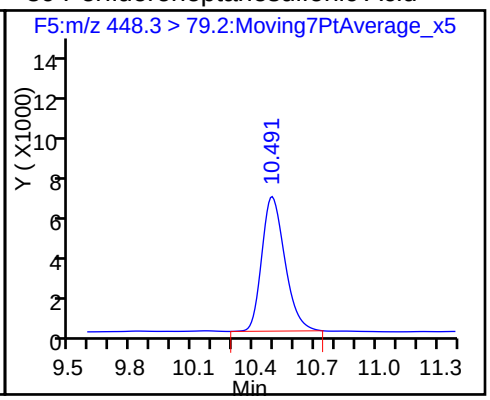
13 Perfluorooctanoic acid



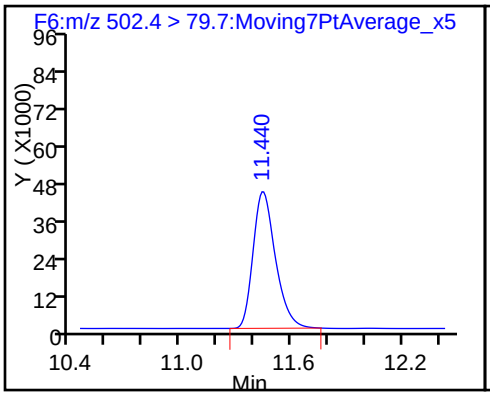
13 Perfluorooctanoic acid



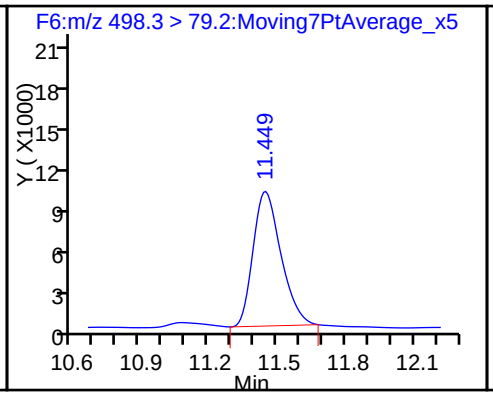
39 Perfluoroheptanesulfonic Acid



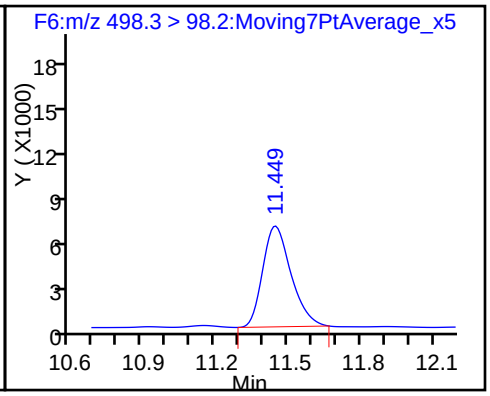
D 16 13C4 PFOS



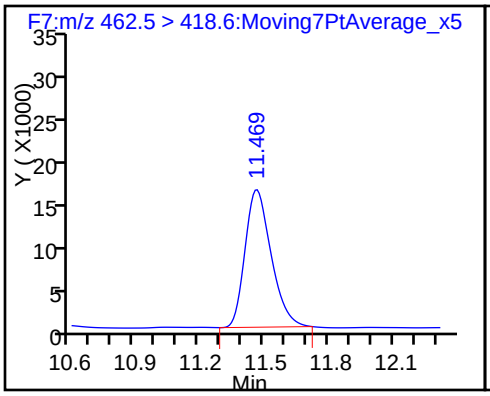
15 Perfluorooctane sulfonic acid



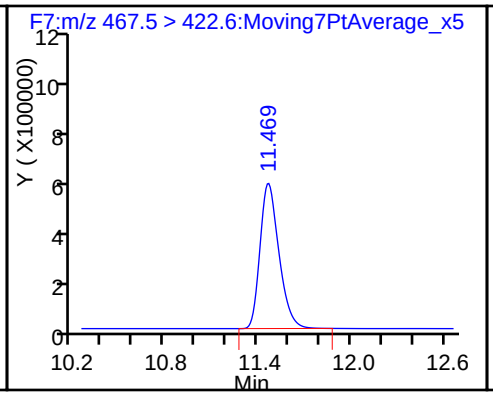
15 Perfluorooctane sulfonic acid



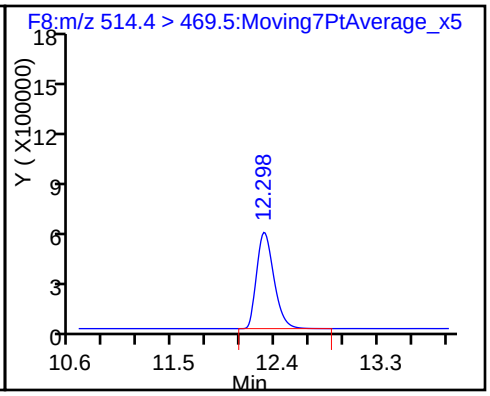
18 Perfluorononanoic acid



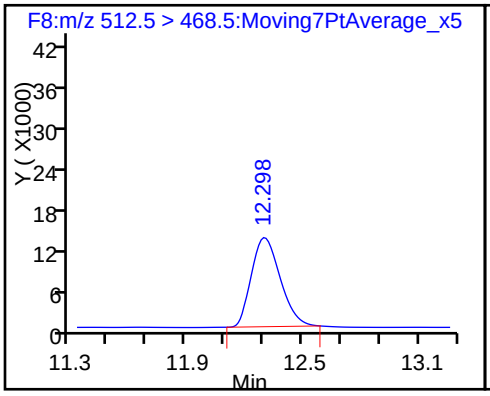
D 17 13C5 PFNA



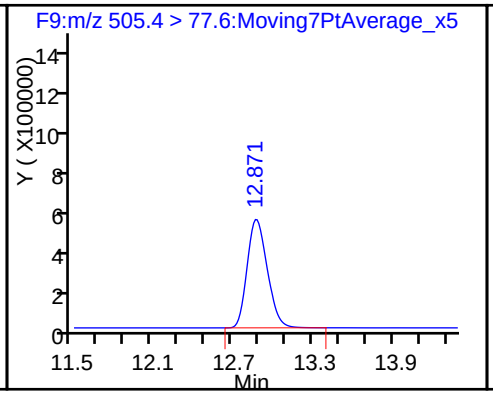
D 19 13C2 PFDA



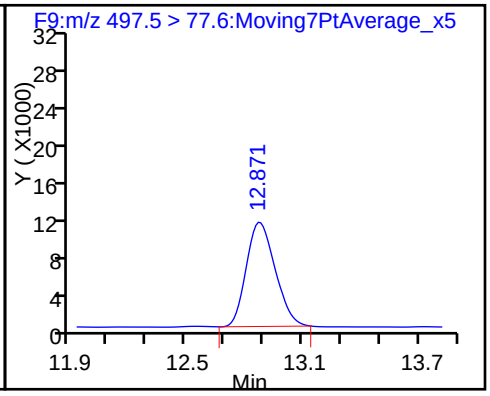
20 Perfluorodecanoic acid



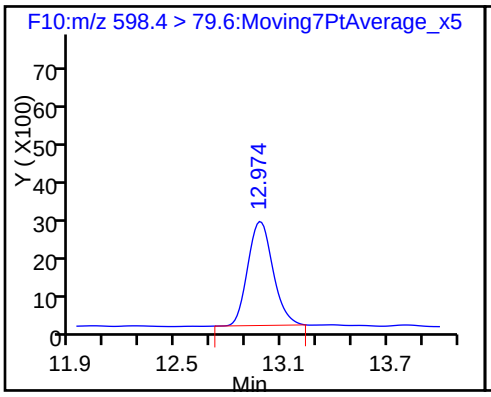
D 23 13C8 FOSA



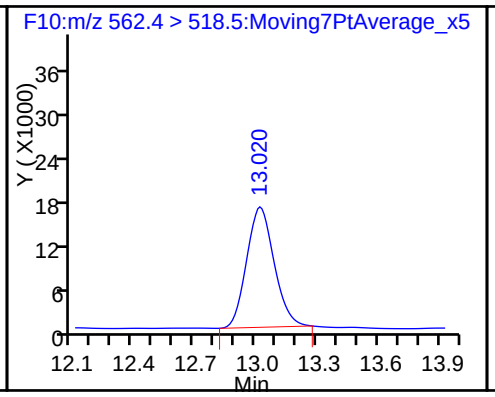
24 Perfluorooctane Sulfonamide



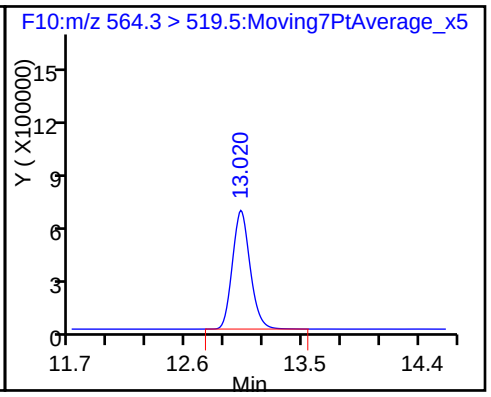
49 Perfluorodecane Sulfonic acid



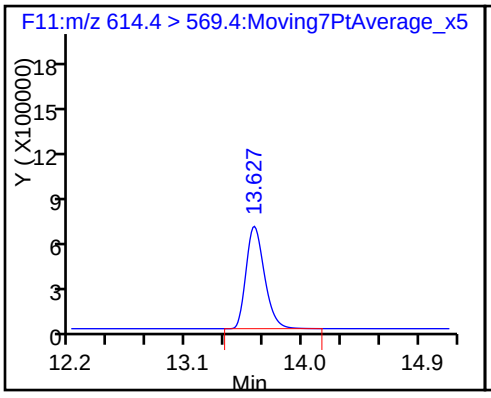
27 Perfluoroundecanoic acid



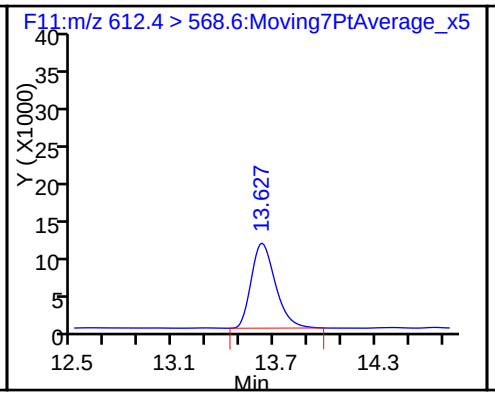
D 26 13C2 PFUnA



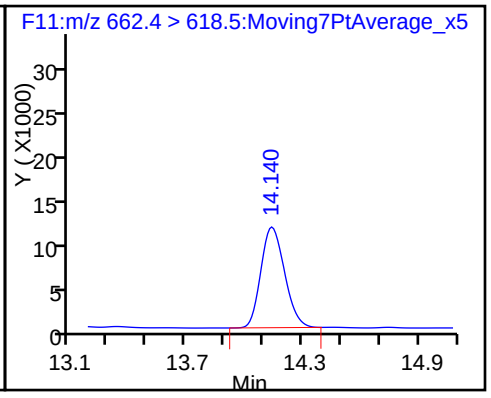
D 28 13C2 PFDoA



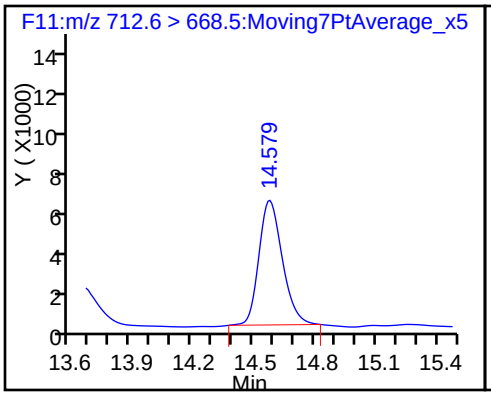
29 Perfluorododecanoic acid



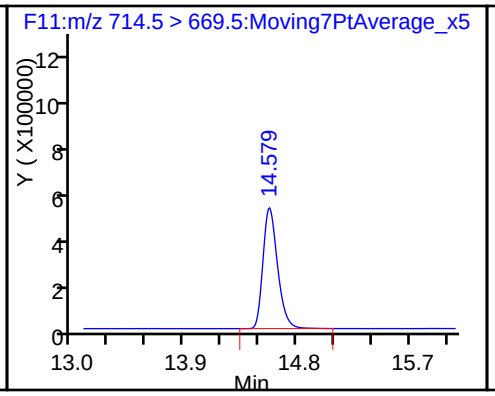
30 Perfluorotridecanoic acid



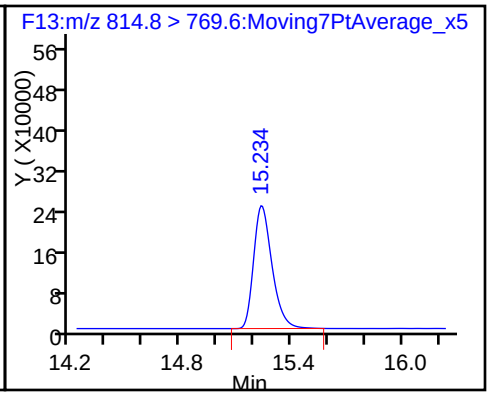
32 Perfluorotetradecanoic acid



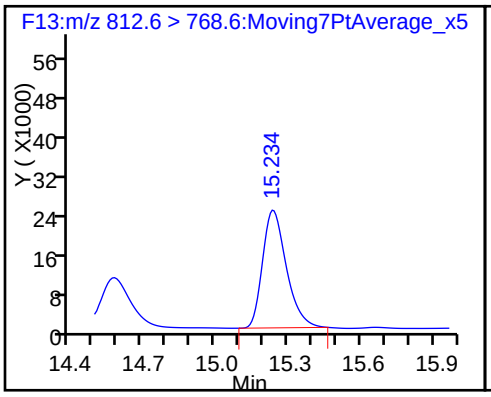
D 33 13C2-PFTeDA



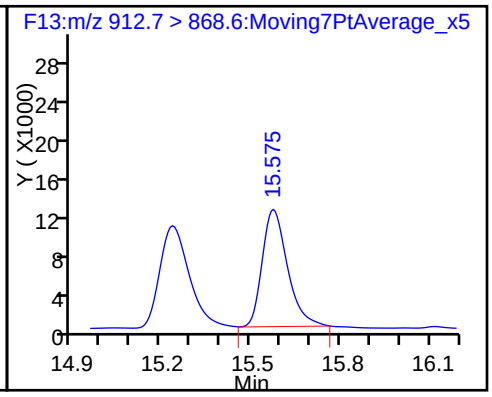
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_004.d
Lims ID: Std L3
Client ID:
Sample Type: IC Calib Level: 3
Inject. Date: 27-May-2016 11:59:21 ALS Bottle#: 12 Worklist Smp#: 4
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L3
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:50:30 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.787	5.790	-0.003		6102158	59.0		118	14691	
2 Perfluorobutyric acid										
212.7 > 168.6	5.791	5.792	-0.001	1.000	411899	5.20		104	1461	
D 3 13C5-PFPeA										
267.6 > 222.7	6.895	6.892	0.003		4514607	59.5		119	9487	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	215346	4.83		96.5	77.8	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.005	7.011	-0.006	1.000	107395	NC			217	
298.8 > 98.6	7.005	7.011	-0.006	1.000	65863		1.63(0.00-0.00)		139	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.005	7.011	-0.006	1.000	107395	4.54		103		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		5630648	60.2		120	8412	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.144	8.140	0.004	1.000	289472	5.40		108	919	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	251708	4.86		97.3	774	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4816964	57.4		115	7041	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1680553	55.4		117	4139	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.396	9.401	-0.005	1.000	248660	4.45		94.0		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.396	9.401	-0.005	1.000	248660	NC			398	
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		5689738	59.4		119	6550	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	266844	5.20		104	661	
412.8 > 168.7	10.482	10.485	-0.003	1.000	78658		3.39(0.00-0.00)	104	289	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.482	10.485	-0.003	1.000	305599	5.02		105		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.482	10.485	-0.003	1.000	305599	NC			1764	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		376516	60.3		126	1031	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	426209	4.56		95.5	797	
498.3 > 98.2	11.440	11.443	-0.003	1.000	261944		1.63(0.00-0.00)	95.5	610	
18 Perfluorononanoic acid										
462.5 > 418.6	11.459	11.462	-0.003	1.000	593475	4.88		97.6	939	
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		4827839	59.4		119	8973	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		6167778	59.9		120	6345	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	682419	5.15		103	1762	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		5442155	57.3		115	3814	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	606618	5.29		106	1126	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	172152	NC			928	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	172152	5.84		121		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	767762	5.17		103	971	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		6398716	59.0		118	6789	
D 28 13C2 PFDoA										
614.4 > 569.4	13.627	13.626	0.001		6214302	55.9		112	3491	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.627	13.626	0.001	1.000	608510	5.34		107	269	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.130	14.138	-0.008	1.000	538198	5.85		117	261	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	235060	4.73		94.6	114	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		4459397	57.4		115	4200	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1680316	56.5		113	3475	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	575613	5.36		107	96.1	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	357536	4.84		96.8	420	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00016 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:50:32 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_004.d

Injection Date: 27-May-2016 11:59:21 Instrument ID: A4

Lims ID: Std L3

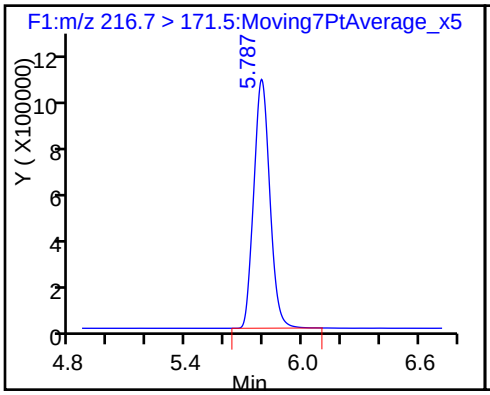
Client ID:

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 4

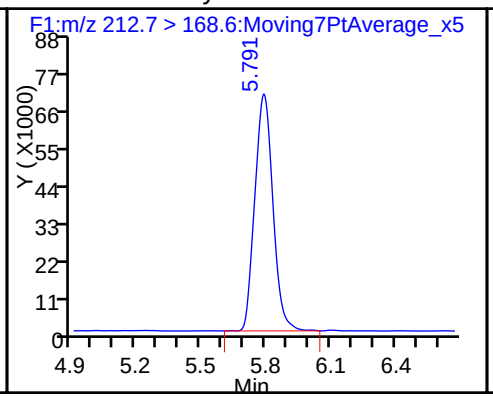
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

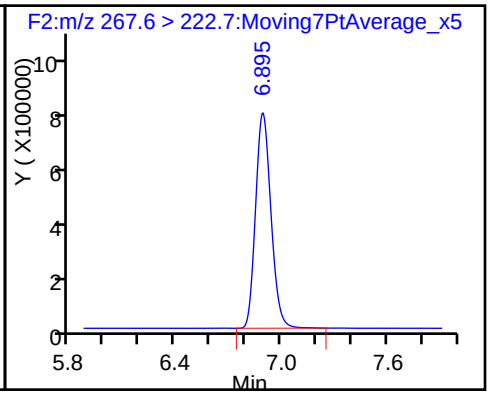
D 1 13C4 PFBA



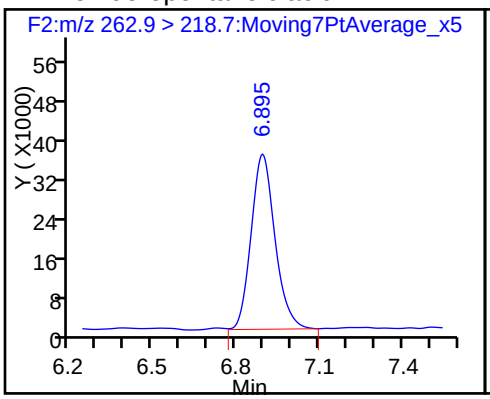
2 Perfluorobutyric acid



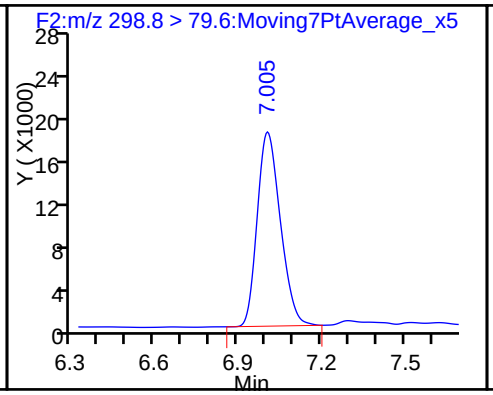
D 3 13C5-PFPeA



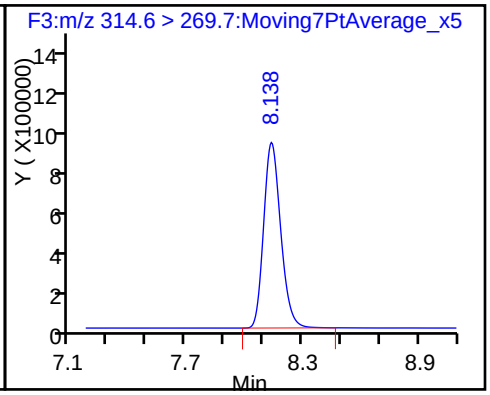
4 Perfluoropentanoic acid



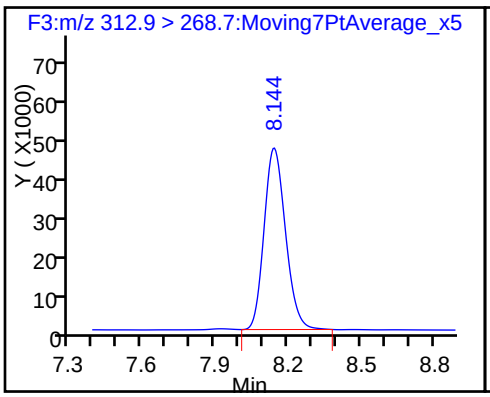
51 Perfluorobutanesulfonic acid



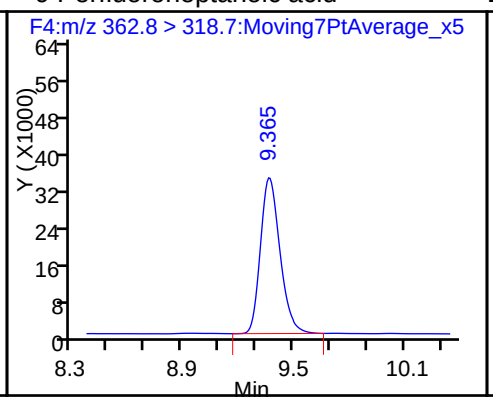
D 6 13C2 PFHxA



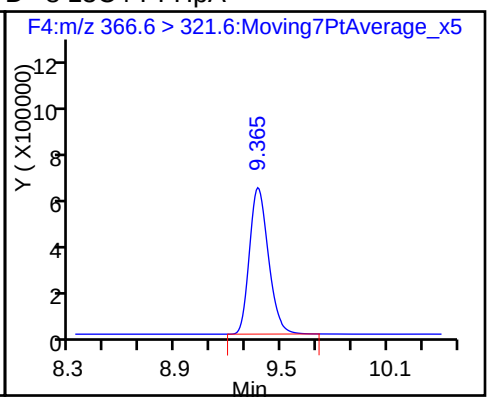
7 Perfluorohexanoic acid



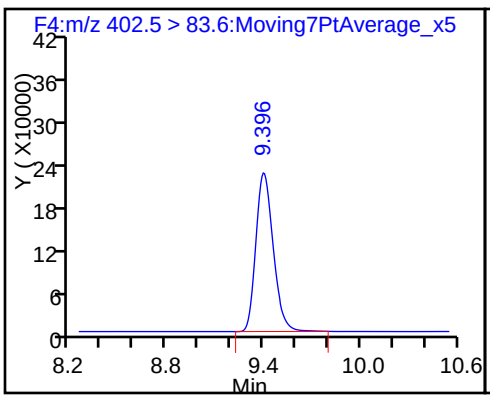
9 Perfluoroheptanoic acid



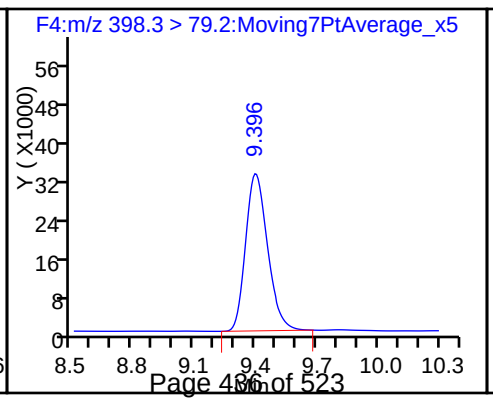
D 8 13C4-PFHpA



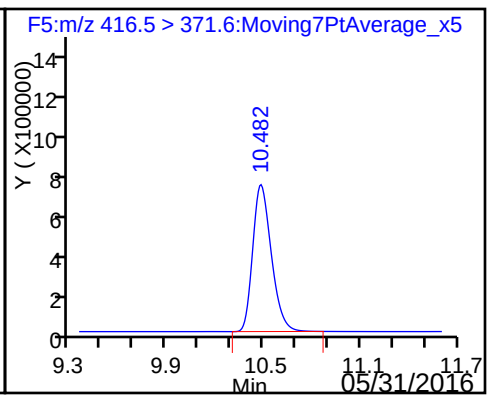
D 11 18O2 PFHxS



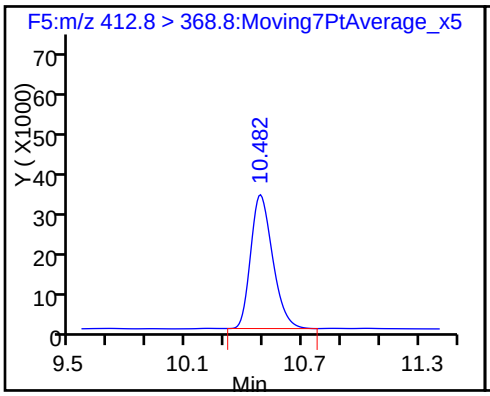
58 Perfluorohexanesulfonic acid



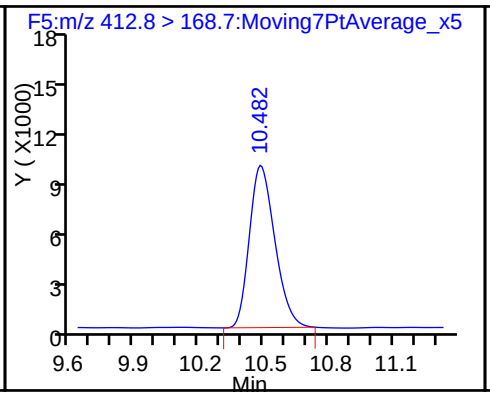
D 12 13C4 PFOA



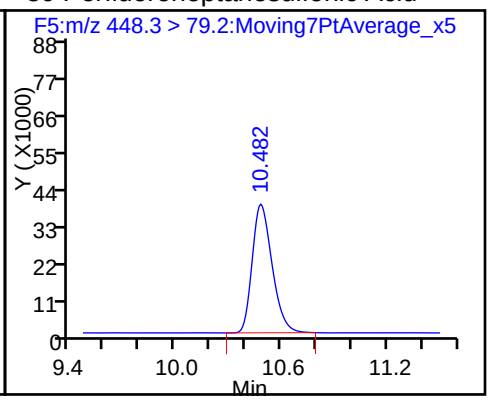
13 Perfluorooctanoic acid



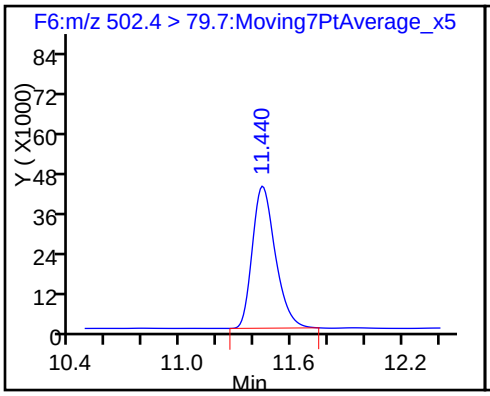
13 Perfluorooctanoic acid



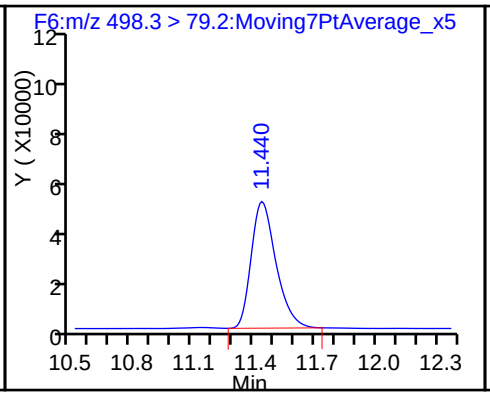
39 Perfluoroheptanesulfonic Acid



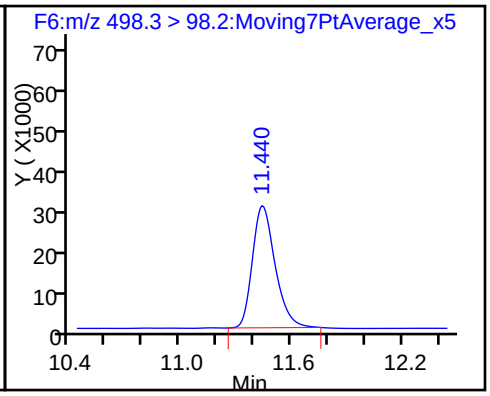
D 16 13C4 PFOS



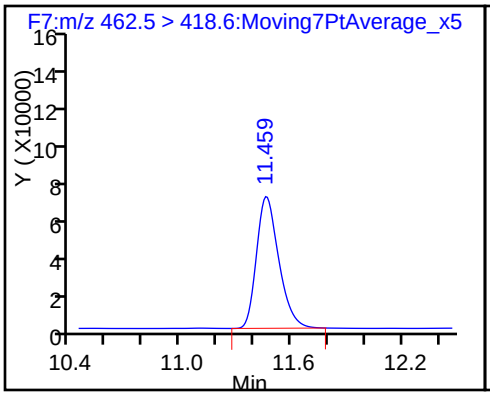
15 Perfluorooctane sulfonic acid



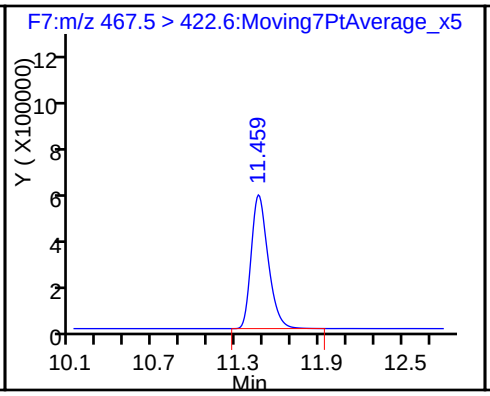
15 Perfluorooctane sulfonic acid



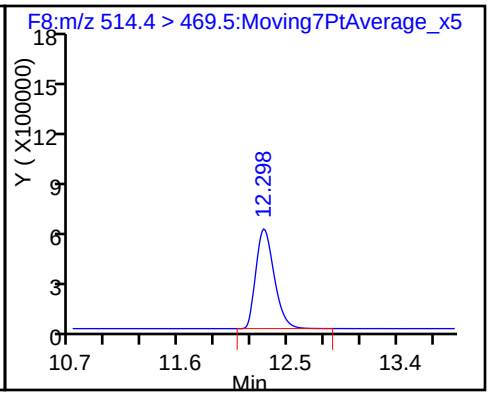
18 Perfluorononanoic acid



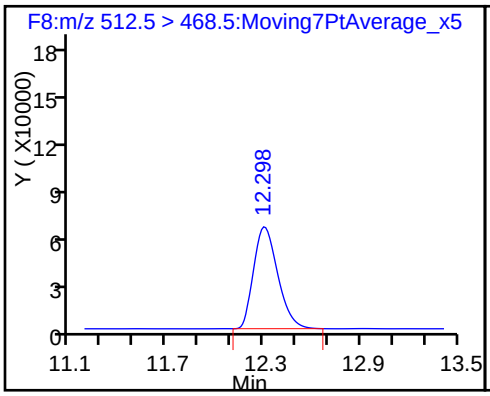
D 17 13C5 PFNA



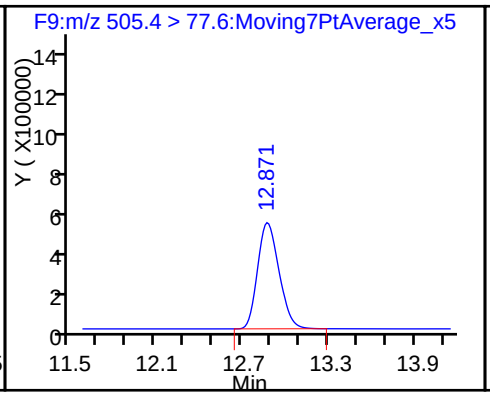
D 19 13C2 PFDA



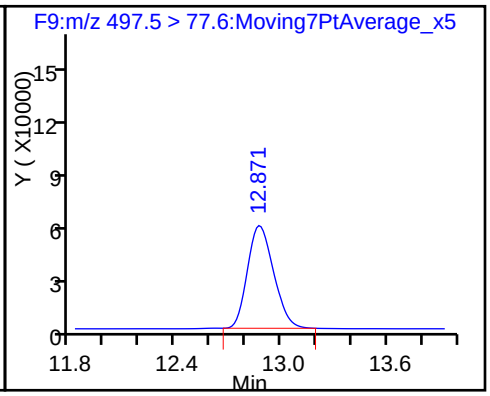
20 Perfluorodecanoic acid



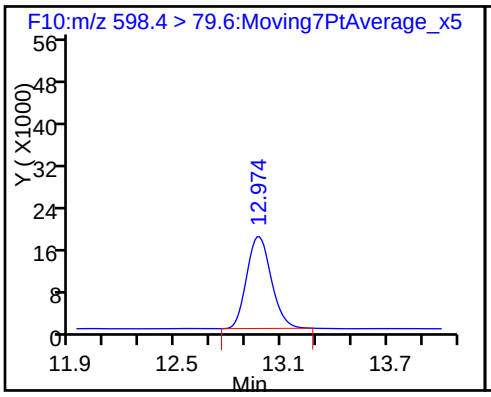
D 23 13C8 FOSA



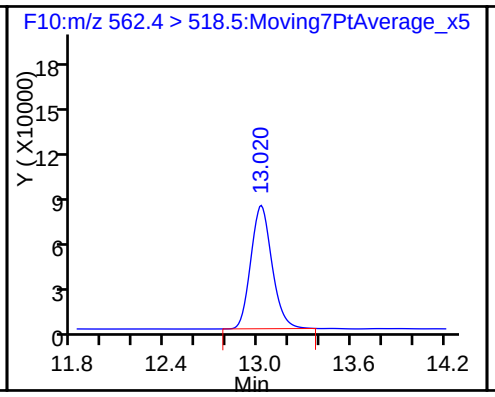
24 Perfluorooctane Sulfonamide



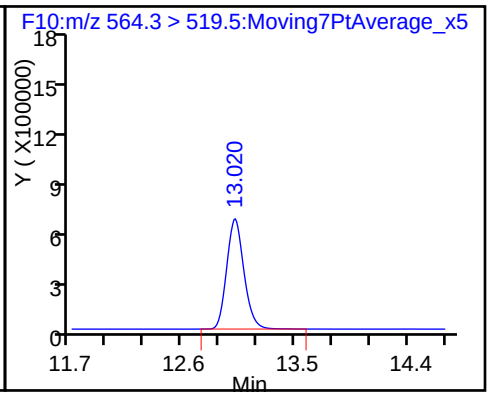
49 Perfluorodecane Sulfonic acid



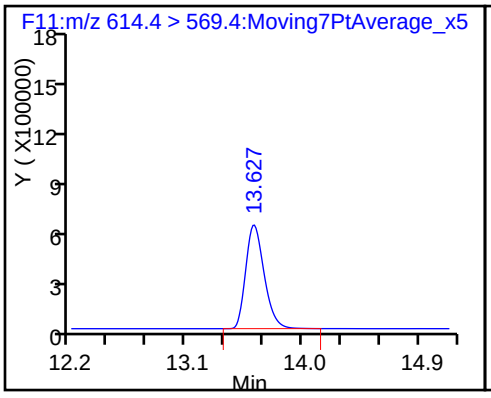
27 Perfluoroundecanoic acid



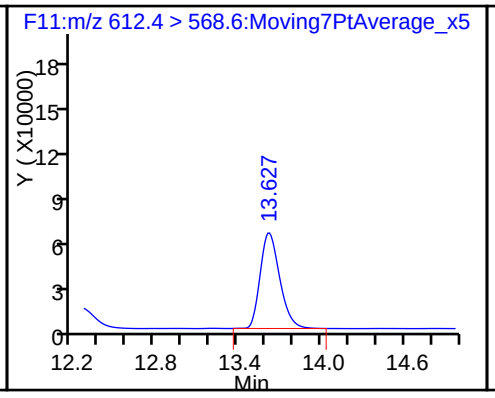
D 26 13C2 PFUnA



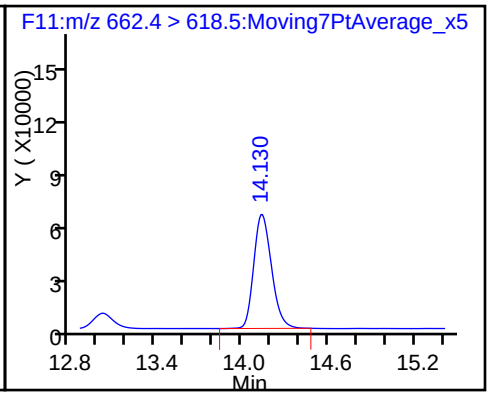
D 28 13C2 PFDoA



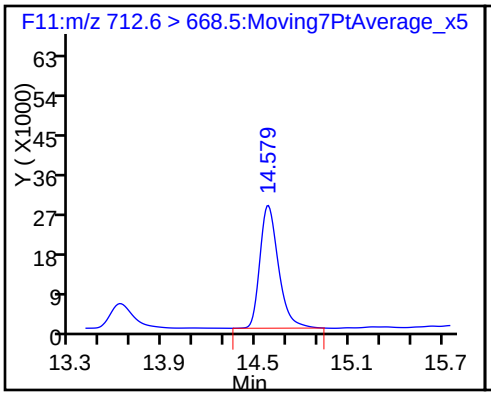
29 Perfluorododecanoic acid



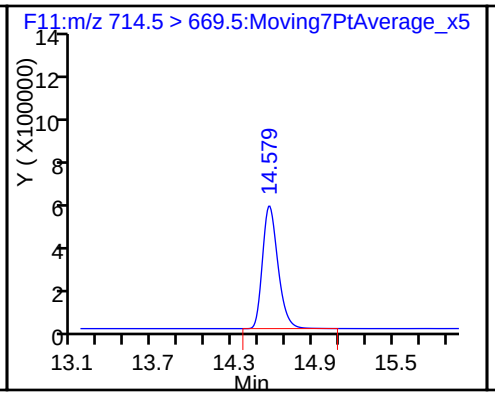
30 Perfluorotridecanoic acid



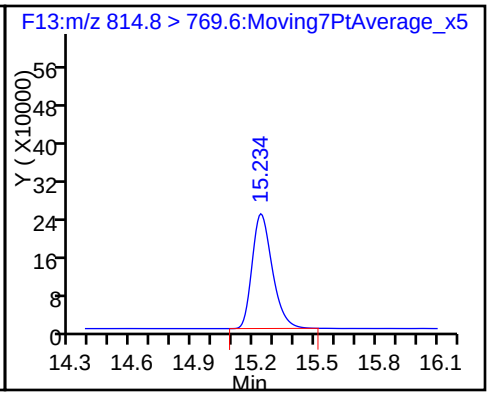
32 Perfluorotetradecanoic acid



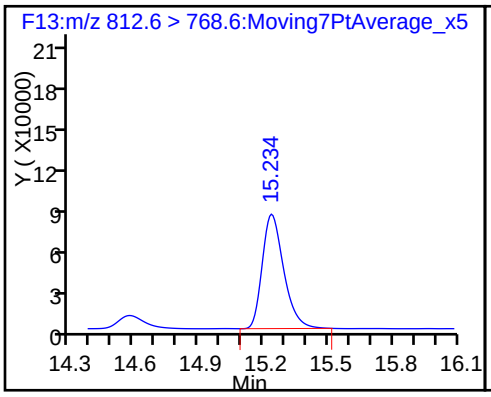
D 33 13C2-PFTeDA



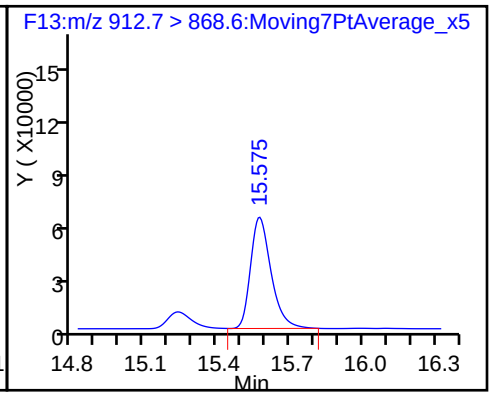
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_005.d
Lims ID: Std L4
Client ID:
Sample Type: IC Calib Level: 4
Inject. Date: 27-May-2016 12:20:32 ALS Bottle#: 13 Worklist Smp#: 5
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L4
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:50:42 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 15:54:25

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.791	5.790	0.001		6130329	59.3		119	18828	
2 Perfluorobutyric acid										
212.7 > 168.6	5.791	5.792	-0.001	1.000	1493014	18.8		93.8	4980	
D 3 13C5-PFPeA										
267.6 > 222.7	6.890	6.892	-0.002		4415347	58.2		116	8480	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	760519	17.4		87.1	250	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.005	7.011	-0.006	1.000	362783	NC			654	
298.8 > 98.6	7.005	7.011	-0.006	1.000	232034		1.56(0.00-0.00)		560	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.005	7.011	-0.006	1.000	362783	17.1		96.9		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		4971985	53.1		106	9074	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	829722	17.8		89.2	1731	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	810433	17.1		85.3	3008	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4422269	52.7		105	7341	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1511920	49.9		105	3328	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.396	9.401	-0.005	1.000	818371	16.3		86.0		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.396	9.401	-0.005	1.000	818371	NC			1391	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		4833468	50.4		101	7797	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	817233	18.5		92.7	1245	
412.8 > 168.7	10.482	10.485	-0.003	1.000	260959		3.13(0.00-0.00)	92.7	887	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.482	10.485	-0.003	1.000	929146	18.6		97.9		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.482	10.485	-0.003	1.000	929146	NC			3380	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		304468	48.7		102	1155	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	1371052	17.9		93.6	2346	
498.3 > 98.2	11.440	11.443	-0.003	1.000	799992		1.71(0.00-0.00)	93.6	1591	
18 Perfluorononanoic acid										
462.5 > 418.6	11.459	11.462	-0.003	1.000	1972169	18.6		92.9	3227	
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		4191465	51.6		103	7798	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		5252314	51.0		102	8197	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	2190054	19.4		97.0	3088	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		4836707	51.0		102	3152	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	2027572	19.9		99.4	2656	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.961	12.969	-0.008	1.000	485982	NC			1758	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.961	12.969	-0.008	1.000	485982	20.4		106		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	2511061	19.1		95.5	2483	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		5667533	52.2		104	5291	
D 28 13C2 PFDoA										
614.4 > 569.4	13.626	13.626	0.0		5821892	52.3		105	3435	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.626	13.626	0.0	1.000	1920992	18.0		90.0	899	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	1559315	18.4		92.0	706	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	710312	15.5		77.7	457	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		4103454	52.8		106	3009	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1561650	52.5		105	3268	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	1655130	18.2		91.0	281	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	1356212	19.8		98.8	1737	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00018 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:50:43 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_005.d

Injection Date: 27-May-2016 12:20:32 Instrument ID: A4

Lims ID: Std L4

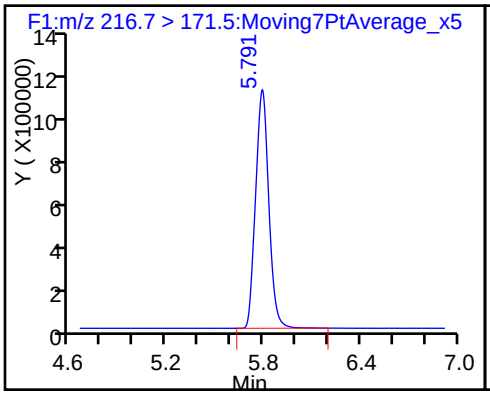
Client ID:

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 5

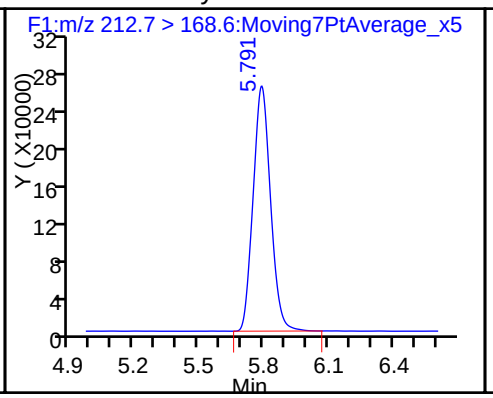
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

