

Groundwater Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG J235421

Bay Head Road Annex NSWC Annapolis Maryland

December 2020



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: 320-23542-1

Client Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Revision: 1

For:

AECOM Technical Services Inc. 3101 Wilson Blvd. Suite 900 Arlington, Virginia 22201

Attn: Kurt Vangelder

Qui Kellmann

Authorized for release by: 12/8/2016 2:40:27 PM

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Detection Summary	6
Client Sample Results	7
Isotope Dilution Summary	9
QC Sample Results	10
QC Association Summary	14
Lab Chronicle	16
Certification Summary	18
Method Summary	19
Sample Summary	20
Chain of Custody	21
Receipt Checklists	22

3

4

6

8

9

11

12

14

## **Definitions/Glossary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

#### TestAmerica Job ID: 320-23542-1

#### **Qualifiers**

#### **LCMS**

Qualifier	Qualifier Description
M	Manual integrated compound.
E	Result exceeded calibration range.
U	Undetected at the Limit of Detection.
D	The reported value is from a dilution.
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
Q	One or more quality control criteria failed.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

### **Glossary**

RER

RPD TEF

TEQ

RL

Relative error ratio

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

<u> </u>	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
a	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

#### **Case Narrative**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Job ID: 320-23542-1

**Laboratory: TestAmerica Sacramento** 

Narrative

#### **CASE NARRATIVE**

Client: AECOM Technical Services Inc.

**Project: Former Bay Head Road Annex (RFP JU06-01)** 

Report Number: 320-23542-1

#### Revision - December 8, 2016

Report revised due to incorrectly applied B flags on the water samples.

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 application 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.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

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 11/15/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.0 C.

#### **Receipt Exceptions**

Listed samples do not include a collection date on the chain of custody.

DPT-16-01-GW-17-21 (320-23542-1), DPT-16-05-GW-17-21 (320-23542-2), DPT-16-05-GW-17-21-MS (320-23542-2[MS]), DPT-16-05-GW-17-21-MSD (320-23542-2[MSD]), DPT-16-34-SO-14-15 (320-23542-3) and DPT-16-34-GW-31-35 (320-23542-4)

#### **PFAS**

The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/- 0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

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TestAmerica Job ID: 320-23542-1

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#### **Case Narrative**

Client: AECOM Technical Services Inc. Project/Site: Former Bay Head Road Annex (RFP JU06-01) TestAmerica Job ID: 320-23542-1

Job ID: 320-23542-1 (Continued)

#### Laboratory: TestAmerica Sacramento (Continued)

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: DPT-16-01-GW-17-21 (320-23542-1), DPT-16-05-GW-17-21 (320-23542-2), DPT-16-05-GW-17-21-MS (320-23542-2[MS]), DPT-16-05-GW-17-21-MSD (320-23542-2[MSD]), DPT-16-34-GW-31-35 (320-23542-4), (320-23542-A-3-B MS) and (320-23542-A-3-C MSD). These analytes have been qualified; however, the peaks did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

The Isotope Dilution Analyte (IDA) recovery for 18O2 PFHxS is above the method recommended limit for the following samples: DPT-16-05-GW-17-21 (320-23542-2) and DPT-16-05-GW-17-21-MS (320-23542-2[MS]). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Due to the high concentration of Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-138217 and analytical batch 320-138814 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

The matrix spike (MS) recovery for preparation batch 320-138217 and analytical batch 320-138814 was outside control limits for Perfluorobutanesulfonic acid (PFBS). Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-138291 and analytical batch 320-138814 were outside control limits for Perfluorooctanoic acid (PFOA). Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Due to the high concentration of Perfluorooctane Sulfonate (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-138291 and analytical batch 320-138814 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Due to the excessive amount of sediment in the sample bottles, the aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction. DPT-16-01-GW-17-21 (320-23542-1), DPT-16-05-GW-17-21 (320-23542-2), DPT-16-05-GW-17-21-MS (320-23542-2[MS]), DPT-16-05-GW-17-21-MSD (320-23542-2[MSD]) and DPT-16-34-GW-31-35 (320-23542-4)

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

#### PERCENT SOLIDS

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

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Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Client Sample ID: DPT-16-01-GW-17-21

TestAmerica Job ID: 320-23542-1

Lab Sample ID: 320-23542-1

Lab Sample ID: 320-23542-2

Lab Sample ID: 320-23542-3

Lab Sample ID: 320-23542-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.062	M	0.0026	0.00078	ug/L	1	_	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.86	E	0.0042	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.011	M	0.0026	0.00095	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.066	D	0.026	0.0078	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	0.98	D	0.042	0.013	ug/L	10		537 (Modified)	Total/NA

### Client Sample ID: DPT-16-05-GW-17-21

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.19	J M	0.0024	0.00072	ug/L	1	_	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.2	JE	0.0039	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.050	J M	0.0024	0.00089	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.21	DJ	0.24	0.072	ug/L	100		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	2.8	JD	0.39	0.12	ug/L	100		537 (Modified)	Total/NA

### Client Sample ID: DPT-16-34-SO-14-15

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	3.2	M J	0.62	0.13	ug/Kg	1	₩	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	34	J	0.62	0.16	ug/Kg	1	₩	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	3.6	JD	6.2	1.3	ug/Kg	10	₩	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) -	35	JD	6.2	1.6	ug/Kg	10	₩	537 (Modified)	Total/NA
DL									

#### Client Sample ID: DPT-16-34-GW-31-35

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.95	EM	0.0025	0.00074	ug/L		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.2	E	0.0039	0.0013	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.12	M	0.0025	0.00090	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1.0	D	0.025	0.0074	ug/L	10	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	1.4	D	0.039	0.013	ug/L	10	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.081	D	0.025	0.0090	ug/L	10	537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

# **Client Sample Results**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

Client Sample ID: DPT-16-01-GW-17-21

Date Collected: 11/14/16 10:30

Lab Sample ID: 320-23542-1 Matrix: Water

Date Received: 11/15/16 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.062	M	0.0026	0.00078	ug/L		11/17/16 08:49	11/20/16 22:33	1
Perfluorooctane Sulfonate (PFOS)	0.86	E	0.0042	0.0013	ug/L		11/17/16 08:49	11/20/16 22:33	1
Perfluorobutanesulfonic acid (PFBS)	0.011	M	0.0026	0.00095	ug/L		11/17/16 08:49	11/20/16 22:33	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	95		25 - 150				11/17/16 08:49	11/20/16 22:33	1
13C4 PFOS	86		25 - 150				11/17/16 08:49	11/20/16 22:33	1
18O2 PFHxS	96		25 - 150				11/17/16 08:40	11/20/16 22:33	1

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.066	D	0.026	0.0078	ug/L		11/17/16 08:49	12/02/16 13:22	10
Perfluorooctane Sulfonate (PFOS)	0.98	D	0.042	0.013	ug/L		11/17/16 08:49	12/02/16 13:22	10
Perfluorobutanesulfonic acid (PFBS)	0.021	U	0.026	0.0095	ug/L		11/17/16 08:49	12/02/16 13:22	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	110		25 - 150				11/17/16 08:49	12/02/16 13:22	10
13C4 PFOS	114		25 - 150				11/17/16 08:49	12/02/16 13:22	10
18O2 PFHxS	129		25 - 150				11/17/16 08:49	12/02/16 13:22	10

Client Sample ID: DPT-16-05-GW-17-21 Lab Sample ID: 320-23542-2

Date Collected: 11/14/16 11:45 Matrix: Water

Date Received: 11/15/16 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.19	JM	0.0024	0.00072	ug/L		11/17/16 08:49	11/20/16 22:40	1
Perfluorooctane Sulfonate (PFOS)	2.2	JE	0.0039	0.0012	ug/L		11/17/16 08:49	11/20/16 22:40	1
Perfluorobutanesulfonic acid (PFBS)	0.050	J M	0.0024	0.00089	ug/L		11/17/16 08:49	11/20/16 22:40	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	77		25 - 150				11/17/16 08:49	11/20/16 22:40	1
13C4 PFOS	63		25 - 150				11/17/16 08:49	11/20/16 22:40	1
18O2 PFHxS	81		25 - 150				11/17/16 08:40	11/20/16 22:40	1

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.21	DJ	0.24	0.072	ug/L		11/17/16 08:49	12/02/16 12:59	100
Perfluorooctane Sulfonate (PFOS)	2.8	J D	0.39	0.12	ug/L		11/17/16 08:49	12/02/16 12:59	100
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.24	0.089	ug/L		11/17/16 08:49	12/02/16 12:59	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	125		25 - 150				11/17/16 08:49	12/02/16 12:59	100
13C4 PFOS	146		25 - 150				11/17/16 08:49	12/02/16 12:59	100
1802 PFHxS	154	^	25 - 150				11/17/16 08:49	12/02/16 12:59	100

TestAmerica Sacramento

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Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	3.2	M J	0.62	0.13	ug/Kg	<u></u>	11/17/16 12:49	11/20/16 21:25	1
Perfluorooctane Sulfonate (PFOS)	34	J	0.62	0.16	ug/Kg	☼	11/17/16 12:49	11/20/16 21:25	1
Perfluorobutanesulfonic acid (PFBS)	0.37	U	0.50	0.13	ug/Kg	₽	11/17/16 12:49	11/20/16 21:25	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	91		25 - 150				11/17/16 12:49	11/20/16 21:25	1
13C4 PFOS	58		25 - 150				11/17/16 12:49	11/20/16 21:25	1
1802 PFHxS	73		25 - 150				11/17/16 12:49	11/20/16 21:25	1

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	3.6	J D	6.2	1.3	ug/Kg	₩	11/17/16 12:49	12/02/16 13:37	10
Perfluorooctane Sulfonate (PFOS)	35	J D	6.2	1.6	ug/Kg	≎	11/17/16 12:49	12/02/16 13:37	10
Perfluorobutanesulfonic acid (PFBS)	3.7	U	5.0	1.3	ug/Kg	₩	11/17/16 12:49	12/02/16 13:37	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	125		25 - 150				11/17/16 12:49	12/02/16 13:37	10
13C4 PFOS	72		25 - 150				11/17/16 12:49	12/02/16 13:37	10
18O2 PFHxS	99		25 - 150				11/17/16 12:49	12/02/16 13:37	10

Client Sample ID: DPT-16-34-GW-31-35 Lab Sample ID: 320-23542-4

Date Collected: 11/14/16 14:30 **Matrix: Water** 

Date Received: 11/15/16 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.95	EM	0.0025	0.00074	ug/L		11/17/16 08:49	11/20/16 23:03	1
Perfluorooctane Sulfonate (PFOS)	1.2	E	0.0039	0.0013	ug/L		11/17/16 08:49	11/20/16 23:03	1
Perfluorobutanesulfonic acid (PFBS)	0.12	M	0.0025	0.00090	ug/L		11/17/16 08:49	11/20/16 23:03	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	54		25 - 150				11/17/16 08:49	11/20/16 23:03	1
13C4 PFOS	74		25 - 150				11/17/16 08:49	11/20/16 23:03	1
18O2 PFHxS	52		25 - 150				11/17/16 08:49	11/20/16 23:03	1

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	1.0	D	0.025	0.0074	ug/L		11/17/16 08:49	12/02/16 16:14	10
Perfluorooctane Sulfonate (PFOS)	1.4	D	0.039	0.013	ug/L		11/17/16 08:49	12/02/16 16:14	10
Perfluorobutanesulfonic acid (PFBS)	0.081	D	0.025	0.0090	ug/L		11/17/16 08:49	12/02/16 16:14	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	101		25 - 150				11/17/16 08:49	12/02/16 16:14	10
13C4 PFOS	125		25 - 150				11/17/16 08:49	12/02/16 16:14	10
18O2 PFHxS	115		25 - 150				11/17/16 08:49	12/02/16 16:14	10

### **Isotope Dilution Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

# Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Solid Prep Type: Total/NA

		004 850		ition Recovery	y (Accept	
			3C4 PFO			
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)		
320-23542-3	DPT-16-34-SO-14-15	91	58	73		
320-23542-3 - DL	DPT-16-34-SO-14-15	125	72	99		
320-23542-3 MS	DPT-16-34-SO-14-15	86	54	72		
320-23542-3 MS - DL	DPT-16-34-SO-14-15	110	63	84		
320-23542-3 MSD	DPT-16-34-SO-14-15	84	60	71		
320-23542-3 MSD - DL	DPT-16-34-SO-14-15	108	67	82		
LCS 320-138291/2-A	Lab Control Sample	107	92	91		
MB 320-138291/1-A	Method Blank	111	89	94		
Surrogate Legend						

#### Surrogate Legend

13C4 PFOA = 13C4 PFOA 13C4 PFOS = 13C4 PFOS 1802 PFHxS = 1802 PFHxS

# Method: 537 (Modified) - Perfluorinated Hydrocarbons

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

			Perce	ent Isotope Diluti	on Recovery (Acceptance Limits
		3C4 PFO	3C4 PFOS	3O2 PFHx	
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	
320-23542-1	DPT-16-01-GW-17-21	95	86	96	
320-23542-1 - DL	DPT-16-01-GW-17-21	110	114	129	
320-23542-2	DPT-16-05-GW-17-21	77	63	81	
320-23542-2 - DL	DPT-16-05-GW-17-21	125	146	154 Q	
320-23542-2 MS	DPT-16-05-GW-17-21-MS	43	59	76	
320-23542-2 MS - DL	DPT-16-05-GW-17-21-MS	78	145	156 Q	
320-23542-2 MSD	DPT-16-05-GW-17-21-MSD	80	65	82	
320-23542-2 MSD - DL	DPT-16-05-GW-17-21-MSD	101	99	116	
320-23542-4	DPT-16-34-GW-31-35	54	74	52	
320-23542-4 - DL	DPT-16-34-GW-31-35	101	125	115	
LCS 320-138217/2-A	Lab Control Sample	78	72	74	
MB 320-138217/1-A	Method Blank	117	105	108	

#### **Surrogate Legend**

13C4 PFOA = 13C4 PFOA 13C4 PFOS = 13C4 PFOS 18O2 PFHxS = 18O2 PFHxS

Page 9 of 22

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

### Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-138217/1-A

**Matrix: Water** 

Analysis Batch: 138814

**Client Sample ID: Method Blank Prep Type: Total/NA** 

**Prep Batch: 138217** 

MB MB Analyte Result Qualifier LOQ DL Unit Prepared Analyzed Dil Fac 0.00075 ug/L Perfluorooctanoic acid (PFOA) 0.0020 U 0.0025 <u>11/17/16 08:49</u> <u>11/20/16 22:18</u> Perfluorooctane Sulfonate (PFOS) 0.0030 U 0.0040 0.0013 ug/L 11/17/16 08:49 11/20/16 22:18 0.0025 0.00092 ug/L 11/17/16 08:49 11/20/16 22:18 Perfluorobutanesulfonic acid (PFBS) 0.0020 U

MB MB

Isotope Dilution	%Recovery Quali	ifier Limits	Prepared	Analyzed	Dil Fac
13C4 PFOA	117	25 - 150	11/17/16 08:49	11/20/16 22:18	1
13C4 PFOS	105	25 - 150	11/17/16 08:49	11/20/16 22:18	1
1802 PFHxS	108	25 - 150	11/17/16 08:49	11/20/16 22:18	1

Lab Sample ID: LCS 320-138217/2-A

**Matrix: Water** 

Analysis Batch: 138814

**Client Sample ID: Lab Control Sample** Prep Type: Total/NA

**Prep Batch: 138217** 

LCS LCS Spike %Rec. Added Analyte Result Qualifier Limits Unit D %Rec Perfluorooctanoic acid (PFOA) 0.0400 0.0392 98 60 - 140 ug/L 0.0371 0.0347 60 - 140 Perfluorooctane Sulfonate ug/L 94 (PFOS) 0.0354 0.0365 ug/L 103 50 - 150Perfluorobutanesulfonic acid (PFBS)

LCS LCS

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA	78		25 - 150
13C4 PFOS	72		25 - 150
18O2 PFHxS	74		25 - 150

Client Sample ID: DPT-16-05-GW-17-21-MS

**Matrix: Water** 

Analysis Batch: 138814

Lab Sample ID: 320-23542-2 MS

Prep Type: Total/NA **Prep Batch: 138217** 

,, c.c	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA)	0.19	JM	0.0398	0.244	4	ug/L		145	60 - 140
Perfluorooctane Sulfonate (PFOS)	2.2	JE	0.0369	2.43	E 4	ug/L		610	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.050	J M	0.0352	0.107	J M	ug/L		161	50 - 150
	MS	MS							

1110	1110	
%Recovery	Qualifier	Limits
43		25 - 150
59		25 - 150
76		25 - 150
	<b>%Recovery</b> 43 59	59

Client Sample ID: DPT-16-05-GW-17-21-MSD

**Matrix: Water** 

Lab Sample ID: 320-23542-2 MSD

**Analysis Batch: 138814** 

Prep Type: Total/NA **Prep Batch: 138217** 

•	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorooctanoic acid (PFOA)	0.19	JM	0.0404	0.210	4 M	ug/L		59	60 - 140	15	30
Perfluorooctane Sulfonate	2.2	JE	0.0374	2.05	E 4	ug/L		-410	60 - 140	17	30

(PFOS)

TestAmerica Sacramento

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: 320-23542-2 MSD Client Sample ID: DPT-16-05-GW-17-21-MSD

**Matrix: Water** Prep Type: Total/NA **Analysis Batch: 138814 Prep Batch: 138217** 

MSD MSD Sample Sample Spike %Rec. **RPD** Result Qualifier Added Result Qualifier Limits Analyte Unit %Rec RPD Limit 0.0357 0.050 J M 0.0881 M ua/L 106 50 - 150 19 30 Perfluorobutanesulfonic acid

(PFBS) MOD MOD

ı		พรบ	MISD	
	Isotope Dilution	%Recovery	Qualifier	Limits
	13C4 PFOA	80		25 - 150
	13C4 PFOS	65		25 - 150
	1802 PFHxS	82		25 - 150

Lab Sample ID: MB 320-138291/1-A Client Sample ID: Method Blank **Matrix: Solid** Prep Type: Total/NA

**Prep Batch: 138291 Analysis Batch: 138814** 

MB MB Analyte Result Qualifier LOQ DL Unit Prepared Analyzed Dil Fac 0.50 0.10 ug/Kg Perfluorooctanoic acid (PFOA) 0.30 U 11/17/16 12:49 11/20/16 21:10 Perfluorooctane Sulfonate (PFOS) 0.30 U 0.50 0.13 ug/Kg 11/17/16 12:49 11/20/16 21:10 Perfluorobutanesulfonic acid (PFBS) 0.30 U 0.40 0.10 ug/Kg 11/17/16 12:49 11/20/16 21:10

Isotope Dilution %Recovery Qualifier I imits Prepared Analyzed Dil Fac 13C4 PFOA 25 150 11/17/16 12:49 11/20/16 21:10 111 13C4 PFOS 25 - 150 11/17/16 12:49 11/20/16 21:10 89 1802 PFHxS 94 25 - 150 11/17/16 12:49 11/20/16 21:10

Lab Sample ID: LCS 320-138291/2-A Client Sample ID: Lab Control Sample

MB MB

**Matrix: Solid Analysis Batch: 138814** 

LCS LCS Spike %Rec. Added Result Qualifier Unit D %Rec Limits Perfluorooctanoic acid (PFOA) 3.98 4.37 ug/Kg 110 60 - 140 3.69 3.90 ug/Kg 106 60 - 140 Perfluorooctane Sulfonate (PEOS)

Perfluorobutanesulfonic acid 3.51 4.70 ug/Kg 134 50 - 150(PFBS)

LCS LCS Isotope Dilution %Recovery Qualifier Limits 13C4 PFOA 107 25 - 150 13C4 PFOS 92 25 - 150 1802 PFHxS 91 25 - 150

Lab Sample ID: 320-23542-3 MS Client Sample ID: DPT-16-34-SO-14-15

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

**Analysis Batch: 138814 Prep Batch: 138291** MS MS Sample Sample Spike %Rec. Result Qualifier Added Result Qualifier Unit %Rec Limits D

Analyte ₩ 12.2 M J Perfluorooctanoic acid (PFOA) 3.2 M J 5.04 ug/Kg 179 60 - 140 Perfluorooctane Sulfonate 34 J 4.68 67.4 E 4 ug/Kg ₩ 719 60 - 140(PFOS) 0.37 U 4.46 6.08 77 136 50 - 150 ug/Kg Perfluorobutanesulfonic acid

(PFBS)

TestAmerica Sacramento

Prep Type: Total/NA

**Prep Batch: 138291** 

### QC Sample Results

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

Isotope Dilution	%Recovery (	Qualifier	Limits
13C4 PFOA	86		25 - 150
13C4 PFOS	54		25 - 150
18O2 PFHxS	72		25 - 150

Lab Sample ID: 320-23542-3 MSD

**Matrix: Solid** 

Analysis Batch: 138814

Client Sample ID: DPT-16-34-SO-14-15

Prep Type: Total/NA **Prep Batch: 138291** 

Sample Sample Spike MSD MSD %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Limits RPD Limit Unit D %Rec ₩ 7 Perfluorooctanoic acid (PFOA) 3.2 M J 5.00 13.1 M J ug/Kg 198 60 - 140 30 34 J 4.64 59.2 E 4 ug/Kg 549 60 - 140 13 30 Perfluorooctane Sulfonate (PFOS) 0.37 U 4.42 5.82 ug/Kg 132 50 - 150 30 Perfluorobutanesulfonic acid (PFBS) MSD MSD Isotope Dilution %Recovery Qualifier Limits

Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

84

60

71

Lab Sample ID: 320-23542-2 MS

**Matrix: Water** 

13C4 PFOA

13C4 PFOS

1802 PFHxS

**Analysis Batch: 140382** 

Client Sample ID: DPT-16-05-GW-17-21-MS

Prep Type: Total/NA

**Prep Batch: 138217** 

Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit %Rec Limits Perfluorooctanoic acid (PFOA) -0.21 J D J 0.0398 0.268 4 D ug/L 140 60 - 140

25 - 150

25 - 150

25 - 150

2.8 J D 0.0369 3.08 4 D ug/L 749 60 - 140 Perfluorooctane Sulfonate (PFOS) - DL Perfluorobutanesulfonic acid 0.19 U 0.0352 0.20 U ug/L NC 50 - 150

(PFBS) - DL

MS MS

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA - DL	78		25 - 150
13C4 PFOS - DL	145		25 - 150
18O2 PFHxS - DL	156	Q	25 - 150

Lab Sample ID: 320-23542-2 MSD

**Matrix: Water** 

(PFBS) - DL

**Analysis Batch: 140382** 

Client Sample ID: DPT-16-05-GW-17-21-MSD

Prep Type: Total/NA

**Prep Batch: 138217 RPD** %Rec.

MSD MSD Sample Sample Spike Result Qualifier Added Result Qualifier Limits Analyte Unit %Rec **RPD** Limit 0.21 J D J 0.0404 0.214 J4D 60 - 140 22 30 ug/L Perfluorooctanoic acid (PFOA) -2.8 J D 0.0374 2.79 4 D Perfluorooctane Sulfonate ug/L -24 60 - 14010 30 (PFOS) - DL 0.19 U 0.0357 0.20 U NC Perfluorobutanesulfonic acid ug/L 50 - 150 30

MSD MSD

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA - DL	101		25 - 150
13C4 PFOS - DL	99		25 - 150
18O2 PFHxS - DL	116		25 - 150

TestAmerica Sacramento

# **QC Sample Results**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

### Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL (Continued)

3.7 U

Client Sample ID: DPT-16-34-SO-14-15 Lab Sample ID: 320-23542-3 MS **Matrix: Solid Prep Type: Total/NA Analysis Batch: 140382 Prep Batch: 138291** Sample Sample Spike MS MS %Rec. Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits 3.6 JJD ₩ 5.04 12.7 J D ug/Kg 182 60 - 140 Perfluorooctanoic acid (PFOA) -35 J D 4.68 69.2 4 D ₩ 740 Perfluorooctane Sulfonate ug/Kg 60 - 140

4.90 JD

ug/Kg

110

50 - 150

**Client Sample ID: DPT-16-34-SO-14-15** 

**Prep Type: Total/NA** 

4.46

(11 BO) BE	MS MS	
Isotope Dilution	%Recovery Qua	lifier Limits
13C4 PFOA - DL	110	25 - 150
13C4 PFOS - DL	63	25 - 150
1802 PFHxS - DL	84	25 - 150

Lab Sample ID: 320-23542-3 MSD

**Matrix: Solid** 

(PFOS) - DL

(PFRS) - DI

Perfluorobutanesulfonic acid

Analysis Batch: 140382									Prep Ba	atch: 13	38291
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorooctanoic acid (PFOA) -	3.6	JJD	5.00	13.1	J D	ug/Kg	<del>\</del>	191	60 - 140	3	30
DL											
Perfluorooctane Sulfonate	35	JD	4.64	63.2	4 D	ug/Kg	≎	617	60 - 140	9	30
(PFOS) - DL											
Perfluorobutanesulfonic acid	3.7	U	4.42	4.97	JD	ug/Kg	₩	113	50 - 150	2	30
(PFBS) - DL											

	MSD MSD	
Isotope Dilution	%Recovery Qualified	r Limits
13C4 PFOA - DL	108	25 - 150
13C4 PFOS - DL	67	25 - 150
18O2 PFHxS - DI	82	25 - 150

# **QC Association Summary**

Client: AECOM Technical Services Inc. Project/Site: Former Bay Head Road Annex (RFP JU06-01) TestAmerica Job ID: 320-23542-1

## LCMS

**Prep Batch: 138217** 

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-1 - DL	DPT-16-01-GW-17-21	Total/NA	Water	3535	
320-23542-1	DPT-16-01-GW-17-21	Total/NA	Water	3535	
320-23542-2 - DL	DPT-16-05-GW-17-21	Total/NA	Water	3535	
320-23542-2	DPT-16-05-GW-17-21	Total/NA	Water	3535	
320-23542-4 - DL	DPT-16-34-GW-31-35	Total/NA	Water	3535	
320-23542-4	DPT-16-34-GW-31-35	Total/NA	Water	3535	
MB 320-138217/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-138217/2-A	Lab Control Sample	Total/NA	Water	3535	
320-23542-2 MS	DPT-16-05-GW-17-21-MS	Total/NA	Water	3535	
320-23542-2 MS - DL	DPT-16-05-GW-17-21-MS	Total/NA	Water	3535	
320-23542-2 MSD	DPT-16-05-GW-17-21-MSD	Total/NA	Water	3535	
320-23542-2 MSD - DL	DPT-16-05-GW-17-21-MSD	Total/NA	Water	3535	

### **Prep Batch: 138291**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-3 - DL	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
MB 320-138291/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-138291/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-23542-3 MS	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 MS - DL	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 MSD - DL	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 MSD	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	

#### **Analysis Batch: 138814**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-1	DPT-16-01-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-2	DPT-16-05-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-3	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-4	DPT-16-34-GW-31-35	Total/NA	Water	537 (Modified)	138217
MB 320-138217/1-A	Method Blank	Total/NA	Water	537 (Modified)	138217
MB 320-138291/1-A	Method Blank	Total/NA	Solid	537 (Modified)	138291
LCS 320-138217/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	138217
LCS 320-138291/2-A	Lab Control Sample	Total/NA	Solid	537 (Modified)	138291
320-23542-2 MS	DPT-16-05-GW-17-21-MS	Total/NA	Water	537 (Modified)	138217
320-23542-2 MSD	DPT-16-05-GW-17-21-MSD	Total/NA	Water	537 (Modified)	138217
320-23542-3 MS	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-3 MSD	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291

#### **Analysis Batch: 140382**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-1 - DL	DPT-16-01-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-2 - DL	DPT-16-05-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-3 - DL	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-2 MS - DL	DPT-16-05-GW-17-21-MS	Total/NA	Water	537 (Modified)	138217
320-23542-2 MSD - DL	DPT-16-05-GW-17-21-MSD	Total/NA	Water	537 (Modified)	138217
320-23542-3 MS - DL	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-3 MSD - DL	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291

Page 14 of 22

# **QC Association Summary**

Client: AECOM Technical Services Inc. Project/Site: Former Bay Head Road Annex (RFP JU06-01) TestAmerica Job ID: 320-23542-1

**LCMS (Continued)** 

Analysis Batch: 140429

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-4 - DL	DPT-16-34-GW-31-35	Total/NA	Water	537 (Modified)	138217

**General Chemistry** 

Analysis Batch: 139136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-3	DPT-16-34-SO-14-15	Total/NA	Solid	D 2216	

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Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Client Sample ID: DPT-16-01-GW-17-21

Date Collected: 11/14/16 10:30 Date Received: 11/15/16 09:30

Lab Sample ID: 320-23542-1

Matrix: Water

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			240.6 mL	0.5 mL	138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1			138814	11/20/16 22:33	TC1	TAL SAC
Total/NA	Prep	3535	DL		240.6 mL	0.5 mL	138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			140382	12/02/16 13:22	SBC	TAL SAC

Client Sample ID: DPT-16-05-GW-17-21 Lab Sample ID: 320-23542-2

Date Collected: 11/14/16 11:45 Date Received: 11/15/16 09:30

**Matrix: Water** 

Batch Batch Dil Initial Final Batch Prepared **Prep Type** Type Method Amount **Amount** Number or Analyzed Run **Factor** Analyst Lab Total/NA 3535 258.6 mL 138217 11/17/16 08:49 HJA TAL SAC Prep 0.5 mL Total/NA 138814 11/20/16 22:40 TC1 TAL SAC Analysis 537 (Modified) 1 Total/NA Prep 3535 DL 138217 11/17/16 08:49 HJA TAL SAC 258.6 mL 0.5 mL Total/NA Analysis 537 (Modified) DL 100 140382 12/02/16 12:59 SBC TAL SAC

Client Sample ID: DPT-16-34-SO-14-15 Lab Sample ID: 320-23542-3

Date Collected: 11/14/16 13:25 Date Received: 11/15/16 09:30

**Matrix: Solid** 

Dil Batch Batch Initial Final Batch Prepared Method **Amount** Amount Number or Analyzed **Prep Type** Type Run **Factor Analyst** Lab Total/NA Analysis D 2216 139136 11/22/16 13:53 MY1 TAL SAC

**Client Sample ID: DPT-16-34-SO-14-15** Lab Sample ID: 320-23542-3

Date Collected: 11/14/16 13:25 Date Received: 11/15/16 09:30

**Matrix: Solid** Percent Solids: 79.5

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.05 g	1.0 mL	138291	11/17/16 12:49	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1			138814	11/20/16 21:25	TC1	TAL SAC
Total/NA	Prep	SHAKE	DL		5.05 g	1.0 mL	138291	11/17/16 12:49	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			140382	12/02/16 13:37	SBC	TAL SAC

Client Sample ID: DPT-16-34-GW-31-35 Lab Sample ID: 320-23542-4

Date Collected: 11/14/16 14:30

**Matrix: Water** Date Received: 11/15/16 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			254.2 mL	0.5 mL	138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1			138814	11/20/16 23:03	TC1	TAL SAC
Total/NA	Prep	3535	DL		254.2 mL	0.5 mL	138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10			140429	12/02/16 16:14	SBC	TAL SAC

TestAmerica Sacramento

### **Lab Chronicle**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

#### TestAmerica Job ID: 320-23542-1

#### **Laboratory References:**

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

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# **Certification Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

### **Laboratory: TestAmerica Sacramento**

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program		<b>EPA Region</b>	Certification ID	<b>Expiration Date</b>
A2LA	DoD ELA	Р		2928-01	01-31-17
The following analyte:	s are included in this repo	ort, but certification is	not offered by the go	overning authority:	
Analysis Method	Prep Method	Matrix	Analyt	е	
537 (Modified)	SHAKE	Solid	Perflu	orooctane Sulfonate (PF	FOS)
D 2216		Solid	Percer	nt Moisture	

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# **Method Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC

#### **Protocol References:**

ASTM = ASTM International

EPA = US Environmental Protection Agency

#### Laboratory References:

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

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# **Sample Summary**

Client: AECOM Technical Services Inc. Project/Site: Former Bay Head Road Annex (RFP JU06-01) TestAmerica Job ID: 320-23542-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-23542-1	DPT-16-01-GW-17-21	Water	11/14/16 10:30	11/15/16 09:30
320-23542-2	DPT-16-05-GW-17-21	Water	11/14/16 11:45	11/15/16 09:30
320-23542-3	DPT-16-34-SO-14-15	Solid	11/14/16 13:25	11/15/16 09:30
320-23542-4	DPT-16-34-GW-31-35	Water	11/14/16 14:30	11/15/16 09:30

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Temperature on Receipt 2.0" TestAmerica

Chain of Custody Record

THE LEADER IN ENVIRONMENTAL TESTING

19 19 19 19 19 19 19 19 19 19 19 19 19 1	Drinking Water? Yes□ No		EADER IN ENVI	THE LEADER IN ENVIRONMENTAL TESTING		
Client AEcom	Project Manager / I'm Gell	belder		Date // 4/76	Chain of Custody Number	umber 1 6
Adress 3101 WILSON BLVD	Telephone Number (Area Code)/Fax Number (AB3) 549-87	9-87-28		Lab Number	Page /	) to
City ARLINGTON VA 22201	Site Contact MIKE GLINSKI	Lab Contact STILL KELL MANN		Analysis (Attach list if more space is needed)		
Project Name and Location (State) Former Ban Head RA Annex	Carrier/Waybill Number				Special	Special Instructions/
Contractifuctures order Town / 60444465	Matrix	Containers & Preservatives	40 25 85		Condition	Conditions of Receipt
Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Time Air Air Sed Sed	NBOH HCI HACO HCI HACO HCI HACO HACO	-19 -19 -19			
2PT-16-01-GW-17-21 11/4/16	1030	2	111			
DPT-16-05-64-17-21	1145 1	7	141			
DB-16-05-64-17-21-MS	1145 1	77	1//			
DPT-16-05-CH-17-71-MSD	1145 1	7	\ \ \ \ \			
ZDPT-16-34-50-14-15	1325		11			
SDPT-1634-64-31-35	1430 1	2	111			
The state of the s						
	- Calan					1
				330 33543 Ch	220 23542 Chair of Custody	
				7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		
100 100 100 100 100 100 100 100 100 100						
Possible Hazard Identification  Won-Hazard	Sample Disposal  Unknown	Disposal By Lab	Archive For	(A Tee-may be assess Months longer than 1 month)	A tee may be assessed if samples are retained longer than 1 month)	retained
Turn Around Time Required  24 Hours	ays 🗆 Other		0			
1. Relinquished By Men AL COM	Date 1 1/16 1 70	1. Received By TRAN SFER	ER TA	FEDEX	Date	Time
2. Relinquished By	Date Time	2. Received By			Date Il Jeche	Time
3. Relinquished By	Date	3. Received By			Date	Time

8/2016

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

# **Login Sample Receipt Checklist**

Client: AECOM Technical Services Inc.

Job Number: 320-23542-1

Login Number: 23542 List Source: TestAmerica Sacramento

List Number: 1

Creator: Nelson, Kym D

Answer	Comment
True	
True	
N/A	
True	
False	Refer to Job Narrative for details.
N/A	
True	
True	
True	
True	
False	Refer to Job Narrative for details.
True	
True	
N/A	
True	
True	
True	
True	
N/A	
	True True N/A True True True True True True True True

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## **ANALYTICAL REPORT**

Job Number: 320-23542-1

Job Description: Former Bay Head Road Annex (RFP JU06-01)

For:

AECOM Technical Services Inc. 3101 Wilson Blvd. Suite 900 Arlington, VA 22201

Attention: Kurt Vangelder

Approved for release.
Jill Kellmann
Manager of Project Management
12/8/2016 2:42 PM

Jill Kellmann, Manager of Project Management 880 Riverside Parkway, West Sacramento, CA, 95605 (916)374-4402

Jui Kellmann

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# **Table of Contents**

$\mathbb{C}^{c}$	over Title Page	1
Da	ata Summaries	4
	Definitions	4
	Case Narrative	5
	Detection Summary	7
	Client Sample Results	8
	Default Detection Limits	10
	Isotope Dilution Summary	11
	QC Sample Results	12
	QC Association	16
	Chronicle	18
	Certification Summary	20
	Method Summary	21
	Sample Summary	22
	Manual Integration Summary	23
	Reagent Traceability	27
	COAs	58
Or	ganic Sample Data	382
	LCMS	382
	Method PFC DOD	382
	Method PFC DOD QC Summary	383
	Method PFC DOD Sample Data	397
	Standards Data	452
	Method PFC DOD ICAL Data	452
	Method PFC DOD CCAL Data	616
	Raw QC Data	682

# **Table of Contents**

Method PFC DOD Blank Data	682
Method PFC DOD LCS/LCSD Data	700
Method PFC DOD MS/MSD Data	714
Method PFC DOD Run Logs	791
Method PFC DOD Prep Data	797
Inorganic Sample Data	833
General Chemistry Data	833
Gen Chem Cover Page	834
Gen Chem MDL	835
Gen Chem Analysis Run Log	837
Gen Chem Prep Data	838
Gen Chem Raw Data	839
Shipping and Receiving Documents	840
Client Chain of Custody	841
Sample Receipt Checklist	842

# **Definitions/Glossary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

## **Qualifiers**

#### **LCMS**

Qualifier	Qualifier Description
M	Manual integrated compound.
E	Result exceeded calibration range.
U	Undetected at the Limit of Detection.
D	The reported value is from a dilution.
J	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
Q	One or more quality control criteria failed.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

# Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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)

TestAmerica Job ID: 320-23542-1

#### **CASE NARRATIVE**

Client: AECOM Technical Services Inc.

**Project: Former Bay Head Road Annex (RFP JU06-01)** 

Report Number: 320-23542-1

#### Revision - December 8, 2016

Report revised due to incorrectly applied B flags on the water samples.

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 application 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.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

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 11/15/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.0 C.

#### **Receipt Exceptions**

Listed samples do not include a collection date on the chain of custody.

DPT-16-01-GW-17-21 (320-23542-1), DPT-16-05-GW-17-21 (320-23542-2), DPT-16-05-GW-17-21-MS (320-23542-2[MS]), DPT-16-05-GW-17-21-MSD (320-23542-2[MSD]), DPT-16-34-SO-14-15 (320-23542-3) and DPT-16-34-GW-31-35 (320-23542-4)

#### <u>PFAS</u>

The first level standard from the initial calibration curve is used to evaluate the tune criteria. The instrument mass windows are set at +/-0.5amu; therefore, detection of the analyte serves as verification that the assigned mass is within +/-0.5amu of the true value, which meets the DoD/DOE QSM tune criterion.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: DPT-16-01-GW-17-21 (320-23542-1), DPT-16-05-GW-17-21 (320-23542-2), DPT-16-05-GW-17-21-MS (320-23542-2[MS]), DPT-16-05-GW-17-21-MSD (320-23542-2[MSD]), DPT-16-34-GW-31-35 (320-23542-4), (320-23542-A-3-B MS) and (320-23542-A-3-C MSD). These analytes have been qualified; however, the peaks did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

The Isotope Dilution Analyte (IDA) recovery for 18O2 PFHxS is above the method recommended limit for the following samples: DPT-16-05-GW-17-21 (320-23542-2) and DPT-16-05-GW-17-21-MS (320-23542-2[MS]). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Due to the high concentration of Perfluorooctanoic acid (PFOA) and Perfluorooctane Sulfonate (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-138217 and analytical batch 320-138814 could not be evaluated for accuracy and

precision. The associated laboratory control sample (LCS) met acceptance criteria.

The matrix spike (MS) recovery for preparation batch 320-138217 and analytical batch 320-138814 was outside control limits for Perfluorobutanesulfonic acid (PFBS). Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-138291 and analytical batch 320-138814 were outside control limits for Perfluorooctanoic acid (PFOA). Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Due to the high concentration of Perfluorooctane Sulfonate (PFOS), the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-138291 and analytical batch 320-138814 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Due to the excessive amount of sediment in the sample bottles, the aqueous portion of these samples was decanted to new bottles prior to spiking and the extraction. DPT-16-01-GW-17-21 (320-23542-1), DPT-16-05-GW-17-21 (320-23542-2), DPT-16-05-GW-17-21-MS (320-23542-2[MS]), DPT-16-05-GW-17-21-MSD (320-23542-2[MSD]) and DPT-16-34-GW-31-35 (320-23542-4)

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

#### **PERCENT SOLIDS**

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

# **Detection Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

### Client Sample ID: DPT-16-01-GW-17-21

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.062	M	0.0026	0.00078	ug/L		_	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	0.86	E	0.0042	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.011	M	0.0026	0.00095	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.066	D	0.026	0.0078	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	0.98	D	0.042	0.013	ug/L	10		537 (Modified)	Total/NA

### Client Sample ID: DPT-16-05-GW-17-21

# Lab Sample ID: 320-23542-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.19	JM	0.0024	0.00072	ug/L	1	_	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	2.2	JE	0.0039	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.050	J M	0.0024	0.00089	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.21	DJ	0.24	0.072	ug/L	100		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) -	2.8	JD	0.39	0.12	ug/L	100		537 (Modified)	Total/NA
DL									

### **Client Sample ID: DPT-16-34-SO-14-15**

### Lab Sample ID: 320-23542-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	3.2	M J	0.62	0.13	ug/Kg	1	☼	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	34	J	0.62	0.16	ug/Kg	1	₩	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	3.6	JD	6.2	1.3	ug/Kg	10	₩	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) -	35	JD	6.2	1.6	ug/Kg	10	Ϋ́	537 (Modified)	Total/NA

### Client Sample ID: DPT-16-34-GW-31-35

### Lab Sample ID: 320-23542-4

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.95	EM	0.0025	0.00074	ug/L	1	_	537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS)	1.2	E	0.0039	0.0013	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.12	M	0.0025	0.00090	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	1.0	D	0.025	0.0074	ug/L	10		537 (Modified)	Total/NA
Perfluorooctane Sulfonate (PFOS) - DL	1.4	D	0.039	0.013	ug/L	10		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.081	D	0.025	0.0090	ug/L	10		537 (Modified)	Total/NA

# **Client Sample Results**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: 320-23542-1 Client Sample ID: DPT-16-01-GW-17-21

Date Collected: 11/14/16 10:30 **Matrix: Water** 

<b>Date</b>	Received:	11/15/16 09:30	

Isotope Dilution

13C4 PFOA

13C4 PFOS

1802 PFHxS

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.062	M	0.0026	0.00078	ug/L		11/17/16 08:49	11/20/16 22:33	1
Perfluorooctane Sulfonate (PFOS)	0.86	E	0.0042	0.0013	ug/L		11/17/16 08:49	11/20/16 22:33	1
Perfluorobutanesulfonic acid (PFBS)	0.011	M	0.0026	0.00095	ug/L		11/17/16 08:49	11/20/16 22:33	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	95		25 - 150				11/17/16 08:49	11/20/16 22:33	1
13C4 PFOS	86		25 - 150				11/17/16 08:49	11/20/16 22:33	1
1802 PFHxS	96		25 - 150				11/17/16 08:49	11/20/16 22:33	1
	uorinated H	lydrocarbo	ons - DL						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.066	D	0.026	0.0078	ug/L		11/17/16 08:49	12/02/16 13:22	10
Perfluorooctane Sulfonate (PFOS)	0.98	D	0.042	0.013	ug/L		11/17/16 08:49	12/02/16 13:22	10
Perfluorobutanesulfonic acid (PFBS)	0.021	U	0.026	0.0095	ug/L		11/17/16 08:49	12/02/16 13:22	10

Client Sample ID: DPT-16-05-GW-17-21

Lab Sample ID: 320-23542-2 Date Collected: 11/14/16 11:45 Matrix: Water

Limits

25 - 150

25 - 150

25 - 150

%Recovery Qualifier

110

114

129

Date Received: 11/15/16 09:30								Matrix	vvale
Method: 537 (Modified) - Perflu		•							
Analyte	Result	Qualifier	LOQ		Unit	D	Prepared	Analyzed	Dil Fa
Perfluorooctanoic acid (PFOA)	0.19	JM	0.0024	0.00072	ug/L		11/17/16 08:49	11/20/16 22:40	
Perfluorooctane Sulfonate (PFOS)	2.2	JE	0.0039	0.0012	ug/L		11/17/16 08:49	11/20/16 22:40	
Perfluorobutanesulfonic acid (PFBS)	0.050	J M	0.0024	0.00089	ug/L		11/17/16 08:49	11/20/16 22:40	•
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C4 PFOA	77		25 - 150				11/17/16 08:49	11/20/16 22:40	
13C4 PFOS	63		25 - 150				11/17/16 08:49	11/20/16 22:40	
1802 PFHxS	81		25 - 150				11/17/16 08:49	11/20/16 22:40	•
Method: 537 (Modified) - Perflu	uorinated H	ydrocarbo	ons - DL						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fa
Perfluorooctanoic acid (PFOA)	0.21	DJ	0.24	0.072	ug/L		11/17/16 08:49	12/02/16 12:59	100
Perfluorooctane Sulfonate (PFOS)	2.8	J D	0.39	0.12	ug/L		11/17/16 08:49	12/02/16 12:59	100
Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.24	0.089	ug/L		11/17/16 08:49	12/02/16 12:59	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fa
13C4 PFOA	125		25 - 150				11/17/16 08:49	12/02/16 12:59	100
13C4 PFOS	146		25 - 150				11/17/16 08:49	12/02/16 12:59	100
1802 PFHxS	154	Q	25 - 150				11/17/16 08:49	12/02/16 12:59	100

TestAmerica Job ID: 320-23542-1

Prepared

Analyzed

10

10

11/17/16 08:49 12/02/16 13:22

11/17/16 08:49 12/02/16 13:22

11/17/16 08:49 12/02/16 13:22

# **Client Sample Results**

Client: AECOM Technical Services Inc.

Analyte

1802 PFHxS

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Result Qualifier

Client Sample ID: DPT-16-34-SO-14-15 Lab Sample ID: 320-23542-3

 Date Collected: 11/14/16 13:25
 Matrix: Solid

 Date Received: 11/15/16 09:30
 Percent Solids: 79.5

LOQ

DL Unit

D

Prepared

· ······· <b>,</b> ···						_		·, · · ·	
Perfluorooctanoic acid (PFOA)	3.2	MJ	0.62	0.13	ug/Kg	₩	11/17/16 12:49	11/20/16 21:25	1
Perfluorooctane Sulfonate (PFOS)	34	J	0.62	0.16	ug/Kg	☼	11/17/16 12:49	11/20/16 21:25	1
Perfluorobutanesulfonic acid (PFBS)	0.37	U	0.50	0.13	ug/Kg	≎	11/17/16 12:49	11/20/16 21:25	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	91		25 - 150				11/17/16 12:49	11/20/16 21:25	1
13C4 PFOS	58		25 - 150				11/17/16 12:49	11/20/16 21:25	1
18O2 PFHxS	73		25 - 150				11/17/16 12:49	11/20/16 21:25	1
Method: 537 (Modified) - Perflu		•	ons - DL						
•		•		DI	l lmié		Drawarad	Analysed	Dil Ess
Analyte	Result	Qualifier	LOQ			D 	Prepared	Analyzed	Dil Fac
Analyte Perfluorooctanoic acid (PFOA)	Result 3.6	Qualifier J D		1.3	ug/Kg	<del></del>	11/17/16 12:49	12/02/16 13:37	10
Analyte	Result 3.6	Qualifier	LOQ	1.3			<u> </u>		
Analyte Perfluorooctanoic acid (PFOA)	Result 3.6	Qualifier J D J D		1.3 1.6	ug/Kg	<del></del>	11/17/16 12:49	12/02/16 13:37	10
Analyte Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS)	3.6 35	Qualifier J D J D U	6.2 6.2	1.3 1.6	ug/Kg ug/Kg	<u>₩</u>	11/17/16 12:49 11/17/16 12:49	12/02/16 13:37 12/02/16 13:37	10 10
Analyte Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS) Perfluorobutanesulfonic acid (PFBS)	3.6 35 3.7	Qualifier J D J D U	6.2 6.2 5.0	1.3 1.6	ug/Kg ug/Kg	<u>₩</u>	11/17/16 12:49 11/17/16 12:49 11/17/16 12:49	12/02/16 13:37 12/02/16 13:37 12/02/16 13:37	10 10 10
Analyte Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS) Perfluorobutanesulfonic acid (PFBS) Isotope Dilution	3.6 35 3.7 %Recovery	Qualifier J D J D U	6.2 6.2 5.0 <i>Limits</i>	1.3 1.6	ug/Kg ug/Kg	<u>₩</u>	11/17/16 12:49 11/17/16 12:49 11/17/16 12:49 <b>Prepared</b>	12/02/16 13:37 12/02/16 13:37 12/02/16 13:37 Analyzed	10 10 10 <b>Dil Fac</b>

Date Collected: 11/14/16 14:30 Matrix: Water Date Received: 11/15/16 09:30

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.95	EM	0.0025	0.00074	ug/L		11/17/16 08:49	11/20/16 23:03	1
Perfluorooctane Sulfonate (PFOS)	1.2	E	0.0039	0.0013	ug/L		11/17/16 08:49	11/20/16 23:03	1
Perfluorobutanesulfonic acid (PFBS)	0.12	M	0.0025	0.00090	ug/L		11/17/16 08:49	11/20/16 23:03	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOA	54		25 - 150				11/17/16 08:49	11/20/16 23:03	1
13C4 PFOS	74		25 - 150				11/17/16 08:49	11/20/16 23:03	1
1802 PFHxS	52		25 - 150				11/17/16 08:49	11/20/16 23:03	1
Method: 537 (Modified) - Perflu	uorinated H	ydrocarbo	ns - DL						
•		•				_	D		
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
			LOQ 0.025	0.0074		D	11/17/16 08:49	Analyzed 12/02/16 16:14	Dil Fac
Perfluorooctanoic acid (PFOA)	1.0	D			ug/L	D			
Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS) Perfluorobutanesulfonic acid	1.0	D D	0.025	0.0074	ug/L ug/L	D	11/17/16 08:49	12/02/16 16:14	10
Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS) Perfluorobutanesulfonic acid (PFBS)	1.0 1.4	D D D	0.025 0.039	0.0074 0.013	ug/L ug/L	<u>D</u>	11/17/16 08:49 11/17/16 08:49	12/02/16 16:14 12/02/16 16:14	10
Analyte Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS) Perfluorobutanesulfonic acid (PFBS) Isotope Dilution 13C4 PFOA	1.0 1.4 0.081	D D D	0.025 0.039 0.025	0.0074 0.013	ug/L ug/L	<u>D</u>	11/17/16 08:49 11/17/16 08:49 11/17/16 08:49	12/02/16 16:14 12/02/16 16:14 12/02/16 16:14	10 10 10

10

11/17/16 08:49 12/02/16 16:14

TestAmerica Job ID: 320-23542-1

Analyzed

Dil Fac

25 - 150

## **Default Detection Limits**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

# Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

ſ	Analyte	LOQ	DL	Units	Method	
	Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	537 (Modified)	
	Perfluorooctane Sulfonate (PFOS)	0.0040	0.0013	ug/L	537 (Modified)	
	Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	537 (Modified)	

# Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: SHAKE

Analyte	LOQ	DL	Units	Method	
Perfluorobutanesulfonic acid (PFBS)	0.40	0.10	ug/Kg	537 (Modified)	_
Perfluorooctane Sulfonate (PFOS)	0.50	0.13	ug/Kg	537 (Modified)	
Perfluorooctanoic acid (PFOA)	0.50	0.10	ug/Kg	537 (Modified)	

# **Isotope Dilution Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

# Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Solid Prep Type: Total/NA

			Perc	ent Isotope l
		3C4 PFO	3C4 PFOS	3O2 PFHx
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)
320-23542-3	DPT-16-34-SO-14-15	91	58	73
320-23542-3 - DL	DPT-16-34-SO-14-15	125	72	99
320-23542-3 MS	DPT-16-34-SO-14-15	86	54	72
320-23542-3 MS - DL	DPT-16-34-SO-14-15	110	63	84
320-23542-3 MSD	DPT-16-34-SO-14-15	84	60	71
320-23542-3 MSD - DL	DPT-16-34-SO-14-15	108	67	82
LCS 320-138291/2-A	Lab Control Sample	107	92	91
MB 320-138291/1-A	Method Blank	111	89	94

#### **Surrogate Legend**

13C4 PFOA = 13C4 PFOA 13C4 PFOS = 13C4 PFOS 18O2 PFHxS = 18O2 PFHxS

### Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water Prep Type: Total/NA

			Perc	ent Isotope
		3C4 PFO	3C4 PFOS	3O2 PFHx
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)
320-23542-1	DPT-16-01-GW-17-21	95	86	96
320-23542-1 - DL	DPT-16-01-GW-17-21	110	114	129
320-23542-2	DPT-16-05-GW-17-21	77	63	81
320-23542-2 - DL	DPT-16-05-GW-17-21	125	146	154 Q
320-23542-2 MS	DPT-16-05-GW-17-21-MS	43	59	76
320-23542-2 MS - DL	DPT-16-05-GW-17-21-MS	78	145	156 Q
320-23542-2 MSD	DPT-16-05-GW-17-21-MSD	80	65	82
320-23542-2 MSD - DL	DPT-16-05-GW-17-21-MSD	101	99	116
320-23542-4	DPT-16-34-GW-31-35	54	74	52
320-23542-4 - DL	DPT-16-34-GW-31-35	101	125	115
LCS 320-138217/2-A	Lab Control Sample	78	72	74
MB 320-138217/1-A	Method Blank	117	105	108

#### Surrogate Legend

13C4 PFOA = 13C4 PFOA 13C4 PFOS = 13C4 PFOS 18O2 PFHxS = 18O2 PFHxS

# **QC Sample Results**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

#### Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-138217/1-A

**Matrix: Water** 

Analysis Batch: 138814

**Client Sample ID: Method Blank** 

**Prep Type: Total/NA** 

**Prep Batch: 138217** 

	INIB	INIR							
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		11/17/16 08:49	11/20/16 22:18	1
Perfluorooctane Sulfonate (PFOS)	0.0030	U	0.0040	0.0013	ug/L		11/17/16 08:49	11/20/16 22:18	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		11/17/16 08:49	11/20/16 22:18	1
	MB	MB							

Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C4 PFOA 117 25 - 150 <u>11/17/16 08:49</u> <u>11/20/16 22:18</u> 13C4 PFOS 25 - 150 105 11/17/16 08:49 11/20/16 22:18 1 1802 PFHxS 108 25 - 150 11/17/16 08:49 11/20/16 22:18

Lab Sample ID: LCS 320-138217/2-A

**Matrix: Water** 

Analysis Batch: 138814

**Client Sample ID: Lab Control Sample** 

**Prep Type: Total/NA Prep Batch: 138217** 

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Perfluorooctanoic acid (PFOA)	0.0400	0.0392		ug/L		98	60 - 140	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0347		ug/L		94	60 - 140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0365		ug/L		103	50 - 150	

LCS LCS

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA	78		25 - 150
13C4 PFOS	72		25 - 150
1802 PFHxS	74		25 - 150

Lab Sample ID: 320-23542-2 MS Client Sample ID: DPT-16-05-GW-17-21-MS

**Matrix: Water** 

Analysis Batch: 138814

Prep Type: Total/NA

Prep Batch: 138217

Analysis Daten. 100014	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA)	0.19	JM	0.0398	0.244	4	ug/L		145	60 - 140
Perfluorooctane Sulfonate (PFOS)	2.2	JE	0.0369	2.43	E 4	ug/L		610	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.050	J M	0.0352	0.107	J M	ug/L		161	50 - 150
	MS	MS							
Isotono Dilution	% Pocovory	Qualifier	Limite						

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA	43		25 - 150
13C4 PFOS	59		25 - 150
1802 PFHxS	76		25 - 150

Lab Sample ID: 320-23542-2 MSD

**Matrix: Water** 

**Analysis Batch: 138814** 

Client Sample ID: DPT-16-05-GW-17-21-MSD

Prep Type: Total/NA **Prep Batch: 138217** 

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluorooctanoic acid (PFOA)	0.19	J M	0.0404	0.210	4 M	ug/L		59	60 - 140	15	30
Perfluorooctane Sulfonate	2.2	JE	0.0374	2.05	E 4	ug/L		-410	60 - 140	17	30

TestAmerica Sacramento

# **QC Sample Results**

LOQ

0.50

0.50

0.40

Spike

Added

3.98

3.69

3.51

MSD MSD

0.0881 M

Result Qualifier

DL Unit

0.10 ug/Kg

0.13 ug/Kg

0.10 ug/Kg

LCS LCS

4.37

3.90

4.70

Result Qualifier

Unit

ug/Kg

ug/Kg

ug/Kg

Unit

ug/L

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

#### Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: 320-23542-2 MSD **Matrix: Water** 

Analysis Batch: 138814

Sample Sample Spike Result Qualifier Added

Analyte 0.050 J M 0.0357 Perfluorobutanesulfonic acid (PFBS)

> MSD MSD %Recovery Qualifier Limits 80 25 - 150 65 25 - 150 25 - 150

> > U

0.30 U

MB MB

82

Lab Sample ID: MB 320-138291/1-A

**Matrix: Solid** 

Isotope Dilution

13C4 PFOA

13C4 PFOS

1802 PFHxS

Analysis Batch: 138814

MR MR

Analyte Result Qualifier Perfluorooctanoic acid (PFOA) 0.30 0.30 U

Perfluorooctane Sulfonate (PFOS) Perfluorobutanesulfonic acid (PFBS)

Isotope Dilution %Recovery Qualifier Limits 13C4 PFOA 111 25 - 150 13C4 PFOS 89 25 - 150 1802 PFHxS 94 25 - 150

Lab Sample ID: LCS 320-138291/2-A

**Analysis Batch: 138814** 

Perfluorooctanoic acid (PFOA) Perfluorooctane Sulfonate (PFOS)

Perfluorobutanesulfonic acid (PFBS)

**Matrix: Solid** 

LCS LCS Isotope Dilution %Recovery Qualifier Limits 25 - 150 13C4 PFOA 107 13C4 PFOS 92 25 - 150 1802 PFHxS 91 25 - 150

Lab Sample ID: 320-23542-3 MS

**Matrix: Solid** 

Analysis Batch: 138814

3.2 M J Perfluorooctanoic acid (PFOA) 34 J Perfluorooctane Sulfonate (PFOS)

(PFBS)

Client Sample ID: DPT-16-05-GW-17-21-MSD

Prep Type: Total/NA

**Prep Batch: 138217** 

%Rec. **RPD** Limits **RPD** Limit

%Rec 30 106 50 - 150 19

**Client Sample ID: Method Blank** 

Prep Type: Total/NA

**Prep Batch: 138291** 

1

1

**Prepared** Analyzed Dil Fac 11/17/16 12:49 11/20/16 21:10

11/17/16 12:49 11/20/16 21:10 11/17/16 12:49 11/20/16 21:10

Prepared Analyzed Dil Fac 11/17/16 12:49 11/20/16 21:10 11/17/16 12:49 11/20/16 21:10 1

11/17/16 12:49 11/20/16 21:10

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

**Prep Batch: 138291** 

%Rec. %Rec Limits 60 - 140

110 106 60 - 140

134 50 - 150

**Client Sample ID: DPT-16-34-SO-14-15** 

Prep Type: Total/NA

**Prep Batch: 138291** %Rec.

Sample Sample Spike MS MS Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits ₩ 5.04 12.2 MJ ug/Kg 179 60 - 140₩ 4.68 67.4 E 4 719 60 - 140ug/Kg 0.37 U 4.46 6.08 ug/Kg 136 50 - 150Perfluorobutanesulfonic acid

## **QC Sample Results**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Isotope Dilution	%Recovery	Qualifier	Limits
13C4 PFOA	86		25 - 150
13C4 PFOS	54		25 - 150
1802 PFHxS	72		25 - 150

Lab Sample ID: 320-23542-3 MSD

**Client Sample ID: DPT-16-34-SO-14-15 Matrix: Solid** 

Prep Type: Total/NA **Analysis Batch: 138814 Prep Batch: 138291** MSD MSD %Rec. Sample Sample **Spike** 

**Analyte** Result Qualifier Added Result Qualifier Unit %Rec Limits **RPD** Limit ₩ Perfluorooctanoic acid (PFOA) 3.2 M J 5.00 13.1 M J 198 60 - 140 7 30 ug/Kg ά 34 J 4.64 59.2 E 4 ug/Kg 549 60 - 140 13 30 Perfluorooctane Sulfonate (PFOS) 0.37 U 4.42 5.82 ug/Kg 132 50 - 150 4 30 Perfluorobutanesulfonic acid (PFBS)

MSD MSD %Recovery Isotope Dilution Qualifier Limits

13C4 PFOA 84 25 - 150 13C4 PFOS 60 25 - 150 1802 PFHxS 71 25 - 150

### Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

Lab Sample ID: 320-23542-2 MS Client Sample ID: DPT-16-05-GW-17-21-MS

**Matrix: Water** 

**Prep Type: Total/NA Analysis Batch: 140382 Prep Batch: 138217** Sample Sample **Spike** MS MS %Rec.

Result Qualifier Added Result Qualifier Limits Analyte Unit %Rec 0.21 J D J 0.0398 0.268 4 D ug/L 140 60 - 140 Perfluorooctanoic acid (PFOA) -2.8 J D 0.0369 3.08 4 D 60 - 140 ug/L 749 Perfluorooctane Sulfonate (PFOS) - DL 0.19 U 0.0352 0.20 U NC 50 - 150 ug/L Perfluorobutanesulfonic acid

25 - 150

(PFBS) - DL

MS MS Isotope Dilution %Recovery Qualifier Limits 13C4 PFOA - DL 78 25 - 150 13C4 PFOS - DL 145 25 - 150

156 Q

Lab Sample ID: 320-23542-2 MSD

1802 PFHxS - DL

Client Sample ID: DPT-16-05-GW-17-21-MSD **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 140382 Prep Batch: 138217** MSD MSD

Sample Sample **Spike** %Rec. **RPD** Result Qualifier Added Result Qualifier Unit Limits **RPD** Limit Analyte D %Rec 0.21 J D J 0.0404 0.214 J4D 4 60 - 140 22 Perfluorooctanoic acid (PFOA) ug/L DL Perfluorooctane Sulfonate 2.8 JD 0.0374 2.79 4 D ug/L -24 60 - 140 10 30 (PFOS) - DL 0.19 U 0.0357 0.20 U NC 50 - 150 NC 30 Perfluorobutanesulfonic acid ug/L

(PFBS) - DL

MSD MSD Qualifier Isotope Dilution %Recovery Limits 13C4 PFOA - DL 101 25 - 150 13C4 PFOS - DL 25 - 150 99 1802 PFHxS - DL 116 25 - 150

TestAmerica Job ID: 320-23542-1

## **QC Sample Results**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

### Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL (Continued)

63

84

Lab Sample ID: 320-23542-3 MS

**Matrix: Solid** 

Analysis Batch: 140382

Client Sample ID: DPT-16-34-SO-14-15 Prep Type: Total/NA

Prep Batch: 138291

Alialysis Batch. 140302	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorooctanoic acid (PFOA) - DL	3.6	JJD	5.04	12.7	JD	ug/Kg	₩	182	60 - 140
Perfluorooctane Sulfonate (PFOS) - DL	35	JD	4.68	69.2	4 D	ug/Kg	₩	740	60 - 140
Perfluorobutanesulfonic acid (PFBS) - DL	3.7	U	4.46	4.90	JD	ug/Kg	₩	110	50 - 150
	MS	MS							
Isotope Dilution	%Recovery	Qualifier	Limits						
13C4 PFOA - DL	110		25 - 150						

25 - 150

25 - 150

Lab Sample ID: 320-23542-3 MSD

**Matrix: Solid** 

(PFBS) - DL

13C4 PFOS - DL 1802 PFHxS - DL

**Analysis Batch: 140382** 

**Client Sample ID: DPT-16-34-SO-14-15** 

**Prep Type: Total/NA Prep Batch: 138291** 

MSD MSD Sample Sample Spike %Rec. **RPD** Analyte Result Qualifier Added Result Qualifier Unit D %Rec Limits **RPD** Limit ₩ 3.6 JJD 5.00 13.1 J D 191 60 - 140 3 30 Perfluorooctanoic acid (PFOA) ug/Kg Perfluorooctane Sulfonate 35 J D 4.64 63.2 4 D ug/Kg ₩ 617 60 - 140 30 (PFOS) - DL 4.97 JD 3.7 U 4.42 ug/Kg 30 Perfluorobutanesulfonic acid 113 50 - 150

MSD MSD Limits Isotope Dilution %Recovery Qualifier 13C4 PFOA - DL 108 25 - 150 25 - 150 13C4 PFOS - DL 67 1802 PFHxS - DL 82 25 - 150

TestAmerica Sacramento

# **QC Association Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

## LCMS

## **Prep Batch: 138217**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-1	DPT-16-01-GW-17-21	Total/NA	Water	3535	
320-23542-1 - DL	DPT-16-01-GW-17-21	Total/NA	Water	3535	
320-23542-2 - DL	DPT-16-05-GW-17-21	Total/NA	Water	3535	
320-23542-2	DPT-16-05-GW-17-21	Total/NA	Water	3535	
320-23542-4 - DL	DPT-16-34-GW-31-35	Total/NA	Water	3535	
320-23542-4	DPT-16-34-GW-31-35	Total/NA	Water	3535	
MB 320-138217/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-138217/2-A	Lab Control Sample	Total/NA	Water	3535	
320-23542-2 MS	DPT-16-05-GW-17-21-MS	Total/NA	Water	3535	
320-23542-2 MS - DL	DPT-16-05-GW-17-21-MS	Total/NA	Water	3535	
320-23542-2 MSD	DPT-16-05-GW-17-21-MSD	Total/NA	Water	3535	
320-23542-2 MSD - DL	DPT-16-05-GW-17-21-MSD	Total/NA	Water	3535	

### **Prep Batch: 138291**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-3	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 - DL	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
MB 320-138291/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-138291/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-23542-3 MS	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 MS - DL	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 MSD	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	
320-23542-3 MSD - DL	DPT-16-34-SO-14-15	Total/NA	Solid	SHAKE	

## Analysis Batch: 138814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-1	DPT-16-01-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-2	DPT-16-05-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-3	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-4	DPT-16-34-GW-31-35	Total/NA	Water	537 (Modified)	138217
MB 320-138217/1-A	Method Blank	Total/NA	Water	537 (Modified)	138217
MB 320-138291/1-A	Method Blank	Total/NA	Solid	537 (Modified)	138291
LCS 320-138217/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	138217
LCS 320-138291/2-A	Lab Control Sample	Total/NA	Solid	537 (Modified)	138291
320-23542-2 MS	DPT-16-05-GW-17-21-MS	Total/NA	Water	537 (Modified)	138217
320-23542-2 MSD	DPT-16-05-GW-17-21-MSD	Total/NA	Water	537 (Modified)	138217
320-23542-3 MS	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-3 MSD	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291

## **Analysis Batch: 140382**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-1 - DL	DPT-16-01-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-2 - DL	DPT-16-05-GW-17-21	Total/NA	Water	537 (Modified)	138217
320-23542-3 - DL	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-2 MS - DL	DPT-16-05-GW-17-21-MS	Total/NA	Water	537 (Modified)	138217
320-23542-2 MSD - DL	DPT-16-05-GW-17-21-MSD	Total/NA	Water	537 (Modified)	138217
320-23542-3 MS - DL	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291
320-23542-3 MSD - DL	DPT-16-34-SO-14-15	Total/NA	Solid	537 (Modified)	138291

# **QC Association Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

## LCMS (Continued)

Analy	ysis	<b>Batc</b>	h: 1	40429
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Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-4 - DL	DPT-16-34-GW-31-35	Total/NA	Water	537 (Modified)	138217

## **General Chemistry**

## **Analysis Batch: 139136**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23542-3	DPT-16-34-SO-14-15	Total/NA	Solid	D 2216	

## Lab Chronicle

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Client Sample ID: DPT-16-01-GW-17-21 Lab Sample ID: 320-23542-1

Date Collected: 11/14/16 10:30 **Matrix: Water** 

Date Received: 11/15/16 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	138814	11/20/16 22:33	TC1	TAL SAC
Total/NA	Prep	3535	DL		138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	140382	12/02/16 13:22	SBC	TAL SAC

Lab Sample ID: 320-23542-2 Client Sample ID: DPT-16-05-GW-17-21

Date Collected: 11/14/16 11:45 **Matrix: Water** 

Date Received: 11/15/16 09:30

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	138814	11/20/16 22:40	TC1	TAL SAC
Total/NA	Prep	3535	DL		138217	11/17/16 08:49	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	100	140382	12/02/16 12:59	SBC	TAL SAC

Client Sample ID: DPT-16-34-SO-14-15 Lab Sample ID: 320-23542-3

Date Collected: 11/14/16 13:25 Matrix: Solid Date Received: 11/15/16 09:30

Dilution Batch Batch Batch **Prepared** Method or Analyzed Prep Type Type Run **Factor** Number **Analyst** D 2216 139136 11/22/16 13:53 MY1 TAL SAC Total/NA Analysis

Lab Sample ID: 320-23542-3 Client Sample ID: DPT-16-34-SO-14-15

Date Collected: 11/14/16 13:25 Matrix: Solid

Date Received: 11/15/16 09:30 Percent Solids: 79.5

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			138291	11/17/16 12:49	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)		1	138814	11/20/16 21:25	TC1	TAL SAC
Total/NA	Prep	SHAKE	DL		138291	11/17/16 12:49	NS1	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	10	140382	12/02/16 13:37	SBC	TAL SAC

Client Sample ID: DPT-16-34-GW-31-35 Lab Sample ID: 320-23542-4

Date Collected: 11/14/16 14:30 **Matrix: Water** Date Received: 11/15/16 09:30

Batch Dilution Batch **Batch Prepared** Method Number **Prep Type** Type Run Factor or Analyzed Analyst Lab Total/NA Prep 3535 138217 11/17/16 08:49 HJA TAL SAC Analysis Total/NA 537 (Modified) 1 138814 11/20/16 23:03 TC1 TAL SAC Total/NA Prep 3535 DL 138217 11/17/16 08:49 HJA TAL SAC Total/NA Analysis DΙ 140429 12/02/16 16:14 SBC TAL SAC 537 (Modified) 10

TestAmerica Job ID: 320-23542-1

## **Lab Chronicle**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

### Laboratory References:

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

TestAmerica Job ID: 320-23542-1

# **Certification Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

## Laboratory: TestAmerica Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

uthority	Program	Program EPA Region DoD ELAP		Certification ID	Expiration Date 01-31-17	
2LA	DoD ELA			2928-01		
The following analytes	are included in this repo	rt, but certification is	not offered by the go	overning authority:		
Analysis Method	Prep Method	Matrix	Analyt	e		
				•		
537 (Modified)	SHAKE	Solid	Perflu	orooctane Sulfonate (PF	FOS)	
	SHAKE	Solid Solid			FOS)	

# **Method Summary**

Client: AECOM Technical Services Inc.

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

TestAmerica Job ID: 320-23542-1

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC

#### **Protocol References:**

ASTM = ASTM International EPA = US Environmental Protection Agency

#### **Laboratory References:**

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

## **Sample Summary**

Client: AECOM Technical Services Inc.