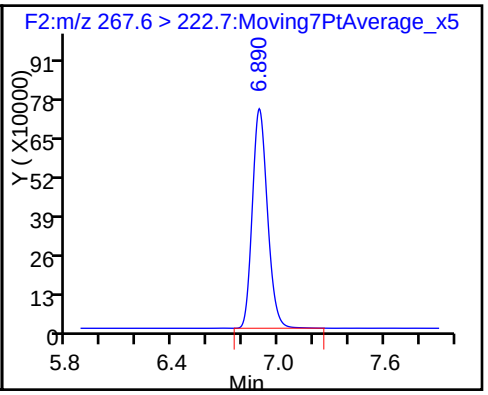
D 1 13C4 PFBA



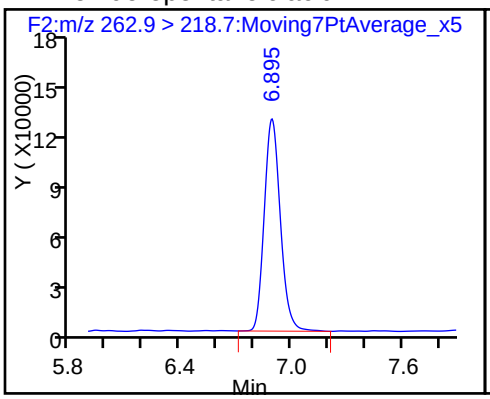
2 Perfluorobutyric acid



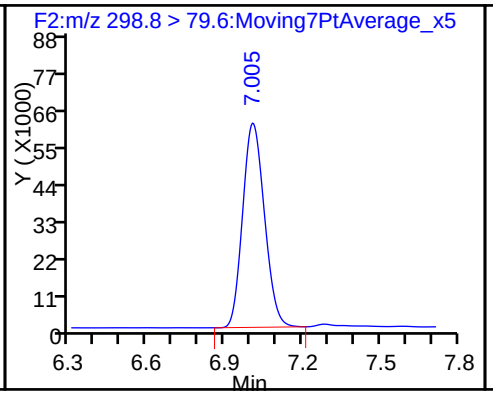
D 3 13C5-PFPeA



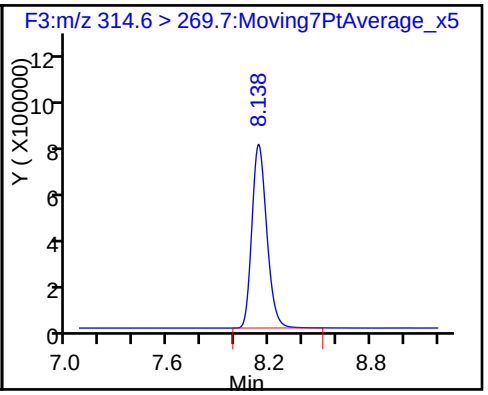
4 Perfluoropentanoic acid



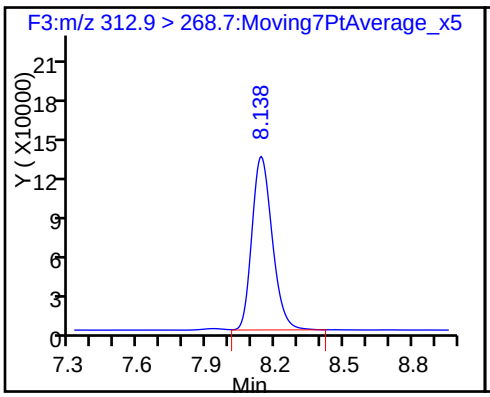
51 Perfluorobutanesulfonic acid



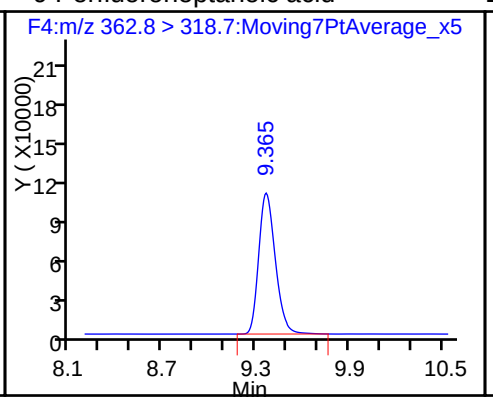
D 6 13C2 PFHxA



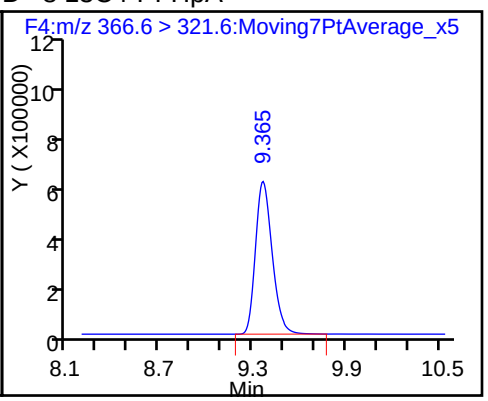
7 Perfluorohexanoic acid



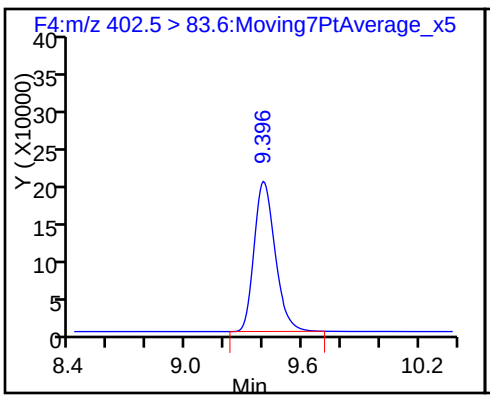
9 Perfluoroheptanoic acid



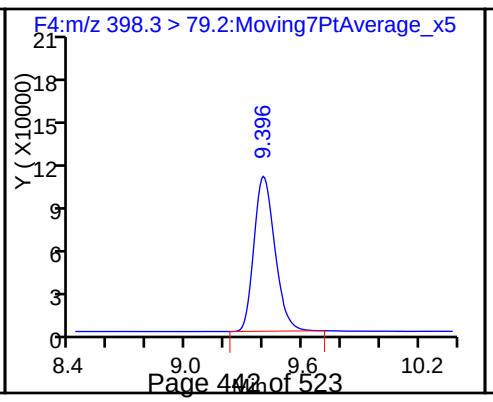
D 8 13C4-PFHpA



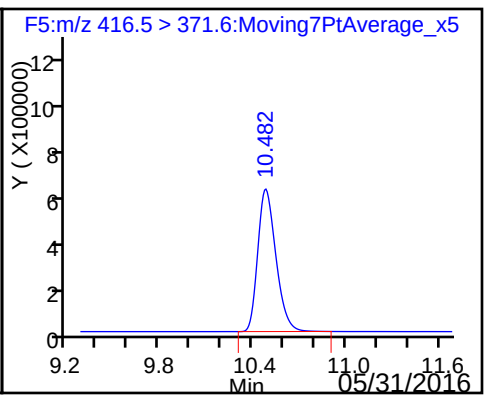
D 11 18O2 PFHxS



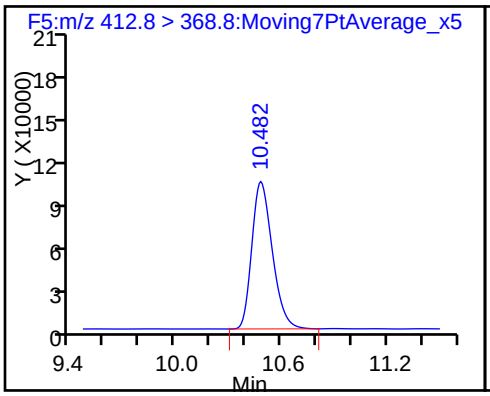
58 Perfluorohexanesulfonic acid



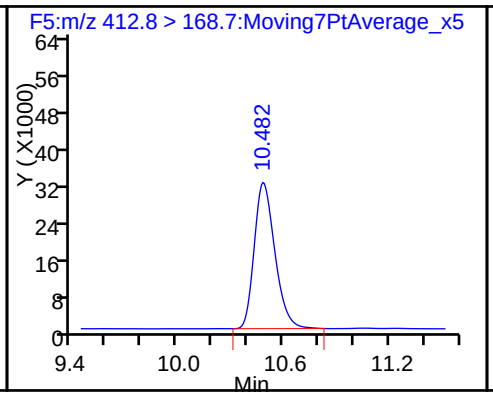
D 12 13C4 PFOA



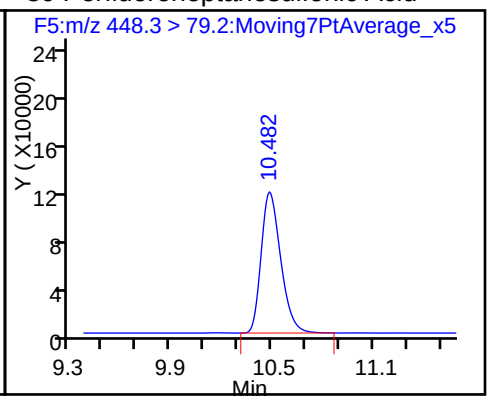
13 Perfluorooctanoic acid



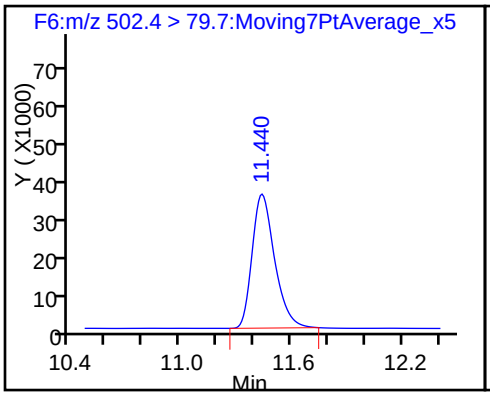
13 Perfluorooctanoic acid



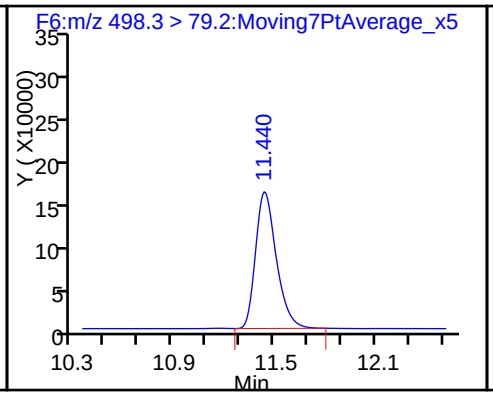
39 Perfluoroheptanesulfonic Acid



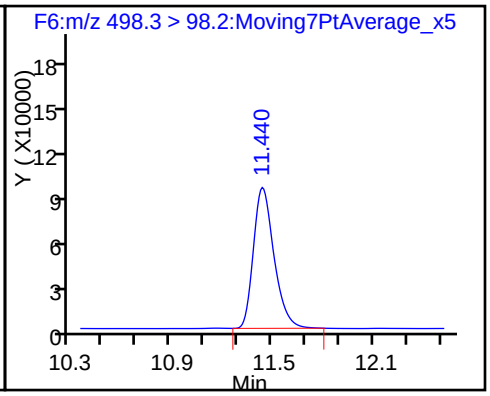
D 16 13C4 PFOS



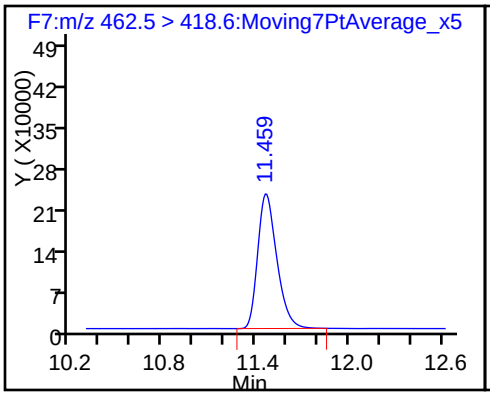
15 Perfluorooctane sulfonic acid



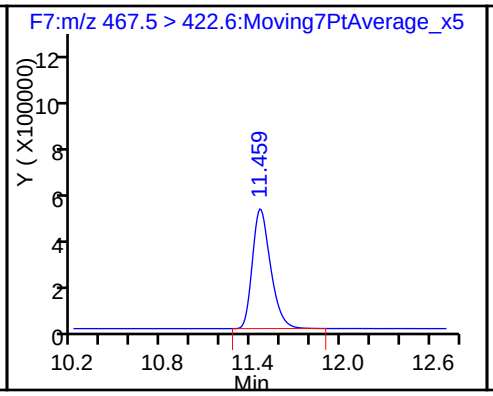
15 Perfluorooctane sulfonic acid



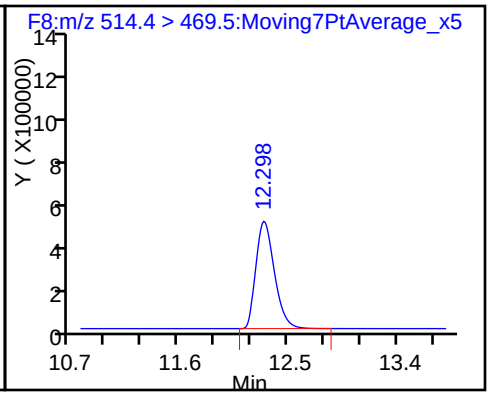
18 Perfluorononanoic acid



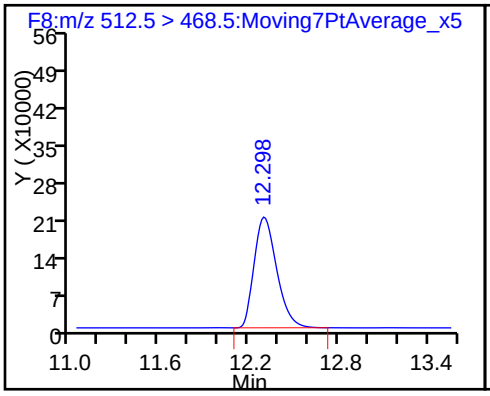
D 17 13C5 PFNA



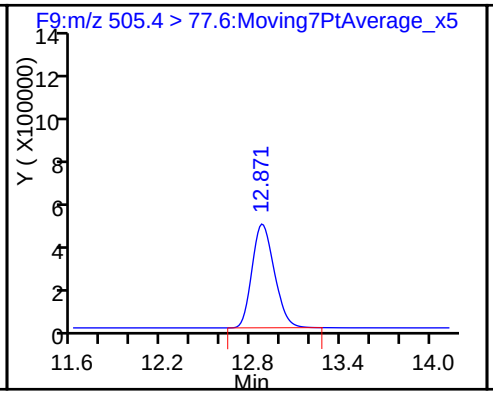
D 19 13C2 PFDA



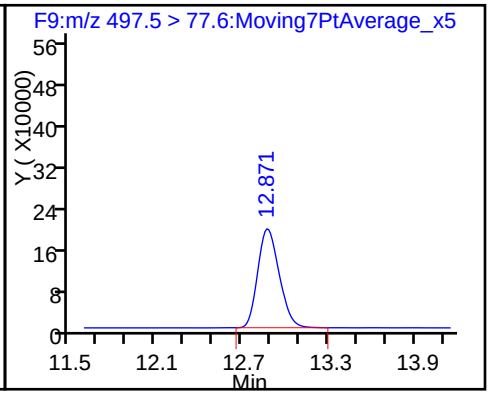
20 Perfluorodecanoic acid



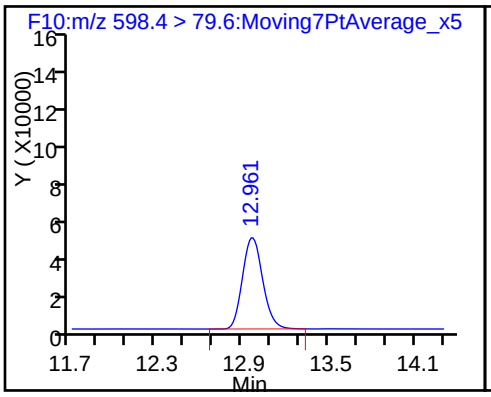
D 23 13C8 FOSA



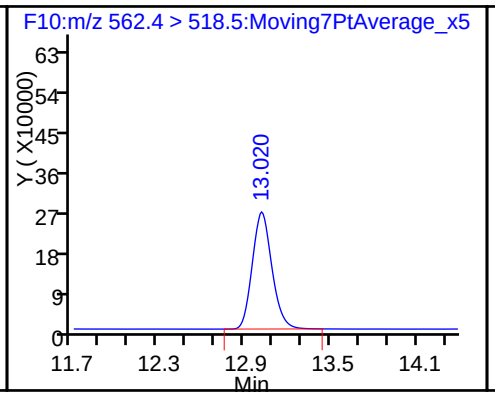
24 Perfluorooctane Sulfonamide



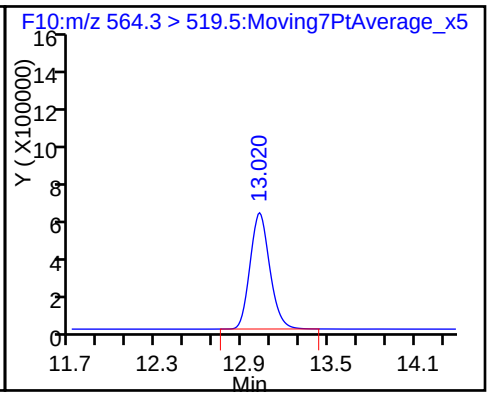
49 Perfluorodecane Sulfonic acid



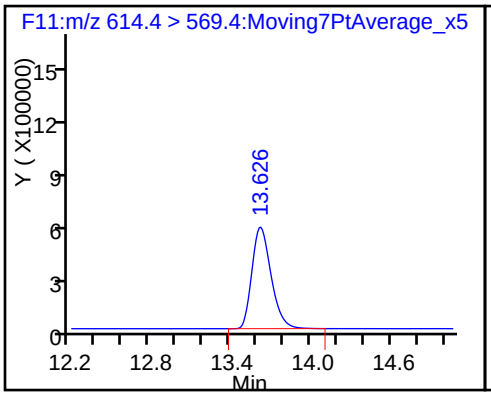
27 Perfluoroundecanoic acid



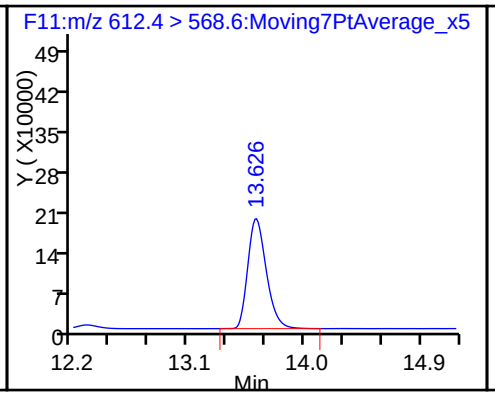
D 26 13C2 PFUnA



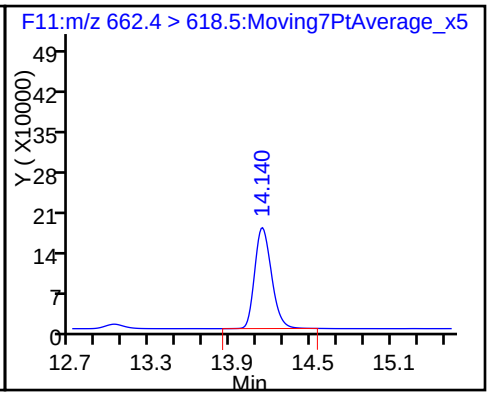
D 28 13C2 PFDoA



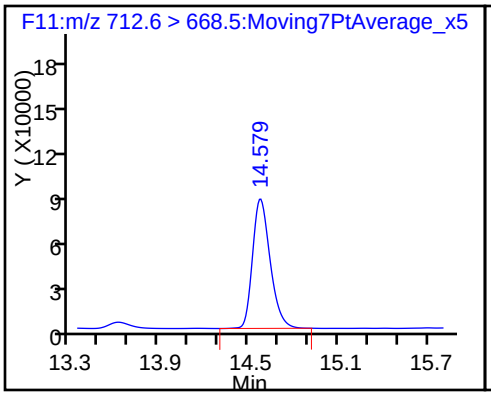
29 Perfluorododecanoic acid



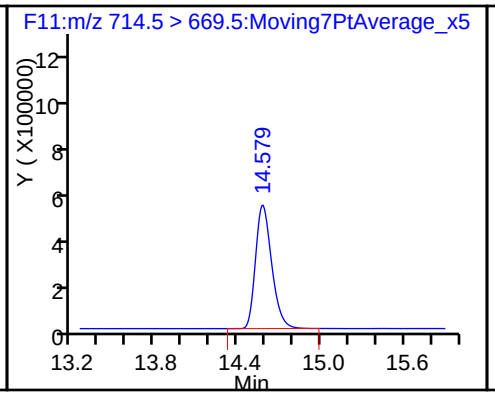
30 Perfluorotridecanoic acid



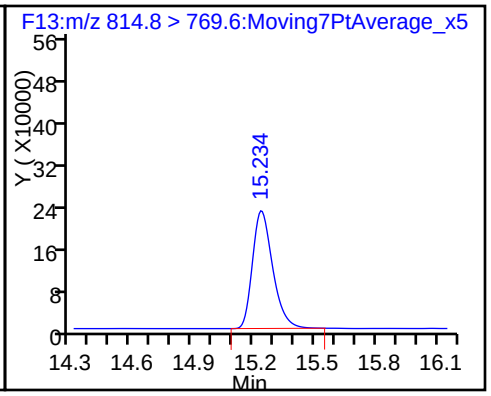
32 Perfluorotetradecanoic acid



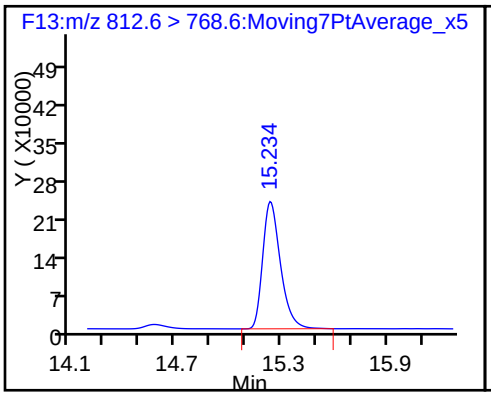
D 33 13C2-PFTeDA



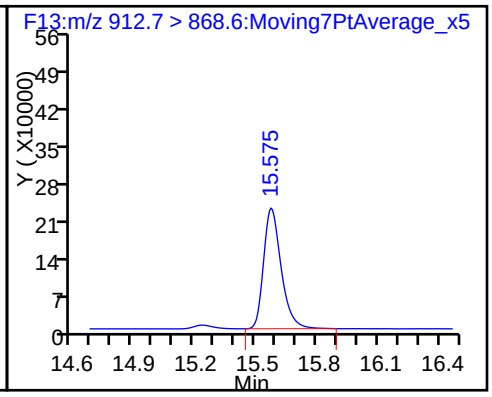
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_006.d
Lims ID: Std L5
Client ID:
Sample Type: IC Calib Level: 5
Inject. Date: 27-May-2016 12:41:42 ALS Bottle#: 14 Worklist Smp#: 6
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:50:49 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.791	5.790	0.001		4445714	43.0		86.0	12758	
2 Perfluorobutyric acid										
212.7 > 168.6	5.791	5.792	-0.001	1.000	3040022	52.7		105	8654	
D 3 13C5-PFPeA										
267.6 > 222.7	6.895	6.892	0.003		3252704	42.9		85.8	5848	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	1588028	49.4		98.8	997	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.010	7.011	-0.001	1.000	751821	NC			1558	
298.8 > 98.6	7.010	7.011	-0.001	1.000	512374		1.47(0.00-0.00)		1372	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.010	7.011	-0.001	1.000	751821	36.7		83.0		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		4308005	46.0		92.1	10683	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.144	8.140	0.004	1.000	2062892	51.4		103	2429	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	2267149	49.8		99.6	5056	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4237757	50.5		101	4835	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1464878	48.3		102	3478	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	2370680	48.6		103		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	2370680	NC			3836	
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		4750565	49.6		99.1	7574	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	2112373	48.7		97.3	2867	
412.8 > 168.7	10.482	10.485	-0.003	1.000	670755		3.15(0.00-0.00)	97.3	2092	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.482	10.485	-0.003	1.000	2412173	49.9		105		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.482	10.485	-0.003	1.000	2412173	NC			3934	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		294545	47.1		98.6	1232	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	3568981	48.0		100	2998	
498.3 > 98.2	11.440	11.443	-0.003	1.000	2186636		1.63(0.00-0.00)	100	2647	
18 Perfluorononanoic acid										
462.5 > 418.6	11.469	11.462	0.007	1.000	5349285	51.1		102	6345	
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		4126872	50.8		102	5282	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		4931920	47.9		95.7	5124	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	5708999	53.8		108	4919	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		4838600	51.0		102	3850	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	5551847	54.4		109	3529	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	1158252	NC			2554	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	1158252	50.2		104		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	6497810	51.0		102	4552	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		5491477	50.6		101	5508	
D 28 13C2 PFDoA										
614.4 > 569.4	13.626	13.626	0.0		5641533	50.7		101	3903	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.626	13.626	0.0	1.000	5537515	53.5		107	2034	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	4159657	52.4		105	1532	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	1901507	44.4		88.8	1148	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		3842279	49.4		98.9	3211	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1419961	47.7		95.5	2830	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	4302103	53.4		107	676	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	3400331	54.5		109	3004	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:50:50 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_006.d

Injection Date: 27-May-2016 12:41:42 Instrument ID: A4

Lims ID: Std L5

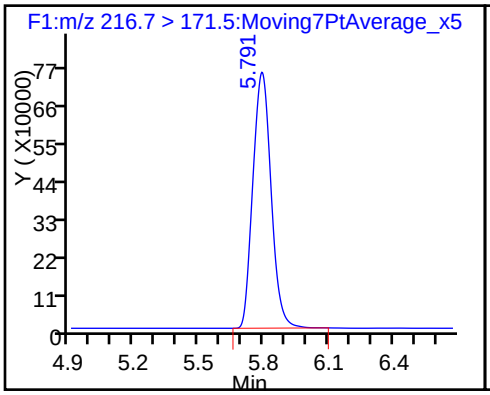
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 6

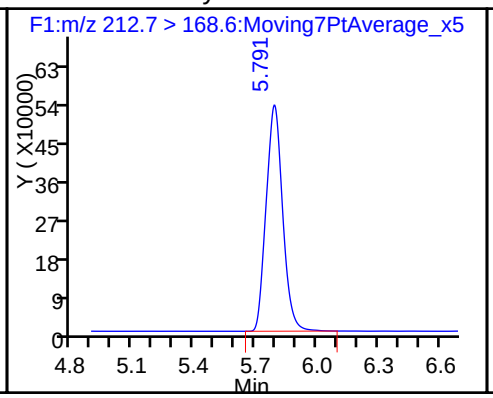
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

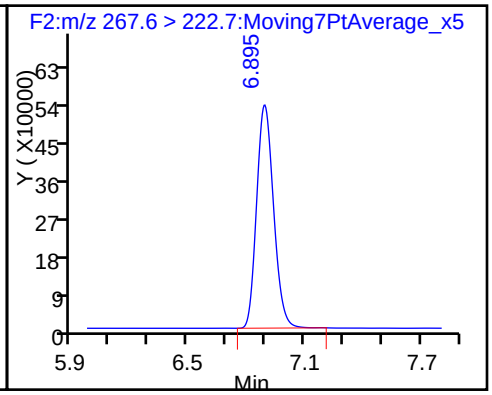
D 1 13C4 PFBA



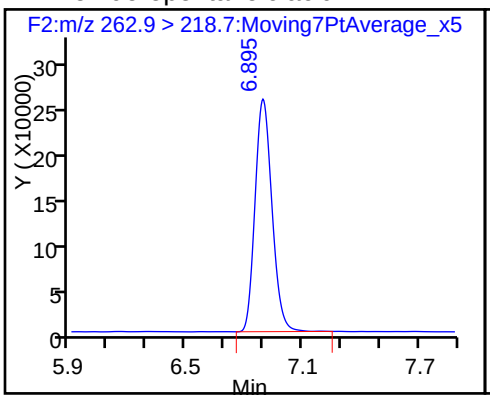
2 Perfluorobutyric acid



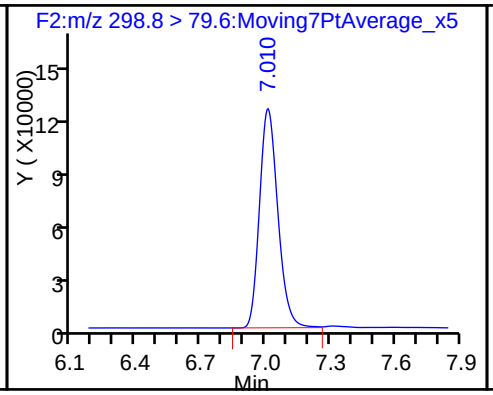
D 3 13C5-PFPeA



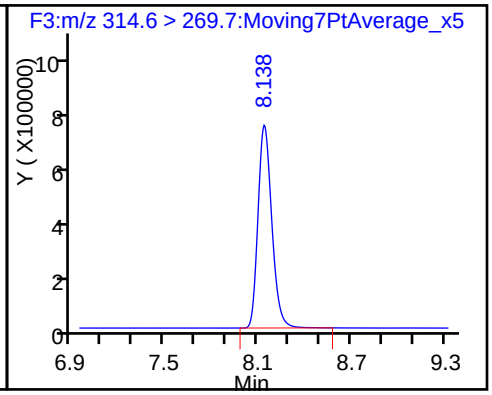
4 Perfluoropentanoic acid



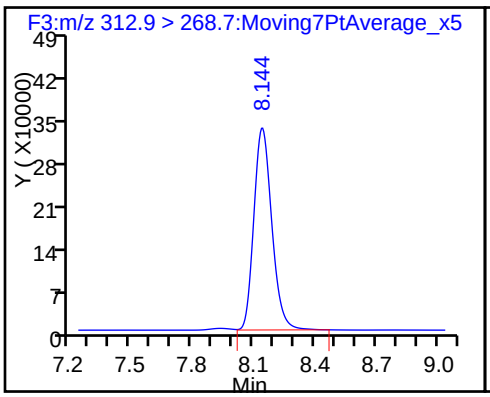
51 Perfluorobutanesulfonic acid



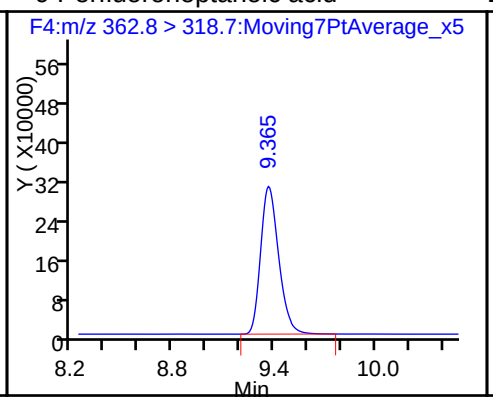
D 6 13C2 PFHxA



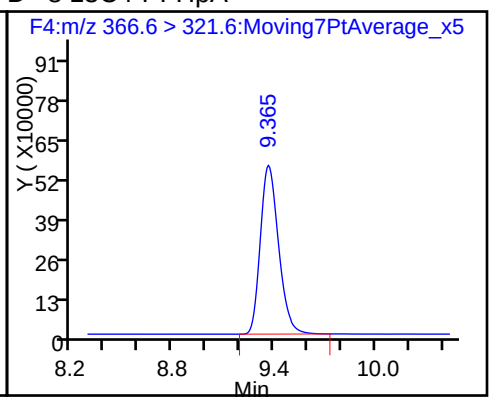
7 Perfluorohexanoic acid



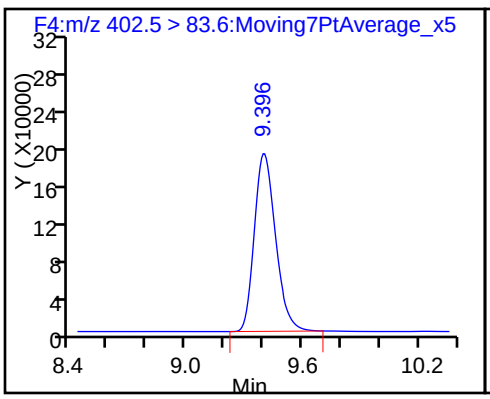
9 Perfluoroheptanoic acid



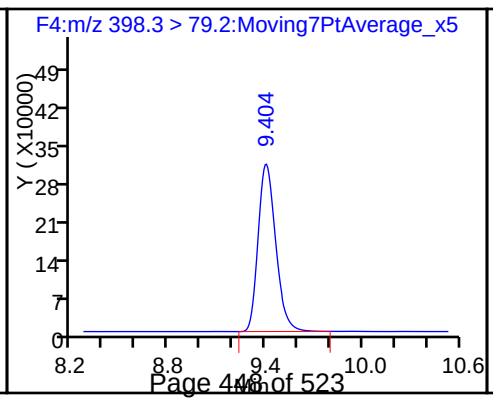
D 8 13C4-PFHpA



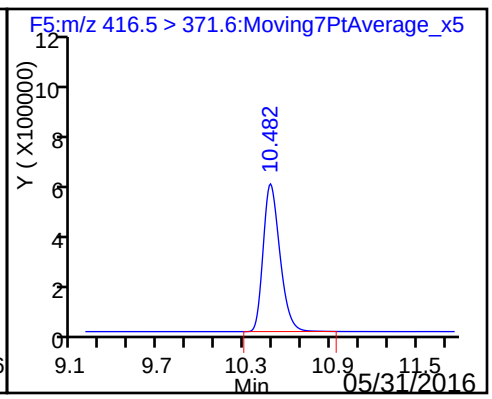
D 11 18O2 PFHxS



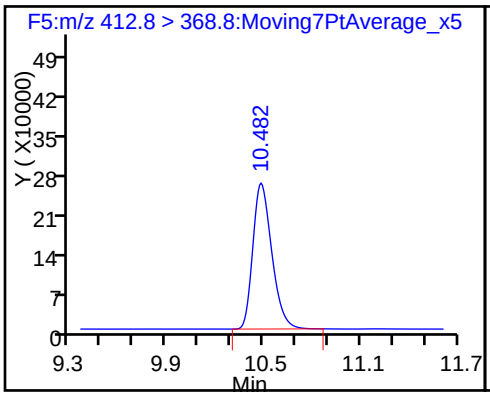
58 Perfluorohexanesulfonic acid



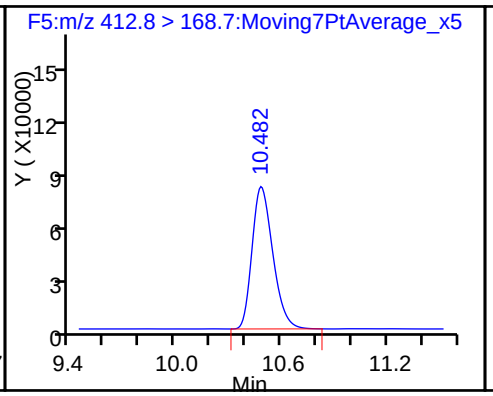
D 12 13C4 PFOA



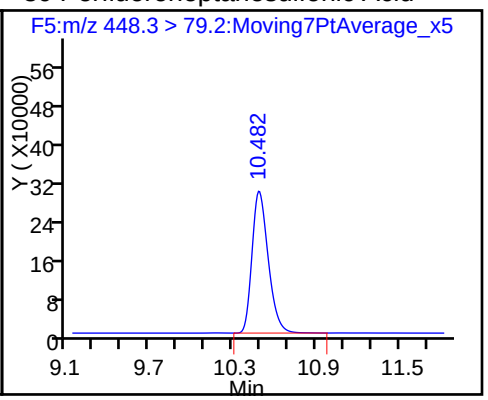
13 Perfluorooctanoic acid



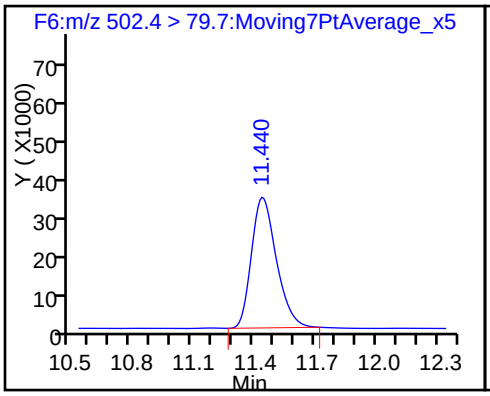
13 Perfluorooctanoic acid



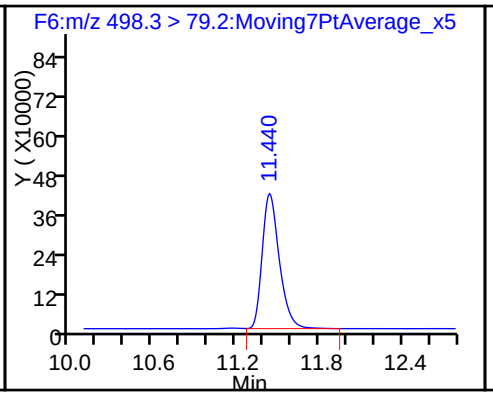
39 Perfluoroheptanesulfonic Acid



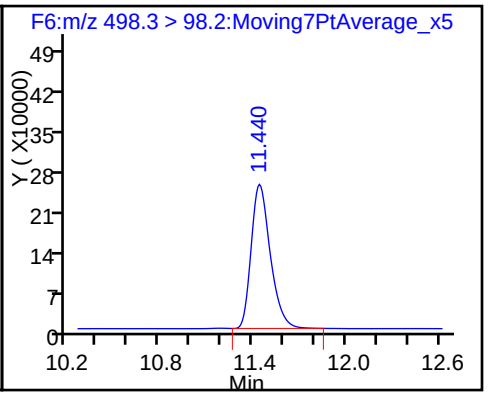
D 16 13C4 PFOS



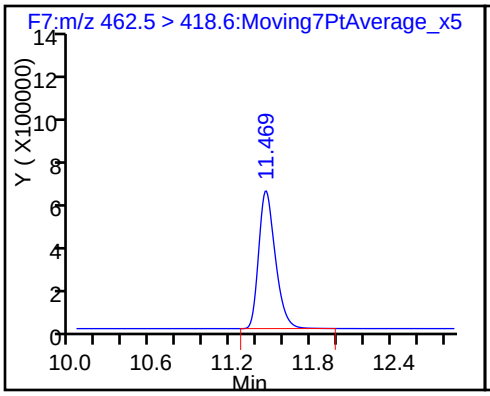
15 Perfluorooctane sulfonic acid



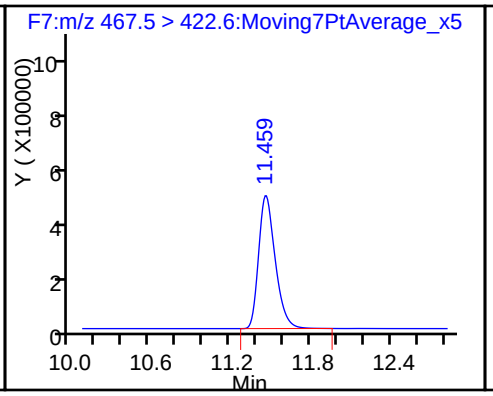
15 Perfluorooctane sulfonic acid



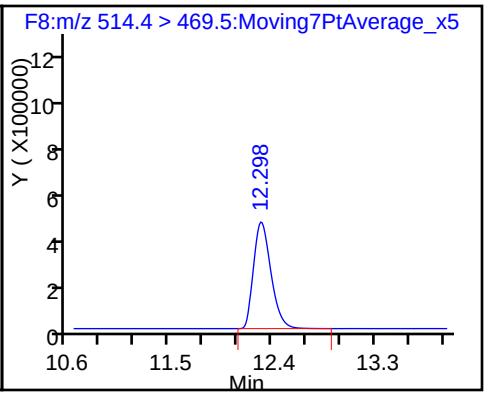
18 Perfluorononanoic acid



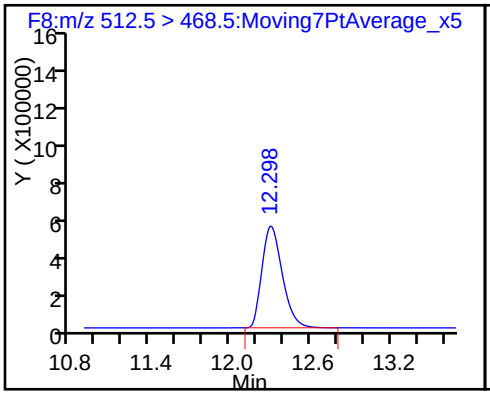
D 17 13C5 PFNA



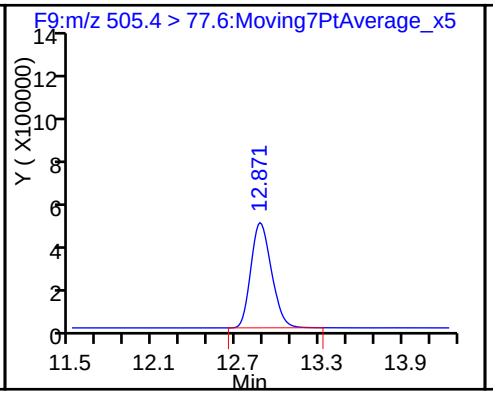
D 19 13C2 PFDA



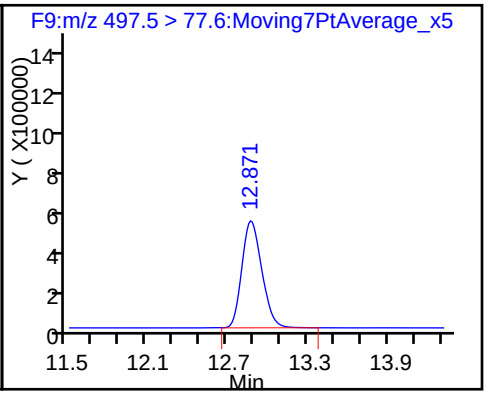
20 Perfluorodecanoic acid



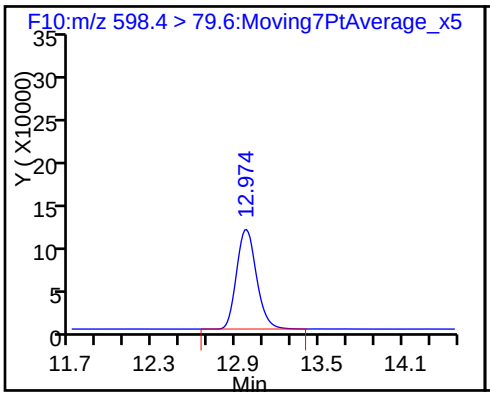
D 23 13C8 FOSA



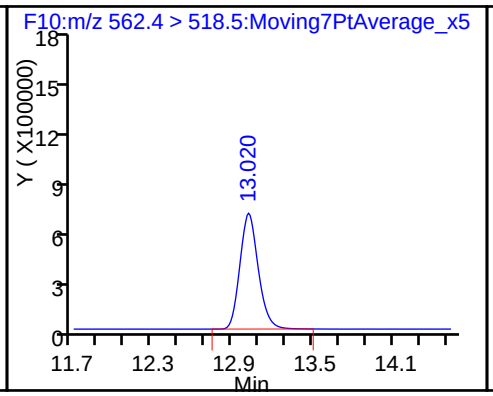
24 Perfluorooctane Sulfonamide



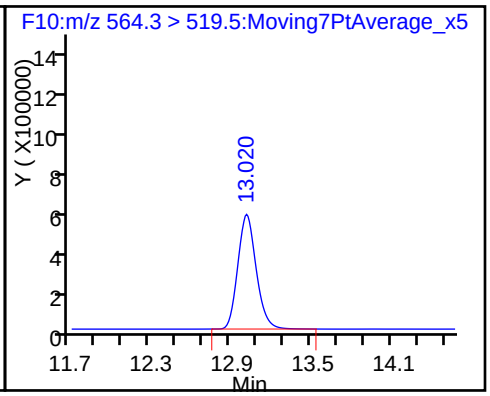
49 Perfluorodecane Sulfonic acid



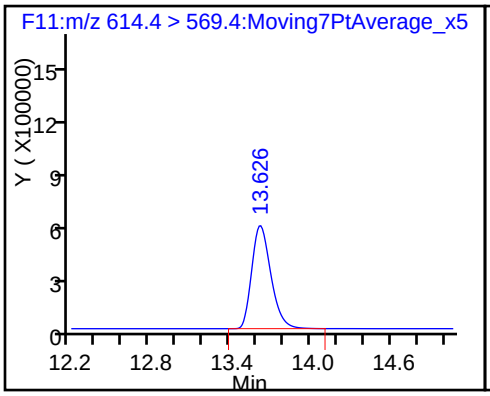
27 Perfluoroundecanoic acid



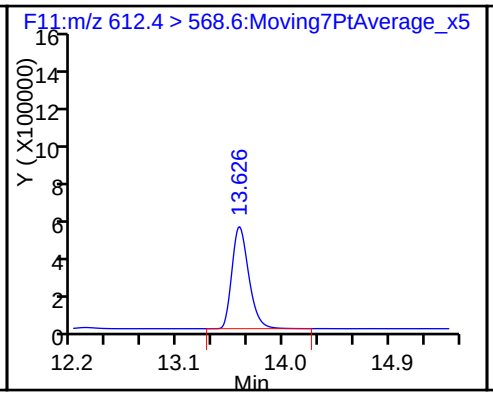
D 26 13C2 PFUnA



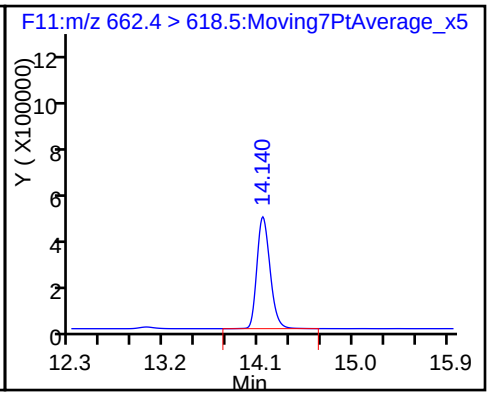
D 28 13C2 PFDoA



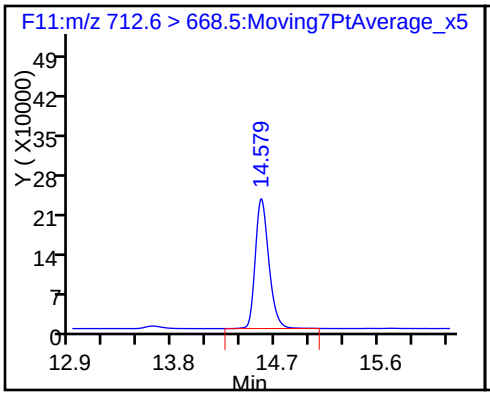
29 Perfluorododecanoic acid



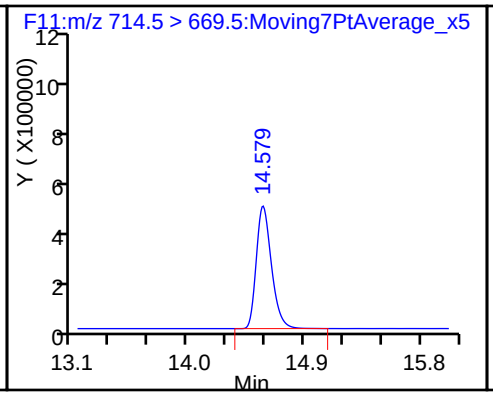
30 Perfluorotridecanoic acid



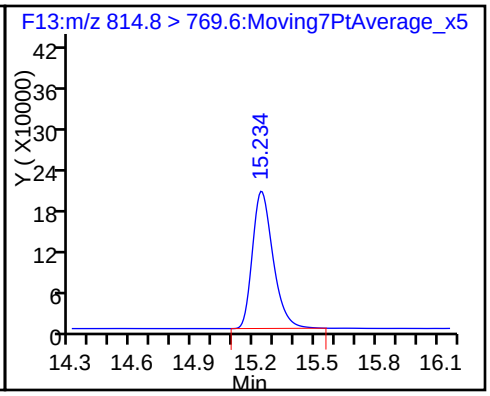
32 Perfluorotetradecanoic acid



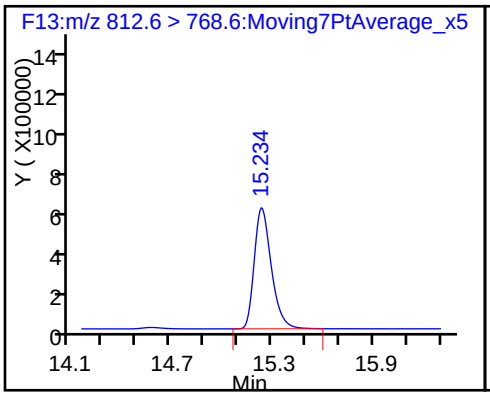
D 33 13C2-PFTeDA



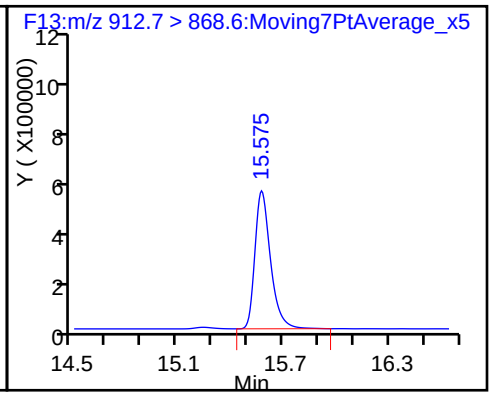
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_007.d
Lims ID: Std L6
Client ID:
Sample Type: IC Calib Level: 6
Inject. Date: 27-May-2016 13:02:54 ALS Bottle#: 15 Worklist Smp#: 7
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L6
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:51:01 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.791	5.790	0.001		4129683	39.9		79.9	10855	
2 Perfluorobutyric acid										
212.7 > 168.6	5.794	5.792	0.002	1.000	11271766	210.3		105	17046	
D 3 13C5-PFPeA										
267.6 > 222.7	6.890	6.892	-0.002		3046275	40.2		80.3	6563	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.890	6.895	-0.005	1.000	5608119	186.3		93.1	1894	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.010	7.011	-0.001	1.000	2740499	NC			5174	
298.8 > 98.6	7.010	7.011	-0.001	1.000	1739607		1.58(0.00-0.00)		3444	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.010	7.011	-0.001	1.000	2740499	187.8		106		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		3592360	38.4		76.8	8171	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	6700227	200.8		100	2266	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	6600504	187.1		93.5	7377	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		3284058	39.1		78.2	7093	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1044335	34.4		72.8	3013	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	6717467	193.3		102		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	6717467	NC			5359	
D 12 13C4 PFOA										
416.5 > 371.6	10.485	10.483	0.002		3335155	34.8		69.6	4602	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.485	10.485	0.0	1.000	6321774	207.1		104	6033	
412.8 > 168.7	10.485	10.485	0.0	1.000	1901540		3.32(0.00-0.00)	104	3439	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.485	10.485	0.0	1.000	6227195	180.8		95.0		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.485	10.485	0.0	1.000	6227195	NC			4735	
D 16 13C4 PFOS										
502.4 > 79.7	11.442	11.441	0.001		209455	33.5		70.1	753	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.442	11.443	-0.001	1.000	10153061	191.8		100	2698	
498.3 > 98.2	11.442	11.443	-0.001	1.000	6092175		1.67(0.00-0.00)	100	3208	
18 Perfluorononanoic acid										
462.5 > 418.6	11.462	11.462	0.0	1.000	15179720	194.8		97.4	8936	
D 17 13C5 PFNA										
467.5 > 422.6	11.462	11.462	0.0		3070065	37.8		75.5	3786	
D 19 13C2 PFDA										
514.4 > 469.5	12.302	12.299	0.003		3862828	37.5		75.0	5604	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.302	12.299	0.003	1.000	17300091	208.3		104	5465	
D 23 13C8 FOSA										
505.4 > 77.6	12.875	12.871	0.004		3912535	41.2		82.4	2881	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.875	12.873	0.002	1.000	16700878	202.5		101	3630	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.965	12.969	-0.004	1.000	3032821	NC			3770	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.965	12.969	-0.004	1.000	3032821	185.0		96.0		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.024	13.021	0.003	1.000	19242949	200.7		100	4801	
D 26 13C2 PFUnA										
564.3 > 519.5	13.024	13.021	0.003		4134664	38.1		76.2	3861	
D 28 13C2 PFDoA										
614.4 > 569.4	13.620	13.626	-0.006		4448387	40.0		80.0	2888	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.620	13.626	-0.006	1.000	16837391	206.5		103	3348	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.134	14.138	-0.004	1.000	13391959	193.1		96.5	2972	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.574	14.577	-0.003	1.000	6381395	170.4		85.2	2136	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.574	14.579	-0.005		3359201	43.2		86.4	2740	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.237	15.235	0.002		1298274	43.6		87.3	2490	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.237	15.235	0.002	1.000	14132019	193.9		97.0	1746	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.578	15.575	0.003	1.000	11405069	199.9		99.9	4282	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00015 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:51:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_007.d

Injection Date: 27-May-2016 13:02:54 Instrument ID: A4

Lims ID: Std L6

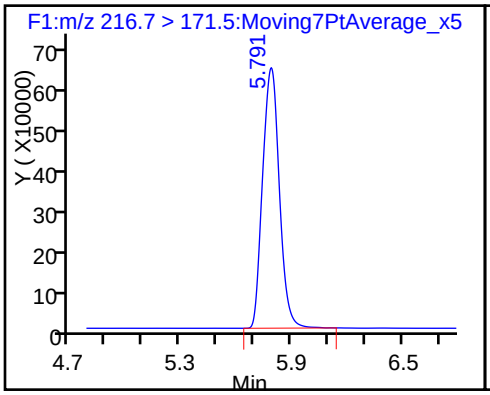
Client ID:

Operator ID: JRB ALS Bottle#: 15 Worklist Smp#: 7

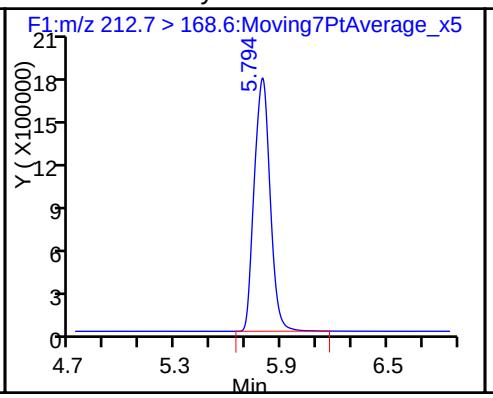
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

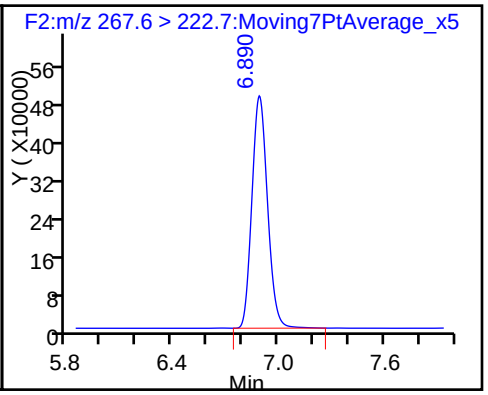
D 1 13C4 PFBA



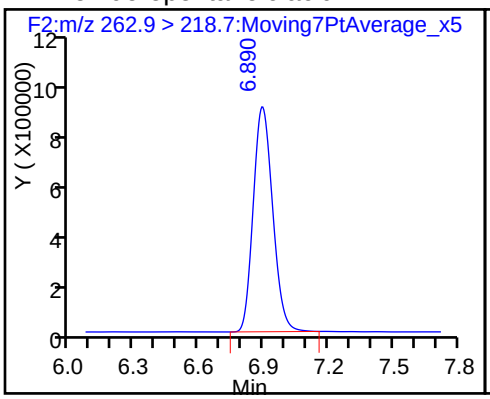
2 Perfluorobutyric acid



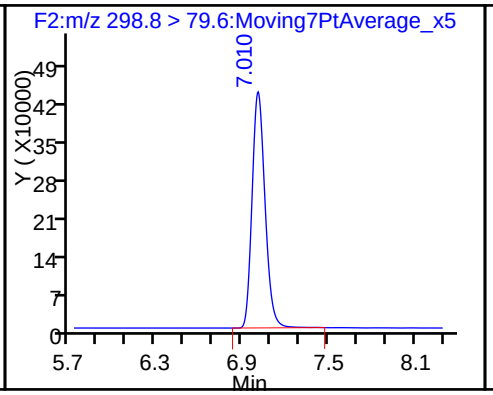
D 3 13C5-PFPeA



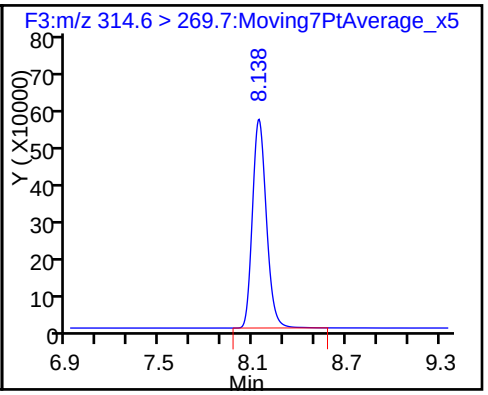
4 Perfluoropentanoic acid



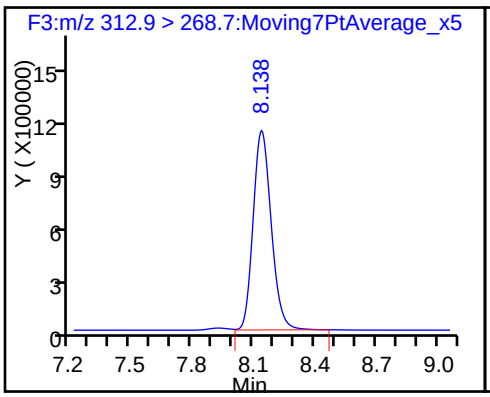
51 Perfluorobutanesulfonic acid



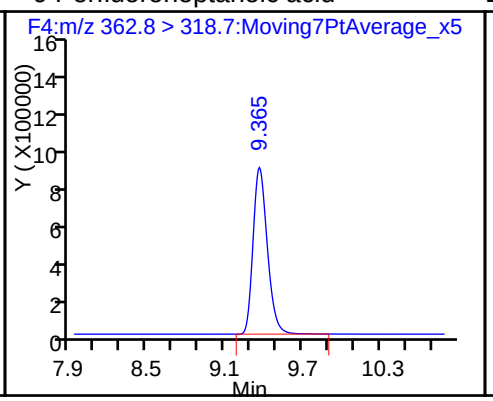
D 6 13C2 PFHxA



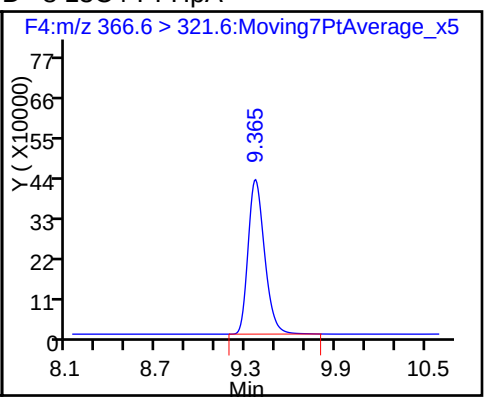
7 Perfluorohexanoic acid



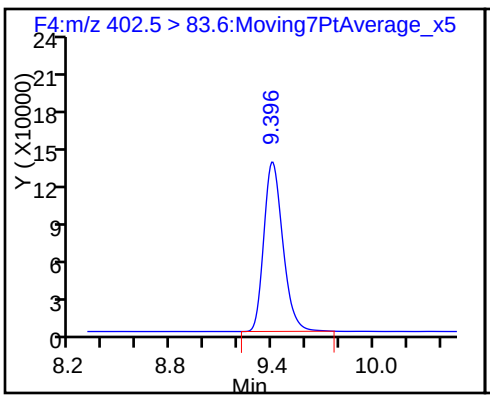
9 Perfluoroheptanoic acid



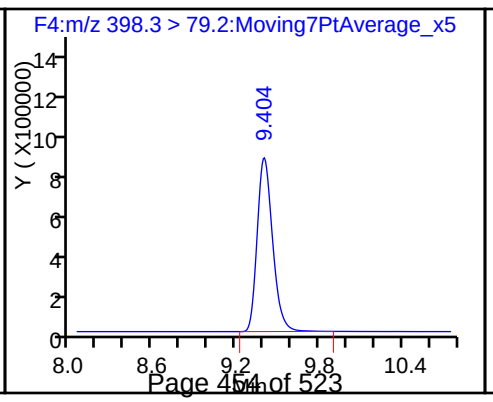
D 8 13C4-PFHpA



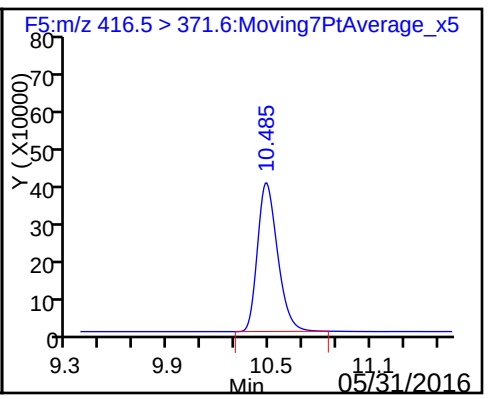
D 11 18O2 PFHxS



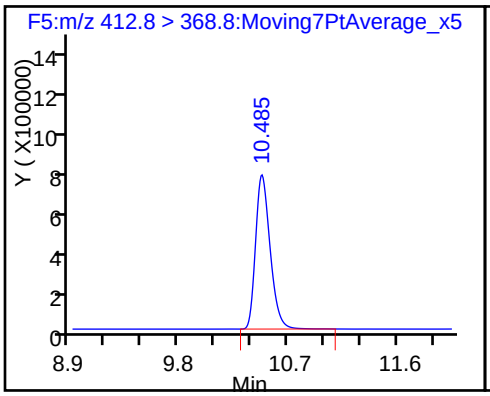
58 Perfluorohexanesulfonic acid



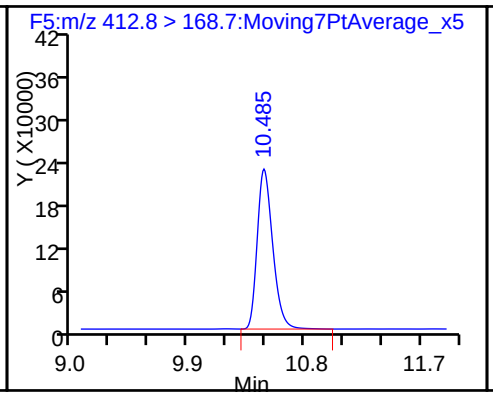
D 12 13C4 PFOA



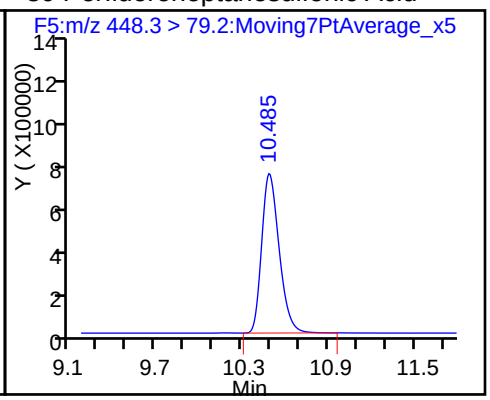
13 Perfluorooctanoic acid



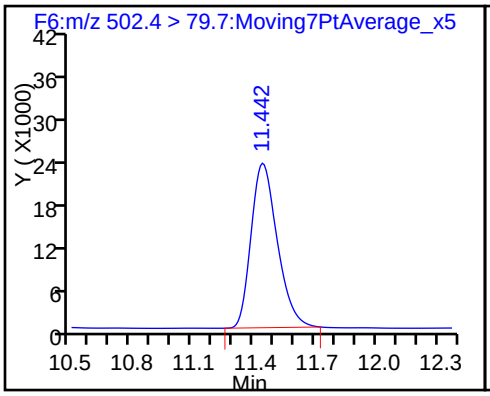
13 Perfluorooctanoic acid



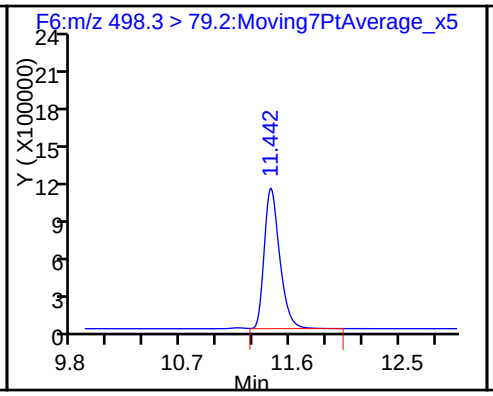
39 Perfluoroheptanesulfonic Acid



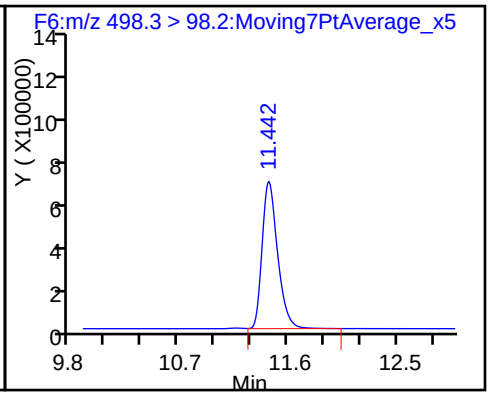
D 16 13C4 PFOS



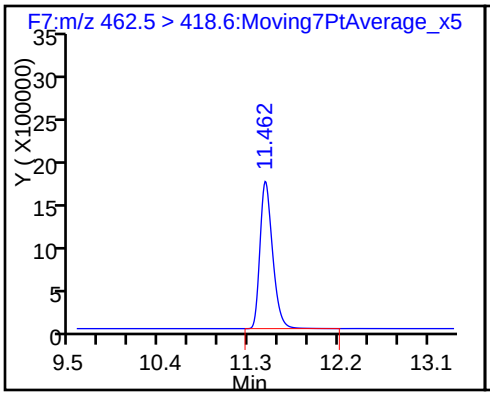
15 Perfluorooctane sulfonic acid



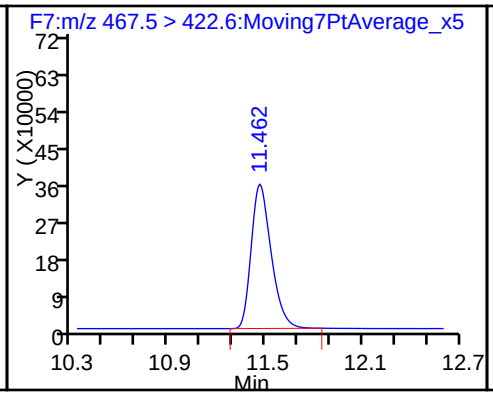
15 Perfluorooctane sulfonic acid



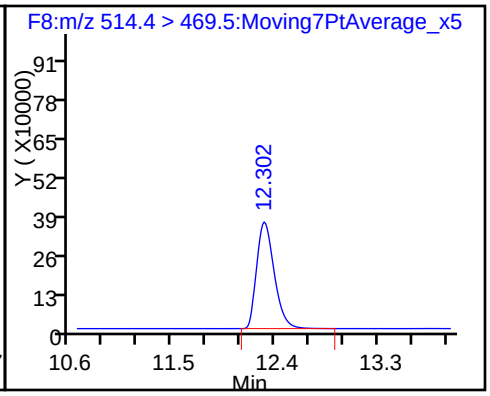
18 Perfluorononanoic acid



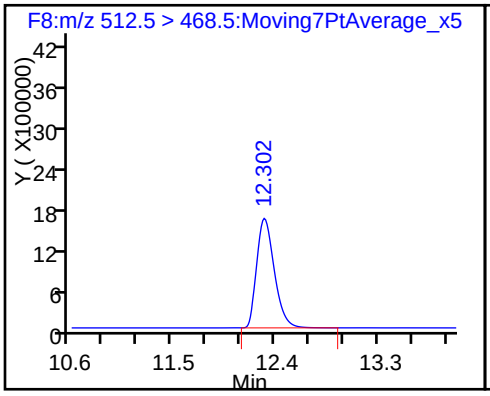
D 17 13C5 PFNA



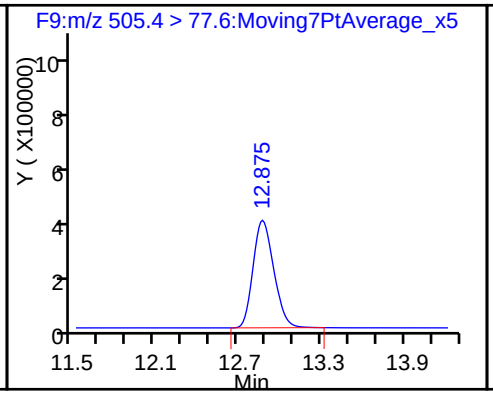
D 19 13C2 PFDA



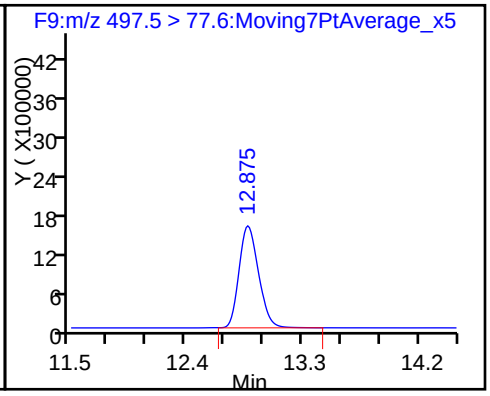
20 Perfluorodecanoic acid



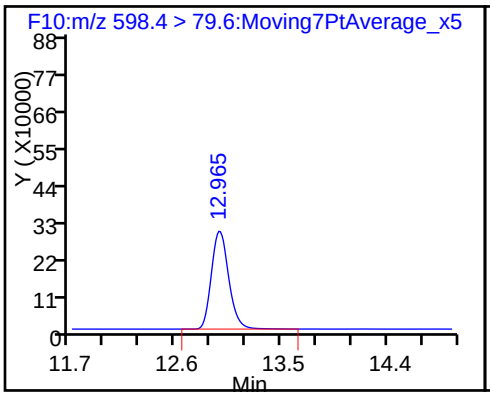
D 23 13C8 FOSA



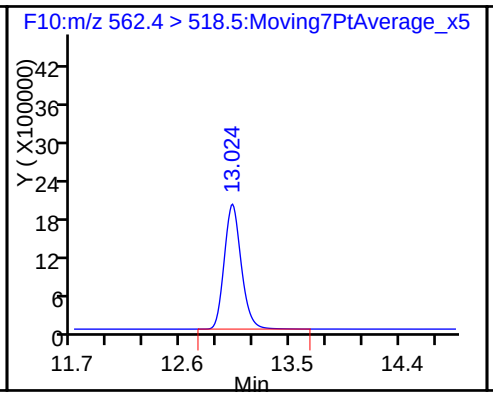
24 Perfluorooctane Sulfonamide



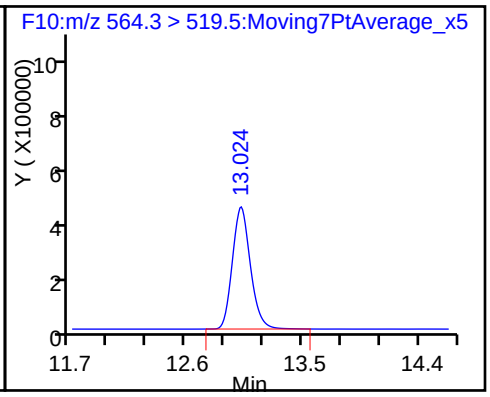
49 Perfluorodecane Sulfonic acid



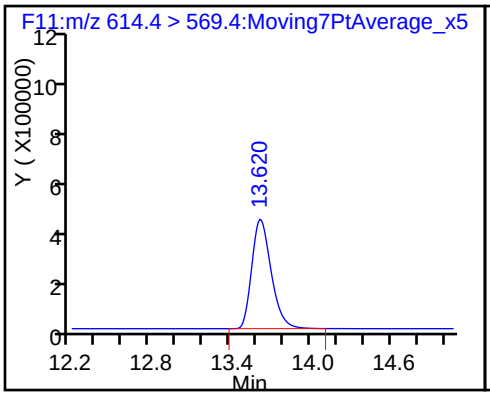
27 Perfluoroundecanoic acid



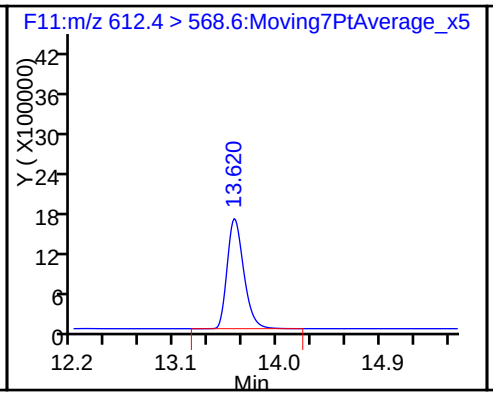
D 26 13C2 PFUnA



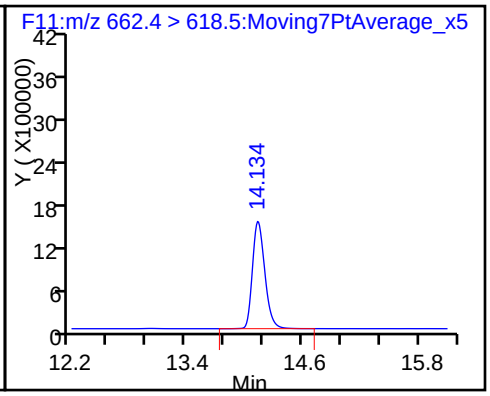
D 28 13C2 PFDoA



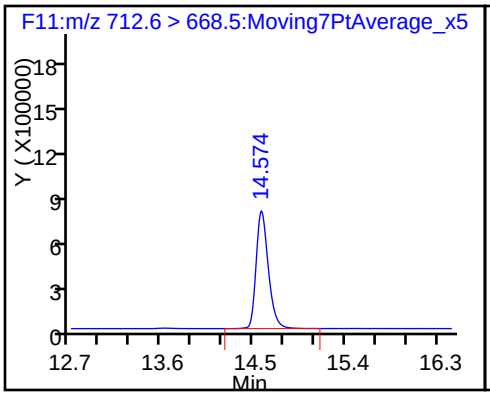
29 Perfluorododecanoic acid



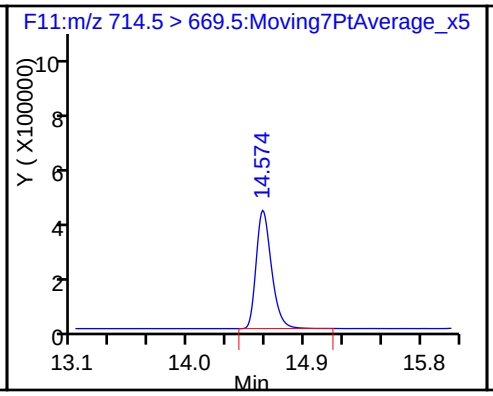
30 Perfluorotridecanoic acid



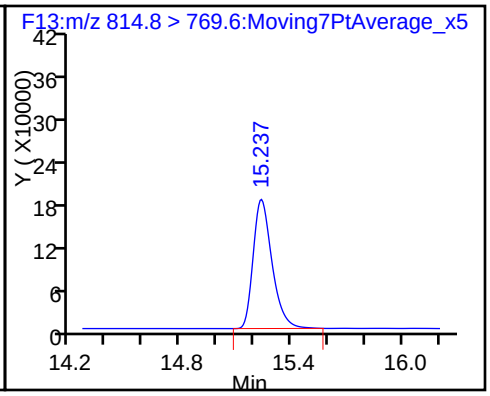
32 Perfluorotetradecanoic acid



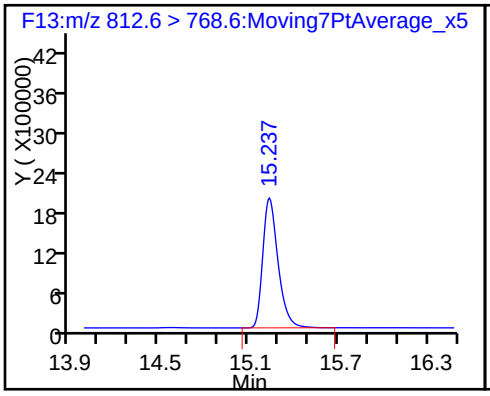
D 33 13C2-PFTeDA



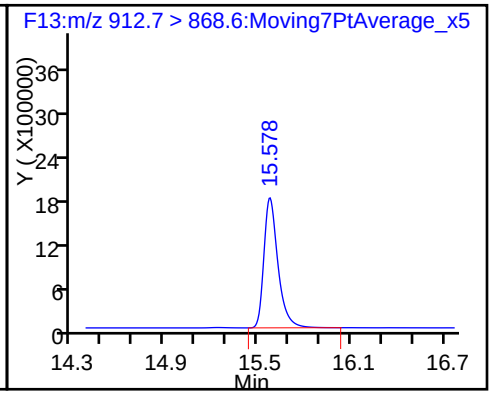
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d
Lims ID: Std L7
Client ID:
Sample Type: IC Calib Level: 7
Inject. Date: 27-May-2016 13:24:04 ALS Bottle#: 16 Worklist Smp#: 8
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: STD L7
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:51:09 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.787	5.790	-0.003		3355560	32.4		64.9	7469	
2 Perfluorobutyric acid										
212.7 > 168.6	5.791	5.792	-0.001	1.000	18531497	425.4		106	22364	
D 3 13C5-PFPeA										
267.6 > 222.7	6.890	6.892	-0.002		2484518	32.8		65.5	5553	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	9327831	379.8		95.0	3498	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.005	7.011	-0.006	1.000	4450007	NC			4580	
298.8 > 98.6	7.005	7.011	-0.006	1.000	2812494		1.58(0.00-0.00)		4396	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.005	7.011	-0.006	1.000	4450007	392.3		111		
D 6 13C2 PFHxA										
314.6 > 269.7	8.133	8.138	-0.005		3010443	32.2		64.3	6380	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.133	8.140	-0.007	1.000	11168800	399.5		99.9	2093	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	10926693	386.1		96.5	6916	
D 8 13C4-PFHpA										
366.6 > 321.6	9.357	9.366	-0.009		2634013	31.4		62.7	4520	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		812066	26.8		56.6	2294	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	10489666	388.2		103		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	10489666	NC			6098	
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		2900631	30.3		60.5	4395	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	10498872	395.5		98.9	6045	
412.8 > 168.7	10.482	10.485	-0.003	1.000	3328897		3.15(0.00-0.00)	98.9	4124	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.482	10.485	-0.003	1.000	10320043	373.3		98.0		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.482	10.485	-0.003	1.000	10320043	NC			5191	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		168111	26.9		56.3	476	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	16274880	383.0		100	2363	
498.3 > 98.2	11.440	11.443	-0.003	1.000	9729875		1.67(0.00-0.00)	100	2767	
18 Perfluorononanoic acid										
462.5 > 418.6	11.459	11.462	-0.003	1.000	27294533	406.8		102	10033	
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		2643621	32.5		65.0	4183	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		3407629	33.1		66.1	5758	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	29059913	396.7		99.2	5879	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		3402041	35.8		71.7	3118	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	29858502	416.3		104	3765	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	4687057	NC			3586	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	4687057	356.2		92.4		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	32308856	383.5		95.9	5439	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		3632488	33.5		67.0	2894	
D 28 13C2 PFDoA										
614.4 > 569.4	13.626	13.626	0.0		3842375	34.5		69.1	2541	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.626	13.626	0.0	1.000	28935429	410.8		103	2905	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	21307860	357.7		89.4	2679	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.570	14.577	-0.007	1.000	10914055	339.4		84.9	2523	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		2884794	37.1		74.2	2660	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1056796	35.5		71.0	1898	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	23508759	397.1		99.3	2028	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	19801766	426.3		107	4001	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00015 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:51:10 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Injection Date: 27-May-2016 13:24:04 Instrument ID: A4

Lims ID: Std L7

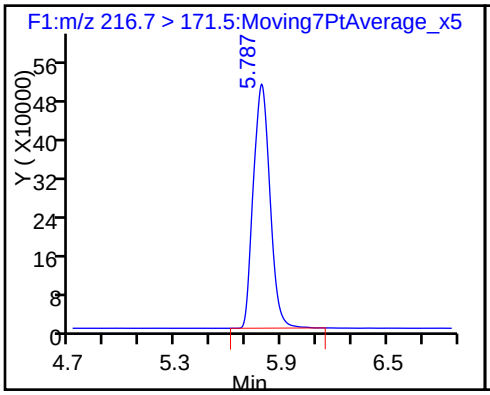
Client ID:

Operator ID: JRB ALS Bottle#: 16 Worklist Smp#: 8

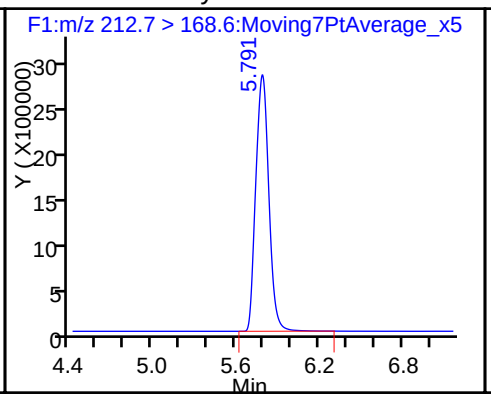
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

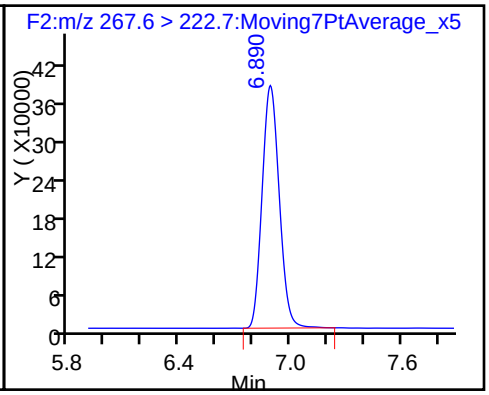
D 1 13C4 PFBA



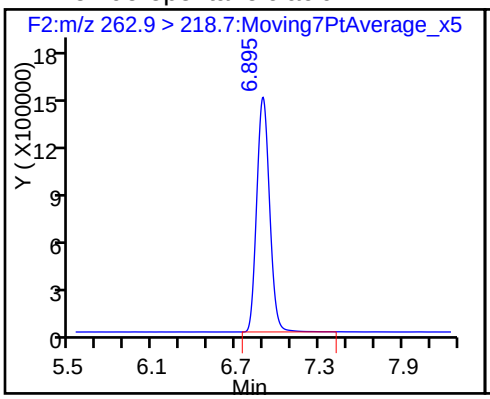
2 Perfluorobutyric acid



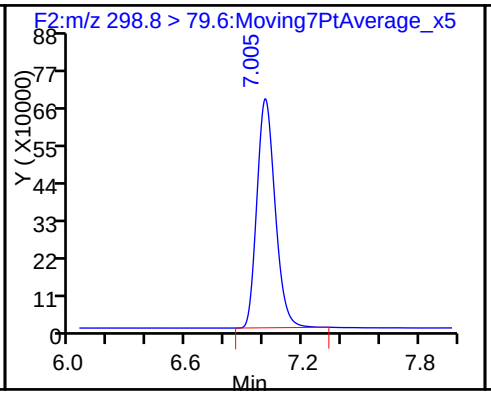
D 3 13C5-PFPeA



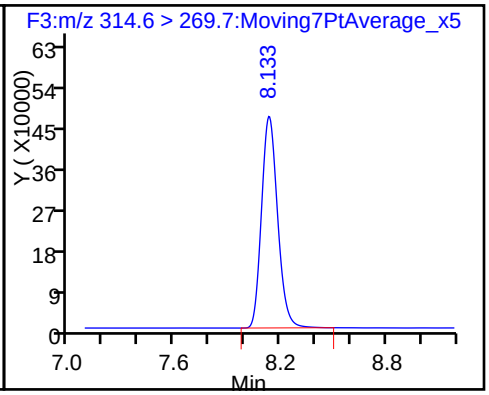
4 Perfluoropentanoic acid



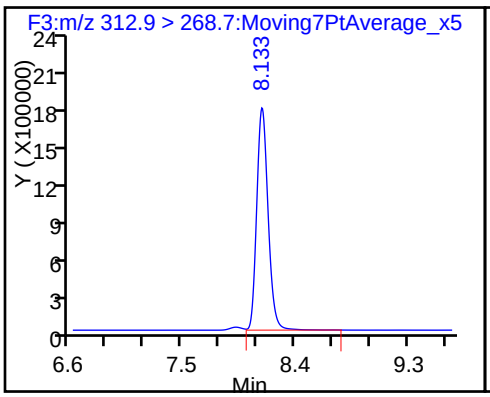
51 Perfluorobutanesulfonic acid



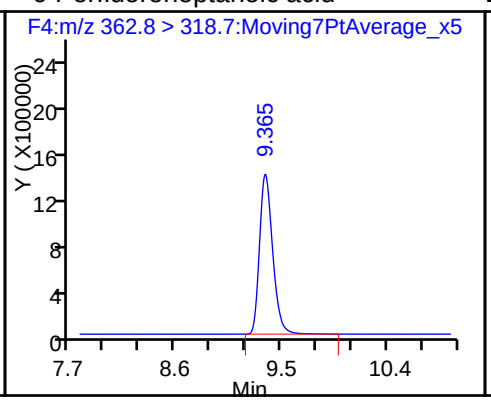
D 6 13C2 PFHxA



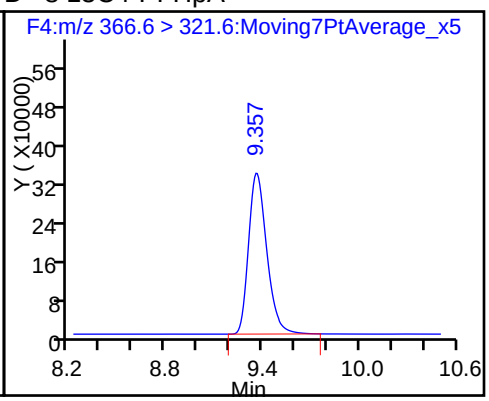
7 Perfluorohexanoic acid



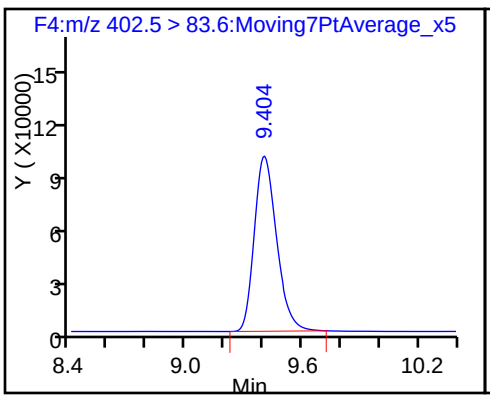
9 Perfluoroheptanoic acid



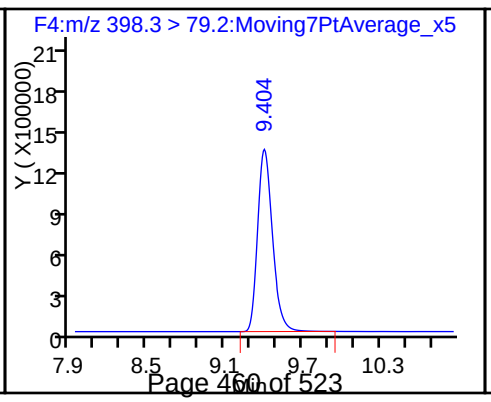
D 8 13C4-PFHpA



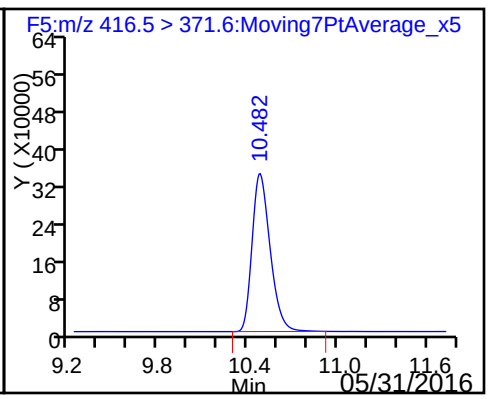
D 11 18O2 PFHxS



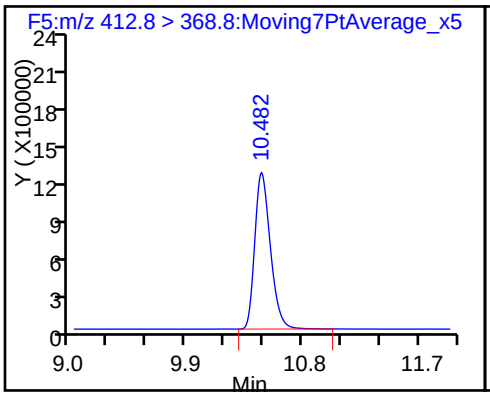
58 Perfluorohexanesulfonic acid



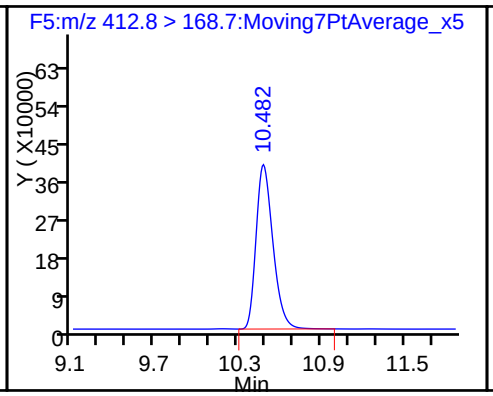
D 12 13C4 PFOA



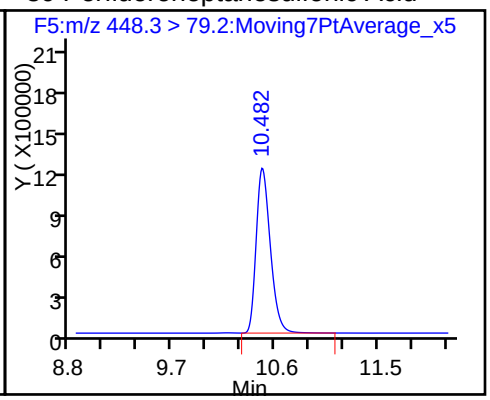
13 Perfluorooctanoic acid



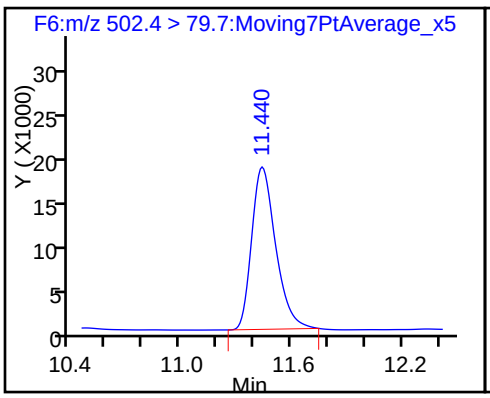
13 Perfluorooctanoic acid



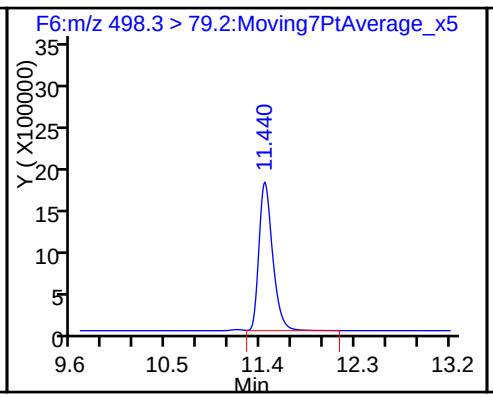
39 Perfluoroheptanesulfonic Acid



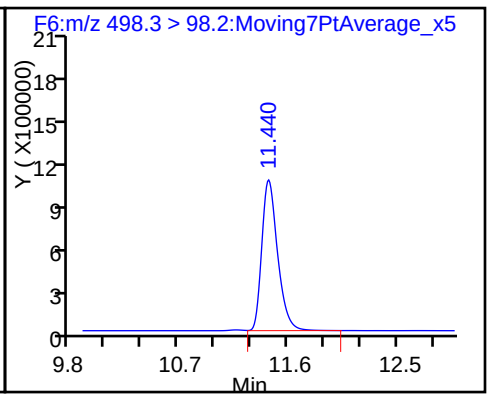
D 16 13C4 PFOS



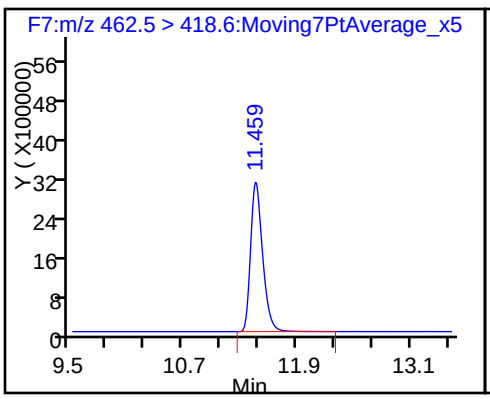
15 Perfluorooctane sulfonic acid



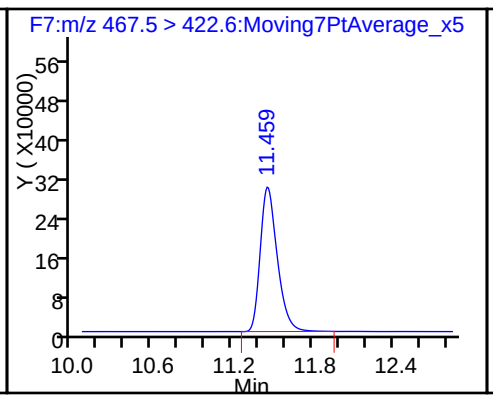
15 Perfluorooctane sulfonic acid



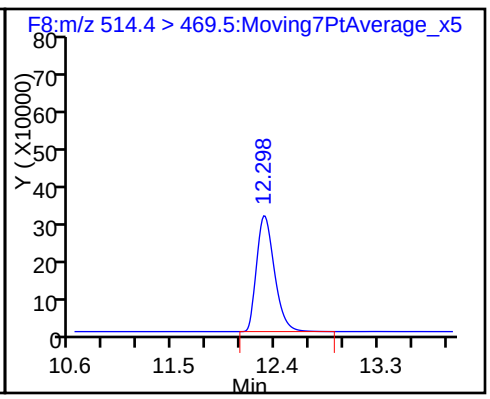
18 Perfluorononanoic acid



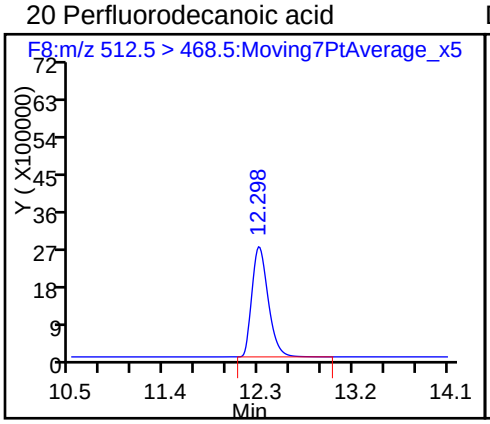
D 17 13C5 PFNA



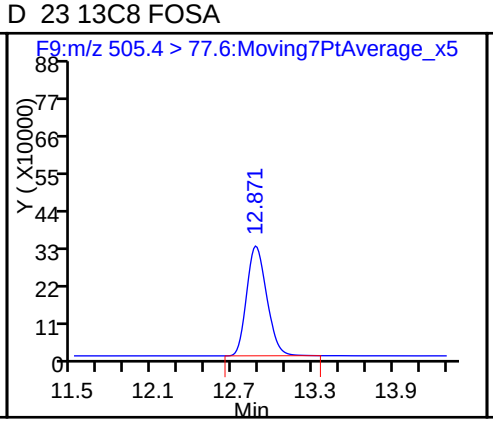
D 19 13C2 PFDA



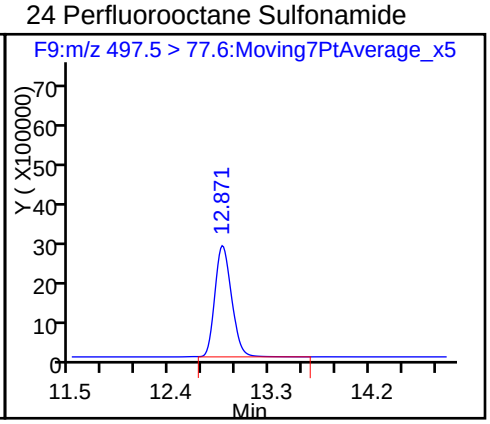
20 Perfluorodecanoic acid



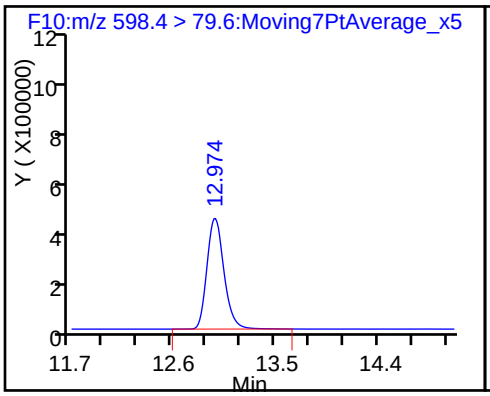
D 23 13C8 FOSA



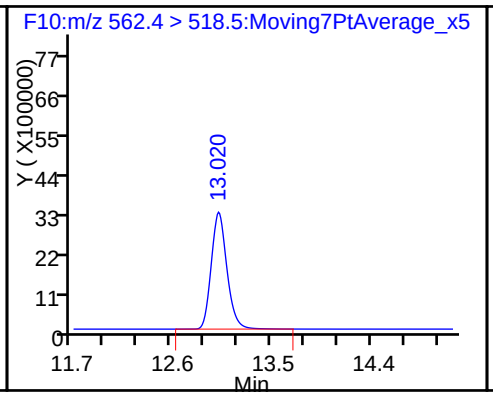
24 Perfluorooctane Sulfonamide



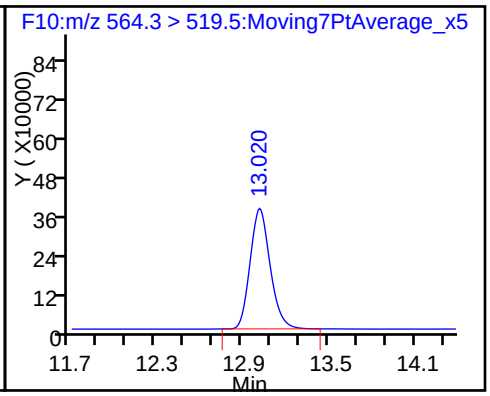
49 Perfluorodecane Sulfonic acid



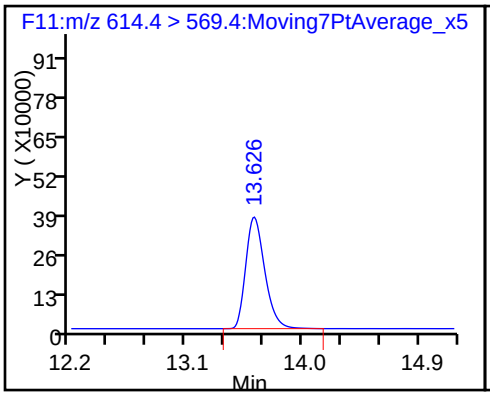
27 Perfluoroundecanoic acid



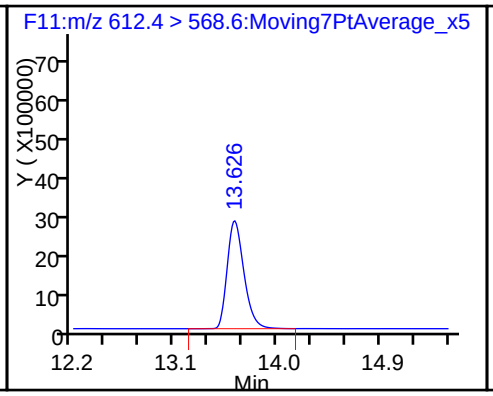
D 26 13C2 PFUnA



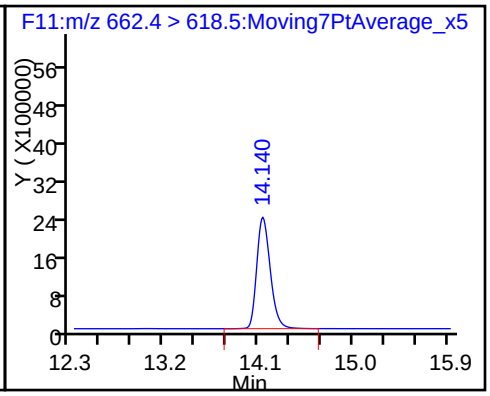
D 28 13C2 PFDoA



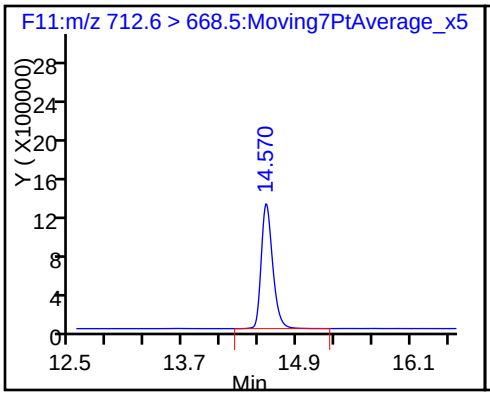
29 Perfluorododecanoic acid



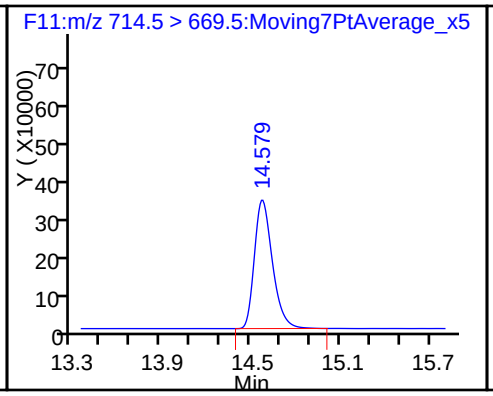
30 Perfluorotridecanoic acid



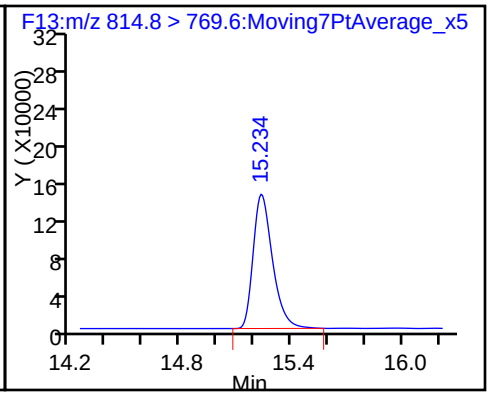
32 Perfluorotetradecanoic acid



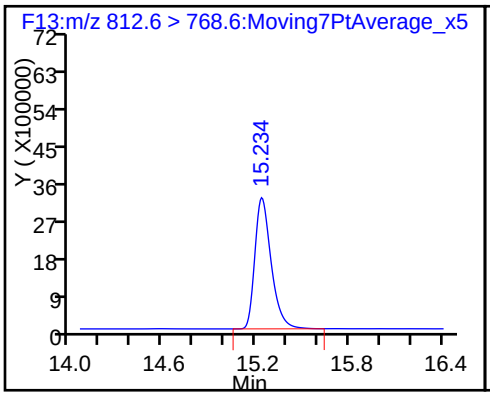
D 33 13C2-PFTeDA



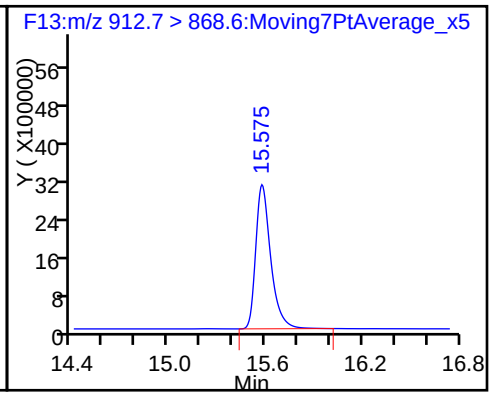
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Lab Sample ID: ICV 320-111733/10 Calibration Date: 05/27/2016 14:06

Instrument ID: A4 Calib Start Date: 05/27/2016 11:17

GC Column: Acquity ID: 2.10(mm) Calib End Date: 05/27/2016 13:24

Lab File ID: 27MAY2016B4A_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6490	0.6106		47.0	50.0	-5.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4942	0.4467		45.2	50.0	-9.6	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID		0.5371		35.9	44.3	-18.8	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4056		43.6	50.0	-12.9	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.5371	0.4909		45.7	50.0	-8.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.574	1.417		42.5	47.3	-10.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		6.445		39.1	47.6	-17.8	25.0
Perfluorooctanoic acid (PFOA)	L1ID		0.4084		44.7	50.0	-10.6	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID		10.80		42.7	47.8	-10.5	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.163		45.8	50.0	-8.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.075	1.076		50.0	50.0	0.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.054	0.9925		47.1	50.0	-5.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	3.741	3.558		45.9	48.3	-4.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.160	1.089		47.0	50.0	-6.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9167	0.8220		44.8	50.0	-10.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.032	1.033		50.0	50.0	0.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5573	0.4620		41.4	50.0	-17.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		2.732		48.1	50.0	-3.8	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.198	2.276		51.8	50.0	3.6	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_010.d
Lims ID: ICV
Client ID:
Sample Type: ICV
Inject. Date: 27-May-2016 14:06:25 ALS Bottle#: 9 Worklist Smp#: 10
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: ICV
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:51:28 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 27-May-2016 14:38:15

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.787	5.790	-0.003		4762953	46.0		92.1	12836	
2 Perfluorobutyric acid										
212.7 > 168.6	5.791	5.792	-0.001	1.000	2908312	47.0			6463	
D 3 13C5-PFPeA										
267.6 > 222.7	6.890	6.892	-0.002		3768377	49.7		99.4	6733	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	1683388	45.2			721	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.005	7.011	-0.006	1.000	775730	NC			1770	
298.8 > 98.6	7.005	7.011	-0.006	1.000	505850		1.53(0.00-0.00)		931	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.005	7.011	-0.006	1.000	775730	35.9				
D 6 13C2 PFHxA										
314.6 > 269.7	8.133	8.138	-0.005		5345566	57.1		114	11504	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	2168211	43.6			2213	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.209	8.231	-0.022	0.874	1628045	NC			5207	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	2193294	45.7			4658	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4467607	53.2		106	4498	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1543863	50.9		108	3545	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.396	9.401	-0.005	1.000	2185638	42.5				

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.396	9.401	-0.005	1.000	2185638	NC			3964	
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		5005370	52.2		104	8349	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	2044289	44.7			3150	
412.8 > 168.7	10.482	10.485	-0.003	1.000	668559		3.06(0.00-0.00)		2148	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.482	10.485	-0.003	1.000	2061791	39.1				
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.482	10.485	-0.003	1.000	2061791	NC			4750	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		321274	51.4		108	949	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	3465080	42.7			3222	
498.3 > 98.2	11.440	11.443	-0.003	1.000	2032381		1.70(0.00-0.00)		2333	
18 Perfluorononanoic acid										
462.5 > 418.6	11.459	11.462	-0.003	1.000	5235010	45.8			4934	
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		4502788	55.4		111	7277	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		5277737	51.2		102	6872	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	5676317	50.0			4286	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		5127590	54.0		108	4296	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	5089191	47.1			3054	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	1153936	NC			3829	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	1153936	45.9				
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	6290982	47.0			4186	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		5776341	53.2		106	4803	
D 28 13C2 PFDoA										
614.4 > 569.4	13.615	13.626	-0.011		6289554	56.5		113	4741	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.627	13.626	0.001	1.000	5169926	44.8			1542	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	4217813	50.0			1427	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.570	14.577	-0.007	1.000	1885580	41.4			895	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.570	14.579	-0.009		4081543	52.5		105	3965	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1437743	48.3		96.7	2542	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	3927794	48.1			613	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	3272932	51.8			2337	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_00016 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:51:29 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_010.d

Injection Date: 27-May-2016 14:06:25 Instrument ID: A4

Lims ID: ICV

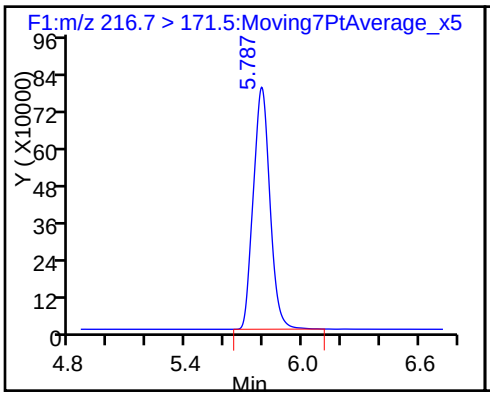
Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 10

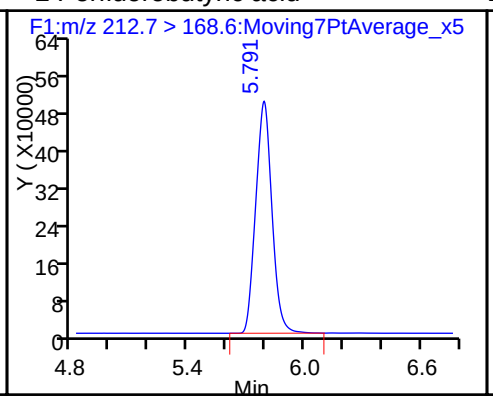
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