Lab Sample ID

320-23542-1

320-23542-2

320-23542-3

320-23542-4

Project/Site: Former Bay Head Road Annex (RFP JU06-01)

Client Sample ID

DPT-16-01-GW-17-21

DPT-16-05-GW-17-21

DPT-16-34-SO-14-15

DPT-16-34-GW-31-35

 Matrix
 Collected
 Received

 Water
 11/14/16 10:30
 11/15/16 09:30

 Water
 11/14/16 11:45
 11/15/16 09:30

Solid

Water

TestAmerica Job ID: 320-23542-1

11/14/16 13:25 11/15/16 09:30

11/14/16 14:30 11/15/16 09:30

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 137684

Lab Sample ID: IC 320-137684/5 Client Sample ID:

Date Analyzed: 11/14/16 11:49 Lab File ID: 14NOV2016A\_005.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.17	Baseline	chandrase nas	11/14/16 16:05

537 (Modified)

Page 23 of 842 12/08/2016

Lab Name: TestAmerica Sacramento	Job No	.: 320-2354	2-1	_		
SDG No.:				_		
Instrument ID: A8_N	Analys	is Batch Nu	mber: 138814			
Lab Sample ID: 320-23542-3	ample ID: 320-23542-3 Client Sample ID: DPT-16-34-S0-14-15					
Date Analyzed: 11/20/16 21:25	Lab Fi	le ID: <u>20NO</u>	V2016D_007.d	GC Colum	nn: Acquity	ID: <u>2.1(mm)</u>
COMPOUND NAME	RETENTION		MANUAL INTE	GRATION		
	TIME		REASON	ANALYST	DATE	
Perfluorooctanoic acid (PFOA)	2.73	Baseline		changnoit	11/23/16 15:14	
Lab Sample ID: 320-23542-3 MS	Client	Sample ID:	DPT-16-34-SO-14-15	MS		
Date Analyzed: 11/20/16 21:33	Lab Fi	le ID: <u>20NO</u>	V2016D_008.d	GC Colum	n: Acquity	ID: <u>2.1(mm)</u>
COMPOUND NAME	RETENTION		MANUAL INTE	GRATION		
	TIME		REASON	ANALYST	DATE	
Perfluorooctanoic acid (PFOA)	2.73	Baseline		changnoit	11/23/16 15:37	
Lab Sample ID: 320-23542-3 MSD	Client	Sample ID:	DPT-16-34-SO-14-15	MSD		
Date Analyzed: 11/20/16 21:40	Lab Fi	le ID: <u>20NO</u>	V2016D_009.d	GC Colum	n: Acquity	ID: <u>2.1(mm)</u>
COMPOUND NAME	RETENTION		MANUAL INTE	GRATION		
	TIME		REASON	ANALYST	DATE	
Perfluorooctanoic acid (PFOA)	2.73	Baseline		westendor fc	11/28/16 16:10	
Lab Sample ID: 320-23542-1	Client	Sample ID:	DPT-16-01-GW-17-21			
Date Analyzed: 11/20/16 22:33	Lab Fi	le ID: <u>20NO</u>	V2016D_016.d	GC Colum	nn: Acquity	ID: <u>2.1(mm)</u>
COMPOUND NAME	RETENTION		MANUAL INTE	GRATION		
	TIME		REASON	ANALYST	DATE	
Perfluorobutanesulfonic acid (PFBS)	1.79	Baseline		changnoit	11/23/16 15:49	
Perfluorooctanoic acid (PFOA)	2.73	Baseline		changnoit	11/23/16 15:49	

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 SDG No.: Analysis Batch Number: 138814 Instrument ID: A8 N Lab Sample ID: 320-23542-2 Client Sample ID: DPT-16-05-GW-17-21 Date Analyzed: 11/20/16 22:40 Lab File ID: 20NOV2016D 017.d GC Column: Acquity ID: 2.1 (mm) COMPOUND NAME RETENTION MANUAL INTEGRATION TIME REASON ANALYST DATE Perfluorobutanesulfonic acid 1.80 Baseline changnoit 11/23/16 15:55 (PFBS) Perfluorooctanoic acid (PFOA) 2.74 Baseline changnoit 11/23/16 15:55 Lab Sample ID: 320-23542-2 MS Client Sample ID: DPT-16-05-GW-17-21-MS MS Date Analyzed: 11/20/16 22:48 Lab File ID: 20NOV2016D 018.d GC Column: Acquity ID: 2.1 (mm) COMPOUND NAME RETENTION MANUAL INTEGRATION TIME REASON ANALYST DATE Perfluorobutanesulfonic acid 1.80 Baseline changnoit 11/23/16 15:59 (PFBS) Lab Sample ID: 320-23542-2 MSD Client Sample ID: DPT-16-05-GW-17-21-MSD MSD Lab File ID: 20NOV2016D\_019.d GC Column: Acquity Date Analyzed: 11/20/16 22:55 ID: 2.1 (mm) COMPOUND NAME RETENTION MANUAL INTEGRATION TIME REASON ANALYST DATE changnoit | 11/23/16 16:15 Perfluorobutanesulfonic acid 1.80 Baseline (PFBS) Perfluorooctanoic acid (PFOA) 2.73 Baseline changnoit 11/23/16 16:15 Lab Sample ID: 320-23542-4 Client Sample ID: DPT-16-34-GW-31-35 Lab File ID: 20NOV2016D 020.d GC Column: Acquity Date Analyzed: 11/20/16 23:03 ID: 2.1 (mm)COMPOUND NAME RETENTION MANUAL INTEGRATION DATE REASON ANALYST TIME changnoit | 11/23/16 16:22 Perfluorobutanesulfonic acid 1.80 Baseline (PFBS) 2.73 Baseline changnoit 11/23/16 16:22 Perfluorooctanoic acid (PFOA)

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 140382

Lab Sample ID: IC 320-140382/4 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorotetradecanoic acid (PFTeA)	4.94	Incomplete Integration	chandrase nas	12/02/16 13:37	

Lab Sample ID: IC 320-140382/5 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctane Sulfonate (PFOS)	3.38	Isomers	chandrase	12/02/16 13:38
			nas	

Lab Sample ID: IC 320-140382/10 Client Sample ID:

COMPOUND NAME RETENTION MANUAL INTEGRATION TIME REASON ANALYST DATE  Perfluorotridecanoic Acid 4.61 Incomplete Integration chandrase 12/02/16 13:42				_		
	COMPOUND NAME	RETENTION	RETENTION MANUAL INTEGRATION			
Perfluorotridecanoic Acid 4.61 Incomplete Integration chandrase 12/02/16 13:42		TIME	REASON	ANALYST	DATE	
(PFTriA) nas		4.61	Incomplete Integration	chandrase	12/02/16 13:42	

Page 26 of 842 12/08/2016

ab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reag	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00011		13C8 FOSA	1 ug/mL
					LCMPFBA 00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00011		13C2 PFDA	1 ug/mL
					LCMPFDoA 00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS 00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00008		13C5 PFNA	1 ug/mL
					LCMPFOA 00012		13C4 PFOA	1 ug/mL
					LCMPFOS 00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00009		13C2 PFUnA	1 ug/mL
.LCM2PFHxDA 00008	01/07/21	Wellingt	on Laboratories, Lot M2F	FH~DA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00007			on Laboratories, Lot M2F		(Purchased Rea		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA 00007	05/27/21		on Laboratories, Lot M41		(Purchased Rea		13C4-PFHpA	50 ug/mL
.LCM5PFPEA 00008	05/22/20		ton Laboratories, Lot M5		(Purchased Rea		13C5-PFPeA	50 ug/mL
.LCM8FOSA 00011	12/22/17		ton Laboratories, Lot M81		(Purchased Rea		13C8 FOSA	50 ug/mL
.LCMPFBA 00008	05/24/21		gton Laboratories, Lot Mi		(Purchased Rea		13C4 PFBA	50 ug/mL
_			· · · · · · · · · · · · · · · · · · ·					
.LCMPFDA 00011	08/19/20		gton Laboratories, Lot M		(Purchased Rea		13C2 PFDA	50 ug/mL
.LCMPFDoA_00008	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
.LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00008	10/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
.LCMPFNA 00008	04/13/19		gton Laboratories, Lot M		(Purchased Rea		13C5 PFNA	50 ug/mL
.LCMPFOA 00012	01/22/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFOA	50 ug/mL
.LCMPFOS_00017	08/03/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00009	02/12/21		ton Laboratories, Lot MP	FUdA0216	(Purchased Rea		13C2 PFUnA	50 ug/mL
LCPFC-L1_00021	12/28/16	08/03/16	MeOH/H2O, Lot 90285	5 mL	LCMPFCSU_00044	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
							1802 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 00057	25 11T.	Perfluorobutyric acid	0.5 ng/mL
						25 411	Perfluorobutanesulfonic acid (PFBS)	0.442 ng/mL
							,	0.5 ng/mL
							Perfluorodecanoic acid	0.5 ng/

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Description	Parent Reag	ent		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid	0.455 ng/mL
							Perfluorononanoic acid	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctane Sulfonate	0.464 ng/mL
							(PFOS)	
							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_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00007	1000 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00008	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00006	01/07/21	Wellingt	on Laboratories, Lot M2P	FHxDA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00006	12/07/20	Wellingt	on Laboratories, Lot M2P	FTeDA1115	(Purchased Rea	agent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00006	05/22/20	Wellingt	on Laboratories, Lot M4F	FHpA0515	(Purchased Rea	agent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00007	05/22/20		on Laboratories, Lot M5F		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00010	12/22/17	Wellingt	on Laboratories, Lot M8F	OSA1215I	(Purchased Rea	agent)	13C8 FOSA	50 ug/mL
LCMPFBA 00007	05/24/21		ton Laboratories, Lot MF		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00010	08/19/20	Welling	gton Laboratories, Lot MF	FDA0815	(Purchased Rea	agent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00007	04/08/21		ton Laboratories, Lot MP:		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00011	04/08/21	Welling	ton Laboratories, Lot MP	FHxA0416	(Purchased Rea	agent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00007	10/23/20	Welling	ton Laboratories, Lot MP	FHxS1015	(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00007	04/13/19		ton Laboratories, Lot MF		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00011	01/22/21		gton Laboratories, Lot MF		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00015	01/22/21		ton Laboratories, Lot MF		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19		ton Laboratories, Lot MP:		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00057	02/01/17		Methanol, Lot 090285		LCPFCSP 00056		Perfluorobutyric acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
Reagent ID	Date	Date		VOTUILLE	Reagent ID	Added	Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	0.1 / 7
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate	0.1 ug/mL 0.0928 ug/mL
							(PFOS)	
							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_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004		Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid	0.884 ug/mL
					LCPFDA 00005	200	(PFBS) Perfluorodecanoic acid	1
					LCPFDA_00005		Perfluorodecanoic acid Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005		Perfluorododecanoic acid	1 ug/mL 0.964 ug/mL
					LCPFHDA 00005		Perfluorodecane Sulfonic acid	1 ug/mL
					LCPFHpS 00008		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br 00001		Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00005		Perfluorononanoic acid	1 ug/mL
					LCPFOA 00006		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br 00001		Perfluorooctane Sulfonate	0.928 ug/mL
							(PFOS)	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00004	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBS_00004	10/09/19	Welling	ton Laboratories, Lot LF	FBS1014	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20	Wellin	gton Laboratories, Lot P.	FD7.0615	(Purchased Rea	gent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00005	01/30/20		ton Laboratories, Lot P.		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20		ton Laboratories, Lot LF		(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA 00005	01/22/21		ton Laboratories, Lot PF		(Purchased Rea		Perfluorodecane Suffonic acid	50 ug/mL
HCLEHPA_00000	01/22/21	Metitild	con naboracorres, not Pr	TIPROTIO	(Lulchased Rea	guir)	retituotonepeanote actu	JU ug/IIIL

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

					Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFHpS 00008	11/06/20		ton Laboratories,	T a L		3		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHpS_00008	12/22/20		ton Laboratories,			(Purchased Reag (Purchased Reag		Perfluorohexanoic acid	50 ug/mL
LCPFHXA_00004	11/28/17		ton Laboratories,			(Purchased Reag		Perfluoronexanoic acid	50 ug/mL
LCPFHxS-br 00001	07/03/20		on Laboratories,			(Purchased Reag		Perfluorohexanesulfonic acid	45.5 ug/mL
LCPFHXS-BI_00001	10/23/20		gton Laboratories,			(Purchased Reag		Perfluorononanoic acid	50 ug/mL
LCPFNA_00005	11/06/20		gton Laboratories			(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFOA_00006	01/30/20		gton Laboratories,			(Purchased Reag		Perfluorooctadecanoic acid	50 ug/mL
	10/14/20		con Laboratories,					Perfluorooctane Sulfonate	46.4 ug/mL
LCPFOS-br_00001						(Purchased Reag		(PFOS)	
LCPFOSA_00006	09/02/17		gton Laboratories,			(Purchased Reag		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00005	01/30/20		gton Laboratories,			(Purchased Reag		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00004	12/09/20		ton Laboratories,	Lot	PFTeDA1215	(Purchased Reag		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18	Welling	ton Laboratories,	Lot	PFTrDA1213	(Purchased Reag	ent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00004	08/19/20	Welling	gton Laboratories,	Lot	PFUdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2 00022	12/28/16	08/03/16	MeOH/H2O, Lot 090	0285	5 mL	LCMPFCSU 00044	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
								1802 PFHxS	47.3 ng/mL
								13C5 PFNA	50 ng/mL
								13C4 PFOA	50 ng/mL
								13C4 FFOA	47.8 ng/mL
								13C2 PFUnA	50 ng/mL
						LODEGOD OOOE7	E0T		
						LCPFCSP_00057	30 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	1 ng/mL
								Perfluoroheptanesulfonic Acid	0.952 ng/mL
								Perfluorohexanoic acid	1 ng/mL
								Perfluorohexadecanoic acid	1 ng/mL
								Perfluorohexanesulfonic acid	0.91 ng/mL
								Perfluorononanoic acid	1 ng/mL
								Perfluorooctanoic acid (PFOA)	1 ng/mL
								Perfluorooctadecanoic acid	1 ng/mL
								Perfluorooctane Sulfonate	0.928 ng/mL
								(PFOS)	
								Perfluorooctane Sulfonamide	1 ng/mL
								Perfluoropentanoic acid	1 ng/mL
								Perfluorotetradecanoic acid	1 ng/mL
								Perfluorotridecanoic acid	1 ng/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-23542-1

				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluoroundecanoic acid	
TCMDECCH 00044	12/20/16	06/20/16	Methanol, Lot Baker	E0000 11T	LCM2PFHxDA 00006	1000 11	13C2-PFHxDA	1 ng/mL 1 ug/mL
.LCMPFCSU_00044	12/20/10	00/20/10	115935	30000 uL	LCM2FFHXDA_00006	1000 uL	13C2-PFRXDA	I ug/IIIL
			113333		LCM2PFTeDA 00006	1000 m.T.	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00006		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00007		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00010		13C8 FOSA	1 ug/mL
					LCMPFBA 00007		13C4 PFBA	1 ug/mL
					LCMPFDA 00010		13C2 PFDA	1 ug/mL
					LCMPFDoA 00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00007	1000 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00008	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00006	01/07/21	Wellingt	on Laboratories, Lot M	12PFHxDA1112	(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00006	12/07/20		on Laboratories, Lot M		(Purchased Read	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00006	05/22/20		on Laboratories, Lot 1		(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00007	05/22/20	Wellingt	on Laboratories, Lot D	M5PFPeA0515	(Purchased Reag		13C5-PFPeA	50 ug/mL
LCM8FOSA_00010	12/22/17		ton Laboratories, Lot D		(Purchased Read		13C8 FOSA	50 ug/mL
LCMPFBA_00007	05/24/21		gton Laboratories, Lot		(Purchased Read		13C4 PFBA	50 ug/mL
LCMPFDA_00010	08/19/20		gton Laboratories, Lot		(Purchased Read		13C2 PFDA	50 ug/mL
LCMPFDoA_00007	04/08/21		ton Laboratories, Lot		(Purchased Read		13C2 PFDoA	50 ug/mL
LCMPFHxA_00011	04/08/21		ton Laboratories, Lot		(Purchased Read		13C2 PFHxA	50 ug/mL
LCMPFHxS_00007	10/23/20		ton Laboratories, Lot		(Purchased Read		1802 PFHxS	47.3 ug/mL
LCMPFNA_00007	04/13/19		gton Laboratories, Lot		(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA_00011	01/22/21		gton Laboratories, Lot		(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00015	01/22/21		gton Laboratories, Lot		(Purchased Read		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19		ton Laboratories, Lot		(Purchased Read	<u> </u>	13C2 PFUnA	50 ug/mL
.LCPFCSP_00057	02/01/1/	08/03/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00056	1000 uL	Perfluorobutyric acid Perfluorobutanesulfonic acid	0.1 ug/mL
							(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	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate	0.0928 ug/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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SDG No.:\_\_\_\_

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004		Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA 00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br 00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00005	200 uL	Perfluorononanoic acid	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br 00001	200 uL	Perfluorooctane Sulfonate	0.928 ug/mL
					_		(PFOS)	_
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00005		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00004	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBS_00004	10/09/19	Welling	ton Laboratories, Lot LE	PFBS1014	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20	Wellin	gton Laboratories, Lot P	FDA0615	(Purchased Rea	gent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00005	01/30/20	Welling	ton Laboratories, Lot PA	FDoA0115	(Purchased Rea	gent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20	Welling	ton Laboratories, Lot L	PFDS0615	(Purchased Rea	gent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA 00005	01/22/21	Welling	ton Laboratories, Lot PI	THpA0116	(Purchased Rea	gent)	Perfluoroheptanoic acid	50 ug/mL
LCPFHpS 00008	11/06/20	Welling	ton Laboratories, Lot LP	FHpS1115	(Purchased Rea	gent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00004	12/22/20	Welling	ton Laboratories, Lot PA	FHxA1215	(Purchased Rea	gent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories, Lot PF	HxDA0707	(Purchased Rea	gent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br 00001	07/03/20		on Laboratories, Lot brP		(Purchased Rea	gent)	Perfluorohexanesulfonic acid	45.5 ug/mL
LCPFNA 00005	10/23/20	Wellin	gton Laboratories, Lot P	FNA1015	(Purchased Rea	gent)	Perfluorononanoic acid	50 ug/mL
LCPFOA 00006	11/06/20	Wellin	gton Laboratories, Lot P	FOA1115	(Purchased Rea	gent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005	01/30/20		ton Laboratories, Lot PA		(Purchased Rea	gent)	Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	Wellingt	on Laboratories, Lot br	PFOSK1015	(Purchased Rea	gent)	Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
LCPFOSA 00006	09/02/17	Welling	ton Laboratories, Lot FO	DSA0815I	(Purchased Rea	gent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00005	01/30/20		ton Laboratories, Lot PI		(Purchased Rea	gent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20	Welling	ton Laboratories, Lot PF	TeDA1215	(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18		ton Laboratories, Lot PF		(Purchased Rea	gent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00004	08/19/20		ton Laboratories, Lot PI		(Purchased Rea	gent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00019			MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	250 uL	13C2-PFHxDA	50 ng/mL
_					_		13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							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
							1802 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 00057	250 uL	Perfluorobutyric acid	5 ng/mL
					_		Perfluorobutanesulfonic acid	4.42 ng/mL
							(PFBS)	J.
							Perfluorodecanoic acid	5 ng/mL
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid	4.55 ng/mL
							Perfluorononanoic acid	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctane Sulfonate	4.64 ng/mL
							(PFOS)	- / -
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
	10/00/16	0.5.10.0.11.5		50000 -		1000 -	Perfluoroundecanoic acid	5 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010		13C8 FOSA	1 ug/mL
					LCMPFBA_00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA_00010		13C2 PFDA	1 ug/mL
					LCMPFDoA_00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA_00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00006	01/07/21	Wellingt	on Laboratories, Lot M2H	PFHxDA1112	(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCM2PFTeDA 00006	12/07/20	Wellingt	on Laboratories, Lot	M2PFTeDA1115	(Purchased Reag	lent.)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00006	05/22/20		on Laboratories, Lo		(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00007	05/22/20		on Laboratories, Lo	-	(Purchased Reag		13C5-PFPeA	50 ug/mL
LCM8FOSA 00010	12/22/17		on Laboratories, Lo		(Purchased Reag		13C8 FOSA	50 ug/mL
LCMPFBA 00007	05/24/21		ton Laboratories, L		(Purchased Reag		13C4 PFBA	50 ug/mL
LCMPFDA 00010	08/19/20		ton Laboratories, L		(Purchased Read		13C2 PFDA	50 ug/mL
LCMPFDoA 00007	04/08/21		on Laboratories, Lo		(Purchased Reag		13C2 PFDoA	50 ug/mL
LCMPFHxA 00011	04/08/21		on Laboratories, Lo		(Purchased Read		13C2 PFHxA	50 ug/mL
LCMPFHxS 00007	10/23/20		on Laboratories, Lo		(Purchased Reag		1802 PFHxS	47.3 ug/mL
LCMPFNA 00007	04/13/19		ton Laboratories, L		(Purchased Reag		13C5 PFNA	50 ug/mL
LCMPFOA 00011	01/22/21		ton Laboratories, L		(Purchased Reag		13C4 PFOA	50 ug/mL
LCMPFOS 00015	01/22/21		ton Laboratories, L		(Purchased Reag		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19		ton Laboratories, Lo		(Purchased Read		13C2 PFUnA	50 ug/mL
.LCPFCSP 00057	02/01/17		Methanol, Lot 09028		LCPFCSP 00056	1000 uL	Perfluorobutyric acid	0.1 ug/mL
_			•		_		Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	]
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							Perfluorononanoic acid	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctane Sulfonate	0.0928 ug/mL
							(PFOS)	
							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_00056	02/01/17	08/01/16	Methanol, Lot 09028	35 10000 uL	LCPFBA_00004	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br 00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00005		Perfluorononanoic acid	1 ug/mL
					LCPFOA 00006	200 111	Perfluorooctanoic acid (PFOA)	1 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00004	01/30/20	Wellin	gton Laboratories, Lot F		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBS_00004	10/09/19		gton Laboratories, Lot L		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, Lot F		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00005	01/30/20	Welling	gton Laboratories, Lot P		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDS_00005	07/02/20		gton Laboratories, Lot L		(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21		gton Laboratories, Lot P		(Purchased Rea		Perfluoroheptanoic acid	50 ug/mL
LCPFHpS_00008	11/06/20		ton Laboratories, Lot LE		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot PF		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001			on Laboratories, Lot br		(Purchased Rea		Perfluorohexanesulfonic acid	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories, Lot F		(Purchased Rea		Perfluorononanoic acid	50 ug/mL
LCPFOA_00006	11/06/20		gton Laboratories, Lot E		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	_	ton Laboratories, Lot br		(Purchased Rea		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17		gton Laboratories, Lot F		(Purchased Rea		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00005	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00004	12/09/20		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00004	12/10/18		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00004	08/19/20	-	gton Laboratories, Lot P		(Purchased Rea		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4_00022	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00044	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
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA 13C4 PFOA	50 ng/mL
							13C4 PFOA 13C4 PFOS	50 ng/mL 47.8 ng/mL
							13C4 PFUS 13C2 PFUnA	47.8 ng/mL 50 ng/mL
					LCPFCSP 00056	100 117	Perfluorobutyric acid	20 ng/mL
					TCITCBE 00000	100 uL	Perfluorobutanesulfonic acid	17.68 ng/mL
							(PFBS)	1/.00 Hg/IIIL
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
	Date	Date	useu	VOIUME	Reagent ID	Added	<u>-</u>	
							Perfluoroheptanoic acid	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid	18.2 ng/mL
							Perfluorononanoic acid	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctane Sulfonate (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
				1			Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00006		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00007		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00010		13C8 FOSA	1 ug/mL
					LCMPFBA 00007		13C4 PFBA	1 ug/mL
					LCMPFDA 00010		13C2 PFDA	1 ug/mL
					LCMPFDoA 00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011		13C2 PFHXA	1 ug/mL
					LCMPFHxS 00007		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00007		13C5 PFNA	1 ug/mL
					LCMPFOA 00011		13C4 PFOA	1 ug/mL
					LCMPFOS 00015		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00008		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00006	01/07/21	Wellingt	l on Laboratories, Lot M2P	FH×DA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00006			on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00006	05/22/20	,	on Laboratories, Lot M41		(Purchased Rea	, ,	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00007	05/22/20	,	on Laboratories, Lot M51		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00010	12/22/17		on Laboratories, Lot M81		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00007	05/24/21		ton Laboratories, Lot Mi		(Purchased Rea	, ,	13C4 PFBA	50 ug/mL
LCMPFDA 00010	08/19/20	Welling	ton Laboratories, Lot M	PFDA0815	(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00007	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00011	04/08/21	,	ton Laboratories, Lot MP		(Purchased Rea	, ,	13C2 PFHXA	50 ug/mL
LCMPFHXS 00007	10/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00007	04/13/19		ton Laboratories, Lot MP ton Laboratories, Lot MP		(Purchased Rea	, ,	13C5 PFNA	50 ug/mL
LCMPFNA 00007	01/22/21		ton Laboratories, Lot Mi		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOA_00011	01/22/21		ton Laboratories, Lot Mi		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFUNA	50 ug/mL
.LCPFCSP 00056	02/01/17		Methanol, Lot 090285	10000 uL				1 ug/mL
. TCLLC2L_00020	02/01/1/	00/01/10	rechanol, Lot 090285	10000 uL	LCPFBS_00004		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00005	200 uL	Perfluorodecanoic acid	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1	
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				Peagent	Parent Reage	nt		
	Exp	Pren	Dilutant			Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFBA_00004 01/30/20 Wellington Laboratories, Lot PFBA0115LCPFBS_00004 10/09/19 Wellington Laboratories, Lot LPFBS1014LCPFDA_00005 07/02/20 Wellington Laboratories, Lot PFDA0115LCPFDA_00005 07/02/20 Wellington Laboratories, Lot PFDA0115LCPFDB_00005 07/02/20 Wellington Laboratories, Lot PFDA0115LCPFBB_00005 01/22/21 Wellington Laboratories, Lot PFHA0116LCPFHPA_00005 01/22/21 Wellington Laboratories, Lot PFHA0116LCPFHPA_00004 12/22/20 Wellington Laboratories, Lot PFHA0115LCPFHXDA_00004 11/28/17 Wellington Laboratories, Lot PFHXA1215LCPFNA_00005 10/33/20 Wellington Laboratories, Lot PFFHX6615LCPFNA_00005 10/33/20 Wellington Laboratories, Lot PFFNA1015LCPFOA_00006 11/06/20 Wellington Laboratories, Lot PFOA115LCPFOA_00005 01/30/20 Wellington Laboratories, Lot PFOA115LCPFOS-br_00001 10/14/20 Wellington Laboratories, Lot PFOA0115LCPFOS-br_00001 10/14/20 Wellington Laboratories, Lot PFOA0115LCPFPBA_00006 09/02/17 Wellington Laboratories, Lot PFOA0115LCPFPBA_00006 11/06/20 Wellington Laboratories, Lot PFOA0115LCPFTDA_00006 12/09/20 Wellington Laboratories, Lot PFPA0115LCPFTDA_00006 12/09/20 Wellington Laboratories, Lot PFTPA01215LCPFTDA_00004 12/09/20 Wellington Laboratories, Lot PFTPA01215LCPFUDA_00004 12/09/20 Wellington Laboratories, Lot PFTPA01215	LCPFDoA_00005		Perfluorododecanoic acid	1 ug/mI				
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mI
					LCPFHpA 00005	200 uL	Perfluoroheptanoic acid	1 ug/mI
					LCPFHpS 00008	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mI
					LCPFHxA 00004	200 uL	Perfluorohexanoic acid	1 ug/mI
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mI
					LCPFHxS-br 00001	200 uL	Perfluorohexanesulfonic acid	0.91 ug/mI
					LCPFNA 00005		Perfluorononanoic acid	1 ug/mI
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mI
					LCPFODA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mI
					LCPFOS-br_00001		Perfluorooctane Sulfonate (PFOS)	0.928 ug/mI
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mI
					LCPFPeA 00005		Perfluoropentanoic acid	1 ug/mI
					LCPFTeDA 00004	200 uL	Perfluorotetradecanoic acid	1 ug/mI
					LCPFTrDA 00004	200 uL	Perfluorotridecanoic acid	1 ug/mI
					LCPFUdA 00004	200 uL	Perfluoroundecanoic acid	1 ug/mI
	01/30/20		gton Laboratories, Lot I	PFBA0115	(Purchased Read	rent)	Perfluorobutyric acid	50 ug/mI
_	10/09/19	Welling	ton Laboratories, Lot L	PFBS1014	(Purchased Reac	rent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mI
	07/02/20				(Purchased Read	rent)	Perfluorodecanoic acid	50 ug/mI
	01/30/20				(Purchased Read		Perfluorododecanoic acid	50 ug/mI
LCPFDS 00005	07/02/20	Welling	ton Laboratories, Lot L	PFDS0615	(Purchased Read	rent)	Perfluorodecane Sulfonic acid	48.2 ug/mI
LCPFHpA 00005	01/22/21	Welling	ton Laboratories, Lot P	FHpA0116	(Purchased Read	rent)	Perfluoroheptanoic acid	50 ug/mI
LCPFHpS 00008	11/06/20	Welling	ton Laboratories, Lot L	PFHpS1115	(Purchased Read	rent)	Perfluoroheptanesulfonic Acid	47.6 ug/mI
LCPFHxA 00004	12/22/20				(Purchased Read	gent)	Perfluorohexanoic acid	50 ug/mI
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories, Lot PI	HxDA0707	(Purchased Read	gent)	Perfluorohexadecanoic acid	50 ug/mI
LCPFHxS-br 00001	07/03/20	Wellingto	on Laboratories, Lot br	PFHxSK0615	(Purchased Read	gent)	Perfluorohexanesulfonic acid	45.5 ug/mI
LCPFNA 00005	10/23/20	Welling	gton Laboratories, Lot I	PFNA1015	(Purchased Read	rent)	Perfluorononanoic acid	50 ug/mI
LCPFOA 00006	11/06/20	Welling	gton Laboratories, Lot I	PFOA1115	(Purchased Read	rent)	Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFODA 00005	01/30/20	Welling	ton Laboratories, Lot P	FODA0115	(Purchased Read	gent)	Perfluorooctadecanoic acid	50 ug/mI
_			•		(Purchased Reac		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mI
					(Purchased Read		Perfluorooctane Sulfonamide	50 ug/mI
					(Purchased Read		Perfluoropentanoic acid	50 ug/mI
					(Purchased Read		Perfluorotetradecanoic acid	50 ug/mI
					(Purchased Read		Perfluorotridecanoic acid	50 ug/mI
LCPFUdA_00004	08/19/20	Welling	ton Laboratories, Lot P	FUdA0815	(Purchased Read	(ent)	Perfluoroundecanoic acid	50 ug/mI
LCPFC-L5 00020	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00044	250 uL	13C2-PFHxDA	50 ng/mI
_			·		_		13C2-PFTeDA	50 ng/mI
							13C4-PFHpA	50 ng/mI
							13C5-PFPeA	50 ng/mI
							13C8 FOSA	50 ng/mI
							13C4 PFBA	50 ng/mI
							13C2 PFDA	50 ng/mI
							13C2 PFDoA	50 ng/mI
							13C2 PFHxA	50 ng/mI
		1					1802 PFHxS	47.3 ng/mI

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C5 PFNA	50 ng/mL
							13C4 PFOA	50 ng/mL
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00056	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	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid	45.5 ng/mL
							Perfluorononanoic acid	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL
							Perfluorooctane Sulfonate (PFOS)	46.4 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_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010		13C8 FOSA	1 ug/mL
					LCMPFBA_00007		13C4 PFBA	1 ug/mL
					LCMPFDA_00010		13C2 PFDA	1 ug/mL
					LCMPFDoA 00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00007		13C5 PFNA	1 ug/mL
					LCMPFOA_00011		13C4 PFOA	1 ug/mL
					LCMPFOS_00015		13C4 PFOS	0.956 ug/mL
T CM2 DEIL DA 0000C	01/07/01	Mollina	on Tabawatawiss Tet MODA	TIIDA 1 1 1 1 0	LCMPFUdA_00008		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00006 LCM2PFTeDA_00006			on Laboratories, Lot M2Pl		(Purchased Rea		13C2-PFHxDA	50 ug/mL
			on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00006 LCM5PFPEA_00007	05/22/20		ton Laboratories, Lot M4P		(Purchased Rea		13C4-PFHpA 13C5-PFPeA	50 ug/mL
	05/22/20		ton Laboratories, Lot MSP		(Purchased Rea			50 ug/mL
LCM8FOSA_00010 LCMPFBA 00007	12/22/17 05/24/21		con Laboratories, Lot M8F gton Laboratories, Lot MP		(Purchased Rea		13C8 FOSA 13C4 PFBA	50 ug/mL 50 ug/mL
	08/19/20				(Purchased Rea			
LCMPFDA_00010			gton Laboratories, Lot MP		(Purchased Rea		13C2 PFDA 13C2 PFDoA	50 ug/mL
LCMPFDoA_00007	04/08/21	Melling	ton Laboratories, Lot MP1	L DOAU416	(Purchased Rea	igent)	13CZ PrDOA	50 ug/mL

Lab 1	Name: TestAmerica	Sacramento	Job No.	: 320-23542-1

				Reagent	Parent Read	gent		
	Frm	Dron	Dilutant	Final		Volume		
Reagent ID	Exp Date	Prep Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFHxA 00011	04/08/21	Welling	ton Laboratories, Lot	MPFHxA0416	(Purchased Re	agent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00007	10/23/20	Welling	ton Laboratories, Lot	MPFHxS1015	(Purchased Re	agent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00007	04/13/19	Welling	ton Laboratories, Lo	t MPFNA0414	(Purchased Re	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00011	01/22/21	Welling	ton Laboratories, Lo	t MPFOA0116	(Purchased Re	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00015	01/22/21	Welling	ton Laboratories, Lo	t MPFOS0116	(Purchased Re	agent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19	Welling	ton Laboratories, Lot	MPFUdA1014	(Purchased Re	agent)	13C2 PFUnA	50 ug/mL
.LCPFCSP 00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
_					LCPFBS_00004	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA 00005	200 uL	Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS 00008	200 uL	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	Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00005		Perfluorononanoic acid	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001		Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00004	01/30/20	Wellin	gton Laboratories, Lo	ot PFBA0115	(Purchased Re	agent)	Perfluorobutyric acid	50 ug/mL
LCPFBS_00004	10/09/19	_	ton Laboratories, Lo		(Purchased Re	agent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, Lo		(Purchased Re		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00005	01/30/20	1	ton Laboratories, Lo		(Purchased Re		Perfluorododecanoic acid	50 ug/mL
LCPFDS_00005	07/02/20		ton Laboratories, Lo		(Purchased Re		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00005	01/22/21		ton Laboratories, Lo		(Purchased Re		Perfluoroheptanoic acid	50 ug/mL
LCPFHpS_00008	11/06/20		ton Laboratories, Lot		(Purchased Re		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		ton Laboratories, Lo		(Purchased Re		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot		(Purchased Re		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00001	07/03/20	,	on Laboratories, Lot		(Purchased Re		Perfluorohexanesulfonic acid	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories, Lo		(Purchased Re		Perfluorononanoic acid	50 ug/mL
LCPFOA_00006	11/06/20		gton Laboratories, Lo		(Purchased Re		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		ton Laboratories, Lo		(Purchased Re		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	1	on Laboratories, Lot		(Purchased Re		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17		ton Laboratories, Lo		(Purchased Re		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00005	01/30/20		ton Laboratories, Lo		(Purchased Re		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20	Welling	ton Laboratories, Lot	PFTeDA1215	(Purchased Re	agent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18		ton Laboratories, Lot		(Purchased Re		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00004	08/19/20	Welling	ton Laboratories, Lo	t PFUdA0815	(Purchased Re	agent)	Perfluoroundecanoic acid	50 ug/mL

Lab Nar	me: TestAmerica	Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFC-L6 00019	12/28/16	08/03/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00044	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
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C4 PFOA	
							13C4 PFOA 13C4 PFOS	50 ng/mL
								47.8 ng/mL
					7.000000	1000 -	13C2 PFUnA	50 ng/mL
					LCPFCSP_00056	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid	176.8 ng/mL
							(PFBS)	200 /
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid	182 ng/mL
							Perfluorononanoic acid	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctadecanoic acid	200 ng/mL
							Perfluorooctane Sulfonate	185.6 ng/mL
							(PFOS)	_
							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_00044	12/28/16	06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00006	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00006		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00007		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00010		13C8 FOSA	1 ug/mL
					LCMPFBA 00007		13C4 PFBA	1 ug/mL
					LCMPFDA 00010		13C2 PFDA	1 ug/mL
					LCMPFDoA 00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011		13C2 PFHxA	1 ug/mL
					LCMPFHxS 00007		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00007		13C5 PFNA	1 ug/mL
					LCMPFOA 00011		13C4 PFOA	1 ug/mL
I		I	I	1	TOWELOW OUTT	I TOOO UL	TOCI FEON	I ug/IIIL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Danasah	Parent Read	gent		
		5	Dilutant	Reagent Final		Volume		
December ID	Exp Date	Prep Date	Used	Volume	December ID	Added	7	0
Reagent ID	Date	Date	Usea	volume	Reagent ID		Analyte	Concentration
					LCMPFOS_00015		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00008		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00006	01/07/21		on Laboratories, Lot M2F		(Purchased Re		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00006	12/07/20		on Laboratories, Lot M2H		(Purchased Re		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00006	05/22/20		on Laboratories, Lot M4		(Purchased Re		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00007	05/22/20		on Laboratories, Lot M5		(Purchased Re		13C5-PFPeA	50 ug/mL
LCM8FOSA_00010	12/22/17		on Laboratories, Lot M8		(Purchased Re		13C8 FOSA	50 ug/mL
LCMPFBA_00007	05/24/21		gton Laboratories, Lot M		(Purchased Re		13C4 PFBA	50 ug/mL
LCMPFDA_00010	08/19/20		gton Laboratories, Lot M		(Purchased Re		13C2 PFDA	50 ug/mL
LCMPFDoA_00007	04/08/21		ton Laboratories, Lot MI		(Purchased Re		13C2 PFDoA	50 ug/mL
LCMPFHxA_00011	04/08/21		ton Laboratories, Lot MI		(Purchased Re		13C2 PFHxA	50 ug/mL
LCMPFHxS_00007	10/23/20	Welling	ton Laboratories, Lot MI	PFHxS1015	(Purchased Re	agent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00007	04/13/19	Welling	gton Laboratories, Lot M	PFNA0414	(Purchased Re	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00011	01/22/21		gton Laboratories, Lot M		(Purchased Re	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00015	01/22/21		gton Laboratories, Lot M		(Purchased Re	agent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19	Welling	ton Laboratories, Lot M	PFUdA1014	(Purchased Re	agent)	13C2 PFUnA	50 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	200 uL	Perfluorobutyric acid	1 ug/mL
_					LCPFBS 00004	200 uL	Perfluorobutanesulfonic acid	0.884 ug/mL
					_		(PFBS)	_
					LCPFDA 00005	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00005	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDS 00005	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA 00005		Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS 00008		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br 00001		Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00005		Perfluorononanoic acid	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br 00001		Perfluorooctane Sulfonate	0.928 ug/mL
					1201100 21_00001	200 41	(PFOS)	0.920 ug/mb
					LCPFOSA 00006	200 uT.	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00004		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00004		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00004	01/30/20	Wellin	l gton Laboratories, Lot B	PFBA0115	(Purchased Re		Perfluorobutyric acid	50 ug/mL
LCPFBS 00004	10/09/19		gton Laboratories, Lot L		(Purchased Re		Perfluorobutanesulfonic acid	44.2 ug/mL
_		_				_	(PFBS)	
LCPFDA_00005	07/02/20		gton Laboratories, Lot B		(Purchased Re		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00005	01/30/20		gton Laboratories, Lot P		(Purchased Re		Perfluorododecanoic acid	50 ug/mL
LCPFDS_00005	07/02/20		gton Laboratories, Lot L		(Purchased Re		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA 00005	01/22/21		gton Laboratories, Lot P		(Purchased Re		Perfluoroheptanoic acid	50 ug/mL
LCPFHpS 00008	11/06/20	Welling	ton Laboratories, Lot L	PFHpS1115	(Purchased Re	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00004	12/22/20		ton Laboratories, Lot P		(Purchased Re	agent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17		ton Laboratories, Lot PA		(Purchased Re		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br 00001	07/03/20		on Laboratories, Lot br		(Purchased Re		Perfluorohexanesulfonic acid	45.5 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No	0-2354	2-1	

			Reagent	Parent Reage	nt		
	Exp Prep	Dilutant	Final		Volume		
Reagent ID	Date Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFNA 00005	10/23/20 Wellin	gton Laboratories, Lot	PFNA1015	(Purchased Read		Perfluorononanoic acid	50 ug/mL
LCPFOA 00006	11/06/20 Wellin	gton Laboratories, Lot	PFOA1115	(Purchased Reagent)		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005		gton Laboratories, Lot E	PFODA0115	(Purchased Read	gent)	Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20 Welling	ton Laboratories, Lot br	PFOSK1015	(Purchased Read	gent)	Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
LCPFOSA 00006	09/02/17 Wellin	gton Laboratories, Lot E	FOSA0815I	(Purchased Read	gent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00005	01/30/20 Wellin	gton Laboratories, Lot E	PFPeA0115	(Purchased Read	gent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20 Welling	ton Laboratories, Lot P	FTeDA1215	(Purchased Read	gent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18 Welling	ton Laboratories, Lot P	FTrDA1213	(Purchased Read	gent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00004	08/19/20 Wellin	gton Laboratories, Lot E	PFUdA0815	(Purchased Read	gent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7 00019	12/28/16 08/03/16	MeOH/H2O, Lot 090285	5 mT <sub>1</sub>	LCMPFCSU 00044	250 uT	13C2-PFHxDA	50 ng/mL
	12, 20, 10   00, 00, 10	110011, 1120, 200 030200	0 1112		200 42	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
						1802 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 00056	2000 uL	Perfluorobutyric acid	400 ng/mL
				_		Perfluorobutanesulfonic acid	353.6 ng/mL
						(PFBS)	_
						Perfluorodecanoic acid	400 ng/mL
						Perfluorododecanoic acid	400 ng/mL
						Perfluorodecane Sulfonic acid	385.6 ng/mL
						Perfluoroheptanoic acid	400 ng/mL
						Perfluoroheptanesulfonic Acid	380.8 ng/mL
						Perfluorohexanoic acid	400 ng/mL
						Perfluorohexadecanoic acid	400 ng/mL
						Perfluorohexanesulfonic acid	364 ng/mL
						Perfluorononanoic acid	400 ng/mL
						Perfluorooctanoic acid (PFOA)	400 ng/mL
						Perfluorooctadecanoic acid	400 ng/mL
						Perfluorooctane Sulfonate (PFOS)	371.2 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_00044	12/28/16 06/28/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006	1000 uL	13C2-PFHxDA	1 ug/mL
				LCM2PFTeDA_00006	1000 uL	13C2-PFTeDA	1 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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					Parent Reage	ent		
	_	_	-1	Reagent				
	Exp	Prep	Dilutant	Final		Volume	_	
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCM4PFHPA 00006	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00007	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00010	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00007	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00010	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00007	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00011	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00007		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00007	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00011		13C4 PFOA	1 ug/mL
					LCMPFOS 00015		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00008		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00006	01/07/21	Wellingto	on Laboratories, Lot M2P	FH×DA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00006	12/07/20		on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00006	05/22/20		on Laboratories, Lot M41		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00007	05/22/20		on Laboratories, Lot M51		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00010	12/22/17		on Laboratories, Lot M81		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00007	05/24/21	,	ton Laboratories, Lot M		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00010	08/19/20		ton Laboratories, Lot M		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00007	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00011	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHXA_00011	10/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMFFHXS_00007	04/13/19		ton Laboratories, Lot Mr		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFNA_00007	01/22/21	,	ton Laboratories, Lot Mi		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOA 00011	01/22/21		ton Laboratories, Lot Mi		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUGA 00008	10/31/19		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFOS 13C2 PFUnA	
				10000 uL		J ,		50 ug/mL
.LCPFCSP_00056	02/01/17	08/01/16	Methanol, Lot 090285	10000 uL	LCPFBA_00004 LCPFBS_00004		Perfluorobutyric acid Perfluorobutanesulfonic acid	1 ug/mL 0.884 ug/mL
					_		(PFBS)	
					LCPFDA_00005		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00005		Perfluorododecanoic acid	1 ug/mL
					LCPFDS_00005		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid	1 ug/mL
					LCPFHpS_00008		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00001		Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00005		Perfluorononanoic acid	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00005	200 uL	Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00001	200 uL	Perfluorooctane Sulfonate (PFOS)	0.928 ug/mL
					LCPFOSA_00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00005	200 uL	Perfluoropentanoic acid	1 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	Welling	gton Laboratories, Lot P	FBA0115	(Purchased Rea	igent)	Perfluorobutyric acid	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFBS_00004	10/09/19	Welling	gton Laboratories, Lo	t LPFBS1014	(Purchased Reag	ent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20	Wellin	gton Laboratories, L	ot PFDA0615	(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00005	01/30/20	Welling	ton Laboratories, Lo	t PFDoA0115	(Purchased Reag	ent)	Perfluorododecanoic acid	50 ug/mL
LCPFDS 00005	07/02/20	Welling	ton Laboratories, Lo	t LPFDS0615	(Purchased Reag		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA 00005	01/22/21	Welling	ton Laboratories, Lo	ot PFHpA0116	(Purchased Reag	ent)	Perfluoroheptanoic acid	50 ug/mL
LCPFHpS 00008	11/06/20	Welling	ton Laboratories, Lo	t LPFHpS1115	(Purchased Reag	ent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00004	12/22/20		ton Laboratories, Lo		(Purchased Reag	ent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories, Lo	t PFHxDA0707	(Purchased Reag	ent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br 00001	07/03/20		on Laboratories, Lot		(Purchased Reag	ent)	Perfluorohexanesulfonic acid	45.5 ug/mL
LCPFNA 00005	10/23/20	Wellin	gton Laboratories, L	ot PFNA1015	(Purchased Reag	ent)	Perfluorononanoic acid	50 ug/mL
LCPFOA 00006	11/06/20		gton Laboratories, L		(Purchased Reag	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00005	01/30/20	Welling	ton Laboratories, Lo	t PFODA0115	(Purchased Reag	ent)	Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00001	10/14/20	Wellingt	on Laboratories, Lot	brPFOSK1015	(Purchased Reag		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
LCPFOSA 00006	09/02/17		ton Laboratories, Lo		(Purchased Reag	ent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00005	01/30/20	Welling	ton Laboratories, Lo	t PFPeA0115	(Purchased Reag	ent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00004	12/09/20	Welling	ton Laboratories, Lo	t PFTeDA1215	(Purchased Reag	ent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00004	12/10/18	Welling	ton Laboratories, Lo	t PFTrDA1213	(Purchased Reag	ent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00004	08/19/20	Welling	ton Laboratories, Lo	t PFUdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC2-L1 00002	01/08/17	07/20/16	MeOH/H2O, Lot 10445	3 5 mT.	LCMPFC2SU 00005	250 u.T.	d-N-EtFOSA-M	50 ng/mL
	01/00/1/	07/20/10	Heoli/1120 <b>,</b>	5 NIE	Herri 1 6250_00003	250 41	d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00014	25 117	Sodium	0.474 ng/mL
					LCFFC23F_00014	25 41	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.4/4 119/11115
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	_
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							MeFOSA	0.5 ng/mL
							N-methyl perfluorooctane	0.5 ng/mL
							sulfonamidoacetic acid	
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 10445	3   10000 uL	LCd-NEtFOSA-M_00001		d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M_00001	03/10/19		LLINGTON, Lot dNEtFO		(Purchased Reag		d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M_00001	01/28/19		LLINGTON, Lot dNMeFO		(Purchased Reag		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA_00001	01/31/18	WEI	LINGTON, Lot d3NMeFC	SAA0113	(Purchased Reag	ent)	d3-NMeFOSAA	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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Reagent IDLCd5-NEtFOSAA 00001	Exp							
<del>-</del>	L LXD	D	Dilukant	Reagent Final		17-1		
<del>-</del>	Date	Prep Date	Dilutant Used	Volume	Reagent ID	Volume Added	Analyte	Concentration
	05/08/20		LINGTON, Lot d5NEtFOSAA		(Purchased Reage		d5-NEtFOSAA	50 ug/mI
LCM2-6:FTS 00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reage		M2-6:2FTS	47.5 ug/mI
LCM2-8:2FTS 00001	04/13/17		ELLINGTON, Lot M282FTS04		(Purchased Reage		M2-8:2FTS	47.9 ug/mI
.LCPFC2SP 00014			Methanol, Lot 104453		LCPFC2SP 00013		Sodium	0.0948 ug/mI
· Herrezor_ooora	01/20/1/	07720710	Mechanol, Loc 104455	3000 41	10110231_00013	300 dE	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0940 ag/mi
							Sodium	0.0958 ug/mI
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	_
							N-ethylperfluoro-1-octanesulfo	0.1 ug/mI
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mI
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP 00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS 00001	200 uL	Sodium	0.948 ug/mI
<del>-</del>			·		_		1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mI
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mI
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mI
					LCN-MeFOSA-M 00001		MeFOSA	1 ug/mI
					LCN-MeFOSAA_00001		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mI
LC6:2FTS_00001	10/03/17	Ţ	WELLINGTON, Lot 62FTS101	L 4	(Purchased Reage	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mI
LC8:2FTS_00001	10/03/17	7	WELLINGTON, Lot 82FTS101	L 4	(Purchased Reage	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mI
LCN-EtFOSA-M_00002	07/14/19	WE	LLINGTON, Lot NEtFOSA07	14M	(Purchased Reage	ent)	N-ethylperfluoro-1-octanesulfo namide	
LCN-EtFOSAA_00001	01/29/18	WE	LLINGTON, Lot NETFOSAA0	113	(Purchased Reage	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCN-MeFOSA-M 00001	07/15/19		LLINGTON, Lot NMeFOSA07		(Purchased Reage	ent)	MeFOSA	50 ug/mI
LCN-MeFOSAA_00001	12/09/19	WE	LLINGTON, Lot NMeFOSAA1	214	(Purchased Reage	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L2_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
		,					d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Description	Parent Reagen	t		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCPFC2SP_00014	50 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	1 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mL
_					LCd-NMeFOSA-M 00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA 00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00001	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reage	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00001	01/28/19	WE	LLINGTON, Lot dNMeFOSA01	14M	(Purchased Reage	ent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18	WEI	LLINGTON, Lot d3NMeFOSAA0	113	(Purchased Reage	ent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20	WEI	LLINGTON, Lot d5NEtFOSAA0	515	(Purchased Reage	ent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17	W	ELLINGTON, Lot M262FTS07	14	(Purchased Reage	ent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17	W	ELLINGTON, Lot M282FTS04	14	(Purchased Reage	ent)	M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL

Lab	Name:	TestAmerica	Sacrament	o Jol	o No.:	: 320-235	42-1	

				Reagent	Parent Reagen	t		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS101	4	(Purchased Reage	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS101	4	(Purchased Reage	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WE	ELLINGTON, Lot NETFOSA07	L4M	(Purchased Reage	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WE	ELLINGTON, Lot NETFOSAA01	113	(Purchased Reage	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	WE	ELLINGTON, Lot NMeFOSA07	L4M	(Purchased Reage	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19		ELLINGTON, Lot NMeFOSAA12		(Purchased Reage		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L3 00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
_			,		_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00014	250 uL	Sodium	4.74 ng/mL
					_		1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	4.79 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001		d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA 00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mL
7.0.1 3771 70.00 37 40.000 37	00/10/20			1 425	LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M_00001	03/10/19		LLINGTON, Lot dNEtFOSA03		(Purchased Reage		d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M_00001	01/28/19		LLINGTON, Lot dNMeFOSA01		(Purchased Reage		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA_00001	01/31/18		LINGTON, Lot d3NMeFOSAA		(Purchased Reage		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00001 LCM2-6:FTS 00001	05/08/20 07/15/17		LINGTON, Lot d5NEtFOSAA		(Purchased Reage		d5-NETFOSAA	50 ug/mL
			ELLINGTON, Lot M262FTS07		(Purchased Reage		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00001	04/13/17		ELLINGTON, Lot M282FTS04 Methanol, Lot 104453		(Purchased Reage		M2-8:2FTS Sodium	47.9 ug/mL 0.0948 ug/mL
.LCPFC2SP_00014	01/20/1/	0//20/16	mechanor, Lot 104453	3000 dF	LCPFC2SP_00013	JOU UL	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL

Lab	Name:	TestAmerica	Sacrament	to Job	b No.:	320-235	42-1	

Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent	Parent Reagent			
				Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M 00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17	WELLINGTON, Lot 62FTS1014		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL	
LC8:2FTS_00001	10/03/17	WELLINGTON, Lot 82FTS1014		(Purchased Reagent)		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL	
LCN-EtFOSA-M_00002	07/14/19	WELLINGTON, Lot NEtFOSA0714M			(Purchased Reagent)		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WELLINGTON, Lot NETFOSAA0113			(Purchased Reagent)		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	WEI	LINGTON, Lot NMeFOSA	0714M	(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19				(Purchased Reagent)		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L4 00003	02/26/17	09/22/16	MeOH/H2O, Lot 104453	5 mT	LCMPFC2SU 00008	250 uT	d-N-EtFOSA-M	50 ng/mL
		-, -,	, ,				d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00017	200 uL	Sodium	18.96 ng/mL
					_		1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	19.16 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	20 ng/mL

Lab 1	Name:	TestAmerica	Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reagent			
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							N-ethyl perfluorooctane sulfonamidoacetic acid	20 ng/mL
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane	20 ng/mL
							sulfonamidoacetic acid	
.LCMPFC2SU 00008	02/26/17	08/26/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00002	200 uL	d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M 00002	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00002	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA 00002	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00002	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00002	200 uL	M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00002	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reage	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00002	06/10/21	WE	LLINGTON, Lot dNMeFOSA06	16M	(Purchased Reagent)		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00002	01/20/21	WEI	LINGTON, Lot d3NMeFOSAA	)116	(Purchased Reagent)		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00002	12/07/20	WEI	LINGTON, Lot d5NEtFOSAA1	1115	(Purchased Reagent)		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00002	01/08/21		ELLINGTON, Lot M262FTS01	16			M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00002	01/08/21	W	ELLINGTON, Lot M282FTS01	16	(Purchased Reage	ent)	M2-8:2FTS	47.9 ug/mL
.LCPFC2SP 00017	03/02/17	09/02/16	Methanol, Lot 104453	10000 uL	LC6:2FTS 00002	100 uL	Sodium	0.474 ug/mL
_					_		1H,1H,2H,2H-perfluorooctane	
							sulfonate (6:2)	
					LC8:2FTS_00002	100 uL	Sodium	0.479 ug/mL
							1H,1H,2H,2H-perfluorooctane	
							sulfonate (8:2)	
					LCN-EtFOSA-M_00003		N-ethylperfluoro-1-octanesulfo namide	_
					LCN-EtFOSAA_00002	100 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mL
					LCN-MeFOSA-M 00002	100 uL	MeFOSA	0.5 ug/mL
					LCN-MeFOSAA 00003	100 uL	N-methyl perfluorooctane	0.5 ug/mL
					_		sulfonamidoacetic acid	
LC6:2FTS 00002	06/25/21		WELLINGTON, Lot 62FTS061	6	(Purchased Reage	ent)	Sodium	47.4 ug/mL
							1H,1H,2H,2H-perfluorooctane	
							sulfonate (6:2)	
LC8:2FTS_00002	10/23/20		WELLINGTON, Lot 82FTS101	5	(Purchased Reage	ent)	Sodium	47.9 ug/mL
ION EFECCA M 00002							1H,1H,2H,2H-perfluorooctane	
	05/24/21	T-77	ELLINGTON, Lot NEtFOSA051	CM	(Purchased Reage		sulfonate (8:2) N-ethylperfluoro-1-octanesulfo	50 ug/mL
LCN-EtFOSA-M_00003	03/24/21	1 VV	LLLINGTON, LOT NETFOSAUSI	T 01M	(Furchased Reage	ent)	namide	50 ug/mi
LCN-EtFOSAA 00002	01/20/21	TAT F	ELLINGTON, Lot NETFOSAA01	16	(Purchased Reage	ant1	N-ethyl perfluorooctane	50 ug/mL
	01/20/21	***	defination, for Necrobinion	110	(rarchasea Reage	2110)	sulfonamidoacetic acid	30 dg/1111
LCN-MeFOSA-M 00002	05/24/21	WELLINGTON, Lot NMeFOSA0714M		(Purchased Reagent)		MeFOSA	50 ug/mL	
LCN-MeFOSAA 00003	01/20/21		LINGTON, LOT NMEFOSAO/14M LINGTON, Lot NMEFOSAA0116				N-methyl perfluorooctane	50 ug/mL
	01,20,21				(= == shabba hoage	/	sulfonamidoacetic acid	20 ag/ mi
LCPFC2-L5_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mT	LCMPFC2SU 00005	250 117	d-N-EtFOSA-M	50 ng/mL
251162 25_00002	01/00/1/	3,,20,10	110011/1120, 100 101133	J 11111		250 41	d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
	I .	I	I	T.	1	l	1 0.2110	1 1,10 119/11111

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reagen	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFC2SP 00013	250 uL	Sodium	47.4 ng/mL
						200 42	1H,1H,2H,2H-perfluorooctane	17.11197.112
							sulfonate (6:2)	
							Sodium	47.9 ng/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	
							N-ethylperfluoro-1-octanesulfo	50 ng/mL
							namide	
							N-ethyl perfluorooctane	50 ng/mL
							sulfonamidoacetic acid	
							MeFOSA	50 ng/mL
							N-methyl perfluorooctane	50 ng/mL
							sulfonamidoacetic acid	
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001		d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00001	03/10/19	WE]	LLINGTON, Lot dNEtFOSA03	L4M	(Purchased Reage	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00001	01/28/19	WE]	LLINGTON, Lot dNMeFOSA01	l4M	(Purchased Reage	ent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18	WEL	LINGTON, Lot d3NMeFOSAA0	113	(Purchased Reage		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20	WEL	LINGTON, Lot d5NEtFOSAA0	515	(Purchased Reage		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reage		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17		ELLINGTON, Lot M282FTS04		(Purchased Reage		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP 00013			Methanol, Lot 104453		LC6:2FTS 00001		Sodium	0.948 ug/mL
		, , ,	,		_		1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	, , , , , ,
					LC8:2FTS 00001	200 uL	Sodium	0.958 ug/mL
					_		1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	_
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo	1 ug/mL
							namide	
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane	1 ug/mL
							sulfonamidoacetic acid	
					LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17	Ţ	WELLINGTON, Lot 62FTS101	4	(Purchased Reage	ent)	Sodium	47.4 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
LC8:2FTS_00001	10/03/17	Ī	WELLINGTON, Lot 82FTS1014	1	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane	47.9 ug/mL
TON BEROOM M 00000	07/14/10		TITINGMON IS NELEOCIONA	414	(Decree le constitution de la Co		sulfonate (8:2)	E0 - / +
LCN-EtFOSA-M_00002	07/14/19		LLINGTON, Lot NEtFOSA071		(Purchased Reage		N-ethylperfluoro-1-octanesulfo namide	
LCN-EtFOSAA_00001	01/29/18		LLINGTON, Lot NETFOSAA01		(Purchased Reage		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M_00001	07/15/19	WE	LLINGTON, Lot NMeFOSA071	4M	(Purchased Reage	ent)	MeFOSA	50 ug/mL

Lab	Name:	TestAmerica	Sacrament	to Job	b No.:	320-235	42-1	

					Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	D.	ilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCN-MeFOSAA_00001	12/09/19	WE	ELLINGTON,	Lot NMeFOSAA12	214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L6 00002	01/08/17	07/20/16	MeOH/H2O,	Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
_						_		d-N-MeFOSA-M	50 ng/mL
								d3-NMeFOSAA	50 ng/mL
								d5-NEtFOSAA	50 ng/mL
								M2-6:2FTS	47.5 ng/mL
								M2-8:2FTS	47.9 ng/mL
						LCPFC2SP_00013	1000 uL	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	189.6 ng/mL
								Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	191.6 ng/mL
								N-ethylperfluoro-1-octanesulfo namide	200 ng/mL
								N-ethyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
								MeFOSA	200 ng/mL
								N-methyl perfluorooctane	200 ng/mL
T. GVD TTG 0.00 C	01/00/17	07/00/16	26 1 2	T . 1044E0	10000 -	7 0 1 1771 7003 17 00001	000 -	sulfonamidoacetic acid	1 / 7
.LCMPFC2SU_00005	01/08/1/	07/08/16	Methanol,	Lot 104453	10000 uL	LCd-NEtFOSA-M 00001		d-N-EtFOSA-M d-N-MeFOSA-M	1 ug/mL
						LCd-NMeFOSA-M_00001 LCd3-NMeFOSAA 00001		d-N-MeFOSA-M d3-NMeFOSAA	1 ug/mL 1 ug/mL
						LCd5-NEtFOSAA 00001		d5-NEtFOSAA	1 ug/mL
						LCM2-6:FTS 00001		M2-6:2FTS	0.95 ug/mL
						LCM2-8:2FTS 00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00001	03/10/19	ME	I.I.TNGTON	Lot dNEtFOSA03	11 4 M	(Purchased Reag		d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00001	01/28/19			Lot dNMeFOSA01		(Purchased Reag		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18			Lot d3NMeFOSAA		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20			Lot d5NEtFOSAA		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17			Lot M262FTS07		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17			Lot M282FTS04		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00013		07/20/16	Methanol,	Lot 104453	10000 uL	LC6:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
						LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
			LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL			
						LCN-EtFOSAA_00001		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
						LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
						LCN-MeFOSAA_00001		N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17		WELLINGTON	, Lot 62FTS101	.4	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL

Lab Name: TestAmerica	a Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS101	4	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mI
LCN-EtFOSA-M_00002	07/14/19	WE	ELLINGTON, Lot NETFOSA071	4M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo	50 ug/mI
LCN-EtFOSAA_00001	01/29/18	WE	ELLINGTON, Lot NETFOSAA01	13	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCN-MeFOSA-M 00001	07/15/19	WE	ELLINGTON, Lot NMeFOSA071	4M	(Purchased Reag	ent)	MeFOSA	50 ug/mI
LCN-MeFOSAA_00001	12/09/19		ELLINGTON, Lot NMeFOSAA12		(Purchased Reag		N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCPFC2-L7 00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mT.	LCMPFC2SU 00005	250 11T.	d-N-EtFOSA-M	50 ng/mI
101102 17_00002	01/00/1/	07720710	110011/1120/ 200 101133	0 1112		200 41	d-N-MeFOSA-M	50 ng/mI
							d3-NMeFOSAA	50 ng/mI
							d5-NEtFOSAA	50 ng/mI
							M2-6:2FTS	47.5 ng/mI
							M2-8:2FTS	47.9 ng/ml
					LCPFC2SP 00013	2000 uL		379.2 ng/mI
					LCFFC25F_00013	2000 uL	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	_
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	383.2 ng/mI
							N-ethylperfluoro-1-octanesulfo namide	400 ng/mI
							N-ethyl perfluorooctane sulfonamidoacetic acid	400 ng/mI
							MeFOSA	400 ng/mI
							N-methyl perfluorooctane sulfonamidoacetic acid	400 ng/mI
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mI
					LCd-NMeFOSA-M 00001		d-N-MeFOSA-M	1 ug/mI
					LCd3-NMeFOSAA 00001		d3-NMeFOSAA	1 ug/mI
					LCd5-NEtFOSAA 00001	200 uL	d5-NEtFOSAA	1 ug/mI
					LCM2-6:FTS 00001	200 uL	M2-6:2FTS	0.95 ug/mI
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mI
LCd-NEtFOSA-M 00001	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reag	ent)	d-N-EtFOSA-M	50 ug/mI
LCd-NMeFOSA-M 00001	01/28/19	WE	LLINGTON, Lot dNMeFOSA01	14M	(Purchased Reag	ent)	d-N-MeFOSA-M	50 ug/mI
LCd3-NMeFOSAA 00001	01/31/18		LINGTON, Lot d3NMeFOSAAC		(Purchased Reag	ent)	d3-NMeFOSAA	50 ug/mI
LCd5-NEtFOSAA 00001	05/08/20		LINGTON, Lot d5NEtFOSAAC		(Purchased Reag	ent)	d5-NEtFOSAA	50 ug/mI
LCM2-6:FTS 00001	07/15/17	W	ELLINGTON, Lot M262FTS07	14	(Purchased Reag	ent)	M2-6:2FTS	47.5 ug/mI
LCM2-8:2FTS 00001	04/13/17		ELLINGTON, Lot M282FTS04	14	(Purchased Reag	ent)	M2-8:2FTS	47.9 ug/mI
.LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mI
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mI
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mI

Lab Name: TestAmerica	a Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS10	14	(Purchased Reag	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS10	14	(Purchased Reag	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WI	ELLINGTON, Lot NETFOSAO	714M	(Purchased Reag	gent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18		ELLINGTON, Lot NETFOSAA		(Purchased Reag		N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	W1	ELLINGTON, Lot NMeFOSAO	714M	(Purchased Reag	gent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	W	ELLINGTON, Lot NMeFOSAA	1214	(Purchased Reag	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFCIC 00019	12/02/16	06/25/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU 00043	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
							1802 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_00007	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluorooctane Sulfonate (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00043	12/02/16	06/02/16	Methanol, Lot Baker 115935	50000 uL	LCM2PFHxDA_00006		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00006		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00006		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00007		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00010		13C8 FOSA	1 ug/mL
					LCMPFBA 00007		13C4 PFBA	1 ug/mL
					LCMPFDA_00010		13C2 PFDA	1 ug/mL
					LCMPFDoA_00007		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00011		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00007		1802 PFHxS	0.946 ug/mL
I	I		T	I	LCMPFNA_00007	I TOOD UL	13C5 PFNA	1 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Beagant	Parent Reag	ent		
	E	D	Dilutant	Reagent Final		17.0 1		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCMPFOA 00011	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00015	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00008		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00006	01/07/21	Wellingt	on Laboratories, Lot M2	PFHxDA1112	(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00006	12/07/20		on Laboratories, Lot M2		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00006	05/22/20		on Laboratories, Lot M		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00007	05/22/20		on Laboratories, Lot M		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00010	12/22/17		on Laboratories, Lot M		(Purchased Rea	-	13C8 FOSA	50 ug/mL
LCMPFBA 00007	05/24/21		ton Laboratories, Lot I		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00010	08/19/20		ton Laboratories, Lot I		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00007	04/08/21		ton Laboratories, Lot M		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00011	04/08/21		ton Laboratories, Lot M		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00007	10/23/20		ton Laboratories, Lot M		(Purchased Rea	-	1802 PFHxS	47.3 ug/mL
LCMPFNA 00007	04/13/19		gton Laboratories, Lot 1		(Purchased Rea	-	13C5 PFNA	50 ug/mL
LCMPFOA 00011	01/22/21		ton Laboratories, Lot I		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00015	01/22/21		gton Laboratories, Lot 1		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00008	10/31/19	Welling	ton Laboratories, Lot M	IPFIIdA1014	(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFACMXB 00007	11/06/20		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorobutanesulfonic acid	1.77 ug/mL
· ECTTHCIME_COOCT	117,00720	Weilinge	con Edbord correct, Edc 1.	INCIMIDITIO	(Fulchabea nea	agene,	(PFBS)	I. // ug/mil
							Perfluorooctane Sulfonate	1.91 ug/mL
							(PFOS)	
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCIC 00020	03/01/17	12/01/16	MeOH/H2O, Lot 09285	5 mT.	LCMPFCSU 00046	250 uT.	13C2-PFHxDA	50 ng/mL
EC11010_00020	03/01/17	12/01/10	Heoli/ 1120, Ede 03203	9 11111		230 41	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 PFDOA 13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA	50 ng/mL
							13C3 PFNA 13C4 PFOA	50 ng/mL
							13C4 PFOA 13C4 PFOS	47.8 ng/mL
					LCPFACMXB 00007	105	13C2 PFUnA Perfluorobutanesulfonic acid	50 ng/mL 44.25 ng/mL
					LCPFACMXB_00007	125 UL	(PFBS)	44.25 NG/ML
							Perfluorooctane Sulfonate	47.75 ng/mL
							(PFOS)	3
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
	[				LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM5PFPEA 00008 LCM8FOSA 00011 LCMPFBA 00008		13C5-PFPeA 13C8 FOSA	

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCMPFDA 00011	1000 uL	13C2 PFDA	1 ug/mI
					LCMPFDoA 00008	1000 uL	13C2 PFDoA	1 ug/mI
					LCMPFHxA 00012	1000 uL	13C2 PFHxA	1 ug/mI
					LCMPFHxS 00008	1000 uL	1802 PFHxS	0.946 ug/mI
					LCMPFNA 00008	1000 uL	13C5 PFNA	1 ug/mI
					LCMPFOA 00012	1000 uL	13C4 PFOA	1 ug/mI
					LCMPFOS 00017		13C4 PFOS	0.956 ug/mI
					LCMPFUdA 00009		13C2 PFUnA	1 ug/mI
.LCM2PFHxDA 00008	01/07/21	Wellingt	on Laboratories, Lot M21	PFHxDA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mI
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M21		(Purchased Rea		13C2-PFTeDA	50 ug/mI
LCM4PFHPA 00007	05/27/21		ton Laboratories, Lot M4		(Purchased Rea		13C4-PFHpA	50 ug/mI
LCM5PFPEA 00008	05/22/20		ton Laboratories, Lot M5		(Purchased Rea		13C5-PFPeA	50 ug/mI
LCM8FOSA 00011	12/22/17		ton Laboratories, Lot M8		(Purchased Rea		13C8 FOSA	50 ug/mI
LCMPFBA 00008	05/24/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFBA	50 ug/mI
LCMPFDA 00011	08/19/20		ton Laboratories, Lot M		(Purchased Rea		13C2 PFDA	50 ug/mI
LCMPFDoA 00008	04/08/21		ton Laboratories, Lot M		(Purchased Rea		13C2 PFDoA	50 ug/mI
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot M		(Purchased Rea		13C2 PFHxA	50 ug/mI
LCMPFHXS 00008	10/23/20		ton Laboratories, Lot Mi		(Purchased Rea		1802 PFHXS	47.3 ug/mI
LCMPFHXS_00006	04/13/19		gton Laboratories, Lot M		(Purchased Rea		13C5 PFNA	50 ug/mI
LCMPFOA 00012	01/22/21		gton Laboratories, Lot M gton Laboratories, Lot M		*		13C4 PFOA	50 ug/mI
		_			(Purchased Rea		13C4 PFOA	
LCMPFOS_00017	08/03/21		gton Laboratories, Lot M		(Purchased Rea			47.8 ug/mI
LCMPFUdA_00009	02/12/21		ton Laboratories, Lot M		(Purchased Rea		13C2 PFUnA	50 ug/mI
.LCPFACMXB_00007	11/06/20	wellingt	on Laboratories, Lot PF	ACMXB1115	(Purchased Rea	igent)	Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mI
							Perfluorooctane Sulfonate (PFOS)	1.91 ug/mI
							Perfluorooctanoic acid (PFOA)	2 ug/mI
LCPFCSP 00064	09/02/17	10/07/16	Methanol, Lot 090285	10000 uL	LCPFBA 00004	100 uL	Perfluorobutyric acid	0.5 ug/mI
_					LCPFBS 00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mI
					_		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mI
					LCPFDA 00005	100 uL	Perfluorodecanoic acid	0.5 ug/mI
					LCPFDoA 00005	100 uL	Perfluorododecanoic acid	0.5 ug/mI
					LCPFDS 00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mI
							Perfluorodecane Sulfonic acid	0.482 ug/mI
					LCPFHpA 00005	100 uTi	Perfluoroheptanoic acid	0.5 ug/mI
					LCPFHpS_00008		Perfluoroheptane Sulfonate	0.476 ug/mI
						100 42	Perfluoroheptanesulfonic Acid	0.476 ug/mI
					LCPFHxA 00004	100 m.	Perfluorohexanoic acid	0.5 ug/mI
					LCPFHxDA 00005		Perfluorohexadecanoic acid	0.5 ug/mI
					LCPFHxS-br 00001		Perfluorohexane Sulfonate	0.455 ug/mI
						100 41	Perfluorohexanesulfonic acid	0.455 ug/mI
					LCPFNA 00005	100 11	Perfluorononanoic acid	0.435 ug/mI
					LCPFOA 00005		Perfluorooctanoic acid (PFOA)	0.5 ug/mI
					LCPFODA 00005		Perfluorooctanoic acid (PFOA)	
								0.5 ug/mI
					LCPFOS-br_00001	100 uL	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mI

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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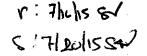
				Reagent	Parent Reagent			
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFPeA 00005	100 111	Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA 00004		Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA 00004	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
.LCPFBA 00004	01/30/20	Wellington Laboratories, Lot PFBA0115			(Purchased Rea	igent)	Perfluorobutyric acid	50 ug/mL
.LCPFBS 00005	03/15/21				(Purchased Reagent)		Perfluorobutane Sulfonate	44.2 ug/mL
_							Perfluorobutanesulfonic acid	44.2 ug/mL
							(PFBS)	_
.LCPFDA 00005	07/02/20	Wellington Laboratories, Lot PFDA0615			(Purchased Reagent)		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA 00005	01/30/20						Perfluorododecanoic acid	50 ug/mL
.LCPFDS 00006	05/24/21			(Purchased Reagent)		Perfluorodecane Sulfonate	48.2 ug/mL	
_							Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA 00005	01/22/21	Welling	ton Laboratories, Lot PE	THpA0116	(Purchased Rea	igent)	Perfluoroheptanoic acid	50 ug/mL
.LCPFHpS 00008	11/06/20	Welling	ton Laboratories, Lot LP	FHpS1115	(Purchased Rea	igent)	Perfluoroheptane Sulfonate	47.6 ug/mL
							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA 00004	12/22/20	Welling	ton Laboratories, Lot PF	HxA1215	(Purchased Rea	igent)	Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00005	06/20/19	Welling	ton Laboratories, Lot PF	HxDA0614	(Purchased Rea	igent)	Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00001	07/03/20	Wellingt	on Laboratories, Lot brP	FHxSK0615	(Purchased Rea	igent)	Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid	45.5 ug/mL
.LCPFNA 00005	10/23/20		gton Laboratories, Lot P	FNA1015	(Purchased Rea	igent)	Perfluorononanoic acid	50 ug/mL
.LCPFOA_00006	11/06/20	Wellin	gton Laboratories, Lot P	FOA1115	(Purchased Rea	igent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00005	01/30/20		ton Laboratories, Lot PE		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00001	10/14/20				(Purchased Reagent)		Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17		ton Laboratories, Lot FC	SA0815I	(Purchased Rea	igent)	Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00005	01/30/20		rton Laboratories, Lot PE		(Purchased Rea		Perfluoropentanoic acid	50 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	Welling	ton Laboratories, Lot PE	FUdA0815	(Purchased Rea	igent)	Perfluoroundecanoic acid	50 ug/mL
LCPFCSP 00066	09/02/17	10/28/16	Methanol, Lot 090285	10000 uL	LCPFBA 00005	100 uL	Perfluorobutyric acid	0.5 ug/mL
_			·		LCPFBS 00005		Perfluorobutane Sulfonate	0.442 ug/mL
					_		Perfluorobutanesulfonic acid	0.442 ug/mL
							(PFBS)	
					LCPFDA_00005		Perfluorodecanoic acid	0.5 ug/mL
					LCPFDoA_00005		Perfluorododecanoic acid	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
							Perfluorodecane Sulfonic acid	0.482 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid	0.5 ug/mL
					LCPFHpS_00008	100 uL	Perfluoroheptane Sulfonate	0.476 ug/mL
							Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid	0.5 ug/mL
					LCPFHxDA_00005		Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate	0.455 ug/mL
							Perfluorohexanesulfonic acid	0.455 ug/mL
					LCPFNA_00005		Perfluorononanoic acid	0.5 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL

ab Name: TestAmerica Sacramento	Job No.: 320-23542-1
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				Reagent	Parent Reagent			
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFOS-br_00002	100 uL	Perfluorooctane Sulfonate (PFOS)	0.464 ug/mL
					LCPFOSA 00006	100 117.	Perfluorooctane Sulfonamide	0.5 ug/mL
					LCPFPeA 00005		Perfluoropentanoic acid	0.5 ug/mL
					LCPFTeDA 00004		Perfluorotetradecanoic acid	0.5 ug/mL
					LCPFTrDA 00004		Perfluorotridecanoic acid	0.5 ug/mL
					LCPFUdA 00004	100 uL	Perfluoroundecanoic acid	0.5 ug/mL
.LCPFBA 00005	05/27/21	Wellin	gton Laboratories, Lo	ot PFBA0516	(Purchased Reag	ent)	Perfluorobutyric acid	50 ug/mL
.LCPFBS 00005	03/15/21		ton Laboratories, Lo		(Purchased Reag	ent)	Perfluorobutane Sulfonate	44.2 ug/mL
_					_		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA 00005	07/02/20	Wellin	gton Laboratories, Lo	ot PFDA0615	(Purchased Reag	ent)	Perfluorodecanoic acid	50 ug/mL
.LCPFDoA 00005	01/30/20	Welling	ton Laboratories, Lo	ot PFDoA0115	(Purchased Reag		Perfluorododecanoic acid	50 ug/mL
.LCPFDS 00006	05/24/21	Welling	ton Laboratories, Lo	ot LPFDS0516	(Purchased Reag	ent)	Perfluorodecane Sulfonate	48.2 ug/mL
_		_			_		Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA 00005	01/22/21	Welling	ton Laboratories, Lo	ot PFHpA0116	(Purchased Reag	ent)	Perfluoroheptanoic acid	50 ug/mL
.LCPFHpS_00008	11/06/20	Welling	ton Laboratories, Lo	t LPFHpS1115	(Purchased Reag	ent)	Perfluoroheptane Sulfonate	47.6 ug/mL
_							Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA 00004	12/22/20	Welling	ton Laboratories, Lo	ot PFHxA1215	(Purchased Reag	ent)	Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA 00005	06/20/19	Welling	ton Laboratories, Lo	t PFHxDA0614	(Purchased Reag	ent)	Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br 00002	07/03/20	Wellingt	on Laboratories, Lot	brPFHxSK0615	(Purchased Reag	ent)	Perfluorohexane Sulfonate	45.5 ug/mL
_							Perfluorohexanesulfonic acid	45.5 ug/mL
.LCPFNA_00005	10/23/20	Wellin	gton Laboratories, L	ot PFNA1015	(Purchased Reag	ent)	Perfluorononanoic acid	50 ug/mL
.LCPFOA 00006	11/06/20	Wellin	gton Laboratories, L	ot PFOA1115	(Purchased Reag	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00005	01/30/20	Welling	ton Laboratories, Lo	ot PFODA0115	(Purchased Reag	ent)	Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br_00002	10/14/20	Wellingt	on Laboratories, Lot	brPFOSK1015	(Purchased Reag	ent)	Perfluorooctane Sulfonate (PFOS)	46.4 ug/mL
.LCPFOSA 00006	09/02/17	Welling	ton Laboratories, Lo	ot FOSA0815I	(Purchased Reag	ent)	Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA 00005	01/30/20	Welling	ton Laboratories, Lo	ot PFPeA0115	(Purchased Reag	ent)	Perfluoropentanoic acid	50 ug/mL
.LCPFTeDA 00004	12/09/20	Welling	ton Laboratories, Lo	t PFTeDA1215	(Purchased Reag	ent)	Perfluorotetradecanoic acid	50 ug/mL
.LCPFTrDA 00004	12/10/18	Welling	ton Laboratories, Lo	t PFTrDA1213	(Purchased Reag	ent)	Perfluorotridecanoic acid	50 ug/mL
.LCPFUdA_00004	08/19/20	Welling	ton Laboratories, Lo	ot PFUdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid	50 ug/mL