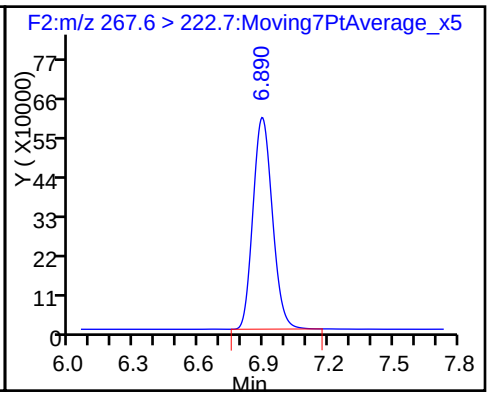
D 1 13C4 PFBA



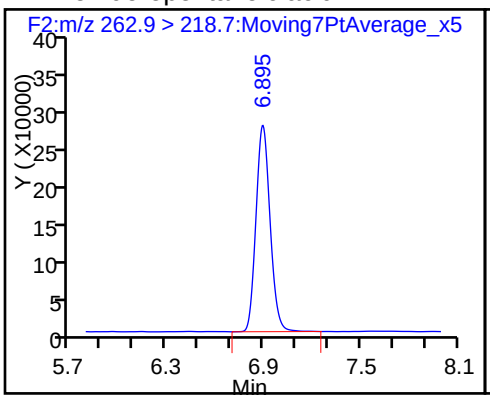
2 Perfluorobutyric acid



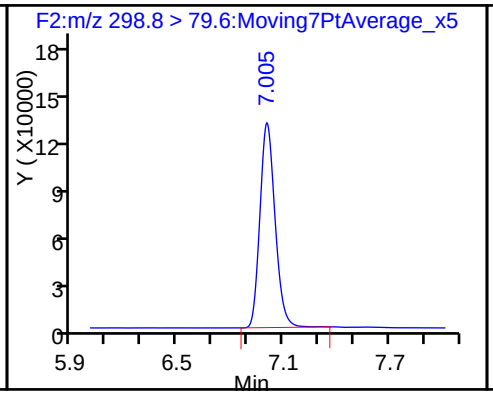
D 3 13C5-PFPeA



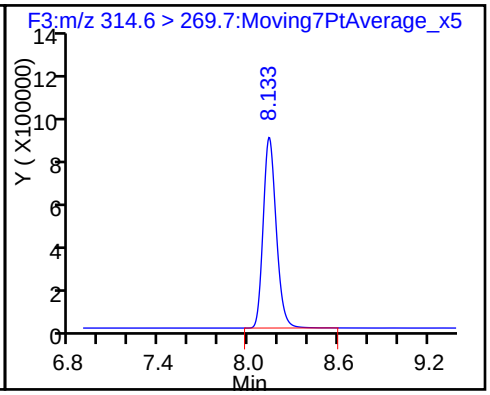
4 Perfluoropentanoic acid



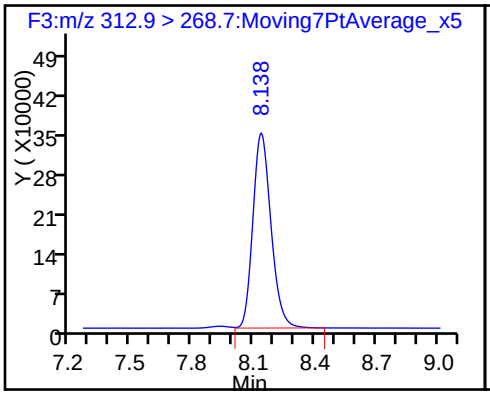
51 Perfluorobutanesulfonic acid



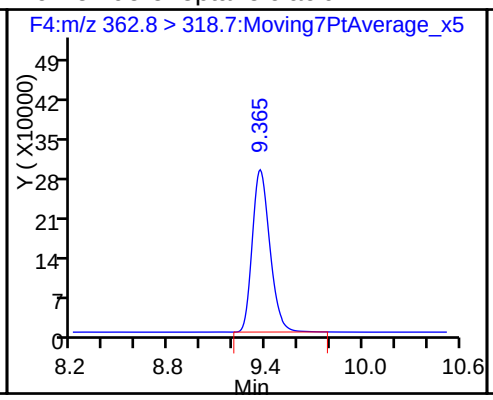
D 6 13C2 PFHxA



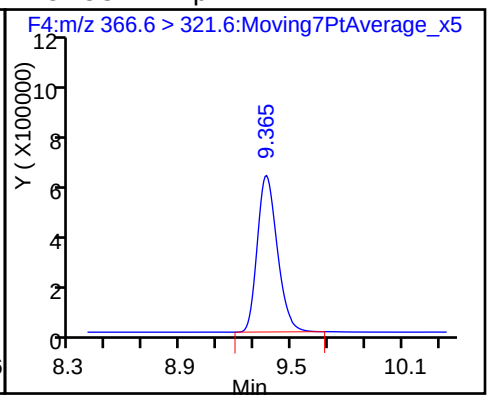
7 Perfluorohexanoic acid



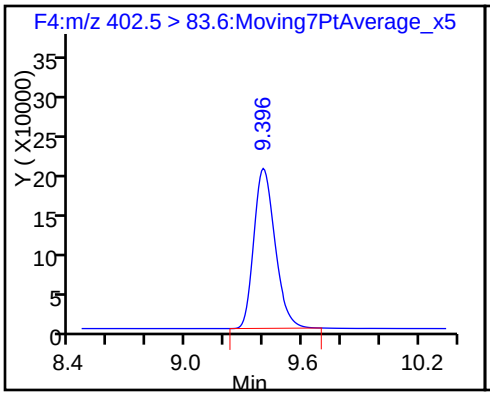
9 Perfluoroheptanoic acid



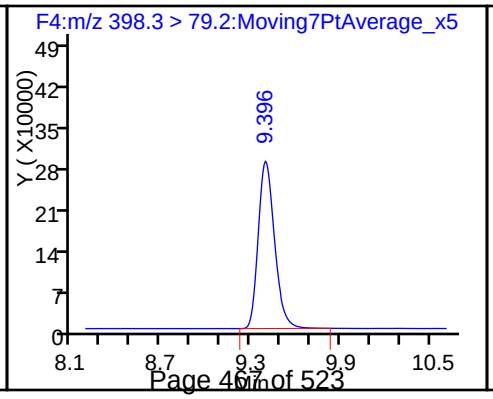
D 8 13C4-PFHpA



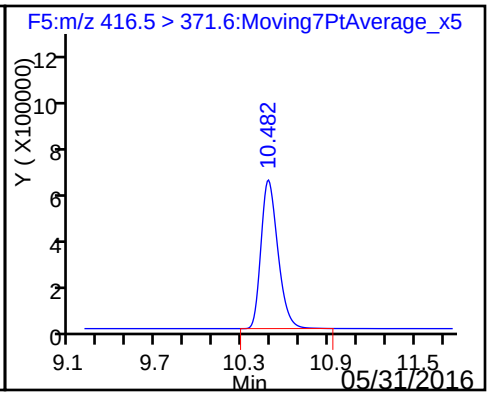
D 11 18O2 PFHxS



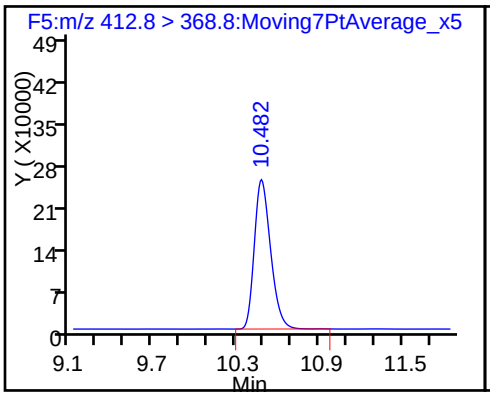
58 Perfluorohexanesulfonic acid



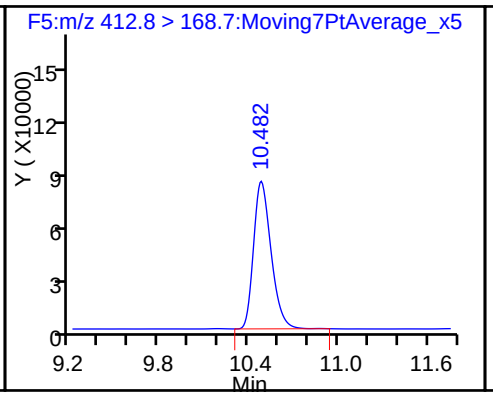
D 12 13C4 PFOA



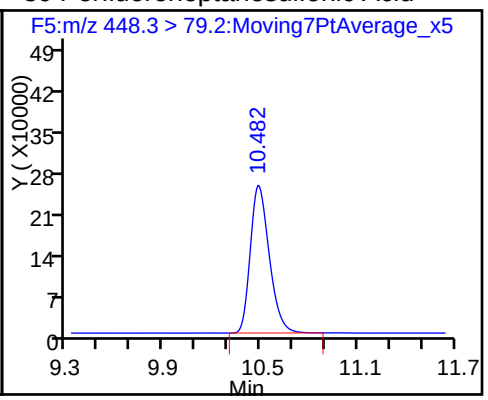
13 Perfluorooctanoic acid



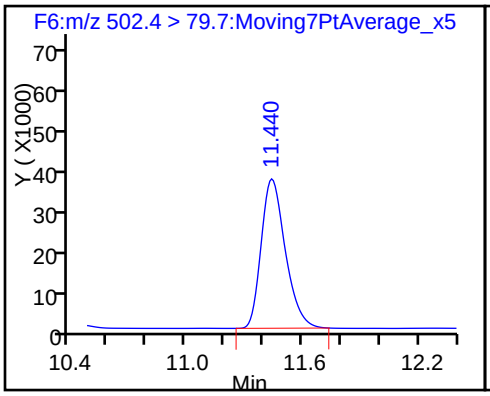
13 Perfluorooctanoic acid



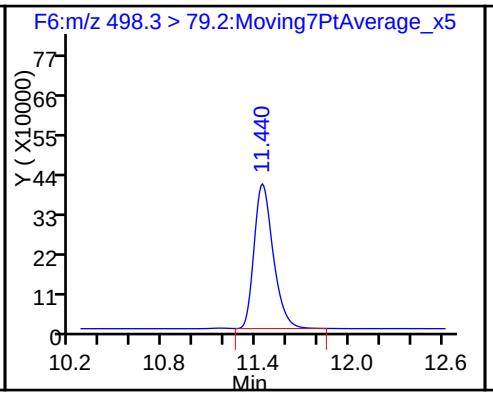
39 Perfluoroheptanesulfonic Acid



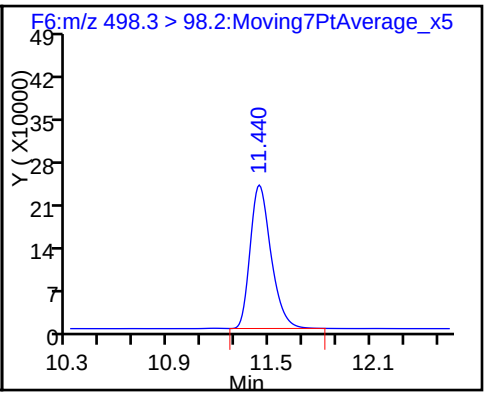
D 16 13C4 PFOS



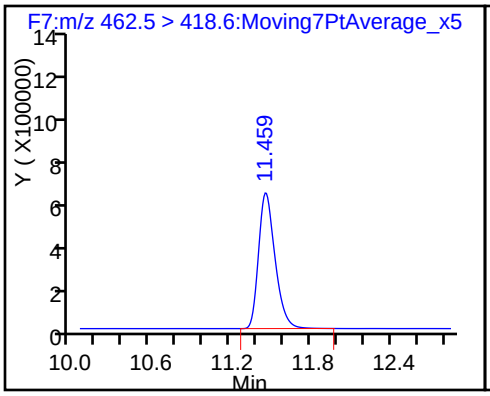
15 Perfluorooctane sulfonic acid



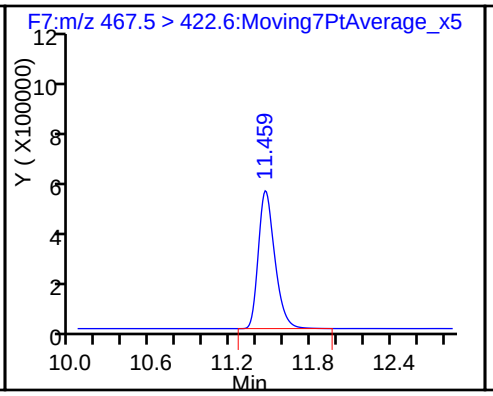
15 Perfluorooctane sulfonic acid



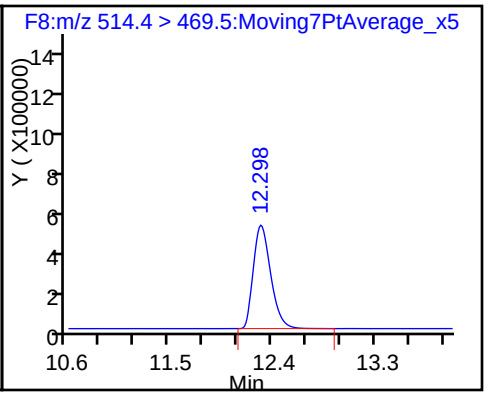
18 Perfluorononanoic acid



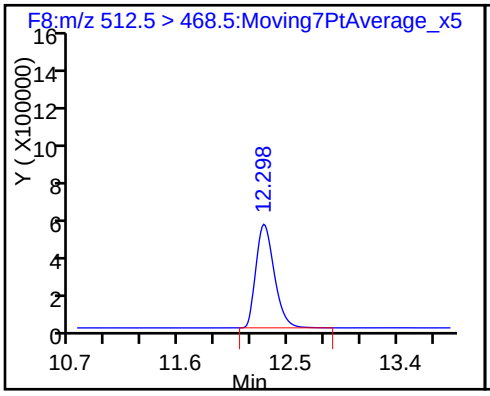
D 17 13C5 PFNA



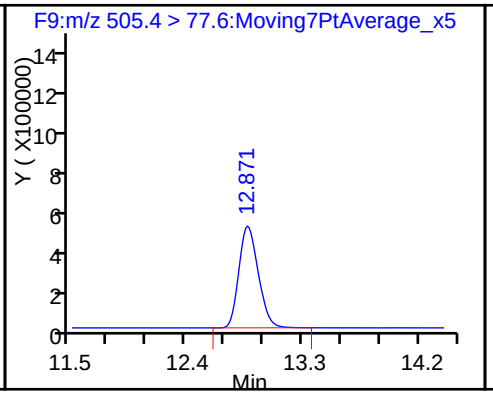
D 19 13C2 PFDA



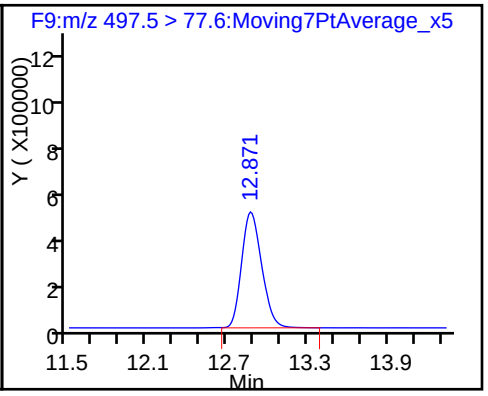
20 Perfluorodecanoic acid



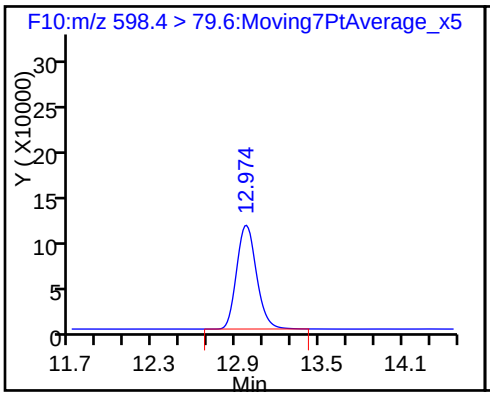
D 23 13C8 FOSA



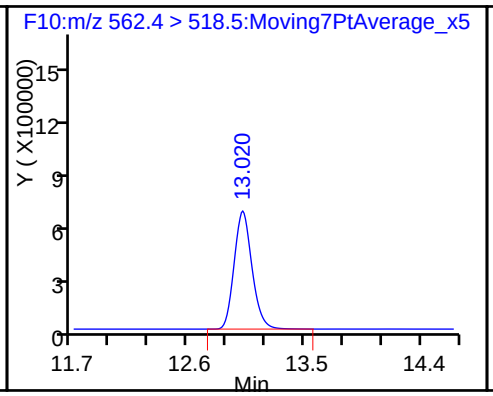
24 Perfluorooctane Sulfonamide



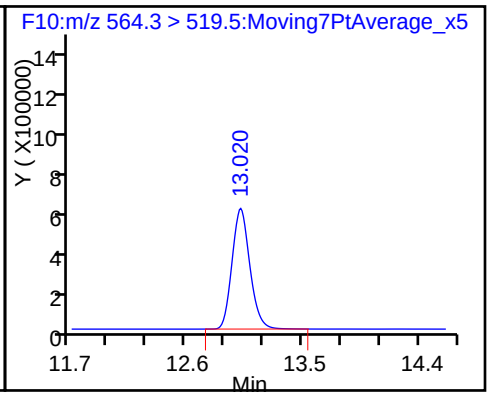
49 Perfluorodecane Sulfonic acid



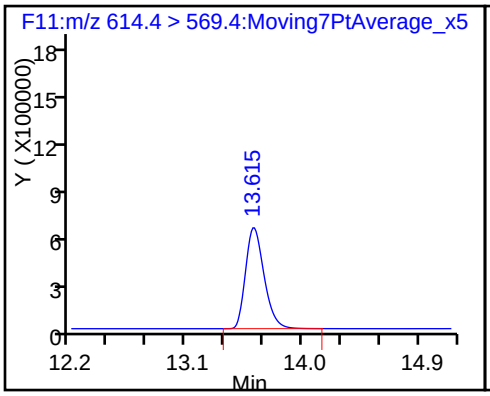
27 Perfluoroundecanoic acid



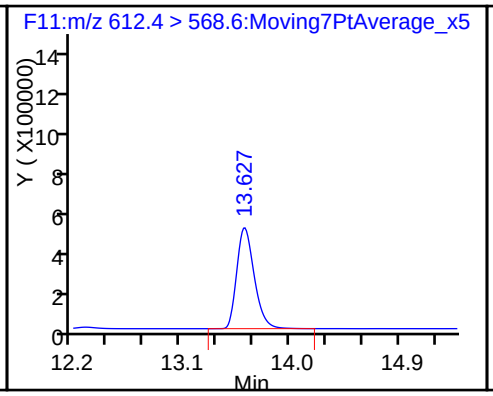
D 26 13C2 PFUnA



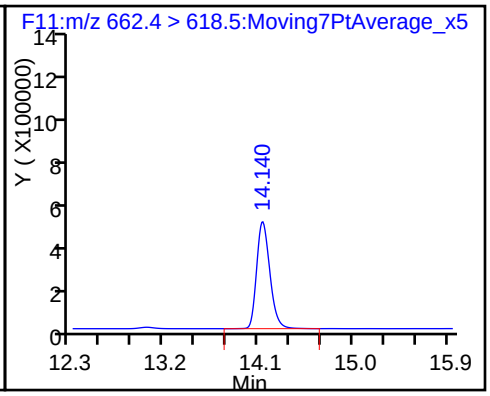
D 28 13C2 PFDoA



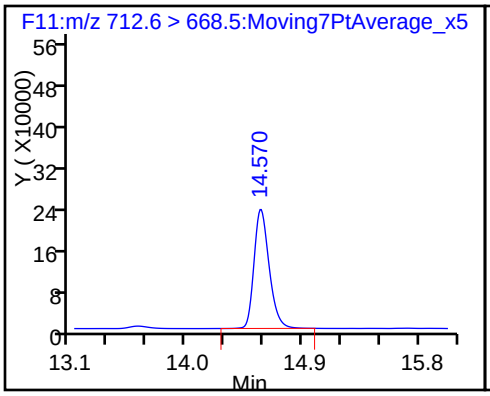
29 Perfluorododecanoic acid



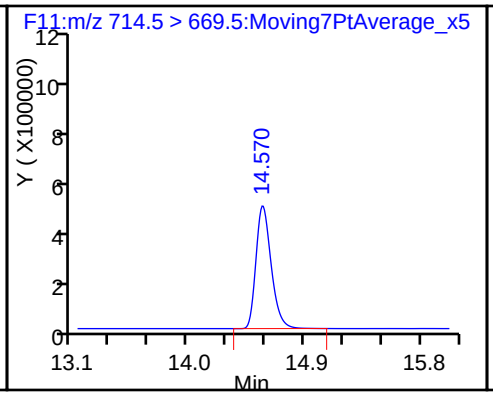
30 Perfluorotridecanoic acid



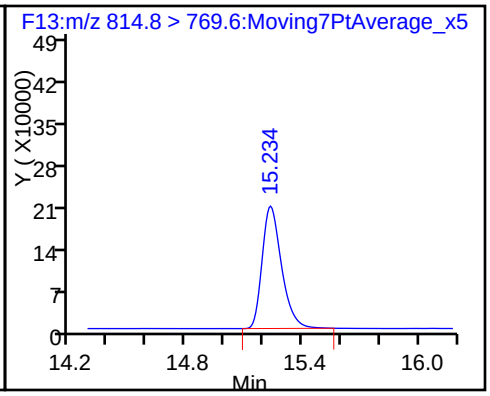
32 Perfluorotetradecanoic acid



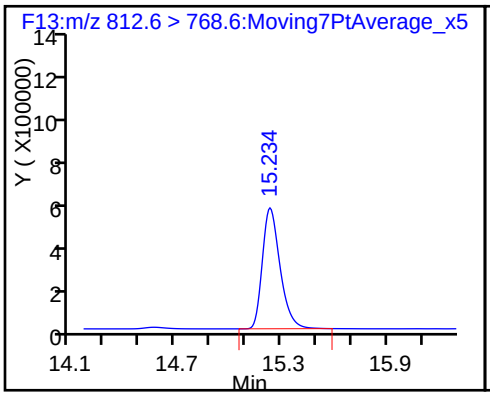
D 33 13C2-PFTeDA



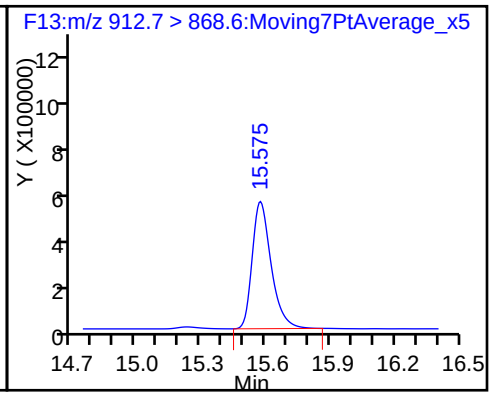
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Lab Sample ID: CCV 320-111733/23 Calibration Date: 05/27/2016 18:42

Instrument ID: A4 Calib Start Date: 05/27/2016 11:17

GC Column: Acquity ID: 2.10(mm) Calib End Date: 05/27/2016 13:24

Lab File ID: 27MAY2016B4A_023.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6490	0.6915		53.3	50.0	6.5	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4942	0.4740		48.0	50.0	-4.1	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID		0.6882		46.0	44.2	4.1	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4513		48.5	50.0	-3.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.5371	0.5293		49.3	50.0	-1.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.574	1.487		44.7	47.3	-5.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		7.252		44.0	47.6	-7.6	25.0
Perfluorooctanoic acid (PFOA)	L1ID		0.4505		49.3	50.0	-1.4	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID		11.15		44.2	47.8	-7.6	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.224		48.3	50.0	-3.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.075	1.202		55.9	50.0	11.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.054	1.111		52.7	50.0	5.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	3.741	3.363		43.3	48.2	-10.1	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.160	1.201		51.8	50.0	3.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9167	0.9270		50.6	50.0	1.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.032	1.091		52.8	50.0	5.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5573	0.4756		42.7	50.0	-14.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.269		57.7	50.0	15.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.198	2.375		54.0	50.0	8.0	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_023.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 27-May-2016 18:42:57 ALS Bottle#: 14 Worklist Smp#: 23
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 09:52:33 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.794	5.790	0.004		4072019	39.4		78.7	12139	
2 Perfluorobutyric acid										
212.7 > 168.6	5.794	5.792	0.002	1.000	2815816	53.3		107	7619	
D 3 13C5-PFPeA										
267.6 > 222.7	6.895	6.892	0.003		3203912	42.2		84.5	6581	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	1518596	48.0		95.9	959	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.014	7.011	0.003	1.000	802755	NC			1808	
298.8 > 98.6	7.014	7.011	0.003	1.000	496028		1.62(0.00-0.00)		1282	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.014	7.011	0.003	1.000	802755	46.0		104		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		4113361	44.0		87.9	9803	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	1856391	48.5		97.0	2713	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.220	8.231	-0.011	0.874	1559642	NC			9304	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	1821889	49.3		98.5	5113	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		3442177	41.0		82.0	4860	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		1248263	41.2		87.0	3831	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	1855698	44.7		94.4		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	1855698	NC			3223	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		3881044	40.5		81.0	4588	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	1748581	49.3		98.6	5320	
412.8 > 168.7	10.482	10.485	-0.003	1.000	572400		3.05(0.00-0.00)		1661	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.482	10.485	-0.003	1.000	2037774	44.0		92.4		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.482	10.485	-0.003	1.000	2037774	NC			4798	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		282170	45.2		94.5	792	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	3146623	44.2		92.4	2909	
498.3 > 98.2	11.440	11.443	-0.003	1.000	1901433		1.65(0.00-0.00)		2771	
18 Perfluorononanoic acid										
462.5 > 418.6	11.469	11.462	0.007	1.000	4254039	48.3		96.5	5552	
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		3475259	42.7		85.5	4914	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		4116684	40.0		79.9	5197	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	4949296	55.9		112	6267	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		4126571	43.5		87.0	4203	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.871	12.873	-0.002	1.000	4583763	52.7		105	2323	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	956792	NC			1657	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	956792	43.3		89.9		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	5665647	51.8		104	4508	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		4718095	43.5		87.0	5290	
D 28 13C2 PFDoA										
614.4 > 569.4	13.627	13.626	0.001		5012463	45.1		90.1	3260	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.627	13.626	0.001	1.000	4646597	50.6		101	2036	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	3598133	52.8		106	1342	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	1568861	42.7		85.3	928	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		3298754	42.4		84.9	3425	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1056305	35.5		71.0	2548	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	3453129	57.7		115	603	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	2508338	54.0		108	2662	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 09:52:33 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_023.d

Injection Date: 27-May-2016 18:42:57 Instrument ID: A4

Lims ID: CCV L5

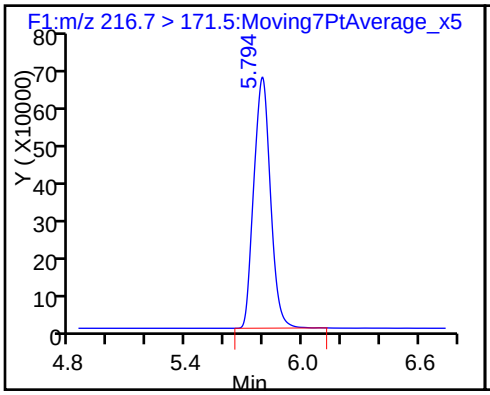
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 23

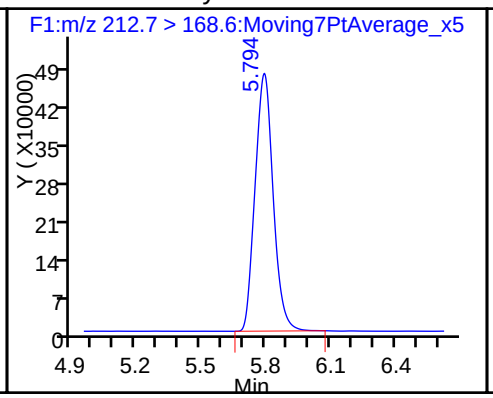
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

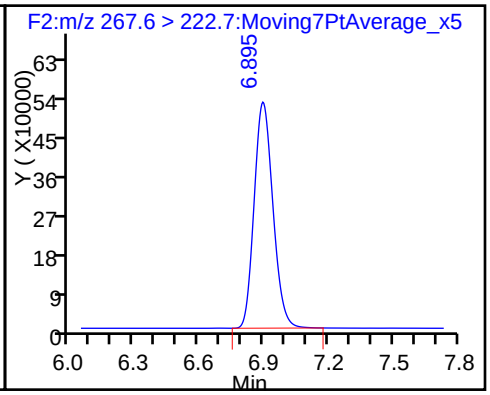
D 1 13C4 PFBA



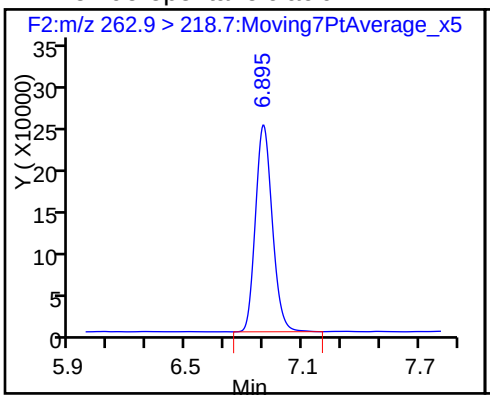
2 Perfluorobutyric acid



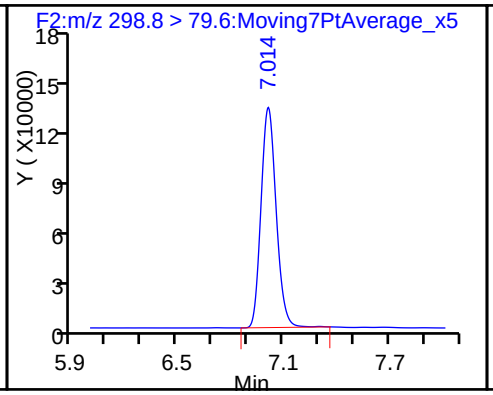
D 3 13C5-PFPeA



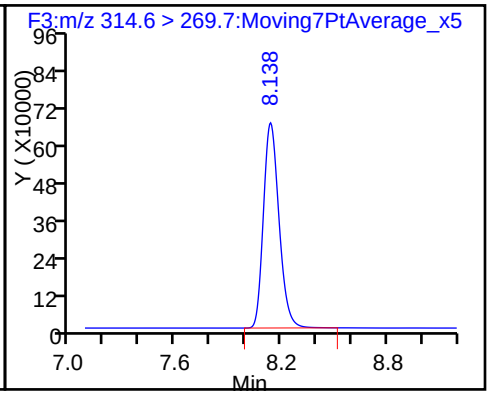
4 Perfluoropentanoic acid



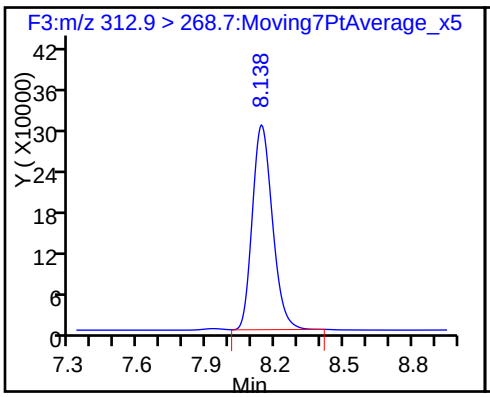
51 Perfluorobutanesulfonic acid



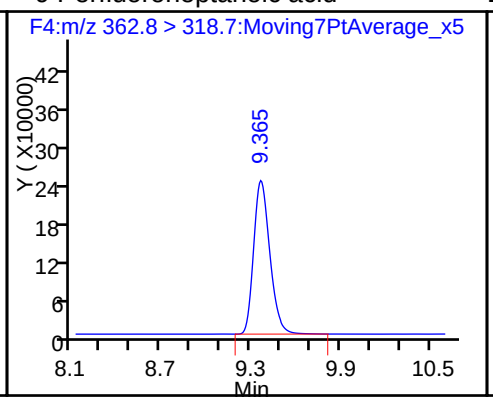
D 6 13C2 PFHxA



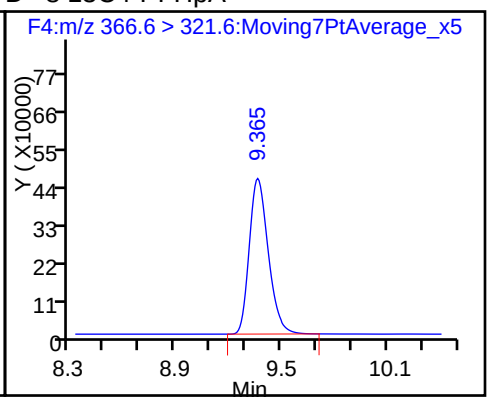
7 Perfluorohexanoic acid



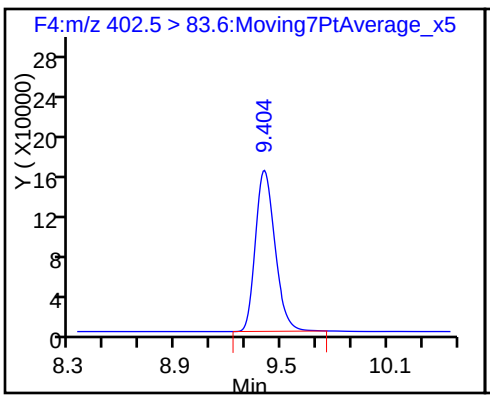
9 Perfluoroheptanoic acid



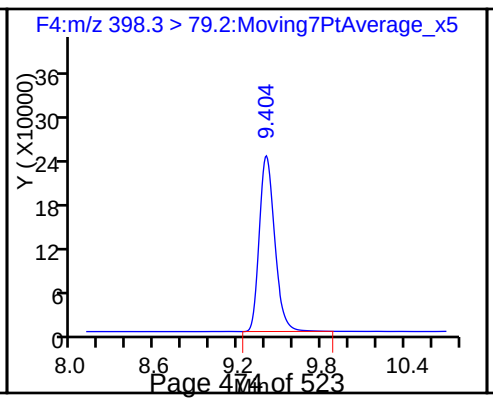
D 8 13C4-PFHpA



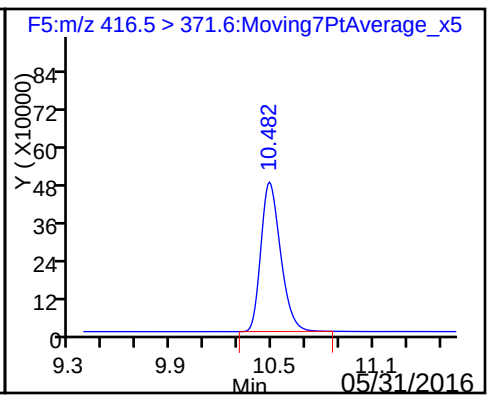
D 11 18O2 PFHxS



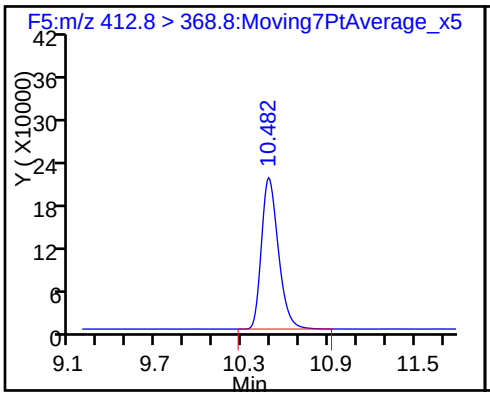
58 Perfluorohexanesulfonic acid



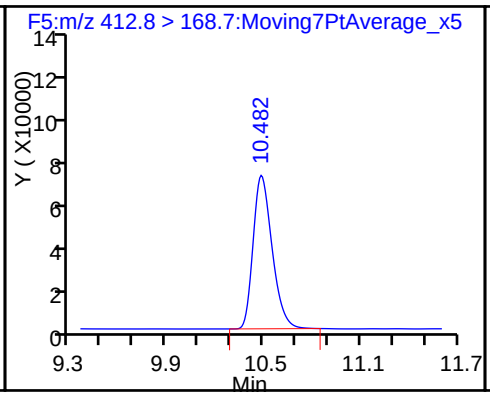
D 12 13C4 PFOA



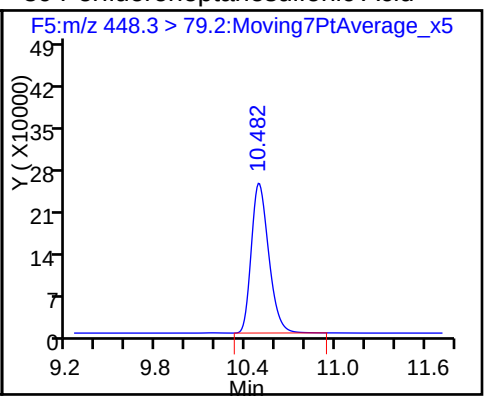
13 Perfluorooctanoic acid



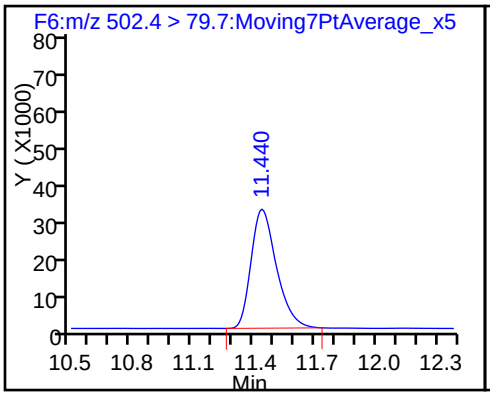
13 Perfluorooctanoic acid



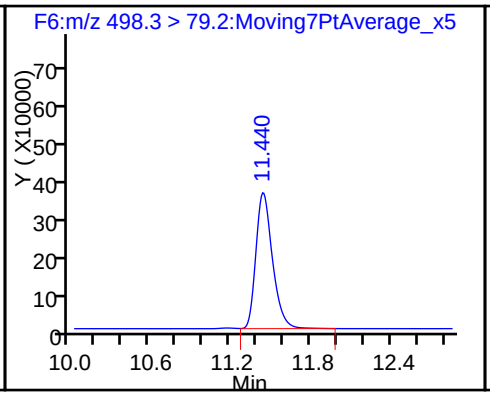
39 Perfluoroheptanesulfonic Acid



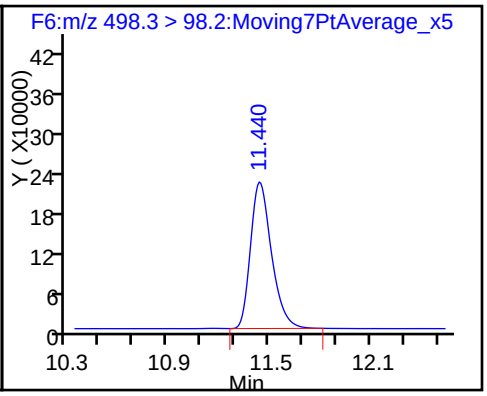
D 16 13C4 PFOS



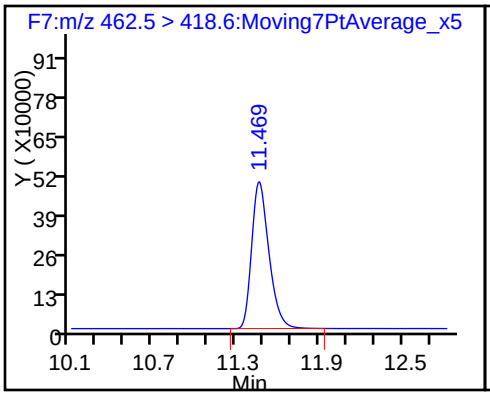
15 Perfluorooctane sulfonic acid



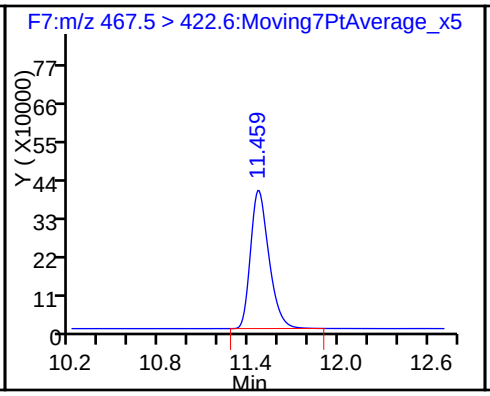
15 Perfluorooctane sulfonic acid



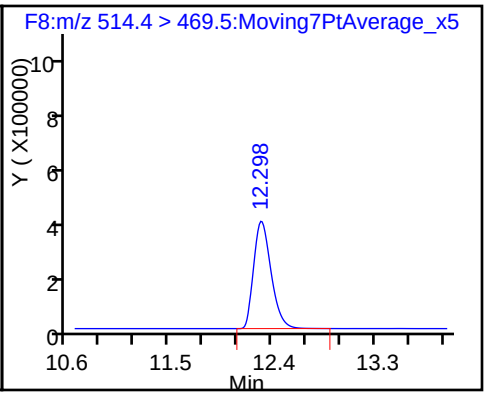
18 Perfluorononanoic acid



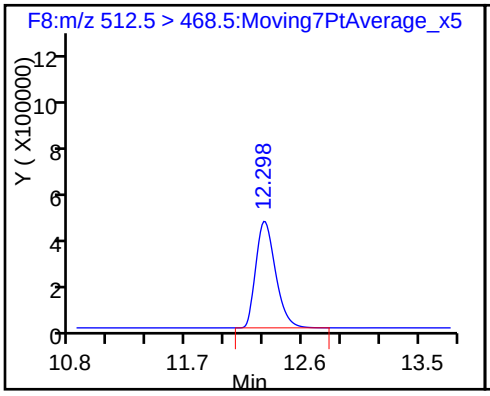
D 17 13C5 PFNA



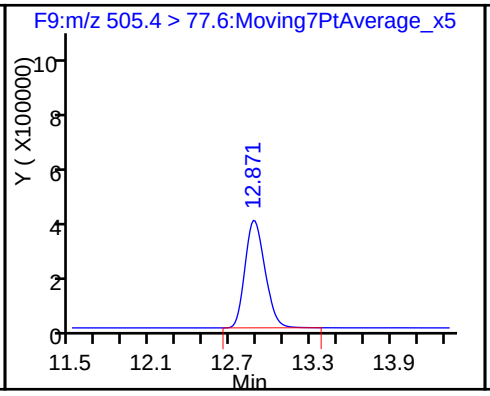
D 19 13C2 PFDA



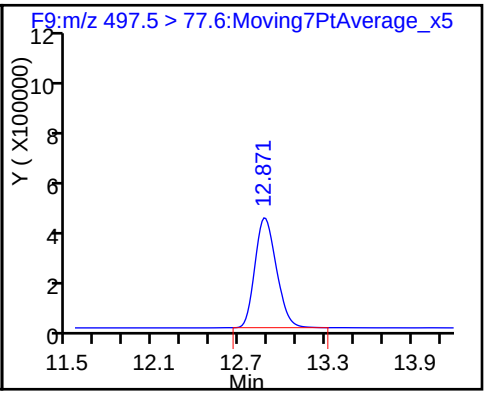
20 Perfluorodecanoic acid



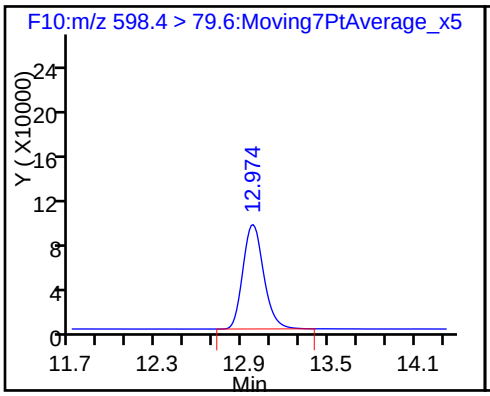
D 23 13C8 FOSA



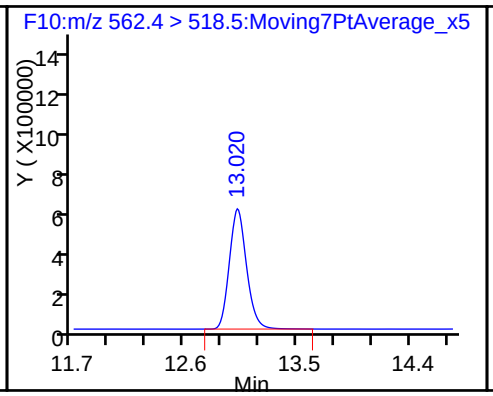
24 Perfluorooctane Sulfonamide



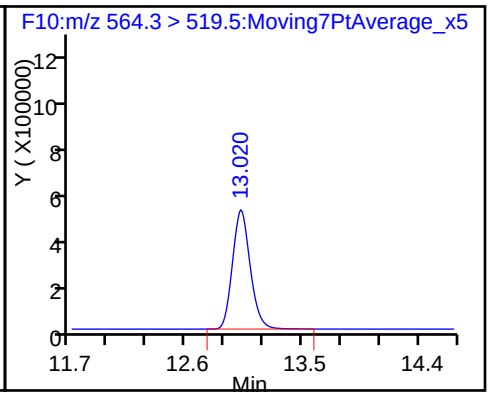
49 Perfluorodecane Sulfonic acid



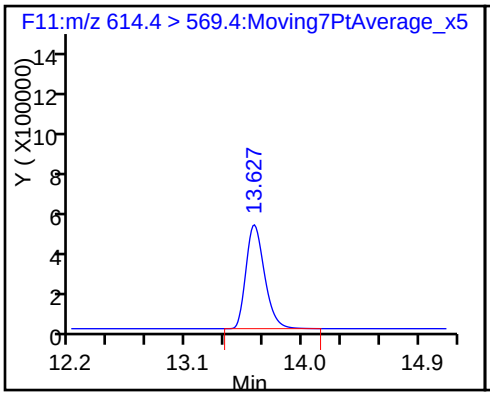
27 Perfluoroundecanoic acid



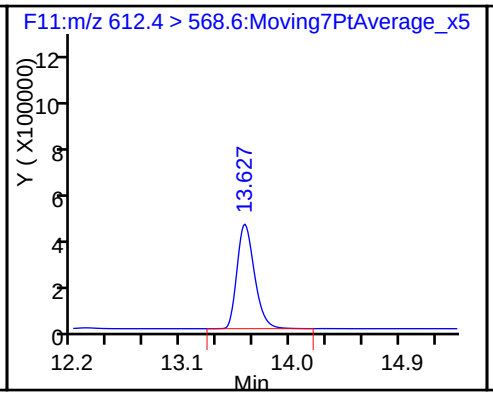
D 26 13C2 PFUnA



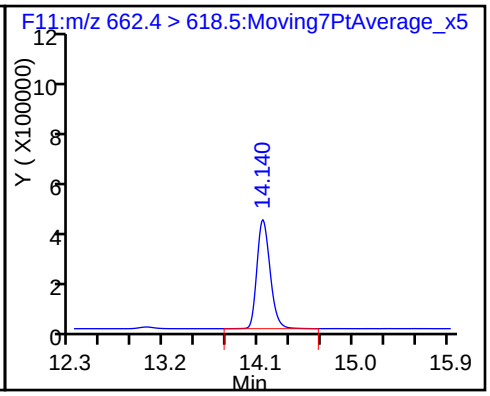
D 28 13C2 PFDoA



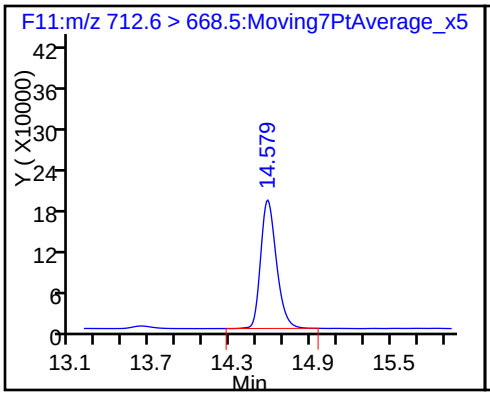
29 Perfluorododecanoic acid



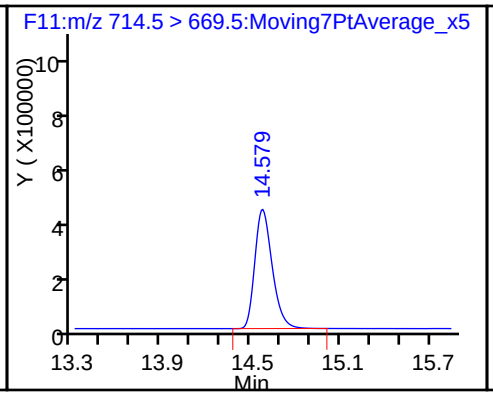
30 Perfluorotridecanoic acid



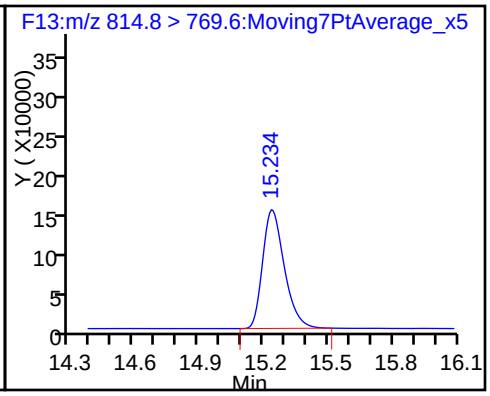
32 Perfluorotetradecanoic acid



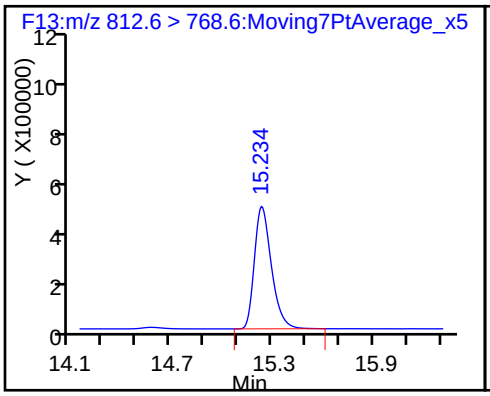
D 33 13C2-PFTeDA



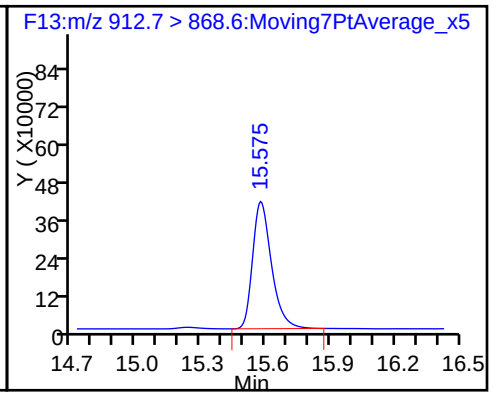
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Lab Sample ID: CCV 320-111733/37 Calibration Date: 05/28/2016 02:08

Instrument ID: A4 Calib Start Date: 05/27/2016 11:17

GC Column: Acquity ID: 2.10(mm) Calib End Date: 05/27/2016 13:24

Lab File ID: 27MAY2016B4A_037.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6490	0.6799		52.4	50.0	4.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.4942	0.4484		45.4	50.0	-9.3	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID		0.6895		46.1	44.2	4.3	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4431		47.6	50.0	-4.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.5371	0.5012		46.7	50.0	-6.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.574	1.675		50.3	47.3	6.4	25.0
Perfluorooctanoic acid (PFOA)	L1ID		0.4168		45.6	50.0	-8.8	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID		9.309		56.4	47.6	18.6	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID		14.23		56.4	47.8	17.9	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.266		49.9	50.0	-0.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.075	1.184		55.1	50.0	10.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.054	1.109		52.6	50.0	5.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	3.741	4.386		56.5	48.2	17.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.160	1.235		53.2	50.0	6.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9167	0.9685		52.8	50.0	5.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.032	1.163		56.3	50.0	12.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5573	0.5026		45.1	50.0	-9.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.051		53.8	50.0	7.6	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.198	2.500		56.9	50.0	13.8	25.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_037.d
Lims ID: CCV L5
Client ID:
Sample Type: CCV
Inject. Date: 28-May-2016 02:08:00 ALS Bottle#: 14 Worklist Smp#: 37
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: CCV L5
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4
Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 10:42:25 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.791	5.790	0.001		4329340	41.9		83.7	15403	
2 Perfluorobutyric acid										
212.7 > 168.6	5.794	5.792	0.002	1.000	2943441	52.4		105	7842	
D 3 13C5-PFPeA										
267.6 > 222.7	6.890	6.892	-0.002		3333257	43.9		87.9	8613	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	1494601	45.4		90.7	913	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.010	7.011	-0.001	1.000	777338	NC			1727	
298.8 > 98.6	7.005	7.011	-0.006	0.999	496200		1.57(0.00-0.00)		1276	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.010	7.011	-0.001	1.000	777338	46.1		104		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		3993271	42.7		85.3	7791	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	1769525	47.6		95.2	2332	
22 PFPeS (Perflouro-1-pentanesulfonat										
348.7 > 79.5	8.215	8.231	-0.016	0.874	1567832	NC			5321	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.365	9.365	0.0	1.000	1854296	46.7		93.3	5239	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		3699510	44.1		88.1	7172	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		1206510	39.8		84.1	4020	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	2020439	50.3		106		
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	2020439	NC			3605	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		4156934	43.4		86.8	6246	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	1732402	45.6		91.2	2685	
412.8 > 168.7	10.482	10.485	-0.003	1.000	554413		3.12(0.00-0.00)		1833	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.491	10.485	0.006	1.000	2116387	56.4		119		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.491	10.485	0.006	1.000	2116387	NC			4526	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		228301	36.5		76.4	699	
15 Perfluorooctane sulfonic acid										
498.3 > 79.2	11.440	11.443	-0.003	1.000	3249455	56.4		118	2907	
498.3 > 98.2	11.440	11.443	-0.003	1.000	1916507		1.70(0.00-0.00)		2760	
18 Perfluorononanoic acid										
462.5 > 418.6	11.469	11.462	0.007	1.000	4453955	49.9		99.9	5514	
D 17 13C5 PFNA										
467.5 > 422.6	11.469	11.462	0.007		3517112	43.3		86.5	7298	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		4319127	41.9		83.8	5139	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	5115777	55.1		110	5540	
D 23 13C8 FOSA										
505.4 > 77.6	12.884	12.871	0.013		3956764	41.7		83.4	3240	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.884	12.873	0.011	1.000	4386790	52.6		105	2976	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	1009679	NC			2533	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	1009679	56.5		117		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	5730191	53.2		106	3942	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		4641393	42.8		85.6	6033	
D 28 13C2 PFDoA										
614.4 > 569.4	13.626	13.626	0.0		4654356	41.8		83.7	3644	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.626	13.626	0.0	1.000	4507602	52.8		106	2058	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	3874322	56.3		113	1678	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	1675124	45.1		90.2	1013	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		3332708	42.9		85.8	3296	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1211176	40.7		81.4	2712	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	3695251	53.8		108	627	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	3028290	56.9		114	2727	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Report Date: 31-May-2016 10:42:26 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_037.d

Injection Date: 28-May-2016 02:08:00 Instrument ID: A4

Lims ID: CCV L5

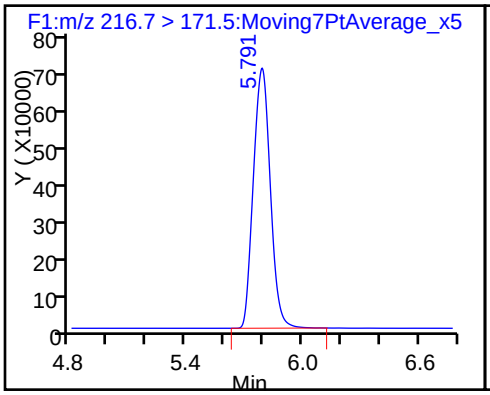
Client ID:

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 37

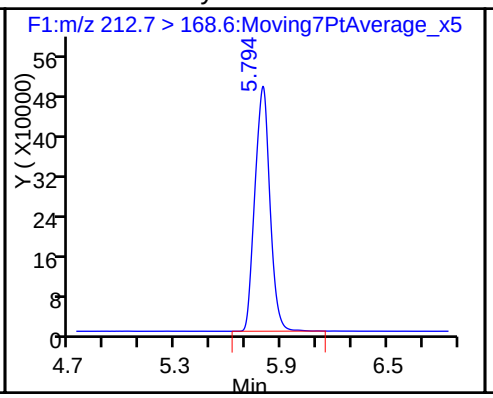
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

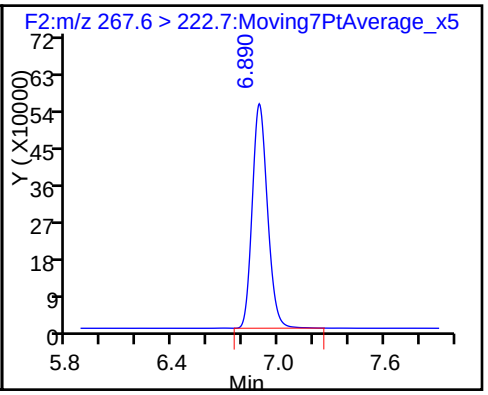
D 1 13C4 PFBA



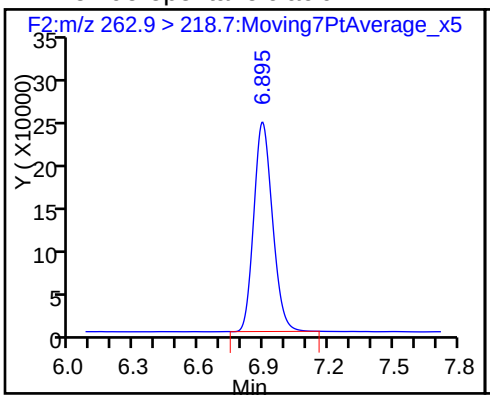
2 Perfluorobutyric acid



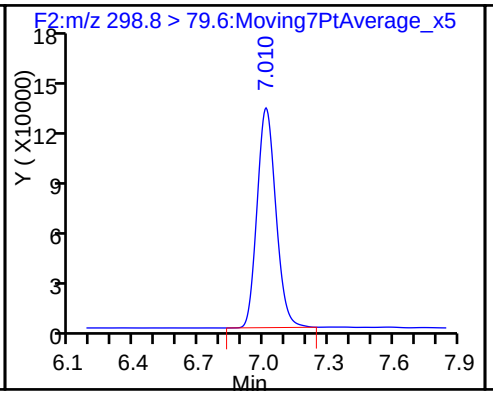
D 3 13C5-PFPeA



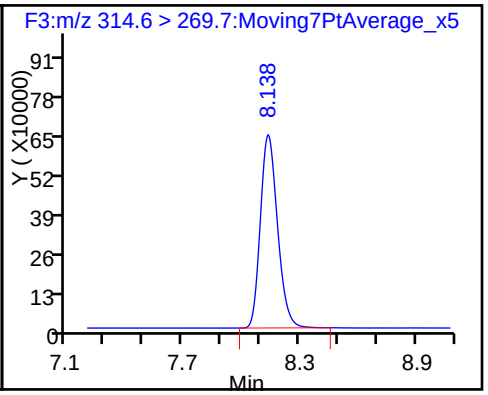
4 Perfluoropentanoic acid



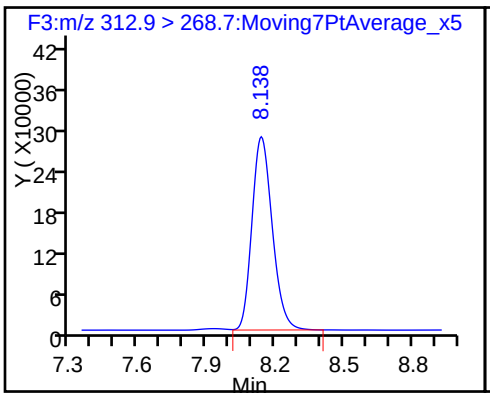
51 Perfluorobutanesulfonic acid



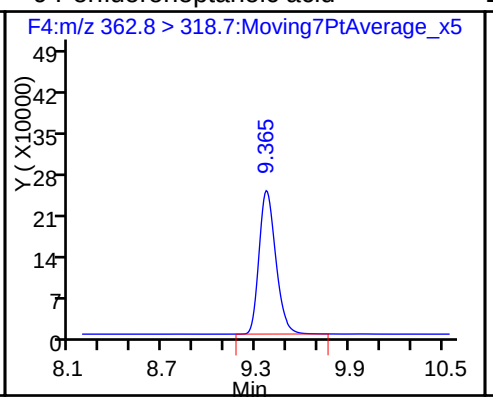
D 6 13C2 PFHxA



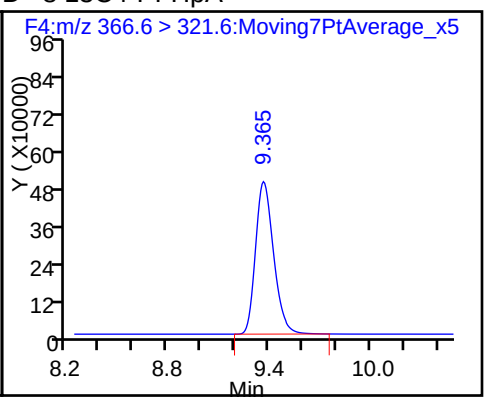
7 Perfluorohexanoic acid



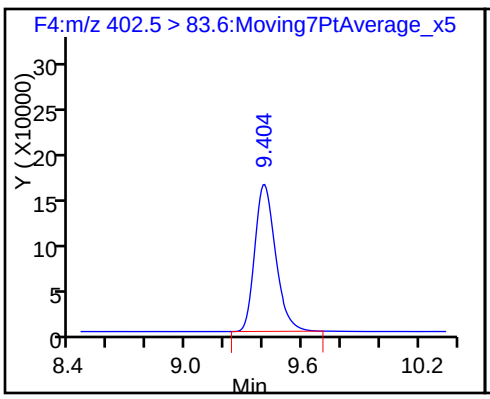
9 Perfluoroheptanoic acid



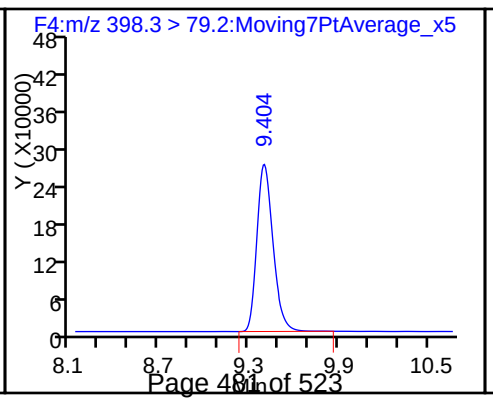
D 8 13C4-PFHpA



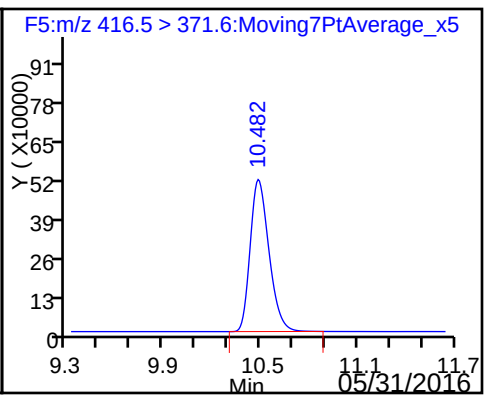
D 11 18O2 PFHxS



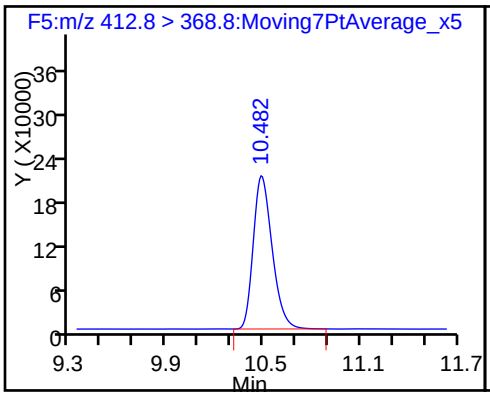
58 Perfluorohexanesulfonic acid



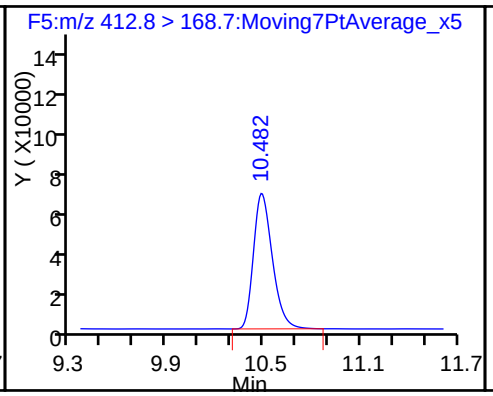
D 12 13C4 PFOA



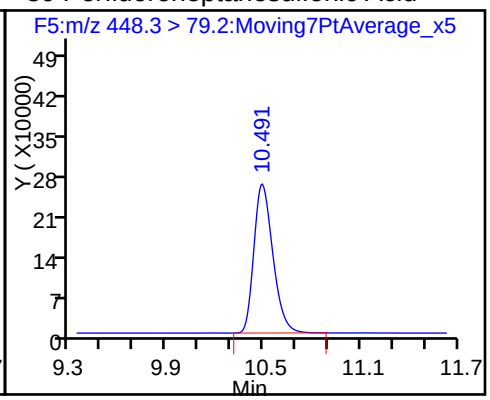
13 Perfluorooctanoic acid



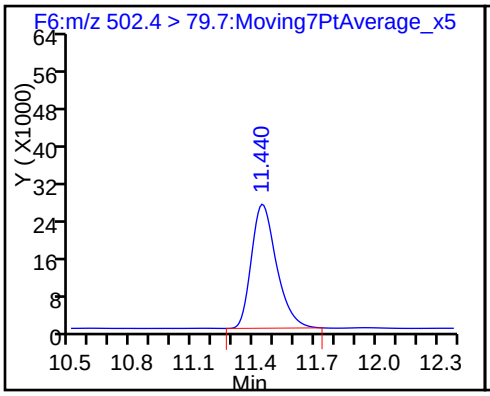
13 Perfluorooctanoic acid



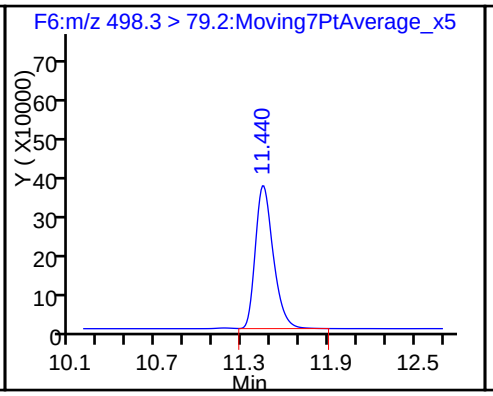
39 Perfluoroheptanesulfonic Acid



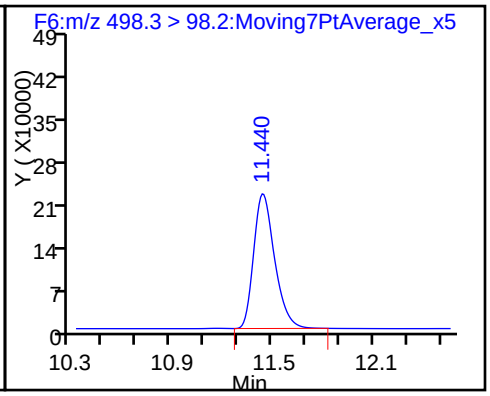
D 16 13C4 PFOS



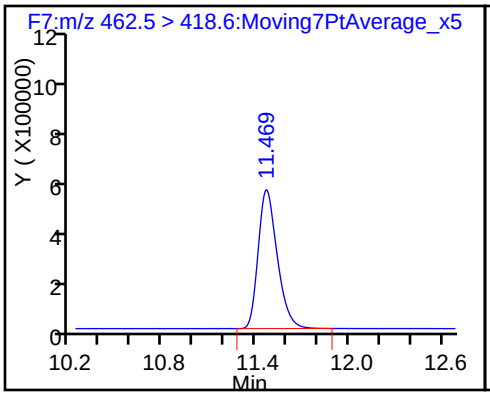
15 Perfluorooctane sulfonic acid



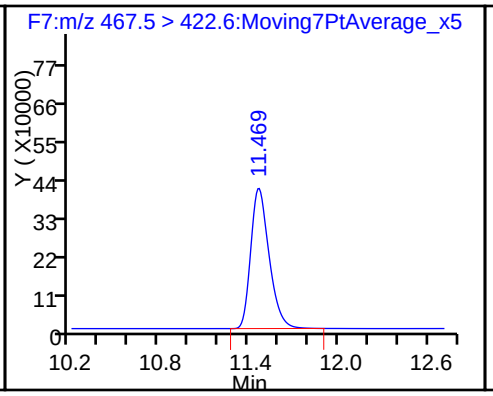
15 Perfluorooctane sulfonic acid



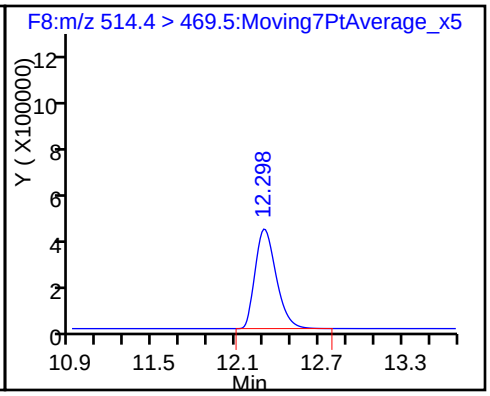
18 Perfluorononanoic acid



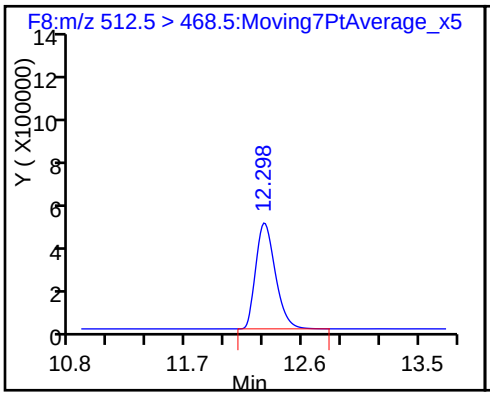
D 17 13C5 PFNA



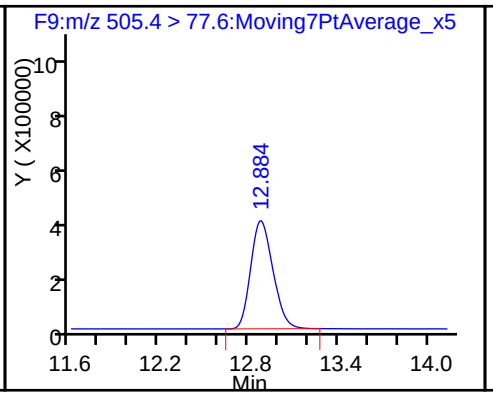
D 19 13C2 PFDA



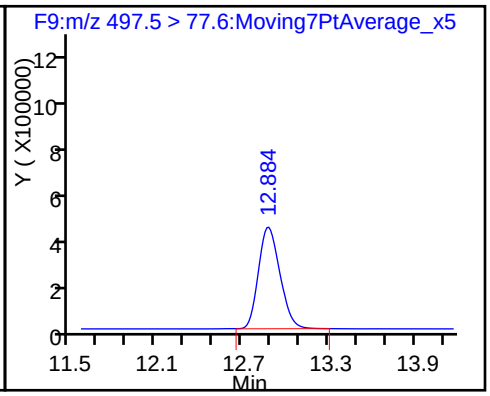
20 Perfluorodecanoic acid



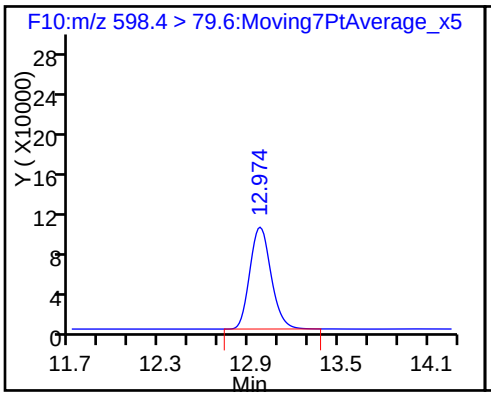
D 23 13C8 FOSA



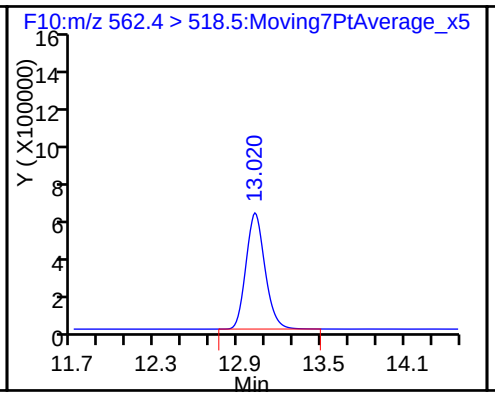
24 Perfluorooctane Sulfonamide



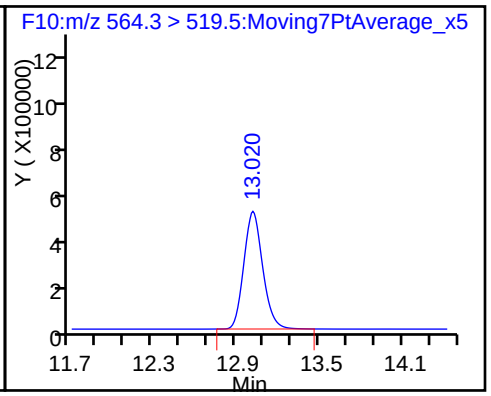
49 Perfluorodecane Sulfonic acid



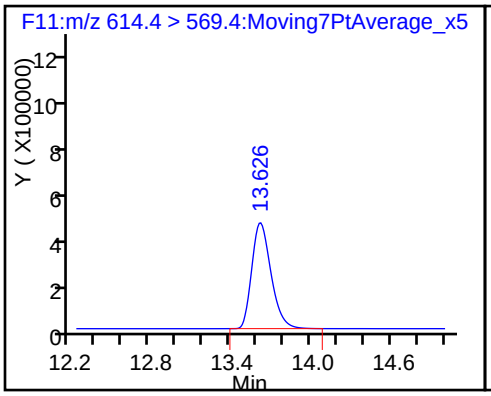
27 Perfluoroundecanoic acid



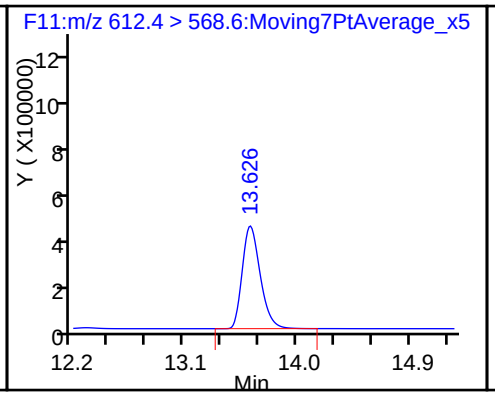
D 26 13C2 PFUnA



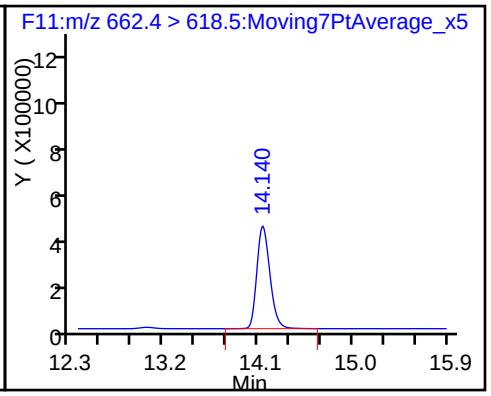
D 28 13C2 PFDoA



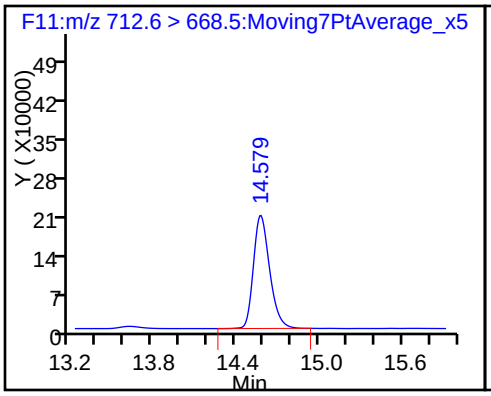
29 Perfluorododecanoic acid



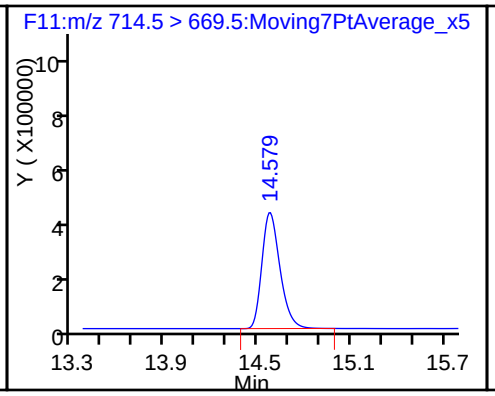
30 Perfluorotridecanoic acid



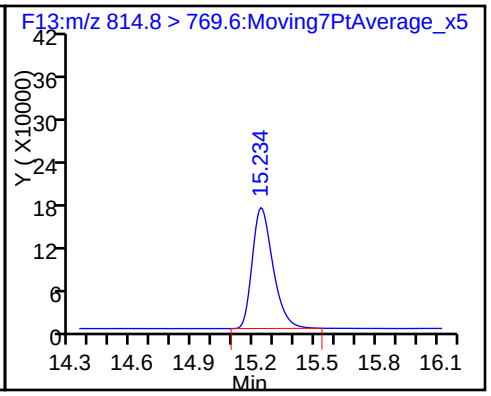
32 Perfluorotetradecanoic acid



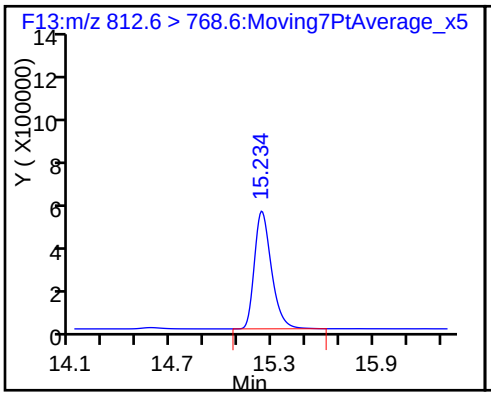
D 33 13C2-PFTeDA



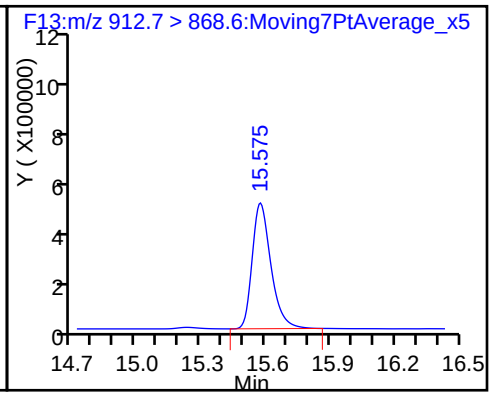
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-18918-1

SDG No.:

Client Sample ID: | Lab Sample ID: MB 320-110721/1-A

Matrix: Water | Lab File ID: 27MAY2016B4A_019.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/20/2016 11:05

Sample wt/vol: 500(mL) | Date Analyzed: 05/27/2016 17:18

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 111733 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U M	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	107		25-150
STL00991	13C4 PFOS	127		25-150
STL00995	13C5 PFNA	97		25-150
STL00990	13C4 PFOA	105		25-150
STL01892	13C4-PFHpA	97		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_019.d
Lims ID: MB 320-110721/1-A
Client ID:
Sample Type: MB
Inject. Date: 27-May-2016 17:18:14 ALS Bottle#: 28 Worklist Smp#: 19
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: mb 320-110721/1-a BOX 78
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 10:47:18 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 31-May-2016 10:05:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.791	5.790	0.001		4705233	45.5		91.0	17501	
2 Perfluorobutyric acid										
212.7 > 168.6	5.778	5.792	-0.014	1.000	8296	0.1358			26.1	
D 3 13C5-PFPeA										
267.6 > 222.7	6.895	6.892	0.003		3596963	47.4		94.8	8647	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.886	6.895	-0.009	1.000	5841	0.1643			4.8	
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		4660266	49.8		99.6	10856	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.138	8.140	-0.002	1.000	14891	0.2070			56.7	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4084681	48.6		97.3	8006	
D 11 18O2 PFHxS										
402.5 > 83.6	9.396	9.399	-0.003		1539618	50.8		107	5009	
58 Perfluorohexanesulfonic acid										
398.3 > 79.2	9.404	9.401	0.003	1.000	9231	0.1802				
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	9231	NC			27.9	
D 12 13C4 PFOA										
416.5 > 371.6	10.482	10.483	-0.001		5023595	52.4		105	7947	
13 Perfluorooctanoic acid										
412.8 > 368.8	10.482	10.485	-0.003	1.000	2796	0.1394			6.2	
D 16 13C4 PFOS										
502.4 > 79.7	11.440	11.441	-0.001		380246	60.9		127	1073	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctane sulfonic acid										M
498.3 > 79.2	11.440	11.443	-0.003	1.000	12482	0.2163			22.5	M
498.3 > 98.2	11.440	11.443	-0.003	1.000	8903		1.40(0.00-0.00)		16.7	M
D 17 13C5 PFNA										
467.5 > 422.6	11.459	11.462	-0.003		3931403	48.4		96.7	6705	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		5352114	51.9		104	6836	
D 23 13C8 FOSA										
505.4 > 77.6	12.871	12.871	0.0		1209449	12.7		25.5	2429	
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	17500	0.1238			28.5	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		6094372	56.2		112	5430	
D 28 13C2 PFDoA										
614.4 > 569.4	13.627	13.626	0.001		5695148	51.2		102	4797	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.627	13.626	0.001	1.000	7373	0.0706			4.8	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	4152	0.0569			2.5	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	17411	0.4419			8.5	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.570	14.579	-0.009		3535235	45.5		91.0	3564	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.234	15.235	-0.001		1061175	35.7		71.3	2636	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.234	15.235	-0.001	1.000	57867	0.2120			12.3	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-May-2016 10:47:27 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_019.d

Injection Date: 27-May-2016 17:18:14 Instrument ID: A4

Lims ID: MB 320-110721/1-A

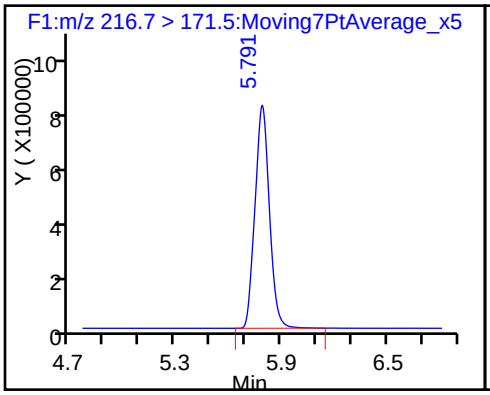
Client ID:

Operator ID: JRB ALS Bottle#: 28 Worklist Smp#: 19

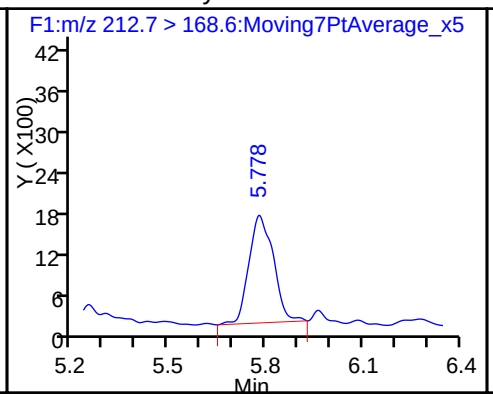
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

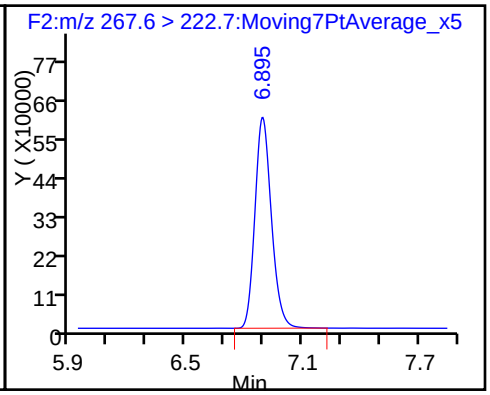
D 1 13C4 PFBA



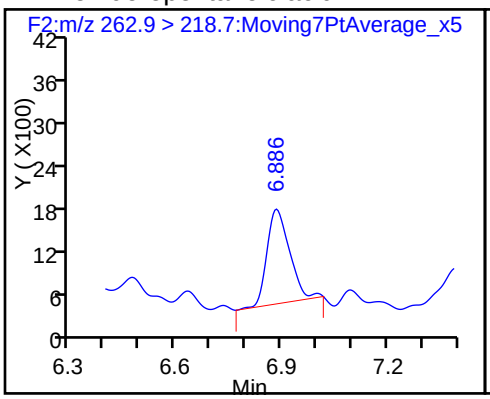
2 Perfluorobutyric acid



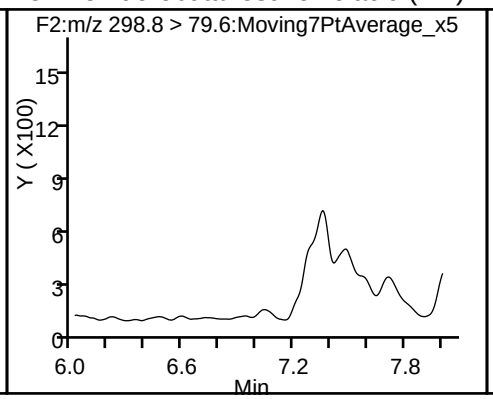
D 3 13C5-PFPeA



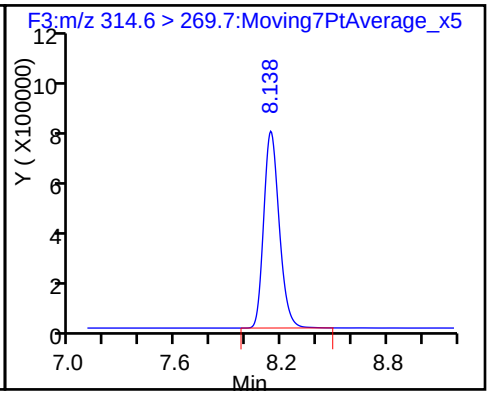
4 Perfluoropentanoic acid



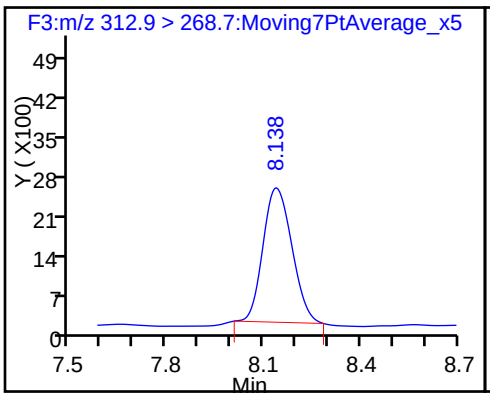
51 Perfluorobutanesulfonic acid (ND)



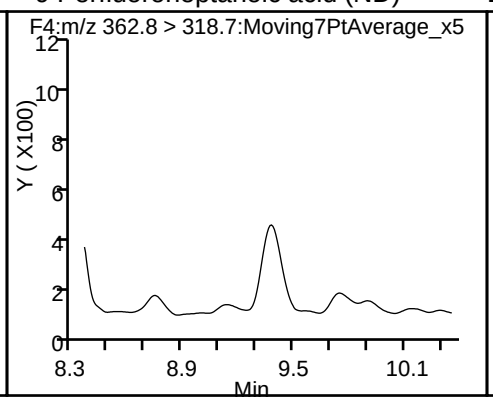
D 6 13C2 PFHxA



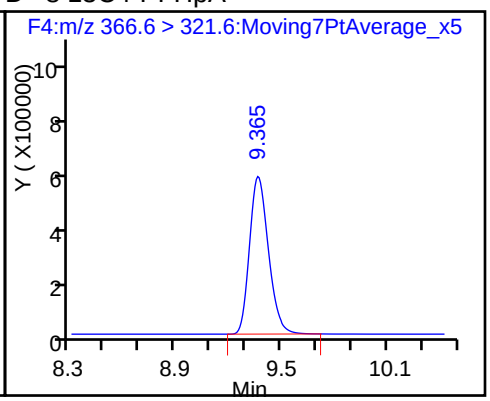
7 Perfluorohexanoic acid



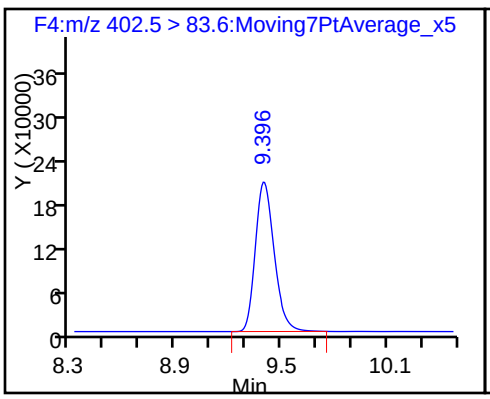
9 Perfluoroheptanoic acid (ND)



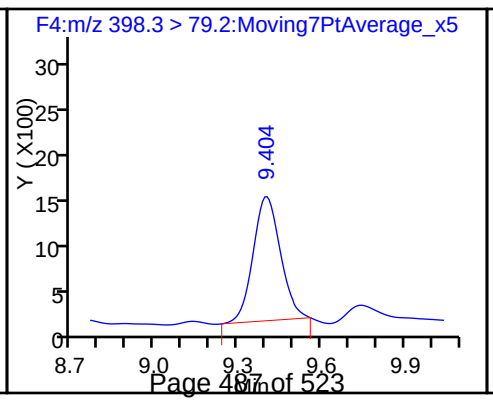
D 8 13C4-PFHpA



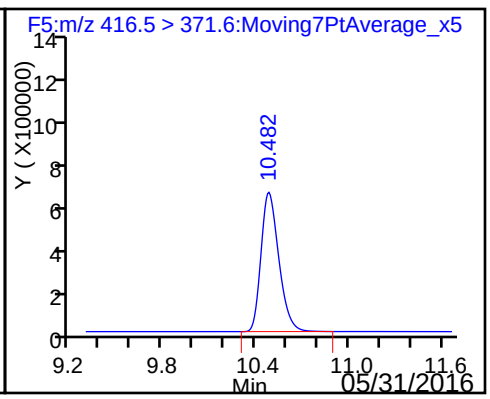
D 11 18O2 PFHxS



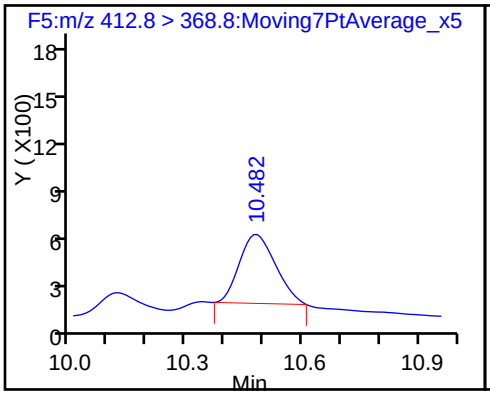
58 Perfluorohexanesulfonic acid



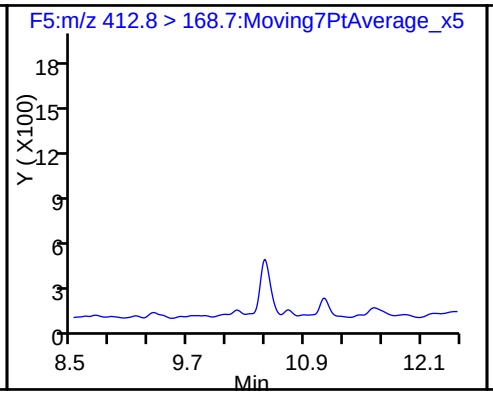
D 12 13C4 PFOA



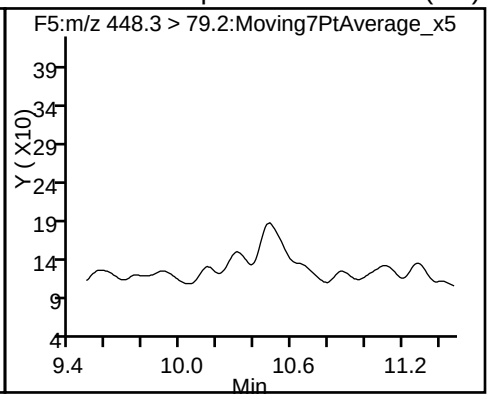
13 Perfluorooctanoic acid



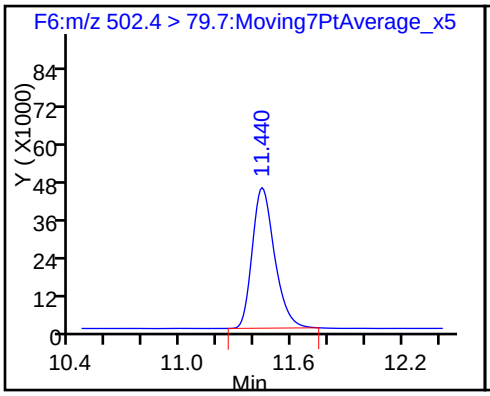
13 Perfluorooctanoic acid



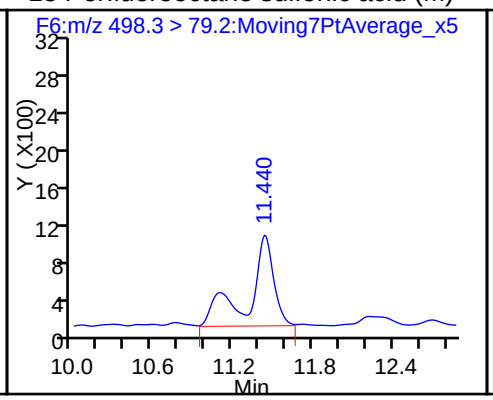
39 Perfluoroheptanesulfonic Acid (ND)



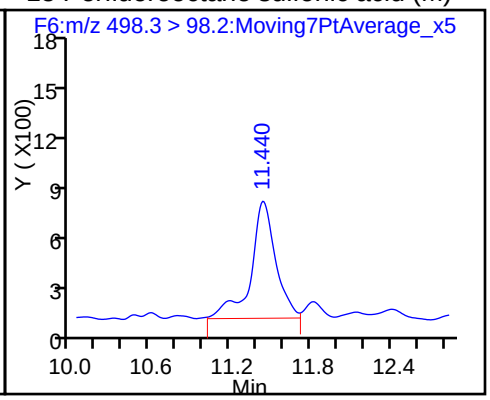
D 16 13C4 PFOS



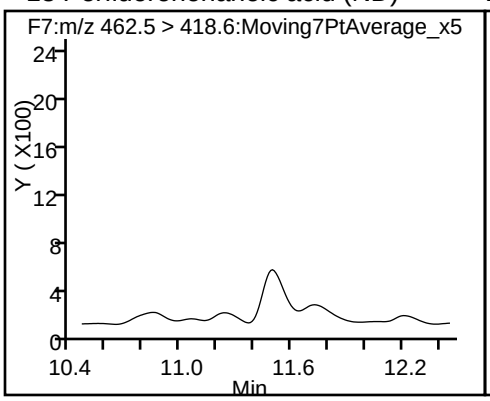
15 Perfluorooctane sulfonic acid (M)



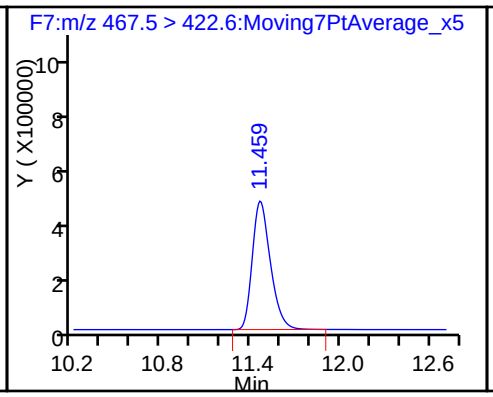
15 Perfluorooctane sulfonic acid (M)



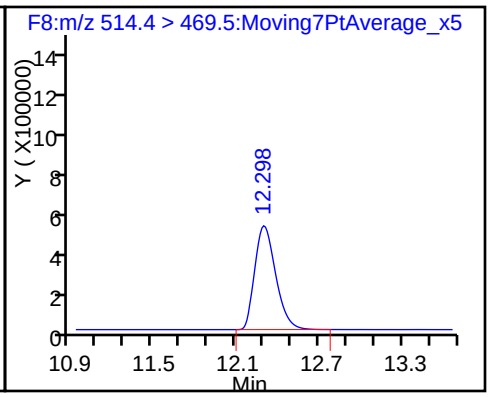
18 Perfluorononanoic acid (ND)



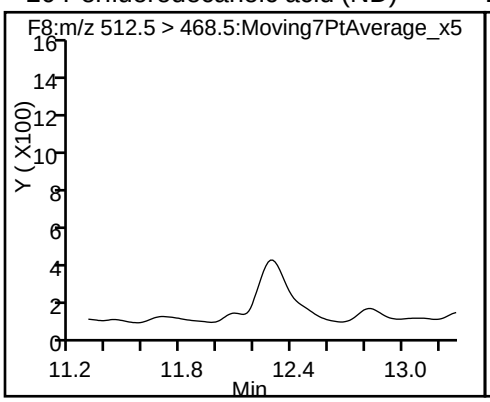
D 17 13C5 PFNA



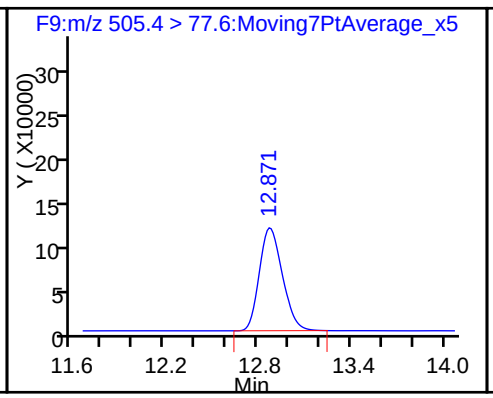
D 19 13C2 PFDA



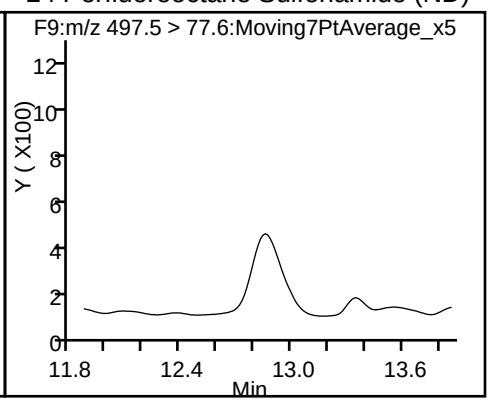
20 Perfluorodecanoic acid (ND)



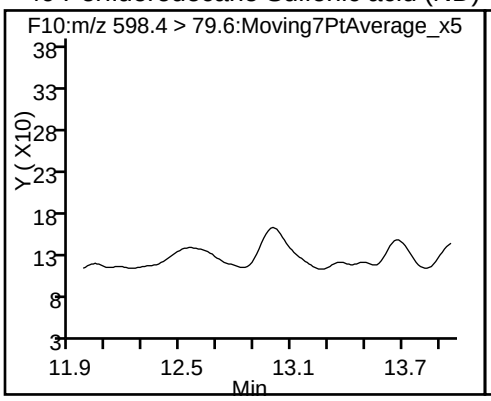
D 23 13C8 FOSA



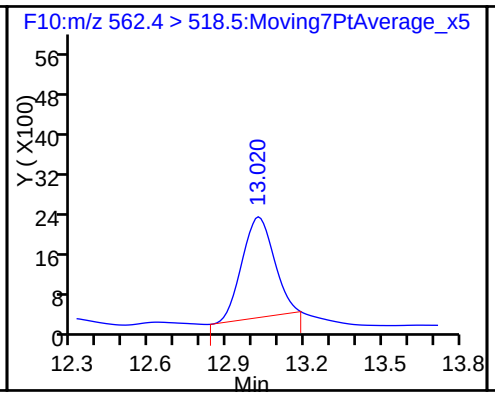
24 Perfluorooctane Sulfonamide (ND)



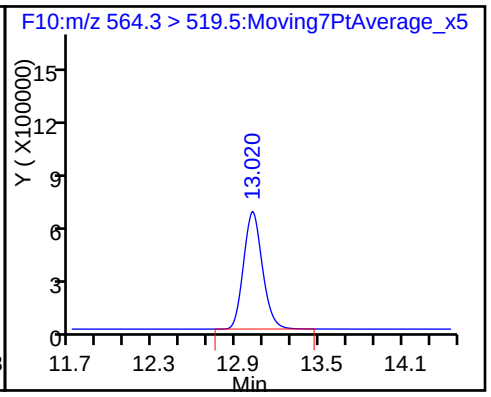
49 Perfluorodecane Sulfonic acid (ND)



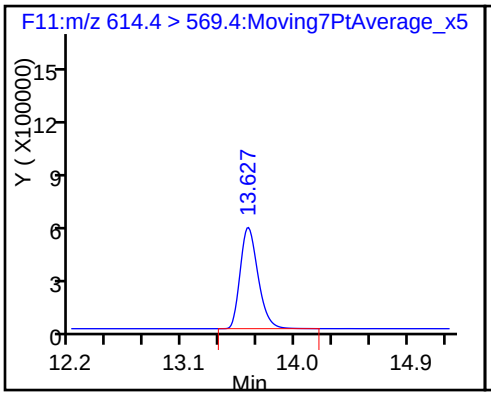
27 Perfluoroundecanoic acid



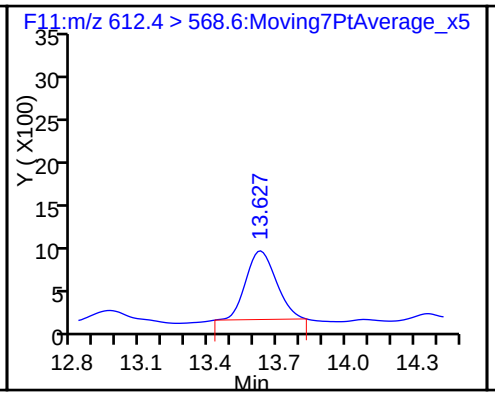
D 26 13C2 PFUnA



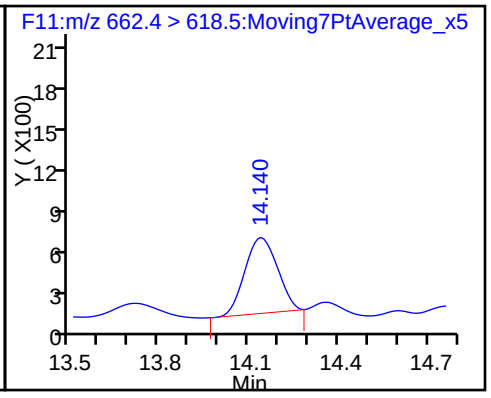
D 28 13C2 PFDoA



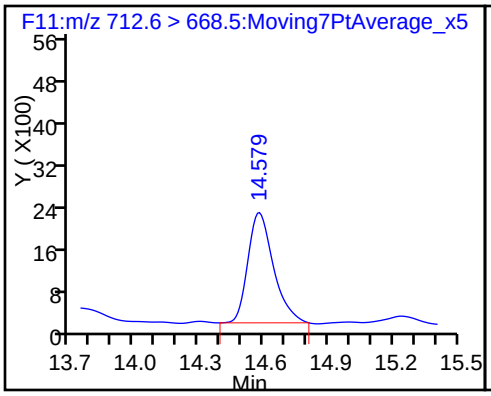
29 Perfluorododecanoic acid



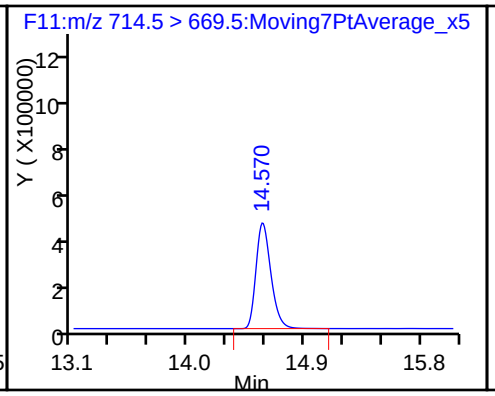
30 Perfluorotridecanoic acid



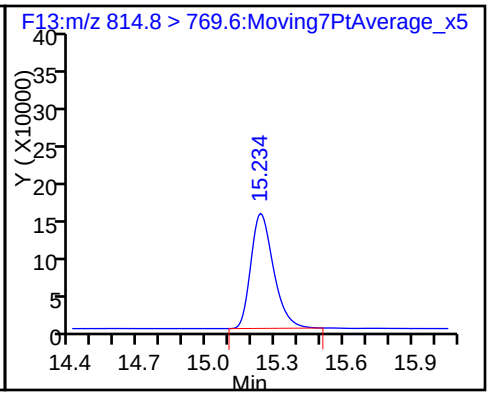
32 Perfluorotetradecanoic acid



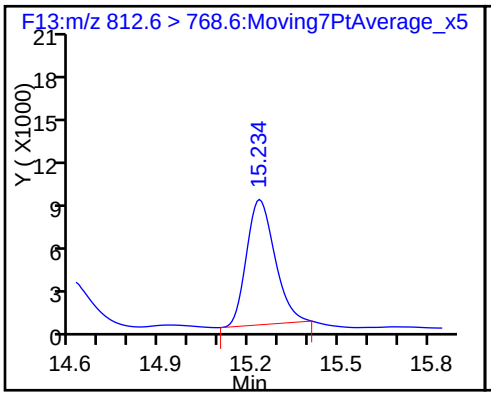
D 33 13C2-PFTeDA



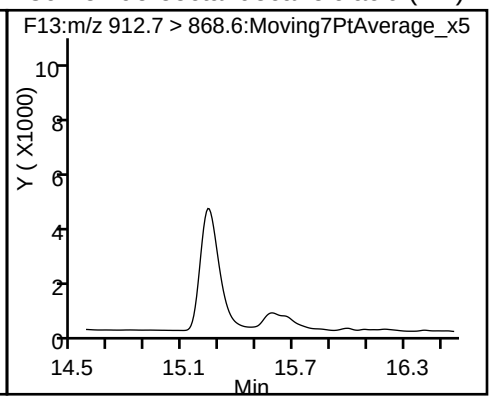
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid (ND)



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

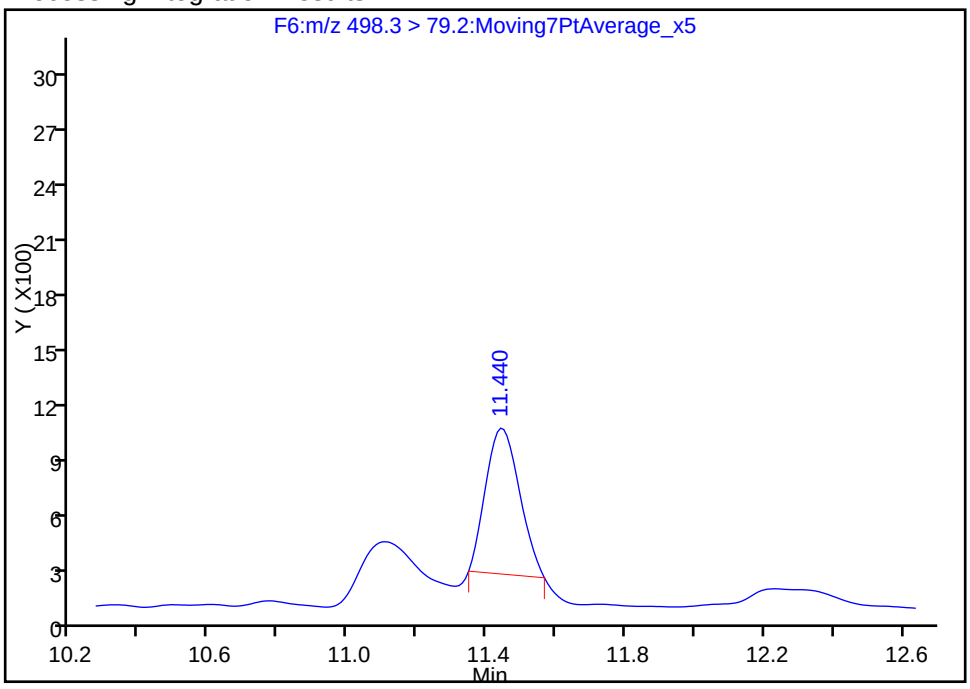
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_019.d
Injection Date: 27-May-2016 17:18:14 Instrument ID: A4
Lims ID: MB 320-110721/1-A
Client ID:
Operator ID: JRB ALS Bottle#: 28 Worklist Smp#: 19
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