## Reagent

LC6:2FTS\_00001





## **CERTIFICATE OF ANALYSIS DOCUMENTATION**

**PRODUCT CODE:** 

6:2FTS

LOT NUMBER:

62FTS1014

**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C<sub>a</sub>H<sub>4</sub>F<sub>13</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

450.15

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt) SOLVENT(S):

Methanol

47.4 ± 2.4 µg/ml >98%

**CHEMICAL PURITY:** LAST TESTED: (mm/dd/yyyy)

10/03/2014

EXPIRY DATE: (mm/dd/yyyy)

10/03/2017

**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

(6:2FTS anion)

Certified By:

B.G. Chittim

**Date:** 03/27/2015

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

### 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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 $x_1, x_2,...x_n$  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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## **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:

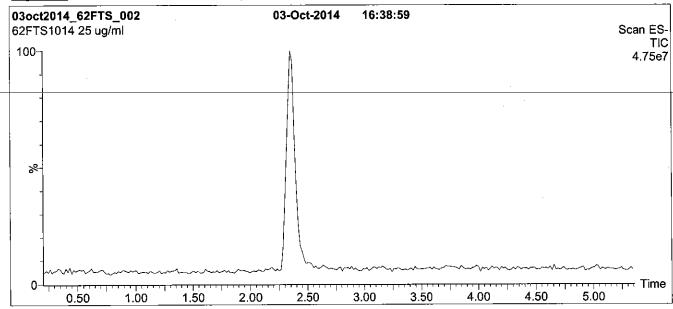
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

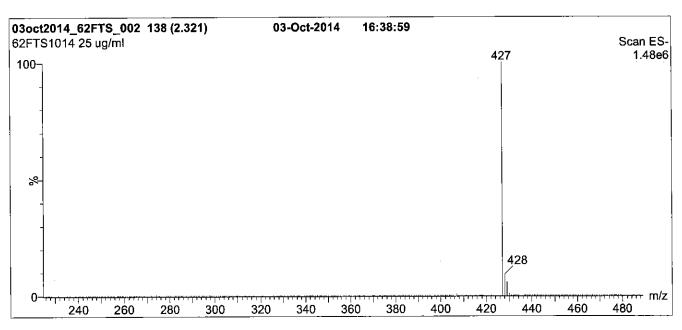




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Figure 1: 6:2FTS; LC/MS Data (TIC and Mass Spectrum)





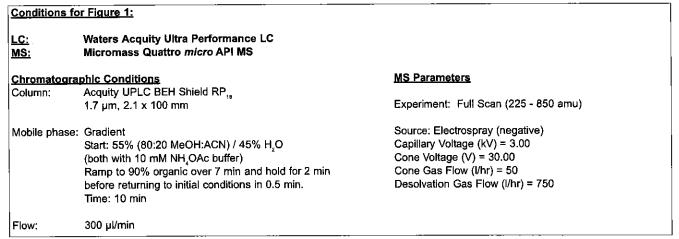
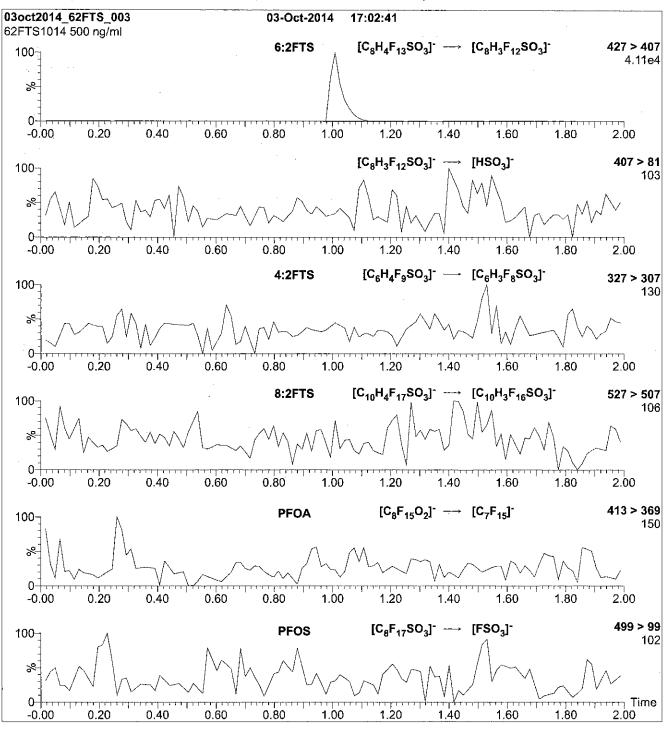
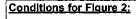


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

**MS Parameters** 

Collision Gas (mbar) = 3.50e-3

Collision Energy (eV) = 25

## Reagent

LC6:2FTS\_00002

R: 8/23/16 SEC



ID: LC6:2FTS\_00002 Exp: 06/25/21 Prpd: SBC 6:2FTS



## **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

6:2FTS

**LOT NUMBER:** 

62FTS0616

**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C<sub>a</sub>H<sub>4</sub>F<sub>13</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

450.15

**CONCENTRATION:** 

**CHEMICAL PURITY:** 

 $50.0 \pm 2.5 \,\mu g/ml$ 

47.4 ± 2.4 µg/ml

(Na salt) SOLVENT(S):

(6:2FTS anion)

Methanol

>98%

LAST TESTED: (mm/dd/yyyy)

06/25/2016

EXPIRY DATE: (mm/dd/yyyy)

06/25/2021

**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:

Date: 06/29/2016

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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

## TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

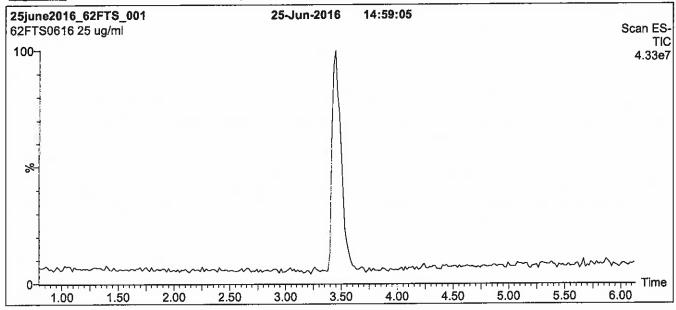
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

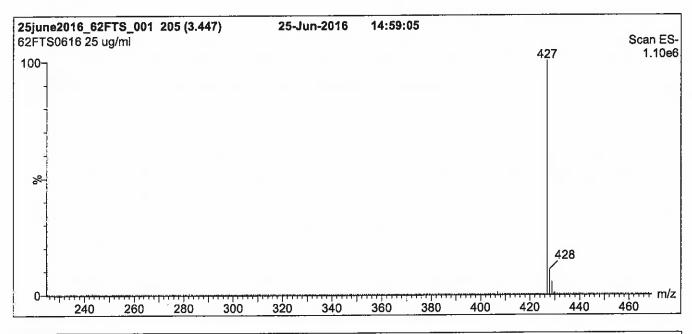




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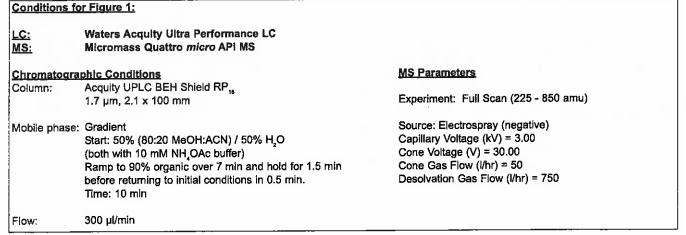
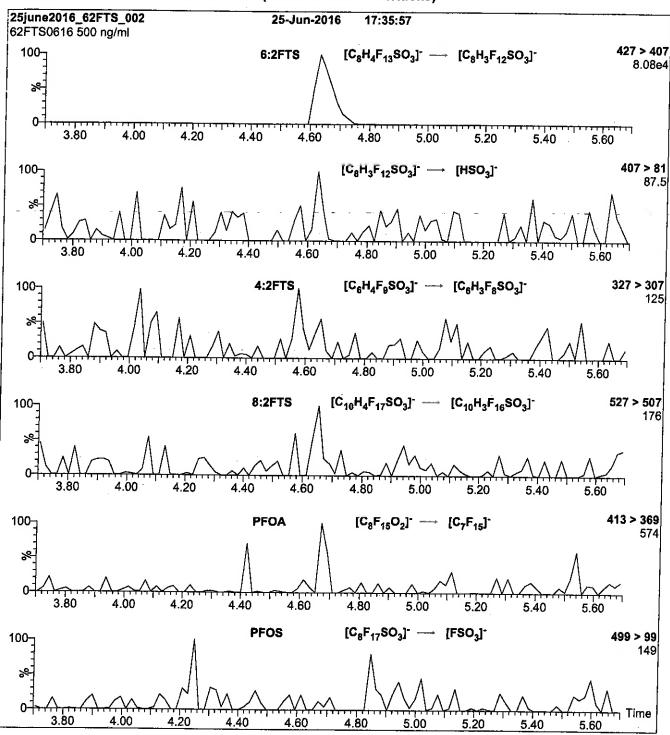
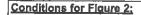


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop Injection

10 µl (500 ng/ml 6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH<sub>4</sub>OAc buffer)

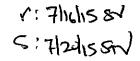
300 µl/min

## MS Parameters

Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 25

## Reagent

LC8:2FTS\_00001





## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

8:2FTS

LOT NUMBER:

82FTS1014

COMPOUND:

Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

**STRUCTURE:** 

CAS #:

Not available

F F F F F F F H H

(8:2FTS anion)

**MOLECULAR FORMULA:** 

C,,H,F,,SO,Na

 $47.9 \pm 2.4 \,\mu g/ml$ 

**MOLECULAR WEIGHT:** 

550.16

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$  (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/03/2014

EXPIRY DATE: (mm/dd/yyyy)

10/03/2017

**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 C Chittim

Date: \_

3/2//2015

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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## **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:**

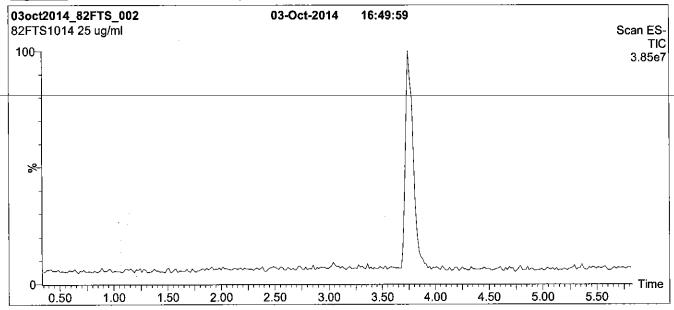
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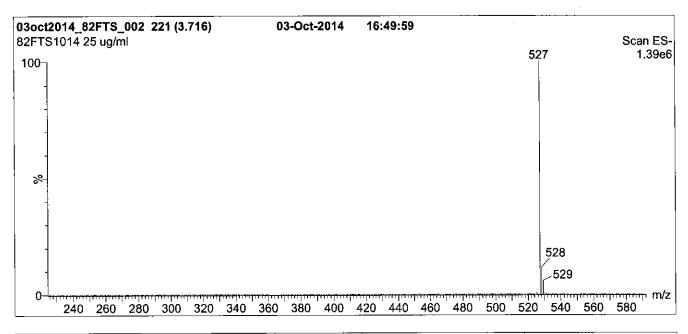




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Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)





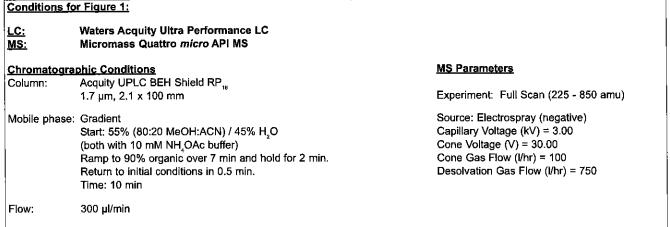
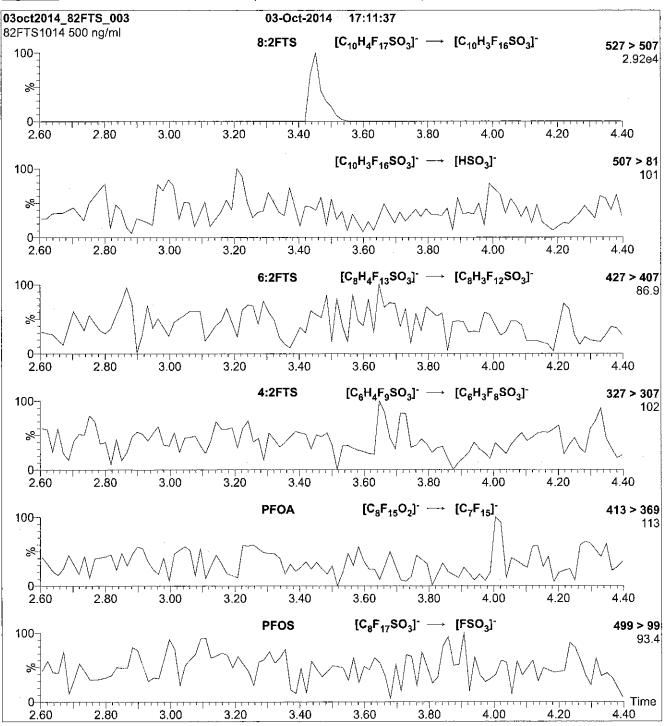
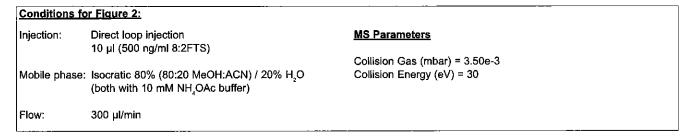


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





## Reagent

LC8:2FTS\_00002

R: 8/23/16 880





## **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

8:2FTS

**LOT NUMBER:** 

82FTS1015

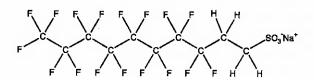
**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE:

CAS #:

Not available



(Na salt)

(8:2FTS anion)

**MOLECULAR FORMULA:** 

C<sub>10</sub>H<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

550.16

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$ 47.9 ± 2.4 µg/ml SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

**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:

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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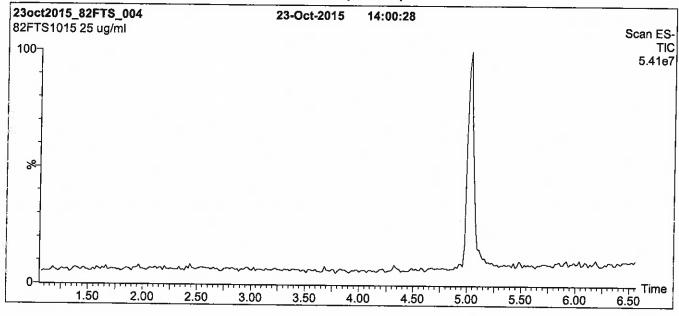
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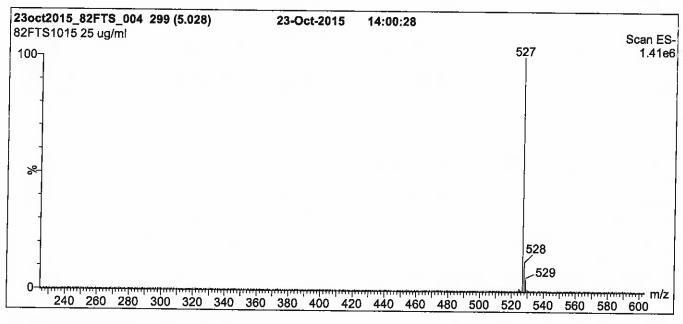


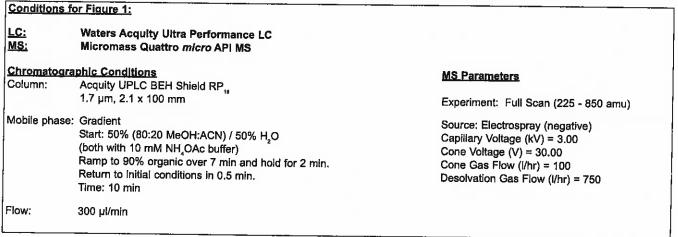


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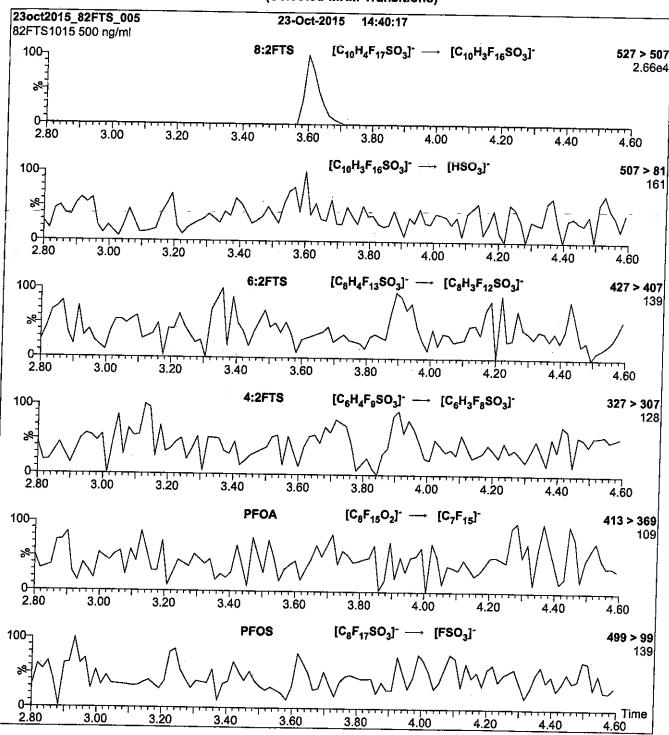
Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)

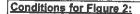






8:2FTS; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O (both with 10 mM NH<sub>4</sub>OAc buffer)

300 µl/min

## MS Parameters

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 30

## Reagent

# LCd-NEtFOSA-M\_00001



## **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

d-N-EtFOSA-M

**LOT NUMBER:** 

dNEtFOSA0314M

**COMPOUND:** 

N-ethyl-d<sub>e</sub>-perfluoro-1-octanesulfonamide

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C<sub>10</sub>D<sub>5</sub>HF<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

03/10/2014

EXPIRY DATE: (mm/dd/yyyy)

03/10/2019

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:** 

SOLVENT(S):

532.23 Methanol

**ISOTOPIC PURITY:** 

≥98% <sup>2</sup>H<sub>5</sub>

## **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: 04/01/2015

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,  $u_x(y)$ , 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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## **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:**

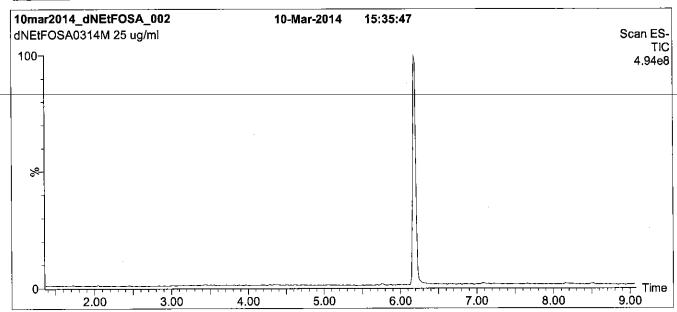
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

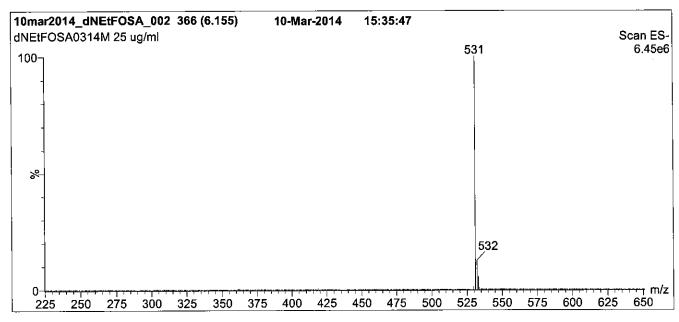




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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





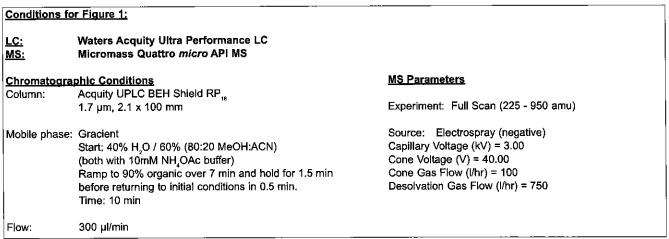
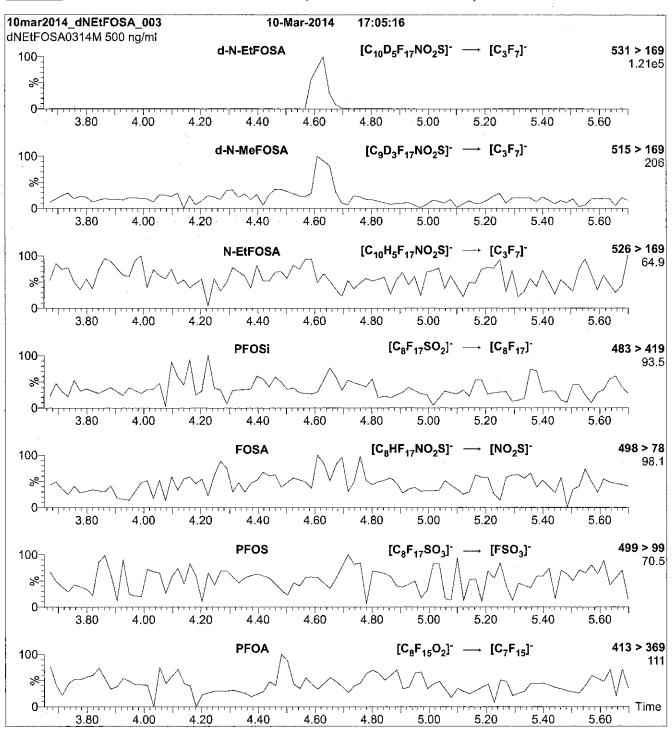
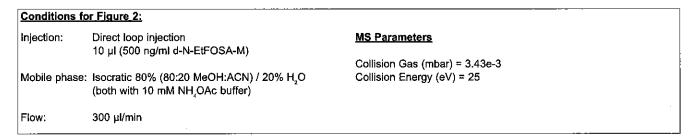


Figure 2: d-N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





## Reagent

# LCd-NEtFOSA-M\_00002



## **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

d-N-EtFOSA-M

dNEtFOSA0314M

532.23

Methanol

≥98% <sup>2</sup>H<sub>5</sub>

**COMPOUND:** 

N-ethyl-d<sub>s</sub>-perfluoro-1-octanesulfonamide

STRUCTURE:

**CAS #:** 

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

SOLVENT(S):

Not available

**MOLECULAR FORMULA:** 

C<sub>10</sub>D<sub>5</sub>HF<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

03/10/2014

EXPIRY DATE: (mm/dd/yyyy)

03/10/2019

**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:

Date: <u>04/01/2015</u>

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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### **HAZARDS**:

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## **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:**

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## 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:

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## **QUALITY MANAGEMENT:**

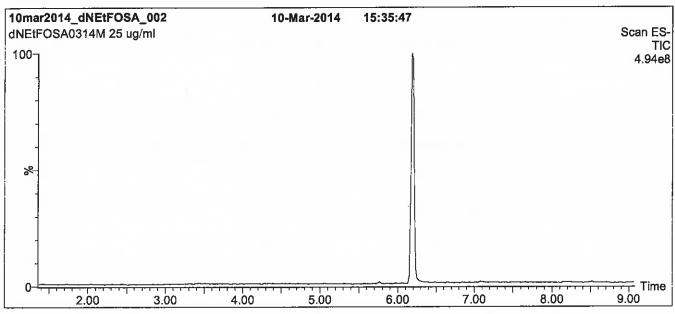
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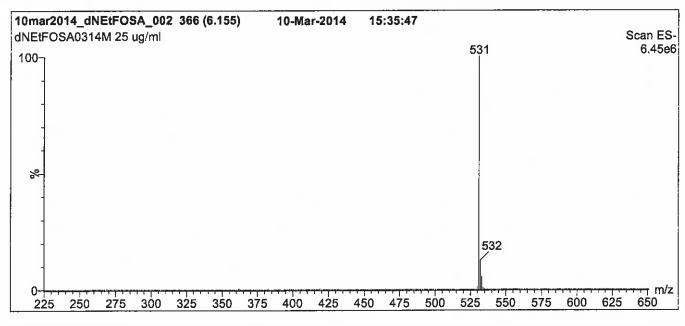




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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





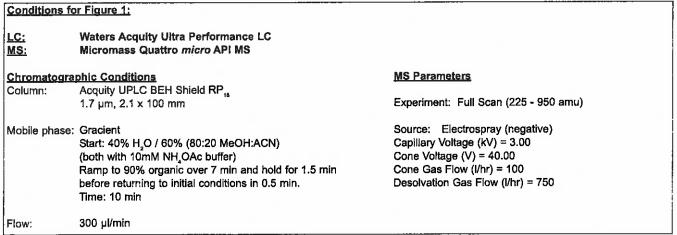
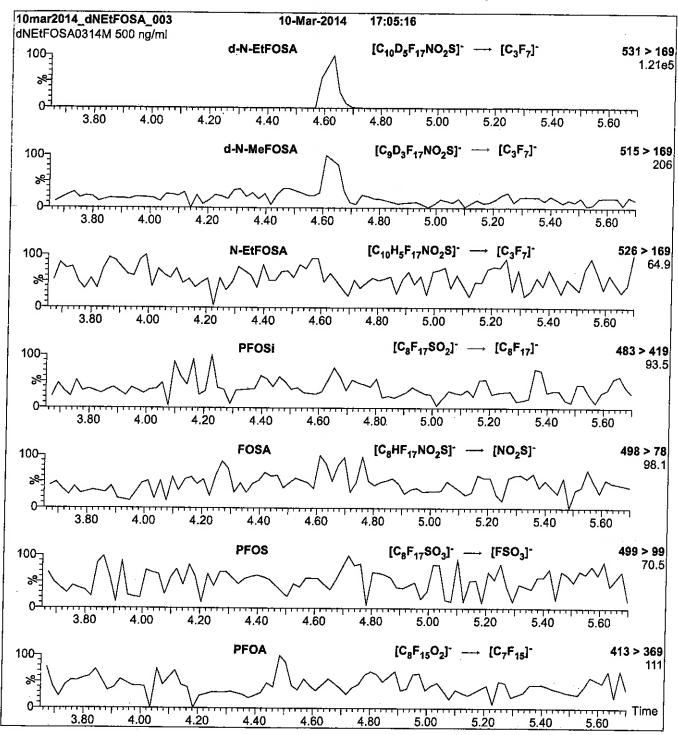
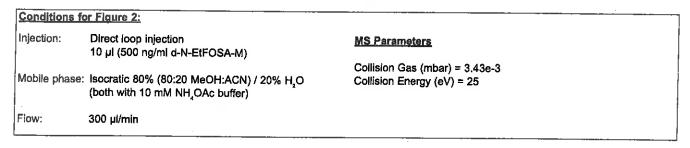


Figure 2: d-N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





## LCd-NMeFOSA-M\_00001



PRODUCT CODE:

d-N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

**ISOTOPIC PURITY:** 

dNMeFOSA0114M

516.19

Methanol

≥98% 2H,

**COMPOUND:** 

N-methyl-d,-perfluoro-1-octanesulfonamide

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C<sub>9</sub>D<sub>3</sub>HF<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/28/2014

EXPIRY DATE: (mm/dd/yyyy)

01/28/2019

**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: 04/01/2015

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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#### 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:**

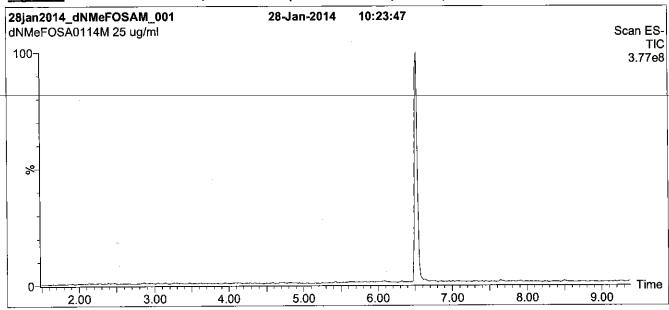
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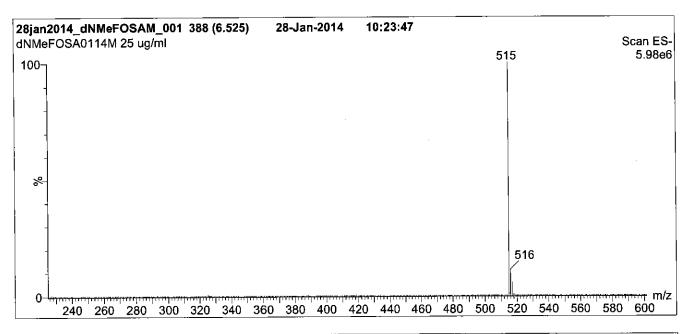




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Figure 1: d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





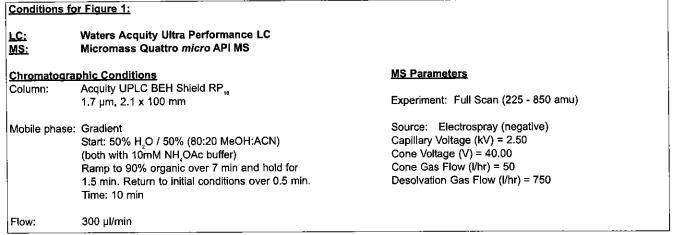
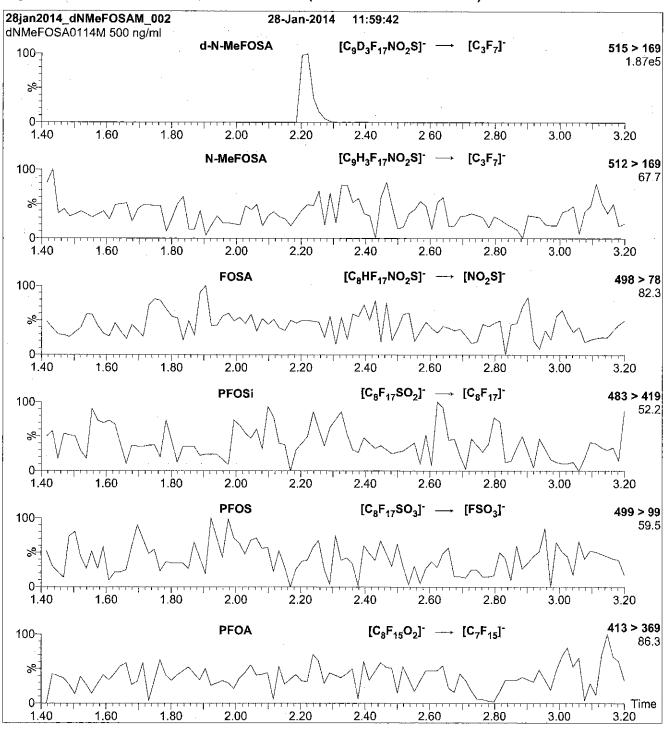
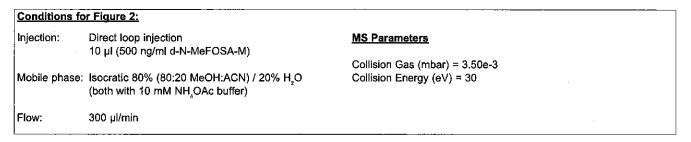


Figure 2: d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





# LCd-NMeFOSA-M\_00002

R: +16/16 CBW

671625

ID: LCd-NMeFOSA-M\_00002 Exp: 06/13/21 Prpd: CBW d-N-MeFOSA-M



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

d-N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

SOLVENT(S):

dNMeFOSA0616M

516.19

Methanol

≥98% 2H,

COMPOUND:

N-methyl-d<sub>3</sub>-perfluoro-1-octanesulfonamide

Not available

**STRUCTURE:** 

<u>CAS #:</u>

F C C C C C SO<sub>2</sub>N CD

**MOLECULAR FORMULA:** 

C<sub>0</sub>D<sub>3</sub>HF<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

06/10/2016

EXPIRY DATE: (mm/dd/yyyy)

06/10/2021

**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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified Bv:

B.G. Chittim

Date:

<u>06/16/2016</u>

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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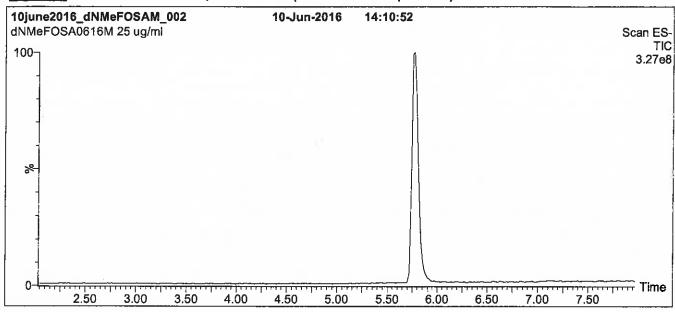
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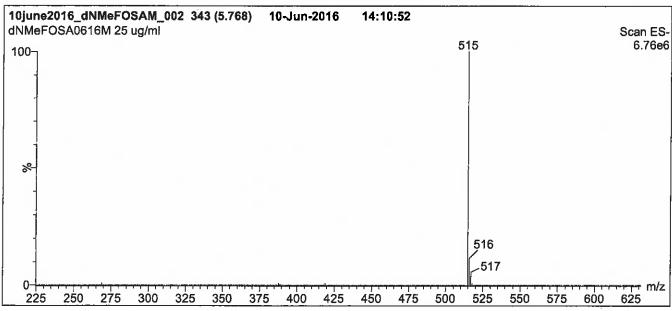




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Figure 1: d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





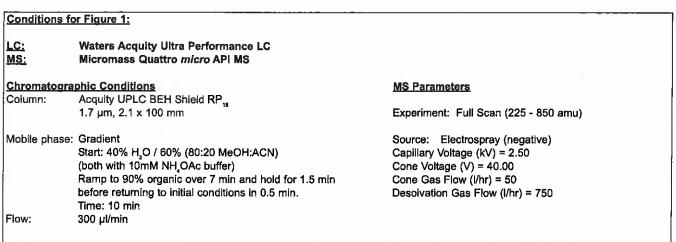
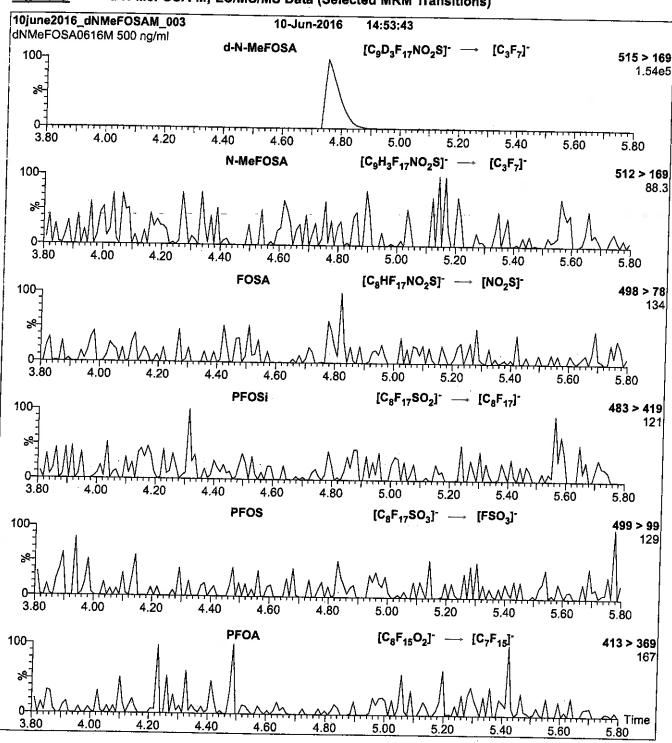
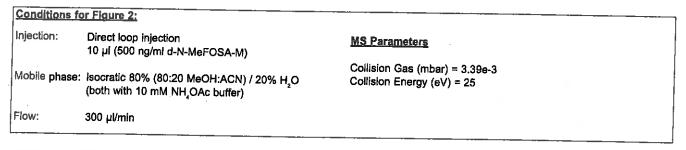


Figure 2: d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





# LCd3-NMeFOSAA\_00001



**PRODUCT CODE:** 

d3-N-MeFOSAA

**LOT NUMBER:** 

d3NMeFOSAA0113

COMPOUND:

N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

 $C_{11}D_3H_3F_{17}NO_4S$ 

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

574.23

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

SOLVENT(S):

Methanol

≥98% 2H,

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/31/2013

EXPIRY DATE: (mm/dd/yyyy)

01/31/2018

**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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

)4/06/2015

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

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

$$x_i, x_2,...x_n$$
 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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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:**

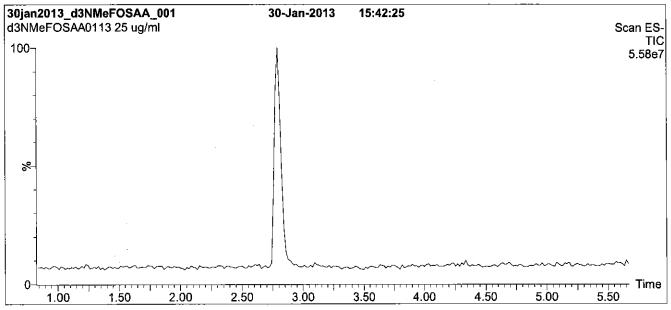
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

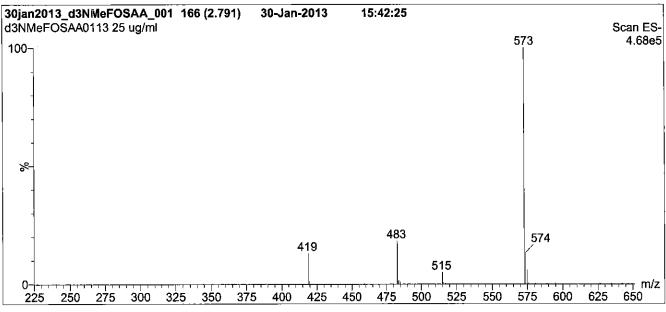




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Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





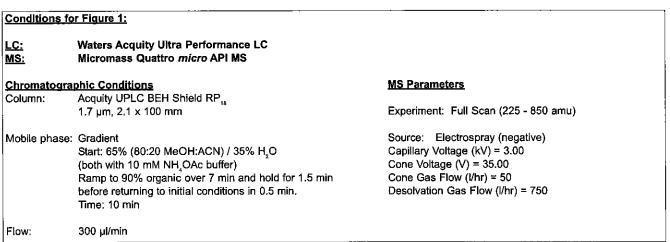
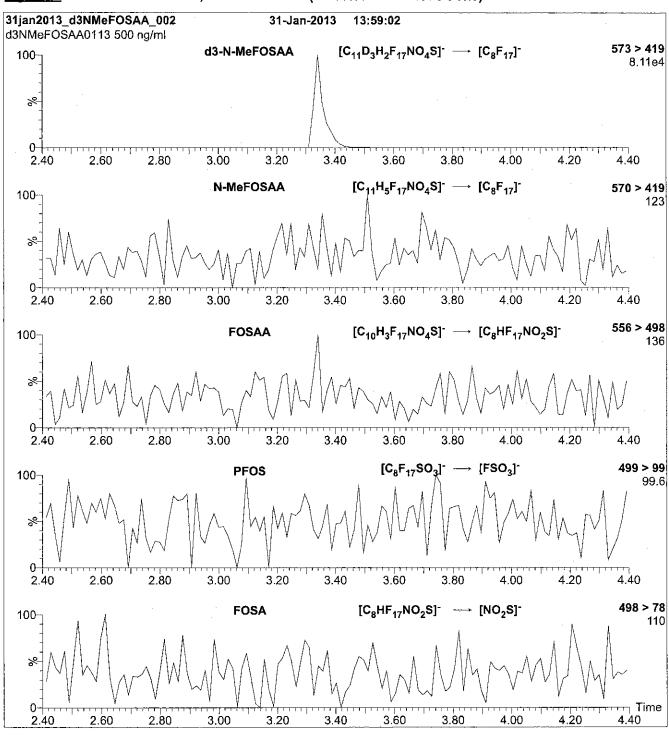


Figure 2: d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

Collision Gas (mbar) = 3.31e-3 Collision Energy (eV) = 25

# LCd3-NMeFOSAA\_00002

# VELLINGTON ABORATORIES

#### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

d3-N-MeFOSAA

**LOT NUMBER:** 

d3NMeFOSAA0116

**COMPOUND:** 

N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

Not available

**MOLECULAR FORMULA:** 

C<sub>11</sub>D<sub>3</sub>H<sub>3</sub>F<sub>17</sub>NO<sub>4</sub>S

**MOLECULAR WEIGHT:** 574.23

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

**ISOTOPIC PURITY:** 

Methanol

Water (<1%) ≥98% 2H,

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

**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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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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#### **HAZARDS:**

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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

 $x_1, x_2, ..., x_n$  on which it depends is:

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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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

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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:**

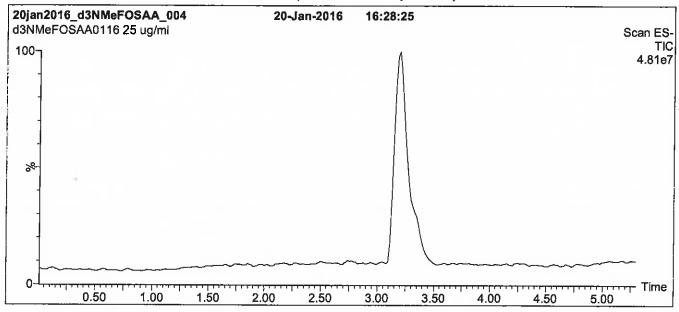
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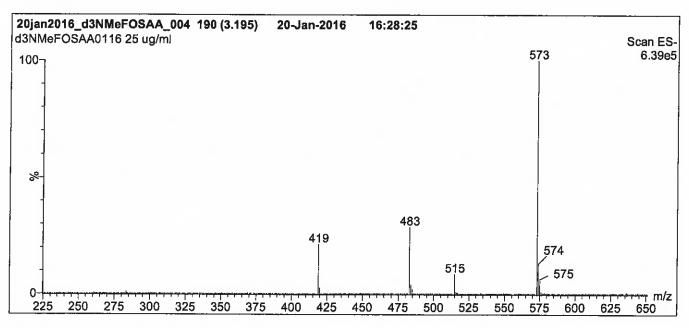




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Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





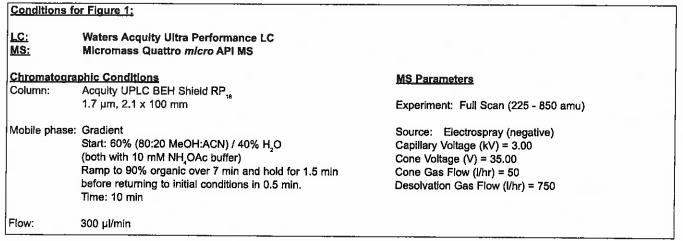
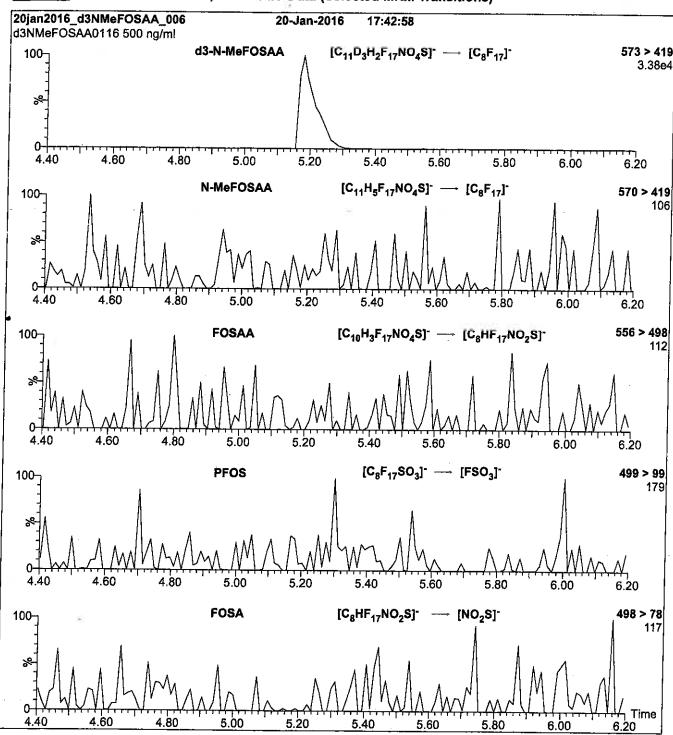


Figure 2: d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

Collision Gas (mbar) = 3.66e-3 Collision Energy (eV) = 25

# LCd5-NEtFOSAA\_00001



**PRODUCT CODE:** 

d5-N-EtFOSAA

**LOT NUMBER:** 

d5NEtFOSAA0515

**COMPOUND:** 

N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

C,,D,H,F,,NO,S

**MOLECULAR WEIGHT:** 

590.27

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

≥98% <sup>2</sup>H<sub>E</sub>

LAST TESTED: (mm/dd/yyyy)

05/08/2015

EXPIRY DATE: (mm/dd/yyyy)

05/08/2020

**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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/11/2015

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:**

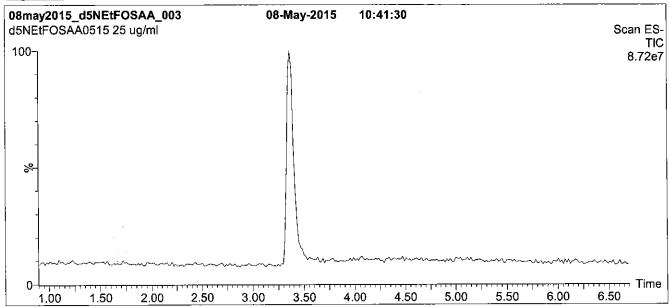
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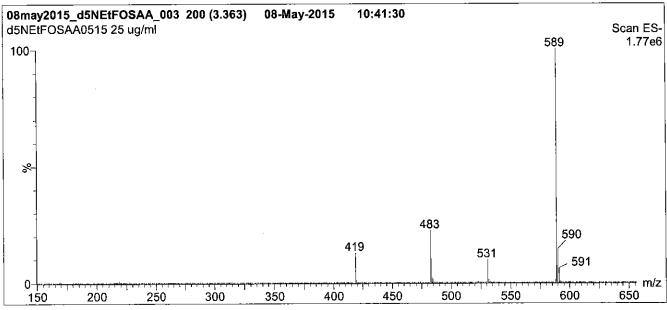




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Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





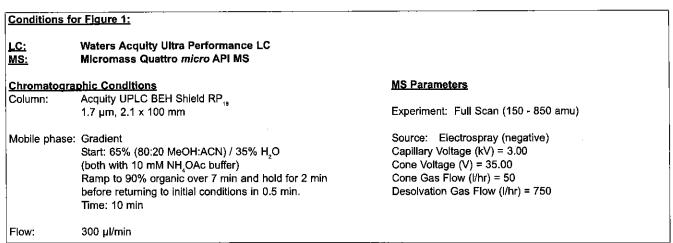
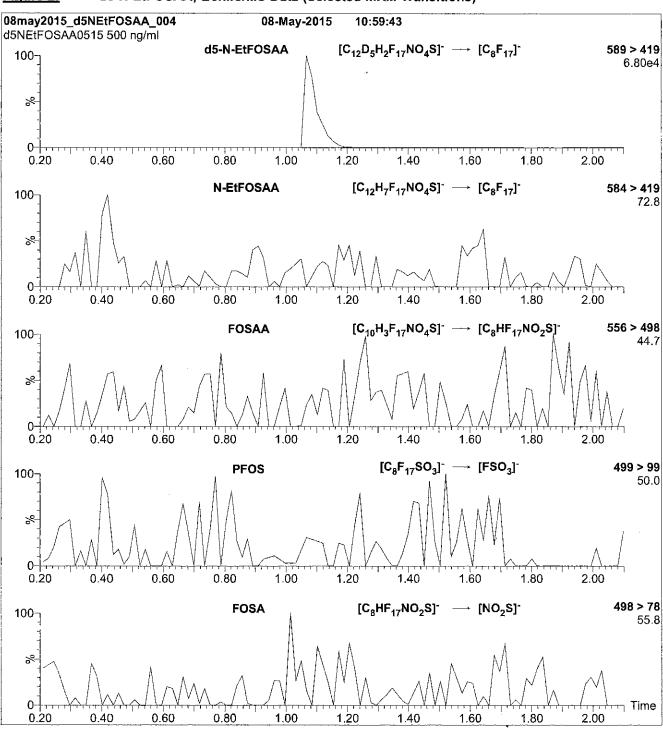
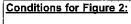


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\rm H_2O$ 

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

#### MS Parameters

Collision Gas (mbar) = 3.24e-3 Collision Energy (eV) = 25

# LCd5-NEtFOSAA\_00002



PRODUCT CODE:

d5-N-EtFOSAA

**LOT NUMBER:** 

d5NEtFOSAA1115

**COMPOUND:** 

N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C,DH3F,NOS

**MOLECULAR WEIGHT:** 

590.27

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

SOLVENT(S):

Methano!

**CHEMICAL PURITY:** 

>98%

Water (<1%)

LAST TESTED: (mm/dd/yyyy)

**ISOTOPIC PURITY:** 

≥98% <sup>2</sup>H<sub>e</sub>

12/07/2015

EXPIRY DATE: (mm/dd/yyyy)

12/07/2020

**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:**

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Certified By:

Date: 12/07/2015

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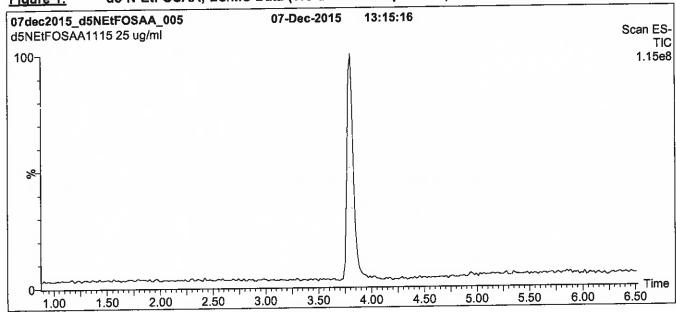
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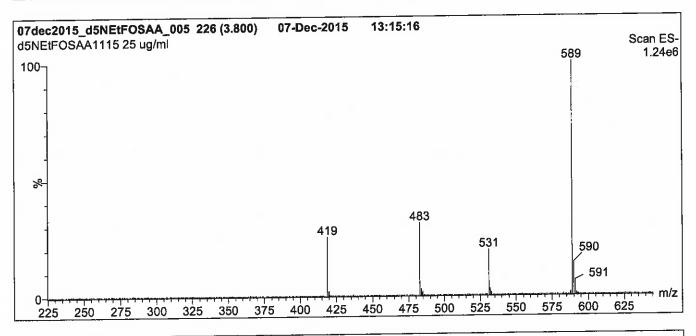


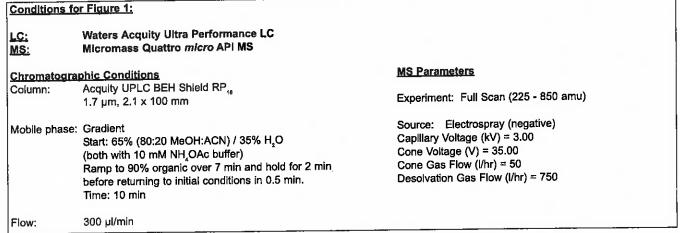


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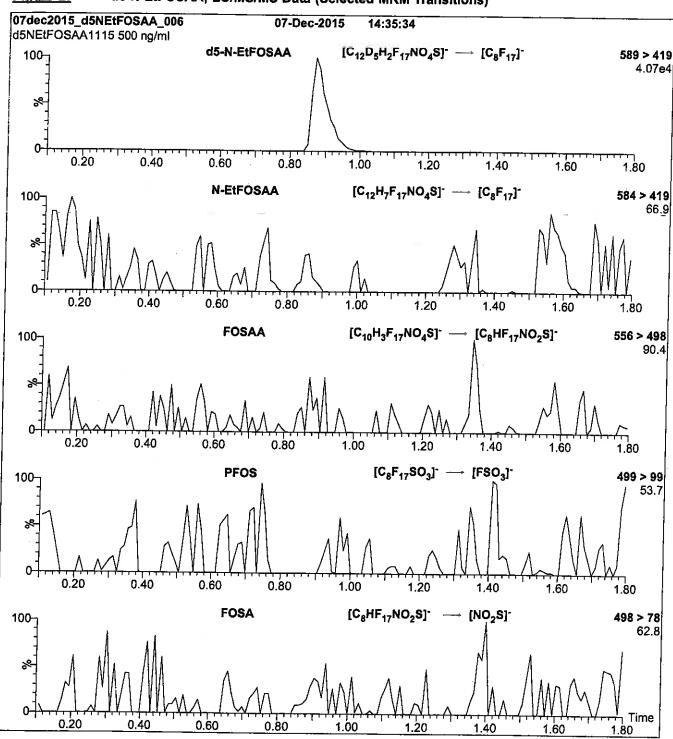


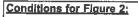






d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H\_O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 25

LCM2-6:FTS\_00001



**PRODUCT CODE:** 

M2-6:2FTS

**LOT NUMBER:** 

M262FTS0714

**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C, Joctane sulfonate

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>6</sub>H<sub>4</sub>F<sub>13</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

452.13

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt) SOLVENT(S):

Methanol

 $47.5 \pm 2.4 \,\mu g/ml$ 

(M2-6:2FTS anion)

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

>99% 13C  $(1,2^{-13}C_{2})$ 

LAST TESTED: (mm/dd/yyyy)

07/15/2014

EXPIRY DATE: (mm/dd/yyyy)

07/15/2017

**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.

The native 6:2FTS contains 4.22% of 34S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

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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#### **UNCERTAINTY:**

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The combined relative standard uncertainty, u<sub>i</sub>(y), of a value y and the uncertainty of the independent parameters

$$x_1, x_2,...x_n$$
 on which it depends is:

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

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

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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:**

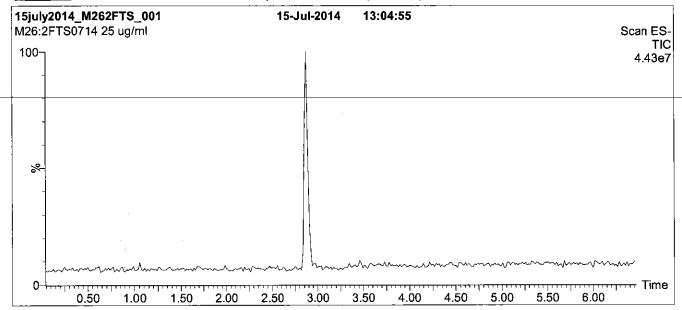
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

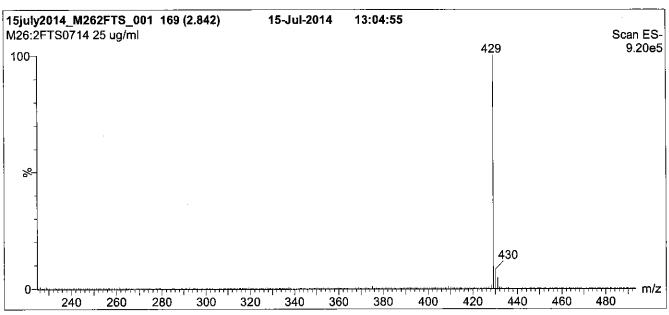




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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





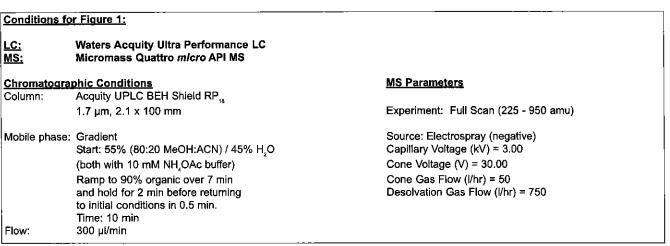
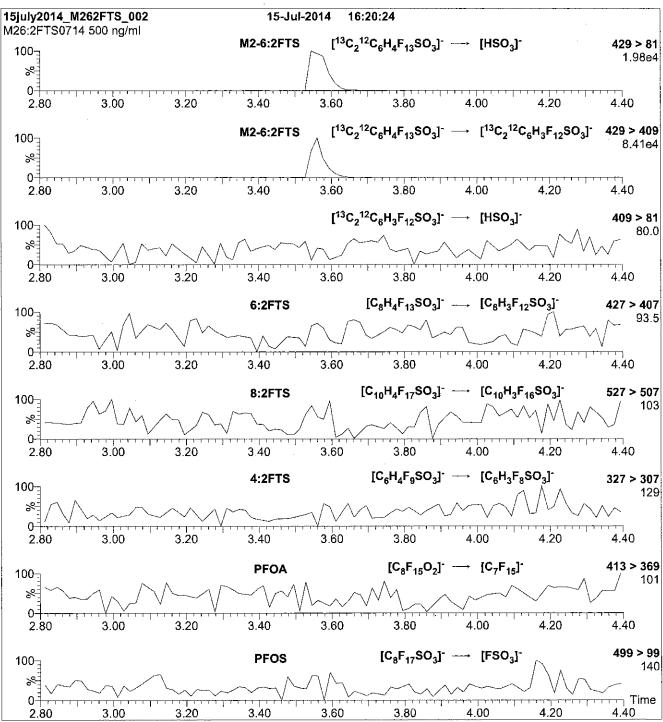
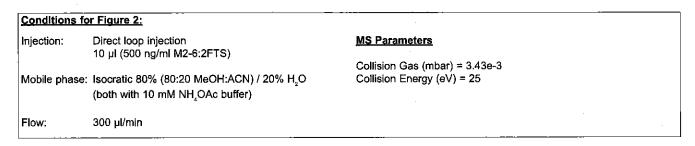


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-6:FTS\_00002



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-6:2FTS

**LOT NUMBER:** 

M262FTS0116

**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C]octane sulfonate

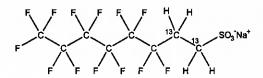
(Na salt)

 $47.5 \pm 2.4 \,\mu g/ml$  (M2-6:2FTS anion)

STRUCTURE:

CAS #:

Not available



**MOLECULAR FORMULA:** 

<sup>13</sup>C, <sup>12</sup>C, H, F, SO, Na

**MOLECULAR WEIGHT:** 

452.13

**CONCENTRATION:** 

50.0 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

>99% 13C

LAST TESTED: (mm/dd/yyyy)

**ISOTOPIC PURITY:** 

(1,2-13C<sub>2</sub>)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

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.

The native 6:2FTS contains 4.22% of <sup>34</sup>S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

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Certified By:

Date: 01/11/2016

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#### **EXPIRY DATE / PERIOD OF VALIDITY:**

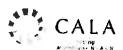
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

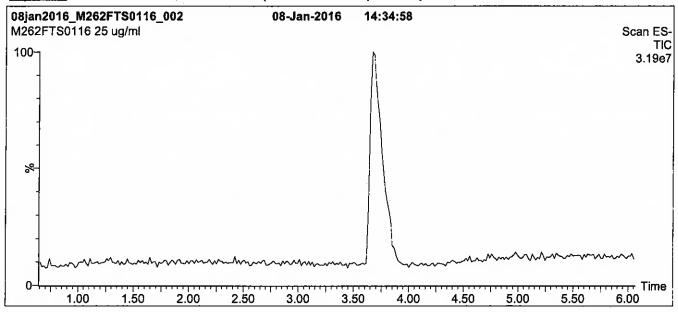
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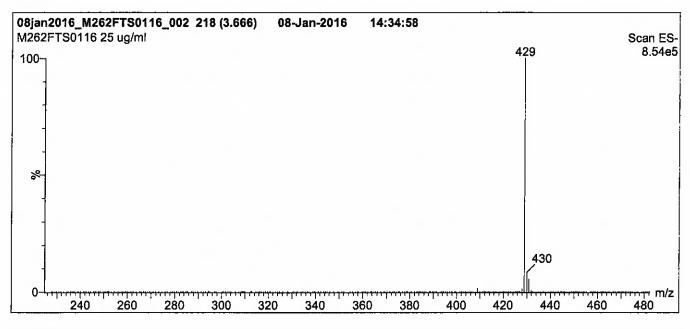




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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





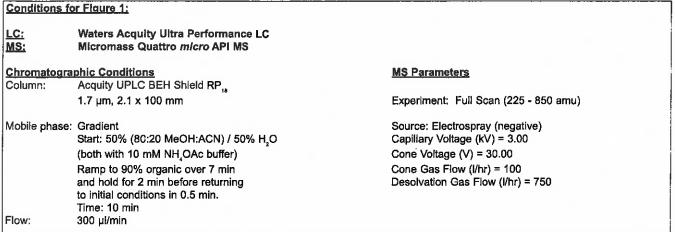
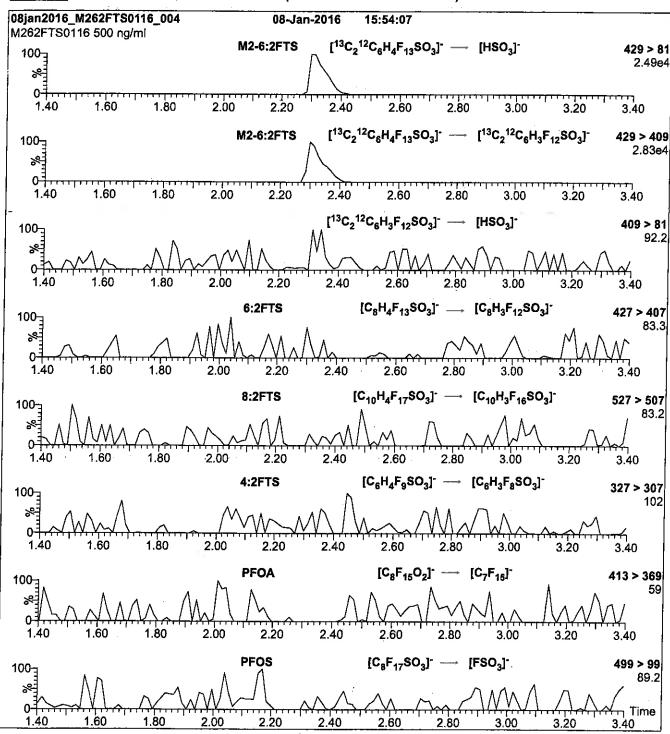
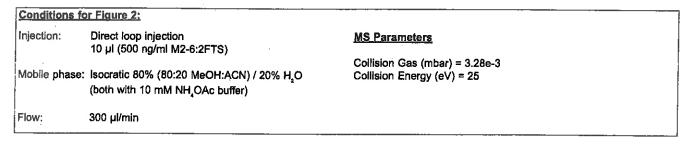


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-8:2FTS 00001



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

**LOT NUMBER:** 

M282FTS0414

**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C,]decane sulfonate

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>H<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

552.15

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt) **SOLVENT(S):** 

Methanol

 $47.9 \pm 2.4 \,\mu g/ml$  (M2-8:2FTS anion)

≥99% 13C

**CHEMICAL PURITY:** LAST TESTED: (mm/dd/yyyy) >98%

**ISOTOPIC PURITY:** 

 $(1,2^{-13}C_2)$ 

EXPIRY DATE: (mm/dd/yyyy)

04/13/2014

04/13/2017

**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.

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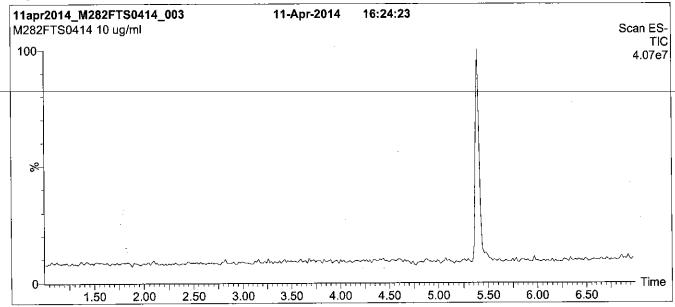
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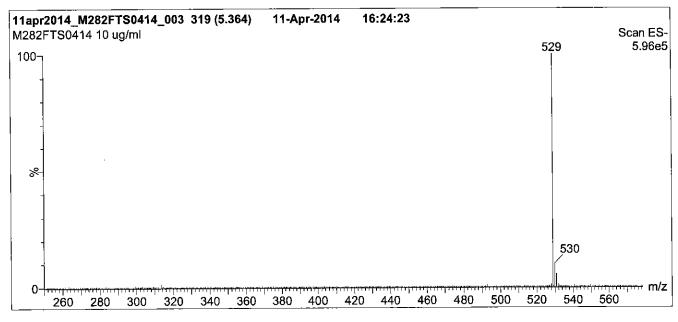




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





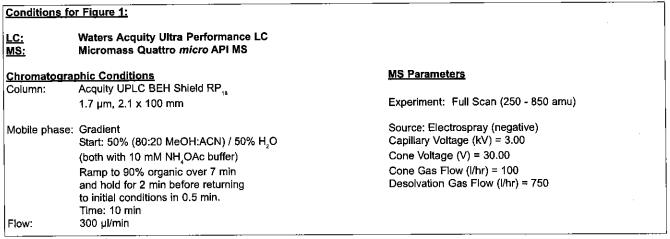
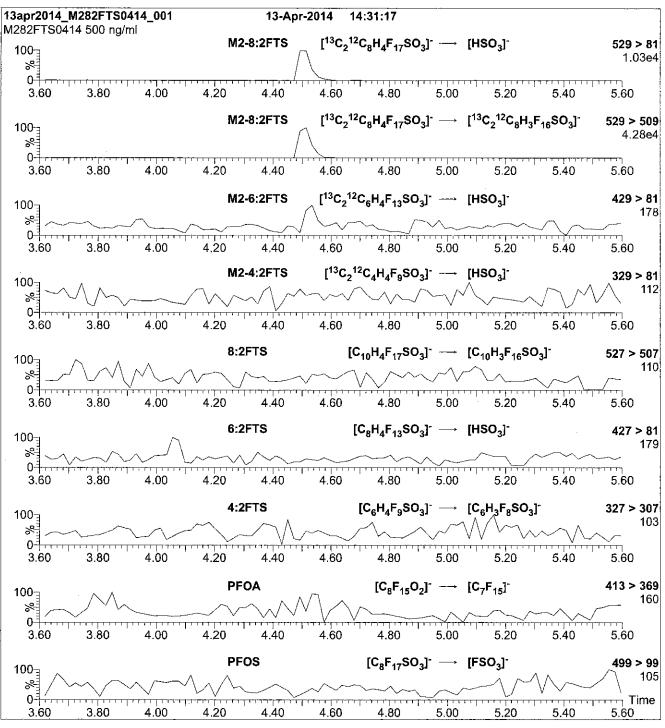
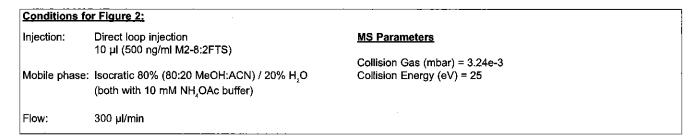


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-8:2FTS\_00002



# ELLINGTON A B O R A T O R I E S

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

**LOT NUMBER:** 

M282FTS0116

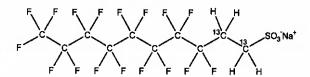
**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C,]decane sulfonate

**STRUCTURE:** 

CAS #:

Not available



 $47.9 \pm 2.4 \,\mu g/ml$  (M2-8:2FTS anion)

**MOLECULAR FORMULA:** 

13C, 12C, H, F, , SO, Na

MOLECULAR WEIGHT:

552.15

**CONCENTRATION:** 

50.0 ± 2.5 µg/ml (Na salt) SOLVENT(S):

Methanol

>98%

≥99% <sup>13</sup>C

**CHEMICAL PURITY:** LAST TESTED: (mm/dd/yyyy)

**ISOTOPIC PURITY:** 

(1,2-13C<sub>2</sub>)

EXPIRY DATE: (mm/dd/yyyy)

01/08/2016 01/08/2021

**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:**

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Certified By:

Date: 01/18/2016

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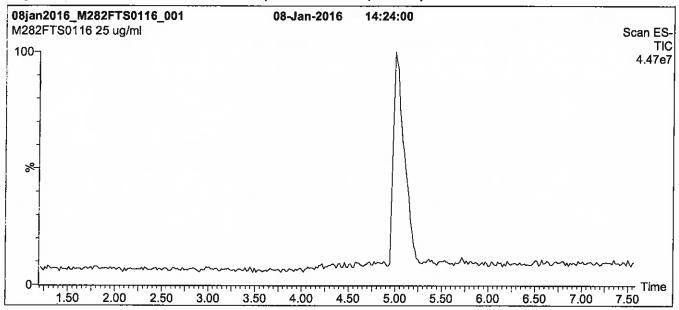
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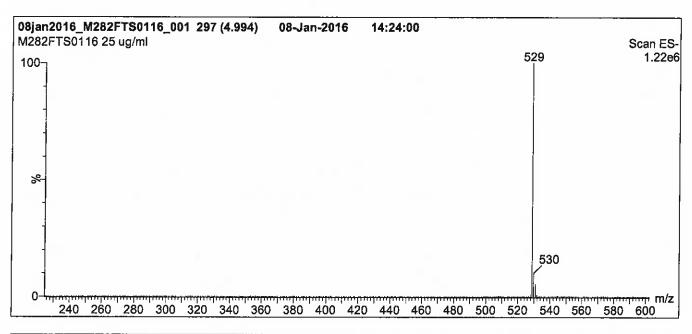




\*\*For additional information or assistance concerning this or any other products from Weilington Laboratories Inc., please visit our website at <a href="www.weil-labs.com">www.weil-labs.com</a> or contact us directly at <a href="mailto:info@weil-labs.com">info@weil-labs.com</a>\*\*

Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





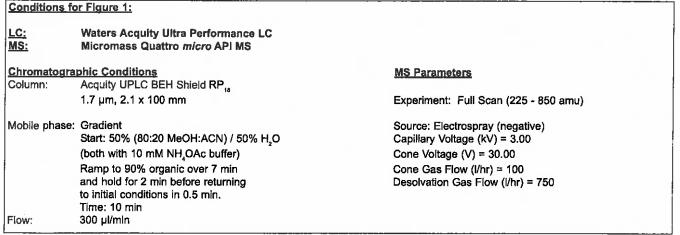
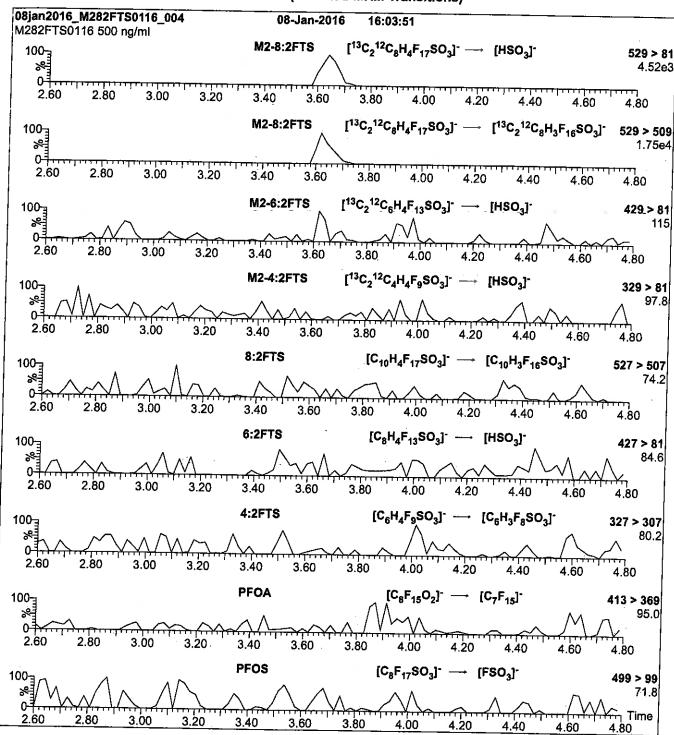
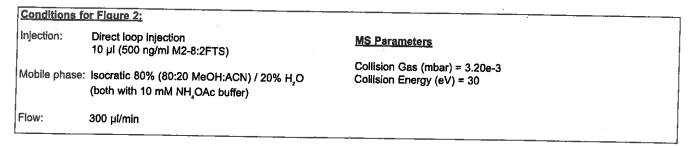


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





# LCM2PFHxDA\_00008



ID: LCM2PFHxDA 00008 13C2-PFHxDA at 50ug/mi



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

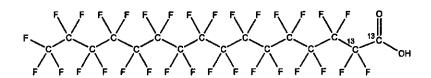
**COMPOUND:** 

Perfluoro-n-[1,2-13C<sub>2</sub>]hexadecanoic acid

**STRUCTURE:** 

CAS#:

Not available



**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>14</sub>HF<sub>31</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

816.11

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol Water (<1%)

**ISOTOPIC PURITY:** 

≥99% 13C (1,2-13C,)

**CHEMICAL PURITY:** LAST TESTED: (mm/dd/yyyy)

>98%

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:

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

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

 $x_1, x_2,...x_n$  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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

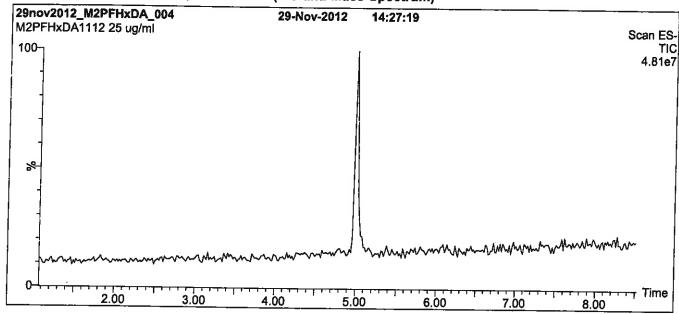
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

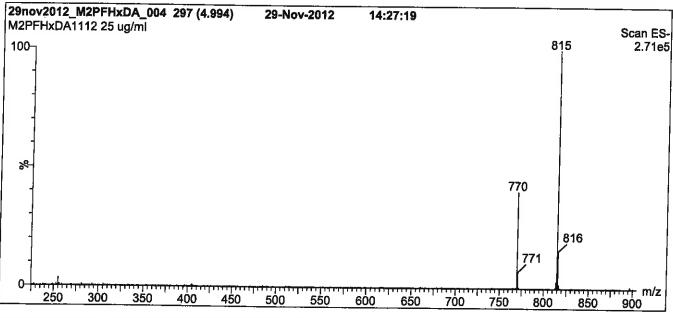




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*







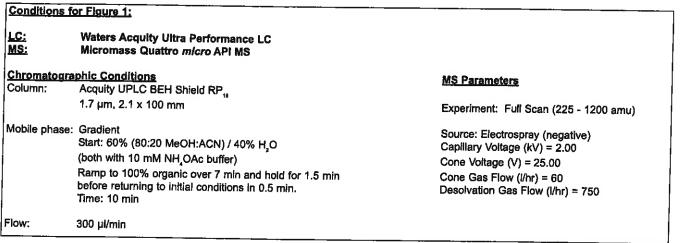
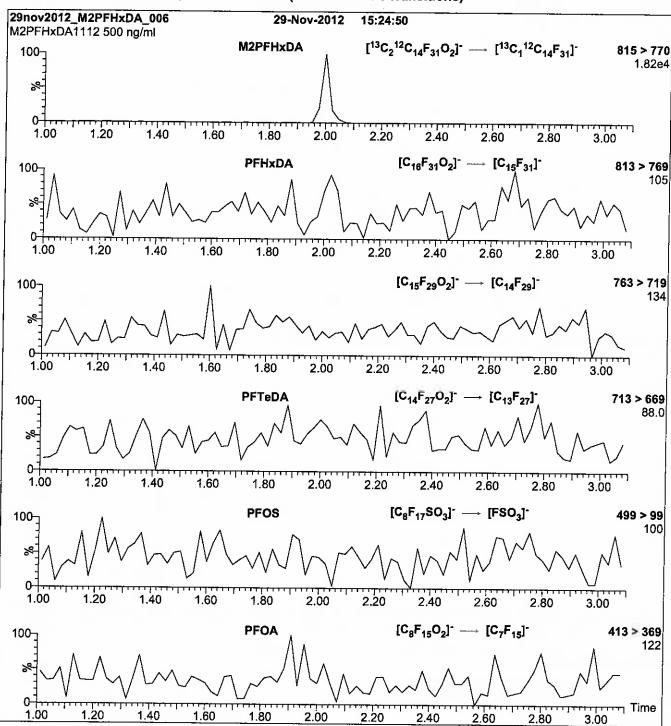


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 μl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>a</sub>O

(both with 10 mM NH OAc buffer)

300 µl/min

#### **MS Parameters**

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

# LCM2PFTeDA\_00007





JD: LCM2PFTeDA\_00007 Exp: 12/07/20 Prpd: SBC 13C2-PFTeDA at 50uo

## CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1115

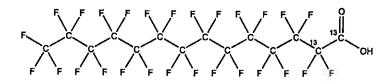
**COMPOUND:** 

Perfluoro-n-[1,2-13C,]tetradecanoic acid

**STRUCTURE:** 

**CAS #:** 

Not available



**MOLECULAR FORMULA:** 

<sup>13</sup>C, <sup>12</sup>C, HF, O,

MOLECULAR WEIGHT:

716.10

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

Water (<1%)

LAST TESTED: (mm/dd/yyyy)

**ISOTOPIC PURITY:** 

>99% 13C (1,2-13C<sub>a</sub>)

EXPIRY DATE: (mm/dd/yyyy)

12/07/2015 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:

Date: 12/08/2015

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

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

 $x_1, x_2,...x_n$  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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

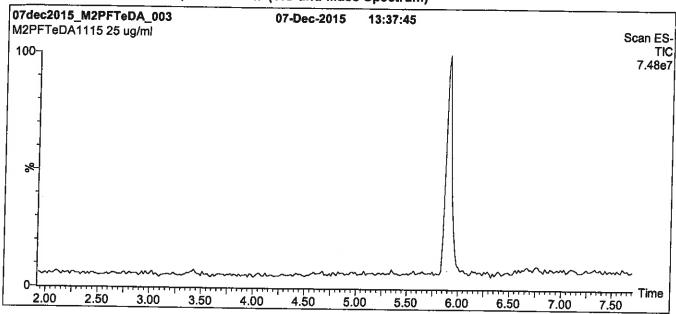
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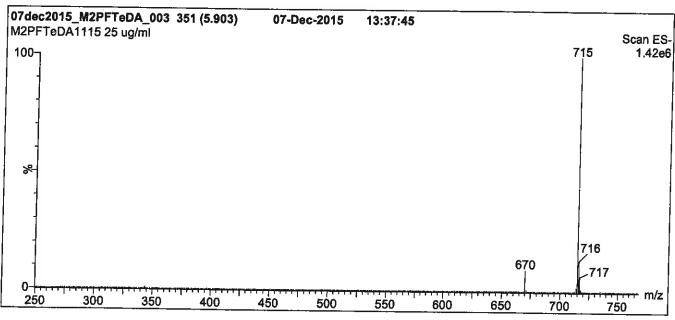




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Figure 1: M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)





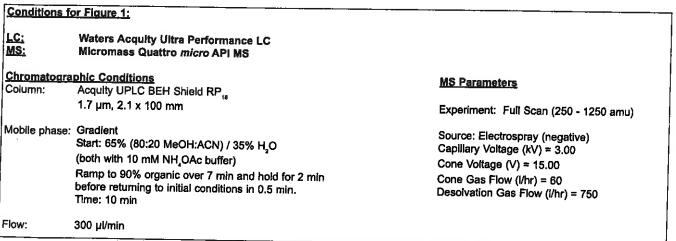
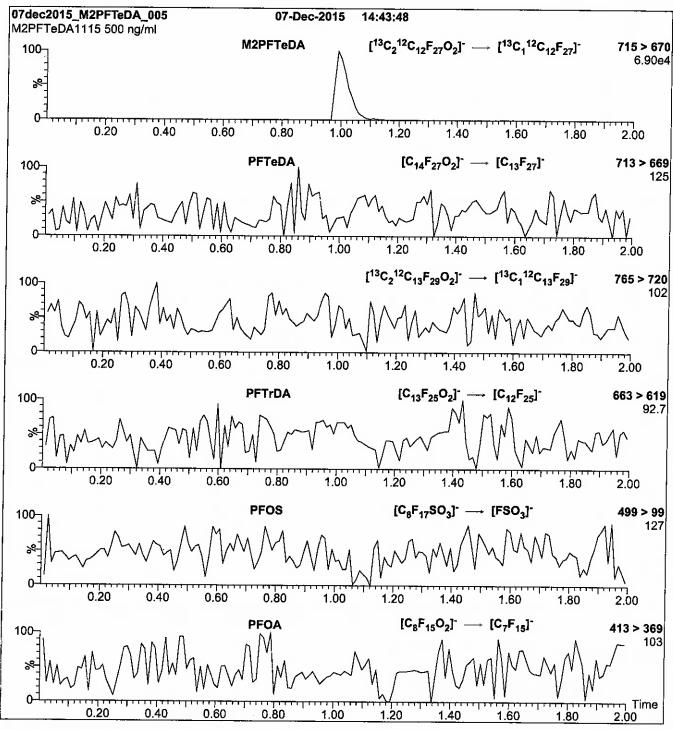


Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/mln

#### MS Parameters

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

# LCM4PFHPA\_00007

P: 8BC 0/22/16



in: LCM4PFHPA 00007 Exp: 05/27/21 Prpd: SBC 13C4-Perfluoroheptanoic a



VELLINGTON ABORATORJES

CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0516

COMPOUND:

Perfluoro-n-[1,2,3,4-13C]heptanoic acid

STRUCTURE:

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

13C, 12C, HF, O,

**MOLECULAR WEIGHT:** 368.03

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

Water (<1%) **ISOTOPIC PURITY:** 

≥99%13C

 $(1,2,3,4-{}^{13}C_{\lambda})$ 

LAST TESTED: (mm/dd/yyyy)

05/27/2016

EXPIRY DATE: (mm/dd/yyyy)

05/27/2021

**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:

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:

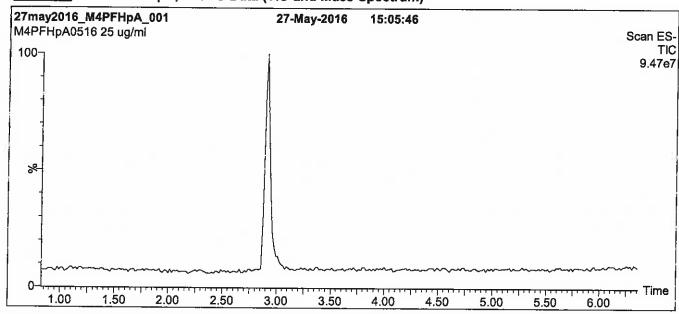
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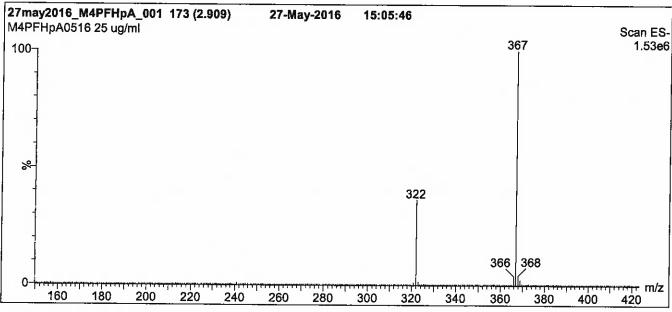




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Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





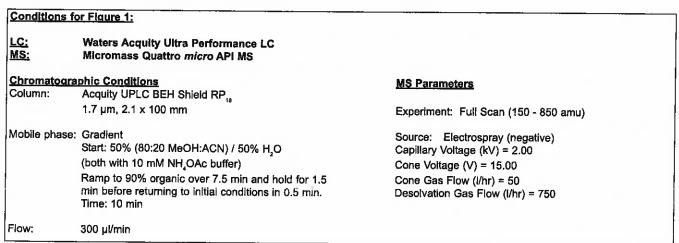
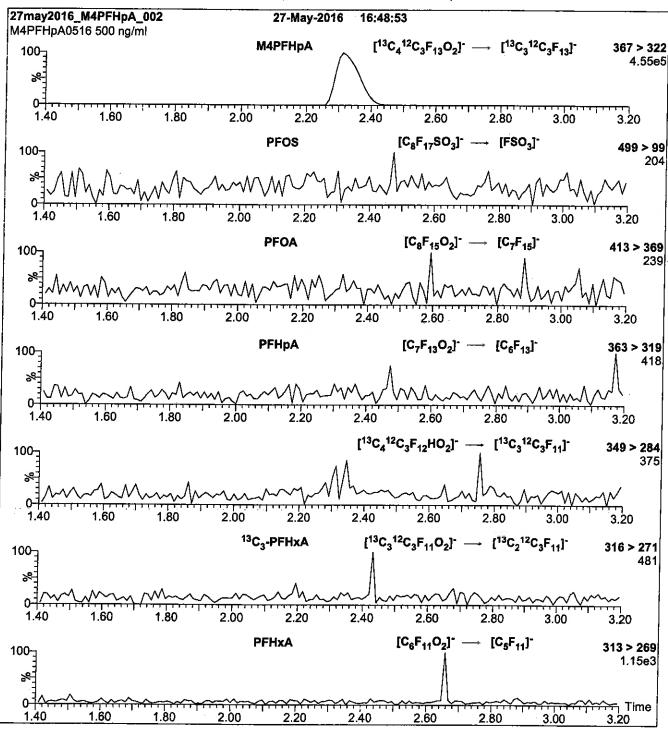
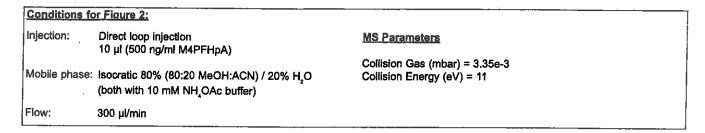


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





# LCM5PFPEA\_00008



ID: LCM5PFPEA\_00008 Exp: 05/22/20 Prpd: SBC 13C5-Perfluoropentanoic a



CERTIFICATE OF ANALYSIS

DOCUMENTATION

**PRODUCT CODE:** 

M5PFPeA

**LOT NUMBER:** 

M5PFPeA0515

**COMPOUND:** 

Perfluoro-n-[13C] pentanoic acid

CAS #:

Not available

STRUCTURE:

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>5</sub>HF<sub>9</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

269.01

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

≥99% 13C

 $(^{13}C_{c})$ 

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:

Date: <u>05/25/2015</u>

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:**

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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#### LIMITED WARRANTY:

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#### QUALITY MANAGEMENT:

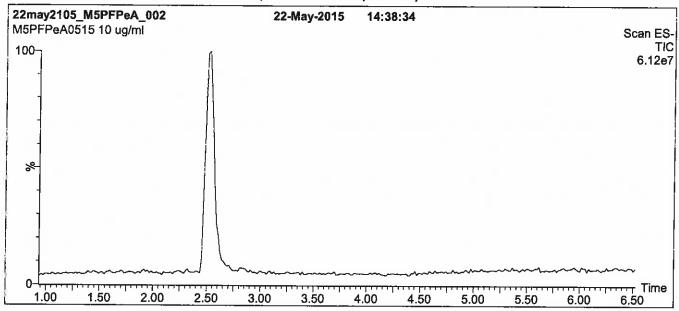
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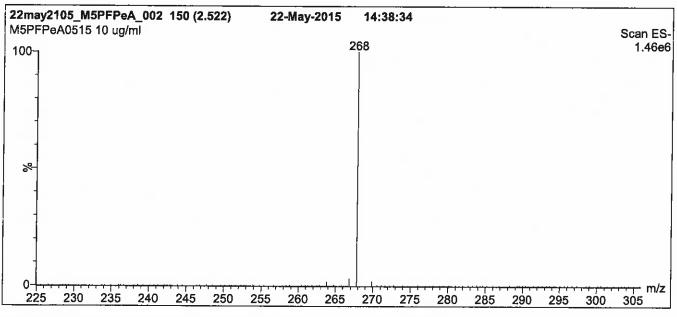




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Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





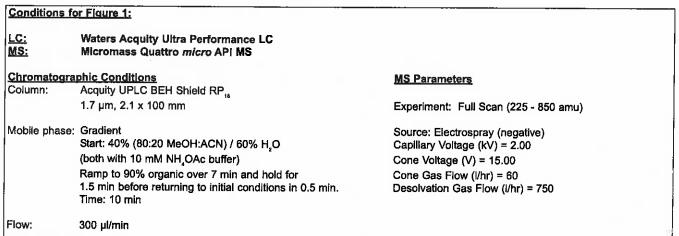
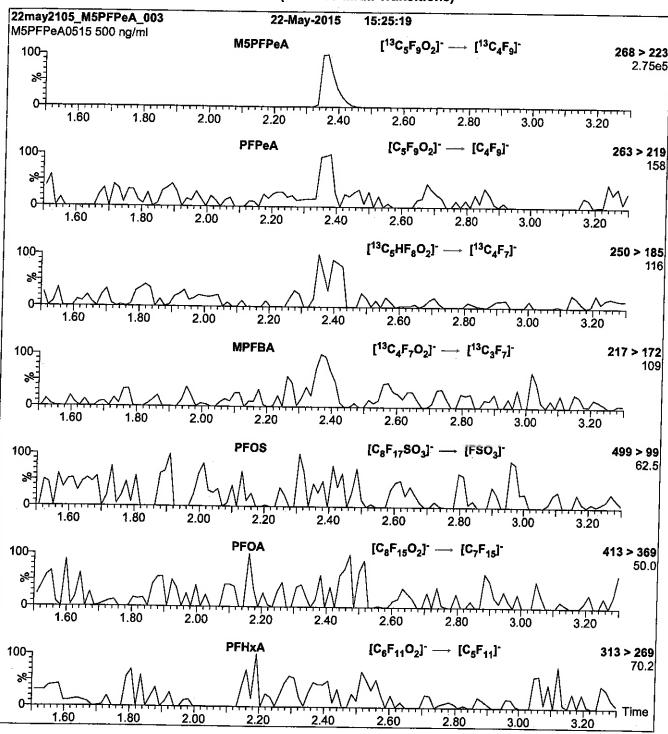
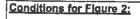


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

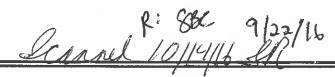
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300 µl/min

### MS Parameters

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

# LCM8FOSA\_00011





ID: LCM8FOSA\_00011 Exp: 12/22/17 Prod: SBC 13C8-Perfluorooctanesulfo



# CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

SOLVENT(S):

**M8FOSA1215I** 

**COMPOUND:** 

Perfluoro-1-[13C\_]octanesulfonamide

**STRUCTURE:** 

CAS #:

Not available

507.09

(13C<sub>a</sub>)

Isopropanol

≥99% <sup>13</sup>C

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>8</sub>H<sub>2</sub>F<sub>12</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

50 ± 2.5 μg/ml

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mrr/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2017

**RECOMMENDED STORAGE:** 

**DOCUMENTATION/ DATA ATTACHED:** 

Refrigerate ampoule

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: 01/14/2016

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

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:**

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The combined relative standard uncertainty,  $u_{o}(y)$ , of a value y and the uncertainty of the independent parameters

 $X_1, X_2, ..., X_n$  on which it depends is:

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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:**

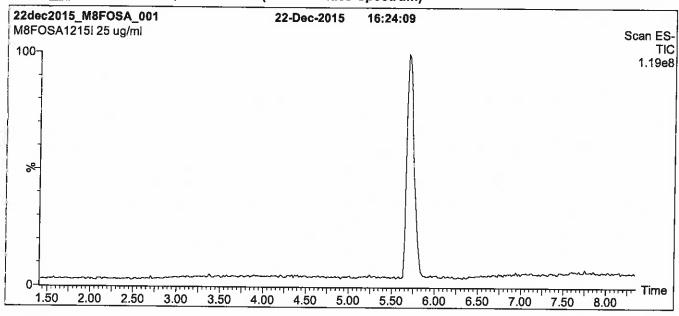
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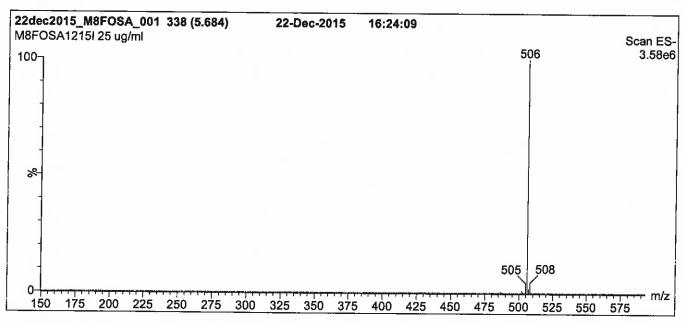




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Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





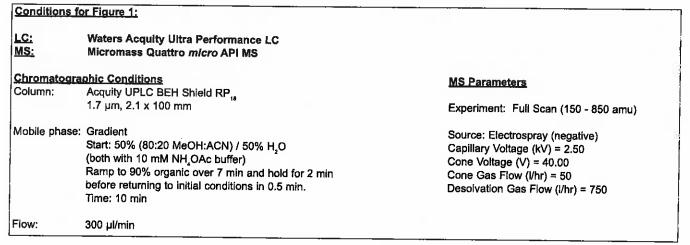
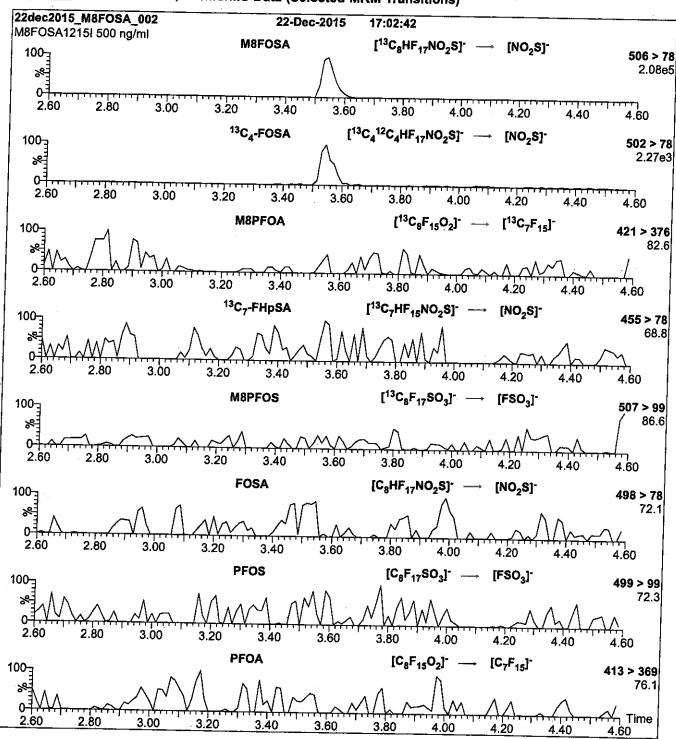
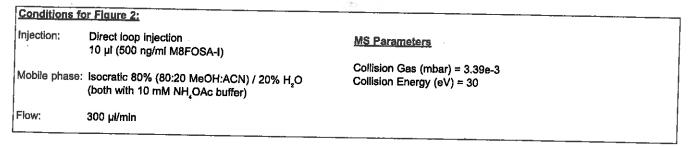


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFBA\_00008

R: 8BC 9/22/16



ID: LCMPFBA 00008 Exp: 05/24/21 Prpd: SBC 13C4-Perfluorobutanoic ac



# **CERTIFICATE OF ANALYSIS DOCUMENTATION**

Scanner 10/14/16

**PRODUCT CODE:** 

**MPFBA** 

**LOT NUMBER:** 

MPFBA0516

**COMPOUND:** 

Perfluoro-n-[1,2,3,4-13C] butanoic acid

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>4</sub>HF<sub>7</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

218.01

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

Water (<1%) ≥99%<sup>13</sup>C

LAST TESTED: (mm/dd/yyyy)

05/24/2016

(1,2,3,4-13C<sub>4</sub>)

EXPIRY DATE: (m:rv/dd/yyyy)

05/24/2021

**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.

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Certified By:

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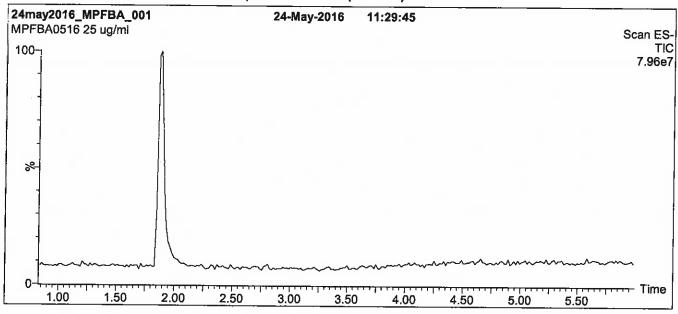
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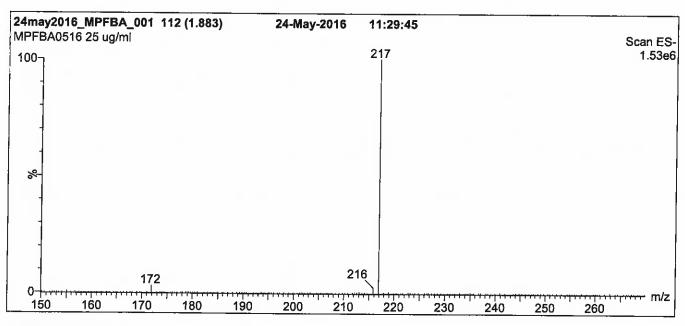




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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)





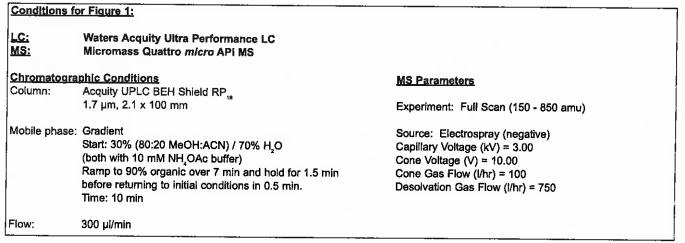
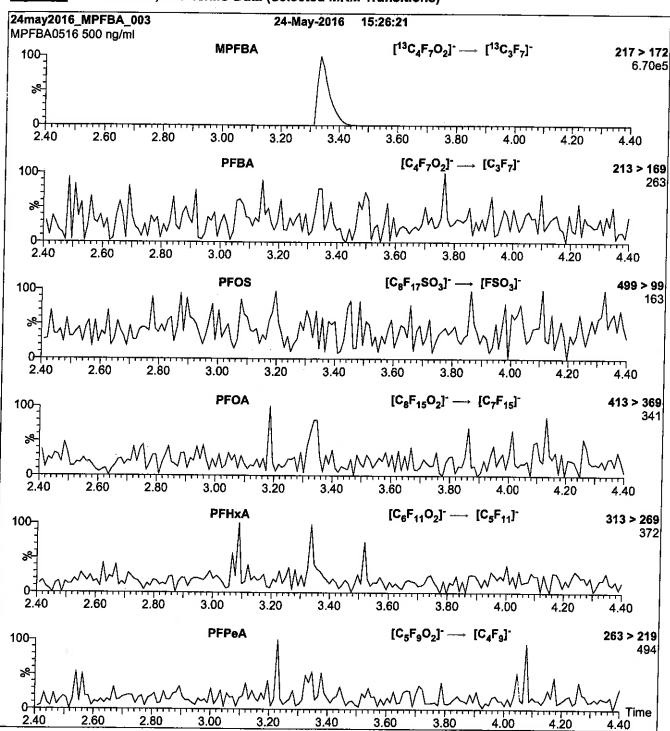
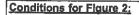


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop Injection

10 μl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

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

(DOM WILL TO THIS TAT 4

300 µl/min

# MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 10

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

# LCMPFDA\_00011



# CERTIFICATE OF ANALYSIS **DOCUMENTATION**

**PRODUCT CODE:** 

**MPFDA** 

**LOT NUMBER:** 

MPFDA0815

**COMPOUND:** 

Perfluoro-n-[1,2-13C] decanoic acid

Not available

**STRUCTURE:** 

CAS #:

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>HF<sub>19</sub>O<sub>2</sub>

**CONCENTRATION:** 

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 

516.07

Methanol

**ISOTOPIC PURITY:** 

SOLVENT(S):

Water (<1%) ≥99% 13C

 $(1,2^{-13}C_3)$ 

LAST TESTED: (mm/dd/yyyy)

08/19/2015

>98%

EXPIRY DATE: (mm/dd/yyyy)

**CHEMICAL PURITY:** 

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 13C,-PFNA.

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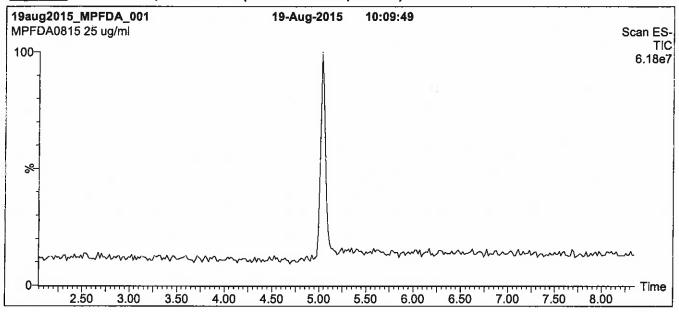
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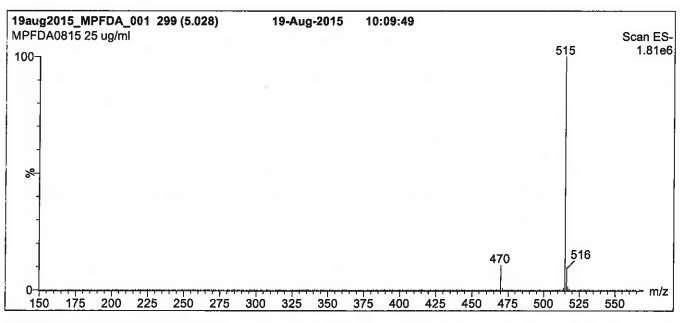




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





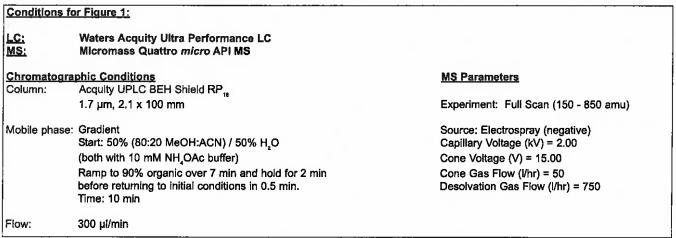
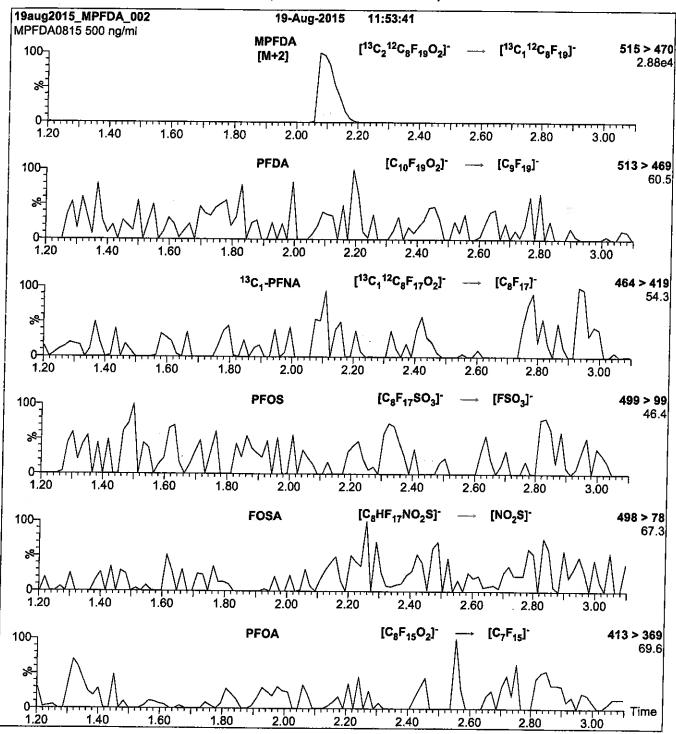
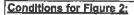


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection: Direct loop injection

10 μl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH\_OAc buffer)

Flow: 300 µl/min

# MS Parameters

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

# LCMPFDoA\_00008

# CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**MPFDoA** 

LOT NUMBER:

MPFDoA0416

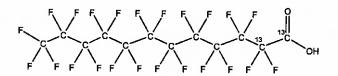
**COMPOUND:** 

Perfluoro-n-[1,2-13C] dodecanoic acid

STRUCTURE:

**CAS #:** 

Not available



**MOLECULAR FORMULA:** 

13C, 12C, HF, O,

**CONCENTRATION:** 

**MOLECULAR WEIGHT:** 

616.08

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

04/08/2016

EXPIRY DATE: (mm/dd/yyyy)

04/08/2021

RECOMMENDED STORAGE:

**ISOTOPIC PURITY:** 

≥99% 13C  $(1,2^{-13}C_{2})$ 

Store ampoule in a cool, dark place

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

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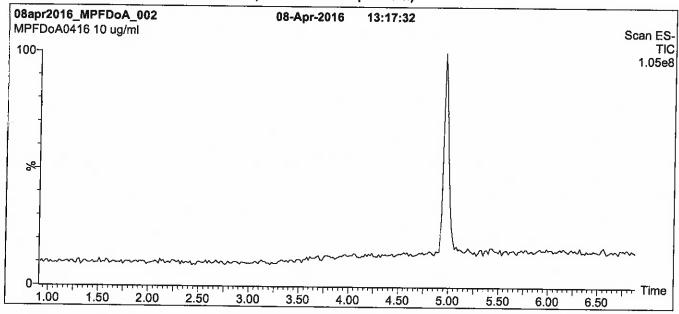
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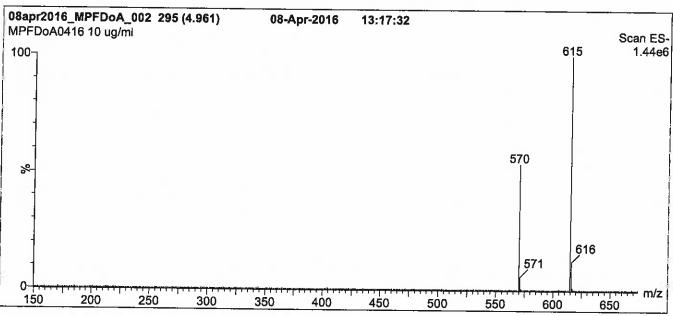


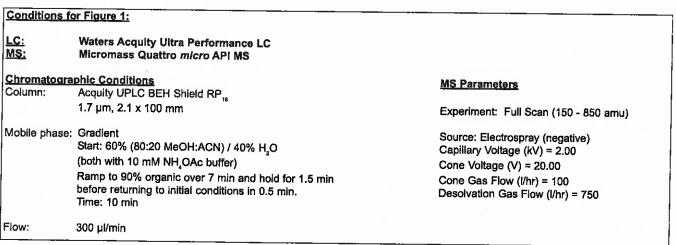


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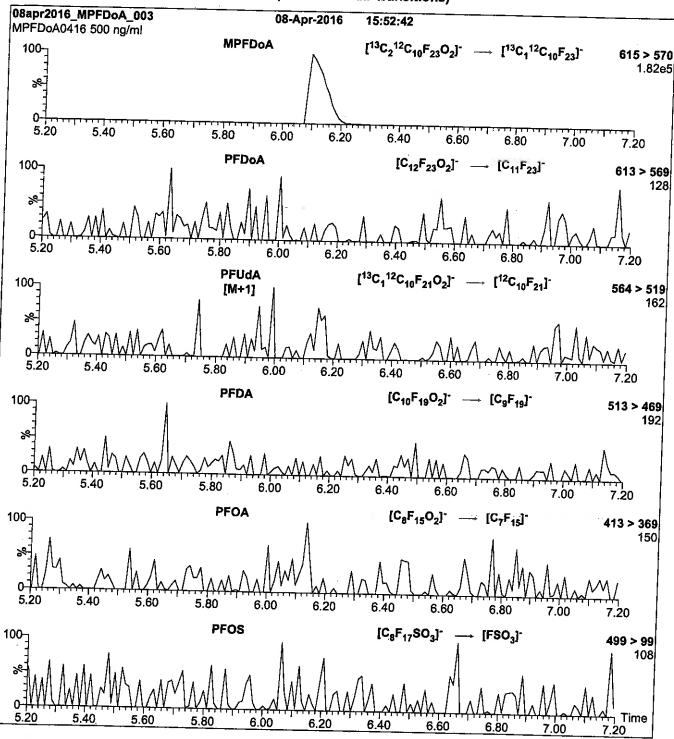
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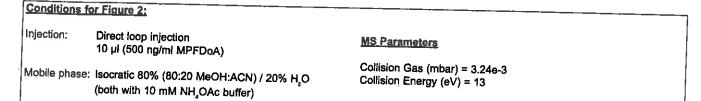






<u>Figure 2:</u> MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





Revision#:3, Revised 2015-03-24

300 µl/min

Flow:

# LCMPFHxA\_00012





739612

ID: LCMPFHxA\_00012 Exp: 04/08/21 Prpd: SBC 13C2-Perfluorohexanoic ad



# CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**MPFHxA** 

LOT NUMBER:

MPFHxA0416

COMPOUND:

Perfluoro-n-[1,2-13C<sub>2</sub>]hexanoic acid

**STRUCTURE:** 

CAS #:

Not available

F F F F F F

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>4</sub>HF<sub>11</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

316.04

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

≥99%¹³C (1,2-¹³C₂)

Water (<1%)

LAST TESTED: (mm/dd/yyyy)

04/08/2016

EXPIRY DATE: (mm/dd/yyyy)

04/08/2021

**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 < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.</li>

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: (

04/29/2016

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

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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 $X_i, X_j, ..., X_n$  on which it depends is:

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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:

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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:**

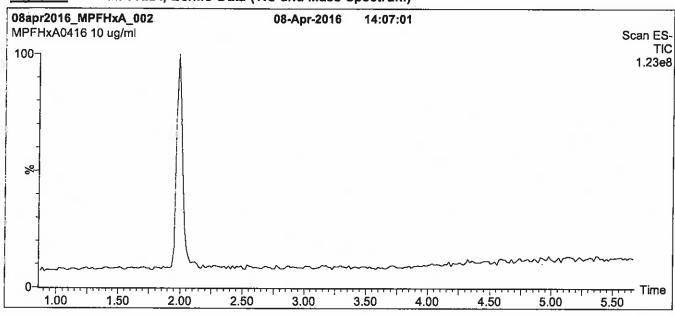
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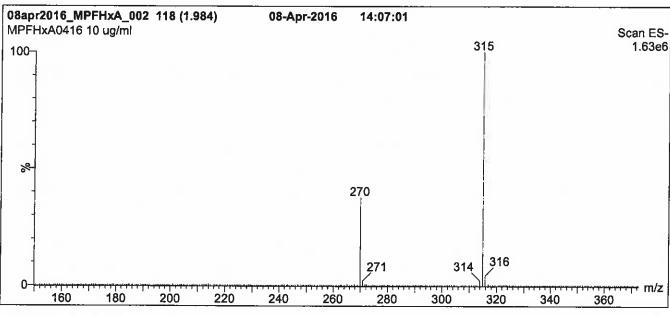




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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)





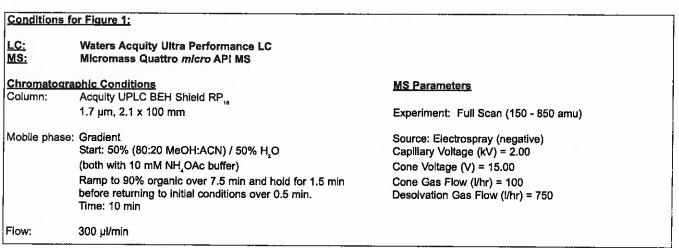
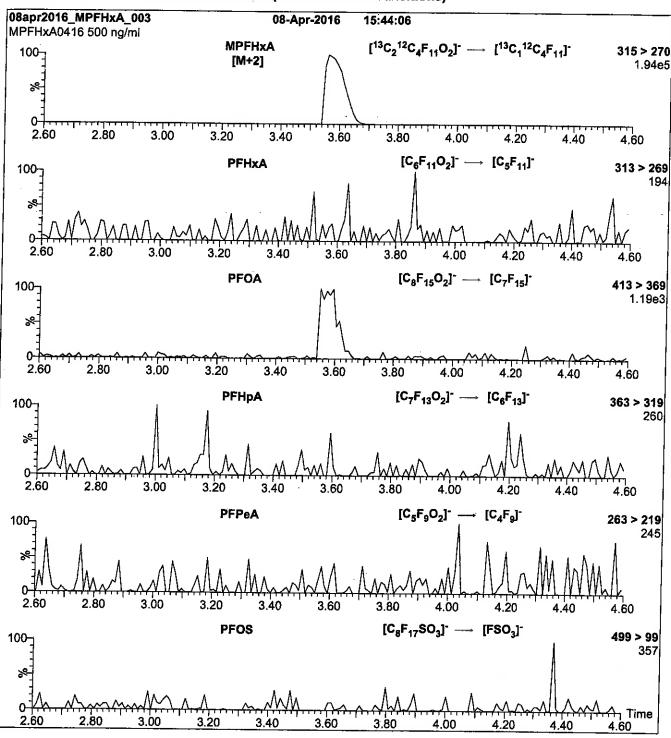
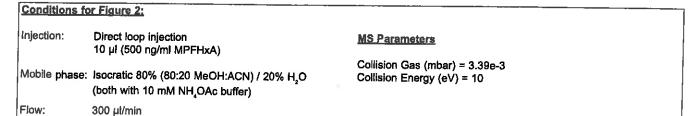


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFHxS\_00008

f: 8BC 9/22/16



ID: LCMPFHxS\_00008 Exp: 10/23/20 Prpd: SBC 18O2-Perfluorohexanesulfo



# VELLINGTC ABORATORI

**CERTIFICATE OF ANALYSIS** 

DOCUMENTATION

PRODUCT CODE:

**MPFHxS** 

**LOT NUMBER:** 

MPFHxS1015

COMPOUND:

Sodium perfluoro-1-hexane[18O2]sulfonate

STRUCTURE:

CAS #:

Not available

**MOLECULAR FORMULA:** 

C<sub>6</sub>F<sub>13</sub>S<sup>18</sup>O<sub>2</sub><sup>16</sup>ONa

**MOLECULAR WEIGHT:** 

426.10

**CONCENTRATION:** 

 $50.0 \pm 2.5 \mu g/ml$  (Na salt)

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

>94% (18O<sub>3</sub>)

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

10/23/2015 10/23/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

 $47.3 \pm 2.4 \mu g/ml$  (MPFHxS anion)

# **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<sub>8</sub>F<sub>13</sub>S<sup>18</sup>O<sub>2</sub>) has been observed to be up to 10% lower than for PFHxS (C<sub>6</sub>F<sub>13</sub>S<sup>16</sup>O<sub>3</sub>) 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:

Date: 10/28/2015

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

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 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, 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:**

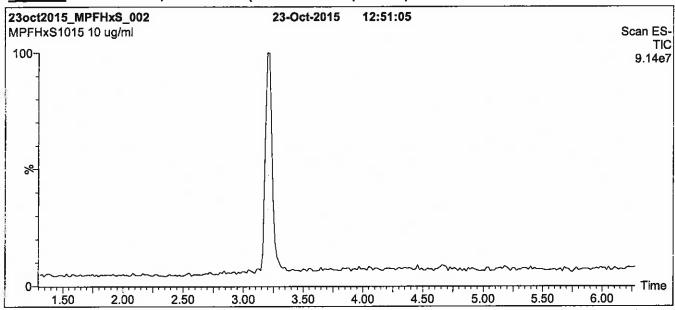
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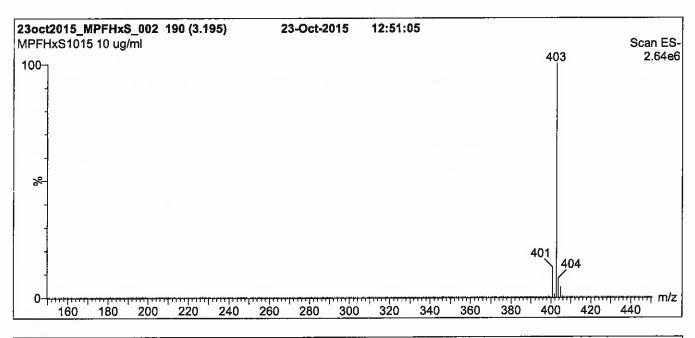




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Figure 1: MPFHxS; LC/MS Data (TIC and Mass Spectrum)





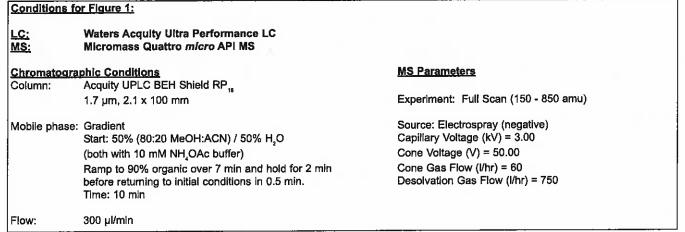
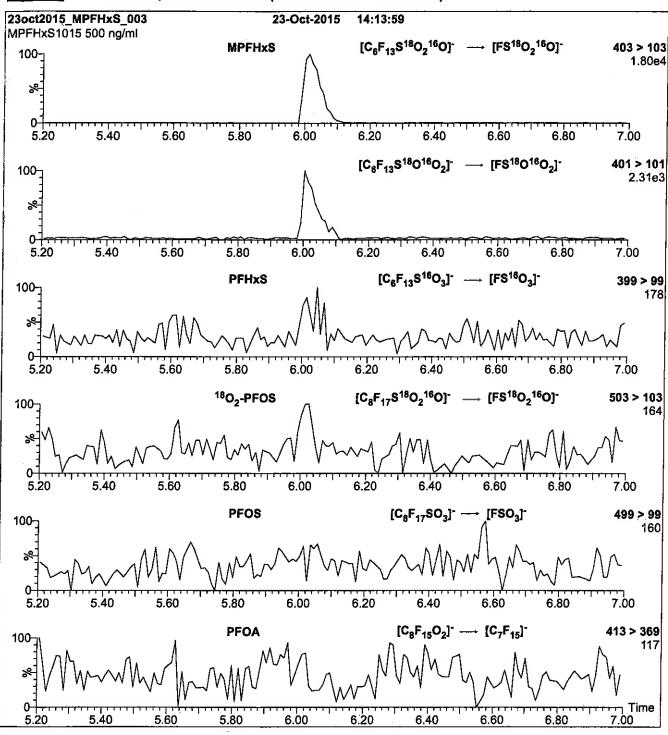
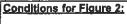


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH,OAc buffer)

# MS Parameters

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

(20...

Flow:

300 µl/min

# LCMPFNA\_00008



# ABORATORIES

# **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

**MPFNA** 

**LOT NUMBER:** 

MPFNA0414

**COMPOUND:** 

Perfluoro-n-[1,2,3,4,5-13C<sub>s</sub>]nonanoic acid

**CAS #:** 

Not available

STRUCTURE:

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>5</sub><sup>12</sup>C<sub>4</sub>HF<sub>17</sub>O<sub>7</sub>

MOLECULAR WEIGHT:

469.04

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanoi Water (<1%)

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

>99%13C

 $(1,2,3,4,5^{-13}C_{5})$ 

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:

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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# **SYNTHESIS / CHARACTERIZATION:**

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# **TRACEABILITY:**

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# **LIMITED WARRANTY:**

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# **QUALITY MANAGEMENT:**

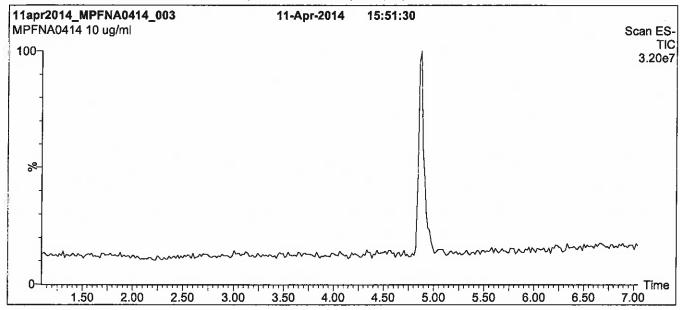
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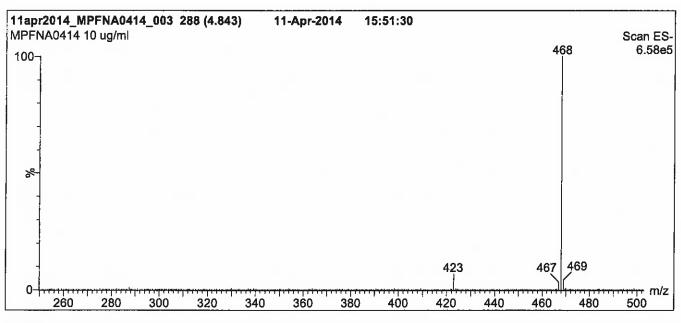




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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





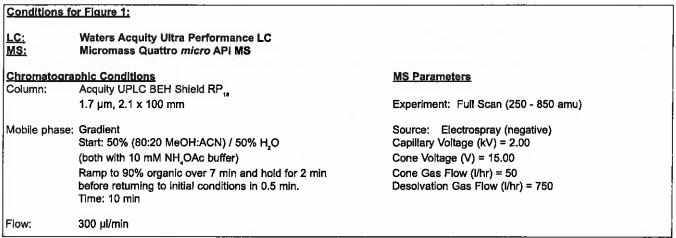
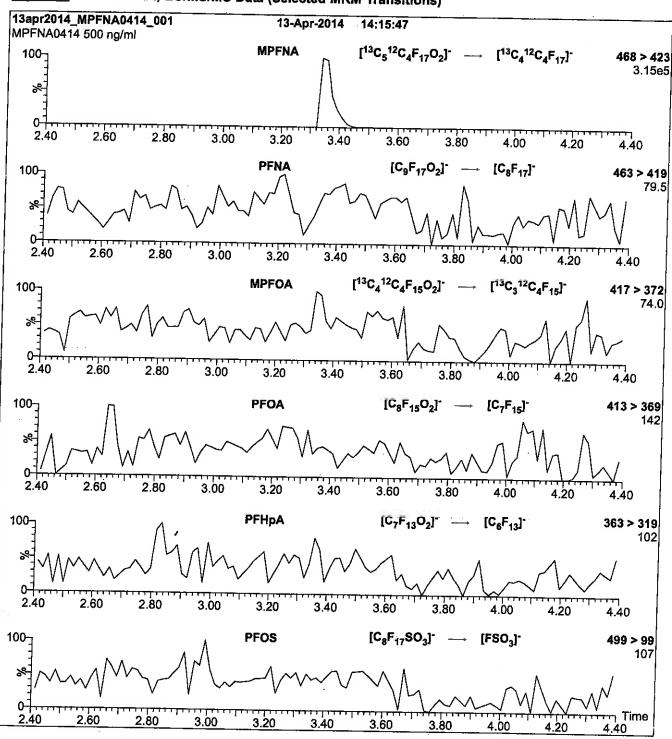
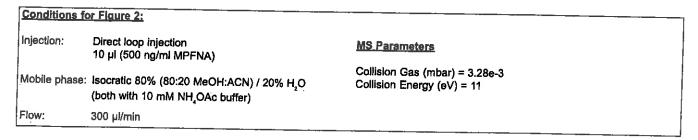


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFOA\_00012



ID: LCMPFOA\_00012 Exp: 01/22/21 Prpd: SBC 13C4-Perfluorooctanoic ac



### **CERTIFICATE OF ANALYSIS DOCUMENTATION**

PRODUCT CODE:

**MPFOA** 

LOT NUMBER:

MPFOA0116

**COMPOUND:** 

Perfluoro-n-[1,2,3,4-13C] octanoic acid

CAS #:

Not available

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>4</sub>HF<sub>15</sub>O<sub>2</sub>

**CONCENTRATION:** 

50 ± 2.5 µg/mi

**MOLECULAR WEIGHT:** 

418.04

SOLVENT(S):

Methanol Water (<1%)

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

≥99% <sup>13</sup>C

 $(1,2,3,4^{-13}C_{\lambda})$ 

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.

Contains ~ 0.1% of native perfluoro-n-octanoic acid (PFOA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

**Certified By:** 

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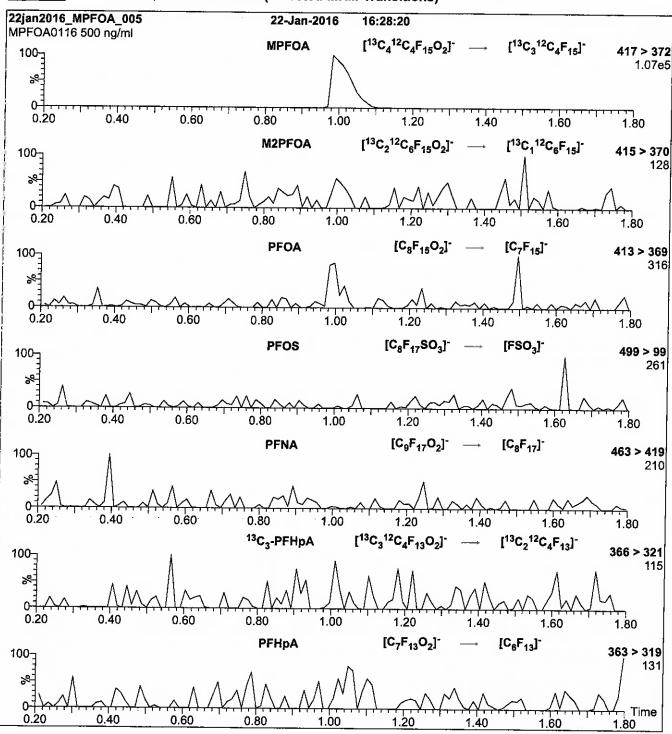
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Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)



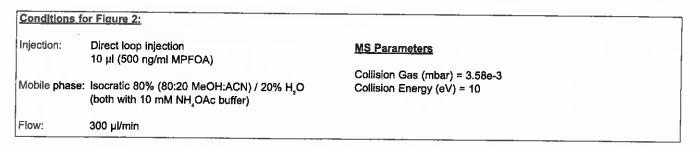
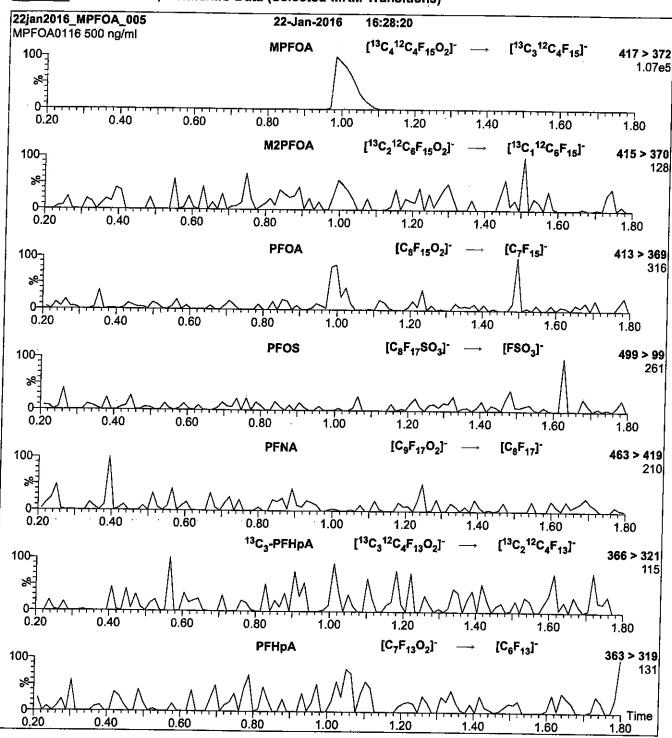
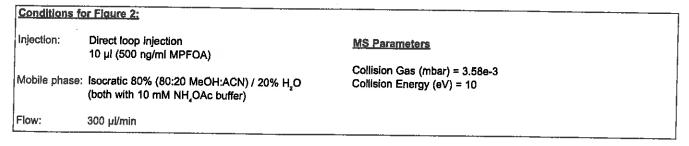


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFOS\_00017

R: 9/9/16 8BC





# VELLINGTON ABORATORIES

### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**MPFOS** 

LOT NUMBER:

**MPFOS0816** 

**COMPOUND:** 

Sodium perfluoro-1-[1,2,3,4-13C] octanesulfonate

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na

MOLECULAR WEIGHT:

526.08

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu\text{g/ml}$  (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

≥99% 13C

(1,2,3,4-13C<sub>4</sub>)

LAST TESTED: (mm/dd/yyyy)

08/03/2016

EXPIRY DATE: (mm/dd/yyyy)

08/03/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

 $47.8 \pm 2.4 \mu g/ml$  (MPFOS anion)

### **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-[1,2,3-13C]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 08/05/2016

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 ciothing 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

 $x_1, x_2, ..., x_n$  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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

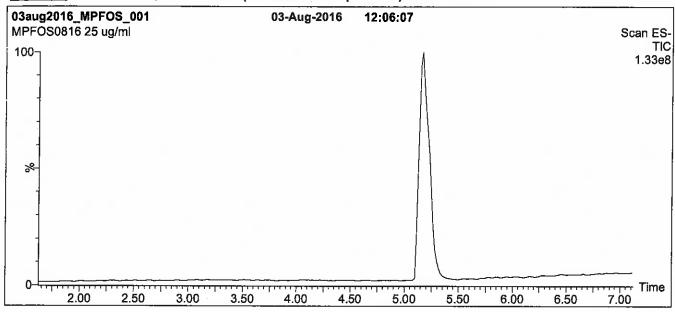
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

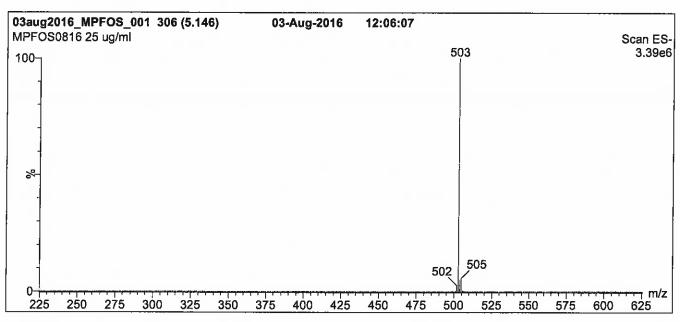




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="mailto:www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

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





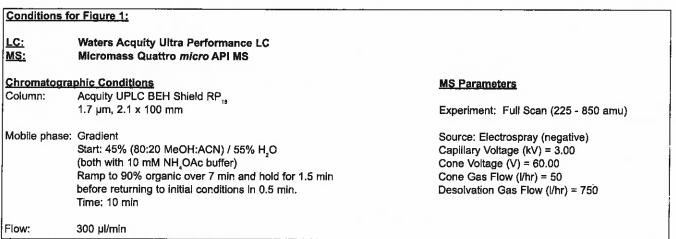
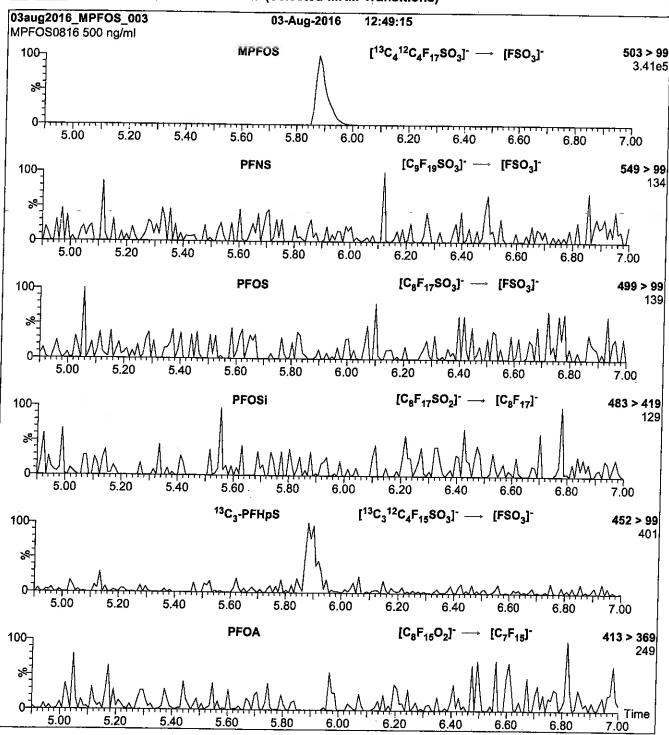
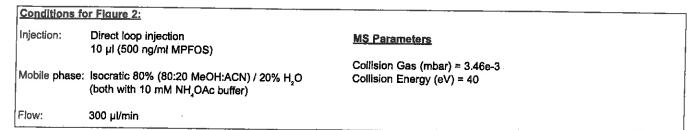


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFUdA\_00009



# WELLINGTON ABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:

**MPFUdA** 

**LOT NUMBER:** 

MPFUdA0216

**COMPOUND:** 

Perfluoro-n-[1,2-13C<sub>2</sub>]undecanoic acid

**STRUCTURE:** 

CAS#:

Not available

**MOLECULAR FORMULA:** 

13C, 12C, HF, O,

**MOLECULAR WEIGHT:** 

566.08

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol Water (<1%)

(1,2-13C<sub>2</sub>)

**ISOTOPIC PURITY:** 

>99% 13C

LAST TESTED: (mm/dd/yyyy)

>98%

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

**CHEMICAL PURITY:** 

02/12/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

### ADDITIONAL INFORMATION:

**DOCUMENTATION/ DATA ATTACHED:** 

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 1-13C,-PFUdA (~1%; see Figure 2), 2-13C,-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the <sup>13</sup>C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified Bv:

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

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 ciothing 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:**

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The combined relative standard uncertainty,  $u_{c}(y)$ , of a value y and the uncertainty of the independent parameters

x1, x2,...x, 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:

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:

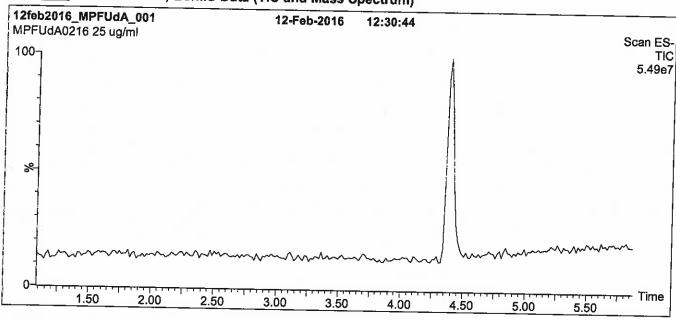
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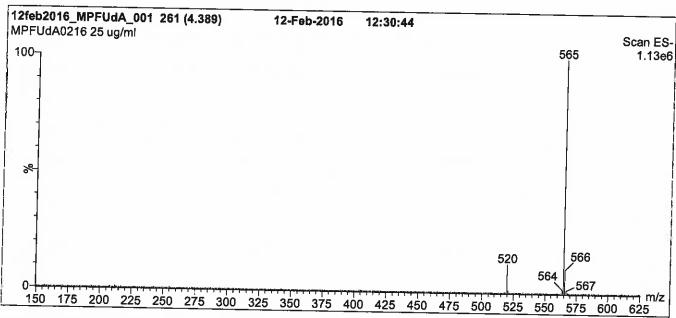




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Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)





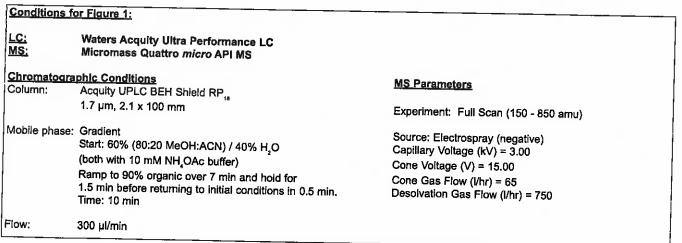
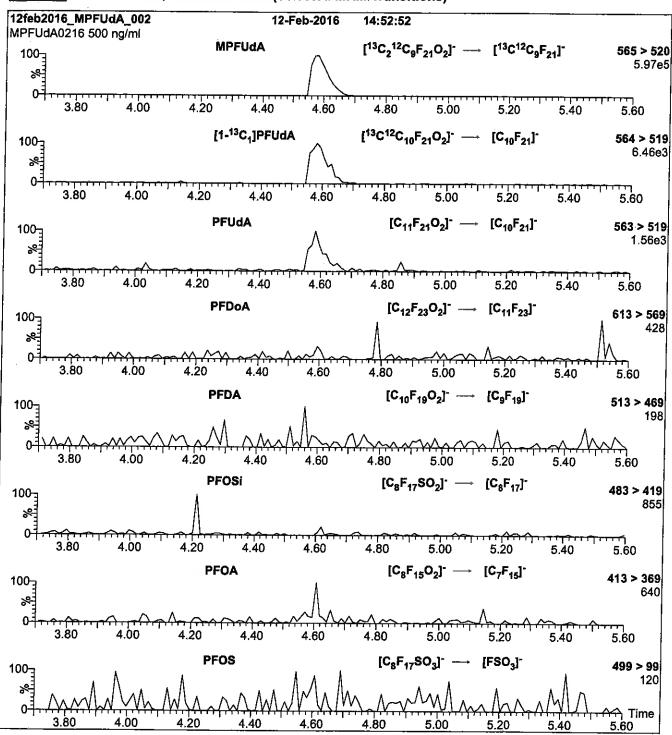
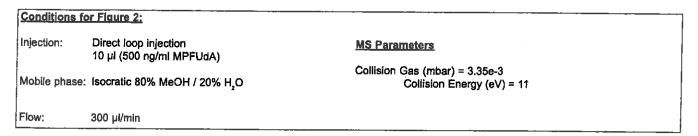


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





# LCN-EtFOSA-M\_00002



### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

N-EtFOSA-M

**LOT NUMBER:** 

NEtFQSA0714M

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamide

CAS #:

4151-50-2

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

C<sub>10</sub>H<sub>8</sub>F<sub>17</sub>NO<sub>2</sub>S

**MOLECULAR WEIGHT:** SOLVENT(S):

527.20 Methanol

**CONCENTRATION: CHEMICAL PURITY:**   $50 \pm 2.5 \,\mu g/ml$ 

>98%

LAST TESTED: (mm/dd/yyyy)

07/14/2014

EXPIRY DATE: (mm/dd/yyyy)

07/14/2019

**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:

Date: 04/01/2015

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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#### 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:**

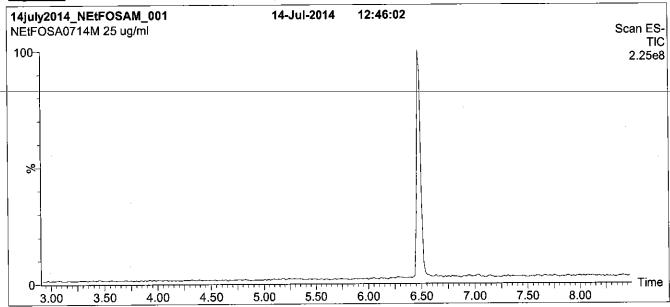
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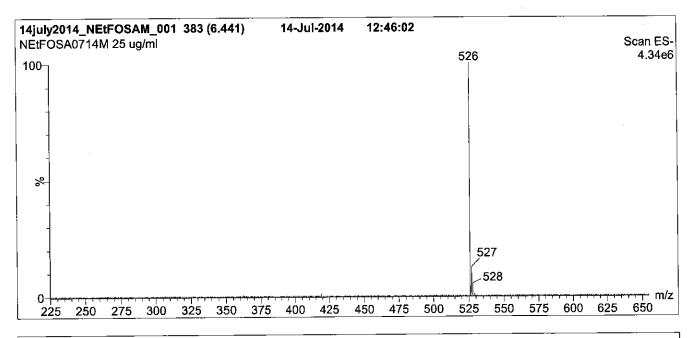




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





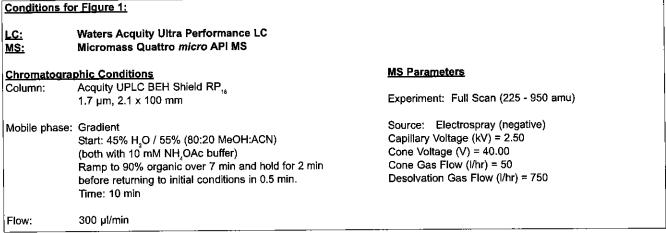
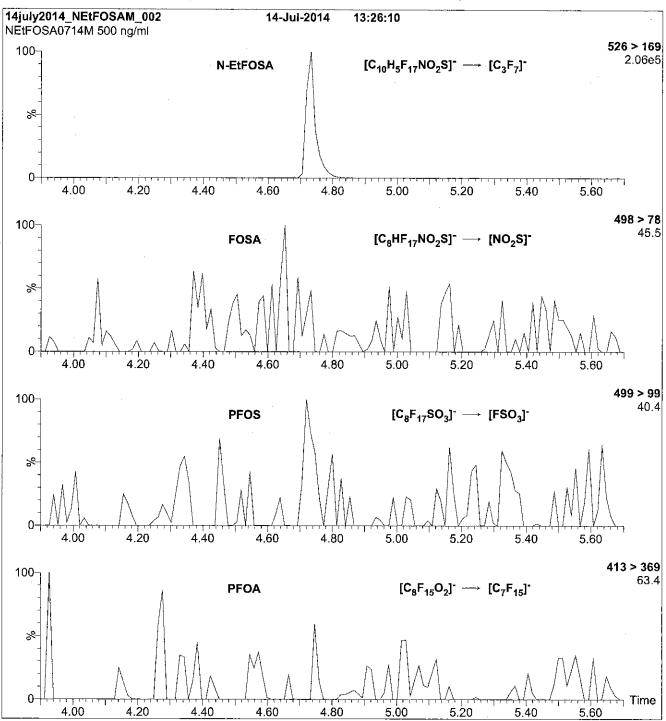
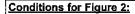


Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml N-EtFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

### **MS Parameters**

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 30

# LCN-EtFOSA-M\_00003

# VELLINGTON ABORATORIES

### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

N-EtFOSA-M

**LOT NUMBER:** 

NEtFOSA0516M

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamide

CAS #:

4151-50-2

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

 $C_{10}H_8F_{17}NO_2S$ 

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:** SOLVENT(S):

527.20

Methanol

### **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:

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

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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### **HOMOGENEITY:**

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### **LIMITED WARRANTY:**

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### **QUALITY MANAGEMENT:**

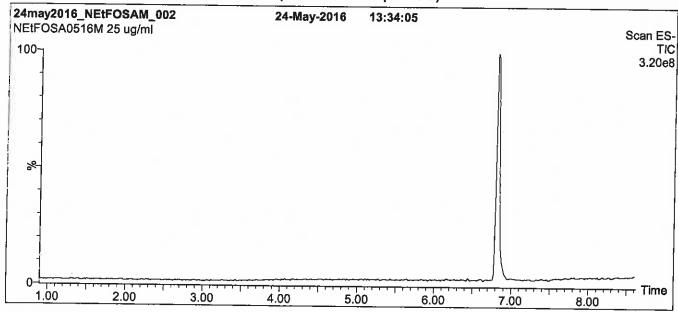
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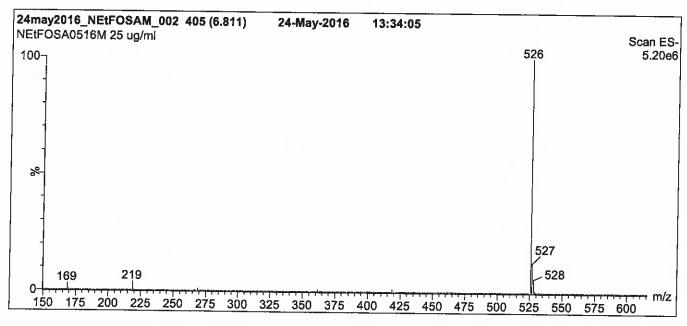




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Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





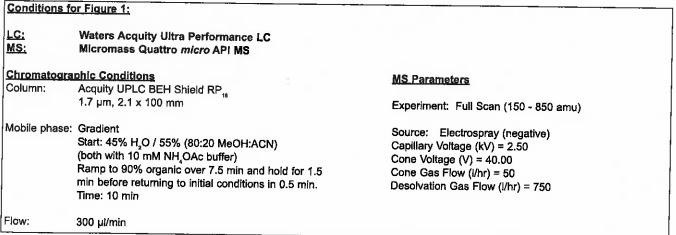
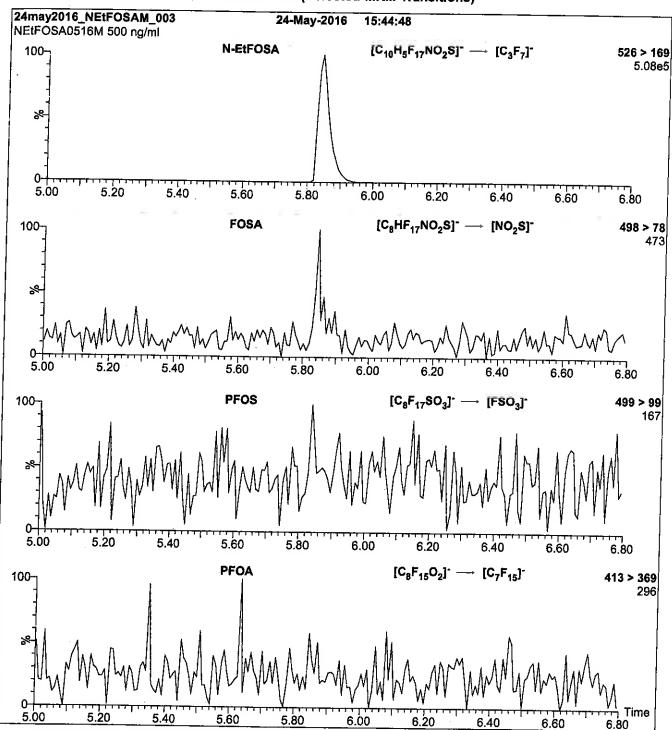
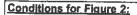


Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop Injection

10 μl (500 ng/ml N-EtFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH OAc buffer)

Flow:

300 µl/min

### MS Parameters

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30

# LCN-EtFOSAA\_00001



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

N-EtFOSAA

**LOT NUMBER:** 

NEtFOSAA0113

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

**CAS #:** 

2991-50-6

ÇH<sub>2</sub>CH<sub>3</sub>

**MOLECULAR FORMULA:** 

C<sub>12</sub>H<sub>8</sub>F<sub>17</sub>NO<sub>4</sub>S

**MOLECULAR WEIGHT:** 

585.23

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/29/2013

EXPIRY DATE: (mm/dd/yyyy)

01/29/2018

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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 04/06/2015

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

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

 $x_1, x_2,...x_n$  on which it depends is:

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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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### **LIMITED WARRANTY:**

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### **QUALITY MANAGEMENT:**

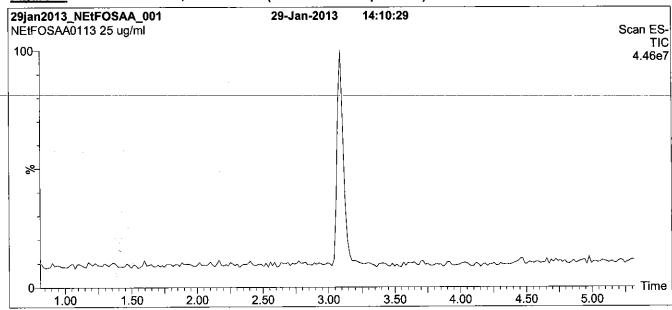
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

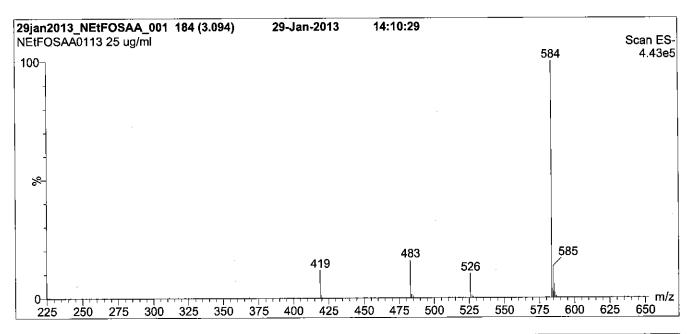




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Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





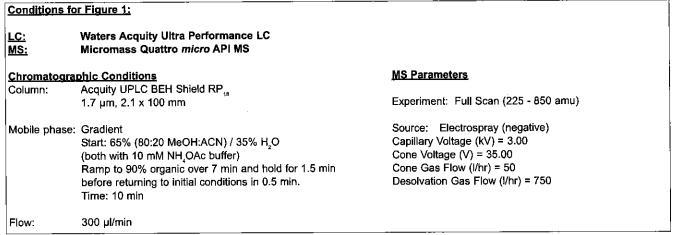
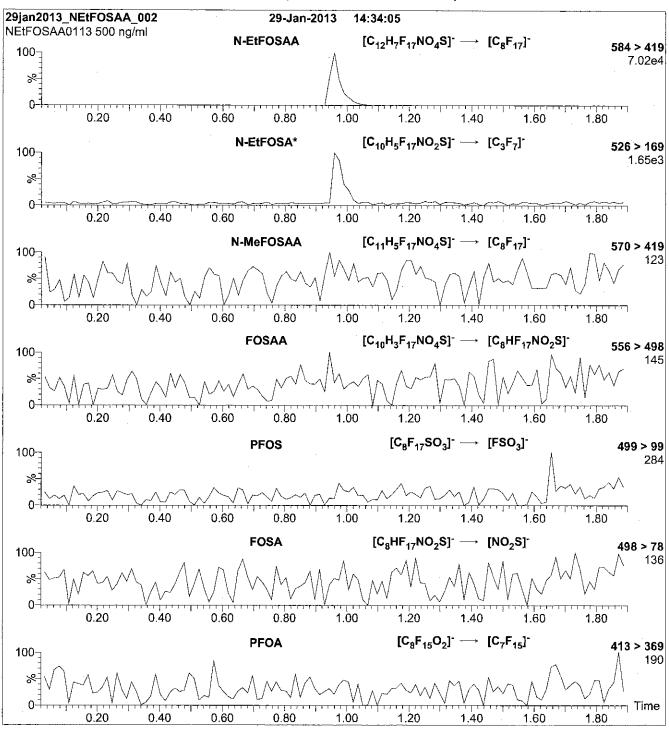
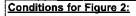


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.



Injection:

Direct loop injection

10 µl (500 ng/ml N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\rm H_2O$ 

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3

Collision Energy (eV) = 25

# LCN-EtFOSAA\_00002





## CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSAA

LOT NUMBER:

NEtFOSAA0116

COMPOUND:

N-ethylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

ÇAS #:

2991-50-6

**MOLECULAR FORMULA:** 

C<sub>12</sub>H<sub>B</sub>F<sub>17</sub>NO<sub>4</sub>S

MOLECULAR WEIGHT:

585.23

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

**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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid molety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

U 1/2 1/2U 10

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

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### LIMITED WARRANTY:

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### **QUALITY MANAGEMENT:**

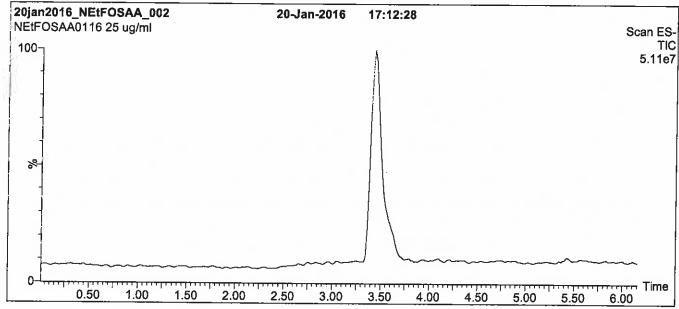
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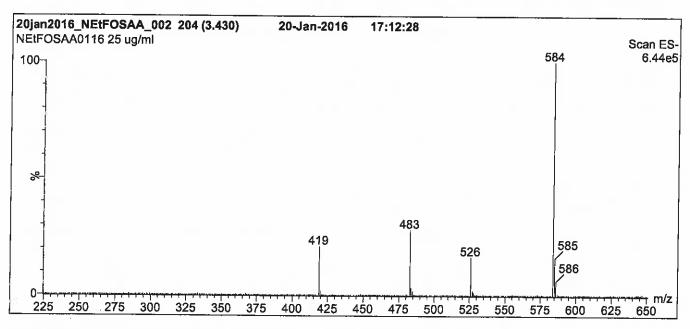




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Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





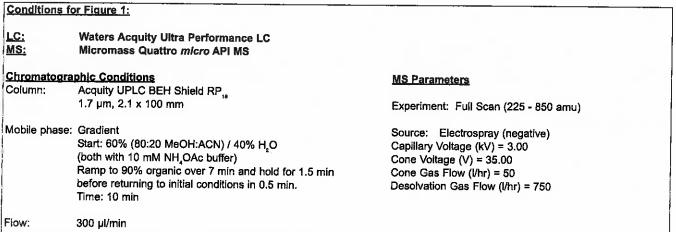
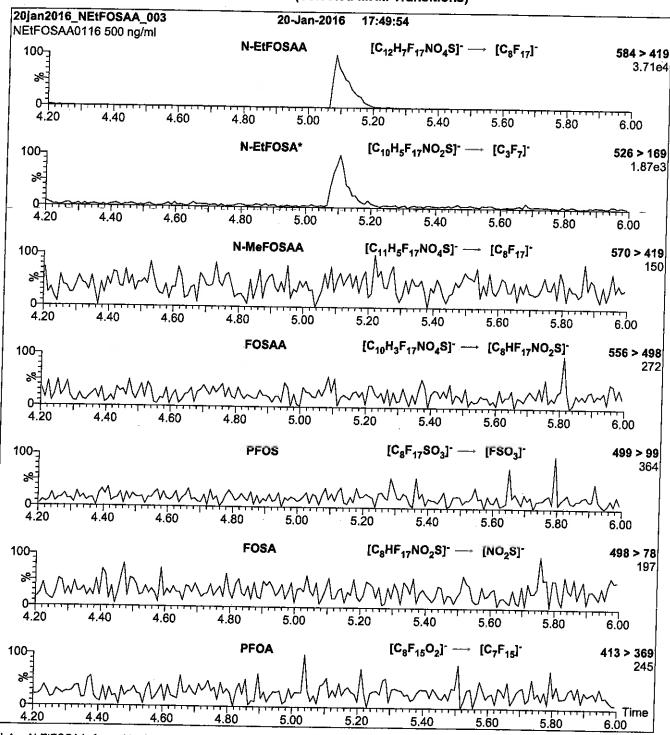
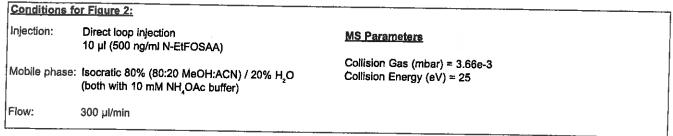


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



Note: N-EtFOSA is formed by fragmentation of N-EtFOSAA.



# LCN-MeFOSA-M\_00001



### CERTIFICATE OF ANALYSIS **DOCUMENTATION**

**PRODUCT CODE:** 

N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

CAS #:

NMeFOSA0714M

513.17

Methanol

**COMPOUND:** 

N-methylperfluoro-1-octanesulfonamide

31506-32-8

STRUCTURE:

**MOLECULAR FORMULA:** 

C<sub>2</sub>H<sub>4</sub>F<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

07/15/2014

EXPIRY DATE: (mm/dd/yyyy)

07/15/2019

**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:

Date: \_ 04/01/2015

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:

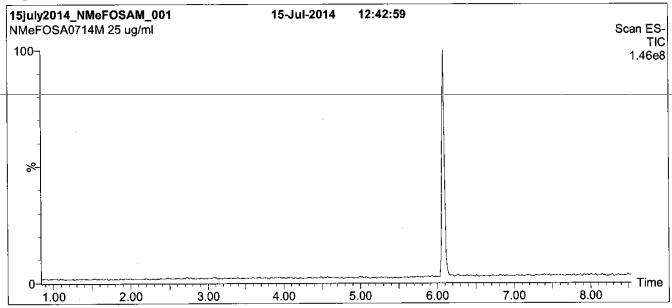
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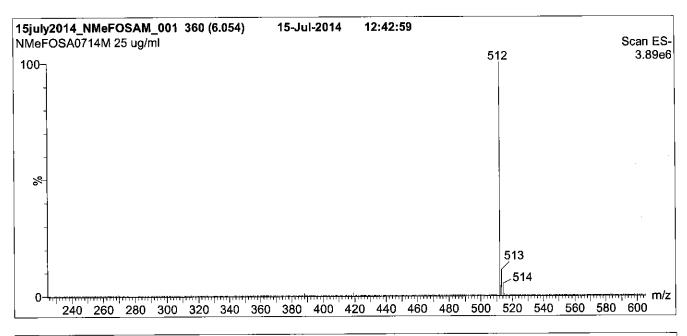




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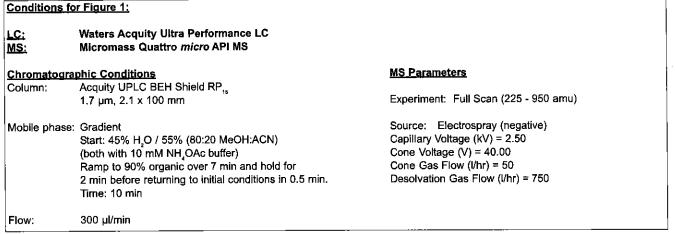
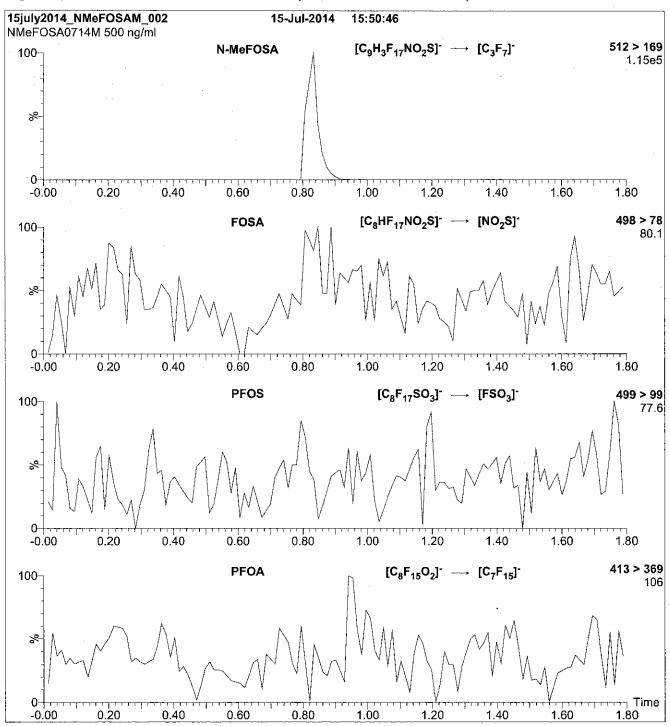
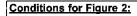


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml N-MeFOSA-M)

 $\begin{array}{lll} \mbox{Mobile phase: Isocratic 80\% (80:20 MeOH:ACN) / 20\% \ H_{_2}O \\ \mbox{(both with 10 mM NH}_{_4}OAc buffer) \end{array}$ 

Flow:

300 µl/min

# MS Parameters

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30

# LCN-MeFOSA-M\_00002



# WELLINGTON LABORATORIES

# **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

NMeFOSA0516M

513.17

Methanol

COMPOUND:

N-methylperfluoro-1-octanesulfonamide

CAS #:

31506-32-8

STRUCTURE:

**MOLECULAR FORMULA:** 

C<sub>9</sub>H<sub>4</sub>F<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

**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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/26/2016

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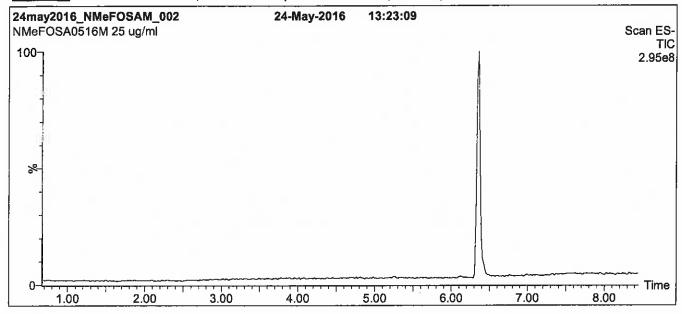
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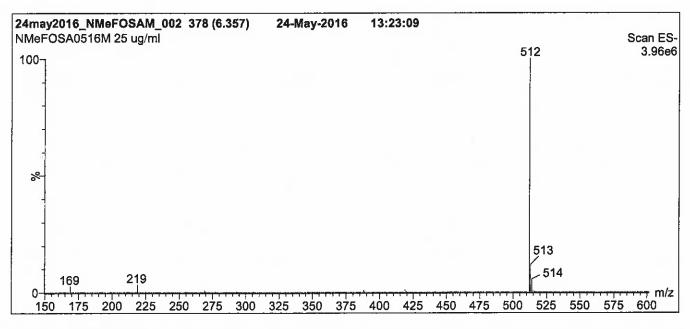




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Figure 1: N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





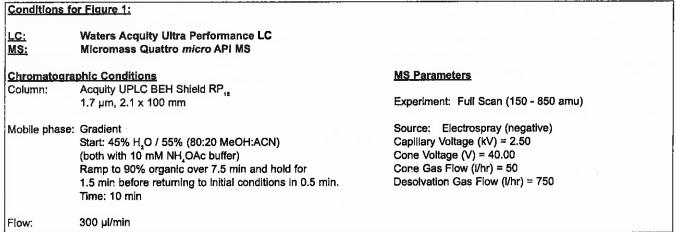
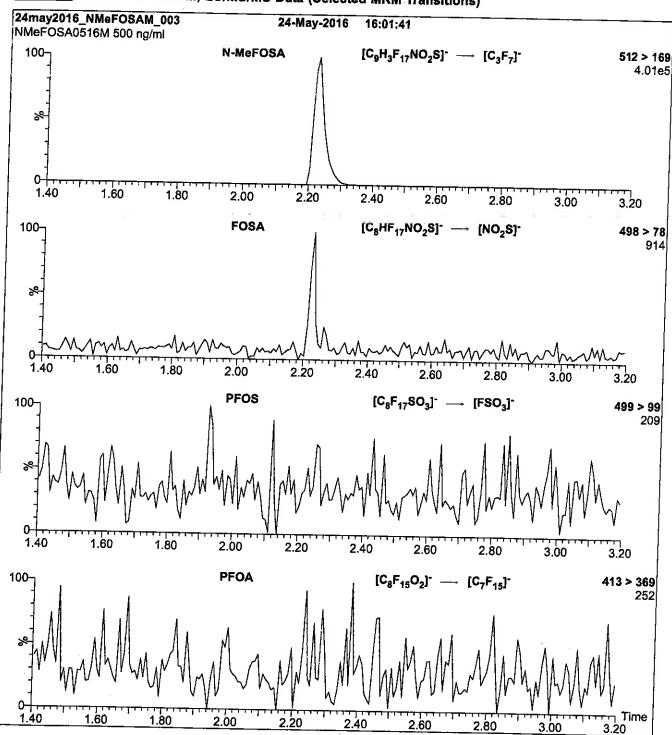
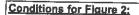


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml N-MeFOSA-M)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH,OAc buffer)

MS Parameters

Collision Gas (mbar) ≈ 3.54e-3 Collision Energy (eV) = 30

Flow:

300 µl/min

# LCN-MeFOSAA\_00001



# CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSAA

**LOT NUMBER:** 

NMeFOSAA1214

**COMPOUND:** 

N-methylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

CAS #:

2355-31-9

**MOLECULAR FORMULA:** 

C<sub>11</sub>H<sub>6</sub>F<sub>17</sub>NO<sub>4</sub>S

**MOLECULAR WEIGHT:** 

571.21

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

12/09/2014

EXPIRY DATE: (mm/dd/yyyy)

12/09/2019

**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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

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Certified By:

Date: 04/06/2015

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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

 $x_1, x_2,...x_n$  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:**

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:**

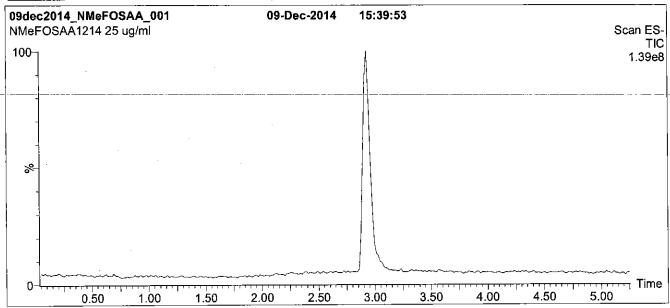
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

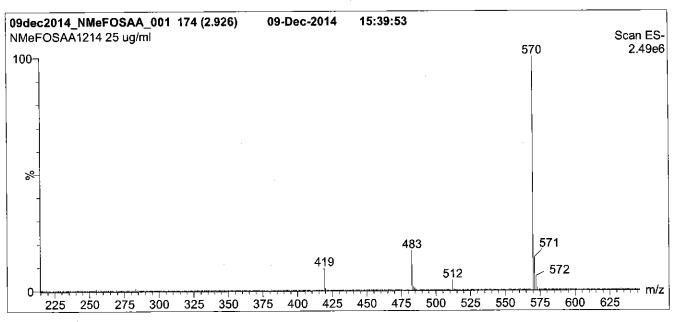




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Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





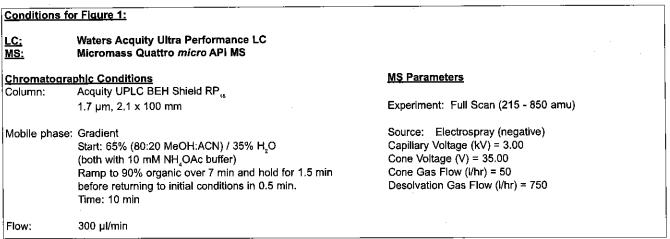
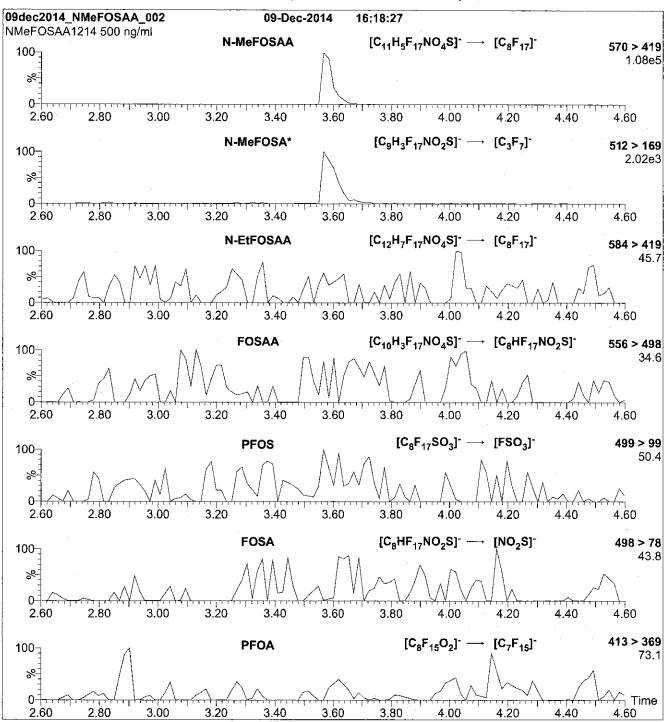
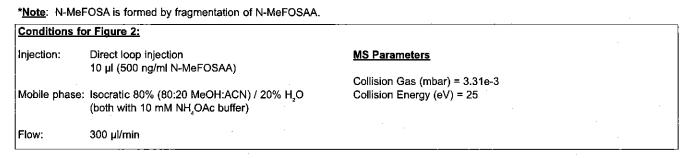


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





# LCN-MeFOSAA\_00003



# WELLINGTON LABORATORIES

# **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

N-MeFOSAA

**LOT NUMBER:** 

NMeFOSAA0116

**COMPOUND:** 

N-methylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

CAS #:

2355-31-9

**MOLECULAR FORMULA:** 

C<sub>11</sub>H<sub>6</sub>F<sub>17</sub>NO<sub>4</sub>S

**MOLECULAR WEIGHT:** 

571.21

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyv)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

**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.

Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/21/2016

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

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.

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# **EXPIRY DATE / PERIOD OF VALIDITY:**

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#### LIMITED WARRANTY:

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# **QUALITY MANAGEMENT:**

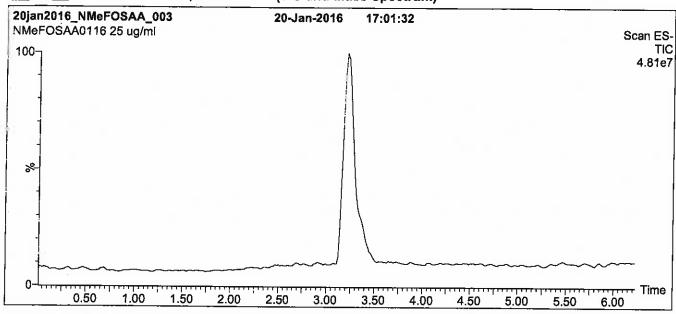
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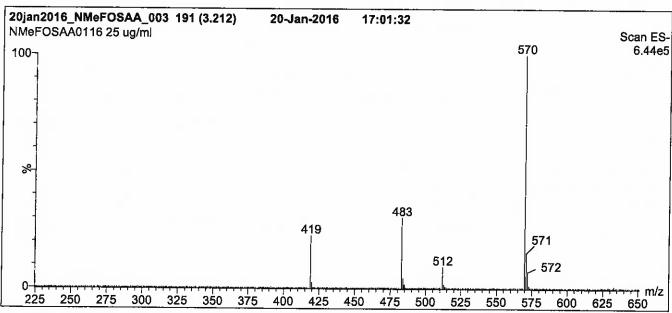




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Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





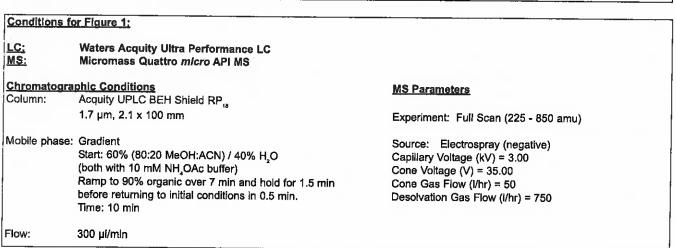
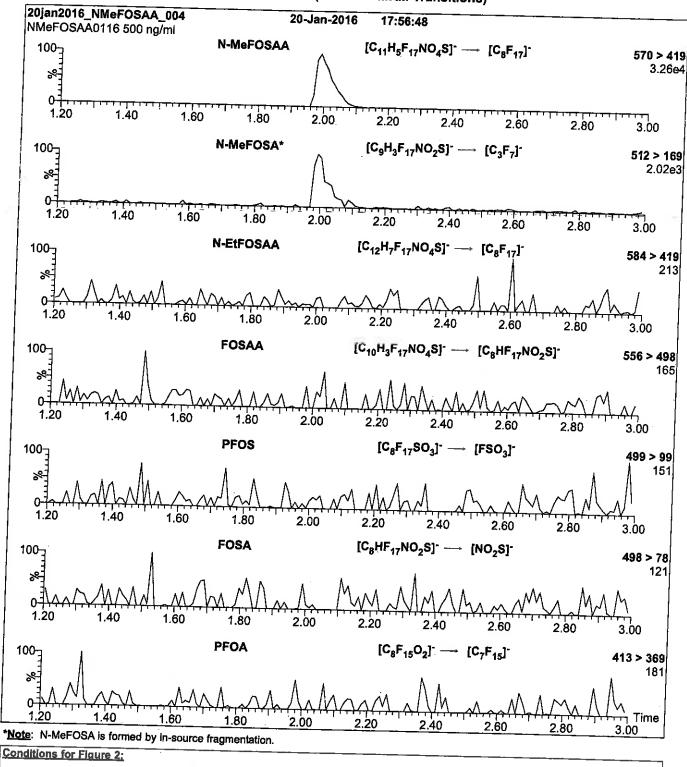
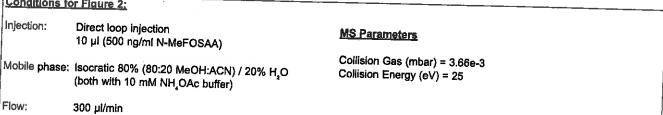


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





# LCPFACMXB\_00007



# CERTIFICATE OF ANALYSIS DOCUMENTATION

# PFAC-MXB

Solution/Mixture of Native
Perfluoroalkylcarboxylic Acids and
Native Perfluoroalkylsulfonates

**PRODUCT CODE:** 

PFAC-MXB

**LOT NUMBER:** 

PFACMXB1115

SOLVENT(S):

Methanol / Water (<1%)

DATE PREPARED: (mm/dd/yyyy)

11/04/2015

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

# **DESCRIPTION:**

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids ( $C_4$ - $C_{14}$ ,  $C_{16}$ , and  $C_{18}$ ) and four native perfluoroalkylsulfonates ( $C_4$ ,  $C_8$ ,  $C_8$  and  $C_{10}$ ). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

### **DOCUMENTATION/ DATA ATTACHED:**

Table A: Components and Concentrations of the Solution/Mixture

Figure 1: LC/MS Data (SIR)

Figure 2: LC/MS/MS Data (Selected MRM Transitions)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

# **ADDITIONAL INFORMATION:**

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

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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:**

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#### **HOMOGENEITY:**

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#### **UNCERTAINTY:**

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 $x_{ij} x_{ij} ... x_{ij}$  on which it depends is:

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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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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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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<sup>\*\*</sup>For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

# Table A: PFAC-MXB; Components and Concentrations (ng/ml, ± 5% in Methanol / Water (<1%))

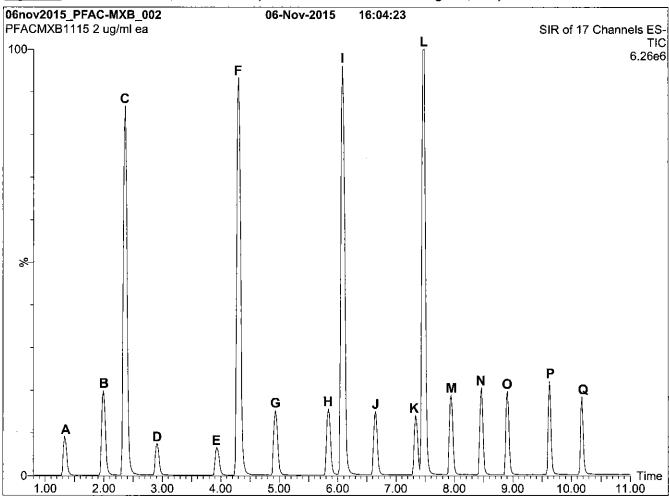
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000		Α
Perfluoro-n-pentanoic acid	PFPeA	2000		В
Perfluoro-n-hexanoic acid	PFHxA	2000		D
Perfluoro-n-heptanoic acid	PFHpA	2000		E
Perfluoro-n-octanoic acid	PFOA	2000		G
Perfluoro-n-nonanoic acid	PFNA	2000		Н
Perfluoro-n-decanoic acid	PFDA	2000		J
Perfluoro-n-undecanoic acid	PFUdA	2000		K
Perfluoro-n-dodecanoic acid	PFDoA	2000		М
Perfluoro-n-tridecanoic acid	PFTrDA	2000		N
Perfluoro-n-tetradecanoic acid	PFTeDA	2000		0
Perfluoro-n-hexadecanoic acid	PFHxDA	2000		Р
Perfluoro-n-octadecanoic acid	PFODA	2000		Q
Name	Abbreviation	Concentration (ng/ml)		Peak
		as the salt	as the anion	Assignment in Figure 1
Potassium perfluoro-1-butanesulfonate	L-PFBS	2000	1770	С
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000	1890	F
Sodium perfluoro-1-octanesulfonate	L-PFOS	2000	1910	- 1
Sodium perfluoro-1-decanesulfonate	L-PFDS	2000	1930	L

Certified By:

B.G. Chittim

Date: 11/11/2015

Figure 1: PFAC-MXB; LC/MS Data (Total Ion Current Chromatogram; SIR)



# **Conditions for Figure 1:**

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

# Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,16

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 55% H<sub>2</sub>O / 45% (80:20 MeOH:ACN)

(both with 10 mM NH, OAc buffer)

Ramp to 95% organic over 10 min and hold for 1 min

before returning to initial conditions in 0.5 min.

Time: 12 min

Flow:

300 µl/min

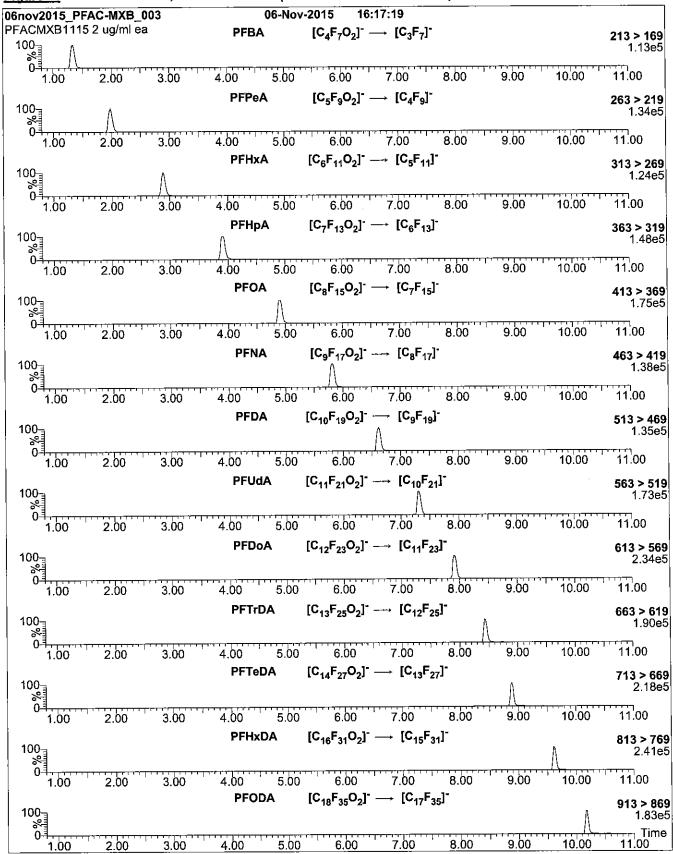
# MS Parameters

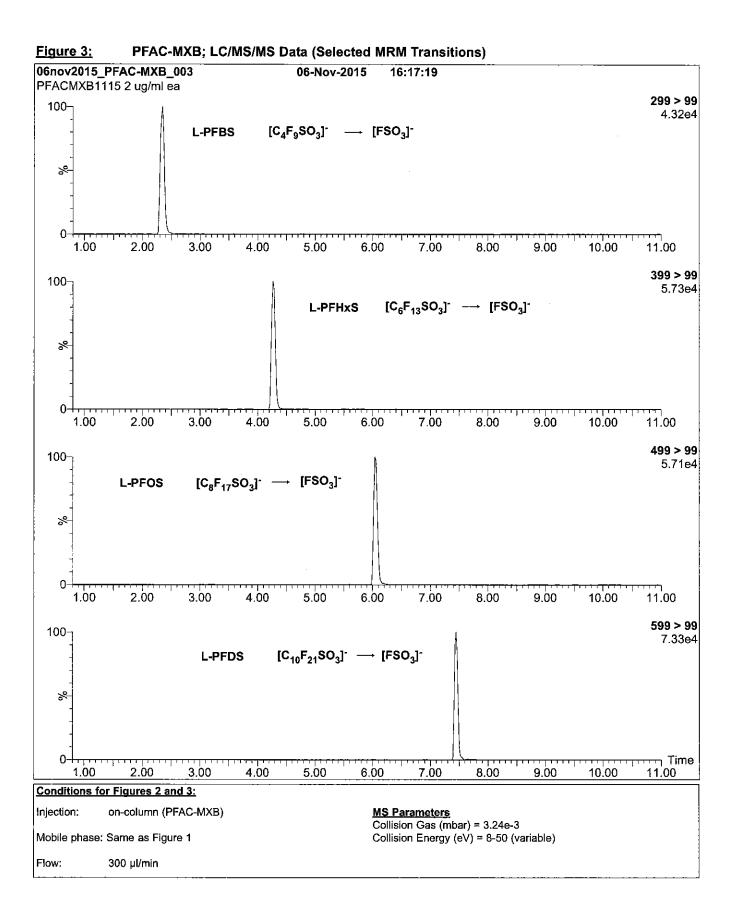
Experiment: SIR of 17 Channels

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (10-70)
Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (I/hr) = 750

Figure 2: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)





# LCPFBA\_00004



ID: LCPFBA\_00004 Exp: 01/30/20 Prpd: CBW PF-n-butanoic acid



# CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFBA** 

LOT NUMBER:

PFBA0115

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4

F F F F

**MOLECULAR FORMULA:** 

C<sub>4</sub>HF<sub>2</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

214.04

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

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:

D C Chittim

Date: \_

(mm/dd/saw)

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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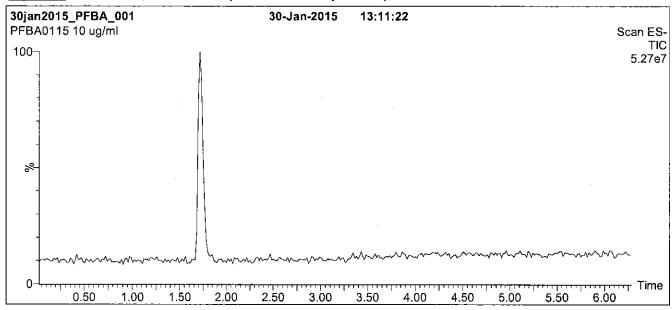
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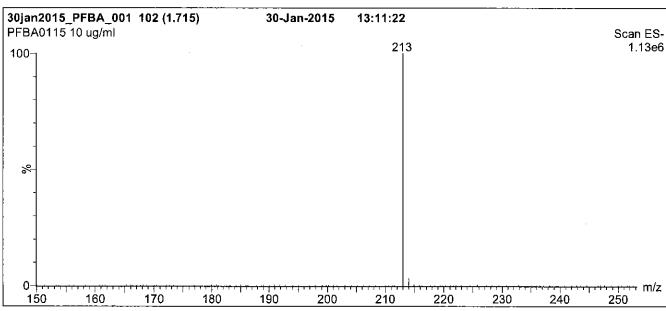


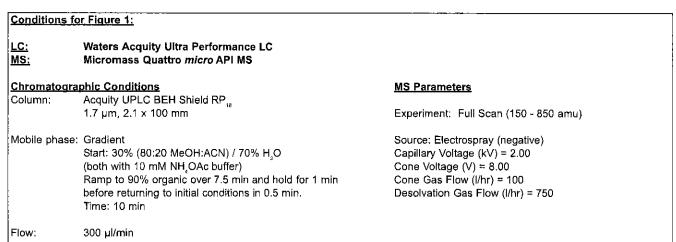


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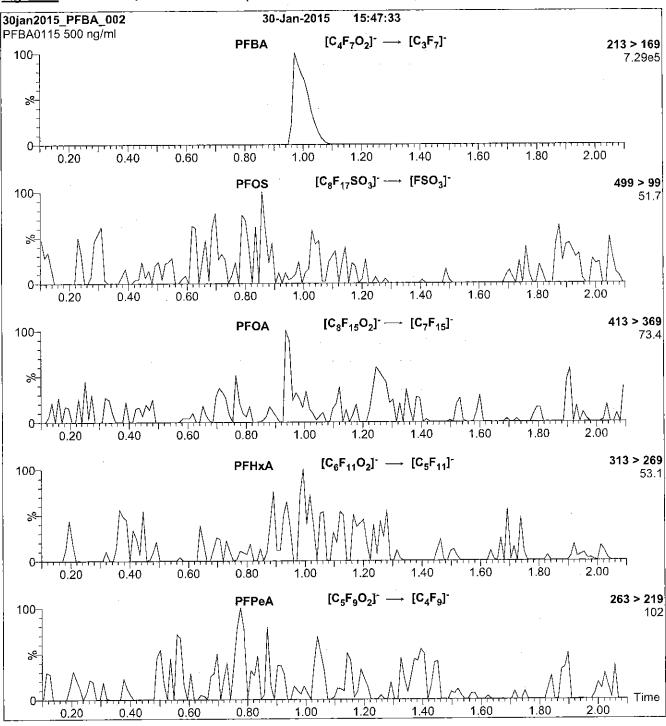
Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)

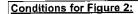






PFBA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml PFBA)

 $\begin{array}{lll} \mbox{Mobile phase: Isocratic 80\% (80:20 MeOH:ACN) / 20\% \ H_{\rm 2}O \\ \mbox{(both with 10 mM NH}_{\rm 4}OAc \ buffer) \end{array}$ 

Flow:

300 µl/min

# **MS Parameters**

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 10

# LCPFBA\_00005

P:8BC 9/13/16







# **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**PFBA** 

**LOT NUMBER:** 

PFBA0516

**COMPOUND:** 

Perfluoro-n-butanoic acid

STRUCTURE:

**CAS #:** 

375-22-4

**MOLECULAR FORMULA:** 

C<sub>4</sub>HF<sub>2</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

214.04

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

SOLVENT(S):

Methanol Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

05/27/2016

EXPIRY DATE: (mm/dd/yyyy)

05/27/2021

**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:

Date: 05/31/2016

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,  $u_{o}(y)$ , 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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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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**

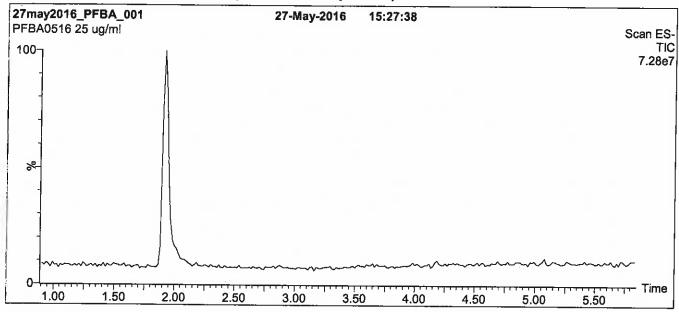
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

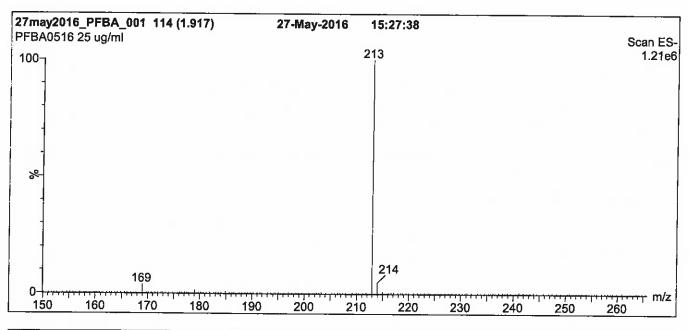




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="mailto:www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

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





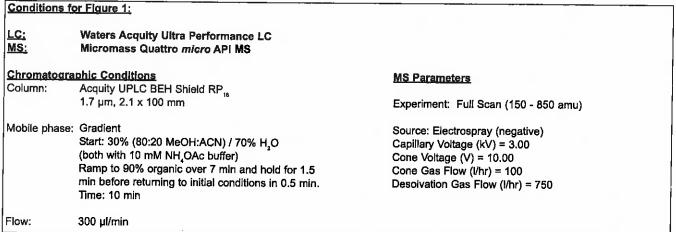
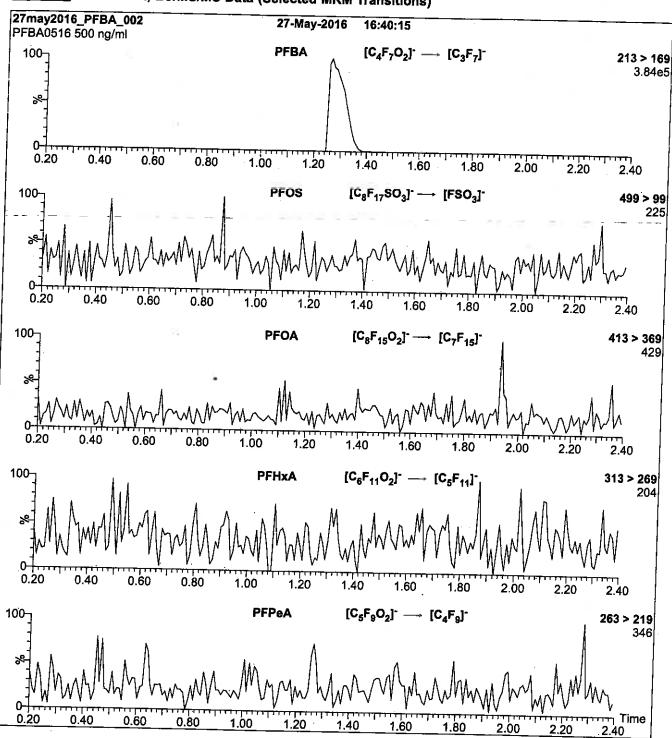
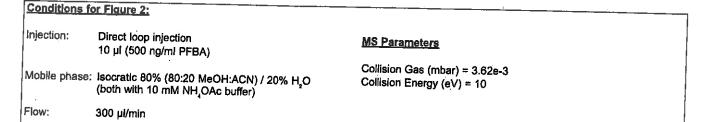


Figure 2: PFBA; LC/MS/MS Data (Selected MRM Transitions)





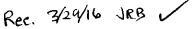
# LCPFBS 00004



ID: LCPFBS\_00004

Exp: 10x9/19 Prpd: CBW

PF-1-butanesulfonate K sa





### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

L-PFBS

LOT NUMBER:

**MOLECULAR WEIGHT:** 

SOLVENT(S):

LPFBS1014

COMPOUND:

Potassium perfluoro-1-butanesulfonate

STRUCTURE:

CAS #:

29420-49-3

338,19

Methanol

F C C SO<sub>3</sub>-K\*

**MOLECULAR FORMULA:** 

C<sub>4</sub>F<sub>6</sub>SO<sub>5</sub>K

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$  (K salt)

 $44.2 \pm 2.2 \,\mu\text{g/ml}$  (PFBS anion)

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:

04/02/2015

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

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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 $x_1, x_2, ... x_n$  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:**

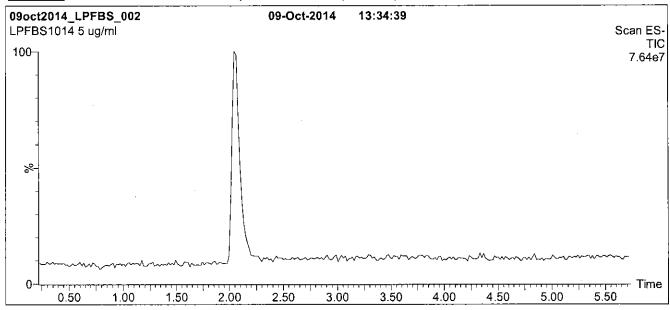
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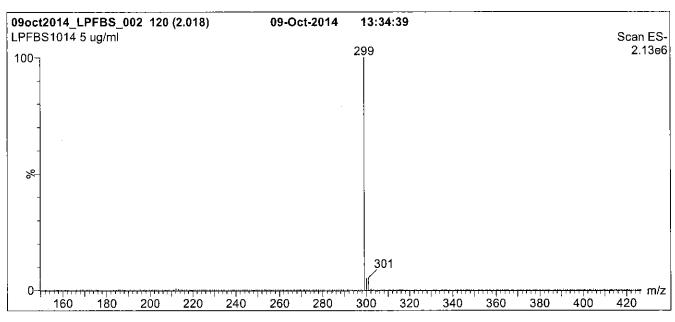




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Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)





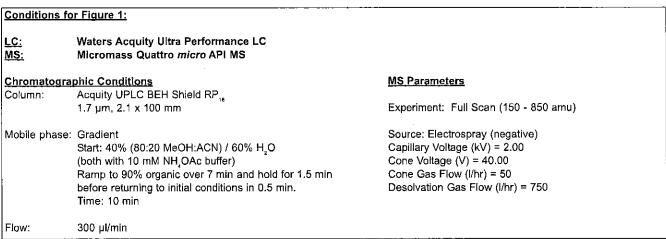
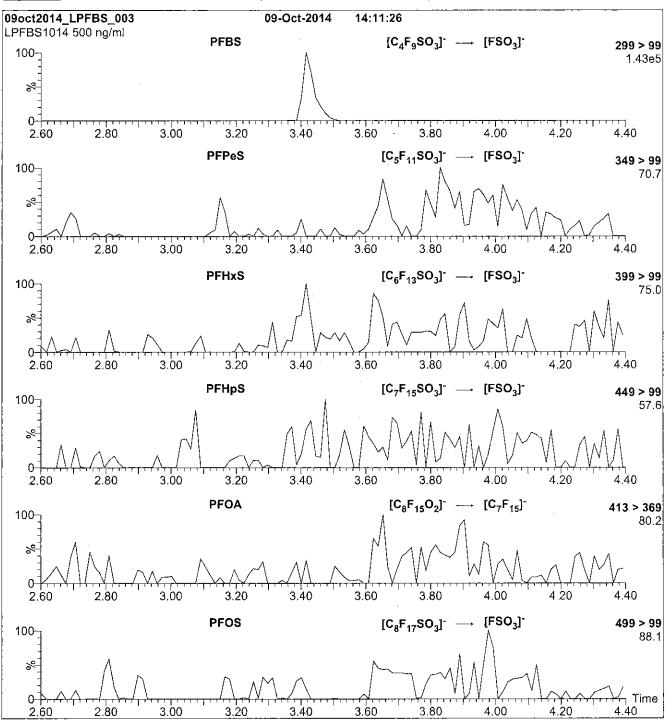
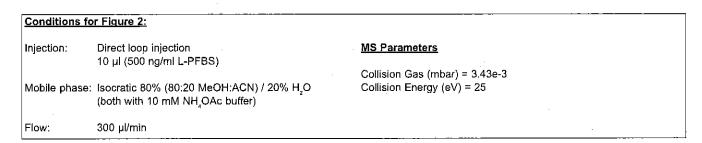


Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)





# LCPFBS 00005

R: 9/9/16 8BC





### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

LOT NUMBER:

M282FTS0116

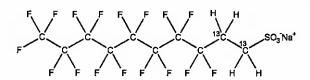
**COMPOUND:** 

Sodium 1H,1H,2H,2H-perfluoro-[1,2-13C]decane sulfonate

**STRUCTURE:** 

CAS #:

Not available



**MOLECULAR FORMULA:** 

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>H<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

552.15

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$ (Na salt) SOLVENT(S):

Methanol

47.9 ± 2.4 µg/ml

(M2-8:2FTS anion)

≥99% <sup>13</sup>C

**CHEMICAL PURITY:** LAST TESTED: (mm/dd/yyyy) >98%

**ISOTOPIC PURITY:** 

(1,2-13C<sub>n</sub>)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

**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.

The native 8:2FTS contains 4.22% of 34S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/18/2016

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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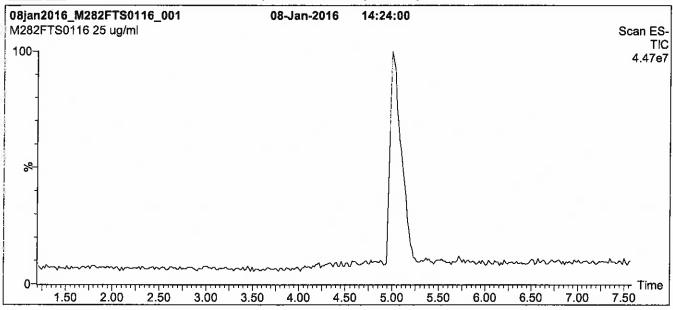
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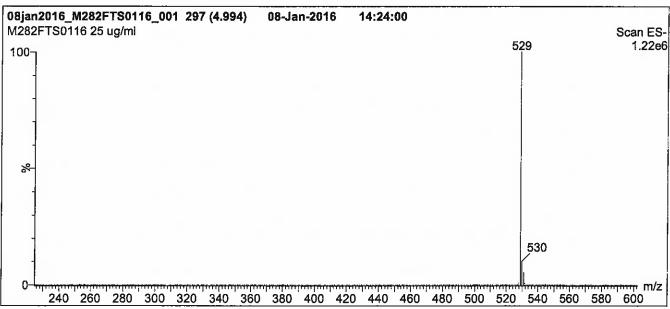




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





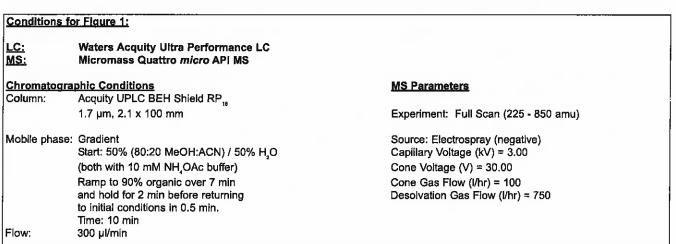
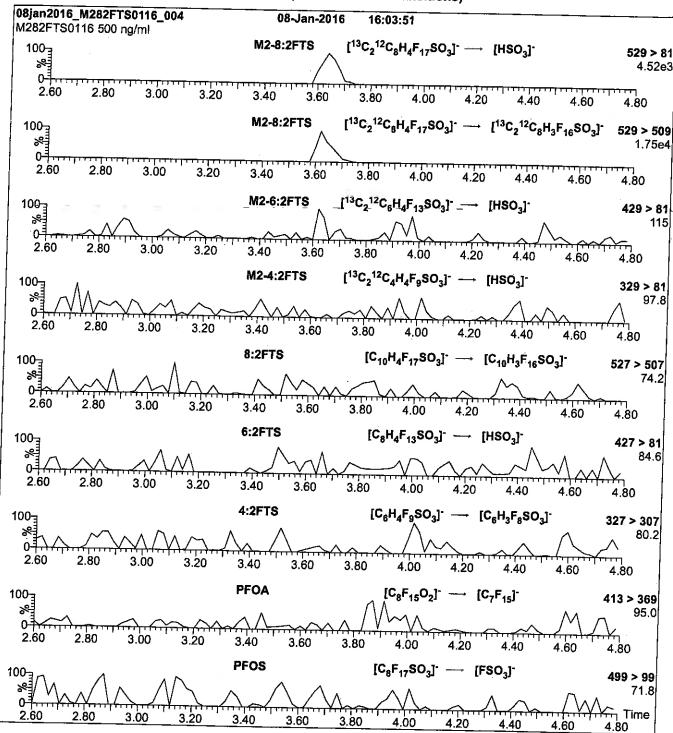


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection: Direct

Direct loop injection

10 μl (500 ng/ml M2-8;2FTS)

MS Parameters

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

Collision I

(both with 10 mM NH, OAc buffer)

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 30

Flow:

300 µl/min



ID: LCPFBS\_00005 Exp: 03/15/21 Prpd: SBC PF-1-butanesulfonate K sa



ID: LCPFBS\_00006 Exp: 03/15/21 Prpd: SBC PF-1-butanesulfonate K sa



# VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

LPFBS0316

**COMPOUND:** 

Potassium perfluoro-1-butanesulfonate

CAS #:

29420-49-3

338.19

Methanol

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

C<sub>4</sub>F<sub>6</sub>SO<sub>5</sub>K

50.0 ± 2.5 μg/ml (K salt)

 $44.2 \pm 2.2 \mu g/ml$  (PFBS anion)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>98%

LAST TESTED: (mm/dd/yyyy)

03/15/2016

EXPIRY DATE: (mm/dd/yyyy)

03/15/2021

**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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 03/21/2016

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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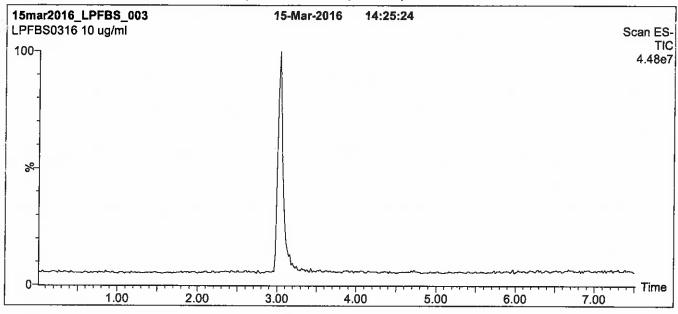
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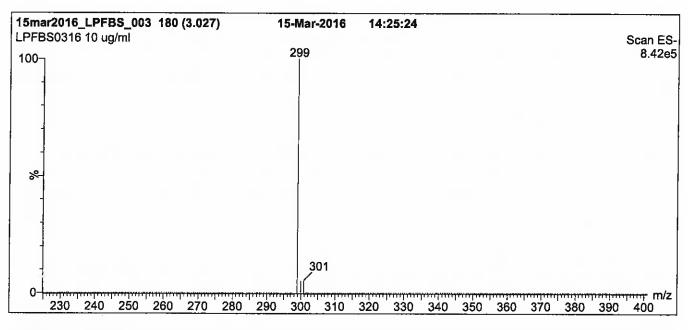


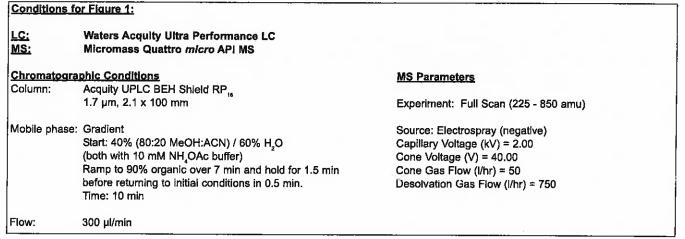


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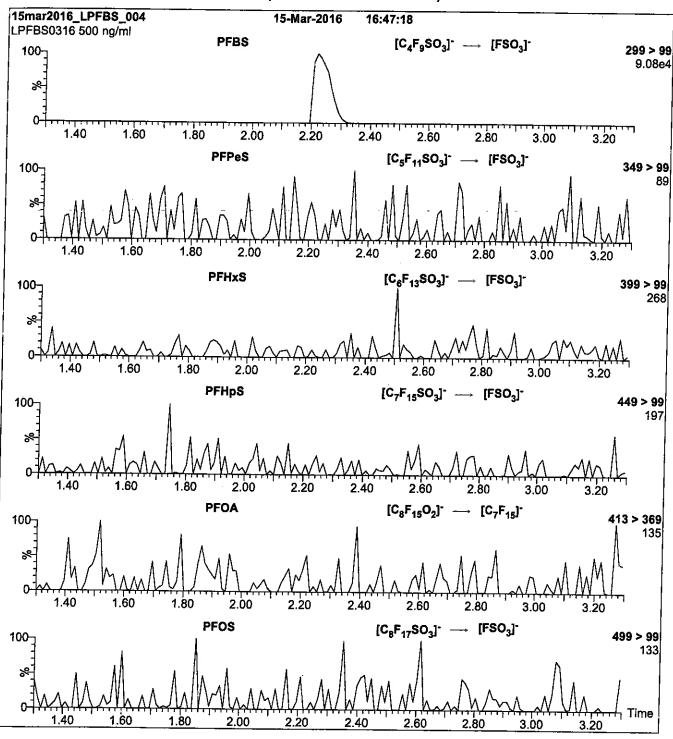
Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)







L-PFBS; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 μl (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H,O

(both with 10 mM NH<sub>2</sub>OAc buffer)

**MS Parameters** 

Collision Gas (mbar) = 3.20e-3 Collision Energy (eV) = 25

Flow:

300 µl/min

# LCPFDA\_00005



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

COMPOUND:

Perfluoro-n-decanoic acid

**STRUCTURE:** 

LOT NUMBER:

PFDA0615

**CAS #:** 

335-76-2

**MOLECULAR FORMULA:** 

**CONCENTRATION:** 

C<sub>10</sub>HF<sub>19</sub>O<sub>2</sub>

 $50 \pm 2.5 \,\mu g/ml$ 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

514.08

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:

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

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.

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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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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#### **EXPIRY DATE / PERIOD OF VALIDITY:**

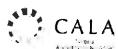
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

#### **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:**

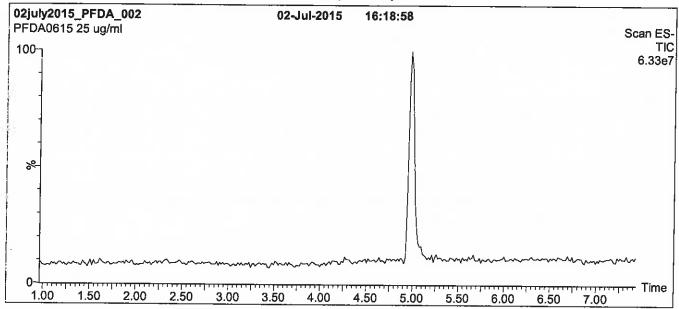
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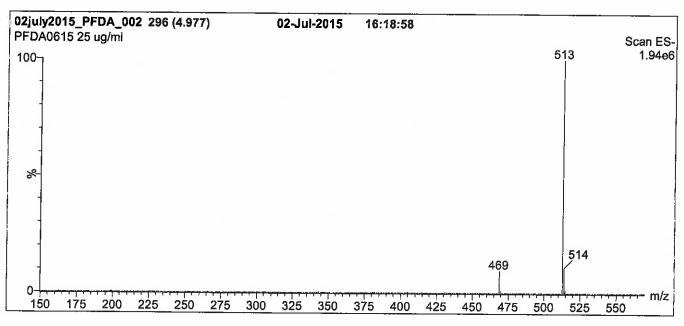




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="mailto:www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

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





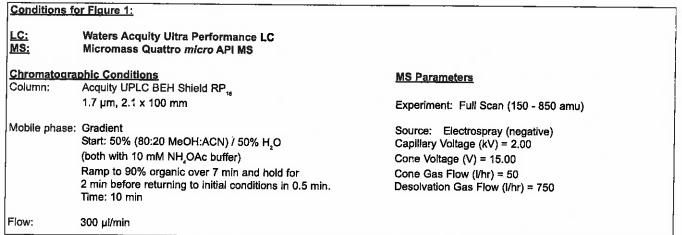
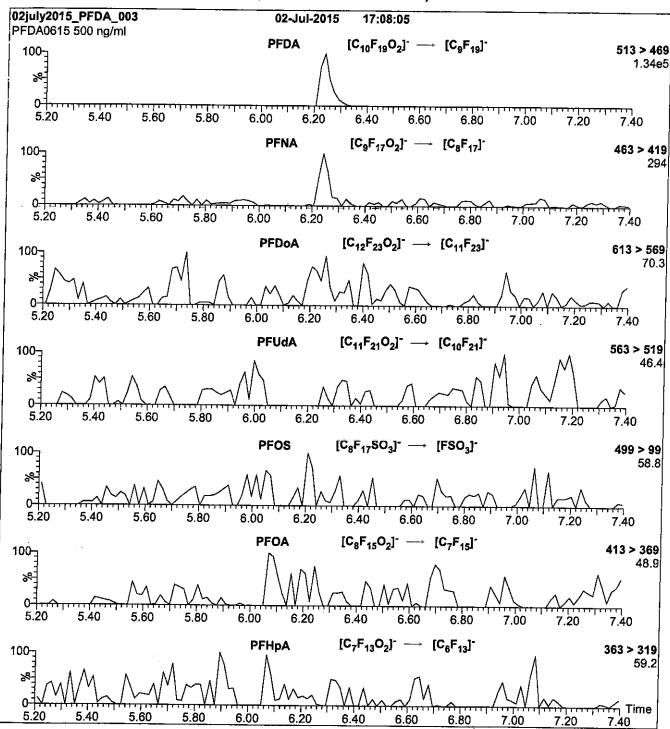
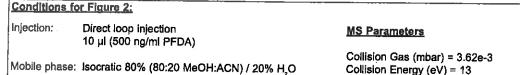


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





(both with 10 mM NH<sub>2</sub>OAc buffer)

Flow: 300 µl/min

# LCPFDoA\_00005

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFDoA** 

LOT NUMBER:

PFDoA0115

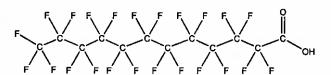
**COMPOUND:** 

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1



**MOLECULAR FORMULA:** 

C<sub>12</sub>HF<sub>23</sub>O<sub>2</sub>

MOLECULAR WEIGHT:

614.10

**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: \_0

/5/25/2013

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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$$x_i, x_j,...x_n$$
 on which it depends is:

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#### **EXPIRY DATE / PERIOD OF VALIDITY:**

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#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

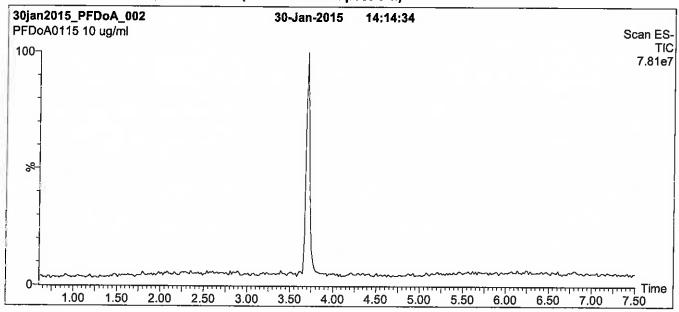
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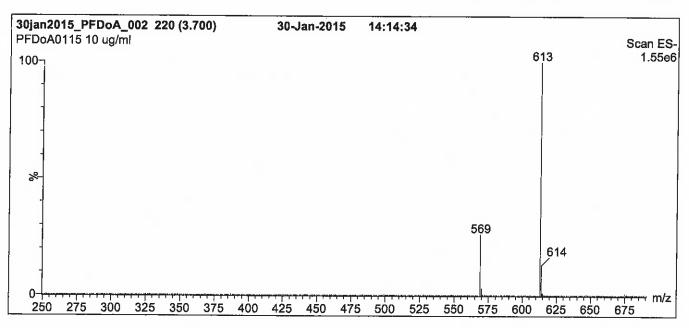




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Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)





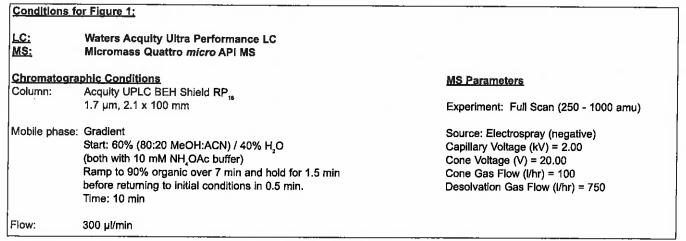
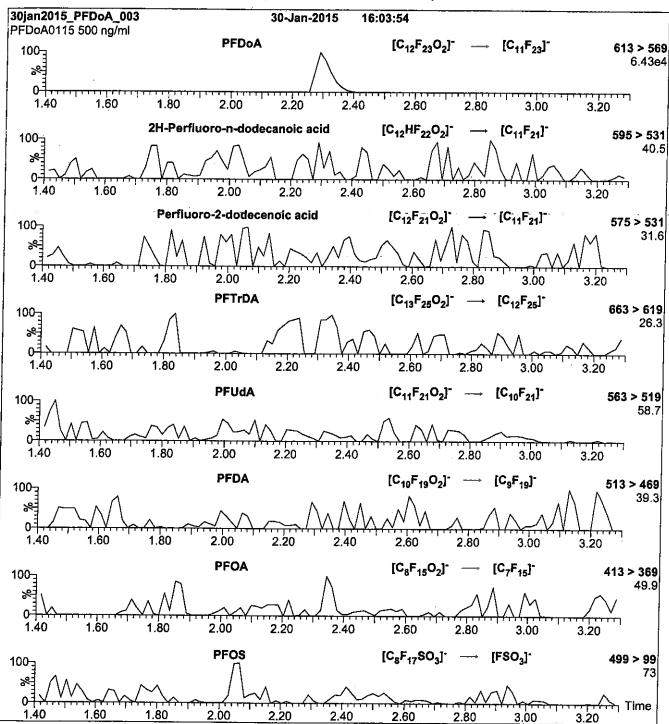
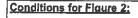


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFDoA)

MS Parameters

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH<sub>2</sub>OAc buffer)

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 13

Flow:

300 µl/min

# LCPFDS\_00005

ID: LCPFDS\_00005 Exp: 07/02/20 Ppd: CBW PF-1-decanesulfonate sodi Rec. 3/29/16 JRB



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFDS

LOT NUMBER:

LPFDS0615

COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #:

2806-15-7

MOLECULAR FORMULA:

C<sub>10</sub>F<sub>21</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:** 

622.13

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$  (Na salt)

 $48.2 \pm 2.4 \mu g/ml$  (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/vvvv)

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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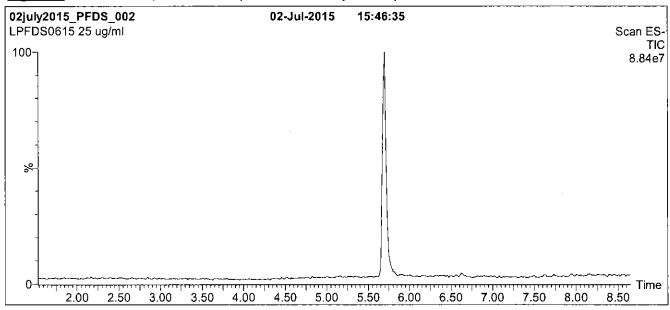
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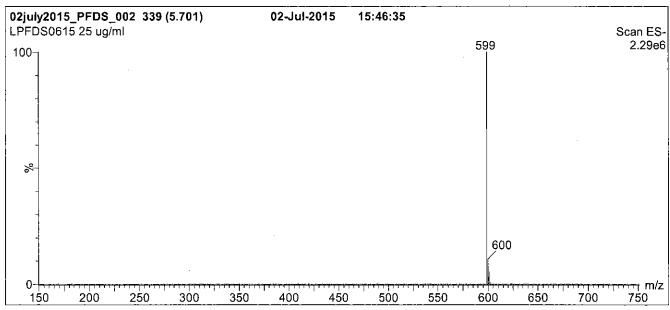




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Figure 1: L-PFDS; LC/MS Data (TIC and Mass Spectrum)





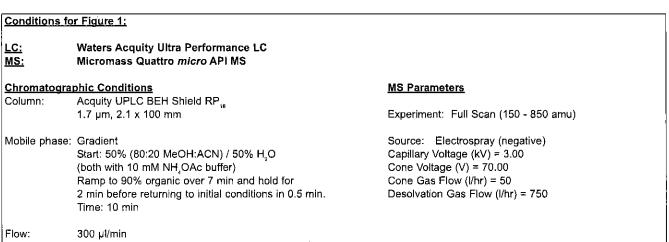
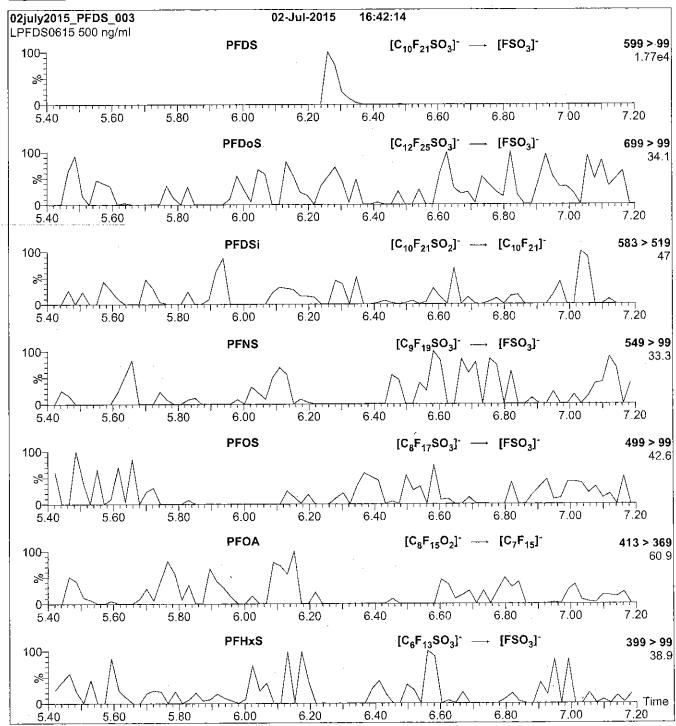
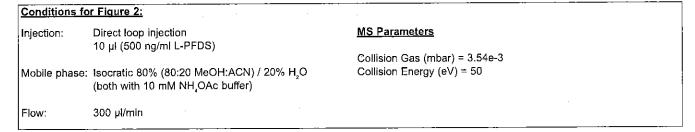


Figure 2: L-PFDS; LC/MS/MS Data (Selected MRM Transitions)





# LCPFHpA\_00005



ID: LCPFHpA\_00005 xp: 01/22/21 Prpd: CBW PF-n-heptanoic acid

R: 4/7/16 CBW



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFHpA** 

LOT NUMBER:

PFHpA0116

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:

CAS #:

375-85-9

MOLECULAR FORMULA:

C,HF,O2

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

**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:**

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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: 02/02/2016

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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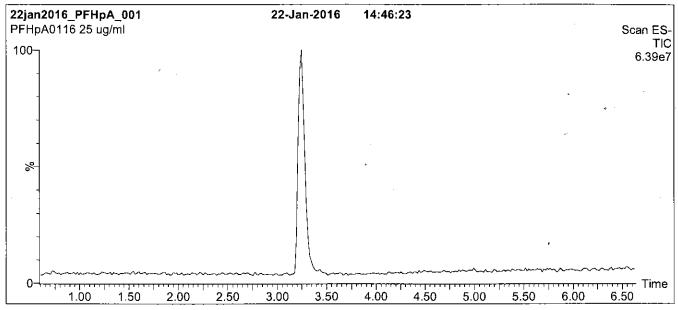
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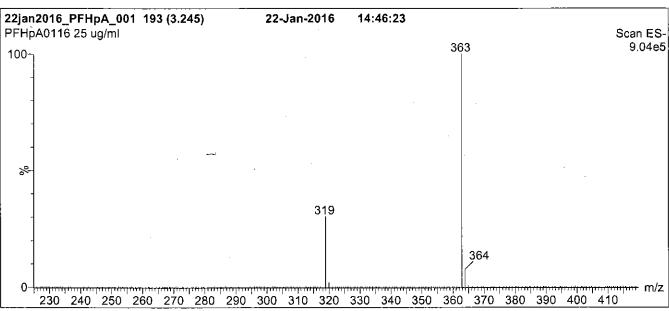