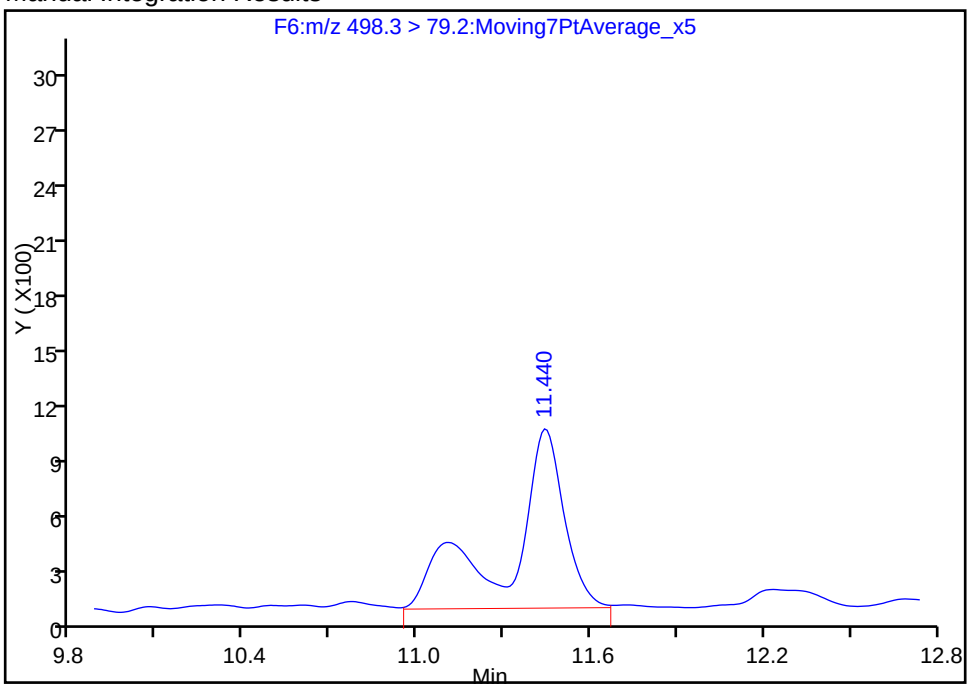
Processing Integration Results

RT: 11.44
Area: 5215
Amount: 0.140703
Amount Units: ng/ml



Manual Integration Results

RT: 11.44
Area: 12482
Amount: 0.216288
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:05:45
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

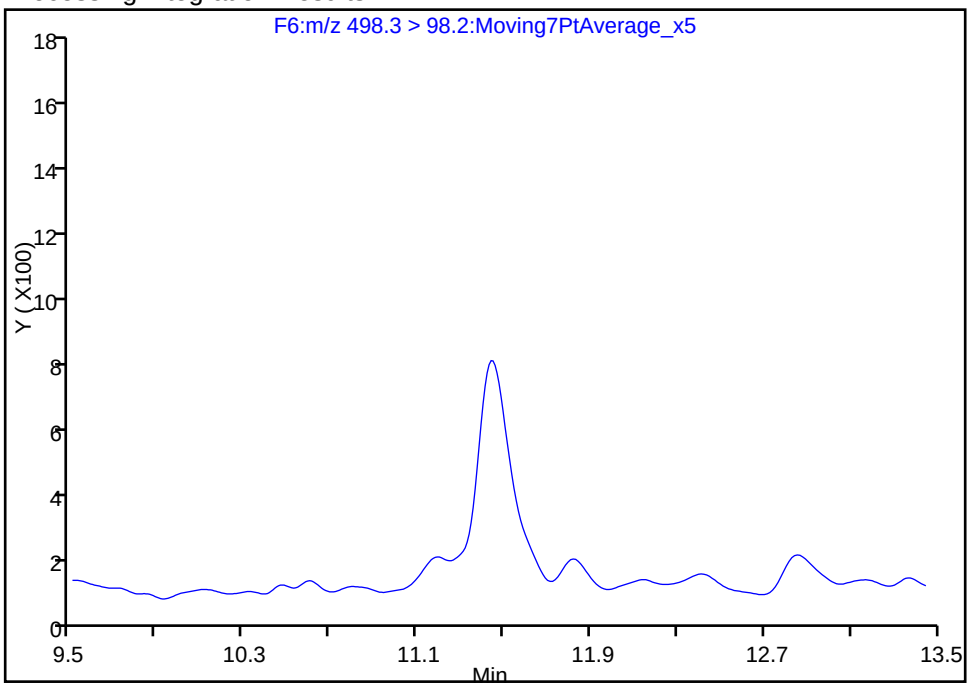
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_019.d
Injection Date: 27-May-2016 17:18:14 Instrument ID: A4
Lims ID: MB 320-110721/1-A
Client ID:
Operator ID: JRB ALS Bottle#: 28 Worklist Smp#: 19
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

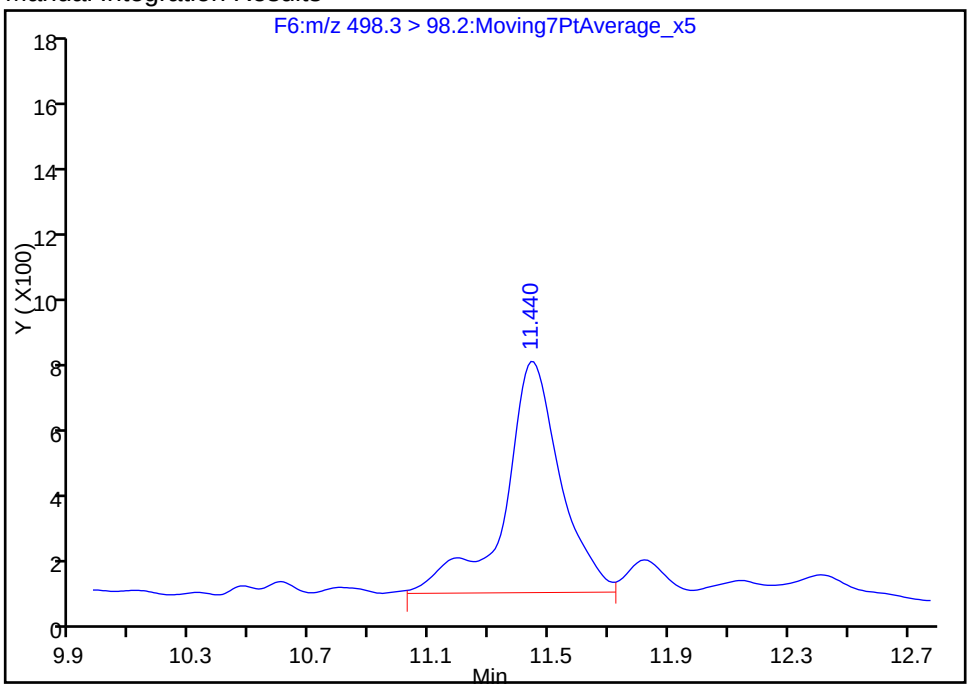
Not Detected
Expected RT: 11.44

Processing Integration Results



Manual Integration Results

RT: 11.44
Area: 8903
Amount: 0.216288
Amount Units: ng/ml



Reviewer: barnettj, 31-May-2016 10:05:45
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-18918-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCS 320-110721/2-A

Matrix: Water | Lab File ID: 27MAY2016B4A_020.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/20/2016 11:05

Sample wt/vol: 500(mL) | Date Analyzed: 05/27/2016 17:39

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 111733 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0305		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0326		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0340		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0273		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0288	M	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0261	M	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	101		25-150
STL00991	13C4 PFOS	126		25-150
STL00995	13C5 PFNA	91		25-150
STL00990	13C4 PFOA	92		25-150
STL01892	13C4-PFHpA	95		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_020.d
Lims ID: LCS 320-110721/2-A
Client ID:
Sample Type: LCS
Inject. Date: 27-May-2016 17:39:25 ALS Bottle#: 29 Worklist Smp#: 20
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: lcs 320-110721/2-a
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 10:47:18 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 13:39:10

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.794	5.790	0.004		4632225	44.8		89.6	12907	
2 Perfluorobutyric acid										
212.7 > 168.6	5.794	5.792	0.002	1.000	996998	16.6		82.9	2371	
D 3 13C5-PFPeA										
267.6 > 222.7	6.895	6.892	0.003		3427630	45.2		90.4	6418	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.895	6.895	0.0	1.000	530814	15.7		78.3	368	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.010	7.011	-0.001	1.000	277267	NC			707	
298.8 > 98.6	7.010	7.011	-0.001	1.000	180683		1.53(0.00-0.00)		402	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.010	7.011	-0.001	1.000	277267	13.6		77.1		
D 6 13C2 PFHxA										
314.6 > 269.7	8.138	8.138	0.0		4524036	48.3		96.7	7975	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.144	8.140	0.004	1.000	646520	15.3		76.3	1659	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.372	9.365	0.007	1.000	657327	15.3		76.3	2308	
D 8 13C4-PFHpA										
366.6 > 321.6	9.365	9.366	-0.001		4007204	47.7		95.4	9509	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		1451660	47.9		101	3743	
58 Perfluorohexanesulfonic acid										M
398.3 > 79.2	9.404	9.401	0.003	1.000	694436	14.4		79.0		M
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	549511	NC			935	
D 12 13C4 PFOA										
416.5 > 371.6	10.485	10.483	0.002		4408256	46.0		92.0	6664	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.485	10.485	0.0	1.000	653971	16.3		81.4	1331	
412.8 > 168.7	10.485	10.485	0.0	1.000	225433		2.90(0.00-0.00)		843	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.485	10.485	0.0	1.000	734221	12.0		62.9		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.485	10.485	0.0	1.000	734221	NC			2158	
D 16 13C4 PFOS										
502.4 > 79.7	11.442	11.441	0.001		375280	60.1		126	1405	
15 Perfluorooctane sulfonic acid										M
498.3 > 79.2	11.442	11.443	-0.001	1.000	1230459	13.1		70.3	2797	M
498.3 > 98.2	11.442	11.443	-0.001	1.000	694350		1.77(0.00-0.00)		1300	M
18 Perfluorononanoic acid										
462.5 > 418.6	11.462	11.462	0.0	1.000	1593087	17.0		84.9	2181	
D 17 13C5 PFNA										
467.5 > 422.6	11.462	11.462	0.0		3703629	45.6		91.1	6938	
D 19 13C2 PFDA										
514.4 > 469.5	12.302	12.299	0.003		5041716	48.9		97.9	5989	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.302	12.299	0.003	1.000	1957728	18.1		90.3	3214	
D 23 13C8 FOSA										
505.4 > 77.6	12.875	12.871	0.004		1810440	19.1		38.2	3703	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.875	12.873	0.002	1.000	642452	16.8		84.2	1190	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.978	12.969	0.009	1.000	356170	NC			1768	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.978	12.969	0.009	1.000	356170	12.1		62.9		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.024	13.021	0.003	1.000	1964268	16.6		83.0	2420	
D 26 13C2 PFUnA										
564.3 > 519.5	13.024	13.021	0.003		5100822	47.0		94.0	5611	
D 28 13C2 PFDoA										
614.4 > 569.4	13.620	13.626	-0.006		5080727	45.7		91.3	4576	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.620	13.626	-0.006	1.000	1505317	16.2		80.8	743	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.134	14.138	-0.004	1.000	1251863	20.4		102	632	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.574	14.577	-0.003	1.000	498544	15.1		75.3	242	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.574	14.579	-0.005		2968269	38.2		76.4	3289	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.237	15.235	0.002		947157	31.8		63.7	2511	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.237	15.235	0.002	1.000	964068	17.4		87.2	196	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.578	15.575	0.003	1.000	895378	21.5		108	1294	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-May-2016 10:47:37 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_020.d

Injection Date: 27-May-2016 17:39:25 Instrument ID: A4

Lims ID: LCS 320-110721/2-A

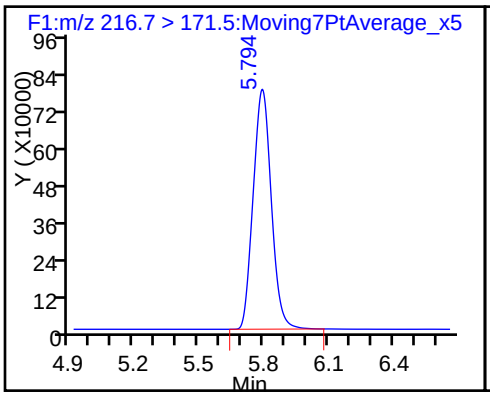
Client ID:

Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 20

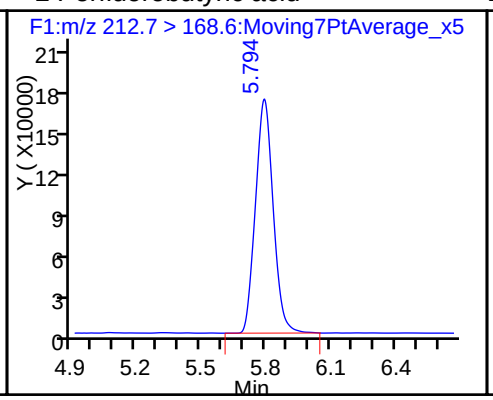
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

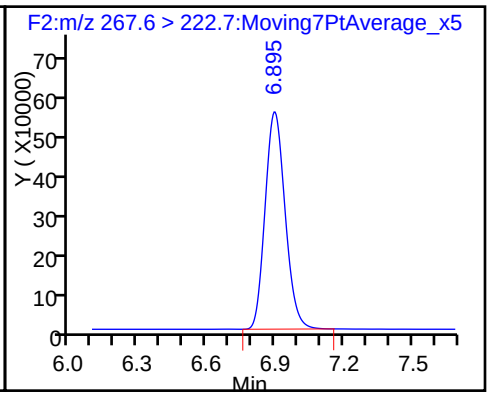
D 1 13C4 PFBA



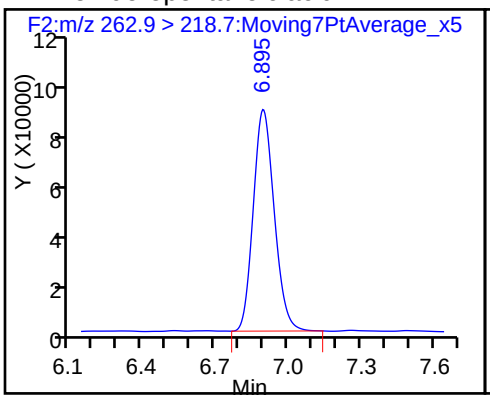
2 Perfluorobutyric acid



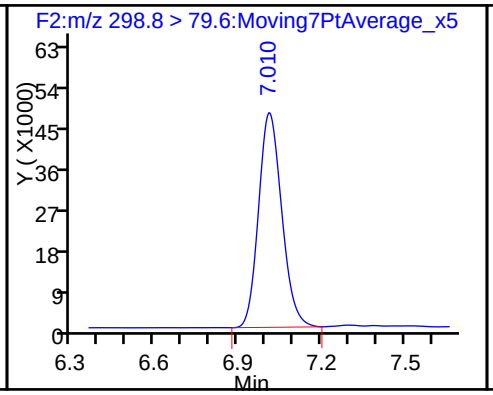
D 3 13C5-PFPeA



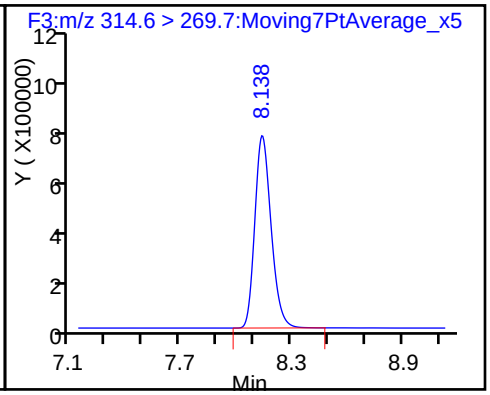
4 Perfluoropentanoic acid



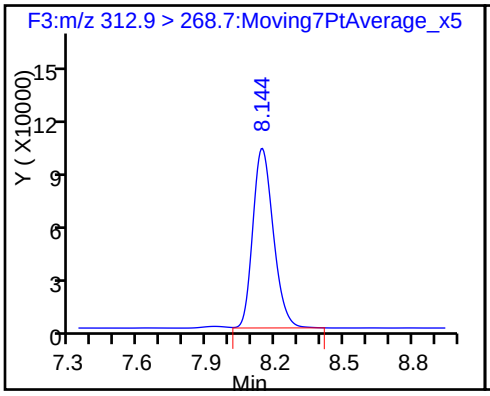
51 Perfluorobutanesulfonic acid



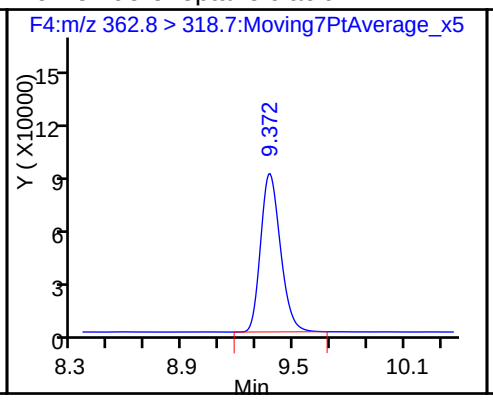
D 6 13C2 PFHxA



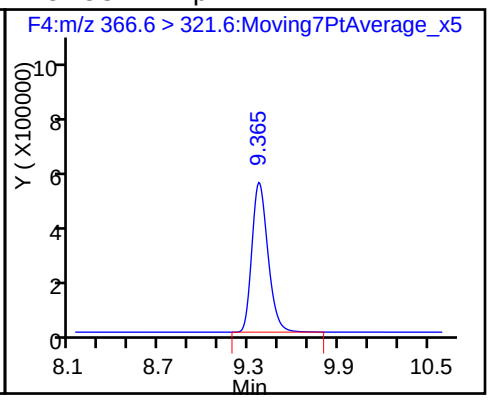
7 Perfluorohexanoic acid



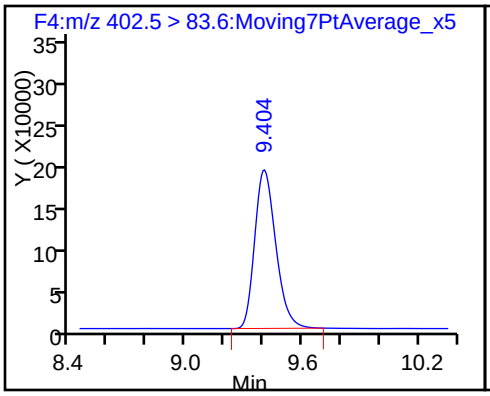
9 Perfluoroheptanoic acid



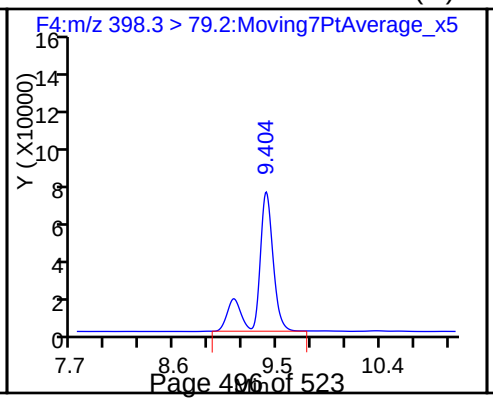
D 8 13C4-PFHpA



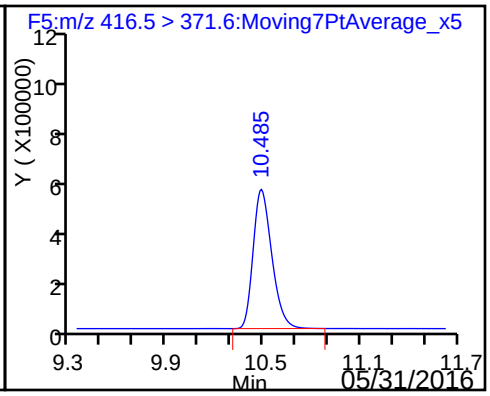
D 11 18O2 PFHxS



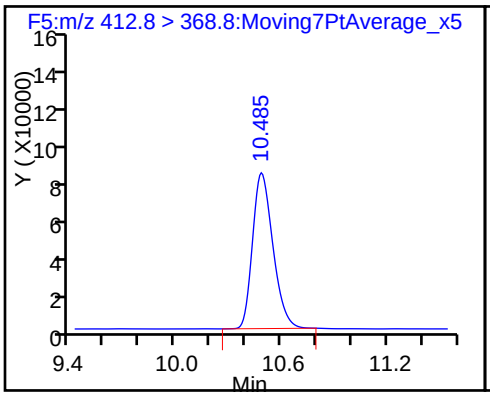
58 Perfluorohexanesulfonic acid (M)



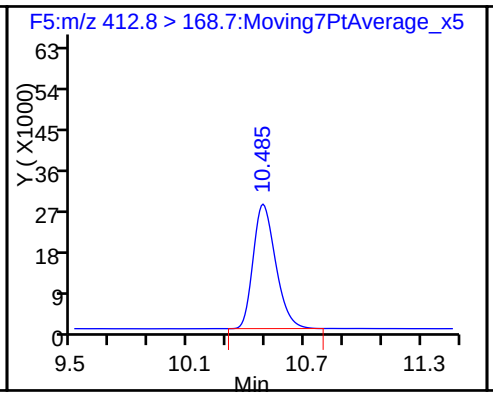
D 12 13C4 PFOA



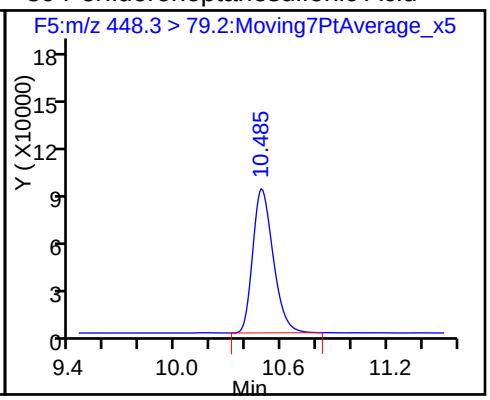
13 Perfluorooctanoic acid



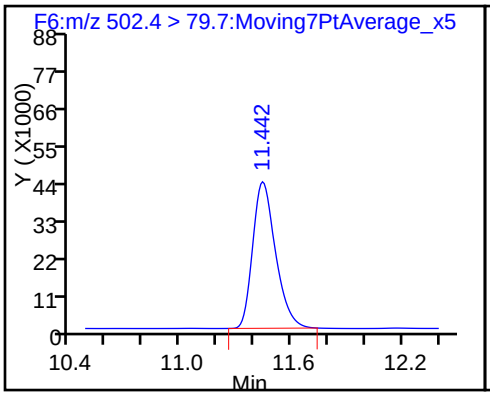
13 Perfluorooctanoic acid



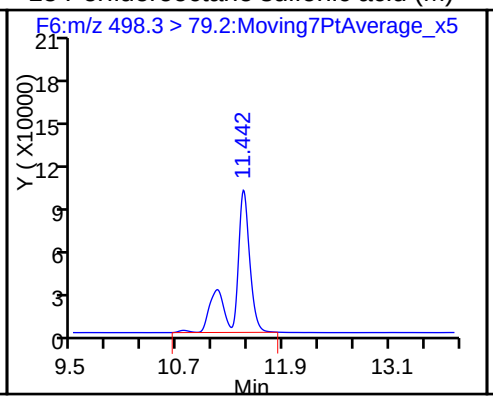
39 Perfluoroheptanesulfonic Acid



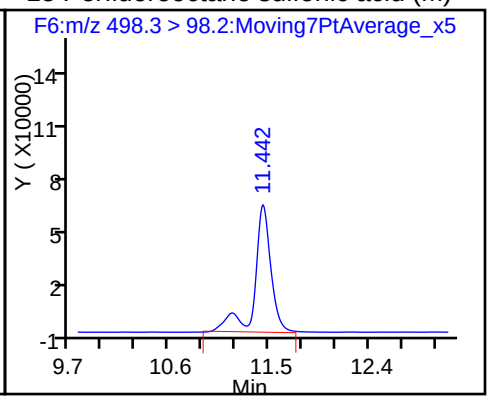
D 16 13C4 PFOS



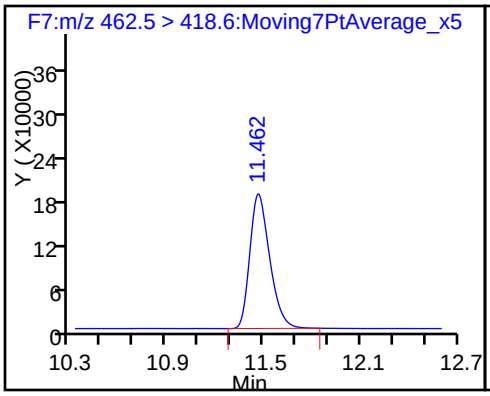
15 Perfluorooctane sulfonic acid (M)



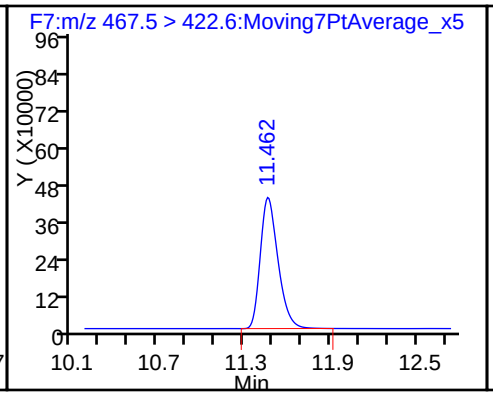
15 Perfluorooctane sulfonic acid (M)



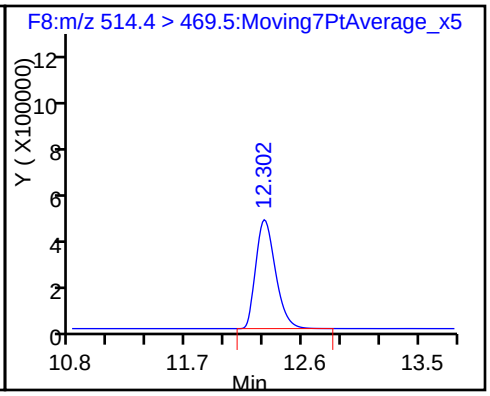
18 Perfluorononanoic acid



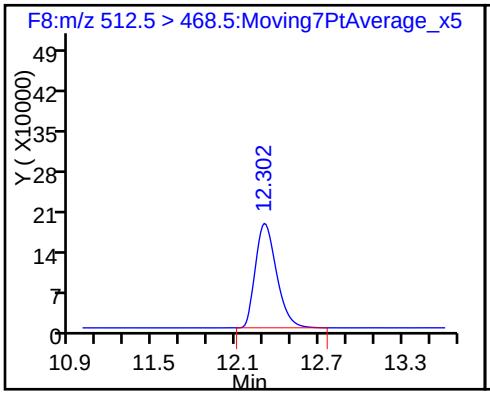
D 17 13C5 PFNA



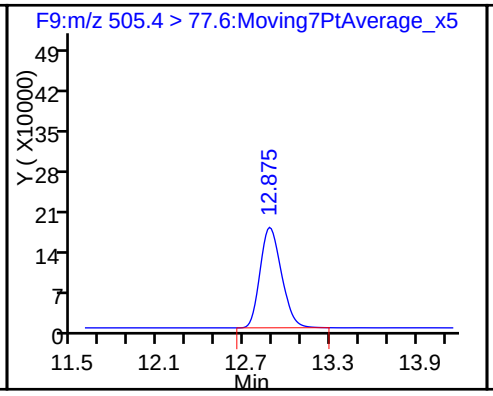
D 19 13C2 PFDA



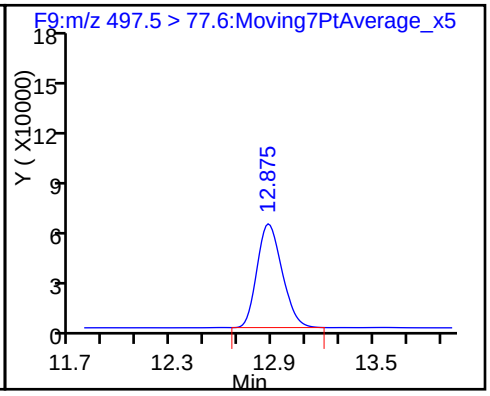
20 Perfluorodecanoic acid



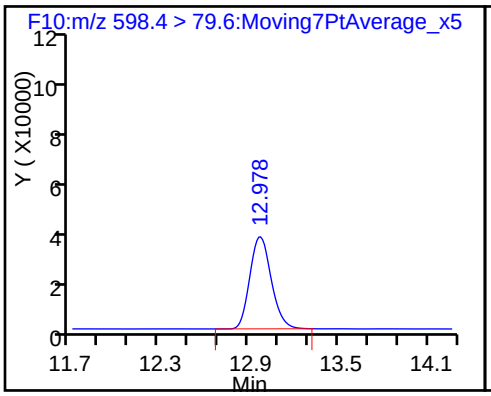
D 23 13C8 FOSA



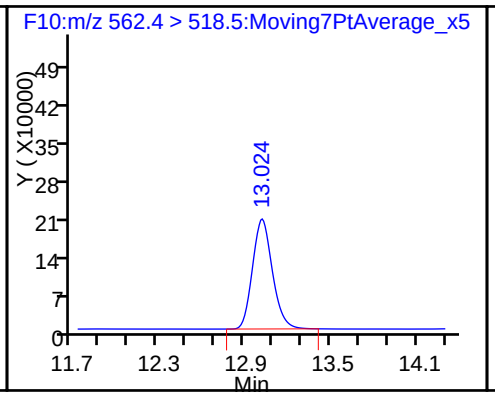
24 Perfluorooctane Sulfonamide



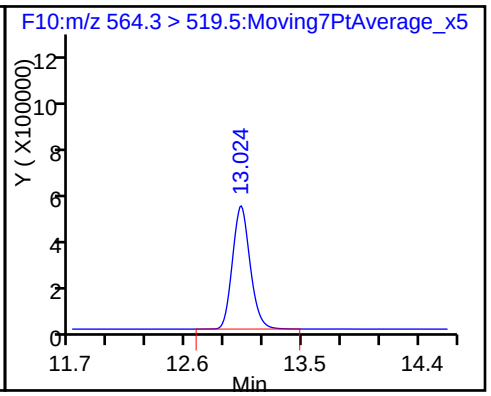
49 Perfluorodecane Sulfonic acid



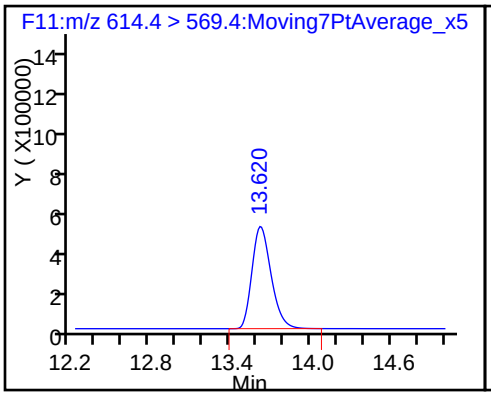
27 Perfluoroundecanoic acid



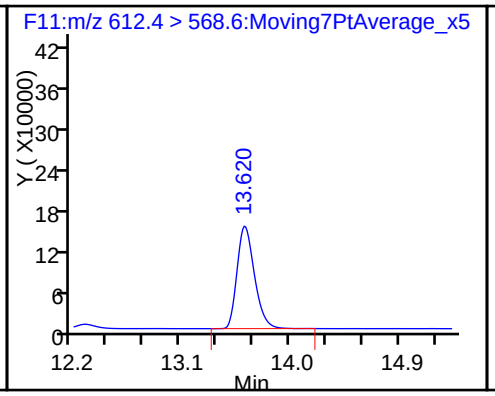
D 26 13C2 PFUnA



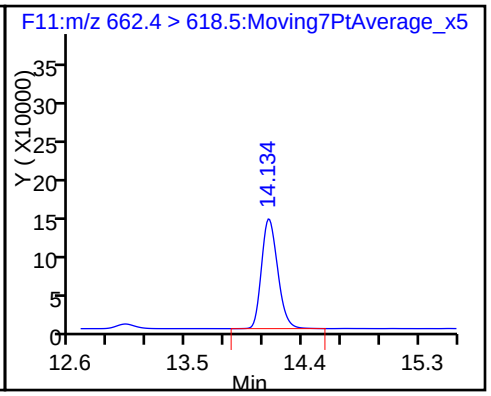
D 28 13C2 PFDoA



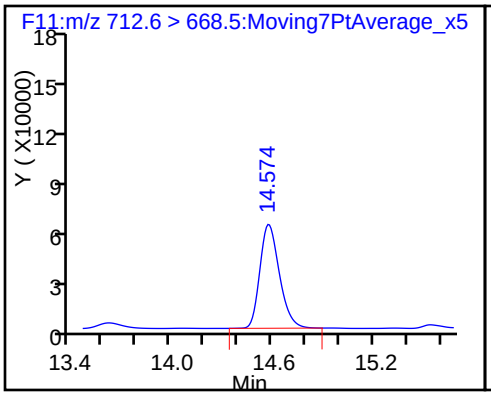
29 Perfluorododecanoic acid



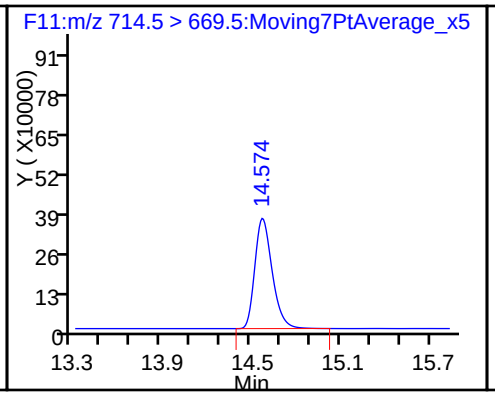
30 Perfluorotridecanoic acid



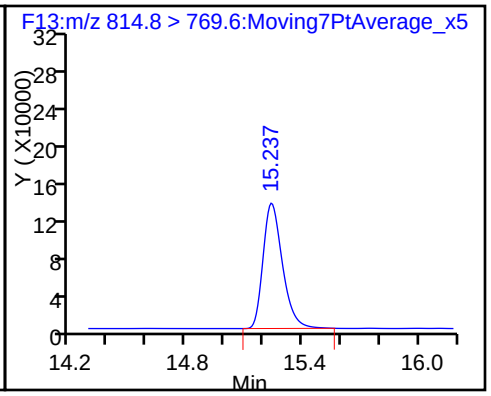
32 Perfluorotetradecanoic acid



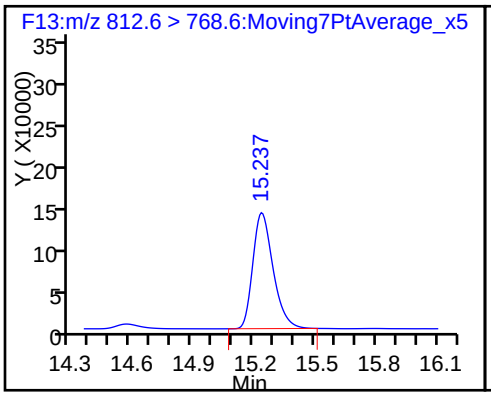
D 33 13C2-PFTeDA



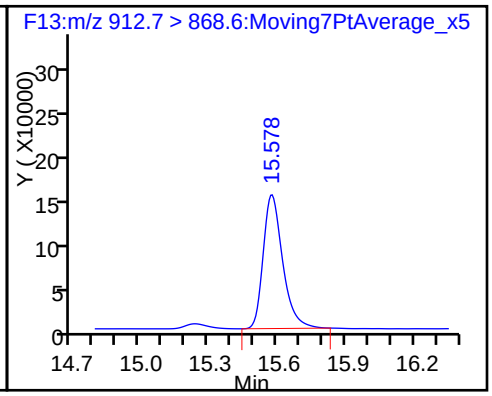
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

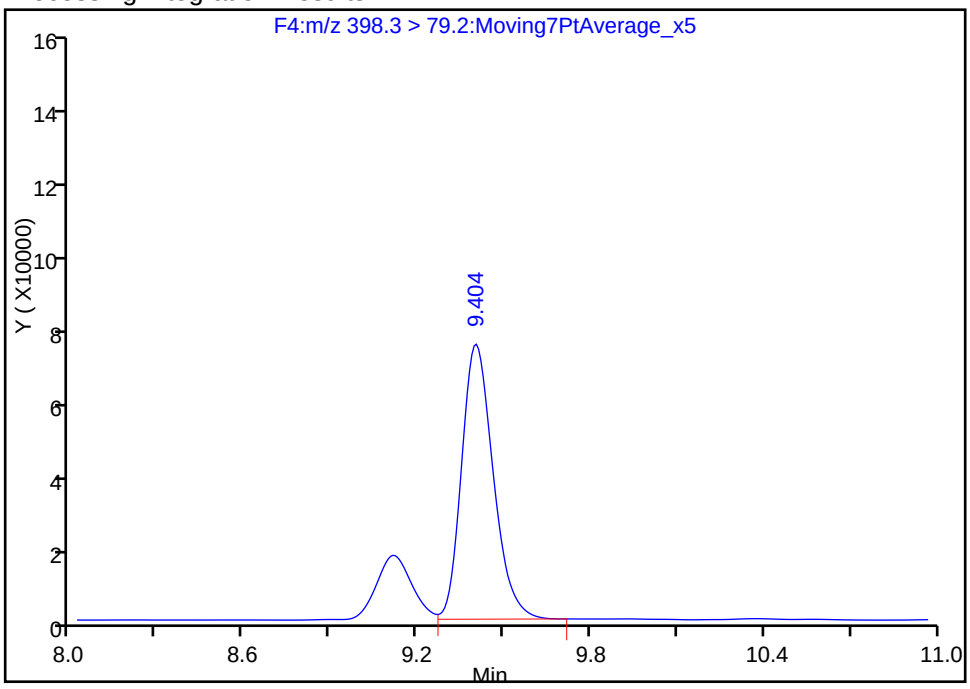
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_020.d
Injection Date: 27-May-2016 17:39:25 Instrument ID: A4
Lims ID: LCS 320-110721/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 20
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F4:MRM

58 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

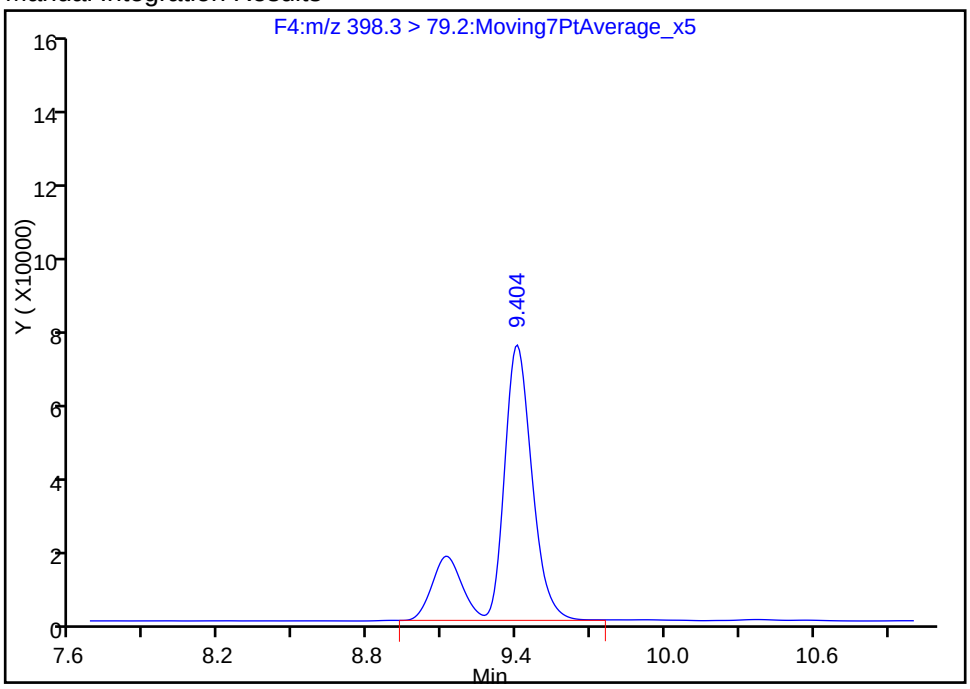
Processing Integration Results

RT: 9.40
Area: 549511
Amount: 11.375117
Amount Units: ng/ml



Manual Integration Results

RT: 9.40
Area: 694436
Amount: 14.375128
Amount Units: ng/ml



Reviewer: barnettj, 29-May-2016 13:39:10
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

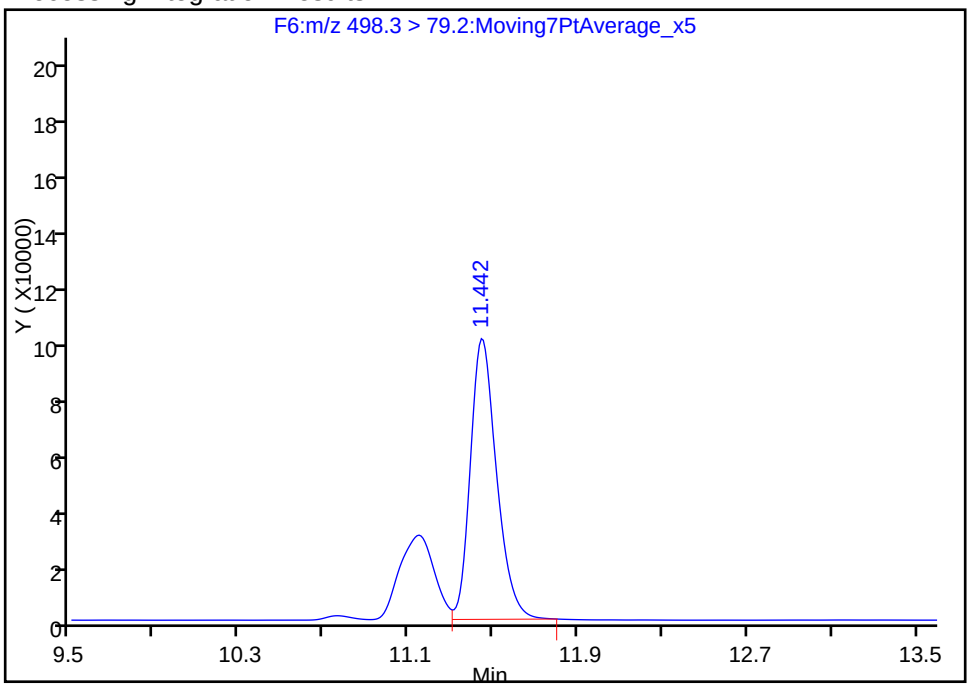
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_020.d
Injection Date: 27-May-2016 17:39:25 Instrument ID: A4
Lims ID: LCS 320-110721/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 20
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

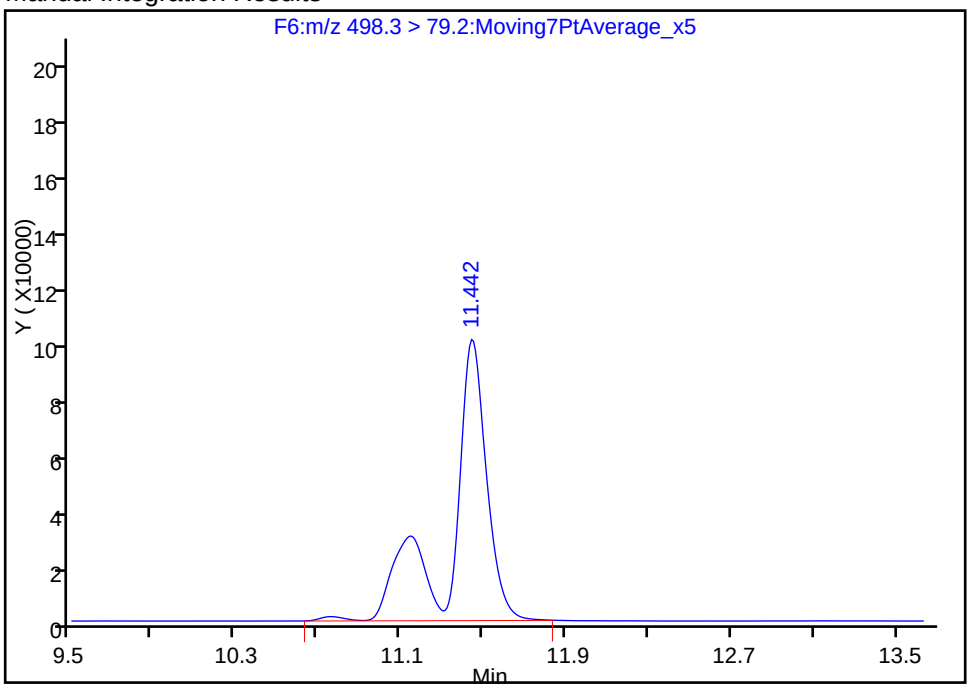
Processing Integration Results

RT: 11.44
Area: 867819
Amount: 9.232206
Amount Units: ng/ml



Manual Integration Results

RT: 11.44
Area: 1230459
Amount: 13.053986
Amount Units: ng/ml



Reviewer: barnettj, 29-May-2016 13:39:10
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

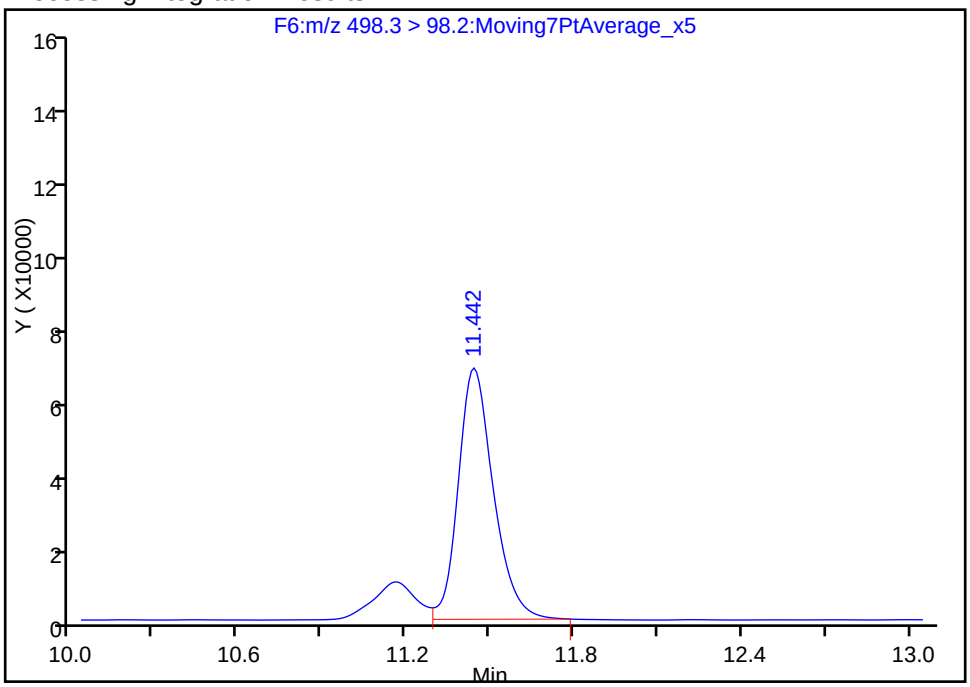
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_020.d
Injection Date: 27-May-2016 17:39:25 Instrument ID: A4
Lims ID: LCS 320-110721/2-A
Client ID:
Operator ID: JRB ALS Bottle#: 29 Worklist Smp#: 20
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

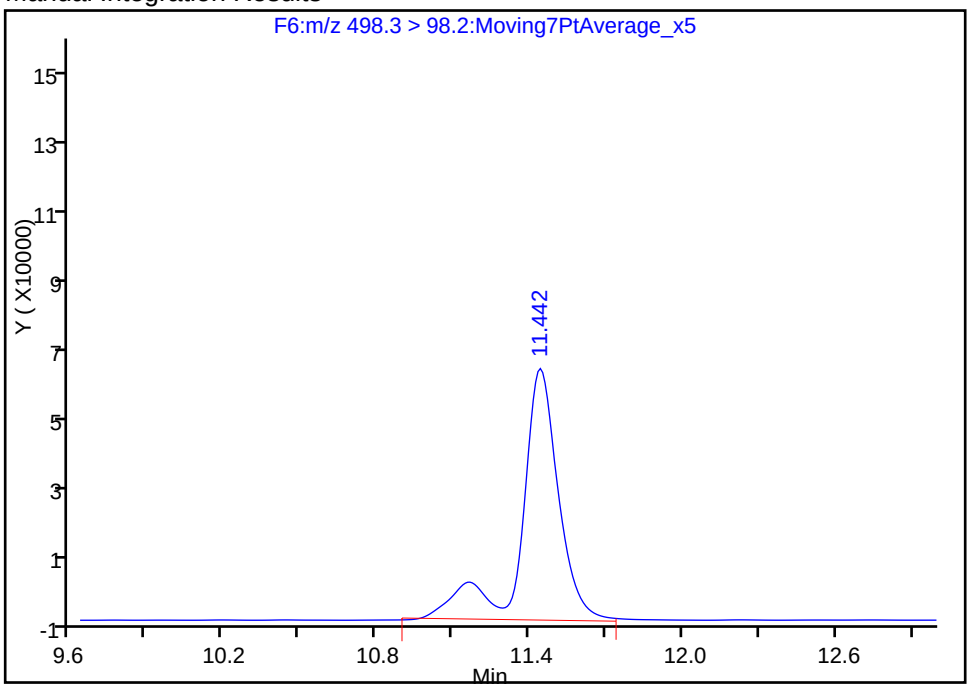
Processing Integration Results

RT: 11.44
Area: 587770
Amount: 9.232206
Amount Units: ng/ml



Manual Integration Results

RT: 11.44
Area: 694350
Amount: 13.053986
Amount Units: ng/ml



Reviewer: barnettj, 29-May-2016 13:39:10
Audit Action: Manually Integrated Audit Reason: Isomers

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento | Job No.: 320-18918-1

SDG No.:

Client Sample ID: | Lab Sample ID: LCSD 320-110721/3-A

Matrix: Water | Lab File ID: 27MAY2016B4A_021.d

Analysis Method: WS-LC-0025 | Date Collected:

Extraction Method: 3535 | Date Extracted: 05/20/2016 11:05

Sample wt/vol: 500(mL) | Date Analyzed: 05/27/2016 18:00

Con. Extract Vol.: 1.0(mL) | Dilution Factor: 1

Injection Volume: 15(uL) | GC Column: Acquity ID: 2.1(mm)

% Moisture: | GPC Cleanup:(Y/N) N

Analysis Batch No.: 111733 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0318		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0305		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0334		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0291		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0314	M	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0284	M	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	84		25-150
STL00991	13C4 PFOS	107		25-150
STL00995	13C5 PFNA	82		25-150
STL00990	13C4 PFOA	83		25-150
STL01892	13C4-PFHpA	81		25-150

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_021.d
Lims ID: LCSD 320-110721/3-A
Client ID:
Sample Type: LCSD
Inject. Date: 27-May-2016 18:00:36 ALS Bottle#: 30 Worklist Smp#: 21
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Sample Info: lcsd 320-110721/3-a
Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C
Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\PFAC_A4.m
Limit Group: LC PFC_DOD ICAL
Last Update: 31-May-2016 10:47:18 Calib Date: 27-May-2016 13:24:04
Integrator: Picker
Quant Method: Isotopic Dilution Quant By: Initial Calibration
Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_008.d