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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





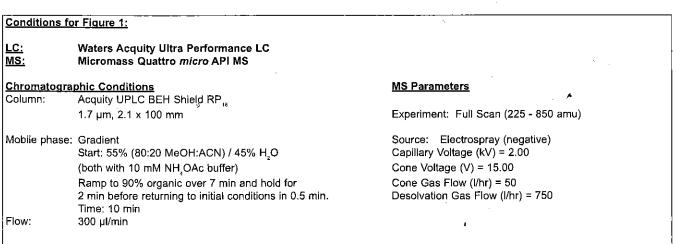
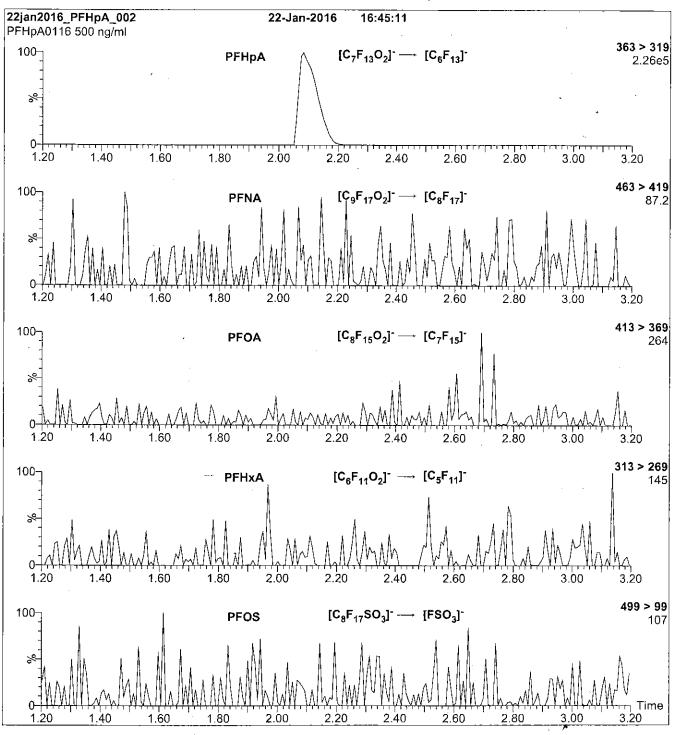
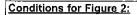


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH<sub>2</sub>OAc buffer)

Flow:

300 µl/min

#### MS Parameters

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 11

# LCPFHpS\_00008





### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

L-PFHpS

LOT NUMBER:

LPFHpS1115

COMPOUND:

Sodium perfluoro-1-heptanesulfonate

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

C<sub>7</sub>F<sub>15</sub>SO<sub>3</sub>Na

472.10

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu g/ml$  (Na salt)

SOLVENT(S):

**MOLECULAR WEIGHT:** 

Methanol

**CHEMICAL PURITY:** 

 $47.6 \pm 2.4 \mu g/ml$  (PFHpS anion) >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 ~ 0.1% of L-PFHxS (C<sub>2</sub>F<sub>4</sub>,SO<sub>3</sub>Na) and ~ 0.2% of L-PFOS (C<sub>2</sub>F<sub>4</sub>,SO<sub>3</sub>Na).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 11/09/2015

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

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,  $u_{x}(y)$ , 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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

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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:**

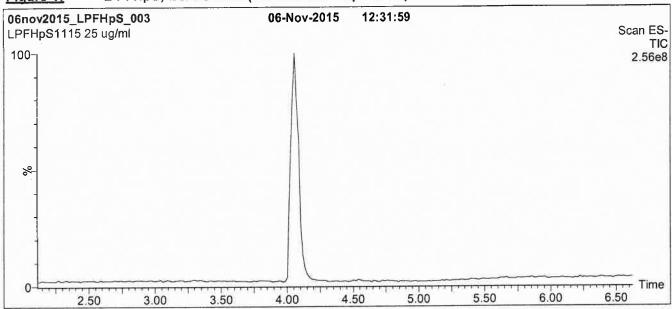
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

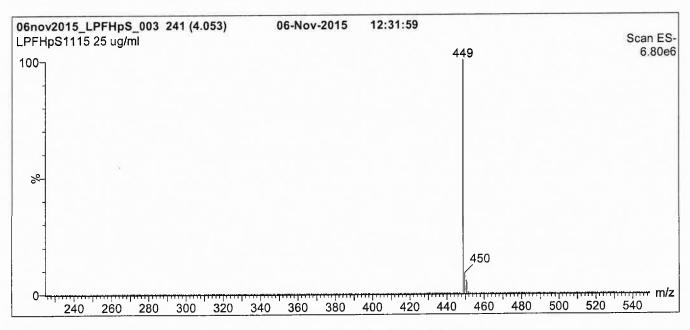




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Figure 1: L-PFHpS; LC/MS Data (TIC and Mass Spectrum)





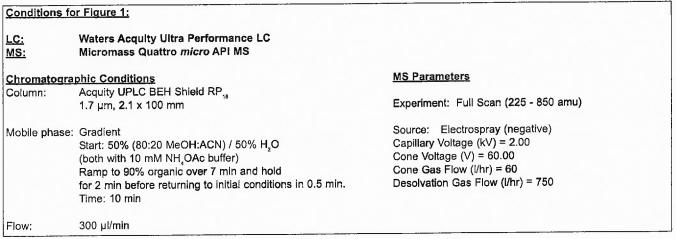
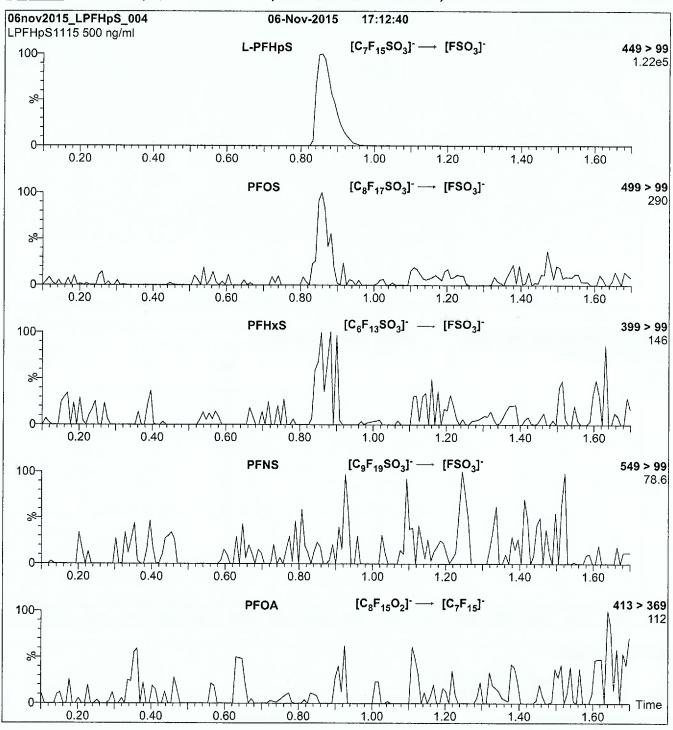
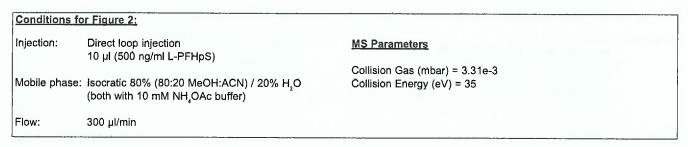


Figure 2: L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)





# LCPFHxA\_00004

Exp.: 12/22/20 Prpd: CBW PF-n-hexanoic acid

#### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**PFHxA** 

**LOT NUMBER:** 

PFHxA1215

**COMPOUND:** 

Perfluoro-n-hexanoic acid

**STRUCTURE:** 

**CAS #:** 

307-24-4

**MOLECULAR FORMULA:** 

C,HF,O,

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

314.05 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:

Date: 12/23/2015

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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#### **UNCERTAINTY:**

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The combined relative standard uncertainty,  $u_{\varepsilon}(y)$ , 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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

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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:**

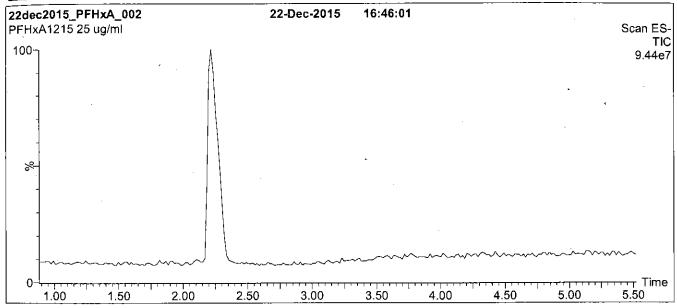
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

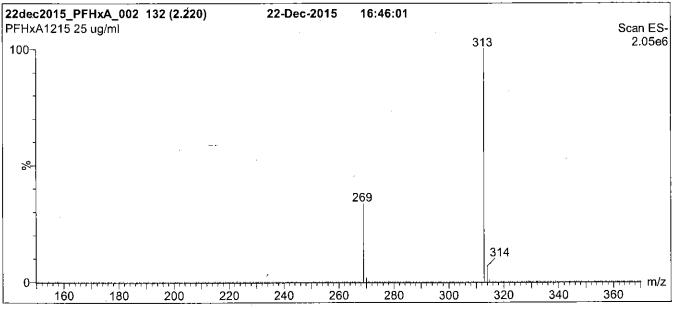




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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





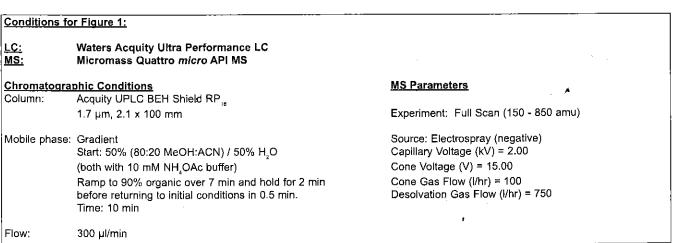
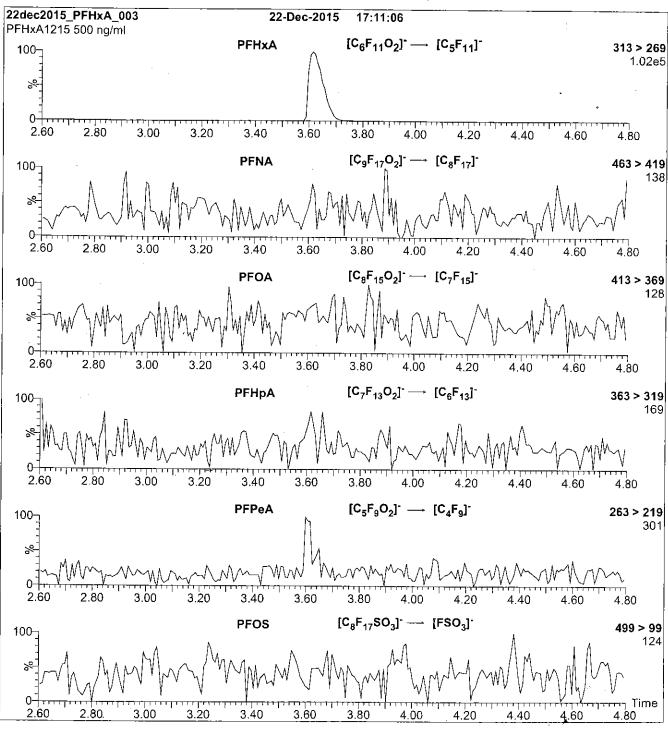
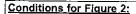


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

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

# LCPFHxDA\_00005



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFHxDA** 

LOT NUMBER:

PFHxDA0614

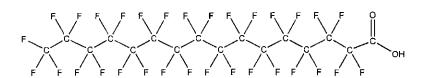
COMPOUND:

Perfluoro-n-hexadecanoic acid

STRUCTURE:

CAS #:

67905-19-5



**MOLECULAR FORMULA:** 

C, HF, O,

50 ± 2.5 μg/ml

**MOLECULAR WEIGHT:** 

814.13

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

**CONCENTRATION:** 

>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.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFTeDA and ~ 0.1% each of 2H-PFHxDA, PFPeDA, and PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

(mm/dd/vvvv)

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#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

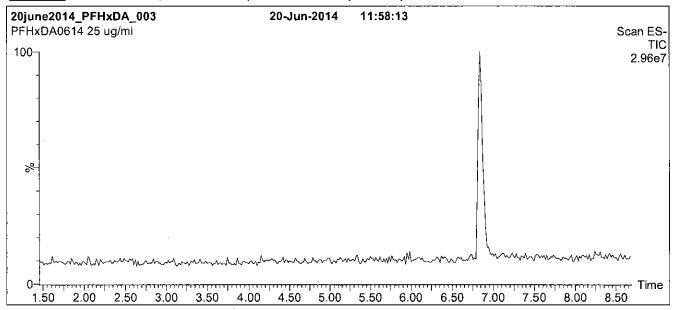
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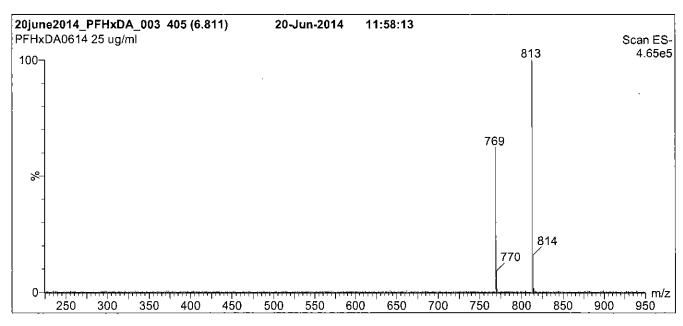




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Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)





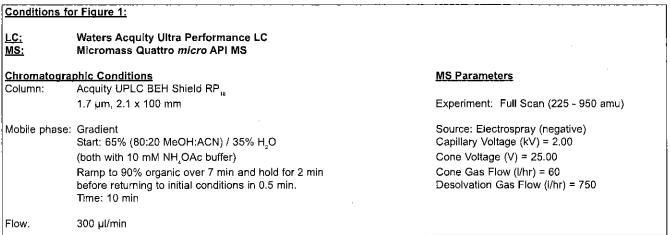
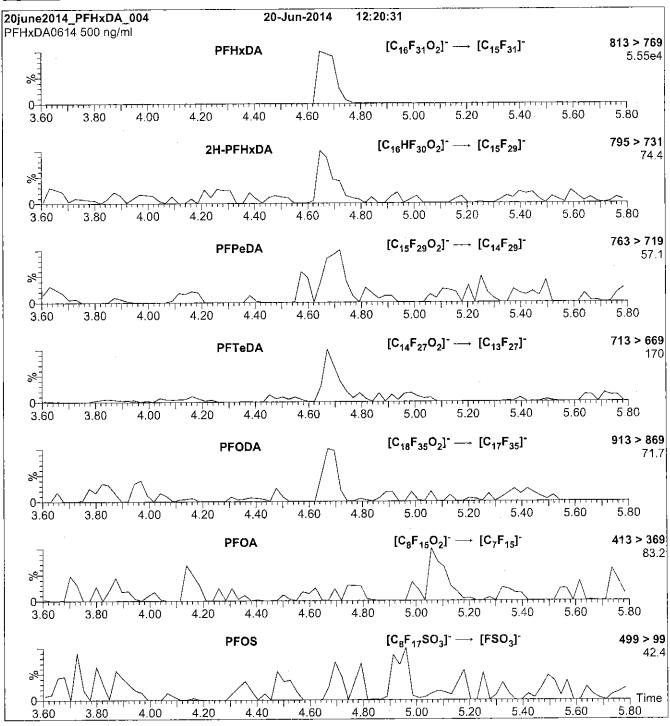
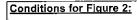


Figure 2: PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 ul (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\rm H_2O$ 

(both with 10 mM NH<sub>2</sub>OAc buffer)

Flow:

300 µl/min

#### MS Parameters

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 15

LCPFHxS-br\_00001



LOPFHxS-br\_00001
 Exp: 07/03/20 Prpd: CBW
 Potassium Perfluorohexane



### CERTIFICATE OF ANALYSIS DOCUMENTATION

#### br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFHxSK

LOT NUMBER:

brPFHxSK0615

**CONCENTRATION:** 

 $50.0 \pm 2.5 \,\mu\text{g/ml}$  (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 19F-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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Table A: br-PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)\*

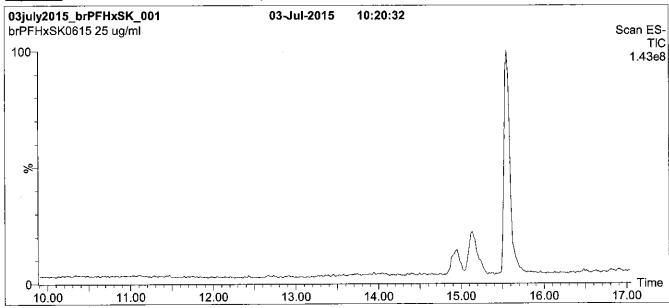
Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K+	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K <sup>+</sup> CF <sub>3</sub>	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K <sup>+</sup> CF <sub>3</sub>	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K <sup>+</sup> CF <sub>3</sub>	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K <sup>+</sup> CF <sub>3</sub>	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF <sub>3</sub> CF <sub>3</sub> CCF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K <sup>+</sup> CF <sub>3</sub>	0.2
7	Other Unidentified Isomers		0.5

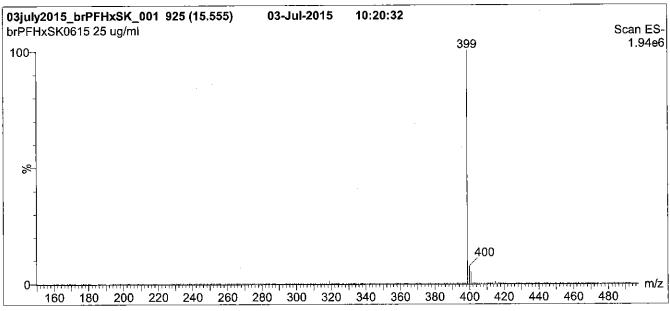
Percent of total perfluorohexanesulfonate isomers only.
Systematic Name: Potassium perfluorohexane-2-sulfonate.

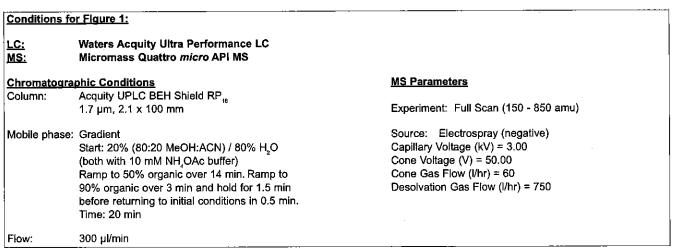
Certified By:

Date: <u>07/15/2015</u>

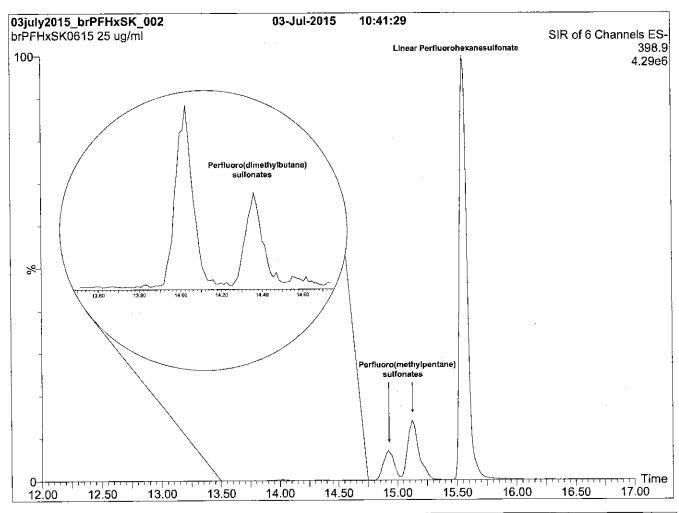
Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)







#### Figure 2: br-PFHxSK; LC/MS Data



#### Conditions for Figure 2:

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

#### Chromatographic Conditions

Column:

Acquity UPLC BEH Shield RP,

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Start: 20% (80:20 MeOH:ACN) / 80% H<sub>2</sub>O

(both with 10 mM NH<sub>4</sub>OAc 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:

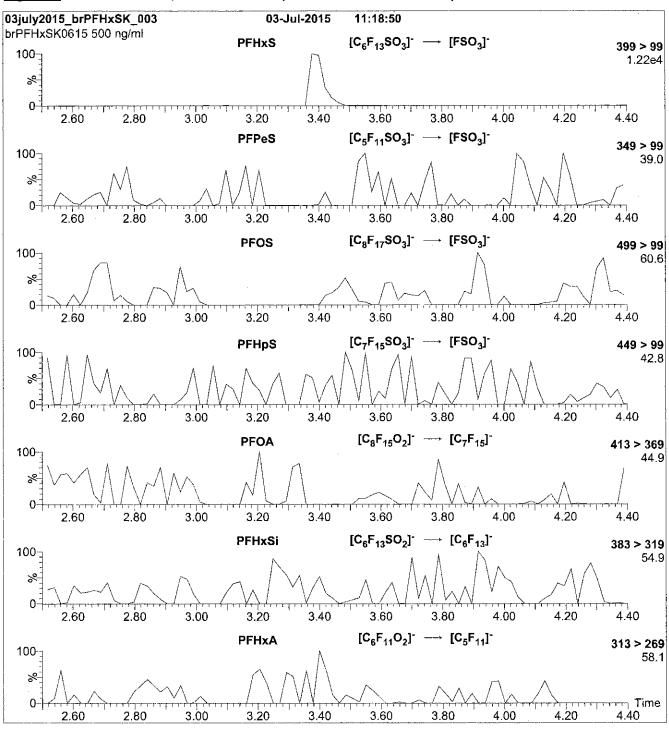
300 µl/min

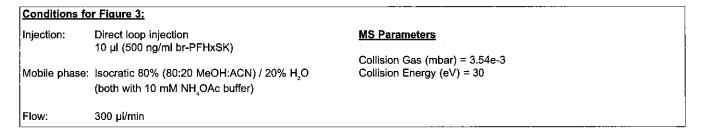
#### **MS Parameters**

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)





# LCPFHxS-br\_00002

8BC-R: 9/13/16



ID: LCPFHxS-br\_00002 Exp: 07/03/20 Prpd: SBC Potassium Perfluorchexane



ID: LCPFHxS-br\_00003

Exp: 07/03/20 Prpd: SBC

Potassium Perfluorohexane



### 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:** 

 $50.0 \pm 2.5 \,\mu\text{g/ml}$  (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: (mrv/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 19F-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).

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

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

 $X_1, X_2, ..., X_n$  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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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 explry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

#### LIMITED WARRANTY:

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

#### **QUALITY MANAGEMENT:**

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





\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

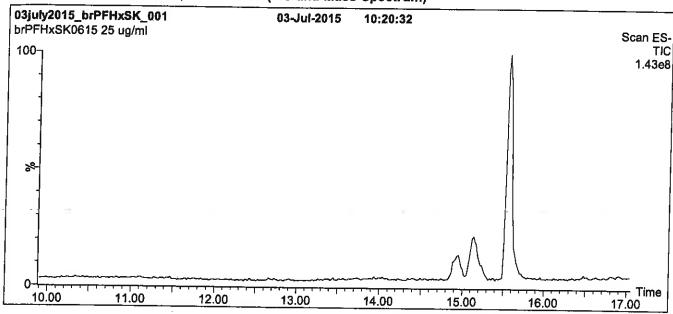
Table A: br-PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)\*

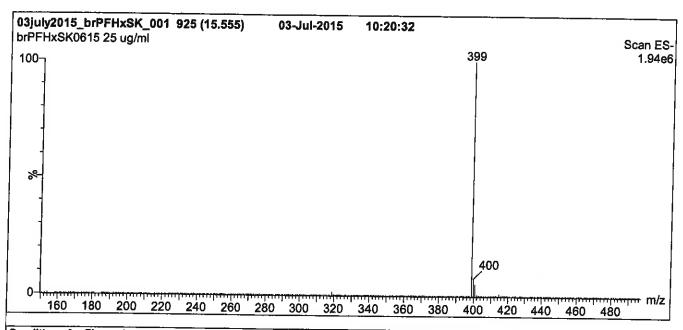
Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K+	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K+ CF <sub>3</sub>	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K <sup>+</sup> CF <sub>3</sub>	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K+ CF <sub>3</sub>	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K+ CF <sub>3</sub>	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF <sub>3</sub> CF <sub>3</sub> CCF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> -K⁺ CF <sub>3</sub>	0.2
7	Other Unidentified Isomers		0.5

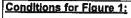
Percent of total perfluorohexanesulfonate isomers only.
 Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: Date: 07/15/2015

Figure 1: br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)







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

#### Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP14

1.7 µm, 2.1 x 100 mm

#### Mobile phase: Gradient

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

300 µl/min

.....

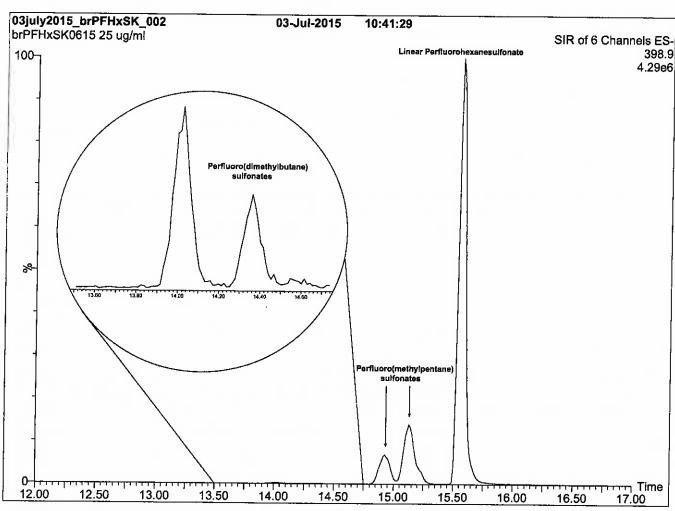
#### **MS Parameters**

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

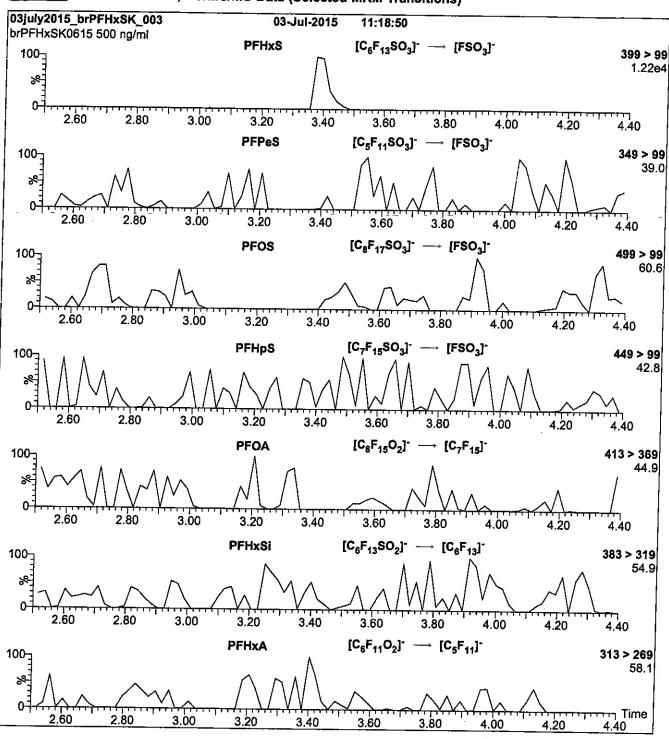
Flow:

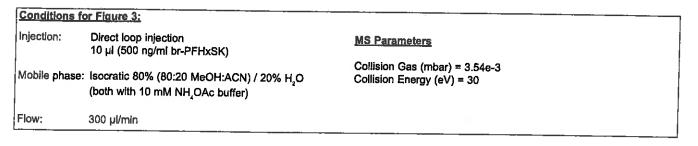
Figure 2: br-PFHxSK; LC/MS Data



#### Conditions for Figure 2: Waters Acquity Ultra Performance LC MS: Micromass Quattro micro API MS Chromatographic Conditions **MS Parameters** Column: Acquity UPLC BEH Shield RP, 1.7 µm, 2.1 x 100 mm Experiment: SIR (6 channels) Mobile phase: Gradient Source: Electrospray (negative) Start: 20% (80:20 MeOH:ACN) / 80% H,O Capillary Voltage (kV) = 3.00 (both with 10 mM NH OAc buffer) Cone Voltage (V) = 50.00 Ramp to 50% organic over 14 min. Ramp to Cone Gas Flow (I/hr) = 60 90% organic over 3 min and hold for 1.5 min Desolvation Gas Flow (I/hr) = 750 before returning to initial conditions in 0.5 min. Time: 20 min Flow: 300 µl/min

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)





# LCPFNA\_00005

Exp: 10/23/20 Prpd: CBW

#### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFNA** 

**LOT NUMBER:** 

PFNA1015

**COMPOUND:** 

Perfluoro-n-nonanoic acid

**STRUCTURE:** 

CAS #:

375-95-1

**MOLECULAR FORMULA:** 

C<sub>a</sub>HF<sub>17</sub>O<sub>2</sub>

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

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).

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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:**

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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.

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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 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:**

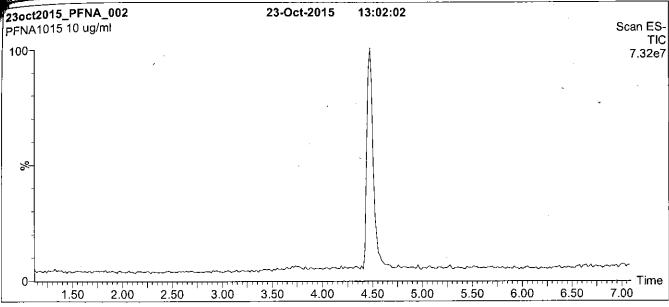
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

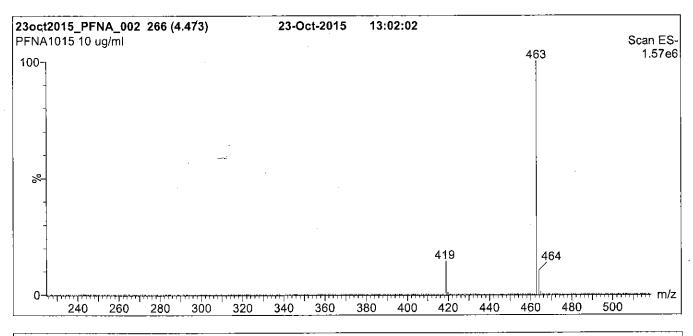




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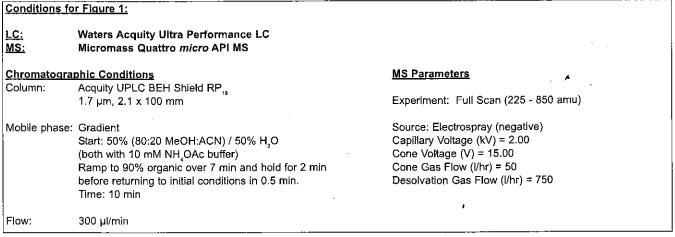
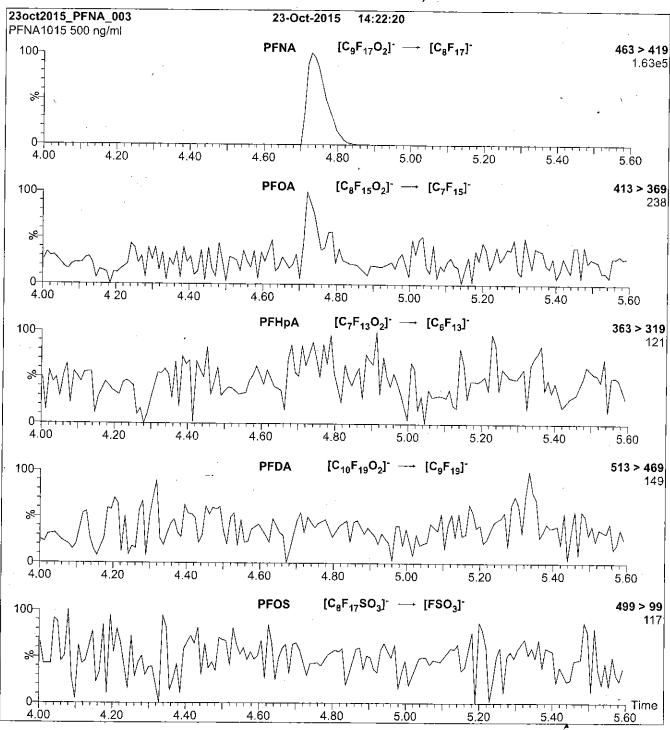
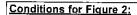


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µI (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### MS Parameters

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

# LCPFOA\_00006





# VELLINGTON ABORATORIES

#### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**PFOA** 

**LOT NUMBER:** 

**PFOA1115** 

**COMPOUND:** 

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

**MOLECULAR FORMULA:** 

C,HF,O,

**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:

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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#### **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.

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 $x_1, x_2,...x_n$  on which it depends is:

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

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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

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#### EXPIRY DATE / PERIOD OF VALIDITY:

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#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

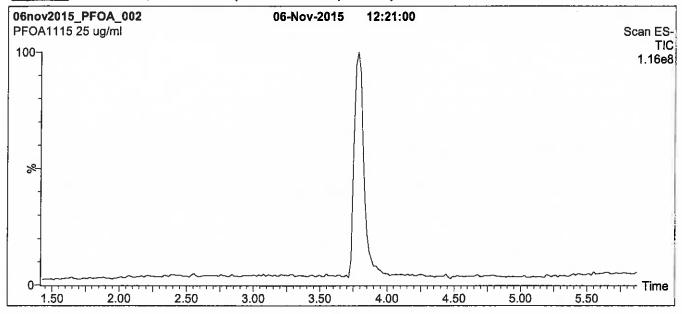
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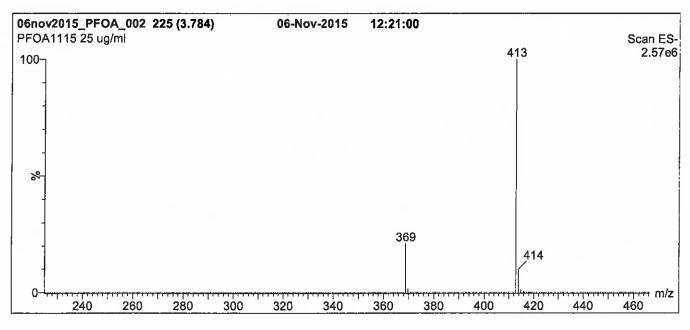




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Figure 1: PFOA; LC/MS Data (TIC and Mass Spectrum)





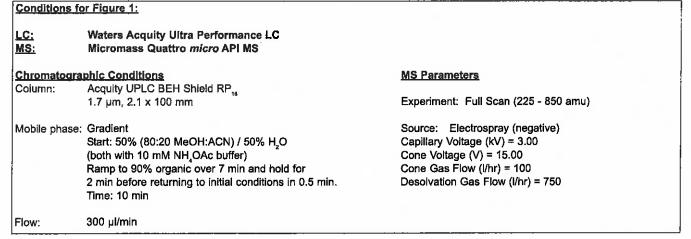
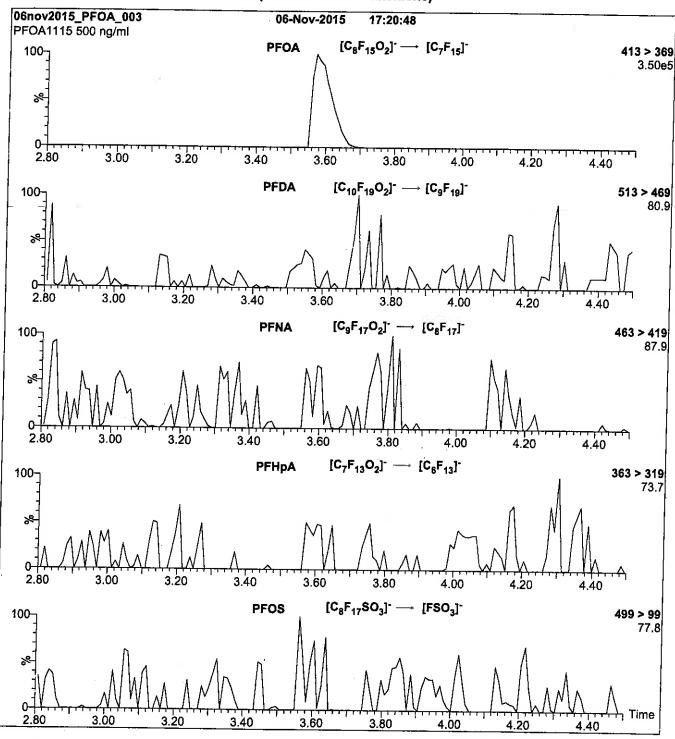


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

Collision Gas (mbar) = 3.17e-3 Collision Energy (eV) = 10

# LCPFODA\_00005

PFODA stock 50ug/mL

#### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFODA** 

**LOT NUMBER:** 

PFODA0115

**COMPOUND:** 

Perfluoro-n-octadecanoic acid

16517-11-6

STRUCTURE:

CAS #:

**MOLECULAR FORMULA:** 

C, HF, O,

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu g/ml$ 

**MOLECULAR WEIGHT:** 

914.14

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.

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Certified By:

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

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

 $x_1, x_2...x_n$  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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

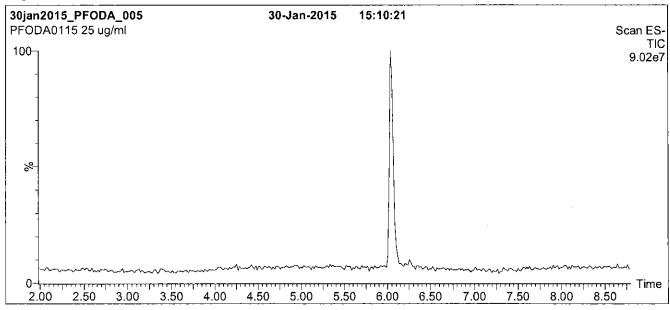
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

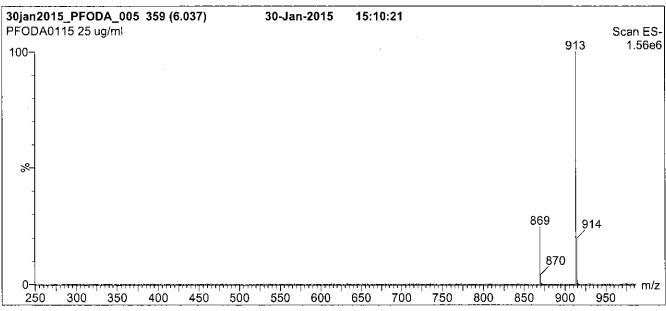




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Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)





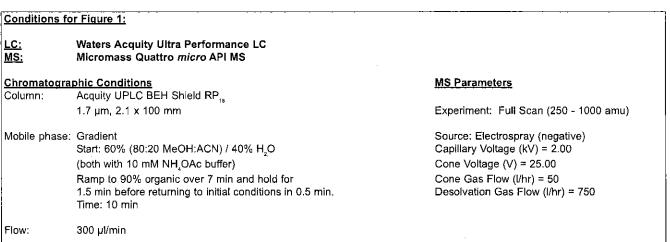
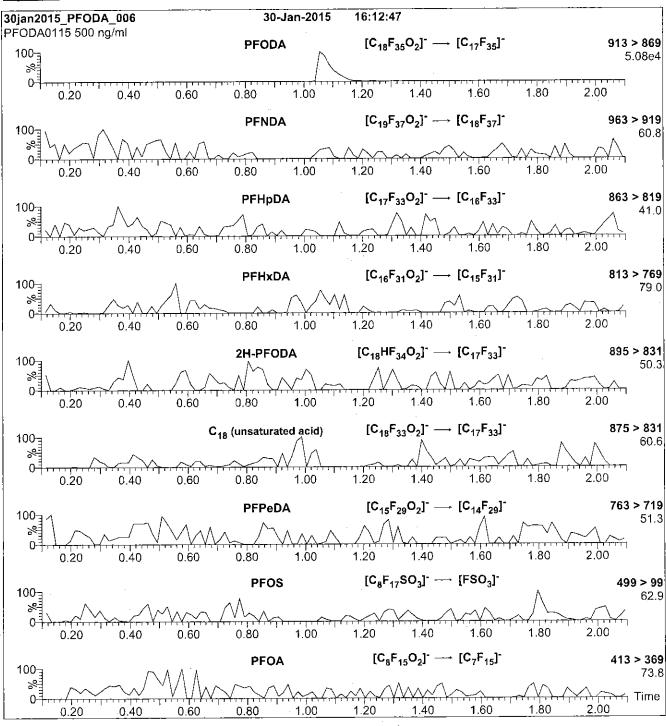
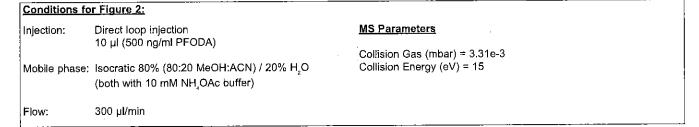


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFOS-br\_00001

Polassium Perfluorooctane



### CERTIFICATE OF ANALYSIS DOCUMENTATION

#### br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT\_CODE:

br-PFOSK

LOT NUMBER:

brPFOSK1015

**CONCENTRATION:** 

 $50 \pm 2.5 \mu g/ml$  (total potassium salt)

 $46.4 \pm 2.3 \,\mu\text{g/ml}$  (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 19F-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).

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#### **HAZARDS:**

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#### **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(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:

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:**

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Table A: br-PFOSK; Isomeric Components and Percent Composition (by 19F-NMR)\*

Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF <sub>3</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup>	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CFSO <sub>3</sub> K <sup>4</sup> CF <sub>3</sub>	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K* CF <sub>3</sub>	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K* CF <sub>3</sub>	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CFCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CFCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> CF <sub>3</sub> -CCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> CF <sub>3</sub> CF <sub>2</sub> -C-CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> -CF-CF-CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub> CF <sub>3</sub>	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> -CF-CF <sub>2</sub> -CF-CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub> CF <sub>3</sub>	0.07

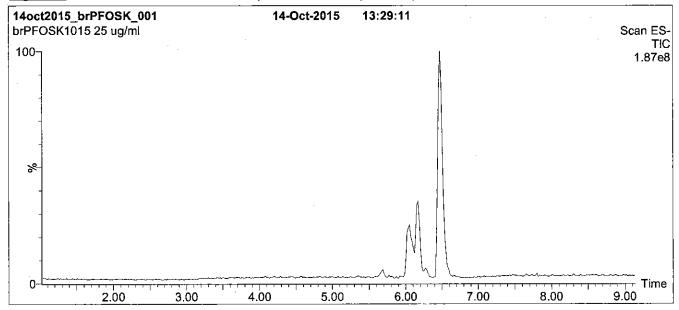
Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
 Systematic Name: Potassium perfluorooctane-2-sulfonate.

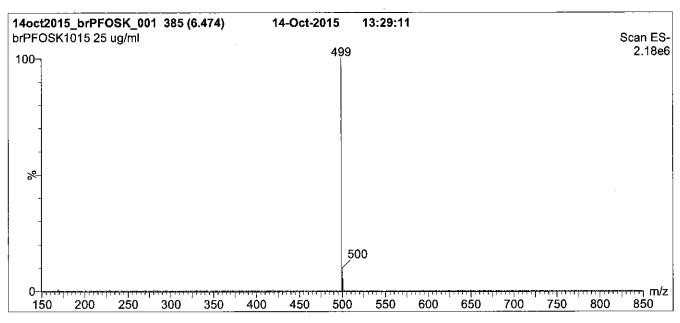
Certified By:

Date:

10/15/2015

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)





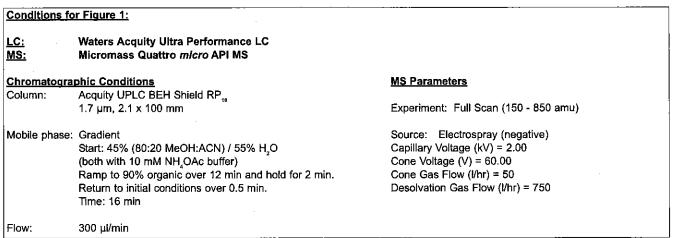
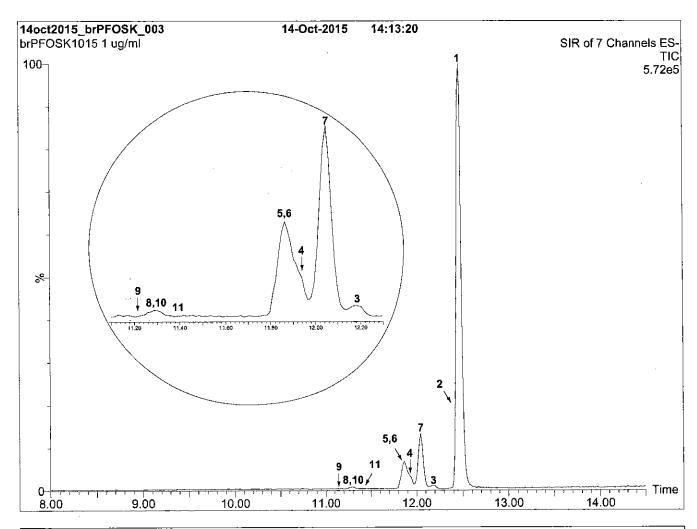


Figure 2: br-PFOSK; LC/MS Data (SIR)



#### Conditions for Figure 2:

<u>LC:</u> MS: Waters Acquity Ultra Performance LC Micromass Quattro micro API MS

#### Chromatographic Conditions:

Column:

Acquity UPLC BEH Shield RP18 (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<sub>2</sub>O (both with 10 mM NH<sub>2</sub>OAc buffer)

Ramp to 90% organic over 15 min and hold for 3 min. Return to initial conditions over 1 min.

Time: 20 min

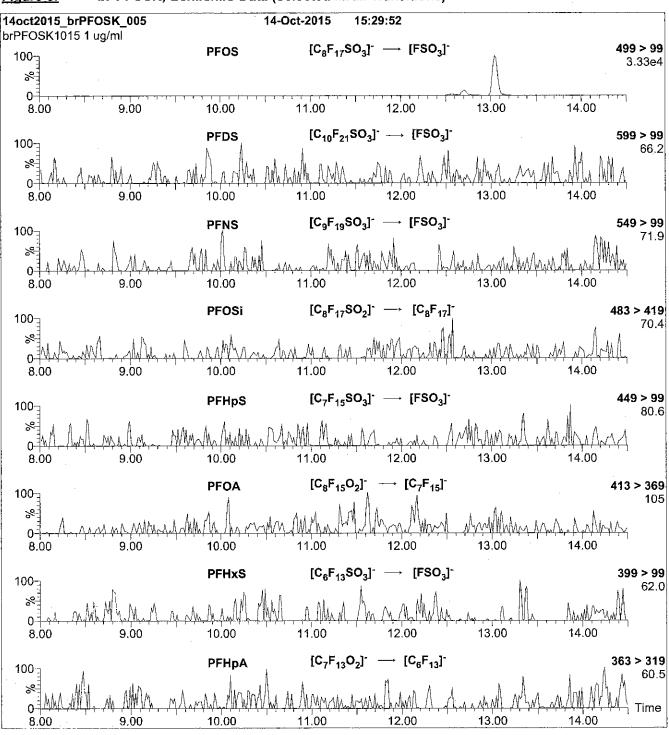
Flow:

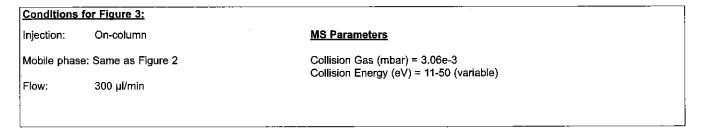
300 µl/min

#### MS Conditions:

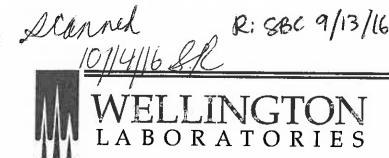
SIR (ES') Source = 110 °C Desolvation = 325 °C Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)





LCPFOS-br\_00002





ID: LCPFOS-br\_00002 Exp: 10/14/20 Prpd: SBC Potassium Perfluorooctane 730516

ID: LCPFOS-br\_00003

Exp: 10/14/20 Prpd: SBC

Potassium Perfluorooctane

### CERTIFICATE OF ANALYSIS DOCUMENTATION

#### br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFOSK

LOT NUMBER:

brPFOSK1015

**CONCENTRATION:** 

 $50 \pm 2.5 \,\mu\text{g/ml}$  (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 19F-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).

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#### **HOMOGENEITY:**

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#### **UNCERTAINTY:**

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

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

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

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

#### TRACEABILITY:

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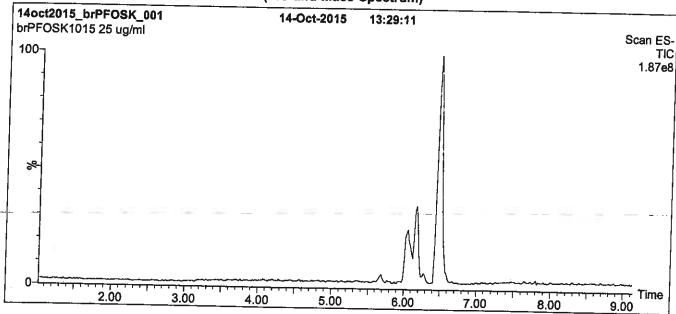
<u>Table A:</u> br-PFOSK; Isomeric Components and Percent Composition (by <sup>16</sup>F-NMR)\*

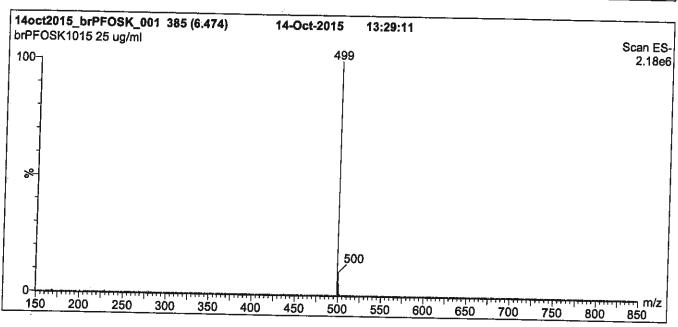
Isomer	Name	Structure	Percent Composition by <sup>19</sup> F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF <sub>3</sub> CF <sub>2</sub> SO <sub>3</sub> K*	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>3</sub> CF <sub>3</sub> CF <sub>3</sub>	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CFCF <sub>2</sub> SO <sub>3</sub> K <sup>4</sup> CF <sub>3</sub>	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CFCF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>4</sup> CF <sub>3</sub>	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub>	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF <sub>3</sub> CFCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K* CF <sub>3</sub>	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> CF <sub>3</sub> −CCF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K⁺ CF <sub>3</sub>	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF3 CF3CF2—C—CF2CF2CF2SO3K↑ CF3	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> -CF-CF-CF <sub>2</sub> CF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub> CF <sub>3</sub>	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF <sub>3</sub> CFCF <sub>2</sub> CFCF <sub>2</sub> CF <sub>2</sub> SO <sub>3</sub> K <sup>+</sup> CF <sub>3</sub> CF <sub>3</sub>	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







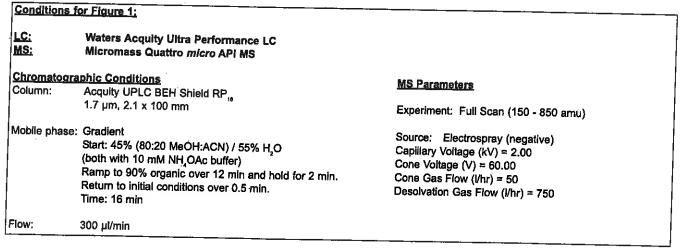
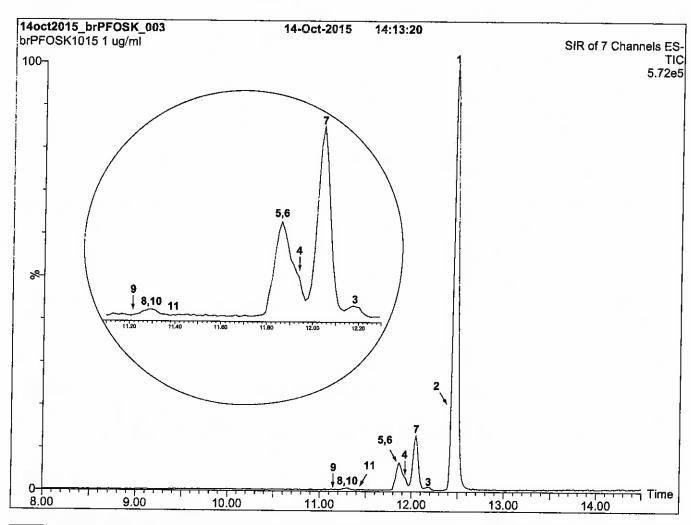


Figure 2: br-PFOSK; LC/MS Data (SIR)



#### Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC

MS: Micromass Quattro micro API MS

#### Chromatographic Conditions:

Column:

Acquity UPLC BEH Shield RP, (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%  $\rm{H_2O}$  (both with 10 mM NH<sub>4</sub>OAc 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:

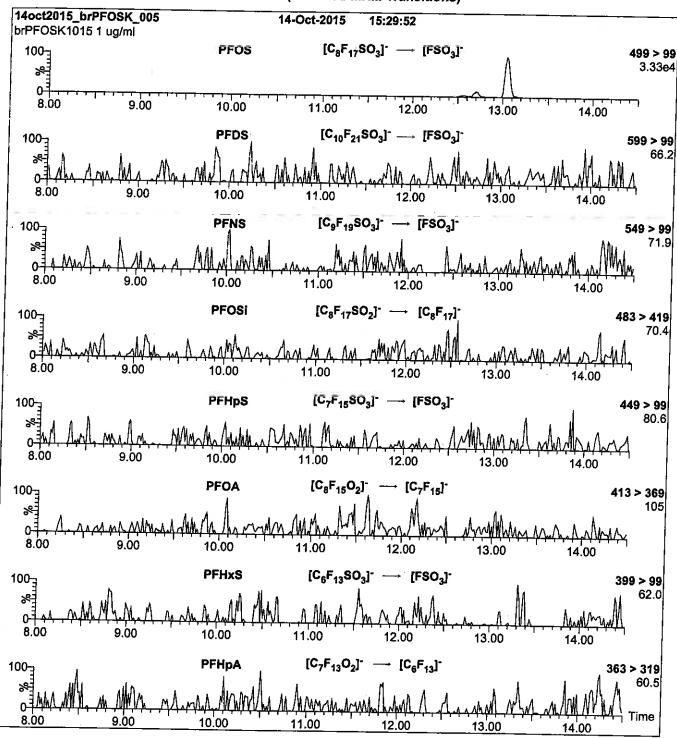
SIR (ES)

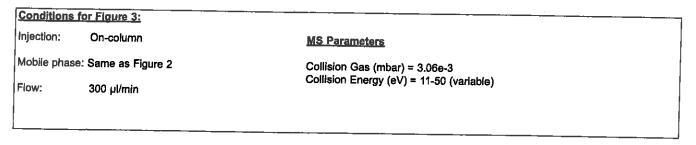
Source = 110 °C

Desolvation = 325 °C

Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)





# LCPFOSA\_00006



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

FOSA-I

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

FOSA0815I

COMPOUND:

Perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

754-91-6

499.14

Isopropanol

F F F F F F F F

**MOLECULAR FORMULA:** 

C,H,F,,NO,S

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

09/02/2015

EXPIRY DATE: (mm/dd/yyyy)

00/02/2010

LAFINI DATE: (mm/cd/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.C. Chillin

Date:

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

$$x_{ij} x_{ij} ... x_{ij}$$
 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:

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:**

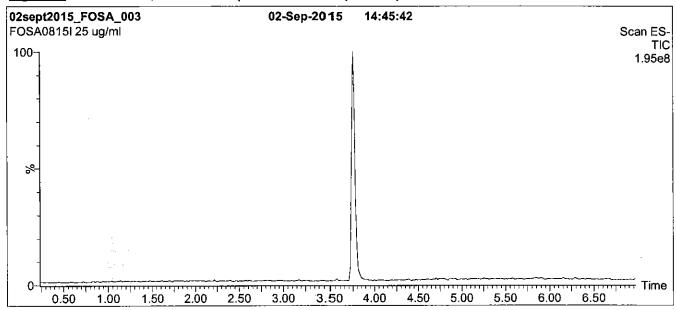
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

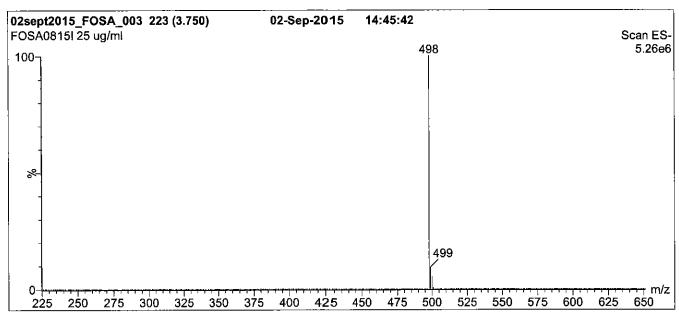




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

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





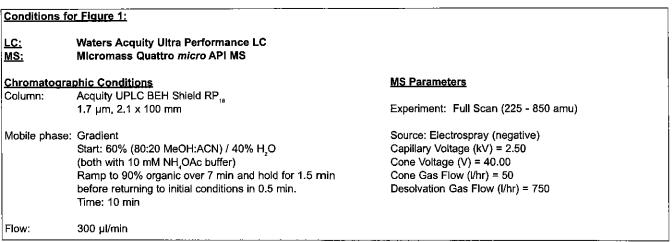
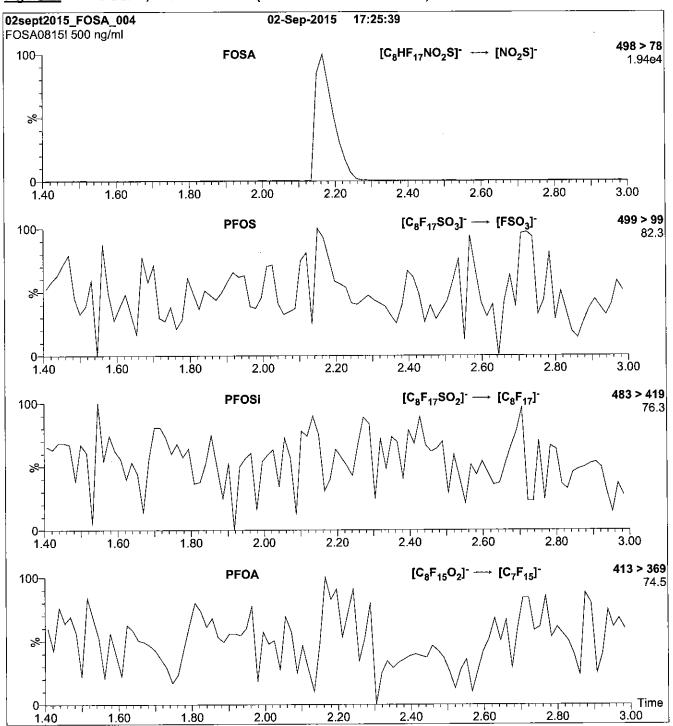
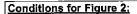


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\rm H_2O$ 

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

Collision Gas (mbar) = 3.54e-3 Collision Energy (eV) = 30

# LCPFPeA\_00005



ID: LCPFPeA\_00005 Exp: 01/30/20 Prpd: CBW PF-n-pentanoic acid



## VELLINGTON ABORATORIES

#### CERTIFICATE OF ANALYSIS **DOCUMENTATION**

**PRODUCT CODE:** 

**PFPeA** 

LOT NUMBER:

PFPeA0115

**COMPOUND:** 

Perfluoro-n-pentanoic acid

**CAS #:** 

2706-90-3

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

C<sub>5</sub>HF<sub>9</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:** 

264.05

**CONCENTRATION:** 

 $50 \pm 2.5 \, \mu g/ml$ 

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<sub>5</sub>H<sub>2</sub>F<sub>5</sub>O<sub>3</sub> (hydrido - derivative) as measured by 19F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 03/26/2015

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

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:**

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

 $X_i, X_{i},...X_{i}$  on which it depends is:

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

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

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

#### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

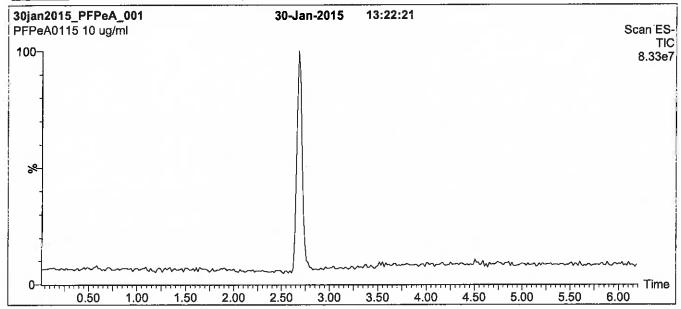
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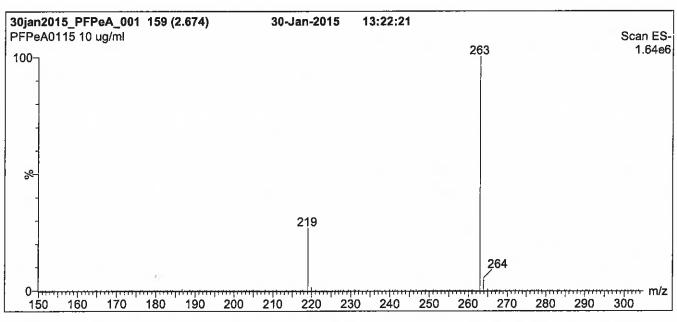




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Figure 1: PFPeA; LC/MS Data (TIC and Mass Spectrum)





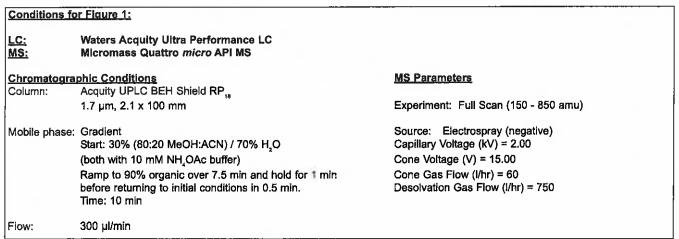
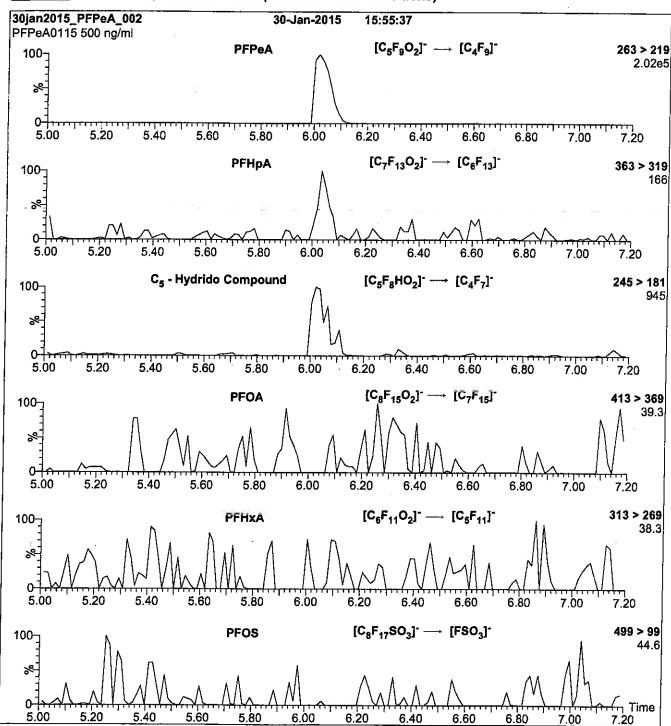
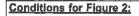


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H\_O

(both with 10 mM NH,OAc buffer)

#### MS Parameters

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

Flow:

300 µl/min

# LCPFTeDA\_00004

#### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFTeDA** 

**LOT NUMBER:** 

PFTeDA1215

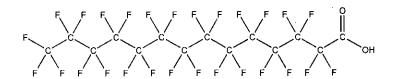
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



**MOLECULAR FORMULA:** 

C, HF, O,

**MOLECULAR WEIGHT:** 

714.11

50 ± 2.5 µg/ml SOLVENT(S): Methanol Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>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 ( $C_{15}HF_{24}O_2$ ).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/09/2015

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

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:**

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 $x_1, x_2,...x_n$  on which it depends is:

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#### 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:**

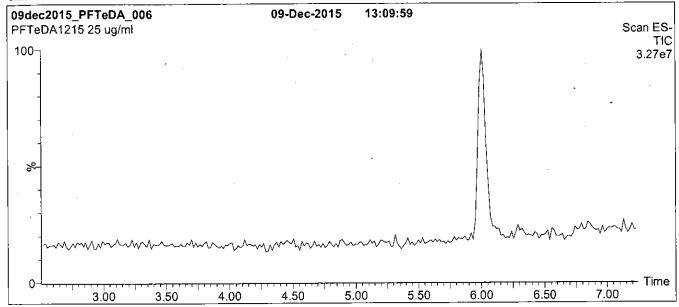
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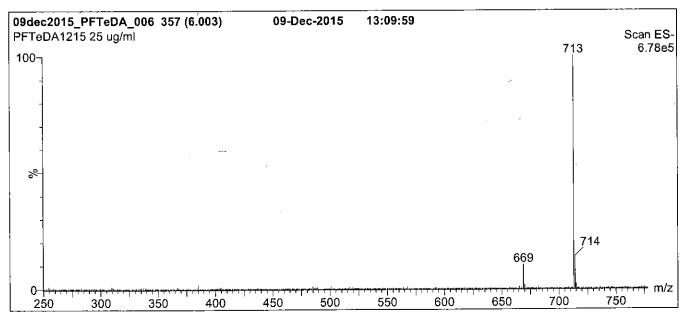




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Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)





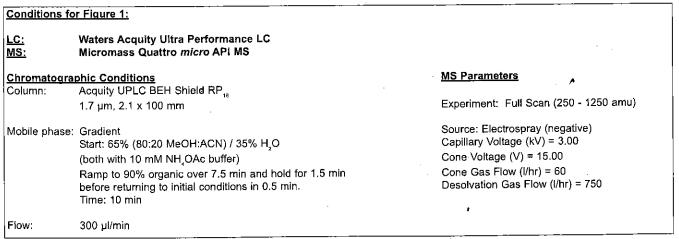
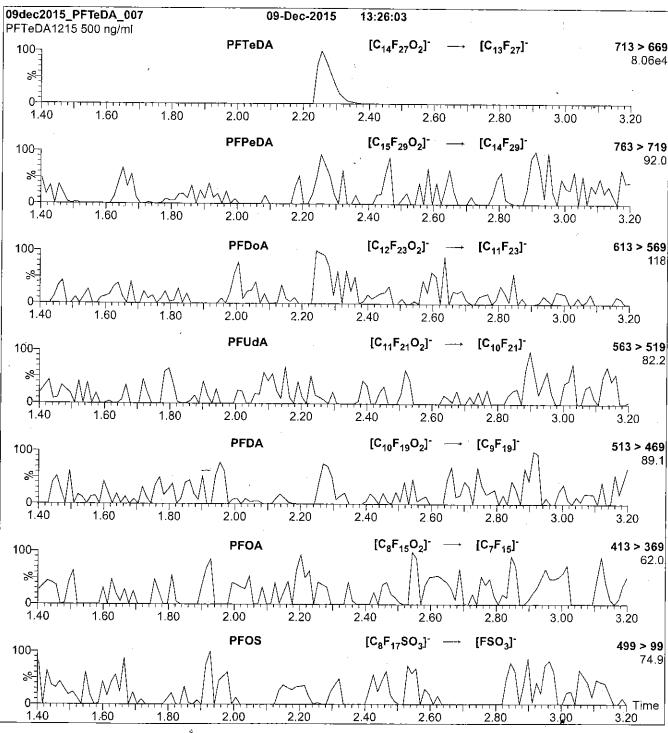
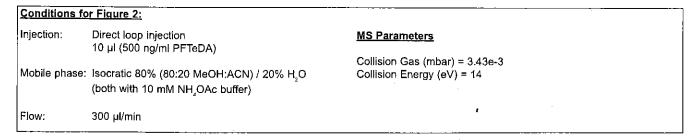


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





# LCPFTrDA\_00004



(D: LCPFTrDA\_00004 Exp: 12/10/18 Prpd: CBW PF~n-tridecanoic acid



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFTrDA** 

**LOT NUMBER:** 

PFTrDA1213

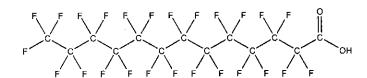
COMPOUND:

Perfluoro-n-tridecanoic acid

STRUCTURE:

CAS #:

72629-94-8



**MOLECULAR FORMULA:** 

C, HF, O,

50 ± 2.5 μg/ml

**MOLECULAR WEIGHT:** 

664.11

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>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:

(mm/dd/www)

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:**

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### **LIMITED WARRANTY:**

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### **QUALITY MANAGEMENT:**

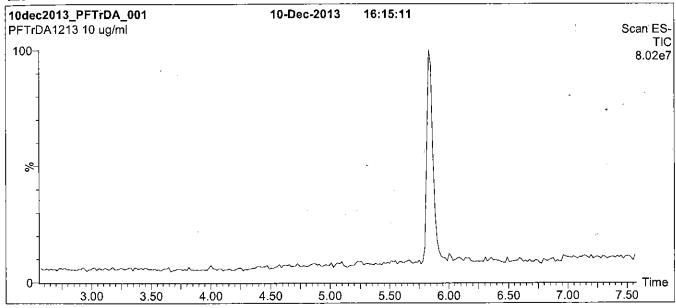
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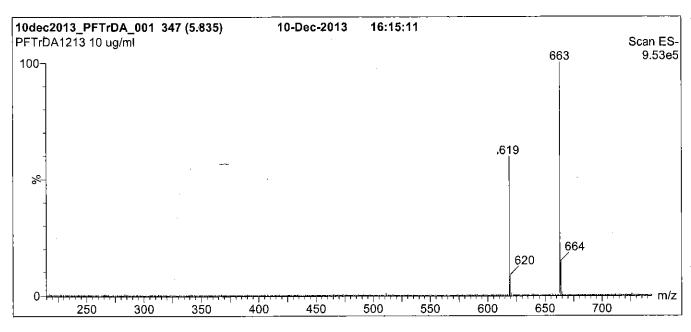




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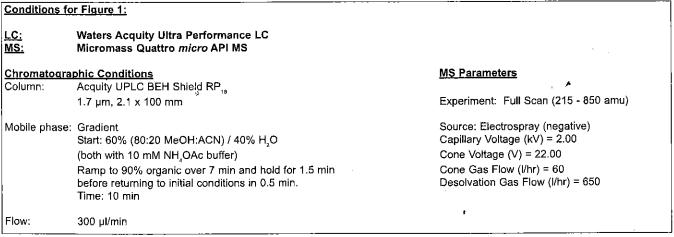
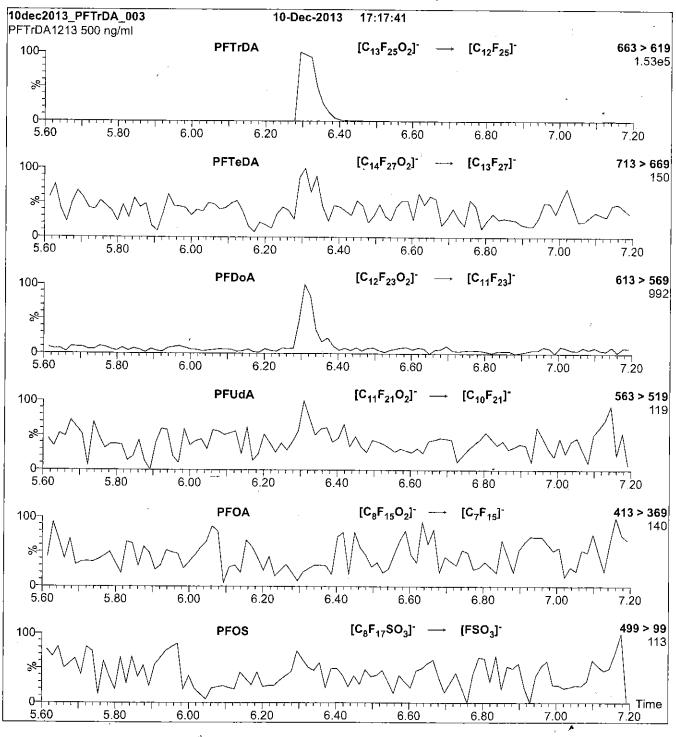
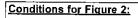


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H<sub>2</sub>O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

### MS Parameters

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 15

# Reagent

# LCPFUdA\_00004



PF-n-undecanoic acid

Rec. 3/29/16 JRB /



# CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFUdA** 

LOT NUMBER:

PFUdA0815

COMPOUND:

Perfluoro-n-undecanoic acid

CAS #:

2058-94-8

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

C11HF21O2

50 . 0.5 . . - /-

MOLECULAR WEIGHT:

564.09

**CONCENTRATION:** 50

 $50 \pm 2.5 \,\mu g/ml$ 

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:

5.0 01411

Date:

<u>08/21/2015 </u>

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

$$x_1, x_2, ..., x_n$$
 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  $\pm 5\%$  (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

#### TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using 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:**

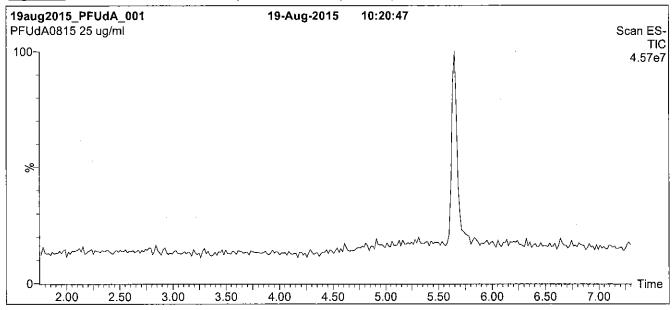
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

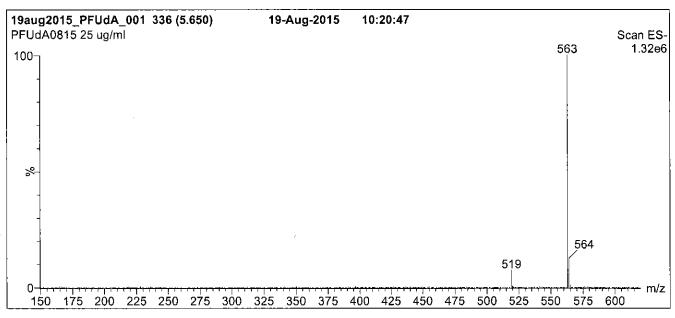




\*\*For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>\*\*

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





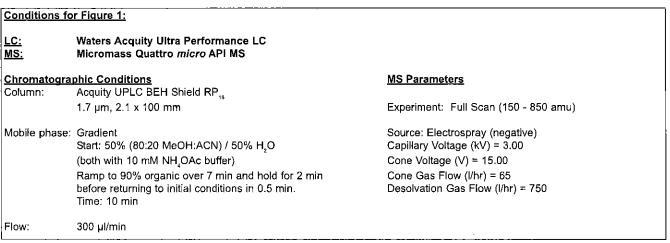
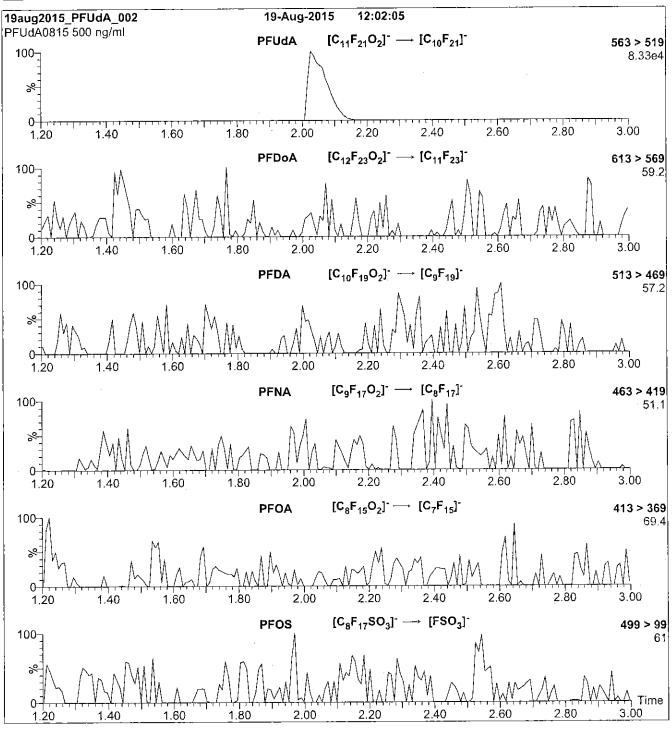
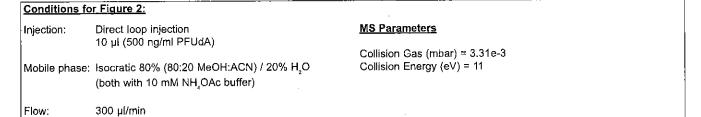


Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)





# Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC\_DOD

### FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-235	42-	_	1	_
---	-----	---	---	---

SDG No.:

Matrix: Solid Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFHxS #	PFOA #	PFOS #
DPT-16-34-SO-14-15	320-23542-3	73	91	58
DPT-16-34-SO-14-15 DL	320-23542-3 DL	99	125	72
	MB 320-138291/1-A	94	111	89
	LCS 320-138291/2-A	91	107	92
DPT-16-34-SO-14-15 MS	320-23542-3 MS	72	86	54
DPT-16-34-SO-14-15 MS DL	320-23542-3 MS DL	84	110	63
DPT-16-34-SO-14-15 MSD	320-23542-3 MSD	71	84	60
DPT-16-34-SO-14-15 MSD DL	320-23542-3 MSD DL	82	108	67

 $\begin{array}{c} \text{QC LIMITS} \\ \text{PFHxS} = 1802 \text{ PFHxS} & 25-150 \\ \text{PFOA} = 13\text{C4 PFOA} & 25-150 \\ \text{PFOS} = 13\text{C4 PFOS} & 25-150 \\ \end{array}$ 

 $\ensuremath{\text{\#}}$  Column to be used to flag recovery values

FORM II 537 (Modified)

### FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.	: 320-23542-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

	I		T	
Client Sample ID	Lab Sample ID	PFHxS #	PFOA #	PFOS #
DPT-16-01-GW-17-21	320-23542-1	96	95	86
DPT-16-01-GW-17-21 DL	320-23542-1 DL	129	110	114
DPT-16-05-GW-17-21	320-23542-2	81	77	63
DPT-16-05-GW-17-21 DL	320-23542-2 DL	154 Ç	125	146
DPT-16-34-GW-31-35	320-23542-4	52	54	74
DPT-16-34-GW-31-35 DL	320-23542-4 DL	115	101	125
	MB 320-138217/1-A	108	117	105
	LCS 320-138217/2-A	74	78	72
DPT-16-05-GW-17-21 -MS MS	320-23542-2 MS	76	43	59
DPT-16-05-GW-17-21 -MS MS DL	320-23542-2 MS DL	156 Ç	78	145
DPT-16-05-GW-17-21 -MSD MSD	320-23542-2 MSD	82	80	65
DPT-16-05-GW-17-21 -MSD MSD DL	320-23542-2 MSD DL	116	101	99

 $\begin{array}{c} \text{QC LIMITS} \\ \text{PFHxS} = 1802 \text{ PFHxS} & 25-150 \\ \text{PFOA} = 13\text{C4 PFOA} & 25-150 \\ \text{PFOS} = 13\text{C4 PFOS} & 25-150 \\ \end{array}$ 

 $<sup>\</sup>ensuremath{\text{\#}}$  Column to be used to flag recovery values

### FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Nam	Name: TestAmerica Sacramento		Job No.: 320	-23542-1
SDG No.	:			
Matrix:	Water	Level: Low	Lab File ID:	20NOV2016D_015.d
Lab ID:	LCS 320-138217/2-A		Client ID:	

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.0400	0.0392	98	60-140	
Perfluorooctane Sulfonate (PFOS)	0.0371	0.0347	94	60-140	
13C4 PFOA	0.100	0.0780	78	25-150	
13C4 PFOS	0.0956	0.0687	72	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0365	103	50-150	
1802 PFHxS	0.0946	0.0703	74	25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values FORM III 537 (Modified)

### FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Nam	e: TestAmerica Sacr	amento	Job No.: 320	-23542-1
SDG No.	:			
Matrix:	Solid	Level: Low	Lab File ID:	20NOV2016D_006.d
Lab ID:	LCS 320-138291/2-A		Client ID:	

	SPIKE ADDED	LCS CONCENTRATION	LCS	QC LIMITS	#
COMPOUND	(ug/Kg)	(ug/Kg)	REC	REC	
Perfluorooctanoic acid (PFOA)	3.98	4.37	110	60-140	
Perfluorooctane Sulfonate (PFOS)	3.69	3.90	106	60-140	
13C4 PFOA	9.94	10.7	107	25-150	
13C4 PFOS	9.50	8.72	92	25-150	
Perfluorobutanesulfonic acid (PFBS)	3.51	4.70	134	50-150	
1802 PFHxS	9.40	8.60	91	25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values FORM III 537 (Modified)

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Matrix: Water Level: Low Lab File ID: 20NOV2016D\_018.d

Lab ID: 320-23542-2 MS Client ID: DPT-16-05-GW-17-21-MS MS

		SAMPLE CONCENTRATION			QC LIMITS	#
COMPOUND	(ug/L)	(ug/L)	(ug/L)	REC	REC	
Perfluorooctanoic acid (PFOA)	0.0398	0.19	0.244	145	60-140	4
Perfluorooctane Sulfonate (PFOS)	0.0369	2.2	2.43	610	60-140	E 4
13C4 PFOA	0.0995	0.074	0.0426	43	25-150	
13C4 PFOS	0.0951	0.058	0.0558	59	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0352	0.050	0.107	161	50-150	JМ
1802 PFHxS	0.0941	0.074	0.0714	76	25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

Lab Name	: TestAmerica	Sacramento		Job	No.:	320-	-23542-1
SDG No.:							
Matrix:	Water	Level:	Low	Lab	File	ID:	02DEC2016B_002.d

Lab ID: 320-23542-2 MS DL Client ID: DPT-16-05-GW-17-21-MS MS DL

	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %	QC LIMITS	#
COMPOUND	(ug/L)	(ug/L)	(ug/L)	REC	REC	
Perfluorooctanoic acid (PFOA)	0.0398	0.21 J	0.268	140	60-140	4 D
Perfluorooctane Sulfonate (PFOS)	0.0369	2.8	3.08	749	60-140	4 D
13C4 PFOA	0.0995	0.12	0.0773	78	25-150	
13C4 PFOS	0.0951	0.13	0.138	145	25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0352	0.19 U	0.20 U	NC	50-150	
1802 PFHxS	0.0941	0.14	0.146	156	25-150	Q

 $<sup>\</sup>ensuremath{\text{\#}}$  Column to be used to flag recovery and RPD values FORM III 537 (Modified)

ab Name: TestAmerica	Sacramento	Job No.:	320-23542-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: 20NOV2016D\_008.d

Lab ID: 320-23542-3 MS Client ID: DPT-16-34-S0-14-15 MS

		SAMPLE CONCENTRATION			QC LIMITS	#
COMPOUND	(ug/Kg)	(ug/Kg)	(ug/Kg)	REC	REC	
Perfluorooctanoic acid (PFOA)	5.04	3.2	12.2	179	60-140	МJ
Perfluorooctane Sulfonate (PFOS)	4.68	34	67.4	719	60-140	E 4
13C4 PFOA	12.6	11	10.8	86	25-150	
13C4 PFOS	12.0	6.9	6.53	54	25-150	
Perfluorobutanesulfonic acid (PFBS)	4.46	0.37 U	6.08	136	50-150	
1802 PFHxS	11.9	8.6	8.62	72	25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

Lab Name	e: <u>TestAmerica Sacr</u>	amento	Job No.: 320-23542-1
SDG No.	:		
Matrix:	Solid	Level: Low	Lab File ID: 02DEC2016B_007.d
Lab ID:	320-23542-3 MS DL		Client ID: DPT-16-34-SO-14-15 MS DL

	SPIKE ADDED	SAMPLE CONCENTRATION	MS CONCENTRATION	MS %	QC LIMITS	#
COMPOUND	(ug/Kg)	(ug/Kg)	(ug/Kg)	REC	REC	
Perfluorooctanoic acid (PFOA)	5.04	3.6J	12.7	182	60-140	JD
Perfluorooctane Sulfonate (PFOS)	4.68	35	69.2	740	60-140	4 D
13C4 PFOA	12.6	16	13.8	110	25-150	
13C4 PFOS	12.0	8.6	7.60	63	25-150	
Perfluorobutanesulfonic acid (PFBS)	4.46	3.7 U	4.90 J	110	50-150	D
1802 PFHxS	11.9	12	9.97	84	25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

Lab	Name:	TestAmerica Sacramento	Job No.:	320-23542-1
CDC	No.			

SDG No.:

Matrix: Water Level: Low Lab File ID: 20NOV2016D\_019.d

Lab ID: 320-23542-2 MSD Client ID: DPT-16-05-GW-17-21-MSD MSD

	SPIKE	MSD	MSD	0	QC L	IMITS	,,
		CONCENTRATION	- 1	용		_	#
COMPOUND	(ug/L)	(ug/L)	REC	RPD	RPD	REC	
Perfluorooctanoic acid (PFOA)	0.0404	0.210	59	15	30	60-140	4 M
Perfluorooctane Sulfonate (PFOS)	0.0374	2.05	-410	17	30	60-140	E 4
13C4 PFOA	0.101	0.0805	80			25-150	
13C4 PFOS	0.0964	0.0631	65			25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0357	0.0881	106	19	30	50-150	М
1802 PFHxS	0.0954	0.0785	82			25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

Lab Nam	me: TestAmerica Sacramento		Jo	b No.:	320-23542-1
SDG No.	:				
Matriv.	Water	Level:	Low La	h Fila	TD: 02DEC2016B 003 d

Lab ID: 320-23542-2 MSD DL Client ID: DPT-16-05-GW-17-21-MSD MSD DL

	SPIKE	MSD	MSD	0	QC L	IMITS	щ
	ADDED	CONCENTRATION	용	용			#
COMPOUND	(ug/L)	(ug/L)	REC	RPD	RPD	REC	
Perfluorooctanoic acid (PFOA)	0.0404	0.214 J	4	22	30	60-140	4 D
Perfluorooctane Sulfonate (PFOS)	0.0374	2.79	-24	10	30	60-140	4 D
13C4 PFOA	0.101	0.102	101			25-150	
13C4 PFOS	0.0964	0.0959	99			25-150	
Perfluorobutanesulfonic acid (PFBS)	0.0357	0.20 U	NC	NC	30	50-150	
1802 PFHxS	0.0954	0.111	116			25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

Lab Nam	me: TestAmerica Sacramento			Job	No.:	320-	-23542-1
SDG No.	:		_				
Matrix:	Solid	Level:	Low	Lab	File	ID:	20NOV2016D_009.d

Lab ID: 320-23542-3 MSD Client ID: DPT-16-34-SO-14-15 MSD

	SPIKE ADDED	MSD CONCENTRATION	MSD %	0/0	QC L	IMITS	#
COMPOUND		(ug/Kg)	REC	RPD	RPD	REC	#
COMPOUND	(ug/Kg)	(ug/kg)	KEC	KPD	KPD	KEC	
Perfluorooctanoic acid (PFOA)	5.00	13.1	198	7	30	60-140	МJ
Perfluorooctane Sulfonate	4.64	59.2	549	13	30	60-140	E 4
(PFOS)							
13C4 PFOA	12.5	10.5	84			25-150	
13C4 PFOS	12.0	7.17	60			25-150	
Perfluorobutanesulfonic acid	4.42	5.82	132	4	30	50-150	
(PFBS)							
1802 PFHxS	11.8	8.38	71			25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

Lab Name	e: <u>TestAmerica Sa</u>	cramento	Job No.:	320-	-23542-1	
SDG No.	:					
Matrix:	Solid	Level: Low	Lab File :	ID:	02DEC2016B_008.d	

Lab ID: 320-23542-3 MSD DL Client ID: DPT-16-34-SO-14-15 MSD DL

	SPIKE ADDED	MSD CONCENTRATION	MSD %	0/0	QC L	IMITS	#
COMPOUND	(ug/Kg)	(ug/Kg)	∞ REC	™ RPD	RPD	REC	#
COMPOUND	(ug/kg)	(ug/kg)	KEC	KED	KED	KEC	
Perfluorooctanoic acid (PFOA)	5.00	13.1	191	3	30	60-140	JD
Perfluorooctane Sulfonate	4.64	63.2	617	9	30	60-140	4 D
(PFOS)							
13C4 PFOA	12.5	13.6	108			25-150	
13C4 PFOS	12.0	8.06	67			25-150	
Perfluorobutanesulfonic acid	4.42	4.97 J	113	2	30	50-150	D
(PFBS)							
1802 PFHxS	11.8	9.64	82			25-150	

<sup>#</sup> Column to be used to flag recovery and RPD values
FORM III 537 (Modified)

### FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
SDG No.:	
Lab File ID: 20NOV2016D_014.d	Lab Sample ID: MB 320-138217/1-A
Matrix: Water	Date Extracted: 11/17/2016 08:49
Instrument ID: A8_N	Date Analyzed: 11/20/2016 22:18
7 7 /7 /7 /7	

Level: (Low/Med) Low

### THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB	
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED
	LCS 320-138217/2-A	20NOV2016D	11/20/2016 22:25
		015.d	
DPT-16-01-GW-17-21	320-23542-1	20NOV2016D_	11/20/2016 22:33
		016.d	
DPT-16-05-GW-17-21	320-23542-2	20NOV2016D_	11/20/2016 22:40
		017.d	
DPT-16-05-GW-17-21-MS MS	320-23542-2 MS	20NOV2016D_	11/20/2016 22:48
		018.d	
DPT-16-05-GW-17-21-MSD MSD	320-23542-2 MSD	20NOV2016D_	11/20/2016 22:55
		019.d	
DPT-16-34-GW-31-35	320-23542-4	20NOV2016D_	11/20/2016 23:03
		020.d	
DPT-16-05-GW-17-21 DL	320-23542-2 DL	02DEC2016B_	12/02/2016 12:59
		001.d	
DPT-16-05-GW-17-21-MS MS DL	320-23542-2 MS DL	02DEC2016B_	12/02/2016 13:06
		002.d	
DPT-16-05-GW-17-21-MSD MSD DL	320-23542-2 MSD DL	02DEC2016B_	12/02/2016 13:14
		003.d	
DPT-16-01-GW-17-21 DL	320-23542-1 DL	02DEC2016B_	12/02/2016 13:22
		004.d	
DPT-16-34-GW-31-35 DL	320-23542-4 DL	02DEC2016C_	12/02/2016 16:14
		011.d	

### FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
SDG No.:	
Lab File ID: 20NOV2016D_005.d	Lab Sample ID: MB 320-138291/1-A
Matrix: Solid	Date Extracted: 11/17/2016 12:49
Instrument ID: A8_N	Date Analyzed: 11/20/2016 21:10
Level: (Low/Med) Low	

### THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB			
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZED		
	LCS 320-138291/2-A	20NOV2016D_ 006.d	11/20/2016 21:18		
DPT-16-34-SO-14-15	320-23542-3	20NOV2016D_ 007.d	11/20/2016 21:25		
DPT-16-34-SO-14-15 MS	320-23542-3 MS	20NOV2016D_ 008.d	11/20/2016 21:33		
DPT-16-34-SO-14-15 MSD	320-23542-3 MSD	20NOV2016D_ 009.d	11/20/2016 21:40		
DPT-16-34-SO-14-15 DL	320-23542-3 DL	02DEC2016B_ 006.d	12/02/2016 13:37		
DPT-16-34-SO-14-15 MS DL	320-23542-3 MS DL	02DEC2016B_ 007.d	12/02/2016 13:44		
DPT-16-34-SO-14-15 MSD DL	320-23542-3 MSD DL	02DEC2016B_ 008.d	12/02/2016 13:52		

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-01-GW-17-21 Lab Sample ID: 320-23542-1

Matrix: Water Lab File ID: 20NOV2016D\_016.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 10:30

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 240.6(mL) Date Analyzed: 11/20/2016 22:33

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.062	М	0.0026	0.0021	0.00078
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.86	E	0.0042	0.0031	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.011	М	0.0026	0.0021	0.00095

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	95		25-150
STL00991	13C4 PFOS	86		25-150
STL00994	1802 PFHxS	96		25-150

Report Date: 23-Nov-2016 15:49:26 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_016.d

Lims ID: 320-23542-A-1-A Client ID: DPT-16-01-GW-17-21

Sample Type: Client

Inject. Date: 20-Nov-2016 22:33:19 ALS Bottle#: 21 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-1-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:49:25 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:49:25

							<u> </u>				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	5 Perfluorobuta	anesulfo	nic acid								M
	298.90 > 80.00	1.791	1.791	0.0	1.000	1514435	5.14				M
	298.90 > 99.00	1.791	1.791	0.0	1.000	648843		2.33(0.00-0.00)			
	D 10 1802 PFH	xS									
	403.00 > 84.00	2.387	2.382	0.005		9191228	45.5		96.2	523603	
15 Perfluorooctanoic acid											M
	413.00 > 369.00	2.732	2.733	-0.001	1.000	4080092	29.9			51238	M
	413.00 > 169.00	2.732	2.733	-0.001	1.000	2758151		1.48(0.90-1.10)		130044	
	D 14 13C4 PFO	А									
	417.00 > 372.00	2.732	2.733	-0.001		6498915	47.6		95.2	687147	
	18 Perfluorooct	ane sulf	onic acio	t							E
	499.00 > 80.00	3.103	3.096	0.007	1.000	60206367	413.5			100767	8E
	499.00 > 99.00	3.103	3.096	0.007	1.000	13735025		4.38(0.90-1.10)		102986	3
	D 17 13C4 PFO	S									
	503.00 > 80.00	3.103	3.096	0.007		6398614	41.1		86.0	149122	

### **QC Flag Legend**

Processing Flags

E - Exceeded Maximum Amount

**Review Flags** 

M - Manually Integrated

Report Date: 23-Nov-2016 15:49:26 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_016.d

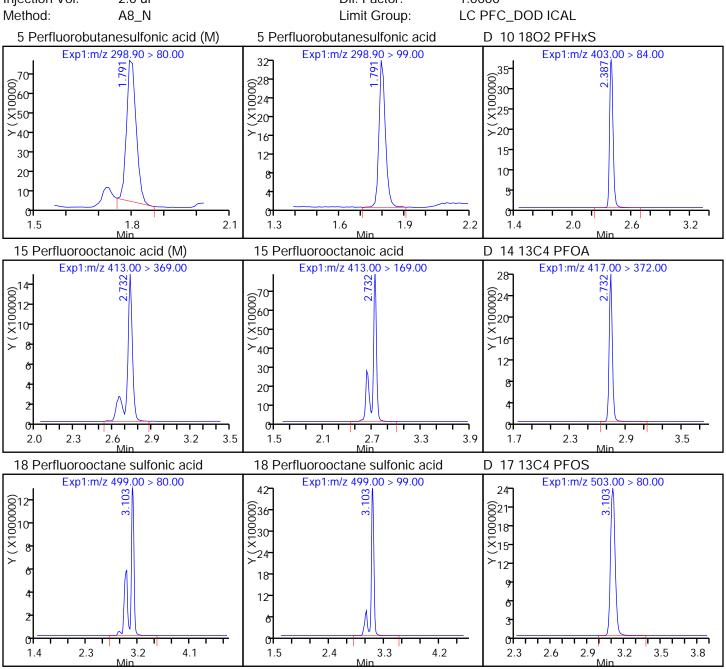
Injection Date: 20-Nov-2016 22:33:19 Instrument ID: A8\_N

Lims ID: 320-23542-A-1-A Lab Sample ID: 320-23542-1

Client ID: DPT-16-01-GW-17-21

Operator ID: A8-PC\A8 ALS Bottle#: 21 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Report Date: 23-Nov-2016 15:49:26 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_016.d

Client ID: DPT-16-01-GW-17-21

Operator ID: A8-PC\A8 ALS Bottle#: 21 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

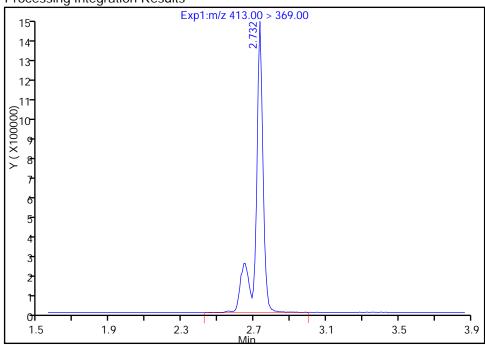
Column: Detector EXP1

### 15 Perfluorooctanoic acid, CAS: 335-67-1

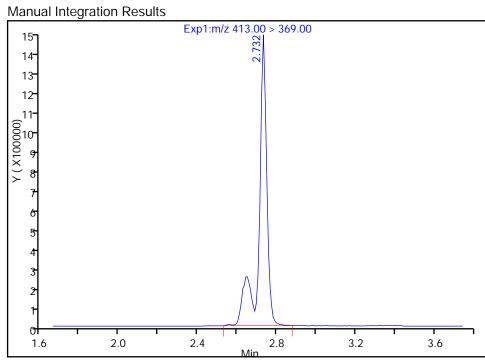
Signal: 1

RT: 2.73
Area: 4133135
Amount: 30.281606
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.73
Area: 4080092
Amount: 29.892984
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:49:25

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 400 of 842

Report Date: 23-Nov-2016 15:49:26 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_016.d

Client ID: DPT-16-01-GW-17-21

Operator ID: A8-PC\A8 ALS Bottle#: 21 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

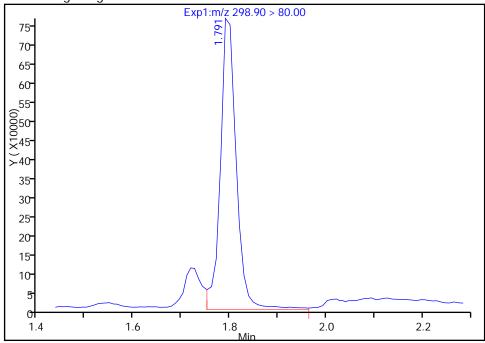
Column: Detector EXP1

### 5 Perfluorobutanesulfonic acid, CAS: 375-73-5

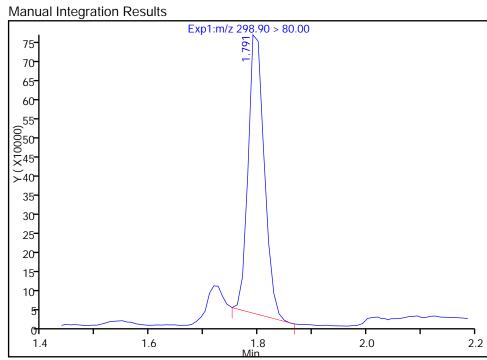
Signal: 1

RT: 1.79
Area: 1768418
Amount: 5.999246
Amount Units: ng/ml

**Processing Integration Results** 



RT: 1.79
Area: 1514435
Amount: 5.137625
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:49:25

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 401 of 842

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-01-GW-17-21 DL Lab Sample ID: 320-23542-1 DL

Matrix: Water Lab File ID: 02DEC2016B\_004.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 10:30

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 240.6(mL) Date Analyzed: 12/02/2016 13:22

Con. Extract Vol.: 0.5(mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 140382 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.066	D	0.026	0.021	0.0078
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.98	D	0.042	0.031	0.013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.021	U	0.026	0.021	0.0095

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	110		25-150
STL00991	13C4 PFOS	114		25-150
STL00994	1802 PFHxS	129		25-150

Report Date: 02-Dec-2016 15:01:37 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_004.d

Lims ID: 320-23542-A-1-A Client ID: DPT-16-01-GW-17-21

Sample Type: Client

Inject. Date: 02-Dec-2016 13:22:02 ALS Bottle#: 4 Worklist Smp#: 27

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-23542-A-1-A 10X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:55:36 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 15:01:36

i ii st Es voi i to violvoi i dilai ai asonas					Date: 02 Dec 2010 10:01:00			,,,			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	5 Perfluorobuta	anesulfo	nic acid								
	298.90 > 80.00	1.916	1.961	-0.045	1.000	274972	0.4359				
	298.90 > 99.00	1.916	1.961	-0.045	1.000	120300		2.29(0.00-0.00)			
	D 10 18O2 PFH	xS									
	403.00 > 84.00	2.559	2.614	-0.055		1849400	6.11		12.9	389202	
15 Perfluorooctanoic acid											
	413.00 > 369.00	2.914	2.984	-0.070	1.000	778389	3.17			9355	
	413.00 > 169.00	2.922	2.984	-0.062	1.003	516345		1.51(0.90-1.10)		24963	
	D 14 13C4 PFO	А									
	417.00 > 372.00	2.914	2.984	-0.070		1203801	5.49		11.0	158086	
	D 17 13C4 PFO	S									
	503.00 > 80.00	3.294	3.365	-0.071		1332769	5.45		11.4	68116	
	18 Perfluorooct	ane sulf	onic acid	b							
	499.00 > 80.00	3.302	3.366	-0.064	1.000	14352193	47.3			915541	
	499.00 > 99.00	3.294	3.366	-0.072	0.998	2921573		4.91(0.90-1.10)		322213	

Report Date: 02-Dec-2016 15:01:37 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: 

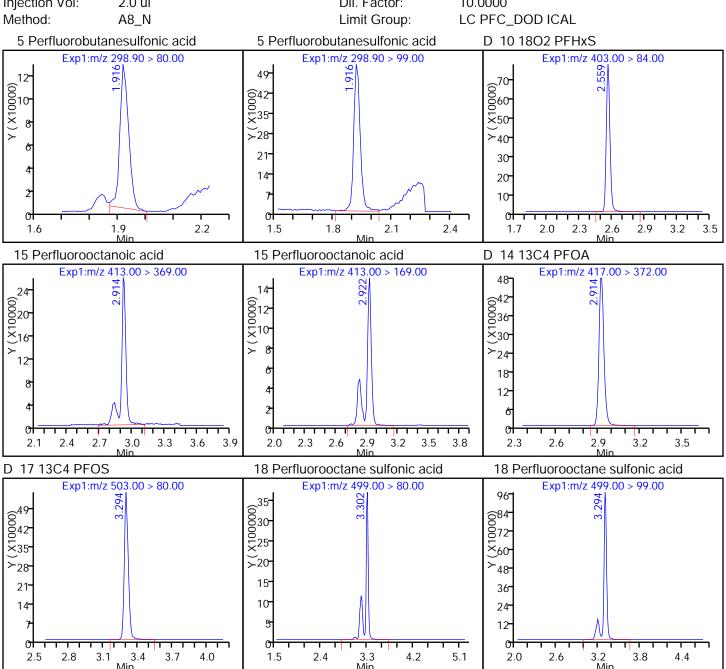
**Injection Date:** 02-Dec-2016 13:22:02 Instrument ID: A8\_N

Lims ID: 320-23542-A-1-A Lab Sample ID: 320-23542-1

Client ID: DPT-16-01-GW-17-21

Operator ID: A8-PC\A8 ALS Bottle#: 4 Worklist Smp#: 27

Dil. Factor: 10.0000 Injection Vol: 2.0 ul



#### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-05-GW-17-21 Lab Sample ID: 320-23542-2

Matrix: Water Lab File ID: 20NOV2016D\_017.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 11:45

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 258.6(mL) Date Analyzed: 11/20/2016 22:40

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.19	JM	0.0024	0.0019	0.00072
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.2	J E	0.0039	0.0029	0.0012
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.050	JМ	0.0024	0.0019	0.00089

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	77		25-150
STL00991	13C4 PFOS	63		25-150
STL00994	1802 PFHxS	81		25-150

Report Date: 23-Nov-2016 15:55:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_017.d

Lims ID: 320-23542-A-2-A Client ID: DPT-16-05-GW-17-21

Sample Type: Client

Inject. Date: 20-Nov-2016 22:40:50 ALS Bottle#: 22 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-2-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:55:17 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:55:17

I II St Ector Retie	won. ona	rigiloit			Bate.		0 110V 2010 10:00:1			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	•									
212.90 > 169.00	1.502	1.493	0.009	1.000	2018566	21.4			12559	
D 213C4 PFBA										
217.00 > 172.00	1.494	1.493	0.001		5421106	27.4		54.9	510052	
D 413C5-PFPe										
267.90 > 223.00	1.762	1.752	0.010		6461102	40.4		80.8	438769	
3 Perfluoropen										
262.90 > 219.00	1.762	1.762	0.0	1.000	4241169	31.6			22271	
5 Perfluorobuta										M
298.90 > 80.00		1.791	0.010	1.000	6513928	26.1	2 24(2 22 2 22)			M
298.90 > 99.00		1.791	0.010	1.000	2910369		2.24(0.00-0.00)			
7 Perfluorohex			0.0	1 000	1/700040	4477			100510	
313.00 > 269.00		2.040	0.0	1.000	16733249	147.7			100510	
D 6 13C2 PFHx		2.040	0.007		F007202	41.0		00.7	2700/2	
315.00 > 270.00		2.040	0.006		5997283	41.3		82.6	378863	
D 11 13C4-PFH <sub>k</sub> 367.00 > 322.00		22//	0.002		4004117	22.1		(12	200405	
		2.366	0.003		4224117	32.1		64.3	390495	
12 Perfluoroher			0.002	1 000	1/0/415	10 F			2007	
363.00 > 319.00		2.372	-0.003	1.000	1686415	19.5			3907	
D 10 18O2 PFH		2 202	0.000		770/22/	20.5		01 5	420450	
403.00 > 84.00		2.382	0.008		7786326	38.5		81.5	439450	
9 Perfluorohex 399.00 > 80.00		onic acid 2.387	0.003	1.000	69378393	397.9				E E
		2.307	0.003	1.000	09370393	397.9				_
D 47 M2-6:2FTS		2.704	0.008		20172	0.2040		0.0		
429.00 > 409.00					20172	0.3848		0.0		
48 Sodium 1H,					245004	ND				
427.00 > 407.00	2./12	2./13	-U.UU I	1.000	345084	NR				

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161121-37097.b\20NOV2016D_017.d											
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
15 Perfluorooctanoic acid M											
413.00 > 369.00		2.733	0.007	1.000	10620697	96.2			133830		
413.00 > 169.00		2.733	0.007	1.000	7444048		1.43(0.90-1.10)		221199		
13 Perfluoroheptanesulfonic Acid											
449.00 > 80.00	•	2.733	0.007	1.000	1888405	16.8					
D 14 13C4 PFO	Α										
417.00 > 372.00		2.733	0.007		5254940	38.5		77.0	306239		
18 Perfluorooc	tane sulf	onic acid	d							Е	
499.00 > 80.00		3.096	0.014	1.000	122004722	1140.2			103884	0E	
499.00 > 99.00	3.110	3.096	0.014	1.000	32962146		3.70(0.90-1.10)		0.0		
20 Perfluorononanoic acid											
463.00 > 419.00	3.110	3.096	0.014	1.000	206059	4.67			687		
D 19 13C5 PFN	A										
468.00 > 423.00	3.110	3.096	0.014		2245929	20.5		41.1	147930		
D 17 13C4 PFO	S										
503.00 > 80.00	3.102	3.096	0.006		4702767	30.2		63.2	67102		
43 Sodium 1H,	1H,2H,2	H-perflu	orooctan	ie							
527.00 > 507.00	3.464	3.456	0.008	1.000	111697	NR					
D 42 M2-8:2FTS	6										
529.00 > 509.00	3.464	3.456	0.008		4759	0.0872		0.0			
D 21 13C8 FOS	Α										
506.00 > 78.00	3.464	3.458	0.006		967198	3.86		7.7	102857		
22 Perfluorooc	tane Sulf	fonamide	е								
498.00 > 78.00	3.472	3.458	0.014	1.000	15242	0.8744			157		
D 23 13C2 PFD	Α										
515.00 > 470.00	3.472	3.465	0.007		3480993	34.7		69.5	238520		
24 Perfluorode	canoic a	cid									
513.00 > 469.00	3.472	3.465	0.007	1.000	85687	1.24			719		
D 45 d3-NMeFC	SAA										
573.00 > 419.00	3.624	3.623	0.001		2128	0.0489		0.0			
44 N-methyl pe	erfluoroo	ctane su	lfonami								
570.00 > 419.00	3.624	3.632	-0.008	1.000	404	NR					
26 Perfluorode	cane Sul	lfonic ac	id								
599.00 > 80.00	3.780	3.782	-0.002	1.000	3114	0.0521					
D 46 d5-NEtFOS	SAA										
589.00 > 419.00	3.799	3.789	0.009		2571	0.0522		0.0			
49 N-ethyl perf	luoroocta	ane sulfo	onamid								
584.00 > 419.00	3.816	3.798	0.018	1.005	983	NR					
D 27 13C2 PFU	nA										
565.00 > 520.00		3.800	-0.002		2632535	33.6		67.1	297669		
28 Perfluoroun	decanoio	c acid									
563.00 > 519.00			-0.093	1.000	30196	0.5578			1023		
D 52 d-N-MeFO	SA-M										
515.00 > 169.00		3.963	0.0		1461	0.0241		0.0			
54 MeFOSA											
512.00 > 169.00	4.132	3.972	0.160	1.000	220	NR					
D 30 13C2 PFD											
615.00 > 570.00		4.091	0.006		Page 407 of 8	32.7		65.4	154806	0/2040	
					raye 40/ 01	042			12/08	0/2016	

Report Date: 23-Nov-2016 15:55:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 51 d-N-EtFOSA-M											
531.00 > 169.00	4.161	4.153	0.008		2007	0.0367		0.0			
53 N-ethylperfluoro-1-octanesulfonami											
526.00 > 169.00	4.161	4.161	0.0	1.000	450	NR					
33 Perfluorotetradecanoic acid											
712.50 > 668.90	4.598	4.586	0.012	1.000	13302	0.1480			304		
713.00 > 169.00	4.592	4.586	0.006	0.999	4436		3.00(0.00-0.00)		941		
D 32 13C2-PFT	eDA										
715.00 > 670.00	4.592	4.586	0.006		9122539	53.5		107	554878		
35 Perfluorohexadecanoic acid											
813.00 > 769.00	5.003	4.990	0.013	1.000	62671	0.6426			1396		
D 34 13C2-PFH	xDA										
815.00 > 770.00	4.996	4.990	0.006		5663432	60.1		120	431418		
36 Perfluorooctadecanoic acid											
913.00 > 869.00	5.352	5.344	0.008	1.000	2725	0.0501			20.6		

## QC Flag Legend Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 23-Nov-2016 15:55:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 22:40:50 Instrument ID: A8\_N Lims ID: 320-23542-A-2-A Lab Sample ID: 320-23542-2 Client ID: DPT-16-05-GW-17-21 Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 17 Injection Vol: Dil. Factor: 2.0 ul 1.0000 LC PFC\_DOD ICAL Method:  $A8_N$ Limit Group: 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 ©28 0024 ©72-<del>∑</del>60 <del>∑</del>20 ∑<sub>16</sub>-**≻**48 **≻**16 36 24 12 1.7 1.0 1.9 1.1 2.0 0.7 1.3 1.6 1.9 1.0 1.3 1.6 2.5 5 Perfluorobutanesulfonic acid (M) 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 99.0035 (018-000015-X)12-030-025-**-20** 15 10 1.9 2.2 2.1 1.6 1.8 1.5 1.3 1.5 1.2 1.8 2.1 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00Exp1:m/z 367.00 > 322.00 046 (000054<sup>-</sup> × 45<sup>-</sup> (2000) (15-00) (15-00) ×<sub>16</sub> <del>-</del>36 27 18 1.9 2.2 2.5 2.0 1.8 2.4 1.4 1.7 2.3 2.6 3.0 1.1 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 16 70 (00014<del>-</del> 628 6024 0600 X 50 <del>×</del>20-<del>-</del>40 ≻16<del>-</del> 30 12 20 10

0

1.3

1.9 Page 409hof 842

3.1

1.8

1.5

2.1

2.4

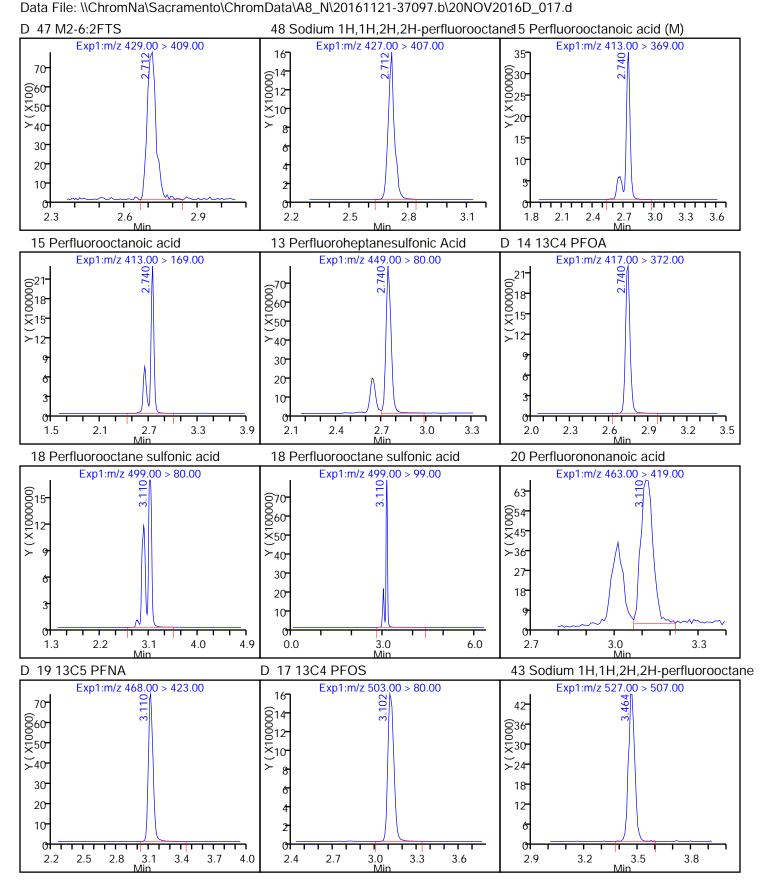
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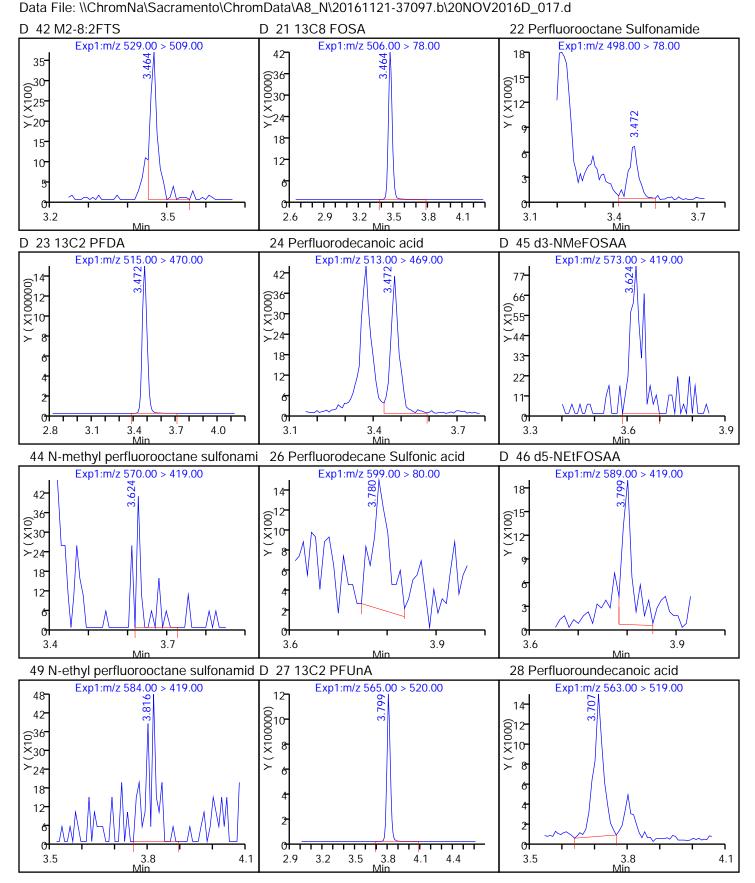
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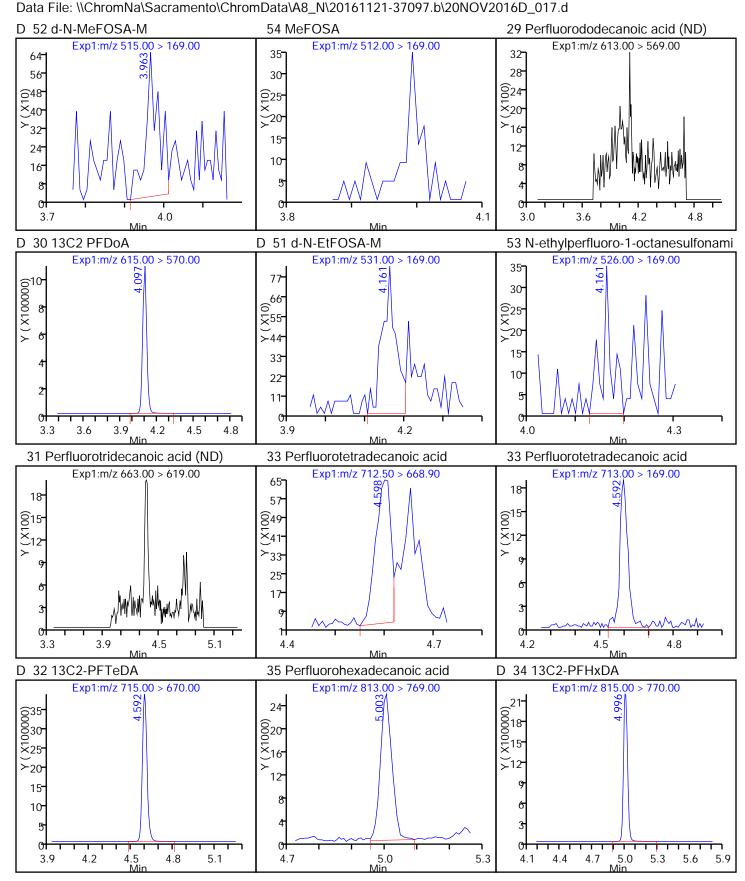
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Min

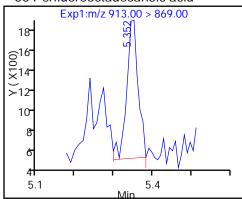
2.6







36 Perfluorooctadecanoic acid



Report Date: 23-Nov-2016 15:55:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_017.d

Injection Date: 20-Nov-2016 22:40:50 Instrument ID: A8\_N

Lims ID: 320-23542-A-2-A Lab Sample ID: 320-23542-2

Client ID: DPT-16-05-GW-17-21

Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

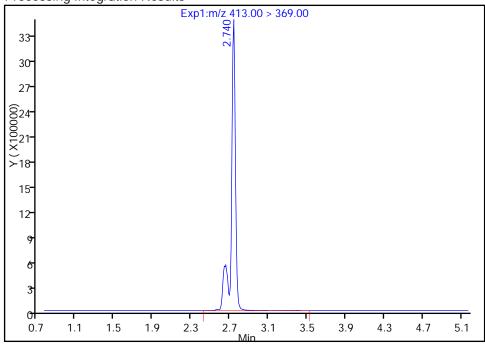
Column: Detector EXP1

### 15 Perfluorooctanoic acid, CAS: 335-67-1

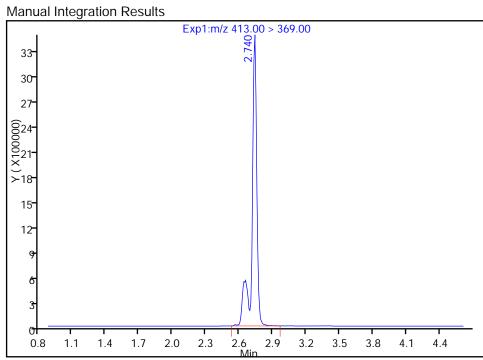
Signal: 1

RT: 2.74
Area: 10746798
Amount: 97.375902
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.74
Area: 10620697
Amount: 96.233310
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:55:17

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 414 of 842

Report Date: 23-Nov-2016 15:55:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_017.d

Injection Date: 20-Nov-2016 22:40:50 Instrument ID: A8\_N

Lims ID: 320-23542-A-2-A Lab Sample ID: 320-23542-2

Client ID: DPT-16-05-GW-17-21

Operator ID: A8-PC\A8 ALS Bottle#: 22 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

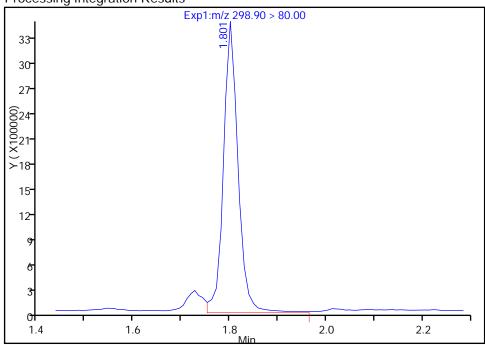
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

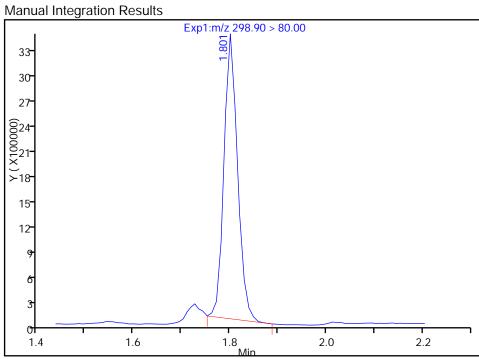
## 5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

RT: 1.80 Area: 7179874 Amount: 28.752097 Amount Units: ng/ml **Processing Integration Results** 



RT: 1.80
Area: 6513928
Amount: 26.085289
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:55:17

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 415 of 842

# FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-05-GW-17-21 DL Lab Sample ID: 320-23542-2 DL

Matrix: Water Lab File ID: 02DEC2016B\_001.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 11:45

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 258.6(mL) Date Analyzed: 12/02/2016 12:59

Con. Extract Vol.: 0.5(mL) Dilution Factor: 100

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 140382 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.21	D J	0.24	0.19	0.072
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.8	JD	0.39	0.29	0.12
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.19	U	0.24	0.19	0.089

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	125		25-150
STL00991	13C4 PFOS	146		25-150
STL00994	1802 PFHxS	154	Q	25-150

Report Date: 02-Dec-2016 15:02:52 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_001.d

Lims ID: 320-23542-A-2-A Client ID: DPT-16-05-GW-17-21

Sample Type: Client

Inject. Date: 02-Dec-2016 12:59:27 ALS Bottle#: 1 Worklist Smp#: 24

Injection Vol: 2.0 ul Dil. Factor: 100.0000

Sample Info: 320-23542-A-2-A 100X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:55:36 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 14:51:28

First Level Reviewer: chandrasenas			ias		Date:	U	12-Dec-2016 14:51:2	.8		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00	1.598	1.615	-0.017		170642	0.5014		1.0	19443	
1 Perfluorobuty 212.90 > 169.00	1.598	1.617	-0.019	1.000	56787	0.1879			538	
D 4 13C5-PFPe 267.90 > 223.00		1.918	-0.031		138551	0.5128		1.0	18929	
3 Perfluoropen 262.90 > 219.00			-0.033	1.000	102256	0.3545			954	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.925	nic acid 1.961 1.961	-0.036 -0.036	1.000 1.000	132946 54603	0.1770	2.43(0.00-0.00)			
D 6 13C2 PFHx 315.00 > 270.00	2.196	2.239	-0.043		120336	0.4882		1.0	16445	
7 Perfluorohex 313.00 > 269.00		id 2.241	-0.037	1.000	362268	1.57			9205	
D 11 13C4-PFH <sub> </sub> 367.00 > 322.00		2.599	-0.040		122200	0.5805		1.2	25468	
12 Perfluorohe 363.00 > 319.00			-0.049	1.000	43655	0.1727			615	
D 10 18O2 PFH: 403.00 > 84.00		2.614	-0.047		220201	0.7281		1.5	48666	
9 Perfluorohex 399.00 > 80.00	2.567	2.615	-0.048	1.000	2619093	5.31				
48 Sodium 1H, 427.00 > 407.00				e 1.000	21353	NR				
D 47 M2-6:2FTS 429.00 > 409.00		2.915	-0.005		6503	0.0467		0.0		

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC201										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	tannic ad									
413.00 > 369.00		2.984	-0.058	1.000	307948	1.10			5050	
413.00 > 169.00	2.926	2.984	-0.058	1.000	182089		1.69(0.90-1.10)		10212	
D 14 13C4 PFO										
417.00 > 372.00			-0.058		137568	0.6270		1.3	28780	
13 Perfluorohe				1 000	20002	0.0057				
449.00 > 80.00		2.986	-0.052	1.000	39882	0.0956				
D 17 13C4 PFO: 503.00 > 80.00		3 365	-0.059		170612	0.6975		1.5	14107	
18 Perfluorooct					170012	0.0770		1.0	11107	
499.00 > 80.00			-0.052	1.000	5622123	14.5			319061	
499.00 > 99.00	3.314	3.366	-0.052	1.000	1111553		5.06(0.90-1.10)		93337	
20 Perfluorono										
463.00 > 419.00		3.373	-0.059	1.000	8185	0.0458			203	
D 19 13C5 PFN		2 274	0.040		001/7	0.50/0		1.0	10057	
468.00 > 423.00		3.374	-0.060		90167	0.5062		1.0	18957	
D 21 13C8 FOS 506.00 > 78.00		3 651	-0.036		39568	0.0955		0.2	1891	
43 Sodium 1H,				Δ	37300	0.0733		0.2	1071	
527.00 > 507.00		-	-0.025		3663	NR				
D 42 M2-8:2FTS										
529.00 > 509.00		3.676	0.001		3338	0.0250		0.0		
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.784	3.738	0.046	1.000	796	0.005107			56.8	
D 23 13C2 PFD										
515.00 > 470.00		3.738	-0.061		80394	0.4841		1.0	2727	
D 45 d3-NMeFO		2 020	0.000		10000	0.1242		0.0		
573.00 > 419.00			-0.009		10098	0.1262		0.0		
44 N-methyl pe 570.00 > 419.00			-0.027	0.998	5077	NR				
D 46 d5-NEtFOS		0.017	0.027	0.770	3377					
589.00 > 419.00		4.009	-0.012		17363	0.1949		0.0		
49 N-ethyl perf	luoroocta	ane sulfo	onamid							
584.00 > 419.00			-0.010	1.002	7400	NR				
D 27 13C2 PFU	nA									
565.00 > 520.00	4.006	4.070	-0.064		56571	0.4498		0.9	7343	
D 52 d-N-MeFO										
515.00 > 169.00	4.100	4.105	-0.005		7275	0.0684		0.0		
54 MeFOSA	4 107	4 110	0.002	1 000	2/15	ND				
512.00 > 169.00		4.110	-0.003	1.000	2615	NR				
D 51 d-N-EtFOS 531.00 > 169.00		4 200	-0.002		9240	0.0907		0.0		
53 N-ethylperflu					7240	0.0707		0.0		
526.00 > 169.00			-0.001	1.000	2999	NR				
D 30 13C2 PFD										
615.00 > 570.00		4.370	-0.072		61374	0.5250		1.0	2188	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.813	4.882	-0.069		Page 418 of 8	342 <sup>0.6651</sup>		1.3	1649708	3/2016
					J					-

Report Date: 02-Dec-2016 15:02:52 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

 <b>2</b> a.a	,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	a 0 : a :	0,0		0.202 07.00				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 34 13C2-PFH 815.00 > 770.00		5.320	-0.082		106019	0.8132		1.6	8539	
35 Perfluorohe 813.00 > 769.00			0.017	1.000	1533	-0.8106			23.4	
36 Perfluorooci 913.00 > 869.00			-0.045	1.000	356	0.003689			24.7	

# QC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 02-Dec-2016 15:02:52 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 12:59:27 Instrument ID: A8\_N Lims ID: 320-23542-A-2-A Lab Sample ID: 320-23542-2 Client ID: DPT-16-05-GW-17-21 Operator ID: A8-PC\A8 ALS Bottle#: Worklist Smp#: 24 Injection Vol: 2.0 ul Dil. Factor: 100.0000 LC PFC\_DOD ICAL Method:  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56<del>-</del> 21 048 0048 ×40 60040 × 0618<del>-</del> 15<del>-</del> 24 24 16 16 1.2 1.9 1.9 1.8 2.1 1.3 1.6 1.6 2.2 2.5 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 46 24 56<del>-</del> 60 60 60 634 <del>∑</del>40 ∑<sub>28</sub>-**≻**32 22 24 16 10 1.9 2.2 1.8 2.1 1.9 2.2 1.5 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 49 14 00012 X X 000 35 × >28 642 8 8 8 8 8 8 21 2.1 2.7 1.9 2.2 2.2 2.4 2.5 2.5 2.8 3.1 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 21 91-77-(00015 X)12 0066 ×55 <sup>678</sup> <del>5</del>65 <del>\_</del>52 39 33

22

2.0

2.3

2.6

2.9

26

13

2.9

 $^{\circ}$ 

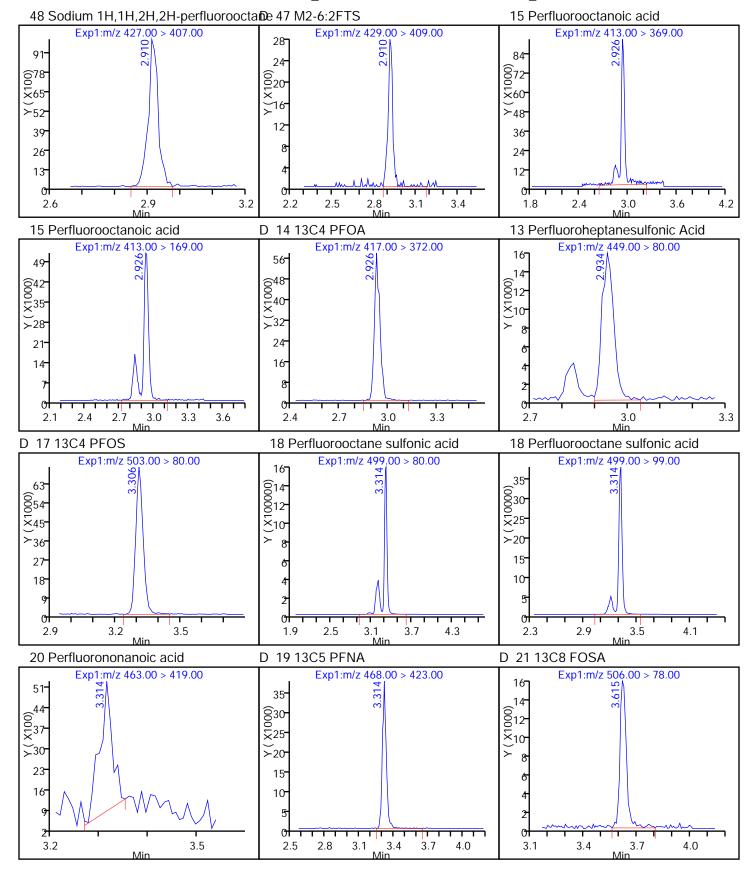
2.2

Page 420hof 842

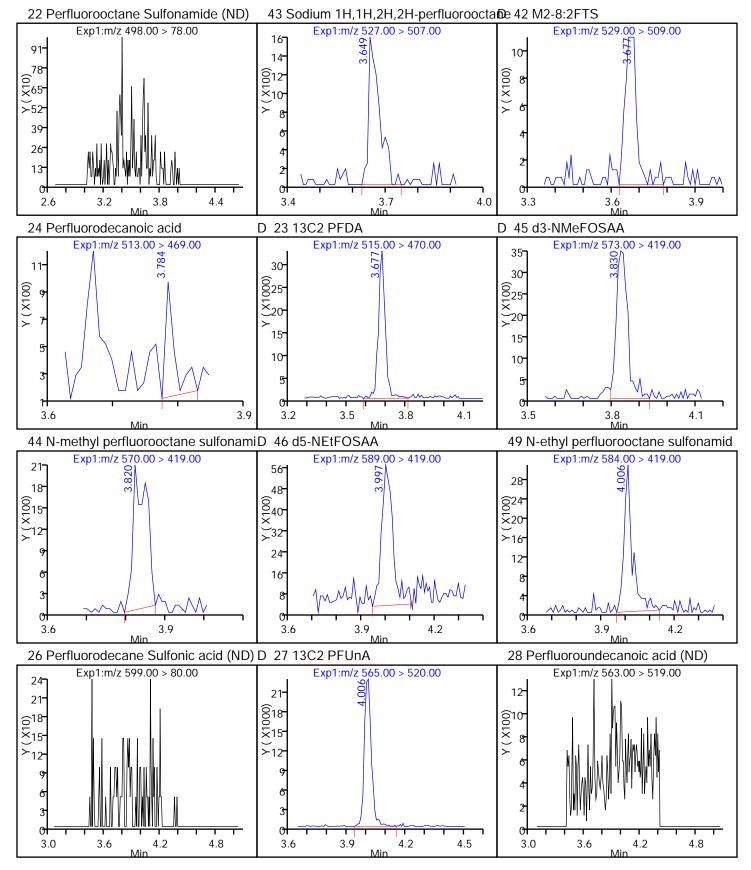
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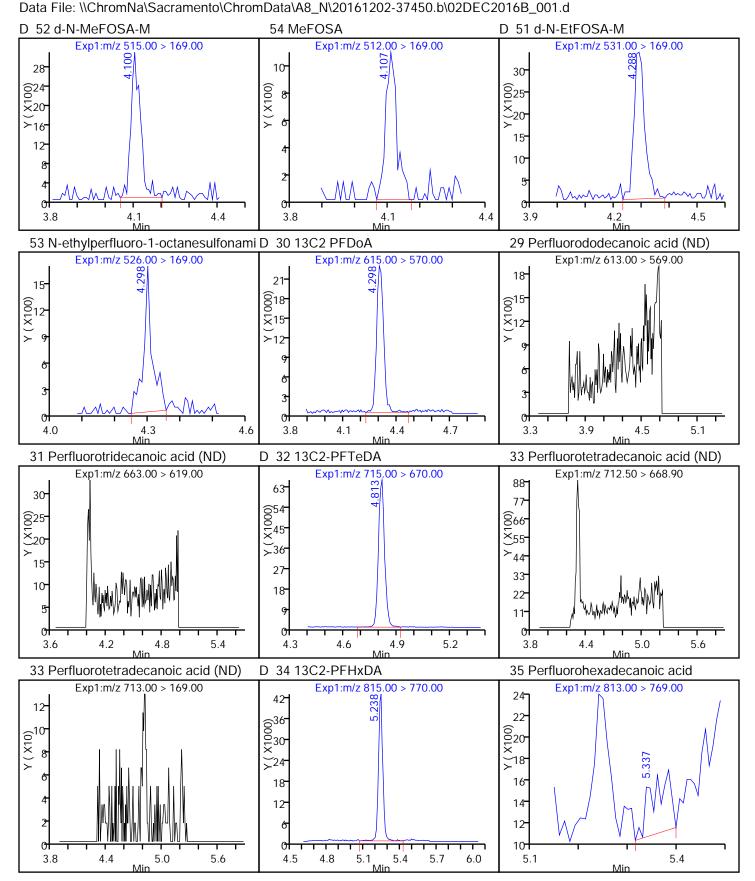
2.3

2.6



Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_001.d

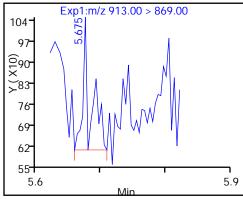




Report Date: 02-Dec-2016 15:02:52 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016B\_001.d}}$ 

#### 36 Perfluorooctadecanoic acid



# FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-SO-14-15 Lab Sample ID: 320-23542-3

Matrix: Solid Lab File ID: 20NOV2016D\_007.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 13:25

Extraction Method: SHAKE Date Extracted: 11/17/2016 12:49

Sample wt/vol: 5.05(g) Date Analyzed: 11/20/2016 21:25

Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 20.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	3.2	МЈ	0.62	0.37	0.13
1763-23-1	Perfluorooctane Sulfonate (PFOS)	34	J	0.62	0.37	0.16
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.37	U	0.50	0.37	0.13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	91		25-150
STL00991	13C4 PFOS	58		25-150
STL00994	1802 PFHxS	73		25-150

Report Date: 23-Nov-2016 14:16:00 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_007.d

Lims ID: 320-23542-A-3-A Client ID: DPT-16-34-SO-14-15

Sample Type: Client

Inject. Date: 20-Nov-2016 21:25:48 ALS Bottle#: 16 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-3-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 16:24:46 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK015

First Level Reviewer: changnoit Date: 23-Nov-2016 15:14:17

I IIST ECVEL ITOME	wor. ond	rigiloit			Bate.		.0 140V 2010 10:11:1	,		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	yric acid									
212.90 > 169.00	1.493	1.493	0.0	1.000	57166	0.3923			531	
D 213C4 PFBA										
217.00 > 172.00	1.493	1.493	0.0		8376510	42.4		84.8	930175	
D 413C5-PFPe										
267.90 > 223.00		1.752	0.0		8191032	51.2		102	670633	
3 Perfluoropen			0.010	1 000	05054	0.5/07			004	
262.90 > 219.00			-0.010	1.000	95954	0.5637			884	
5 Perfluorobuta			0.0	1 000	27500	0.1000				
298.90 > 80.00 298.90 > 99.00		1.791 1.791	0.0	1.000 1.000	27508 12560	0.1228	2.19(0.00-0.00)			
7 Perfluorohex			0.0	1.000	12500		2.17(0.00 0.00)			
313.00 > 269.00		2.040	0.002	1.000	141021	1.02			2379	
D 613C2 PFHx										
315.00 > 270.00		2.040	0.002		7288295	50.2		100	449988	
D 11 13C4-PFH	pΑ									
367.00 > 322.00		2.366	0.001		6468335	49.2		98.4	444770	
12 Perfluorohe	ptanoic a	acid								
363.00 > 319.00	2.367	2.372	-0.005	1.000	101808	0.7689			570	
D 10 1802 PFH:	xS									
403.00 > 84.00	2.383	2.382	0.001		6982890	34.6		73.1	522646	
9 Perfluorohex										
399.00 > 80.00	2.388	2.387	0.001	1.000	797472	5.10				
D 47 M2-6:2FTS										
429.00 > 409.00			0.002		6119	0.1167		0.0		
48 Sodium 1H,		•								
427.00 > 407.00	2.706	2.713	-0.007	1.000	69778	NR				

Report Date: 23-Nov-2016 14:16:00 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File:				to\Chrom			7.b\20NOV2016D_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc	tanoic a	cid								М
413.00 > 369.00		2.733	-0.008	1.000	1659453	12.7			24917	M
413.00 > 169.00	2.725	2.733	-0.008	1.000	1099513		1.51(0.90-1.10)		37747	
13 Perfluorohe	ptanesu	lfonic Ac	cid							
449.00 > 80.00	2.743	2.733	0.010	1.000	38246	0.3716				
D 14 13C4 PFO										
417.00 > 372.00	2.725	2.733	-0.008		6239172	45.7		91.4	605585	
18 Perfluorooc										
499.00 > 80.00		3.096	0.008	1.000	13290993	135.5	4 40/0 00 4 40)		133677	
499.00 > 99.00		3.096	0.008	1.000	2969240		4.48(0.90-1.10)		361023	
20 Perfluorono			0.0	1 000	(4105	0.70/1			E 40	M
463.00 > 419.00		3.096	0.0	1.000	64185	0.7061			543	M
D 19 13C5 PFN		2.007	0.000		4/2/00/	40.0		04/	202742	
468.00 > 423.00		3.096	0.008		4626806	42.3		84.6	303643	
D 17 13C4 PFO		2.004	0.000		4210421	27.7		E7.0	207212	
503.00 > 80.00		3.096	0.008		4310431	27.7		57.9	297213	
43 Sodium 1H, 527.00 > 507.00		•			22722	ND				
		3.430	-0.005	1.004	23732	NR				
D 42 M2-8:2FTS 529.00 > 509.00		2 154	-0.020		2521	0.0462		0.0		
		3.430	-0.020		2321	0.0462		0.0		
D 21 13C8 FOS 506.00 > 78.00		2 /50	-0.007		5123735	20.4		40.9	204639	
					5123735	20.4		40.9	204039	
22 Perfluorooc 498.00 > 78.00		3.458	e 0.001	1.000	5586574	60.5			1827	
D 23 13C2 PFD		3.430	0.001	1.000	3300374	00.5			1027	
515.00 > 470.00		3 465	-0.006		3631532	36.2		72.5	356782	
24 Perfluorode			0.000		3031332	30.2		72.0	330702	
513.00 > 469.00			-0.006	1.000	32315	0.4484			510	
D 45 d3-NMeFC		3.403	0.000	1.000	32313	0.4404			310	
573.00 > 419.00		3 623	-0.006		1242	0.0286		0.0		
44 N-methyl pe						0.0200		0.0		
570.00 > 419.00				0.998	1449	NR				
26 Perfluorode				0.770						
599.00 > 80.00			-0.008	1.000	1273	0.0232				
D 46 d5-NEtFO										
589.00 > 419.00		3.789	0.004		2016	0.0409		0.0		
49 N-ethyl perf										
584.00 > 419.00		3.798	0.003	1.002	2367	NR				
D 27 13C2 PFU										
565.00 > 520.00		3.800	-0.007		2306352	29.4		58.8	186835	
28 Perfluoroun										
563.00 > 519.00		3.800	-0.101	1.000	66347	1.40			1614	
D 52 d-N-MeFO										
515.00 > 169.00		3.963	-0.023		1337	0.0221		0.0		
54 MeFOSA			-					-		
512.00 > 169.00	3.966	3.972	-0.006	1.000	2008	NR				
D 30 13C2 PFD										
615.00 > 570.00		4.091	-0.007		Page 427 of 8	22.7		45.4	120978	0/2040
					Page 427 of 8	042			12/0	0/2016

Report Date: 23-Nov-2016 14:16:00 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

- 1	Data i no.	110111	Jiiii Va io	acramon	0.01110111	Data / 10_11201	01121 0707	7.B(20110 V2010B_0	70 7 . u		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 51 d-N-EtFOS 531.00 > 169.00		4.153	-0.004		2198	0.0402		0.0		
	53 N-ethylperflu 526.00 > 169.00				1.000	378	NR				
	D 32 13C2-PFTe 715.00 > 670.00		4.586	-0.005		3799101	22.3		44.5	322006	
	35 Perfluorohe: 813.00 > 769.00		oic acid 4.990	0.001	1.000	34151	0.3945			790	
	D 34 13C2-PFH: 815.00 > 770.00		4.990	0.001		2916703	30.9		61.9	401932	
	36 Perfluorooct 913.00 > 869.00			-0.008	1.000	1355	0.0359			21.9	
	,	0.000	3.311	3.300		. 500	3.3007			,	

# QC Flag Legend Processing Flags

NR - Missing Quant Standard

Review Flags

M - Manually Integrated

Report Date: 23-Nov-2016 14:16:00 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 21:25:48 Instrument ID: A8\_N Lims ID: 320-23542-A-3-A Lab Sample ID: 320-23542-3 Client ID: DPT-16-34-SO-14-15 Operator ID: A8-PC\A8 ALS Bottle#: 16 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 LC PFC\_DOD ICAL Method:  $A8_N$ Limit Group: 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 28 (35<u>-</u> 030 0025 ∑<sub>20</sub>-<del>∑</del>25 ∑16<del>-</del> ≻20 15 12 15<del>-</del> 10 10 0.9 1.5 1.4 1.7 2.1 1.1 2.0 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 16 12 38 14 √ (×1000) 6 2 2 32 ×<sub>26</sub>-×10 20 2.0 2.1 1.9 1.8 1.7 1.5 1.3 1.6 2.2 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 32 56<del>-</del> ©24 ©20 ©28**-**0024**-**0048 ×40 ∑<sub>16</sub>-×20 >32 ≻<sub>16</sub>-24 12 16 2.1 1.5 1.8 2.1 1.8 2.1 2.4 2.4 2.7 2.7 1.8 D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 32 32 42 ©28**-**6<sup>28</sup> 624 ×30-×20 <u>>24</u> 16 ≻<sub>16</sub>-18 12