Column 1 : Det: F1:MRM
Process Host: XAWRK048

First Level Reviewer: barnettj Date: 29-May-2016 13:40:36

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 1 13C4 PFBA										
216.7 > 171.5	5.800	5.790	0.010		3952701	38.2		76.4	14643	
2 Perfluorobutyric acid										
212.7 > 168.6	5.800	5.792	0.008	1.000	852517	16.6		83.1	2861	
D 3 13C5-PFPeA										
267.6 > 222.7	6.904	6.892	0.012		3012064	39.7		79.4	7761	
4 Perfluoropentanoic acid										
262.9 > 218.7	6.904	6.895	0.009	1.000	472605	15.9		79.4	304	
5 Perfluorobutane Sulfonate										
298.8 > 79.6	7.014	7.011	0.003	1.000	245542	NC			534	
298.8 > 98.6	7.014	7.011	0.003	1.000	165443		1.48(0.00-0.00)		417	
51 Perfluorobutanesulfonic acid										
298.8 > 79.6	7.014	7.011	0.003	1.000	245542	14.6		82.4		
D 6 13C2 PFHxA										
314.6 > 269.7	8.144	8.138	0.006		3969255	42.4		84.8	10521	
7 Perfluorohexanoic acid										
312.9 > 268.7	8.149	8.140	0.009	1.000	568208	15.3		76.4	1636	
9 Perfluoroheptanoic acid										
362.8 > 318.7	9.372	9.365	0.007	1.000	582752	15.9		79.6	2113	
D 8 13C4-PFHpA										
366.6 > 321.6	9.372	9.366	0.006		3407847	40.6		81.2	5723	
D 11 18O2 PFHxS										
402.5 > 83.6	9.404	9.399	0.005		1204144	39.7		83.9	3865	
58 Perfluorohexanesulfonic acid										M
398.3 > 79.2	9.404	9.401	0.003	1.000	629557	15.7		86.3		M
10 Perfluorohexane Sulfonate										
398.3 > 79.2	9.404	9.401	0.003	1.000	492673	NC			930	
D 12 13C4 PFOA										
416.5 > 371.6	10.491	10.483	0.008		3966968	41.4		82.8	5944	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooctanoic acid										
412.8 > 368.8	10.491	10.485	0.006	1.000	551315	15.3		76.3	1087	
412.8 > 168.7	10.491	10.485	0.006	1.000	184233		2.99(0.00-0.00)		679	
39 Perfluoroheptanesulfonic Acid										
448.3 > 79.2	10.491	10.485	0.006	1.000	660053	12.7		66.6		
14 Perfluoroheptane Sulfonate										
448.3 > 79.2	10.491	10.485	0.006	1.000	660053	NC			2213	
D 16 13C4 PFOS										
502.4 > 79.7	11.449	11.441	0.008		318741	51.0		107	887	
15 Perfluorooctane sulfonic acid										M
498.3 > 79.2	11.449	11.443	0.006	1.000	1137170	14.2		76.5	2048	M
498.3 > 98.2	11.449	11.443	0.006	1.000	598957		1.90(0.00-0.00)		1396	M
18 Perfluorononanoic acid										
462.5 > 418.6	11.469	11.462	0.007	1.000	1401287	16.7		83.5	2514	
D 17 13C5 PFNA										
467.5 > 422.6	11.469	11.462	0.007		3313039	40.8		81.5	5384	
D 19 13C2 PFDA										
514.4 > 469.5	12.298	12.299	-0.001		4706593	45.7		91.4	5535	
20 Perfluorodecanoic acid										
512.5 > 468.5	12.298	12.299	-0.001	1.000	1753606	17.3		86.7	2702	
D 23 13C8 FOSA										
505.4 > 77.6	12.884	12.871	0.013		922279	9.72		19.4	3290	
24 Perfluorooctane Sulfonamide										
497.5 > 77.6	12.884	12.873	0.011	1.000	322207	16.6		82.9	1082	
25 Perfluorodecane Sulfonate										
598.4 > 79.6	12.974	12.969	0.005	1.000	351237	NC			991	
49 Perfluorodecane Sulfonic acid										
598.4 > 79.6	12.974	12.969	0.005	1.000	351237	14.1		73.0		
27 Perfluoroundecanoic acid										
562.4 > 518.5	13.020	13.021	-0.001	1.000	1802005	17.0		85.1	1616	
D 26 13C2 PFUnA										
564.3 > 519.5	13.020	13.021	-0.001		4562565	42.0		84.1	5528	
D 28 13C2 PFDoA										
614.4 > 569.4	13.626	13.626	0.0		4437311	39.9		79.8	2911	
29 Perfluorododecanoic acid										
612.4 > 568.6	13.626	13.626	0.0	1.000	1383065	17.0		85.0	750	
30 Perfluorotridecanoic acid										
662.4 > 618.5	14.140	14.138	0.002	1.000	1170638	24.5		122	674	
32 Perfluorotetradecanoic acid										
712.6 > 668.5	14.579	14.577	0.002	1.000	391445	15.2		75.8	246	
D 33 13C2-PFTeDA										
714.5 > 669.5	14.579	14.579	0.0		2315589	29.8		59.6	2571	
D 35 13C2-PFHxDA										
814.8 > 769.6	15.242	15.235	0.007		643685	21.6		43.3	1787	
34 Perfluorohexadecanoic acid										
812.6 > 768.6	15.242	15.235	0.007	1.000	736640	19.7		98.5	147	
36 Perfluorooctandecanoic acid										
912.7 > 868.6	15.575	15.575	0.0	1.000	145227	5.13		25.7	320	

QC Flag Legend

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

Report Date: 31-May-2016 10:47:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_021.d

Injection Date: 27-May-2016 18:00:36 Instrument ID: A4

Lims ID: LCSD 320-110721/3-A

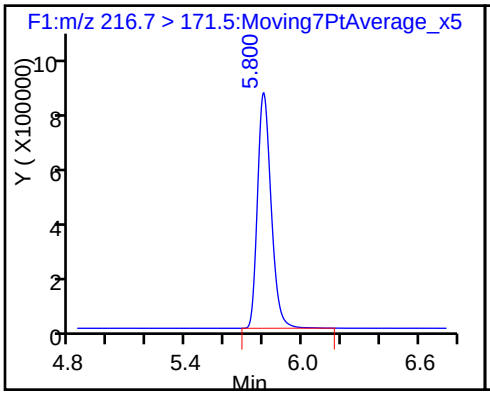
Client ID:

Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 21

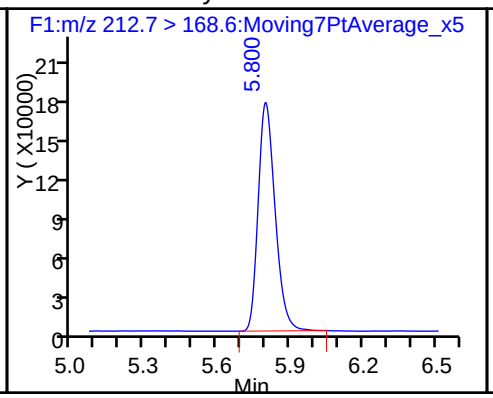
Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

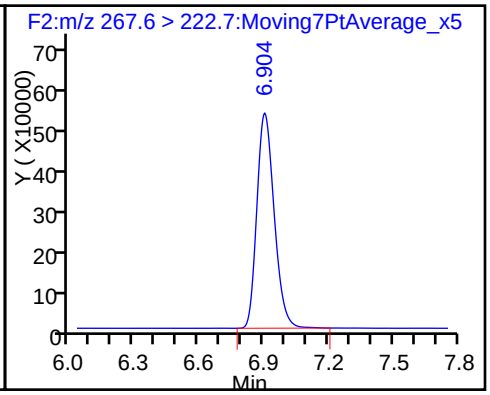
D 1 13C4 PFBA



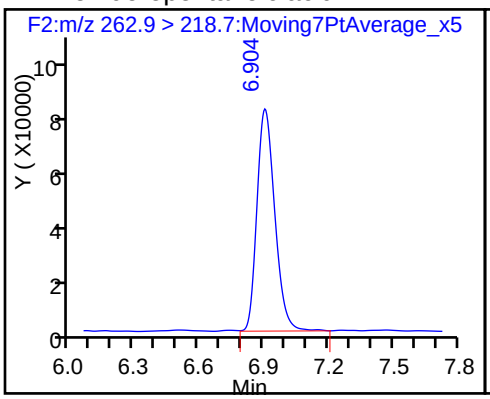
2 Perfluorobutyric acid



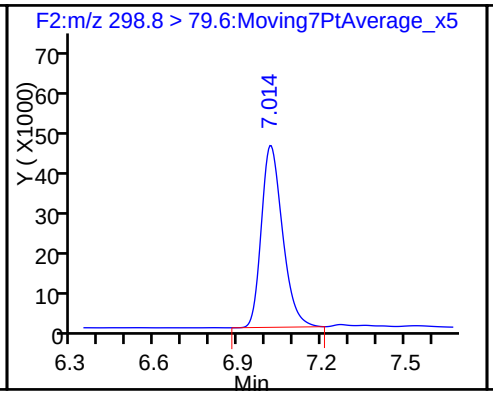
D 3 13C5-PFPeA



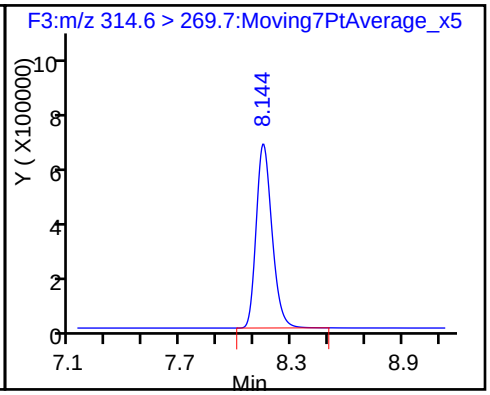
4 Perfluoropentanoic acid



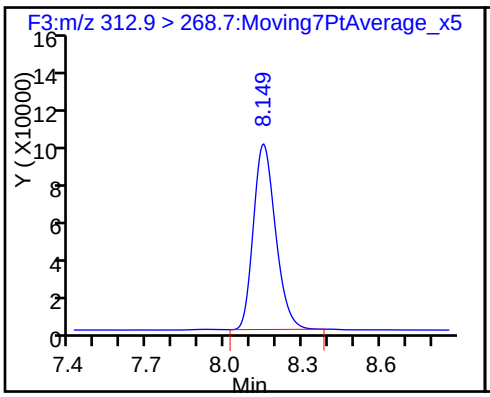
51 Perfluorobutanesulfonic acid



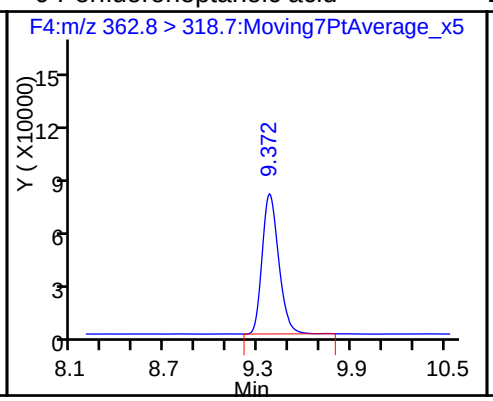
D 6 13C2 PFHxA



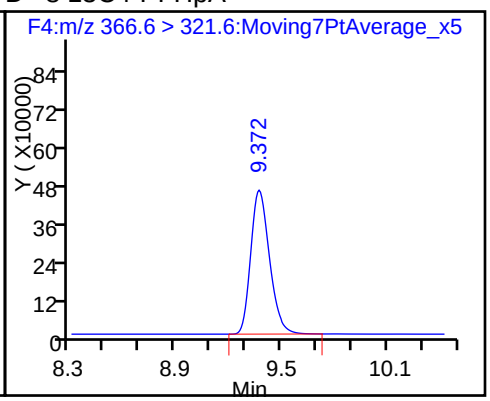
7 Perfluorohexanoic acid



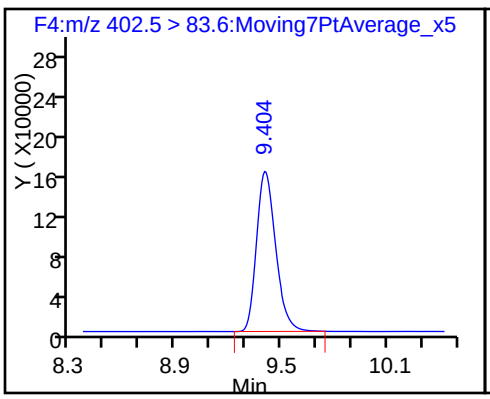
9 Perfluoroheptanoic acid



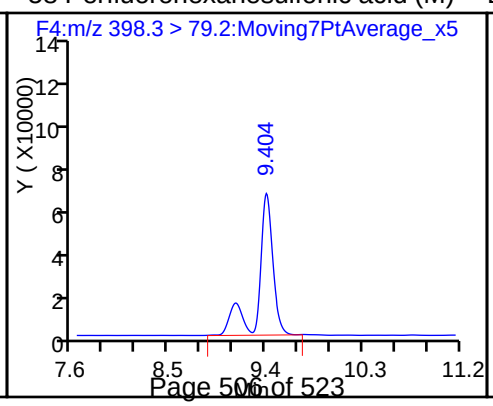
D 8 13C4-PFHpA



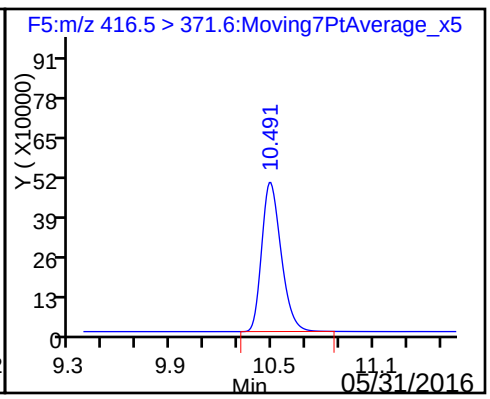
D 11 18O2 PFHxS



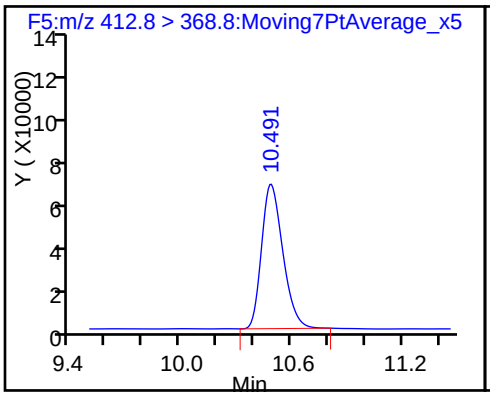
58 Perfluorohexanesulfonic acid (M)



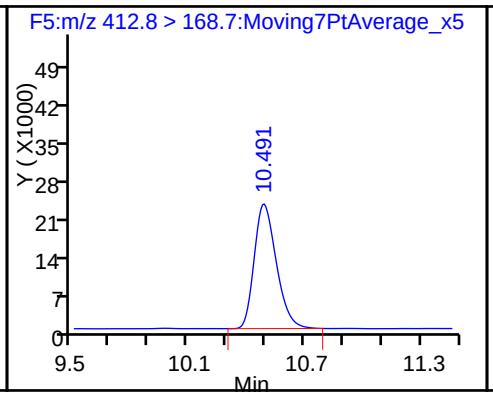
D 12 13C4 PFOA



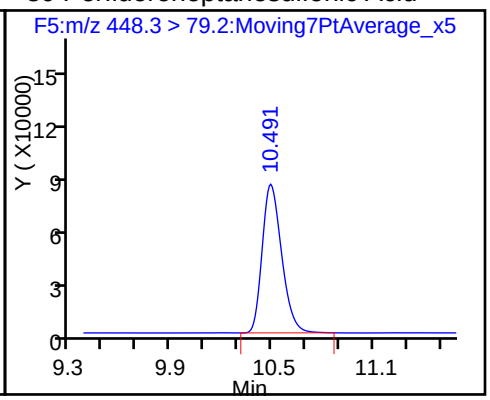
13 Perfluorooctanoic acid



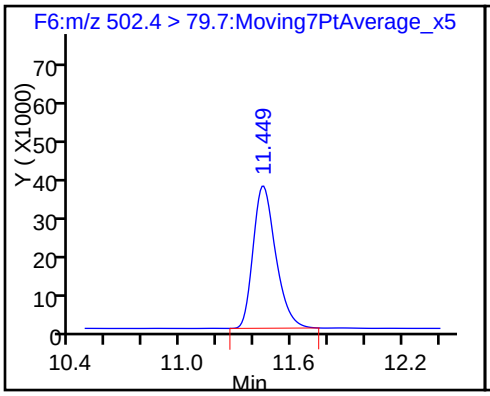
13 Perfluorooctanoic acid



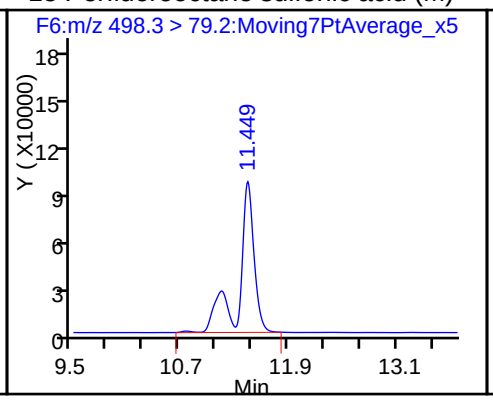
39 Perfluoroheptanesulfonic Acid



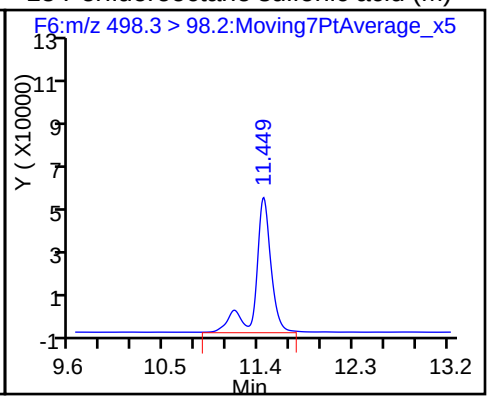
D 16 13C4 PFOS



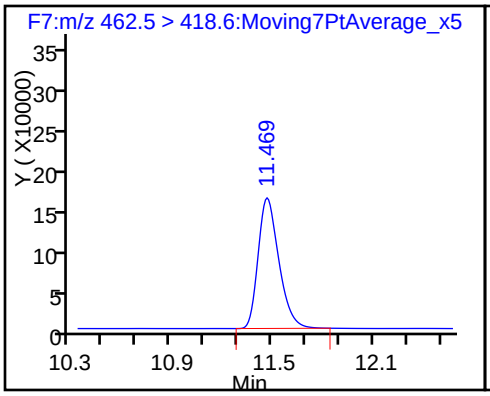
15 Perfluorooctane sulfonic acid (M)



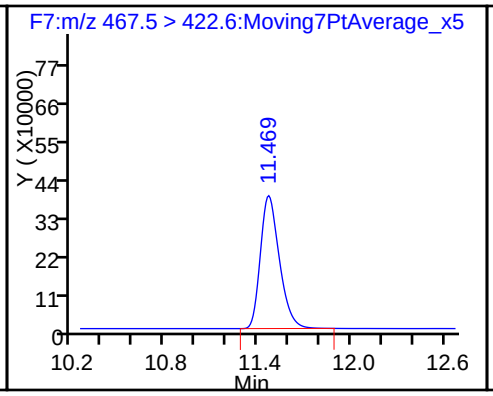
15 Perfluorooctane sulfonic acid (M)



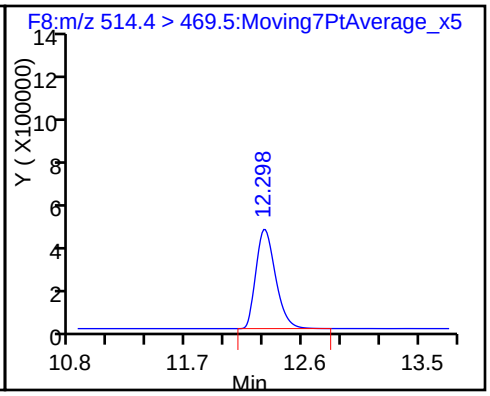
18 Perfluorononanoic acid



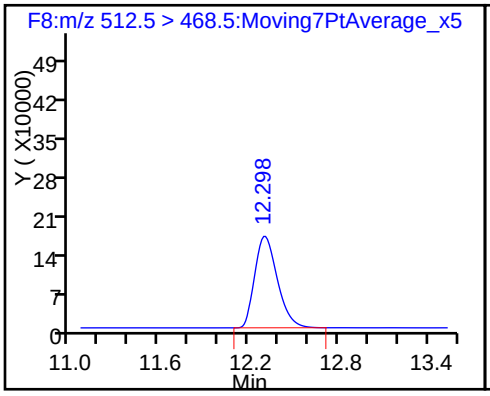
D 17 13C5 PFNA



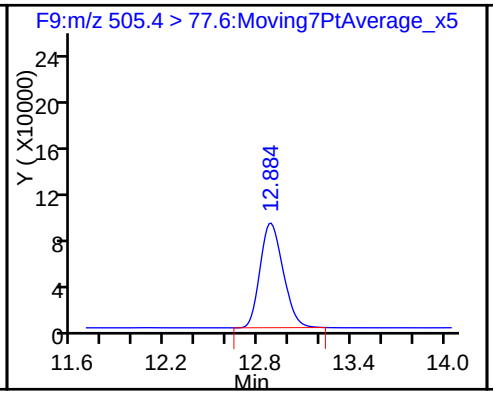
D 19 13C2 PFDA



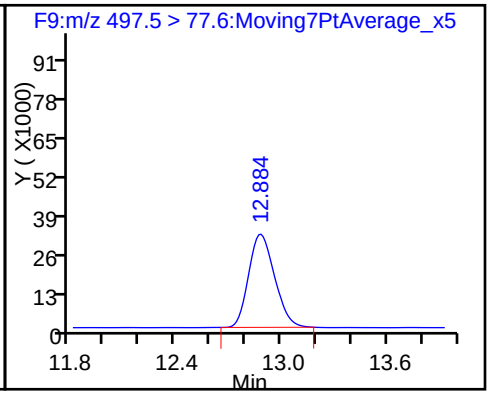
20 Perfluorodecanoic acid



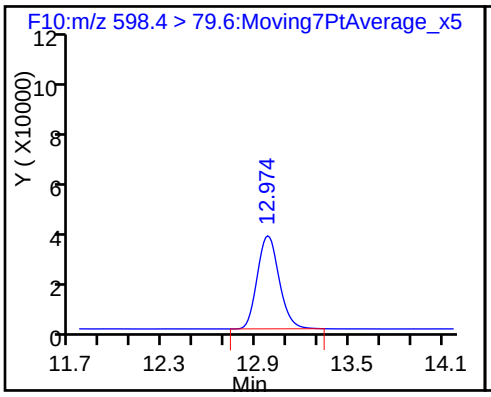
D 23 13C8 FOSA



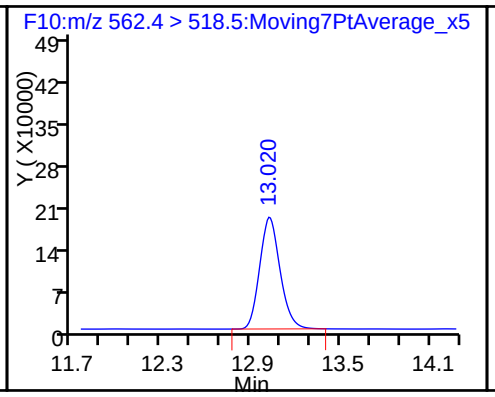
24 Perfluorooctane Sulfonamide



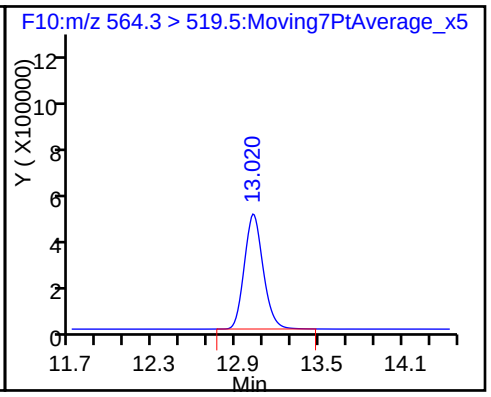
49 Perfluorodecane Sulfonic acid



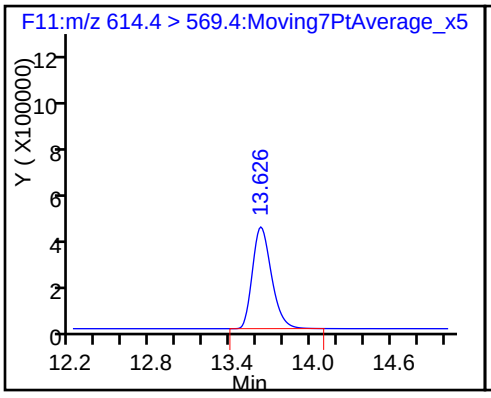
27 Perfluoroundecanoic acid



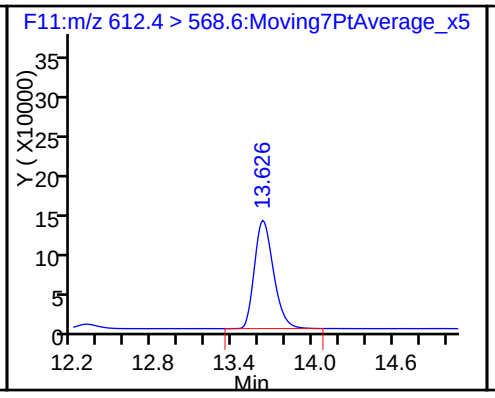
D 26 13C2 PFUnA



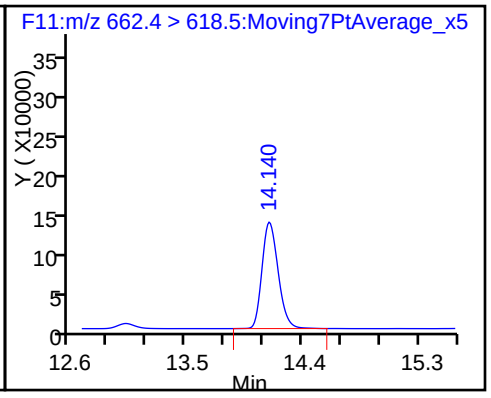
D 28 13C2 PFDoA



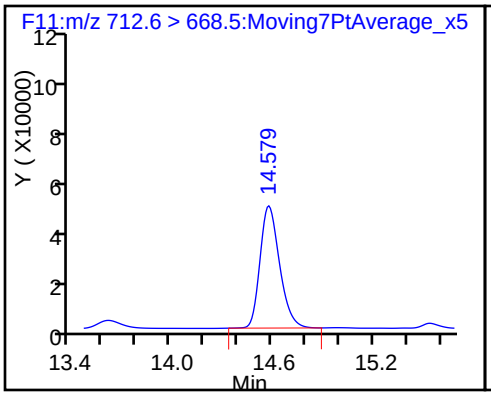
29 Perfluorododecanoic acid



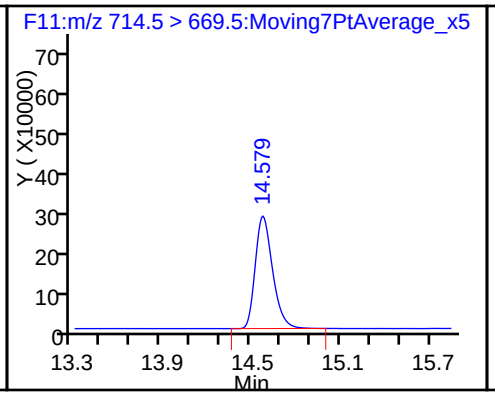
30 Perfluorotridecanoic acid



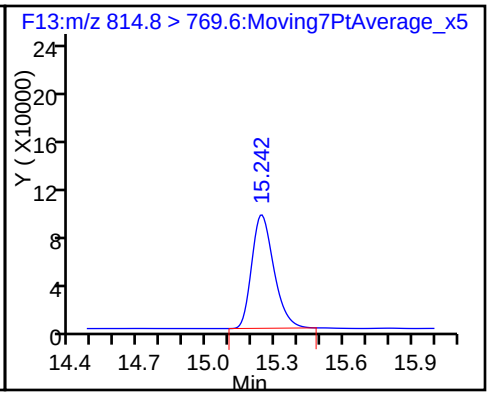
32 Perfluorotetradecanoic acid



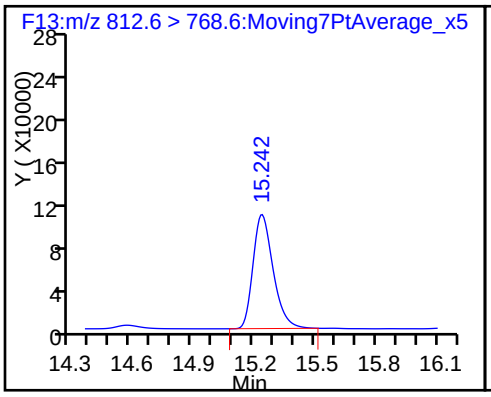
D 33 13C2-PFTeDA



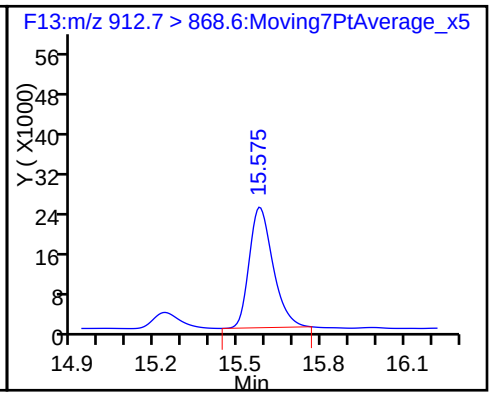
D 35 13C2-PFHxDA



34 Perfluorohexadecanoic acid



36 Perfluorooctandecanoic acid



Manual Integration/User Assign Peak Report

TestAmerica Sacramento

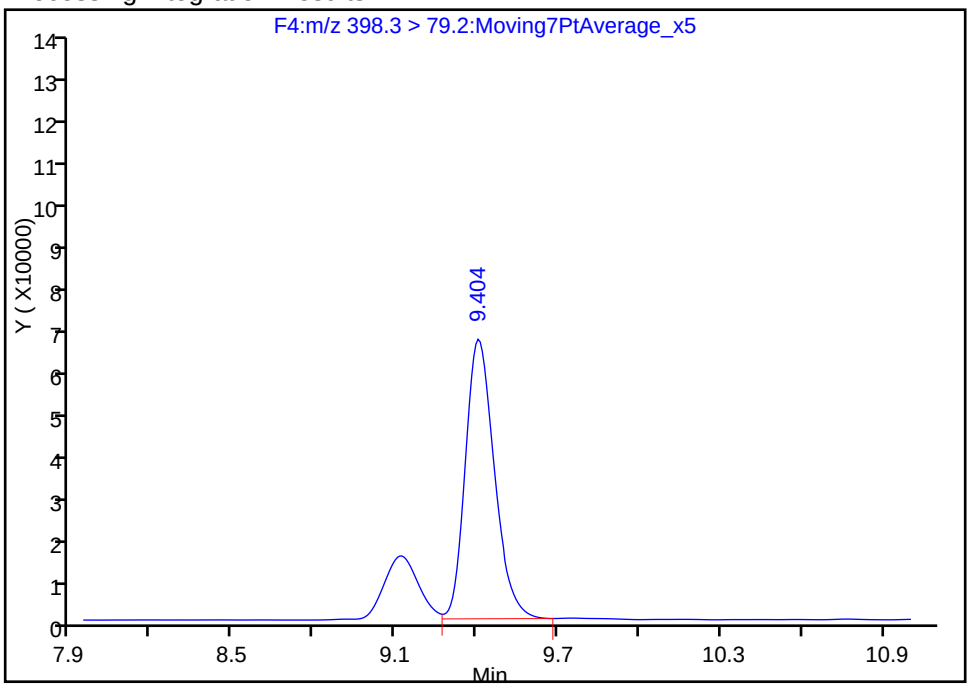
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_021.d
Injection Date: 27-May-2016 18:00:36 Instrument ID: A4
Lims ID: LCSD 320-110721/3-A
Client ID:
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 21
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F4:MRM

58 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

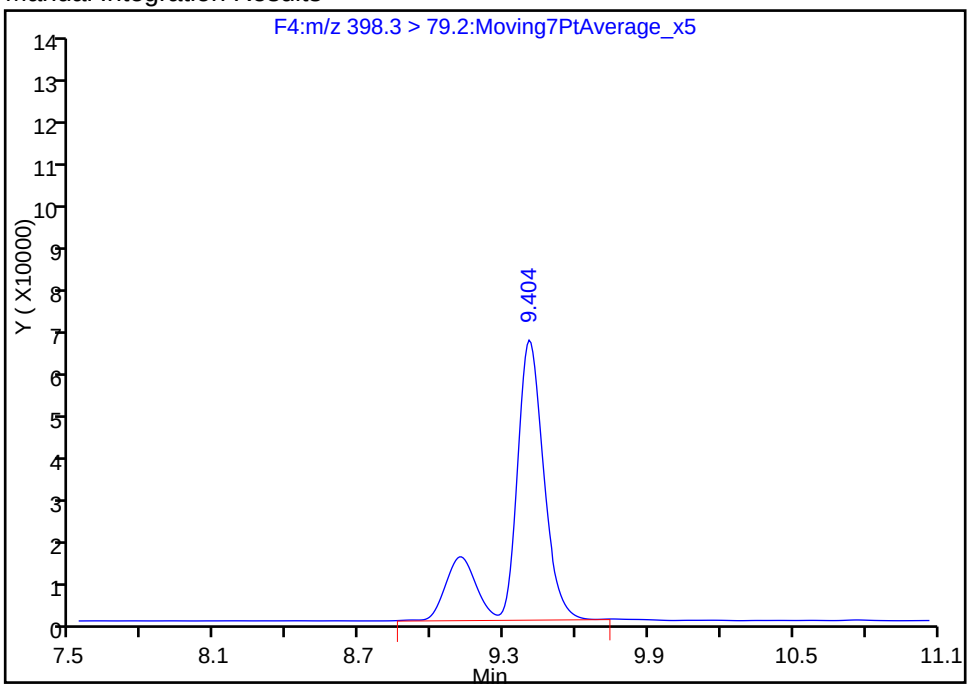
Processing Integration Results

RT: 9.40
Area: 492673
Amount: 12.294892
Amount Units: ng/ml



Manual Integration Results

RT: 9.40
Area: 629557
Amount: 15.710899
Amount Units: ng/ml



Reviewer: barnettj, 29-May-2016 13:40:36
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

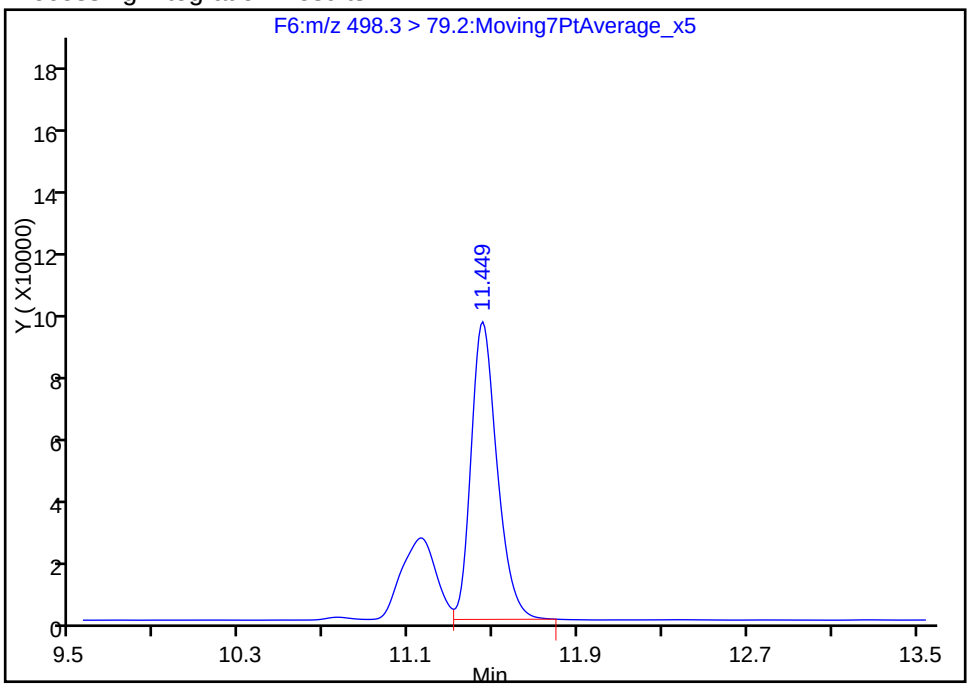
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_021.d
Injection Date: 27-May-2016 18:00:36 Instrument ID: A4
Lims ID: LCSD 320-110721/3-A
Client ID:
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 21
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

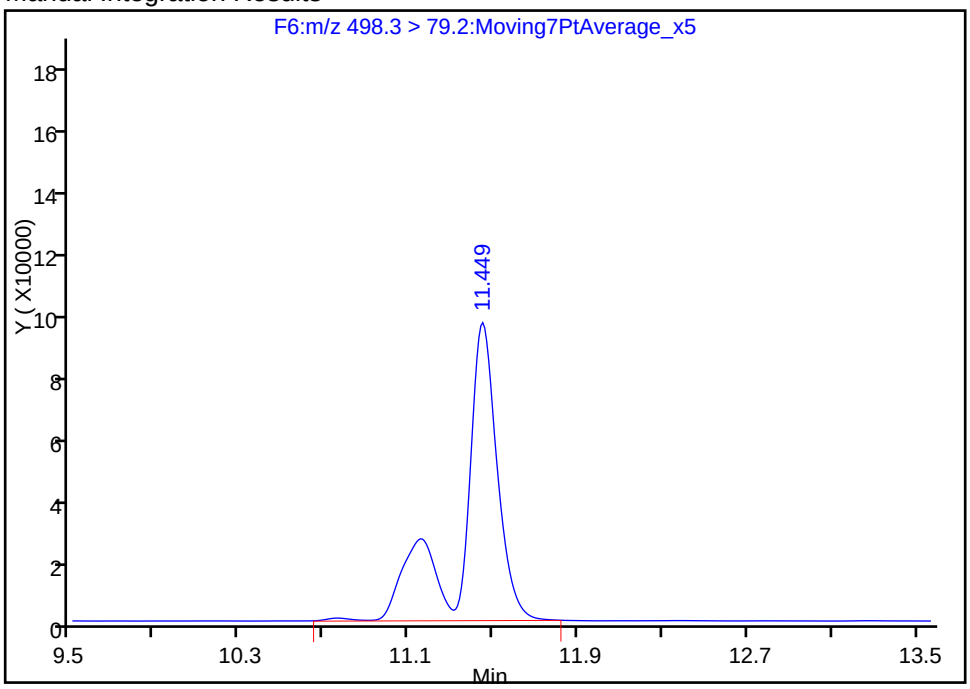
Processing Integration Results

RT: 11.45
Area: 823047
Amount: 10.298961
Amount Units: ng/ml



Manual Integration Results

RT: 11.45
Area: 1137170
Amount: 14.196650
Amount Units: ng/ml



Reviewer: barnettj, 29-May-2016 13:40:36
Audit Action: Manually Integrated Audit Reason: Isomers

Manual Integration/User Assign Peak Report

TestAmerica Sacramento

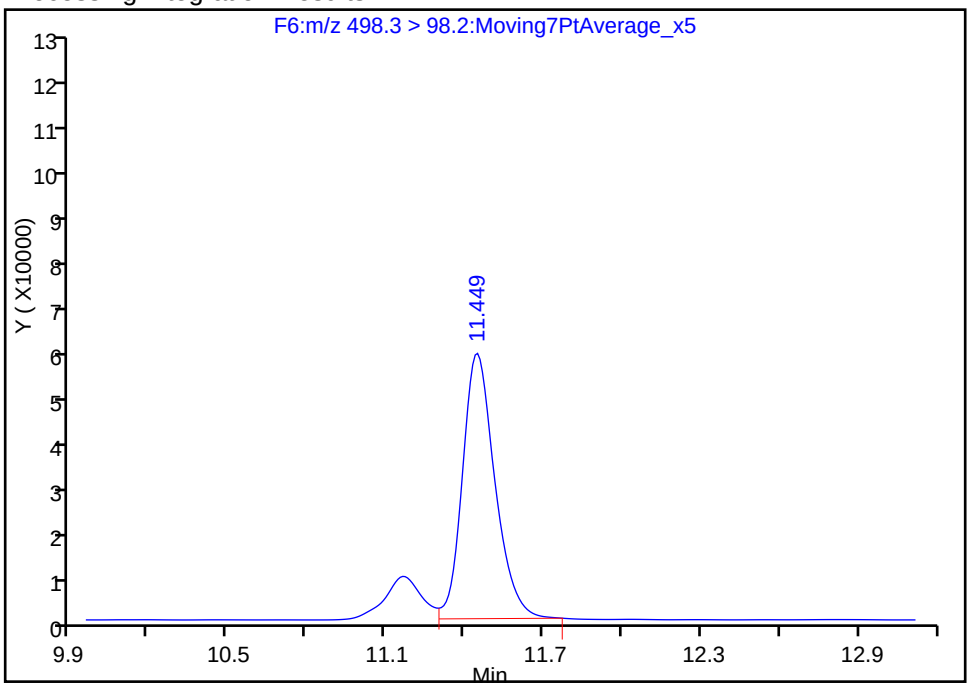
Data File: \\ChromNA\Sacramento\ChromData\A4\20160527-31151.b\27MAY2016B4A_021.d
Injection Date: 27-May-2016 18:00:36 Instrument ID: A4
Lims ID: LCSD 320-110721/3-A
Client ID:
Operator ID: JRB ALS Bottle#: 30 Worklist Smp#: 21
Injection Vol: 15.0 ul Dil. Factor: 1.0000
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

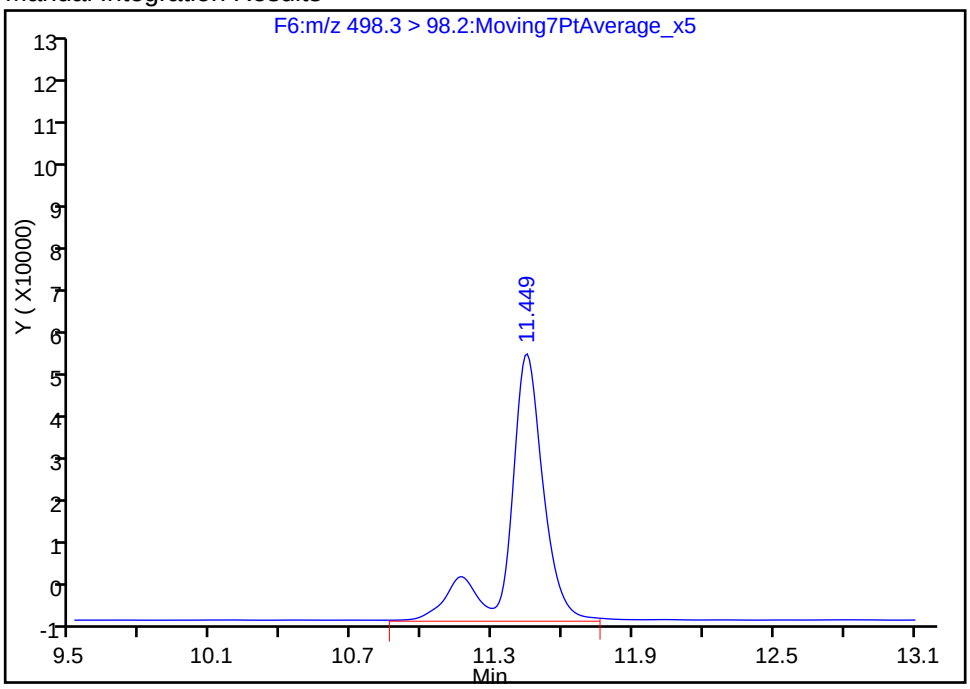
Processing Integration Results

RT: 11.45
Area: 487609
Amount: 10.298961
Amount Units: ng/ml



Manual Integration Results

RT: 11.45
Area: 598957
Amount: 14.196650
Amount Units: ng/ml



Reviewer: barnettj, 29-May-2016 13:40:36
Audit Action: Manually Integrated Audit Reason: Isomers

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Instrument ID: A4 Start Date: 05/27/2016 11:17

Analysis Batch Number: 111733 End Date: 05/28/2016 02:08

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-111733/2 IC		05/27/2016 11:17	1	27MAY2016B4A_002.d	Acquity 2.1(mm)
STD 320-111733/3 IC		05/27/2016 11:38	1	27MAY2016B4A_003.d	Acquity 2.1(mm)
STD 320-111733/4 IC		05/27/2016 11:59	1	27MAY2016B4A_004.d	Acquity 2.1(mm)
STD 320-111733/5 IC		05/27/2016 12:20	1	27MAY2016B4A_005.d	Acquity 2.1(mm)
STD 320-111733/6 IC		05/27/2016 12:41	1	27MAY2016B4A_006.d	Acquity 2.1(mm)
STD 320-111733/7 IC		05/27/2016 13:02	1	27MAY2016B4A_007.d	Acquity 2.1(mm)
STD 320-111733/8 IC		05/27/2016 13:24	1	27MAY2016B4A_008.d	Acquity 2.1(mm)
ZZZZZ		05/27/2016 13:45	1		Acquity 2.1(mm)
ICV 320-111733/10		05/27/2016 14:06	1	27MAY2016B4A_010.d	Acquity 2.1(mm)
ZZZZZ		05/27/2016 14:27	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 14:48	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 15:10	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 15:31	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 15:54	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 16:14	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 16:35	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 16:57	1		Acquity 2.1(mm)
MB 320-110721/1-A		05/27/2016 17:18	1	27MAY2016B4A_019.d	Acquity 2.1(mm)
LCS 320-110721/2-A		05/27/2016 17:39	1	27MAY2016B4A_020.d	Acquity 2.1(mm)
LCSD 320-110721/3-A		05/27/2016 18:00	1	27MAY2016B4A_021.d	Acquity 2.1(mm)
ZZZZZ		05/27/2016 18:21	1		Acquity 2.1(mm)
CCV 320-111733/23		05/27/2016 18:42	1	27MAY2016B4A_023.d	Acquity 2.1(mm)
320-18918-1		05/27/2016 21:54	1	27MAY2016B4A_025.d	Acquity 2.1(mm)
320-18918-2		05/27/2016 22:15	1	27MAY2016B4A_026.d	Acquity 2.1(mm)
ZZZZZ		05/27/2016 22:36	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 22:57	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 23:18	1		Acquity 2.1(mm)
ZZZZZ		05/27/2016 23:39	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 00:00	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 00:22	1		Acquity 2.1(mm)
ZZZZZ		05/28/2016 00:43	4		Acquity 2.1(mm)
ZZZZZ		05/28/2016 01:04	4		Acquity 2.1(mm)
ZZZZZ		05/28/2016 01:25	20		Acquity 2.1(mm)
ZZZZZ		05/28/2016 01:46	1		Acquity 2.1(mm)
CCV 320-111733/37		05/28/2016 02:08	1	27MAY2016B4A_037.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18918-1

SDG No.:

Batch Number: 110721 Batch Start Date: 05/20/16 11:05 Batch Analyst: Marchenko, Veronika P

Batch Method: 3535 Batch End Date: 05/21/16 14:39

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00040	LCPFCSP 00049
MB 320-110721/1		3535, WS-LC-0025				500 mL	1.0 mL	50 uL	
LCS 320-110721/2		3535, WS-LC-0025				500 mL	1.0 mL	50 uL	20 uL
LCSD 320-110721/3		3535, WS-LC-0025				500 mL	1.0 mL	50 uL	20 uL
320-18918-A-1	OF-RW83-0516	3535, WS-LC-0025	T	564.40 g	45.55 g	518.9 mL	1.0 mL	50 uL	
320-18918-A-2	OF-FB83-0516	3535, WS-LC-0025	T	558.61 g	43.94 g	514.7 mL	1.0 mL	50 uL	

Batch Notes	
Balance ID	QA-070
Batch Comment	0.1N NaOH/H2O: 607459
H2O ID	5/18/16
Hexane ID	0000135581
Manifold ID	5
Methanol ID	625009
Pipette ID	EC15219, EC15131
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	HJA
Solvent Lot #	626675
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 18918, 18987, 18988 Work List ID(s): 31151

Extraction Batch: 110721 Analysis Batch(es): 111733

Delivery Rank 4 Due Date: 5-31-16

A. Calibration/Instrument Run QC	1st Level	2nd Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch#	✓	✓	
2. ICAL, CCV Frequency & Criteria met.	✓	✓	
• $RF_{average}$ criteria appropriate for the method..	✓	✓	
• Linear Regression criteria appropriate if required ($r \geq 0.995$).	✓	✓	
• Quadratic fit criteria appropriate if required ($r^2 \geq 0.990$).			✓
• For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005?	✓	✓	
• All curve points show calculated concentrations.	✓	✓	
3. Peaks correctly ID'd by data system.	✓	✓	
5. Tune check frequency & criteria met and Tune check report attached.	✓	✓	
B. QA/QC			
1. Are all QC samples properly linked in TALS?	✓	✓	
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	✓	
3. LCS/LCSD and MB data are within control limits. If not, NCM is present.	✓	✓	
4. Are MS/MSD recoveries and RPD within control limits?			✓
5. Holding Times were met for prep and analytical.	✓	✓	
6. IS/Surrogate recoveries meet criteria or properly noted. NCM	✓	✓	
C. Sample Analysis			
1. Was correct analysis performed and were project instructions followed?	✓	✓	
2. If required, are compounds within RT windows?			✓
3. If required, are positive hits confirmed and >40% RPD flagged?			✓
4. Manual Integrations reviewed and appropriate.	✓	✓	
5. All analytes correctly reported. (Primary, secondary, acceptable status)	✓	✓	
6. Correct reporting limits used. (based on client request, prep factors, and dilutions)	✓	✓	
D. Documentation			
1. Are all non-conformances documented/attached? NCM# 53464, 53477	✓	✓	
2. Do results make sense (e.g. dilutions, etc.)?	✓	✓	
3. Have all flags been reviewed for appropriateness?	✓	✓	
4. For level 3 and 4 reports, have forms and raw data been reviewed?		✓	
5. Was QC Checker run for this job?	✓	✓	

**Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.*

1st Level (Analyst): JRB Date: 5-31-16

2nd Level Reviewer: [signature] Date: 5/31/2016

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Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110721

Analyst: Marchenko, Veronika P

Batch Open: 5/20/2016 11:05:40AM

Method Code: 320-3535_IVWT-320

Due 5/31

Batch End: 5-21-16 14:39

Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	PHs Rcvd	PHs Adj1	PHs Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-110721/1 N/A	N/A		500 mL				N/A	N/A	N/A		MB 320-110721/1-A
				1.0 mL								
2	LCS~320-110721/2 N/A	N/A		500 mL				N/A	N/A	N/A		LCS 320-110721/2-A
				1.0 mL								
3	LCSD~320-110721/3 N/A	N/A		500 mL				N/A	N/A	N/A		LCSD 320-110721/3-A
				1.0 mL								
	320-18918-A-1 (PFC_IDA_DOD5) CH2	N/A (320-18918-1)	564.40 g	518.9 mL				5/21/16	11_Days	4		320-18918-A-1-A
			45.55 g	1.0 mL								
	320-18918-A-2 (PFC_IDA_DOD5) CH2	N/A (320-18918-1)	558.61 g	514.7 mL				5/21/16	11_Days	4		320-18918-A-2-A
			43.94 g	1.0 mL								
6	320-18987-A-1 (PFC_IDA_DOD5) 6/10	N/A (320-18987-1)	599.67 g	554.8 mL				5/25/16	12_Days	4		320-18987-A-1-A
			44.89 g	1.0 mL								
7	320-18987-A-2 (PFC_IDA_DOD5) 6/10	N/A (320-18987-1)	593.46 g	547.9 mL				5/25/16	12_Days	4		320-18987-A-2-A
			45.60 g	1.0 mL								
8	320-18988-A-1 (PFC_IDA_DOD5) 6/10	N/A (320-18988-1)	600.01 g	554.7 mL				5/25/16	12_Days	4		320-18988-A-1-A
			45.33 g	1.0 mL								
9	320-18988-A-2 (PFC_IDA_DOD5) 6/10	N/A (320-18988-1)	603.1 g	556.7 mL				5/25/16	12_Days	4		320-18988-A-2-A
			46.40 g	1.0 mL								
10	320-18988-A-3 (PFC_IDA_DOD5) 6/10	N/A (320-18988-1)	598.91 g	552.8 mL				5/25/16	12_Days	4		320-18988-A-3-A
			46.14 g	1.0 mL								

Page 515 of 523

05/31/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110721 Analyst: Marchenko, Veronika P Batch Open: 5/20/2016 11:05:40AM

Method Code: 320-3535_IVWT-320 Batch End:

Batch Notes

Manifold ID	5
Methanol ID	625009
Hexane ID	0000135581
Sodium Hypochlorite ID	NA
First Start time	NA
First End time	NA
Balance ID	QA-070
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A
H2O ID	5/18/16
Pipette ID	EC15219, EC15131
Solvent Name	0.3% NH4OH/MeOH
Solvent Lot #	626675
Analyst ID - Reagent Drop	VPM
Analyst ID - SU Reagent Drop	VPM
Analyst ID - SU Reagent Drop Witness	HJA
Acid Name	NA
Acid ID	NA
Reagent ID	NA
Reagent Lot Number	NA
NaCl ID	NA

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110721 Analyst: Marchenko, Veronika P Batch Open: 5/20/2016 11:05:40AM

Method Code: 320-3535_IVWT-320 Batch End:

SOP Number	WS-LC-0025
Batch Comment	0.1N NaOH/H2O: 607459

Comments

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110721
Method Code: 320-3535_IVWT-320

Analyst: Marchenko, Veronika P

Batch Open: 5/20/2016 11:05:40AM
Batch End:

Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-110721/1	LCMPFCSU_00040	50 uL	1.0 mL	VPM 5-20-16	HJA 5-20-16
LCS 320-110721/2	LCMPFCSU_00040	50 uL	1.0 mL		
LCS 320-110721/2	LCPFCSP_00049	20 uL	1.0 mL		
LCSD 320-110721/3	LCMPFCSU_00040	50 uL	1.0 mL		
LCSD 320-110721/3	LCPFCSP_00049	20 uL	1.0 mL		
320-18918-A-1	LCMPFCSU_00040	50 uL	1.0 mL		
320-18918-A-2	LCMPFCSU_00040	50 uL	1.0 mL		
320-18987-A-1	LCMPFCSU_00040	50 uL	1.0 mL		
320-18987-A-2	LCMPFCSU_00040	50 uL	1.0 mL		
320-18988-A-1	LCMPFCSU_00040	50 uL	1.0 mL		
320-18988-A-2	LCMPFCSU_00040	50 uL	1.0 mL		
320-18988-A-3	LCMPFCSU_00040	50 uL	1.0 mL		

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-110721

Analyst: Marchenko, Veronika P

Batch Open: 5/20/2016 11:05:40AM

Method Code: 320-3535_IVWT-320

Batch End:

Other Reagents:

Reagent	Amount/Units	Lot#:

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Preparation Data Review Checklist

Preparation Batch Number(s): 110721 Test: PFC_IDA_DOD5

Earliest Holding Time: 5-20-16

Sample List Tab	1st Level Reviewer	2nd Level Reviewer
Samples identified to the correct method	✓	✓
All necessary NCMs filed (including holding time)	✓	✓
Method/sample/login/QAS checked and correct	✓	✓
Worksheet Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All samples properly preserved	NA	NA
Weights in anticipated range and not targeted	✓	✓
All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and Cl Check)	✓	✓
The pH is transcribed correctly in TALS	NA	NA
All additional information transcribed into TALS is correct and raw data is attached	✓	✓
Comments are transcribed correctly in TALS	✓	✓
Reagents Tab	**1st Level Reviewer**	**2nd Level Reviewer**
All necessary reagents not expired and entered into TALS	✓	✓
All spike amounts correct and added to necessary samples and QC	✓	✓
Batch Information	**1st Level Reviewer**	**2nd Level Reviewer**
Date and time accurate and entered into TALS correctly	✓	✓
All necessary 'batch information' complete and entered into TALS correctly	✓	✓

1st Level Reviewer: VPM Date: 5-21-16

2nd Level Reviewer: [signature] Date: 5/21/16

Comments:

Shipping and Receiving Documents

CTO-WE01

Chain of Custody Record

Temperature on Receipt 3.1°C

Drinking Water? Yes [X] No [ ]

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client: CH2M HILL	Project Manager: Tiffany Hill	Date: 5-16-16	Chain of Custody Number: 286006
Address: 5701 Cleveland Street, Suite 200	Telephone Number (Area Code)/Fax Number	Lab Number	Page 1 of 1
City: Virginia Beach, State: VA, Zip Code	Site Contact	Lab Contact: Laura Turpen	Analysis (Attach list if more space is needed)
Project Name and Location (State): Fentress PFC Sampling WE01	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed	Soil	Containers & Preservatives: Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Select PFCs	Special Instructions/ Conditions of Receipt
OF-RW83-0516	5/16/16	~~8:45~~ 8:20		X			X						2	
OF-FB83-0516	5/16/16	8:15		X			X						2	

320-18918 Chain of Custody

Possible Hazard Identification
[ ] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal
[ ] Return To Client [ ] Disposal By Lab [ ] Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
[ ] 24 Hours [ ] 48 Hours [ ] 7 Days [X] 14 Days [ ] 21 Days [ ] Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Juliana Dean	5-16-16	10:30AM	1. Received By: CME 5/17	5/17/16	0915
2. Relinquished By	Date	Time	2. Received By	Date	Time
3. Relinquished By	Date	Time	3. Received By	Date	Time

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-18918-1

Login Number: 18918
List Number: 1
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Contract_ID	SIO_STN_Number	Phase	IsolationId_ID	Sample_Name	OSIM_Code	Analysis_Group	Analytical_Method	FRC_Code	Lab_Code	Lab_Name	Leachate_Method	Sample_Basis	Extraction_Method	Result_Type	Lab_QC_Type	Sample_Medium	QC_Level	Date/Time_Collected	Date_Received	Leachate_Date	Leachate_Time	Extraction_Date	Extraction_Time	Analysis_Date	Analysis_Time	Lab_Sample_ID	Dilution	Run_Number	Percent_Moisture	Percent_Lipid	Chem_Name	Analyte_ID	Analyte_Value	Original_Analyte_Value	Result_Units	Lab_Qualifier	Validator_Qualifier	QC_Criteria_Type	Analysis_Result_Type	Result_Narrative	QC_Control_Limit_Code	QC_Accuracy_Upper	QC_Accuracy_Lower	Quoted_Limit_Date	QC_Narrative	MDL	Detection_Limit	QAM_Version	DL	LOD	LOQ	Analysis_Batch	Validator_Name	Val_Date
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.016	0.016	ng/L			PB	TRG				00000000			0.0024	1.0	0.00075	0.0024	0.0024	105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.36	0.36	ng/L		M	PB	TRG				00000000			0.0024	1.0	0.00075	0.0024	0.0024	105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.014	0.014	ng/L			PB	TRG				00000000			0.0024	1.0	0.00086	0.0024	0.0024	105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.32	0.32	ng/L		Y2	PB	TRG				00000000			0.0024	1.0	0.00082	0.0024	0.0024	105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160525	01:29:00	105-18750-1	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	DLI	NSS	W		05/09/2016 09:12	05/06/2016			20160509	16:04:00	20160526	12:24:00	105-18750-1	20	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.80	0.80	ng/L		D M Q	PB	TRG				00000000		0.375	0.5	1.0	0.214	0.556	0.375	105-18750-1	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	NM-100-180926/S-A	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	LBS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0035	0.0035	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	NM-100-180926/S-A	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	LBS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0018	0.0018	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00082	0.0024	0.0024	105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0018	0.0018	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00086	0.0024	0.0024	105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.0167	0.0167	ng/L		J M Q	PB	TRG				00000000		0.0012	0.0024	1.0	0.0012	0.0028	0.0024	105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:00	05/06/2016			20160509	16:04:00	20160525	01:51:00	105-18750-2	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-2	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			Perfluorohexanoic acid (PFHpA)	375-85-9	0.013	0.013	ng/L			PB	TRG				00000000		0.0079	0.0020	0.0024	0.0079	0.0020	0.0024	105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0018	0.0018	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00086	0.0024	0.0024	105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.016	0.016	ng/L			PB	TRG				00000000		0.0012	0.0024	1.0	0.0012	0.0028	0.0024	105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:44	05/06/2016			20160509	16:04:00	20160525	02:02:00	105-18750-3	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-3	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			Perfluorohexanoic acid (PFHpA)	375-85-9	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00076	0.0024	0.0024	105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0018	0.0018	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00086	0.0024	0.0024	105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.0114	0.0114	ng/L		J	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.0012	0.0028	0.0024	105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:32	05/06/2016			20160509	16:04:00	20160525	01:55:00	105-18750-4	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-4	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			Perfluorohexanoic acid (PFHpA)	375-85-9	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00076	0.0024	0.0024	105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0067	0.0067	ng/L		M Q	PB	TRG				00000000		0.0012	0.0024	1.0	0.00082	0.0024	0.0024	105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.0129	0.0129	ng/L		J	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.0012	0.0028	0.0024	105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:20	05/06/2016			20160509	16:04:00	20160525	01:49:00	105-18750-5	1	1			1363 PFAA	1363 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-5	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:08	05/06/2016			20160509	16:04:00	20160525	01:37:00	105-18750-6	1	1			Perfluorohexanoic acid (PFHpA)	375-85-9	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00076	0.0024	0.0024	105-18750-6	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:08	05/06/2016			20160509	16:04:00	20160525	01:37:00	105-18750-6	1	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.0019	0.0019	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00077	0.0024	0.0024	105-18750-6	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:08	05/06/2016			20160509	16:04:00	20160525	01:37:00	105-18750-6	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0018	0.0018	ng/L		U	PT_ISC			PB	TRG				00000000			0.0024	1.0	0.00086	0.0024	0.0024	105-18750-6	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:08	05/06/2016			20160509	16:04:00	20160525	01:37:00	105-18750-6	1	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.0167	0.0167	ng/L		J M Q	PB	TRG				00000000		0.0012	0.0024	1.0	0.0012	0.0028	0.0024	105-18750-6	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:08	05/06/2016			20160509	16:04:00	20160525	01:37:00	105-18750-6	1	1			1802 PFAS	1802 PFAS	NA			PT_ISC			PB	SUMI				00000000							105-18750-6	105-111160	
NAUTI0SIO0000	W001		OCEANA_NAS	OP-R4H4-0116	NONE	SVOA	TAMS_WLS-0005	SVOA	TAMS	Test America	NONE	NA	SW8181	SSD	NSS	W		05/09/2016 09:08	05/06/2016			20160509	16:04:00	20160525	01:37:00	105-18750-6	1	1			1414 PFAA	1414 PFAA	NA			PT_ISC			PB	SUMI				00000000							105-18750-6	105

Contract_ID	Inv_YSI_Number	Phase	IsolationId_ID	Sample_Name	OWM_Code	Analysis_Group	Analytical_Method	FBG_Code	Lab_Code	Lab_Name	Leachate_Method	Sample_Basis	Extraction_Method	Result_Type	Lab_ID_Type	Sample_Medium	QC_Level	Date/Time_Collected	Date_Received	Leachate_Date	Leachate_Time	Extraction_Date	Extraction_Time	Analysis_Date	Analysis_Time	Lab_Sample_ID	Dilution	Run_Number	Percent_Moisture	Percent_Lipid	Chem_Name	Analyte_ID	Analyte_Value	Original_Analyte_Value	Result_Units	Lab_Qualifier	Validator_Qualifier	QC_Criteria_Type	Analysis_Result_Type	Result_Narrative	QC_Control_Limit_Code	QC_Accuracy_Upper	QC_Accuracy_Lower	Control_Limit_Date	QC_Narrative	MDL	Detection_Limit	EMM_Version	EL	LOD	LOQ	Analysis_Batch	Validator_Name	Val_Date
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TMS_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 09:51	05/11/2016			20160512	0050-00	20160526	12:46:00	320-18756-1	20	1			Iron	7439-89-6	5300		DIL_I		PR	SUMI		TRG				0000000			100	L		22	85	100	320-18756-1	280-104010	
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	MATAL	6010C	MET	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 09:51	05/11/2016			20160512	0050-00	20160526	12:46:00	320-18756-1	1	1			Iron	7439-89-6	5300		DIL_I		PR	SUMI		TRG				0000000			100	L		22	85	100	320-18756-1	280-104010	
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.964		DIL_I	D	PR	TRG		TRG				0000000			0.021	0.098	0.098	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			Perfluorooctanoic acid (PFOA)	335-67-1	0.7		DIL_I	D M	PR	TRG		TRG				0000000			0.014	0.098	0.098	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.098		DIL_I	D	PR	TRG		TRG				0000000			0.012	0.098	0.098	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			Perfluorononanoic acid (PFNA)	375-95-1	0.031		DIL_I	D	PR	TRG		TRG				0000000			0.009	0.098	0.098	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.2		DIL_I	D B M	PR	TRG		TRG				0000000			0.014	0.057	0.076	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-TRMTS40-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 11:50	05/11/2016			20160512	0050-00	20160526	18:11:00	320-18756-3	10	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	0.075		DIL_I	D	PR	TRG		TRG				0000000			0.014	0.057	0.076	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-TRMTS40-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8270C	000	MAS	W	D	05/10/2016 11:50	05/11/2016			20160512	0050-00	20160526	18:11:00	320-18756-3	10	1			1802 PFHxS	1802 PFHxS	166		PCT_ISC	CL		SUMI		SUM		150	25		0000000				L					320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-TRMTS40-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8270C	000	MAS	W	D	05/10/2016 11:50	05/11/2016			20160512	0050-00	20160526	18:11:00	320-18756-3	10	1			13C4 PFOS	13C4 PFOS	55		PCT_ISC	CL		SUMI		SUM		150	25		0000000				L					320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-TRMTS40-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 11:50	05/11/2016			20160512	0050-00	20160526	18:11:00	320-18756-3	10	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.2		DIL_I	D B M	PR	TRG		TRG				0000000			0.014	0.057	0.076	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-TRMTS40-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8270C	000	MAS	W	D	05/10/2016 11:50	05/11/2016			20160512	0050-00	20160526	18:11:00	320-18756-3	10	1			1802 PFHxS	1802 PFHxS	166		PCT_ISC	CL		SUMI		SUM		150	25		0000000				L					320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-TRMTS40-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8270C	000	MAS	W	D	05/10/2016 11:50	05/11/2016			20160512	0050-00	20160526	18:11:00	320-18756-3	10	1			13C4 PFOS	13C4 PFOS	55		PCT_ISC	CL		SUMI		SUM		150	25		0000000				L					320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8310A	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			Perfluorooctanesulfonic acid (PFOS)	1763-23-1	1.2		DIL_I	D B M	PR	TRG		TRG				0000000			0.014	0.057	0.076	320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8270C	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			1802 PFHxS	1802 PFHxS	166		PCT_ISC	CL		SUMI		SUM		150	25		0000000				L					320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-FR70-0116	NONE	SVOA	TA_WS-C-0015	SVOA	TAMER	Test America	NONE	NA	SW8270C	000	MAS	W	D	05/10/2016 10:06	05/11/2016			20160512	0050-00	20160526	13:07:00	320-18756-2	20	1			13C4 PFOS	13C4 PFOS	55		PCT_ISC	CL		SUMI		SUM		150	25		0000000				L					320-18756-1	320-111190		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-CLTHW-0116	NONE	MCHEM	9060	PCHAR	TAMER	Test America	NONE	NA	NONE	000	MAS	W	D	05/10/2016 10:48	05/11/2016			20160518	0100-00	20160526	21:55:59	320-18756-3	2	1			Total organic carbon (TOC)	TOC	51		NPL_I		PR	TRG		TRG				0000000			0.31	1.0	2.0	320-18756-1	280-106566		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-CLTHW-0116	NONE	MCHEM	9060	PCHAR	TAMER	Test America	NONE	NA	NONE	000	MAS	W	D	05/10/2016 10:48	05/11/2016			20160518	0100-00	20160526	21:55:59	320-18756-3	2	1			Total organic carbon (TOC)	TOC	51		NPL_I		PR	TRG		TRG				0000000			0.31	1.0	2.0	320-18756-1	280-106566		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-CLTHW-0116	NONE	MCHEM	9060	PCHAR	TAMER	Test America	NONE	NA	NONE	000	MAS	W	D	05/10/2016 10:48	05/11/2016			20160518	0100-00	20160526	21:55:59	320-18756-3	2	1			Total organic carbon (TOC)	TOC	50		NPL_I		PR	TRG		TRG				0000000			0.31	1.0	2.0	320-18756-1	280-106566		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-CLTHW-0116	NONE	MCHEM	9060	PCHAR	TAMER	Test America	NONE	NA	NONE	000	MAS	W	D	05/10/2016 10:48	05/11/2016			20160518	0100-00	20160526	21:55:59	320-18756-3	2	1			Total organic carbon (TOC)	TOC	50		NPL_I		PR	TRG		TRG				0000000			0.31	1.0	2.0	320-18756-1	280-106566		
NAUXTRIAD9000	WEEK		OCEANA_NAS	OP-CLTHW-0116	FILT	FWCHEM	9060	PCHAR	TAMER	Test America	NONE	FF	NONE	000	MAS	W	D	05/10/2016 10:48	05/11/2016			20160518	0100-00	20160526	21:23:43	320-18756-3	2	1			Dissolved organic carbon	DOC	29		NPL_I		PR	TRG		TRG				0000000			0.31	1.0	2.0	320-18756-1	280-106567

Contract_ID	DO_CTO_Number	Phase	Installation_ID	Sample_Name	CH2M_Code	Analysis_Group	Analytical_Method	PRC_Code	Lab_Code	Lab_Name	Leachate_Method	Sample_Basis	Extraction_Method	Result_Type	Lab_QC_Type	Sample_Medium	QC_Level	DateTime_Collected	Date_Received	Leachate_Date	Leachate_Time	Extraction_Date	Extraction_Time	Analysis_Date	Analysis_Time	Lab_Sample_ID	Dilution	Run_Number	Percent_Moisture	Percent_Lipid	Chem_Name	Analyte_ID	Analyte_Value	Original_Analyte_Value	Result_Units	Lab_Qualifier	Validator_Qualifier	GC_Column_Type	Analysis_Result_Type	Result_Narrative	QC_Control_Limit_Code	QC_Accuracy_Upper	QC_Accuracy_Lower	Control_Limit_Date	QC_Narrative	MDL	Detection_Limit	QSM_Version	DL	LOD	LOQ	SDG	Analysis_Batch	Validator_Name	Val_Date
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00085	0.0019	0.0024	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0029	UG_L	U M		PR	TRG				00000000			0.0039	5	0.0012	0.0029	0.0039	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			18O2 PFHXS	18O2 PFHXS		84	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			13C4 PFOS	13C4 PFOS		24	PCT_REC	Q		PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			13C5 PFNA	13C5 PFNA		100	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			13C4 PFOA	13C4 PFOA		106	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB83-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/16/2016 08:15	05/17/2016			20160520	11:05:00	20160527	22:15:00	320-18918-2	1	1			13C4-PFHPA	13C4-PFHPA		96	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		76	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00080	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		81	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00075	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		85	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00065	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		77	PCT_REC			PR	TRG		LSA	150	50	00000000			0.0025	5	0.00092	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		79	PCT_REC	M		PR	TRG		LSA	140	60	00000000			0.0025	5	0.00087	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		70	PCT_REC	M		PR	TRG		LSA	140	60	00000000			0.0040	5	0.0013	0.0030	0.0040	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			18O2 PFHXS	18O2 PFHXS		101	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			13C4 PFOS	13C4 PFOS		126	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			13C5 PFNA	13C5 PFNA		91	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			13C4 PFOA	13C4 PFOA		92	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110721/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:39:00	LCS 320-110721/2-A	1	1			13C4-PFHPA	13C4-PFHPA		95	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		80	PCT_REC			PR	TRG		LSP	140	60	00000000			0.0025	5	0.00080	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		76	PCT_REC			PR	TRG		LSP	140	60	00000000			0.0025	5	0.00075	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		84	PCT_REC			PR	TRG		LSP	140	60	00000000			0.0025	5	0.00065	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		82	PCT_REC			PR	TRG		LSP	150	50	00000000			0.0025	5	0.00092	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		86	PCT_REC	M		PR	TRG		LSP	140	60	00000000			0.0025	5	0.00087	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		76	PCT_REC	M		PR	TRG		LSP	140	60	00000000			0.0040	5	0.0013	0.0030	0.0040	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			18O2 PFHXS	18O2 PFHXS		84	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			13C4 PFOS	13C4 PFOS		107	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			13C5 PFNA	13C5 PFNA		82	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			13C4 PFOA	13C4 PFOA		83	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-110721/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	18:00:00	LCSD 320-110721/3-A	1	1			13C4-PFHPA	13C4-PFHPA		81	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00080	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00075	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00065	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00092	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00087	0.0020	0.0025	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0030	UG_L	U M		PR	TRG				00000000			0.0040	5	0.0013	0.0030	0.0040	320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			18O2 PFHXS	18O2 PFHXS		107	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			13C4 PFOS	13C4 PFOS		127	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			13C5 PFNA	13C5 PFNA		97	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			13C4 PFOA	13C4 PFOA		105	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110721/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/20/2016 11:05	05/20/2016			20160520	11:05:00	20160527	17:18:00	MB 320-110721/1-A	1	1			13C4-PFHPA	13C4-PFHPA		97	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18918-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00079	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00074	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0020	UG_L	U M		PR	TRG				00000000			0.0025	5	0.00065	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00091	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00086	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0030	UG_L	U		PR	TRG				00000000			0.0040	5	0.0013	0.0030	0.0040	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			18O2 PFHXS	18O2 PFHXS		111	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			13C4 PFOS	13C4 PFOS		114	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			13C5 PFNA	13C5 PFNA		111	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			13C4 PFOA	13C4 PFOA		116	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-FB74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:08	05/13/2016			20160517	11:08:00	20160526	17:50:00	320-18849-1	1	1			13C4-PFHPA	13C4-PFHPA		105	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0019	UG_L	U M		PR	TRG				00000000			0.0024	5	0.00078	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.00076	UG_L	J		PR	TRG				00000000			0.0024	5	0.00072	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0011	UG_L	J		PR	TRG				00000000			0.0024	5	0.00063	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00089	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00084	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0029	UG_L	U		PR	TRG				00000000			0.0039	5	0.0012	0.0029	0.0039	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			18O2 PFHXS	18O2 PFHXS		115	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			13C4 PFOS	13C4 PFOS		118	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			13C5 PFNA	13C5 PFNA		92	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			13C4 PFOA	13C4 PFOA		96	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:10:00	320-18849-2	1	1			13C4-PFHPA	13C4-PFHPA		93	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		98	PCT_REC			PR	TRG		MSA	140	60	00000000			0.0024	5	0.00077	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		102	PCT_REC			PR	TRG		MSA	140	60	00000000			0.0024	5	0.00072	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			Perfluorononanoic acid (PFNA)	375-95-1		108	PCT_REC			PR	TRG		MSA	140	60	00000000			0.0024	5	0.00063	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		81	PCT_REC			PR	TRG		MSA	150	50	00000000			0.0024	5	0.00088	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		101	PCT_REC	M		PR	TRG		MSA	140	60	00000000			0.0024	5	0.00084	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		117	PCT_REC	M		PR	TRG		MSA	140	60	00000000			0.0039	5	0.0012	0.0029	0.0039	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			18O2 PFHXS	18O2 PFHXS		103	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			13C4 PFOS	13C4 PFOS		106	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			13C5 PFNA	13C5 PFNA		77	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			13C4 PFOA	13C4 PFOA		81	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MS	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:31:00	320-18849-2	1	1			13C4-PFHPA	13C4-PFHPA		85	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		101	PCT_REC			PR	TRG		MSP	140	60	00000000			0.0024	5	0.00078	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		100	PCT_REC			PR	TRG		MSP	140	60	00000000			0.0024	5	0.00073	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			Perfluorononanoic acid (PFNA)	375-95-1		105	PCT_REC			PR	TRG		MSP	140	60	00000000			0.0024	5	0.00064	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		96	PCT_REC			PR	TRG		MSP	150	50	00000000			0.0024	5	0.00089	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		108	PCT_REC	M		PR	TRG		MSP	140	60	00000000			0.0024	5	0.00085	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		115	PCT_REC	M		PR	TRG		MSP	140	60	00000000			0.0039	5	0.0012	0.0029	0.0039	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			18O2 PFHXS	18O2 PFHXS		89	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			13C4 PFOS	13C4 PFOS		95	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			13C5 PFNA	13C5 PFNA		65	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			13C4 PFOA	13C4 PFOA		68	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW74-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	MSD	W	4	05/11/2016 14:17	05/13/2016			20160517	11:08:00	20160527	15:54:00	320-18849-2	1	1			13C4-PFHPA	13C4-PFHPA		75	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00079	0.0020	0.0025	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00074	0.0020	0.0025	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0020	UG_L	U M		PR	TRG				00000000			0.0025	5	0.00065	0.0020	0.0025	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00091	0.0020	0.0025	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00086	0.0020	0.0025	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0030	UG_L	U M		PR	TRG				00000000			0.0040	5	0.0013	0.0030	0.0040	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			18O2 PFHXS	18O2 PFHXS		102	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			13C4 PFOS	13C4 PFOS		114	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			13C5 PFNA	13C5 PFNA		100	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			13C4 PFOA	13C4 PFOA		99	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-FB59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:08	05/13/2016			20160517	11:08:00	20160527	16:14:00	320-18849-3	1	1			13C4-PFHPA	13C4-PFHPA		96	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0046	UG_L			PR	TRG				00000000			0.0024	5	0.00077	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.086	UG_L	M		PR	TRG				00000000			0.0024	5	0.00072	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.00066	UG_L	J		PR	TRG				00000000			0.0024	5	0.00063	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.011	UG_L			PR	TRG				00000000			0.0024	5	0.00088	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.30	UG_L	M		PR	TRG				00000000			0.0024	5	0.00083	0.0019	0.0024	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.55	UG_L	M		PR	TRG				00000000			0.0038	5	0.0012	0.0029	0.0038	320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			18O2 PFHXS	18O2 PFHXS		78	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			13C4 PFOS	13C4 PFOS		77	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			13C5 PFNA	13C5 PFNA		72	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			13C4 PFOA	13C4 PFOA		88	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	OF-RW59-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/12/2016 17:16	05/13/2016			20160517	11:08:00	20160527	16:35:00	320-18849-4	1	1			13C4-PFHPA	13C4-PFHPA		78	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111733		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		108	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00080	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		105	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00075	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		108	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00065	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		95	PCT_REC			PR	TRG		LSA	150	50	00000000			0.0025	5	0.00092	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		93	PCT_REC	M		PR	TRG		LSA	140	60	00000000			0.0025	5	0.00087	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		99	PCT_REC	M		PR	TRG		LSA	140	60	00000000			0.0040	5	0.0013	0.0030	0.0040	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			18O2 PFHXS	18O2 PFHXS		100	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			13C4 PFOS	13C4 PFOS		103	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			13C5 PFNA	13C5 PFNA		99	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			13C4 PFOA	13C4 PFOA		100	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-110230/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:28:00	LCS 320-110230/2-A	1	1			13C4-PFHPA	13C4-PFHPA		91	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00080	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00075	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00065	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00092	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00087	0.0020	0.0025	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0030	UG_L	U		PR	TRG				00000000			0.0040	5	0.0013	0.0030	0.0040	320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			18O2 PFHXS	18O2 PFHXS		113	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			13C4 PFOS	13C4 PFOS		119	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			13C5 PFNA	13C5 PFNA		112	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			13C4 PFOA	13C4 PFOA		116	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	MB 320-110230/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/17/2016 11:08	05/17/2016			20160517	11:08:00	20160526	17:07:00	MB 320-110230/1-A	1	1			13C4-PFHPA	13C4-PFHPA		104	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-18849-1	320-111390		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.089	UG_L			PR	TRG				00000000			0.0026	5	0.00083	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.62	UG_L	M		PR	TRG				00000000			0.0026	5	0.00077	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.021	UG_L			PR	TRG				00000000			0.0026	5	0.00067	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.056	UG_L			PR	TRG				00000000			0.0026	5	0.00094	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.55	UG_L	M		PR	TRG				00000000			0.0026	5	0.00090	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			18O2 PFHXS	18O2 PFHXS		89	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			13C5 PFNA	13C5 PFNA		69	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			13C4 PFOA	13C4 PFOA		80	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:25:00	320-19022-1	1	1			13C4-PFHPA	13C4-PFHPA		83	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160602	10:16:00	320-19022-1	5	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		1.8	UG_L	D M		PR	TRG				00000000			0.021	5	0.0066	0.015	0.021	320-19022-1	320-112205		
N6247016D9000	WE01		OCEANA_NAS	OF-STORLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160602	10:16:00	320-19022-1	5	2			13C4 PFOS	13C4 PFOS		101	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112205		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.078	UG_L			PR	TRG				00000000			0.0026	5	0.00083	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.011	UG_L			PR	TRG				00000000			0.0026	5	0.00068	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.057	UG_L			PR	TRG				00000000			0.0026	5	0.00095	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.60	UG_L	M		PR	TRG				00000000			0.0026	5	0.00090	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			18O2 PFHXS	18O2 PFHXS		88	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			13C5 PFNA	13C5 PFNA		54	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	02:47:00	320-19022-2	1	1			13C4-PFHPA	13C4-PFHPA		77	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:15:00	320-19022-2	5	2			Perfluorooctanoic acid (PFOA)	335-67-1		1.3	UG_L	D M		PR	TRG				00000000			0.013	5	0.0039	0.010	0.013	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:15:00	320-19022-2	5	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		1.9	UG_L	D M		PR	TRG				00000000			0.021	5	0.0066	0.016	0.021	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:15:00	320-19022-2	5	2			13C4 PFOS	13C4 PFOS		102	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-TRMLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:15:00	320-19022-2	5	2			13C4 PFOA	13C4 PFOA		84	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.092	UG_L			PR	TRG				00000000			0.0025	5	0.00082	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.75	UG_L	M		PR	TRG				00000000			0.0025	5	0.00076	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.019	UG_L			PR	TRG				00000000			0.0025	5	0.00067	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.060	UG_L			PR	TRG				00000000			0.0025	5	0.00093	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.57	UG_L	M		PR	TRG				00000000			0.0025	5	0.00089	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			18O2 PFHXS	18O2 PFHXS		89	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			13C5 PFNA	13C5 PFNA		66	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			13C4 PFOA	13C4 PFOA		73	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:08:00	320-19022-3	1	1			13C4-PFHPA	13C4-PFHPA		77	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:37:00	320-19022-3	5	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		1.9	UG_L	D M		PR	TRG				00000000			0.020	5	0.0065	0.015	0.020	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-POLLAG-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:37:00	320-19022-3	5	2			13C4 PFOS	13C4 PFOS		101	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.087	UG_L			PR	TRG				00000000			0.0025	5	0.00080	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.71	UG_L	M		PR	TRG				00000000			0.0025	5	0.00075	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.019	UG_L			PR	TRG				00000000			0.0025	5	0.00066	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.061	UG_L			PR	TRG				00000000			0.0025	5	0.00092	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.57	UG_L	M		PR	TRG				00000000			0.0025	5	0.00087	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			18O2 PFHXS	18O2 PFHXS		70	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			13C5 PFNA	13C5 PFNA		40	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			13C4 PFOA	13C4 PFOA		48	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:29:00	320-19022-4	1	1			13C4-PFHPA	13C4-PFHPA		52	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:58:00	320-19022-4	5	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		2.0	UG_L	D M		PR	TRG				00000000			0.020	5	0.0064	0.015	0.020	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-CLTANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160531	23:58:00	320-19022-4	5	2			13C4 PFOS	13C4 PFOS		72	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:51:00	320-19022-5	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.093	UG_L			PR	TRG				00000000			0.0027	5	0.00087	0.0022	0.0027	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:51:00	320-19022-5	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0056	UG_L			PR	TRG				00000000			0.0027	5	0.00071	0.0022	0.0027	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:51:00	320-19022-5	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.15	UG_L			PR	TRG				00000000			0.0027	5	0.0010	0.0022	0.0027	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:51:00	320-19022-5	1	1			18O2 PFHXS	18O2 PFHXS		40	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:51:00	320-19022-5	1	1			13C5 PFNA	13C5 PFNA		35	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	03:51:00	320-19022-5	1	1			13C4-PFHPA	13C4-PFHPA		44	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:19:00	320-19022-5	10	2			Perfluorooctanoic acid (PFOA)	335-67-1		3.8	UG_L	D M		PR	TRG				00000000			0.027	5	0.0081	0.022	0.027	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:19:00	320-19022-5	10	2			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		1.2	UG_L	D M		PR	TRG				00000000			0.027	5	0.0094	0.022	0.027	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:19:00	320-19022-5	10	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		1.6	UG_L	D M		PR	TRG				00000000			0.043	5	0.014	0.033	0.043	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:19:00	320-19022-5	10	2			18O2 PFHXS	18O2 PFHXS		109	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:19:00	320-19022-5	10	2			13C4 PFOS	13C4 PFOS		109	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-BACKWASH-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:19:00	320-19022-5	10	2			13C4 PFOA	13C4 PFOA		96	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:12:00	320-19022-6	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.11	UG_L			PR	TRG				00000000			0.0025	5	0.00079	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:12:00	320-19022-6	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0050	UG_L			PR	TRG				00000000			0.0025	5	0.00064	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:12:00	320-19022-6	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.094	UG_L			PR	TRG				00000000			0.0025	5	0.00090	0.0020	0.0025	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:12:00	320-19022-6	1	1			18O2 PFHXS	18O2 PFHXS		77	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:12:00	320-19022-6	1	1			13C5 PFNA	13C5 PFNA		55	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:12:00	320-19022-6	1	1			13C4-PFHPA	13C4-PFHPA		79	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:41:00	320-19022-6	10	2			Perfluorooctanoic acid (PFOA)	335-67-1		4.0	UG_L	D M		PR	TRG				00000000			0.025	5	0.0073	0.020	0.025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:41:00	320-19022-6	10	2			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		1.1	UG_L	D M		PR	TRG				00000000			0.025	5	0.0085	0.020	0.025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:41:00	320-19022-6	10	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		1.5	UG_L	D M		PR	TRG				00000000			0.039	5	0.013	0.029	0.039	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:41:00	320-19022-6	10	2			18O2 PFHXS	18O2 PFHXS		107	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:41:00	320-19022-6	10	2			13C4 PFOS	13C4 PFOS		117	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-FILTER-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	00:41:00	320-19022-6	10	2			13C4 PFOA	13C4 PFOA		87	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:33:00	320-19022-7	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.13	UG_L			PR	TRG				00000000			0.0026	5	0.00083	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:33:00	320-19022-7	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0064	UG_L			PR	TRG				00000000			0.0026	5	0.00068	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:33:00	320-19022-7	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.15	UG_L			PR	TRG				00000000			0.0026	5	0.00095	0.0021	0.0026	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:33:00	320-19022-7	1	1			18O2 PFHXS	18O2 PFHXS		27	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:33:00	320-19022-7	1	1			13C5 PFNA	13C5 PFNA		23	PCT_REC	Q		PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	04:33:00	320-19022-7	1	1			13C4-PFHPA	13C4-PFHPA		29	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	01:02:00	320-19022-7	10	2			Perfluorooctanoic acid (PFOA)	335-67-1		5.9	UG_L	D M		PR	TRG				00000000			0.026	5	0.0077	0.021	0.026	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	01:02:00	320-19022-7	10	2			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		1.3	UG_L	D M		PR	TRG				00000000			0.026	5	0.0090	0.021	0.026	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	01:02:00	320-19022-7	10	2			Perfluorooctane Sulfonate (PFOS)	1763-23-1		2.3	UG_L	D M		PR	TRG				00000000			0.041	5	0.013	0.031	0.041	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	01:02:00	320-19022-7	10	2			18O2 PFHXS	18O2 PFHXS		105	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	01:02:00	320-19022-7	10	2			13C4 PFOS	13C4 PFOS		89	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-INF01-PT-0615	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	DL1	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160601	01:02:00	320-19022-7	10	2			13C4 PFOA	13C4 PFOA		75	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00076	0.0019	0.0024	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00071	0.0019	0.0024	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0019	UG_L	U M		PR	TRG				00000000			0.0024	5	0.00062	0.0019	0.0024	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00087	0.0019	0.0024	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0019	UG_L	U		PR	TRG				00000000			0.0024	5	0.00083	0.0019	0.0024	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0029	UG_L	U M		PR	TRG				00000000			0.0038	5	0.0012	0.0029	0.0038	320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			18O2 PFHXS	18O2 PFHXS		129	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			13C4 PFOS	13C4 PFOS		127	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			13C5 PFNA	13C5 PFNA		105	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			13C4 PFOA	13C4 PFOA		123	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	OF-PROCESS BLANK-PT-0516	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	REG	W	4	05/19/2016 13:35	05/20/2016			20160525	15:20:00	20160529	05:58:00	320-19022-8	1	1			13C4-PFHPA	13C4-PFHPA		121	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-111859		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		90	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00080	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		85	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00075	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		87	PCT_REC			PR	TRG		LSA	140	60	00000000			0.0025	5	0.00065	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		87	PCT_REC			PR	TRG		LSA	150	50	00000000			0.0025	5	0.00092	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		85	PCT_REC	M		PR	TRG		LSA	140	60	00000000			0.0025	5	0.00087	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		104	PCT_REC	M		PR	TRG		LSA	140	60	00000000			0.0040	5	0.0013	0.0030	0.0040	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			18O2 PFHXS	18O2 PFHXS		114	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			13C4 PFOS	13C4 PFOS		111	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			13C5 PFNA	13C5 PFNA		110	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			13C4 PFOA	13C4 PFOA		113	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCS 320-111374/2-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BS	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:18:00	LCS 320-111374/2-A	1	1			13C4-PFHPA	13C4-PFHPA		111	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		86	PCT_REC			PR	TRG		LSP	140	60	00000000			0.0025	5	0.00080	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		85	PCT_REC			PR	TRG		LSP	140	60	00000000			0.0025	5	0.00075	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		84	PCT_REC			PR	TRG		LSP	140	60	00000000			0.0025	5	0.00065	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		86	PCT_REC			PR	TRG		LSP	150	50	00000000			0.0025	5	0.00092	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		85	PCT_REC	M		PR	TRG		LSP	140	60	00000000			0.0025	5	0.00087	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		113	PCT_REC	M		PR	TRG		LSP	140	60	00000000			0.0040	5	0.0013	0.0030	0.0040	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			18O2 PFHXS	18O2 PFHXS		118	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			13C4 PFOS	13C4 PFOS		114	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			13C5 PFNA	13C5 PFNA		112	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			13C4 PFOA	13C4 PFOA		115	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	LCSD 320-111374/3-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	BSD	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	18:39:00	LCSD 320-111374/3-A	1	1			13C4-PFHPA	13C4-PFHPA		114	PCT_REC			PR	SURR		SLSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			Perfluoroheptanoic acid (PFHpA)	375-85-9		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00080	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			Perfluorooctanoic acid (PFOA)	335-67-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00075	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			Perfluorononanoic acid (PFNA)	375-95-1		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00065	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			Perfluorobutanesulfonic acid (PFBS)	375-73-5		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00092	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			Perfluorohexanesulfonic acid (PFHxS)	355-46-4		0.0020	UG_L	U		PR	TRG				00000000			0.0025	5	0.00087	0.0020	0.0025	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			Perfluorooctane Sulfonate (PFOS)	1763-23-1		0.0030	UG_L	U		PR	TRG				00000000			0.0040	5	0.0013	0.0030	0.0040	320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			18O2 PFHXS	18O2 PFHXS		127	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			13C4 PFOS	13C4 PFOS		125	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			13C5 PFNA	13C5 PFNA		121	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			13C4 PFOA	13C4 PFOA		132	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-19022-1	320-112007		
N6247016D9000	WE01		OCEANA_NAS	MB 320-111374/1-A	NONS	SVOA	TA_WS-LC-0025	SVOA	TAMER	Test America	NONE	NA	SW3535	000	LB1	W	4	05/25/2016 15:20	05/25/2016			20160525	15:20:00	20160531	17:56:00	MB 320-111374/1-A	1	1			13C4-PFHPA	13C4-PFHPA		124	PCT_REC			PR	SURR		SMSA	150	25	00000000				5				320-19022-1	320-112007		

Data Validation Summary

Oceana CTO-WE44, NALF Fentress

TO: Tiffany Hill/CVO

Anita Dodson/VBO

FROM: Tiffany McGlynn/GNV

CC: Herb Kelly/GNV

DATE: June 14, 2016

Introduction

The following data validation report discusses the data validation process and findings for TestAmerica Laboratories in the Sample Delivery Groups (SDGs) listed in the table below.

Samples were analyzed using the following analytical methods:

- WS-LC-0025 Perfluorinated Hydrocarbons
- SW6010C Iron, total & dissolved

The samples included in these SDGs are listed in the table below.

SDG	Sample_Name	Matrix
320-18704-1	OF-RW44-0516	Water
320-18704-1	OF-FB44-0516	Water
320-18704-1	OF-RW42B2-0516	Water
320-18704-1	OF-FB42B2-0516	Water
320-18704-1	OF-RW42A-0516	Water
320-18704-1	OF-FB42A-0516	Water
320-18704-1	OF-RW42B-0516	Water
320-18704-1	OF-FB42B-0516	Water
320-18704-1	OF-RW42C-516	Water
320-18704-1	OF-RW42CD-0516	Water

SDG	Sample_Name	Matrix
320-18704-1	OF-FB42C-0516	Water
320-18719-1	OF-FB08-0516	Water
320-18719-1	OF-RW08-0516	Water
320-18719-1	OF-FB71-0516	Water
320-18719-1	OF-RW71-0516	Water
320-18719-1	OF-FB84-0516	Water
320-18719-1	OF-RW84-0516	Water
320-18794-1	OF-INF01-0516	Water
320-18794-1	OF-EFF01-0516	Water
320-18794-1	OF-FB78-0516	Water
320-18794-1	OF-RW78-0516	Water
320-18794-1	OF-RW78D-0516	Water
320-18794-1	OF-FB77-0516	Water
320-18794-1	OF-RW77-0516	Water
320-18796-1	OF-STORLAG-0516	Water
320-18796-1	OF-TRMTLAG-0516	Water
320-18796-1	OF-POLLLAG-0516	Water
320-18796-1	OF-CLTANK-0516	Water
320-18796-1	OF-BACKWASH-0516	Water
320-18796-1	OF-FILTER-0516	Water
320-18918-1	OF-RW83-0516	Water
320-18918-1	OF-FB83-0516	Water
320-18849-1	OF-FB74-0516	Water
320-18849-1	OF-RW74-0516	Water
320-18849-1	OF-FB59-0516	Water
320-18849-1	OF-RW59-0516	Water
320-19022-1	OF-STORLAG-PT-0516	Water
320-19022-1	OF-TRMLAG-PT-0516	Water
320-19022-1	OF-POLLAG-PT-0516	Water
320-19022-1	OF-CLTANK-PT-0516	Water
320-19022-1	OF-BACKWASH-PT-0516	Water
320-19022-1	OF-FILTER-PT-0516	Water
320-19022-1	OF-INF01-PT-0615	Water
320-19022-1	OF-PROCESS BLANK-PT-0516	Water

Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: Sampling and Analysis Plan Perfluorinated Compound Investigation, Naval Auxiliary Landing Field Fentress, Chesapeake, Virginia Contract Task Order WE44 (December 2015), National Functional Guidelines for Organic Data Review

(August 2014), and National Functional Guidelines for Inorganic Data Review (August 2014), with Region 3 Modification (Use of 'B' qualifier) as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Tuning Instrument
- Initial/Continuing Calibrations
- Blanks
- Internal Standards
- Laboratory Control Samples
- Matrix Spike/Spike Duplicate
- Serial Dilution
- Isotope Dilution Analyte
- Field Duplicates
- Identification/Quantitation
- Reporting Limits
- Total vs. Dissolved

Overall Evaluation of Data/Potential Usability Issues

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

Data Completeness

The SDGs were received complete and intact.

Technical Holding Times

According to the chain of custody records, sampling was performed on 5/4/16 through 5/19/16. Samples were received at the laboratory 5/6/16 through 5/20/16. All sample preparation and analyses were performed within holding time requirements.

Blanks

Several compounds were detected in the field blanks and method blanks as listed below. Affected data are summarized in **Attachment 1**.

Blank ID	Compound	Conc.	Units
OF-FB42C-0516	Perfluorohexanesulfonic acid (PFHxS)	0.0011	UG_L
OF-FB44-0516	Perfluorooctane Sulfonate (PFOS)	0.0037	UG_L
OF-FB42B2-0516	Perfluorohexanesulfonic acid (PFHxS)	0.00097	UG_L
OF-FB42A-0516	Perfluorooctane Sulfonate (PFOS)	0.0029	UG_L
OF-FB78-0516	Perfluorooctane Sulfonate (PFOS)	0.011	UG_L
OF-FB78-0516	Perfluorooctanoic acid (PFOA)	0.0040	UG_L
OF-FB78-0516	Perfluorohexanesulfonic acid (PFHxS)	0.0016	UG_L
MB 280-325382/1-A	Iron	23.7	UG_L
MB 320-109334/1-A	Perfluorooctane Sulfonate (PFOS)	0.00149	UG_L
MB 320-109334/1-A	Perfluorooctane Sulfonate (PFOS)	0.00149	UG_L
MB 320-109640/1-A	Perfluorooctane Sulfonate (PFOS)	0.00136	UG_L
MB 320-109640/1-A	Perfluorooctane Sulfonate (PFOS)	0.00136	UG_L

Lab Control Sample/Sample Duplicate

Perfluorohexanesulfonic acid (PFHxS) did not meet RPD criteria between the LCS and LCSD in SDGs 320-18719-1 and 320-18704-1. Affected data are summarized in **Attachment 1**.

Isotope Dilution Analyte

Internal standards exhibited low or high recoveries for the samples listed below. Affected data are summarized in **Attachment 1**.

SDG	Sample_Name
320-18794-1	OF-INF01-0516
320-18794-1	OF-EFF01-0516
320-18794-1	OF-RW78-0516
320-18796-1	OF-STORLAG-0516
320-18796-1	OF-POLLLAG-0516
320-18796-1	OF-CLTANK-0516
320-18796-1	OF-BACKWASH-0516

SDG	Sample_Name
320-18918-1	OF-RW83-0516
320-18918-1	OF-FB83-0516
320-19022-1	OF-INF01-PT-0615

Total vs. Dissolved

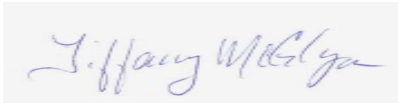
Iron did not meet criteria for total and dissolved for sample OF-STORLAG-0516. Affected data are summarized in **Attachment 1**.

Conclusion

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,



Tiffany McGlynn

Qualification Flags

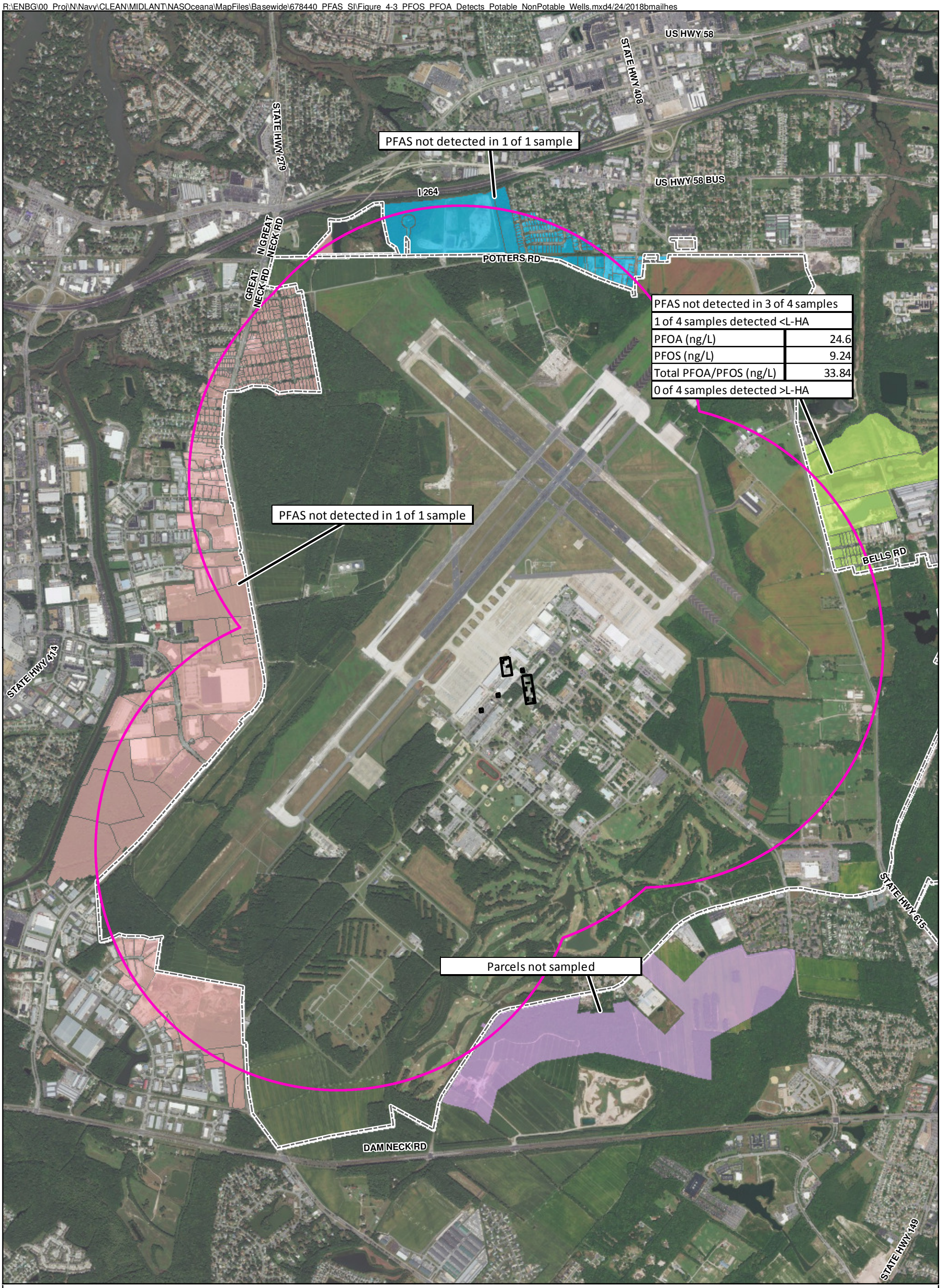
Exclude	More appropriate data exist for this analyte.
R	Data were rejected for use.
UL	Analyte not detected, quantitation limit is potentially biased low.
UJ	Analyte not detected, estimated quantitation limit.
U	Analyte not detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
L	Analyte present, estimated value potentially biased low.
K	Analyte present, estimated value potentially biased high.
N	Analyte identification presumptive; no second column analysis performed or GC/MS tentative identification.
J	Analyte present, estimated value.
NJ	Analysis indicates the presence of an analyte that was "tentatively identified" and the associated value represents its approximate concentration.
None	Placeholder for calculating quality control issues that do not require flagging.
=	Analyte was detected at a concentration greater than the quantitation limit.

Qualifier Code Reference

Value	Description
%SOL	High Moisture content
2C	Second Column – Poor Dual Column Reproducibility
2S	Second Source – Bad reproducibility between tandem detectors
BD	Blank Spike/Blank Spike Duplicate(LCS/LCSD) Precision
BRL	Below Reporting Limit
BSH	Blank Spike/LCS – High Recovery
BSL	Blank Spike/LCS – Low Recovery
CC	Continuing Calibration
CCBL	Continuing Calibration Blank Contamination
CCH	Continuing Calibration Verification – High Recovery
CCL	Continuing Calibration Verification – Low Recovery
DL	Redundant Result – due to Dilution
EBL	Equipment Blank Contamination
EMPC	Estimated Possible Maximum Concentration
ESH	Extraction Standard - High Recovery
ESL	Extraction Standard - Low Recovery
FBL	Field Blank Contamination
FD	Field Duplicate
HT	Holding Time
ICB	Initial Calibration – Bad Linearity or Curve Function
ICH	Initial Calibration – High Relative Response Factors
ICL	Initial Calibration – Low Relative Response Factors
IR15	Ion ratio exceeds +/- 15% difference
ISH	Internal Standard – High Recovery
ISL	Internal Standard – Low Recovery
LD	Lab Duplicate Reproducibility
LR	Concentration Exceeds Linear Range
MBL	Method Blank Contamination
MDP	Matrix Spike/Matrix Spike Duplicate Precision
MI	Matrix interference obscuring the raw data

Value	Description
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

R:\ENBG\00_Proj\N\Navy\CLEAN\MIDLANT\NASOceana\MapFiles\Basewide\678440_PFAS_SI\Figure_4-3_PFOS_PFOA_Detects_Potable_NonPotable_Wells.mxd4/24/2018bmailhes



Legend

- Non-Core Target Treatment Area (2004)
- Core Target Treatment Area (2004) (Core)
- Sampling Area
- Installation Boundary

Off-Base Parcels

- East
- North
- South
- West

N
W E
S

0 1,000 2,000 4,000 Feet

Imagery Source: ©2017 Esri

Figure 4-3
COCs Detections in Potable Wells Sampled from Parcels Located Off-Base
Basewide Per- and Polyfluoroalkyl Substances Site Inspection Report
NAS Oceana, Virginia Beach, Virginia

ch2m