0

1.6

1.9 2.2 2.5 Page 429hof 842 2.8

1.8

1.5

2.1

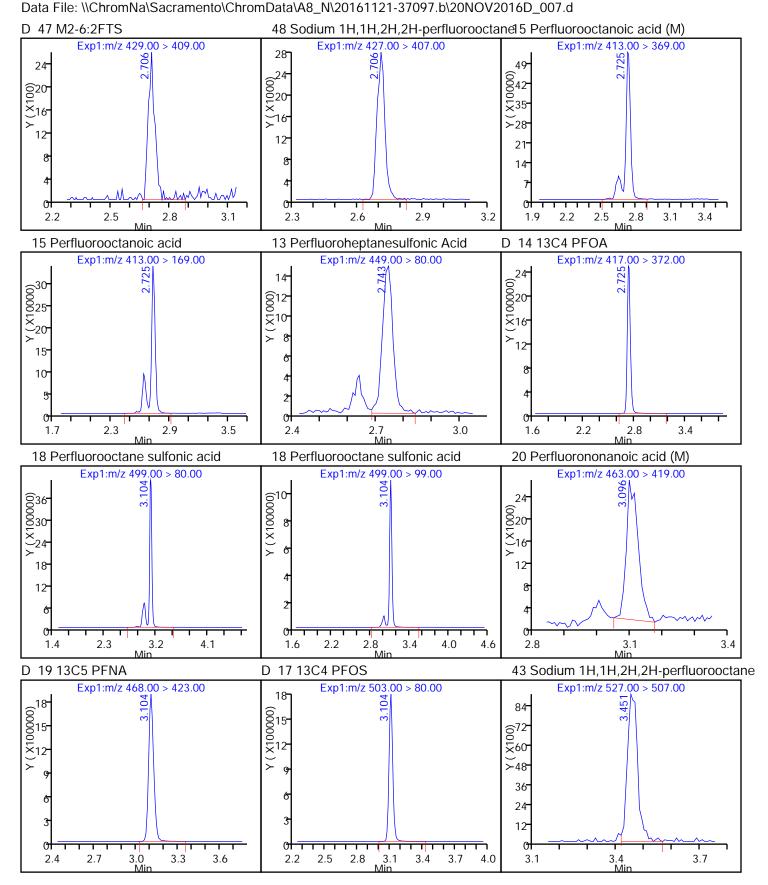
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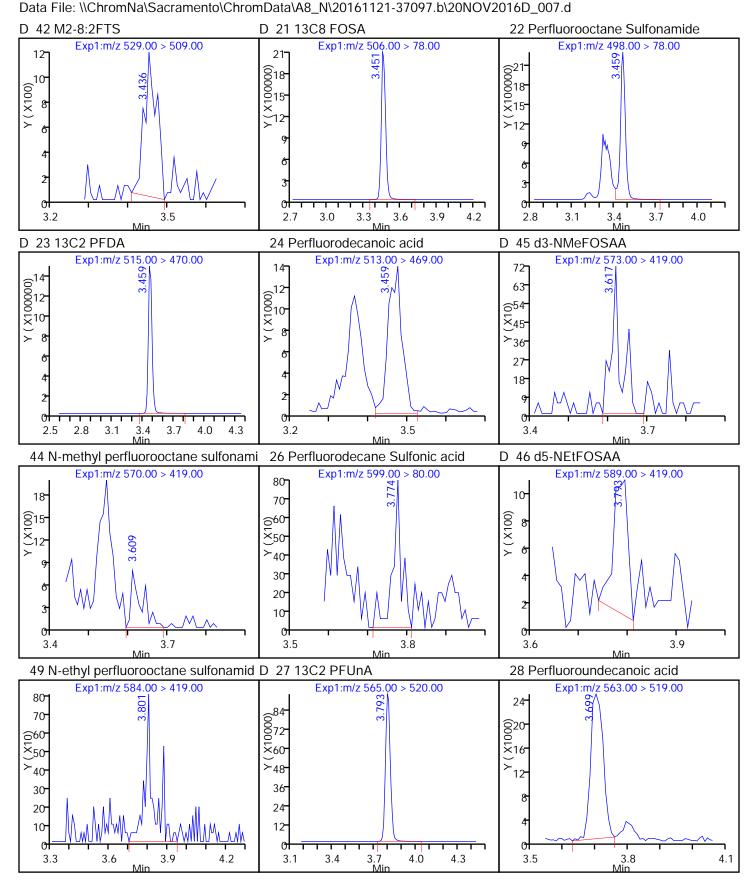
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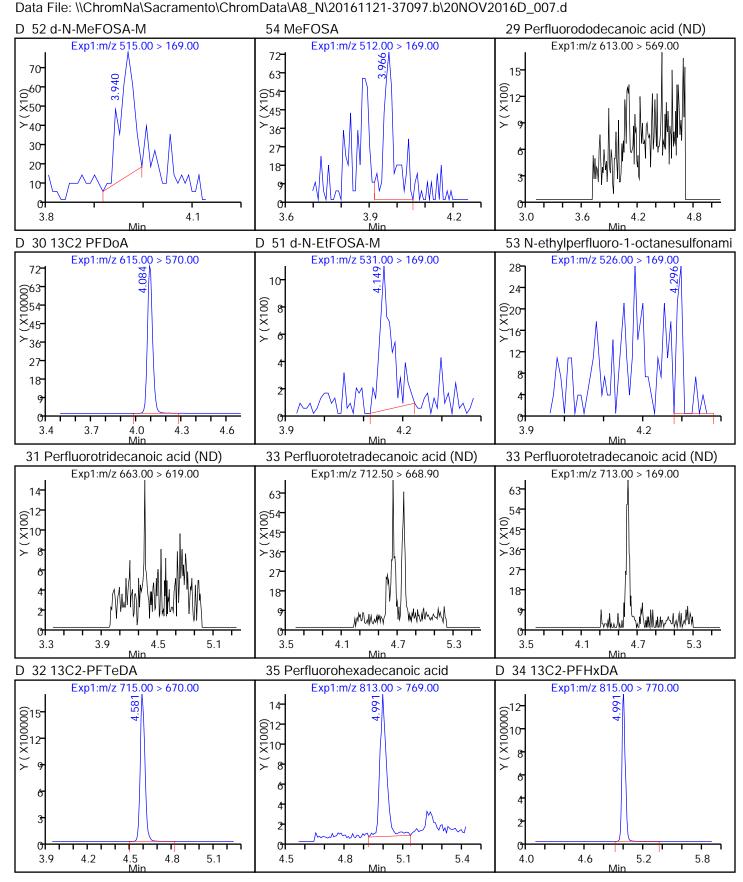
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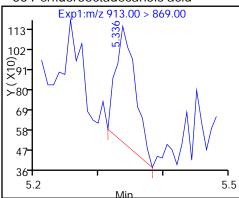
2.4







36 Perfluorooctadecanoic acid



Report Date: 23-Nov-2016 14:16:00 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_007.d

Injection Date: 20-Nov-2016 21:25:48 Instrument ID: A8\_N

Lims ID: 320-23542-A-3-A Lab Sample ID: 320-23542-3

Client ID: DPT-16-34-SO-14-15

Operator ID: A8-PC\A8 ALS Bottle#: 16 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

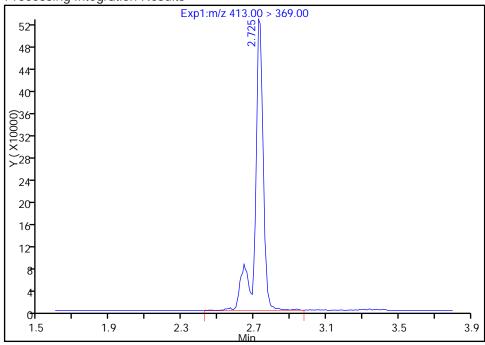
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

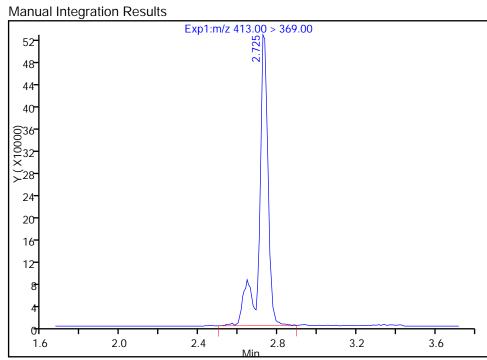
### 15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.72 Area: 1675254 Amount: 12.784798 Amount Units: ng/ml **Processing Integration Results** 



RT: 2.72 Area: 1659453 Amount: 12.664212 Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:14:17

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 434 of 842

# FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-SO-14-15 DL Lab Sample ID: 320-23542-3 DL

Matrix: Solid Lab File ID: 02DEC2016B\_006.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 13:25

Extraction Method: SHAKE Date Extracted: 11/17/2016 12:49

Sample wt/vol: 5.05(g) Date Analyzed: 12/02/2016 13:37

Con. Extract Vol.: 1.0 (mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 20.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 140382 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	3.6	JD	6.2	3.7	1.3
1763-23-1	Perfluorooctane Sulfonate (PFOS)	35	JD	6.2	3.7	1.6
375-73-5	Perfluorobutanesulfonic acid (PFBS)	3.7	U	5.0	3.7	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	125		25-150
STL00991	13C4 PFOS	72		25-150
STL00994	1802 PFHxS	99		25-150

Report Date: 02-Dec-2016 15:08:13 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_006.d

Lims ID: 320-23542-A-3-A Client ID: DPT-16-34-SO-14-15

Sample Type: Client

Inject. Date: 02-Dec-2016 13:37:02 ALS Bottle#: 6 Worklist Smp#: 29

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-23542-A-3-A 10X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 15:05:01 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 15:02:50

First Level Reviewer: chandrasenas				Date: 02-Dec-2016 15:0				2:50				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 2 13C4 PFBA												
217.00 > 172.00		1.615	-0.033		1614574	4.74		9.5	266296			
1 Perfluorobuty	vric acid											
212.90 > 169.00	•	1.617	-0.035	1.000	10185	0.0356			76.1			
D 413C5-PFPe	eΑ											
267.90 > 223.00	1.877	1.918	-0.041		1442054	5.34		10.7	572894			
3 Perfluoropen												
262.90 > 219.00	1.877	1.920	-0.043	1.000	17598	0.0586			132			
5 Perfluorobuta												
298.90 > 80.00		1.961	-0.045	1.000	5999	0.0124	1 04(0 00 0 00)					
298.90 > 99.00		1.961	-0.045	1.000	3098		1.94(0.00-0.00)					
D 6 13C2 PFHx 315.00 > 270.00		2.239	-0.060		1209075	4.91		9.8	165509			
7 Perfluorohex			-0.000		1207073	7.71		7.0	100007			
313.00 > 269.00		2.241	-0.062	1.000	26164	0.1132			681			
D 11 13C4-PFH <sub>I</sub>												
367.00 > 322.00		2.599	-0.063		1225690	5.82		11.6	255164			
12 Perfluorohe	ptanoic a	acid										
363.00 > 319.00	2.536	2.600	-0.064	1.000	16399	0.0647			230			
D 10 1802 PFH	xS											
403.00 > 84.00	2.544	2.614	-0.070		1415961	4.68		9.9	582115			
9 Perfluorohex												
399.00 > 80.00	2.551	2.615	-0.064	1.000	167174	0.5270						
48 Sodium 1H,		•										
427.00 > 407.00		2.913	-0.020	1.000	38473	NR						
D 47 M2-6:2FTS		0.015	0.000		0704	0.0104		0.0				
429.00 > 409.00	2.893	2.915	-0.022		2701	0.0194		0.0				

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016B_006.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc	tanoic ac	cid								
413.00 > 369.00		2.984	-0.075	1.000	404716	1.44			5840	
413.00 > 169.00	2.909	2.984	-0.075	1.000	239802		1.69(0.90-1.10)		19169	
D 14 13C4 PFO										
417.00 > 372.00			-0.075		1376307	6.27		12.5	175339	
13 Perfluorohe	-			1 000	7207	0.0055				
449.00 > 80.00		2.986	-0.068	1.000	7306	0.0355				
D 17 13C4 PFO 503.00 > 80.00		2 265	-0.083		840509	3.44		7.2	167660	
18 Perfluorooc					040307	3.44		1.2	107000	
499.00 > 80.00			-0.084	1.000	2655370	13.9			872555	
499.00 > 99.00		3.366		1.000	603840		4.40(0.90-1.10)		57610	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.297	3.373	-0.076	1.000	16867	0.0970			317	
D 19 13C5 PFN										
468.00 > 423.00		3.374	-0.085		876878	4.92		9.8	65703	
D 21 13C8 FOS										
506.00 > 78.00			-0.055		1001179	2.42		4.8	209244	
22 Perfluorooci				1 000	10//052	F / O			2012	
498.00 > 78.00			-0.051	1.000	1066053	5.69			2013	
43 Sodium 1H, 527.00 > 507.00		•		e 1.000	5105	NR				
24 Perfluorode			-0.030	1.000	3103	IVIX				
513.00 > 469.00		3.738	0.004	1.000	1042	0.008431			28.7	
D 23 13C2 PFD		0.700	0.00.			0.000.0			20.7	
515.00 > 470.00		3.738	-0.082		637552	3.84		7.7	23465	
D 45 d3-NMeFC	SAA									
573.00 > 419.00	3.787	3.839	-0.052		1138	0.0142		0.0		
44 N-methyl pe	rfluoroo	ctane su	ılfonami							
570.00 > 419.00	3.805	3.847	-0.042	1.005	1627	NR				
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.980	4.009	-0.029		2861	0.0321		0.0		
49 N-ethyl perf										
584.00 > 419.00		4.016	-0.045	0.998	1455	NR				
D 27 13C2 PFU		4.070	0.000		20002	0.44			2/020	
565.00 > 520.00		4.070	-0.099		390923	3.11		6.2	36028	
28 Perfluoroun 563.00 > 519.00		4.071	-0.197	1.000	12722	0.1536			303	
		4.071	-0.197	1.000	12/22	0.1550			303	
D 52 d-N-MeFO 515.00 > 169.00		4.105	0.187		242	0.002276		0.0		
54 MeFOSA	7.272	4.100	0.107		272	0.002270		0.0		
512.00 > 169.00	4.102	4.110	-0.008	1.000	544	NR				
D 30 13C2 PFD			2.000		<b>.</b>					
615.00 > 570.00		4.370	-0.095		304563	2.61		5.2	9620	
D 32 13C2-PFT										
715.00 > 670.00		4.882	-0.095		651319	2.69		5.4	135746	
D 34 13C2-PFH	xDA									
815.00 > 770.00		5.320	-0.111		Page 437 of	842 2.86		5.7	31399 12/08	3/2016
					. 490 107 01				, 00	., _ 3 1 3

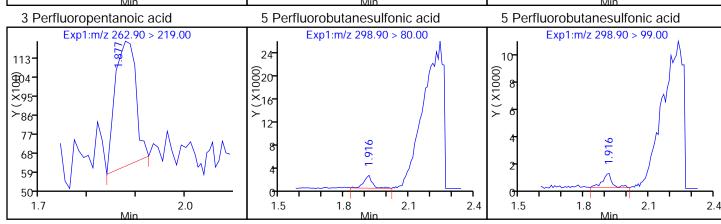
Report Date: 02-Dec-2016 15:08:13 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

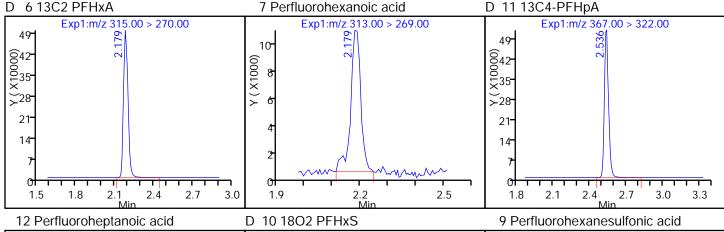
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
35 Perfluorohe: 813.00 > 769.00			-0.038	1.000	627	-0.8128			11.9	
36 Perfluorooct 913.00 > 869.00		oic acid 5.720	-0.049	1.000	574	0.0120			9.0	

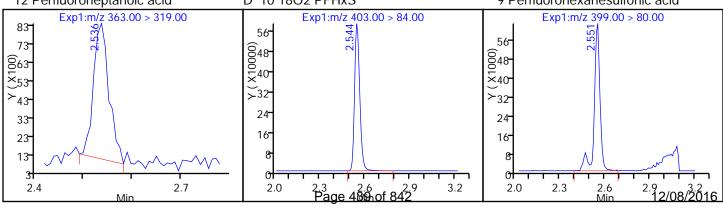
# QC Flag Legend Processing Flags

NR - Missing Quant Standard

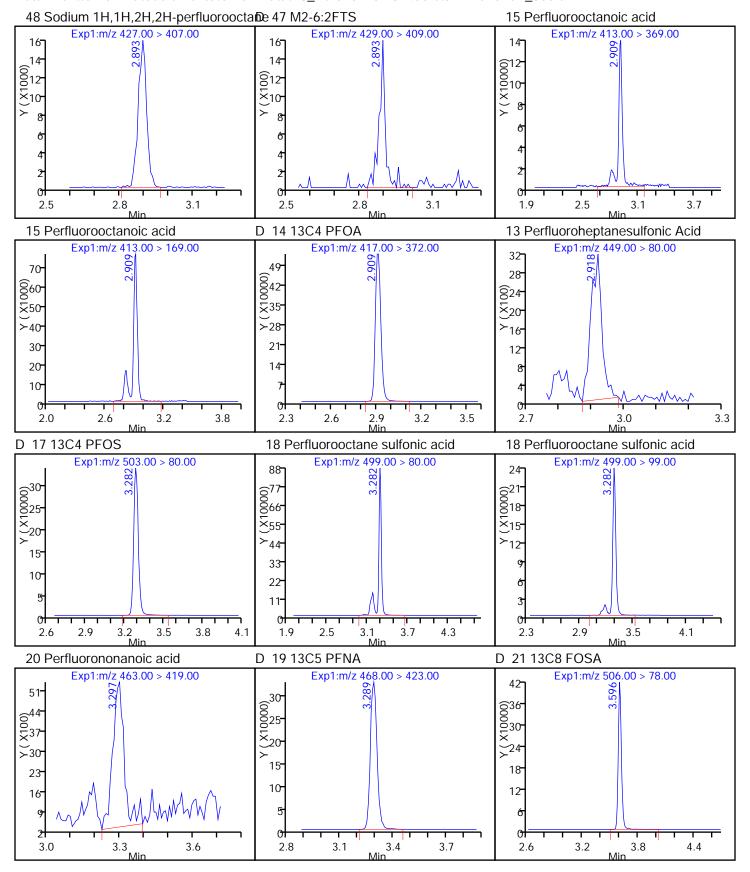
Report Date: 02-Dec-2016 15:08:13 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_006.d Data File: **Injection Date:** 02-Dec-2016 13:37:02 Instrument ID: A8\_N Lims ID: 320-23542-A-3-A Lab Sample ID: 320-23542-3 Client ID: DPT-16-34-SO-14-15 Operator ID: A8-PC\A8 ALS Bottle#: 6 Worklist Smp#: 29 Injection Vol: 2.0 ul Dil. Factor: 10.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 **6**35 <del>∑</del>35 ×30-≻28 ≻25<del>-</del> 24 21 20 14 15<del>-</del> 16 10 2.3 1.9 2.5 1.1 1.7 1.3 1.6 1.9 0.7 1.3 3.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 24 10 113 Y (X1000) **3**04 ×95 ∑16<del>-</del> ≻86-12 77 68



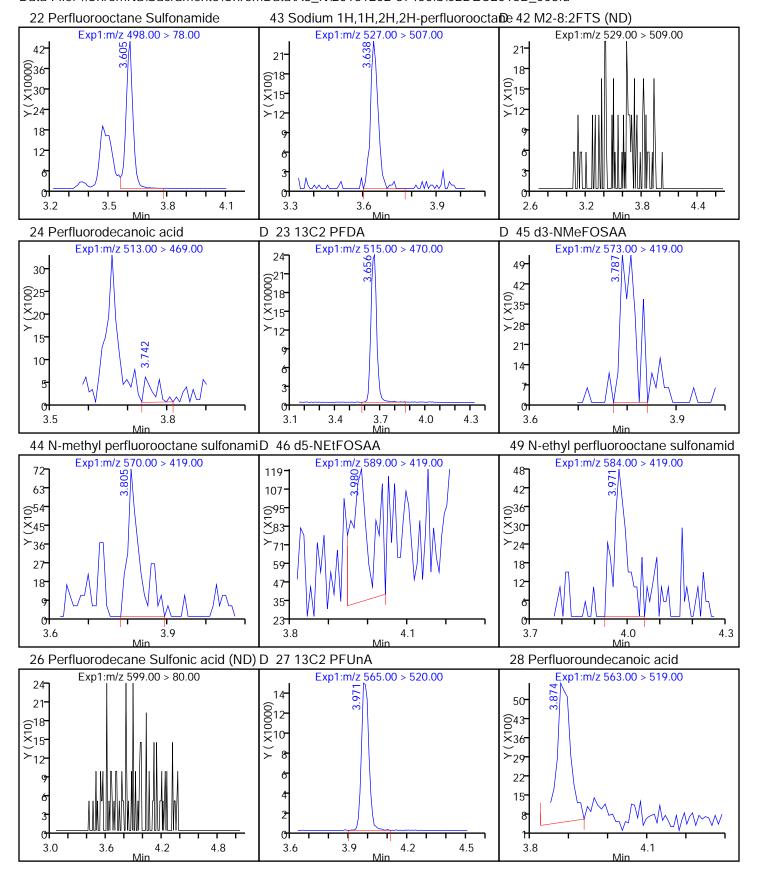


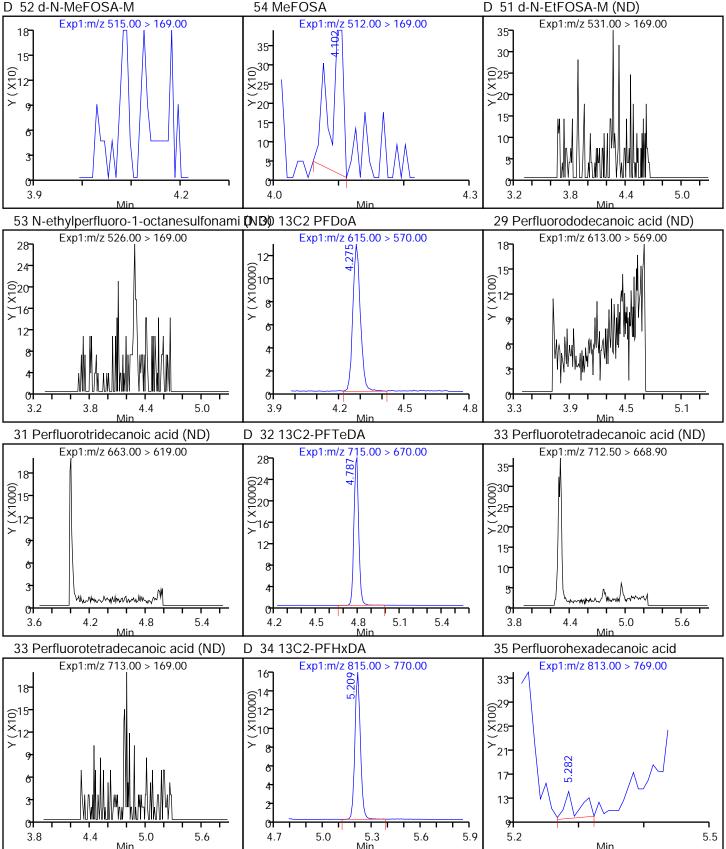


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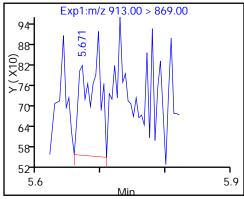




Report Date: 02-Dec-2016 15:08:13 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016B\_006.d}}$ 

#### 36 Perfluorooctadecanoic acid



# FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-GW-31-35 Lab Sample ID: 320-23542-4

Matrix: Water Lab File ID: 20NOV2016D\_020.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 14:30

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 254.2(mL) Date Analyzed: 11/20/2016 23:03

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.95	E M	0.0025	0.0020	0.00074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.2	E	0.0039	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.12	М	0.0025	0.0020	0.00090

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	54		25-150
STL00991	13C4 PFOS	74		25-150
STL00994	1802 PFHxS	52		25-150

Report Date: 23-Nov-2016 16:22:37 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_020.d

Lims ID: 320-23542-A-4-A Client ID: DPT-16-34-GW-31-35

Sample Type: Client

Inject. Date: 20-Nov-2016 23:03:21 ALS Bottle#: 25 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-4-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 16:22:35 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 16:22:35

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
5 Perfluorobut	anesulfo	nic acid								M
298.90 > 80.00	1.800	1.791	0.009	1.000	9736539	61.3				M
298.90 > 99.00	1.800	1.791	0.009	1.000	4218666		2.31(0.00-0.00)			
D 10 18O2 PFH	xS									
403.00 > 84.00	2.391	2.382	0.009		4952033	24.5		51.8	235624	
15 Perfluorooc	tanoic ac	id								EM
413.00 > 369.00	2.731	2.733	-0.002	1.000	37038385	481.0			328488	EM
413.00 > 169.00	2.731	2.733	-0.002	1.000	26318365		1.41(0.90-1.10)		710449	
D 14 13C4 PFO	A									
417.00 > 372.00	2.731	2.733	-0.002		3666272	26.9		53.7	255201	
18 Perfluorooc	tane sulf	onic acio	d							E
499.00 > 80.00	3.111	3.096	0.015	1.000	77796488	624.8			714775	E
499.00 > 99.00	3.103	3.096	0.007	0.997	19589306		3.97(0.90-1.10)		108693	3
D 17 13C4 PFO	D 17 13C4 PFOS									
503.00 > 80.00	3.103	3.096	0.007		5472838	35.1		73.5	106582	

## **QC Flag Legend**

Processing Flags

E - Exceeded Maximum Amount

**Review Flags** 

M - Manually Integrated

Report Date: 23-Nov-2016 16:22:37 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_020.d

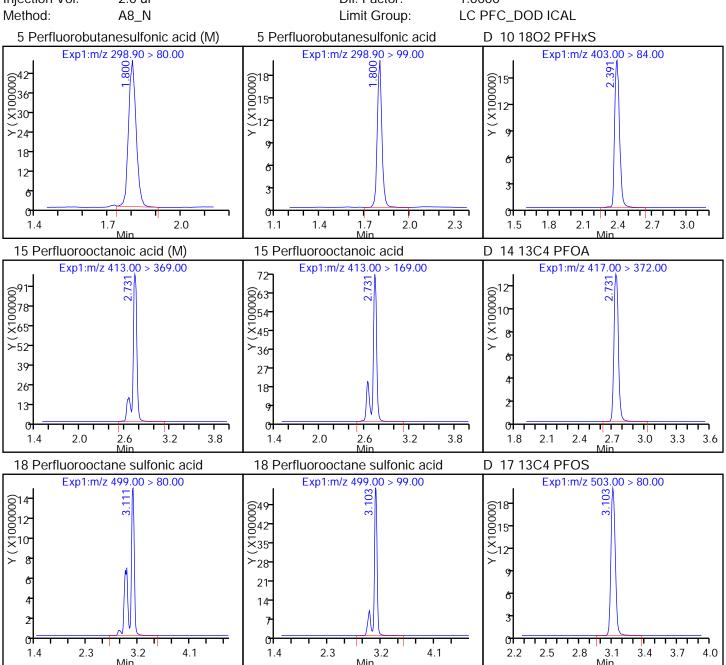
Injection Date: 20-Nov-2016 23:03:21 Instrument ID: A8\_N

Lims ID: 320-23542-A-4-A Lab Sample ID: 320-23542-4

Client ID: DPT-16-34-GW-31-35

Operator ID: A8-PC\A8 ALS Bottle#: 25 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Report Date: 23-Nov-2016 16:22:37 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_020.d

Injection Date: 20-Nov-2016 23:03:21 Instrument ID: A8\_N

Lims ID: 320-23542-A-4-A Lab Sample ID: 320-23542-4

Client ID: DPT-16-34-GW-31-35

Operator ID: A8-PC\A8 ALS Bottle#: 25 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

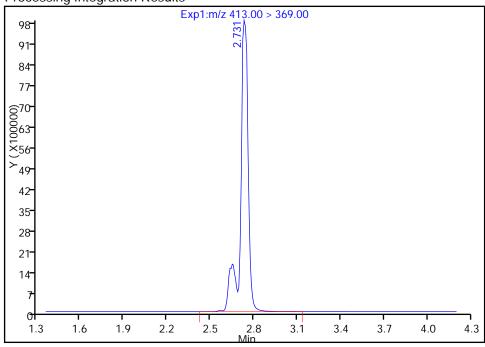
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

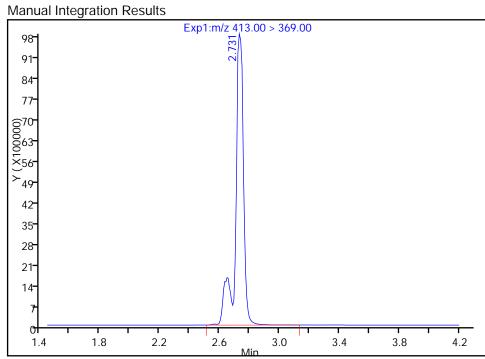
### 15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.73 Area: 37051374 Amount: 481.1936 Amount Units: ng/ml **Processing Integration Results** 



RT: 2.73
Area: 37038385
Amount: 481.0249
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 16:22:35

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 447 of 842

Report Date: 23-Nov-2016 16:22:37 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_020.d

Injection Date: 20-Nov-2016 23:03:21 Instrument ID: A8\_N

Lims ID: 320-23542-A-4-A Lab Sample ID: 320-23542-4

Client ID: DPT-16-34-GW-31-35

Operator ID: A8-PC\A8 ALS Bottle#: 25 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

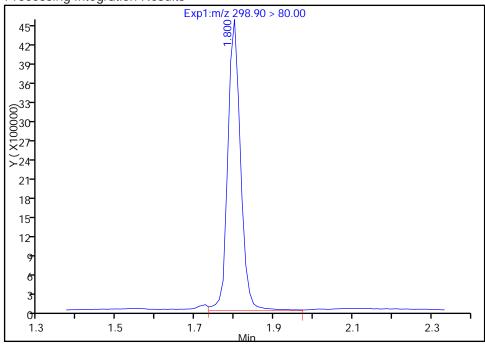
Column: Detector EXP1

### 5 Perfluorobutanesulfonic acid, CAS: 375-73-5

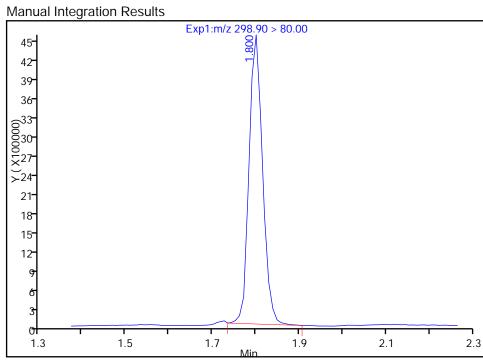
Signal: 1

RT: 1.80
Area: 10204327
Amount: 64.251922
Amount Units: ng/ml

**Processing Integration Results** 



RT: 1.80 Area: 9736539 Amount: 61.306478 Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 16:22:35

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 448 of 842

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-GW-31-35 DL Lab Sample ID: 320-23542-4 DL

Matrix: Water Lab File ID: 02DEC2016C\_011.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 14:30

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 254.2(mL) Date Analyzed: 12/02/2016 16:14

Con. Extract Vol.: 0.5(mL) Dilution Factor: 10

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 140429 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	1.0	D	0.025	0.020	0.0074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	1.4	D	0.039	0.030	0.013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.081	D	0.025	0.020	0.0090

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	101		25-150
STL00991	13C4 PFOS	125		25-150
STL00994	1802 PFHxS	115		25-150

Report Date: 04-Dec-2016 18:06:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\02DEC2016C\_011.d

Lims ID: 320-23542-A-4-A Client ID: DPT-16-34-GW-31-35

Sample Type: Client

Inject. Date: 02-Dec-2016 16:14:44 ALS Bottle#: 9 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-23542-a-4-a 10X NEW ALQ

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 04-Dec-2016 18:06:22 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 04-Dec-2016 18:06:33

RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
anesulfo	nic acid								
1.900	1.907	-0.007	1.000	2295661	4.10				
1.900	1.907	-0.007	1.000	970696		2.36(0.00-0.00)			
κS									
2.531	2.534	-0.003		1642742	5.43		11.5	129525	
A									
2.888	2.886	0.002		1107241	5.05		10.1	140047	
anoic ac	id								
2.888	2.894	-0.006	1.000	11600134	51.3			226911	
2.888	2.894	-0.006	1.000	7752752		1.50(0.90-1.10)		495730	
ane sulfo	onic acid	d							
3.262	3.267	-0.005	1.000	23773320	71.8			493443	
3.270	3.267	0.003	1.002	5086471		4.67(0.90-1.10)		811148	
5									
3.262	3.267	-0.005		1456234	5.95		12.5	46290	
	anesulfo 1.900 1.900 (S 2.531 A 2.888 anoic ac 2.888 2.888 ane sulfo 3.262 3.270	RT RT  Inesulfonic acid 1.900 1.907 1.900 1.907 IS 2.531 2.534 IN 2.888 2.886 IN 2.888 2.894 IN 2.888 2.894 IN 2.888 2.894 IN 3.262 3.267 3.270 3.267 IN 3.263	RT RT RT  Innesulfonic acid 1.900 1.907 -0.007 1.900 1.907 -0.007 IS 2.531 2.534 -0.003 INITIAL RESULT RESU	RT RT RT RT RT  Innesulfonic acid 1.900 1.907 -0.007 1.000 1.900 1.907 -0.007 1.000 IS 2.531 2.534 -0.003 IS 2.888 2.886 0.002 IS	RT RT RT RT RT RESPONSE  Inesulfonic acid 1.900 1.907 -0.007 1.000 2295661 1.900 1.907 -0.007 1.000 970696  IS 2.531 2.534 -0.003 1642742  A 2.888 2.886 0.002 1107241  anoic acid 2.888 2.894 -0.006 1.000 11600134 2.888 2.894 -0.006 1.000 7752752  ane sulfonic acid 3.262 3.267 -0.005 1.000 23773320 3.270 3.267 0.003 1.002 5086471	RT RT RT RT RT Response ng/ml  Inesulfonic acid 1.900 1.907 -0.007 1.000 2295661 4.10 1.900 1.907 -0.007 1.000 970696  IS 2.531 2.534 -0.003 1642742 5.43  A 2.888 2.886 0.002 1107241 5.05  Inencia acid 2.888 2.894 -0.006 1.000 11600134 51.3 2.888 2.894 -0.006 1.000 7752752  Inencia sulfonic acid 3.262 3.267 -0.005 1.000 23773320 71.8 3.270 3.267 0.003 1.002 5086471	RT RT RT RT RT REsponse ng/ml Ratio(Limits)  Innesulfonic acid 1.900 1.907 -0.007 1.000 2295661 4.10 1.900 1.907 -0.007 1.000 970696 2.36(0.00-0.00)  IS 2.531 2.534 -0.003 1642742 5.43  A 2.888 2.886 0.002 1107241 5.05  Ianoic acid 2.888 2.894 -0.006 1.000 11600134 51.3 2.888 2.894 -0.006 1.000 7752752 1.50(0.90-1.10)  Inne sulfonic acid 3.262 3.267 -0.005 1.000 23773320 71.8 3.270 3.267 0.003 1.002 5086471 4.67(0.90-1.10)	RT RT RT RT RT RT Response ng/ml Ratio(Limits) %Rec  Inesulfonic acid 1.900 1.907 -0.007 1.000 2295661 4.10 1.900 1.907 -0.007 1.000 970696 2.36(0.00-0.00)  IS 2.531 2.534 -0.003 1642742 5.43 11.5  A 2.888 2.886 0.002 1107241 5.05 10.1  anoic acid 2.888 2.894 -0.006 1.000 11600134 51.3 2.888 2.894 -0.006 1.000 7752752 1.50(0.90-1.10)  ane sulfonic acid 3.262 3.267 -0.005 1.000 23773320 71.8 3.270 3.267 0.003 1.002 5086471 4.67(0.90-1.10)	RT RT RT RT RT RT Response ng/ml Ratio(Limits) %Rec S/N  Inesulfonic acid 1.900 1.907 -0.007 1.000 2295661 4.10 1.900 1.907 -0.007 1.000 970696 2.36(0.00-0.00)  ISS 2.531 2.534 -0.003 1642742 5.43 11.5 129525  A. 2.888 2.886 0.002 1107241 5.05 10.1 140047  Inesulfonic acid 2.888 2.894 -0.006 1.000 11600134 51.3 2.888 2.894 -0.006 1.000 7752752 1.50(0.90-1.10) 495730  Inesulfonic acid 3.262 3.267 -0.005 1.000 23773320 71.8 3.270 3.267 0.003 1.002 5086471 4.67(0.90-1.10) 811148

Report Date: 04-Dec-2016 18:06:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\02DEC2016C\_011.d

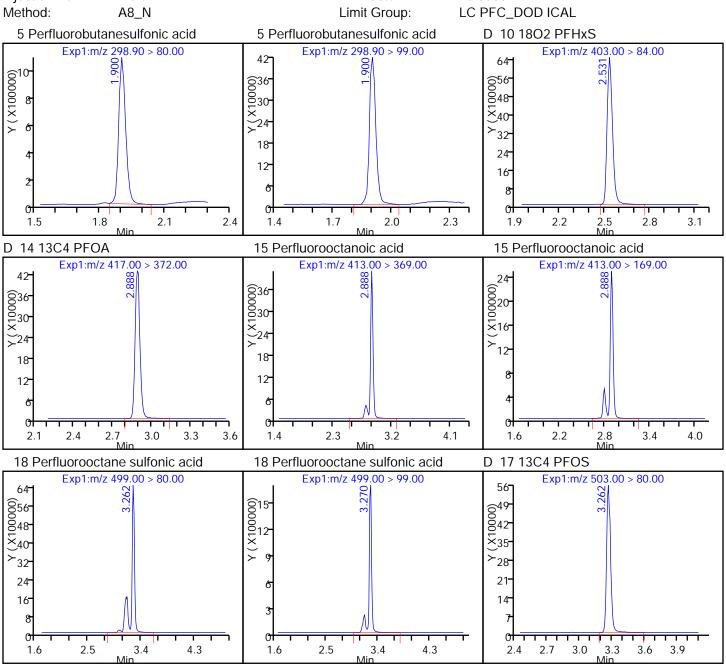
Injection Date: 02-Dec-2016 16:14:44 Instrument ID: A8\_N

Lims ID: 320-23542-A-4-A Lab Sample ID: 320-23542-4

Client ID: DPT-16-34-GW-31-35

Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 10.0000



## LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

#### Calibration Files:

LEVEL:	LAF	B SAMPLE ID:	LAB FILE ID:
Level 1	L IC	320-137684/4	14NOV2016A 004.d
Level 2	2 IC	320-137684/13	14NOV2016A 013.d
Level 3	3 IC	320-137684/5	14NOV2016A 005.d
Level 4	1 IC	320-137684/14	14NOV2016A 014.d
Level 5	5 IC	320-137684/6	14NOV2016A 006.d
Level 6	5 IC	320-137684/15	14NOV2016A 015.d
Level 7	7 IC	320-137684/7	14NOV2016A 007.d
Level 8	3 IC	320-137684/16	14NOV2016A 016.d
Level 9	) IC	320-137684/8	14NOV2016A 008.d
Level 1	LO IC	320-137684/17	14NOV2016A 017.d
Level 1	L1 IC	320-137684/9	14NOV2016A 009.d
Level 1	L2 IC	320-137684/18	14NOV2016A_018.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.518 1.513		1.518		1.518		1.518		1.518		1.267 - 1.767	1.517
Perfluoropentanoic acid (PFPeA)	1.801 1.794		1.801		1.791		1.791		1.791		1.545 - 2.045	1.795
Perfluorobutanesulfonic acid (PFBS)	1.839 1.832		1.839		1.830		1.829		1.830		1.653 - 2.013	1.833
Perfluorohexanoic acid (PFHxA)	2.102 2.091		2.102		2.094		2.087		2.087		1.844 - 2.344	2.094
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.449		2.445		2.379		2.371		2.367		2.149 - 2.649	2.402
Perfluoroheptanoic acid (PFHpA)	2.448 2.433		2.452		2.443		2.432		2.431		2.190 - 2.690	2.440
6:2FTS		2.774 2.750		2.758		2.760		2.758		2.758	2.510 - 3.010	2.760
Perfluorooctanoic acid (PFOA)	+++++ 2.802		2.829		2.805		2.808		2.799		2.561 - 3.061	2.809
Perfluoroheptanesulfonic Acid (PFHpS)	2.834 2.810		2.829		2.821		2.816		2.807		2.569 - 3.069	2.820
Perfluorooctane Sulfonate (PFOS)	+++++ 3.072		3.101		3.198		3.185		3.159		2.904 - 3.404	3.143
Perfluorononanoic acid (PFNA)	3.212 3.186		3.215		3.198		3.194		3.183		2.948 - 3.448	3.198
Perfluorooctane Sulfonamide (FOSA)	3.484 3.485		3.487		3.480		3.484		3.482		3.234 - 3.734	3.484
8:2FTS		3.531 3.515		3.523		3.524		3.514		3.514	3.270 - 3.770	3.520
Perfluorodecanoic acid (PFDA)	3.577 3.553		3.571		3.564		3.560		3.550		3.312 - 3.812	3.563

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.707 3.688		3.696		3.699		3.696		3.686	3.445 - 3.945	3.695
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.876 3.860		3.868		3.861		3.859		3.868	3.615 - 4.115	3.865
Perfluorodecanesulfonic acid (PFDS)	3.900 3.866		3.893		3.885		3.872		3.870		3.631 - 4.131	3.881
Perfluoroundecanoic acid (PFUnA)	3.917 3.892		3.910		3.902		3.889		3.887		3.650 - 4.150	3.900
MeFOSA		3.973 3.964		3.973		3.975		3.972		3.972	3.722 - 4.222	3.972
N-EtFOSA-M		4.161 4.156		4.154		4.155		4.154		4.154	3.905 - 4.405	4.156
Perfluorododecanoic acid (PFDoA)	4.224		4.210		4.197		4.193		4.192		3.950 - 4.450	4.200
Perfluorotridecanoic Acid (PFTriA)	4.490 4.457		4.485		4.470		4.466		4.457		4.221 - 4.721	4.471
Perfluorotetradecanoic acid (PFTeA)	4.745 4.706		4.731		4.721		4.715		4.707		4.471 - 4.971	4.721
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 5.126		5.169		5.145		5.135		5.135		4.898 - 5.398	5.142
Perfluoro-n-octadecanoic acid (PFODA)	5.571 5.510		5.558		5.539		5.525		5.516		5.287 - 5.787	5.537
13C4 PFBA	1.518		1.526		1.518		1.518		1.510		1.267 - 1.767	1.517
13C5-PFPeA	1.801 1.794		1.801		1.791		1.791		1.791		1.545 - 2.045	1.795
13C2 PFHxA	2.102		2.102		2.094		2.087		2.087		1.844 - 2.344	2.094
13C4-PFHpA	2.448		2.452		2.443		2.432		2.424		2.187 - 2.687	2.437
1802 PFHxS	2.464		2.467		2.458		2.447		2.447		2.205 - 2.705	2.455
M2-6:2FTS		2.766 2.750		2.766		2.760		2.758		2.758	2.510 - 3.010	2.760
13C4 PFOA	2.826	,,,,,	2.821		2.813		2.808		2.799		2.561 - 3.061	2.812
13C4 PFOS	3.212 3.186		3.206		3.198		3.194		3.183		2.947 - 3.447	3.197
13C5 PFNA	3.212 3.186		3.206		3.198		3.194		3.183		2.947 - 3.447	3.197
13C8 FOSA	3.484		3.487		3.480		3.475		3.482		3.231 - 3.731	3.481
M2-8:2FTS	3.177	3.531 3.507		3.523		3.524		3.522		3.514	3.270 - 3.770	3.520

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A8\_N

Calibration Start Date: 11/14/2016 11:42

GD No.: 320-23542-1

Analy Batch No.: 137684

ID: 2.1(mm)

Heated Purge: (Y/N) N

Calibration End Date: 11/14/2016 13:27

Calibration ID: 26566

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12										
13C2 PFDA	3.577		3.571		3.564		3.560		3.550		3.311 - 3.811	3.561
	3.544											
d3-NMeFOSAA		3.696		3.696		3.689		3.686		3.686	3.439 - 3.939	3.689
		3.678										
d5-NEtFOSAA		3.868		3.859		3.861		3.850		3.850	3.607 - 4.107	3.857
		3.852										
13C2 PFUnA	3.917		3.910		3.902		3.889		3.887		3.650 - 4.150	3.900
	3.892											
d-N-MeFOSA-M		3.963		3.963		3.965		3.963		3.963	3.714 - 4.214	3.964
		3.964										
d-N-EtFOSA-M		4.154		4.147		4.148		4.146		4.146	3.898 - 4.398	4.148
		4.148										
13C2 PFDoA	4.216		4.210		4.190		4.186		4.185		3.945 - 4.445	4.195
	4.184											
13C2-PFTeDA	4.737		4.731		4.714		4.715		4.707		4.468 - 4.968	4.718
	4.706											
13C2-PFHxDA	5.167		5.158		5.145		5.135		5.124		4.893 - 5.393	5.143
	5.126											

## LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

#### Calibration Files:

LEVEL:		LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-137684/4	14NOV2016A 004.d
Level	2	IC 320-137684/13	14NOV2016A 013.d
Level	3	IC 320-137684/5	14NOV2016A 005.d
Level	4	IC 320-137684/14	14NOV2016A 014.d
Level	5	IC 320-137684/6	14NOV2016A 006.d
Level	6	IC 320-137684/15	14NOV2016A 015.d
Level	7	IC 320-137684/7	14NOV2016A 007.d
Level	8	IC 320-137684/16	14NOV2016A 016.d
Level	9	IC 320-137684/8	14NOV2016A 008.d
Level	10	IC 320-137684/17	14NOV2016A 017.d
Level	11	IC 320-137684/9	14NOV2016A 009.d
Level	12	IC 320-137684/18	14NOV2016A_018.d

ANALYTE		Cl	F		CURVE TYPE		COEFFICIENT	#	MIN CF	%RSD	# MAX	R^2	# MIN R^2
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TIPE	В	M1	M2			%RSD	OR COD	OR COD
13C4 PFBA	186753 236465 178725		184880 209514 189584		Ave		197653.540			11.0	50.0		
13C5-PFPeA	151476 194997 141434		154480 166385 150547		Ave		159886.543			11.9	50.0		
13C2 PFHxA	131714 176393 129902		134980 154781 143378		Ave		145191.167			12.3	50.0		
13C4-PFHpA	127266 163159 117130		123873 139676 117359		Ave		131410.400			13.4	50.0		
1802 PFHxS	186681 241891 186676		191307 214803 191140		Ave		202083.027			11.0	50.0		
M2-6:2FTS		46038 47820 44437		44956 66679 64629	Ave		52426.1439			19.7	50.0		
13C4 PFOA	132085 170046 118382		136388 143595 118391		Ave		136481.063			14.1	50.0		

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE		Cl	F		CURVE		COEFFICIENT	#	MIN CF	%RSD		MAX			IN R^2
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TYPE	В	M1	M2			8	KSD	OR COD	0	R COD
13C4 PFOS	140602 190353 140904		146408 164827 151270		Ave		155727.280			12.3	5	0.0			
13C5 PFNA	105676 136121 97928		105687 113471 97422		Ave		109384.190			13.1	5	0.0			
13C8 FOSA	231911 305729 229150		228274 267469 242208		Ave		250790.180			12.2	5	0.0			
M2-8:2FTS		49544 49164 46901		47156 66179 68498			54573.4795			18.3	5	0.0			
13C2 PFDA	95161 123392 89201		93894 104471 95176		Ave		100215.640			12.4	5	0.0			
d3-NMeFOSAA		41601 40894 34724		40988 54802 47924	Ave		43489.0433			16.0	5	0.0			
d5-NEtFOSAA		47587 47828 40605		44545 60199 54935			49283.1667			14.5	5	0.0			
13C2 PFUnA	75635 98846 68259		74725 83202 69945		Ave		78435.0367			14.4	5	0.0			
d-N-MeFOSA-M		55528 57677 50288		57262 74738 68051			60590.4433			14.9	5	0.0			
d-N-EtFOSA-M		50117 52252 46057		50427 67935 61398	Ave		54697.5733			15.1	5	0.0			
13C2 PFDoA	72175 95377 68165		73582 79357 75378		Ave		77338.8800			12.4	5	0.0			
13C2-PFTeDA	163258 212084 149617		161462 176579 160747		Ave		170624.357			12.9	5	0.0			
13C2-PFH×DA	88272 114657 83802		89062 95842 94164		Ave		94299.7500			11.5	5	0.0			

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

#### CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RRE	' %RSD	#	MAX	R^2	 MIN R^2
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	TYPE	В	M1	M2				%RSD	OR COD	OR COD
Perfluorobutanoic acid (PFBA)	170838	195362	156859	155437	213061	AveID		0.8697			7.5		35.0		
	142588														
Perfluoropentanoic acid (PFPeA)	181632	175099	171439	141250	200758	AveID		1.0390			11.4		35.0		
Perfluorobutanesulfonic acid (PFBS)	127146 303158		285600		401000	AveID		1.5170			12.1		50.0		
Periluoroputanesulionic acid (PFBS)	225208	356025	283600	277793	401826	Aveid		1.51/0			12.1		50.0		
Perfluorohexanoic acid (PFHxA)	135330		125895		166052	7110 T D		0.9448			6.2		35.0		
refiluotonexanote actu (FFRXA)	122162	151768	123093	121455	100032	Aveid		0.9440			0.2		33.0		
Perfluorohexanesulfonic acid (PFHxS)	++++	231396	226281	185465	260028	AveID		1.0591			8.0		35.0		
	184851		100050		4 60444			1 0001			0.5		0.5.0		
Perfluoroheptanoic acid (PFHpA)	138054	145221	126956	119312	163114	AvelD		1.0234			3.7		35.0		
6:2FTS	114181	40536		38359		AveID		0.8532			10.4		35.0		
0:2115	34197	51456	60254	30339	43121	Aveid		0.6332			10.4		33.0		
Perfluorooctanoic acid (PFOA)	++++		156234	123859	176720	AveID		1.0501			6.2		35.0		
	114070														
Perfluoroheptanesulfonic Acid (PFHpS)	164899	197442	163447	159289	229142	AveID		1.1413			5.8		50.0		
	155260														
Perfluorooctane Sulfonate (PFOS)	+++++	182843	165637	146829	202054	AveID		1.0876			3.3		35.0		
	165443														
Perfluorononanoic acid (PFNA)	98794	119032	103453	97968	130769	AveID		0.9823			4.0		35.0		
	94475														
Perfluorooctane Sulfonamide (FOSA)	214768	258489	202005	206788	291150	AveID		0.9011			7.6		35.0		
	187637														

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

#### CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE			RRF			CURVE		COEFFICIE	NT #	MIN RRF	%RSD	 MAX	R^2		MIN R^2
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	TYPE	В	M1	M2			%RSD	OR COD		OR COD
8:2FTS	36793	37983 53989	63867	38926	45020	AveID		0.8423			11.5	35.0			
Perfluorodecanoic acid (PFDA)	102058 90752	103571	94938	84936	120030	AveID		0.9922			4.6	35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	30841	34300 43004	52528	31177	36960	AveID		0.8766			13.8	35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	29918	33776 44007	53091	35264	37625	AveID		0.7894			14.0	35.0			
Perfluorodecanesulfonic acid (PFDS)	82473 93914	104014	84093	86096	118653	AveID		0.6079			3.7	50.0			
Perfluoroundecanoic acid (PFUnA)	89184 70268	86932	73688	67492	95431	AveID		1.0282			7.6	35.0			
MeFOSA	41341	47776 59730	71435	45683	51156	AveID		0.8710			12.4	35.0			
N-EtFOSA-M	38440	43332 54966	66001	39458	47873	AveID		0.8815			12.9	35.0			
Perfluorododecanoic acid (PFDoA)	73806 69861	78741	67208	63111	90508	AveID		0.9550			4.5	35.0			
Perfluorotridecanoic Acid (PFTriA)	68558 72462	79142	62850	64701	90968	AveID		0.9443			5.0	50.0			
Perfluorotetradecanoic acid (PFTeA)	142094 122054	147082	130108	116280	167539	AveID		1.7787			6.8	50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 81051	88750	118495	75164	112335	L1ID	0.5477	1.0772					1.0000		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	69086 80431	72606	81153	84470	112104	AveID		1.0761			11.6	50.0			

Note: The ml coefficient is the same as Ave RRF for an Ave curve type.

## LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

#### Calibration Files:

LEVEL:		LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-137684/4	14NOV2016A 004.d
Level	2	IC 320-137684/13	14NOV2016A 013.d
Level	3	IC 320-137684/5	14NOV2016A 005.d
Level	4	IC 320-137684/14	14NOV2016A 014.d
Level	5	IC 320-137684/6	14NOV2016A 006.d
Level	6	IC 320-137684/15	14NOV2016A 015.d
Level	7	IC 320-137684/7	14NOV2016A 007.d
Level	8	IC 320-137684/16	14NOV2016A 016.d
Level	9	IC 320-137684/8	14NOV2016A 008.d
Level	10	IC 320-137684/17	14NOV2016A 017.d
Level	11	IC 320-137684/9	14NOV2016A 009.d
Level	12	IC 320-137684/18	14NOV2016A_018.d

ANALYTE	CURVE			RESPONSE				CONCE	NTRATION (N	G/ML)	
	TYPE -	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C4 PFBA	Ave	9337655 9479214	10475703	9243990	8936233	11823267	50.0	50.0	50.0	50.0	50.0
13C5-PFPeA	Ave	7573795 7527340	8319267	7724013	7071703	9749845	50.0	50.0	50.0	50.0	50.0
13C2 PFHxA	Ave	6585676 7168880	7739058	6748988	6495105	8819643	50.0	50.0	50.0	50.0	50.0
13C4-PFHpA	Ave	6363291 5867935	6983820	6193648	5856487	8157939	50.0 50.0	50.0	50.0	50.0	50.0
1802 PFHxS	Ave	8830019 9040925	10160165	9048832	8829789	11441433	47.3 47.3	47.3	47.3	47.3	47.3
M2-6:2FTS	Ave	2271427	2186782 3069884	3167233	2135389	2110736	47.5	47.5 47.5	47.5	47.5	47.5
13C4 PFOA	Ave	6604259 5919540	7179751	6819396	5919095	8502278	50.0	50.0	50.0	50.0	50.0
13C4 PFOS	Ave	6720753 7230705	7878720	6998315	6735234	9098857	47.8 47.8	47.8	47.8	47.8	47.8

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

ab Name:	TestAmerica Sacramento	Job No.:	320-23542-1	Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE	CURVE			RESPONSE				CONCEN	ITRATION (N	G/ML)	
	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C5 PFNA	Ave	5283790 4871116	5673546	5284368	4896384	6806053	50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	11595532	13373430	11413682	11457517	15286472	50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	2354945	2373160	3169967	2258760	2246539	50.0	47.9	47.9	47.9	47.9
13C2 PFDA	Ave	4758041	3281047 5223539	4694685	4460035	6169615	50.0	47.9 50.0	50.0	50.0	50.0
d3-NMeFOSAA	Ave	4758777 2044718	2080071	2740100	2049410	1736199	50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	2391408	2379328	3009967	2227255	2030246	50.0	50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	3781752 3497235	4160080	3736242	3412926	4942276	50.0	50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	2883849	2776398 3402541	3736883	2863079	2514383	50.0	50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	2612591	2505838	3396758	2521340	2302830	50.0	50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	3608738 3768909	3967844	3679078	3408241	4768854	50.0	50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	8162889 8037332	8828960	8073104	7480844	10604178	50.0	50.0	50.0	50.0	50.0
13C2-PFH×DA	Ave	4413600 4708207	4792086	4453082	4190109	5732841	50.0	50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

#### Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-137684/4	14NOV2016A 004.d	
Level 2	IC 320-137684/13	14NOV2016A 013.d	
Level 3	IC 320-137684/5	14NOV2016A 005.d	
Level 4	IC 320-137684/14	14NOV2016A 014.d	
Level 5	IC 320-137684/6	14NOV2016A 006.d	
Level 6	IC 320-137684/15	14NOV2016A 015.d	
Level 7	IC 320-137684/7	14NOV2016A 007.d	
Level 8	IC 320-137684/16	14NOV2016A 016.d	
Level 9	IC 320-137684/8	14NOV2016A 008.d	
Level 10	IC 320-137684/17	14NOV2016A 017.d	
Level 11	IC 320-137684/9	14NOV2016A 009.d	
Level 12	IC 320-137684/18	14NOV2016A 018.d	

ANALYTE	IS	CURVE			RESPONSE				CONCE	TRATION (N	NG/ML)	
	REF	TYPE -	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorobutanoic acid (PFBA)		AveID	85419 28517516	3907232	156859	7771826	1065307	0.500	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	90816	3501981	171439	7062509	1003791	0.500	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	133996 39816824	6294518	252470	12278449	1776071	0.442	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	67665 24432332	3035352	125895	6072771	830262	0.500	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 33642968	4211405	205916	8438680	1183129	+++++ 182	18.2	0.910	45.5	4.55
Perfluoroheptanoic acid (PFHpA)		AveID	69027	2904421	126956	5965596	815572	0.500	20.0	1.00	50.0	5.00
6:2FTS		AveID	162096	19214 9756112	1142424	36364	2043932	4.74	0.474	19.0	0.948	47.4
Perfluorooctanoic acid (PFOA)		AveID	+++++ 22813929	3032598	156234	6192971	883601	+++++ 200	20.0	1.00	50.0	5.00

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE	IS	CURVE			RESPONSE				CONCEN	ITRATION (N	G/ML)	
	REF	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluoroheptanesulfonic Acid (PFHpS)		AveID	78492 29561540	3759299	155602	7582180	1090716	0.476	19.0	0.952	47.6	4.76
Perfluorooctane Sulfonate (PFOS)		AveID	+++++ 30706189	3393561	153711	6812886	937530	+++++ 186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)		AveID	49397 18895041	2380645	103453	4898420	653846	0.500	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)		AveID	107384 37527381	5169777	202005	10339396	1455748	0.500	20.0	1.00	50.0	5.00
8:2FTS		AveID	176239	18194 10344377	1223686	37291	2156480	4.79	0.479	19.2	0.958	47.9
Perfluorodecanoic acid (PFDA)		AveID	51029 18150490	2071411	94938	4246788	600149	0.500	20.0	1.00	50.0	5.00
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		AveID	154205	17150 8600829	1050550	31177	1848003	5.00	0.500	20.0	1.00	50.0
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		AveID	149588	16888 8801345	1061824	35264	1881272	5.00	0.500	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	39752 18106699	2005394	81066	4149841	571908	0.482	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)		AveID	44592 14053548	1738635	73688	3374586	477157	0.500	20.0	1.00	50.0	5.00
MeFOSA		AveID	206706	23888 11946092	1428691	45683	2557821	5.00	0.500	20.0	1.00	50.0
N-EtFOSA-M		AveID	192199	21666	1320019	39458	2393631	5.00	0.500	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)		AveID	36903 13972115	1574822	67208	3155550	452538	0.500	20.0	1.00	50.0	5.00

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 137684

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 11/14/2016 11:42 Calibration End Date: 11/14/2016 13:27 Calibration ID: 26566

ANALYTE	IS	CURVE		RESPONSE						CONCENTRATION (NG/ML)				
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10		
			LVL 11	LVL 12				LVL 11	LVL 12					
Perfluorotridecanoic Acid (PFTriA)		AveID	34279		62850		454838	0.500		1.00		5.00		
				1582837		3235045			20.0		50.0			
			14492441					200						
Perfluorotetradecanoic acid (PFTeA)		AveID	71047		130108		837693	0.500		1.00		5.00		
				2941630		5813985			20.0		50.0			
			24410873					200						
Perfluoro-n-hexadecanoic acid		L1ID	++++		118495		561675	++++		1.00		5.00		
(PFHxDA)				1774997		3758175			20.0		50.0			
			16210200					200						
Perfluoro-n-octadecanoic acid		AveID	34543		81153		560518	0.500		1.00		5.00		
(PFODA)				1452122		4223490			20.0		50.0			
			16086225					200						

Curve Type Legend:

AveID = Average isotope dilution L1ID = Linear 1/conc IsoDil Report Date: 14-Nov-2016 16:27:47 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_004.d

Lims ID: IC L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 14-Nov-2016 11:42:23 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:27:46 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:01:27

First Level Revie	wer: cha	ındrasen	as		Date:	1	4-Nov-2016 16:01:2	27		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	•									
212.90 > 169.00		1.517	0.001	1.000	85419	0.5259		105	965	
D 2 13C4 PFBA 217.00 > 172.00		1.517	0.001		9337655	47.2		94.5	133762	n
3 Perfluoropen			0.001		7337033	47.2		74.5	133702	J
262.90 > 219.00		1.795	0.006	1.000	90816	0.5770		115	1120	
D 413C5-PFPe										
267.90 > 223.00		1.795	0.006		7573795	47.4		94.7	165776	5
5 Perfluorobuta	anesulfo	nic acid								
298.90 > 80.00		1.833	0.006	1.000	133996	0.4732		107		
298.90 > 99.00		1.833	0.006	1.000	56968		2.35(0.00-0.00)	107		
7 Perfluorohex 313.00 > 269.00		2.094	0.008	1.000	67665	0.5437		109	1570	
D 6 13C2 PFHx		2.074	0.000	1.000	07003	0.5437		107	1370	
315.00 > 270.00		2.094	0.008		6585676	45.4		90.7	904511	
9 Perfluorohex	anesulfo	onic acid								
399.00 > 80.00	2.384	2.399	-0.015	1.000	126019	0.6374		140		
D 11 13C4-PFH										
367.00 > 322.00		2.437	0.011		6363291	48.4		96.8	641575	
12 Perfluorohe			0.000	4 000	(0007	0.5000		407	707	
363.00 > 319.00		2.440	0.008	1.000	69027	0.5300		106	797	
D 10 1802 PFH: 403.00 > 84.00		2.455	0.009		8830019	43.7		92.4	453725	
15 Perfluorooct			0.007		0030017	43.7		72.4	433723	
413.00 > 369.00		2.811	0.015	1.000	100177	0.7222		144	1401	
413.00 > 169.00	2.826	2.811	0.015	1.000	49276		2.03(0.90-1.10)	144	2189	
D 14 13C4 PFO	A									
417.00 > 372.00	2.826	2.811	0.015		Page 464 of 8	842 <sup>48.4</sup>		96.8	500240 12/08	3/2016
					-					

Report Date: 14-Nov-2016 16:27:47 Chrom Revision: 2.2 17-Oct-2016 09:27:18

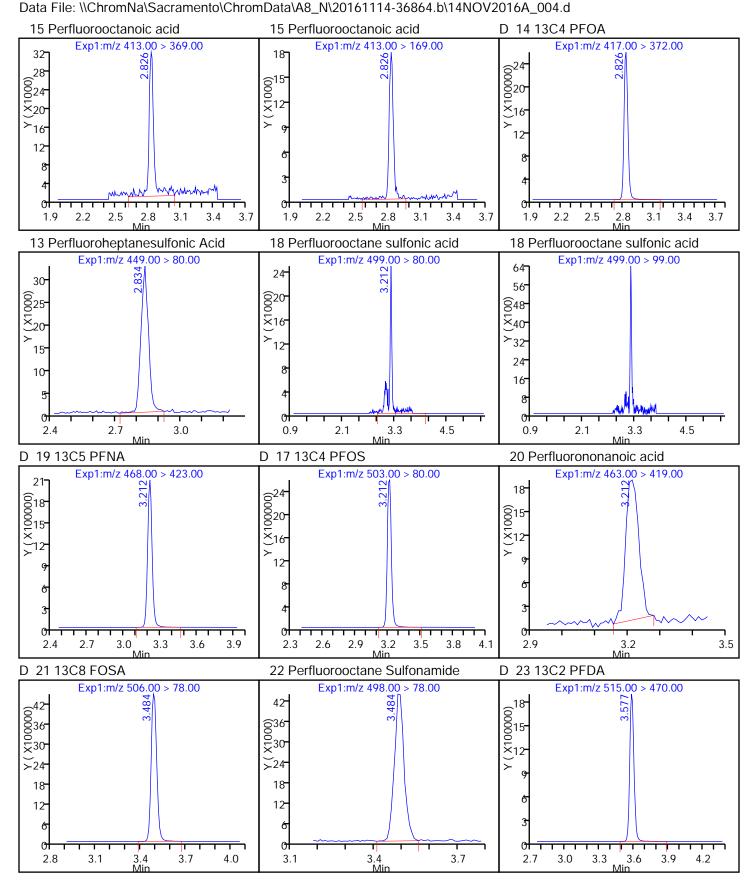
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_004.d

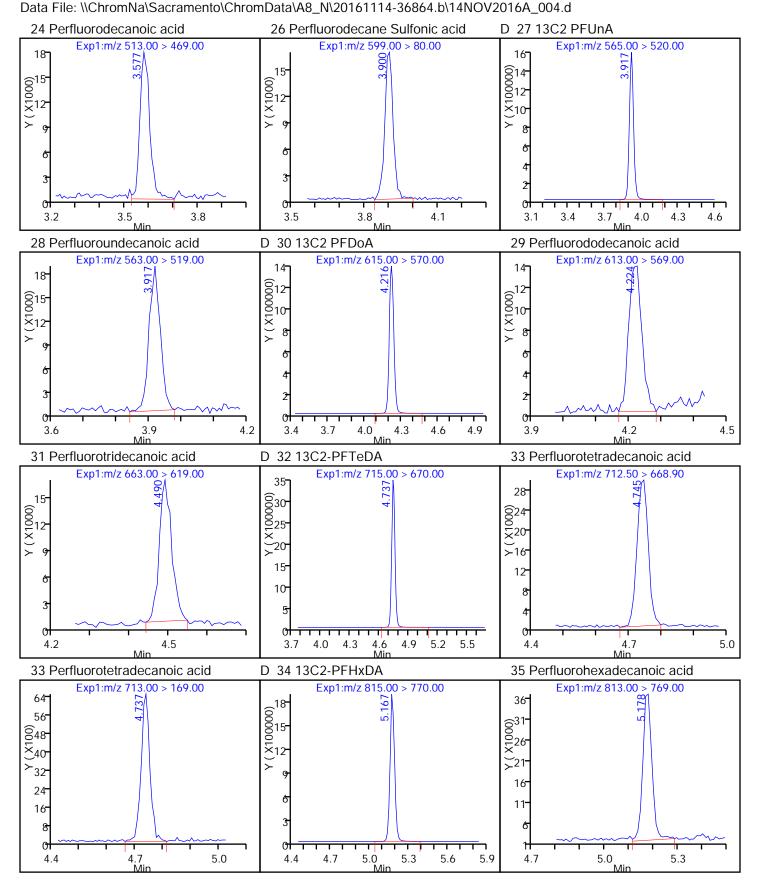
Data File:	\\Cnrc	วทางลงระ	icrameni	O/Chrom	Data\A8_IN\201	01114-3080	4.D\14NOV2016A_0	JU4.U		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohep	tanesul	fonic Ac	id							
449.00 > 80.00		2.819		1.000	78492	0.4891		103		
18 Perfluoroocta	ane sulf	onic acid	d							
499.00 > 80.00		3.154		1.000	99187	0.6486		140	12095	
D 19 13C5 PFNA										
468.00 > 423.00	3.212	3.197	0.015		5283790	48.3		96.6	340849	
D 17 13C4 PFOS	5									
503.00 > 80.00	3.212	3.197	0.015		6720753	43.2		90.3	253226	
20 Perfluoronon		cid								
463.00 > 419.00	3.212	3.198	0.014	1.000	49397	0.4759		95.2	715	
D 21 13C8 FOSA										
506.00 > 78.00	3.484	3.481	0.003		11595532	46.2		92.5	339991	
22 Perfluoroocta										
498.00 > 78.00		3.484	0.0	1.000	107384	0.5138		103	6184	
D 23 13C2 PFDA										
515.00 > 470.00		3.561	0.016		4758041	47.5		95.0	261957	
24 Perfluorodec			0.045	4 000	54000	0.5404		400	4.404	
513.00 > 469.00			0.015	1.000	51029	0.5404		108	1491	
26 Perfluorodec				1 000	20752	0.4451		04 E		
599.00 > 80.00		3.881	0.019	1.000	39752	0.4651		96.5		
D 27 13C2 PFUn 565.00 > 520.00		3.900	0.017		3781752	48.2		96.4	518778	
			0.017		3701732	40.2		90.4	310770	
28 Perfluoround 563.00 > 519.00		3.900	0.017	1.000	44592	0.5734		115	1079	
D 30 13C2 PFDo.		3.700	0.017	1.000	44372	0.5734		113	1077	
615.00 > 570.00		4.195	0.021		3608738	46.7		93.3	229019	
29 Perfluorodod			0.021		3000730	40.7		73.3	227017	
613.00 > 569.00			0.024	1.000	36903	0.5354		107	401	
31 Perfluorotride			0.024	1.000	30703	0.0004		107	401	
663.00 > 619.00		4.471	0.019	1.000	34279	0.5030		101	1174	
D 32 13C2-PFTe		1.171	0.017	1.000	01277	0.0000		101	1171	
715.00 > 670.00		4.718	0.019		8162889	47.8		95.7	171717	4
33 Perfluorotetra										
712.50 > 668.90		4.721	0.024	1.000	71047	0.5534		111	157	
713.00 > 169.00		4.721	0.016	0.998	14378		4.94(0.00-0.00)	111	3220	
D 34 13C2-PFHx	DA						, ,			
815.00 > 770.00		5.143	0.024		4413600	46.8		93.6	300594	
35 Perfluorohex	adecan	oic acid								
813.00 > 769.00		5.148	0.030	1.000	91596	0.6696		134	328	
36 Perfluoroocta	adecano	oic acid								
913.00 > 869.00		5.537	0.034	1.000	34543	0.4448		89.0	128	
Reagents:										
LCPFC-L1 00021	1		Δ	mount A	dded: 1.00	Units	:· ml			

LCPFC-L1\_00021

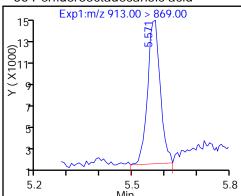
Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2016 16:27:47 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_004.d **Injection Date:** 14-Nov-2016 11:42:23 Instrument ID: A8\_N Lims ID: IC L1 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 <u>@</u>36 (36<sup>-</sup> (000130<sup>-</sup> (30<sup>-</sup> 6<sup>38</sup> × × 830 \S\_24-<u>~</u>26 18 20 18 12 12 14 1.7 0.9 1.4 1.2 1.5 1.8 1.4 1.7 2.0 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid D Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0056<del>-</del> 24 ©30 00 25 () 648 (S<sub>20</sub> <del>-</del>40 ≻32<del>-</del> 15 24 10 16 2.0 2.3 2.0 1.3 1.9 2.5 1.7 1.7 2.3 1.4 0.7 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 28 28 42 824<del>-</del> ©24-0020-× × 16-×30. <u>8</u>20-∑<sub>16</sub>-<sup>-</sup>24 12 18 12 2.1 2.4 1.8 2.1 2.4 2.7 1.9 2.5 1.8 1.5 1.3 3.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 28 35<del>-</del> 0030-0025-00001 0020 6001 ×20-∑<sub>16</sub> ∑16<del>-</del> <del>-</del>20 12 15 10 0 1.8 2.1 2.4 2.7 3.0 2.1 2.7 1.9 2.2 2.5 1.5 Page 466 of 842 1.6





36 Perfluorooctadecanoic acid



Report Date: 14-Nov-2016 16:27:49 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_005.d

Lims ID: IC L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 14-Nov-2016 11:49:56 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:27:49 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:05:49

First Level Revie	wer: cha	<u>ndrasen</u>	as		Date:	1	4-Nov-2016 16:05:4	19		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty										
212.90 > 169.00		1.517	0.001	1.000	156859	0.9755		97.5	1474	
D 2 13C4 PFBA 217.00 > 172.00		1.517	0.009		9243990	46.8		93.5	100862	6
3 Perfluoropen			0.007		7243770	40.0		73.3	100002	O
262.90 > 219.00		1.795	0.006	1.000	171439	1.07		107	1913	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.801	1.795	0.006		7724013	48.3		96.6	114669	6
5 Perfluorobuta										
	1.839 1.839	1.833 1.833	0.006	1.000 1.000	252470 108552	0.8700	2.33(0.00-0.00)	98.4 98.4		
7 Perfluorohex			0.000	1.000	108332		2.33(0.00-0.00)	90.4		
313.00 > 269.00		2.094	0.008	1.000	125895	0.9871		98.7	3129	
D 6 13C2 PFHx	Α									
315.00 > 270.00	2.102	2.094	0.008		6748988	46.5		93.0	576196	
9 Perfluorohex										
399.00 > 80.00		2.399	0.046	1.000	205916	1.02		112		
D 11 13C4-PFH <sub>1</sub> 367.00 > 322.00	•	2.437	0.015		6193648	47.1		94.3	501821	
12 Perfluorohe			0.013		0173040	77.1		74.5	301021	
363.00 > 319.00		2.440	0.012	1.000	126956	1.00		100	1482	
D 10 18O2 PFH:	xS									
403.00 > 84.00	2.467	2.455	0.012		9048832	44.8		94.7	421933	
15 Perfluorooct										
413.00 > 369.00 413.00 > 169.00		2.811 2.811	0.018 0.010	1.000 0.997	156234 86502	1.09	1.81(0.90-1.10)	109 109	2009 3726	
D 14 13C4 PFO		2.011	0.010	0.771	00302		1.01(0.70-1.10)	107	3120	
417.00 > 372.00		2.811	0.010		Page 470 of 84	2 50.0		99.9	449229	0/2016
					rage 470 of 84	-2			12/08	0/2016

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61114-3686	4.b\14NOV2016A_0	)05.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Signal	IXI	IXI	IXI	IXI	Response	rig/iii	Ratio(Eiritis)	70TCC	3/11	i lags
13 Perfluoroh 449.00 > 80.00	•		id 0.010	1.000	155602	0.9312		97.8		
18 Perfluoroo				1 000	450744	0.0450		404	0005	
499.00 > 80.00 499.00 > 99.00		3.154 3.154	-0.053 0.052	1.000 1.034	153711 33768	0.9653	4.55(0.90-1.10)	104 104	2225 2442	
D 19 13C5 PF		3.134	0.032	1.034	33700		4.55(0.70-1.10)	104	2772	
468.00 > 423.0		3.197	0.009		5284368	48.3		96.6	667010	
D 17 13C4 PF0										
503.00 > 80.00		3.197	0.009		6998315	44.9		94.0	296248	
20 Perfluoron 463.00 > 419.0		acid 3.198	0.017	1.000	103453	1.00		99.7	1584	
D 21 13C8 FO		3.170	0.017	1.000	103433	1.00		77.1	1304	
506.00 > 78.00		3.481	0.006		11413682	45.5		91.0	500156	
22 Perfluoroo										
498.00 > 78.00		3.484	0.003	1.000	202005	0.9820		98.2	13642	
D 23 13C2 PFI	DA									
515.00 > 470.0		3.561	0.010		4694685	46.8		93.7	229767	
24 Perfluorod										
513.00 > 469.0		3.562	0.009	1.000	94938	1.02		102	2688	
26 Perfluorod 599.00 > 80.00		3.881	0.012	1.000	81066	0.9109		94.5		
D 27 13C2 PFU		3.001	0.012	1.000	81000	0.7107		74.5		
565.00 > 520.0		3.900	0.010		3736242	47.6		95.3	305895	
28 Perfluorou		c acid								
563.00 > 519.0	0 3.910	3.900	0.010	1.000	73688	0.9591		95.9	1824	
D 30 13C2 PF										
615.00 > 570.0			0.015		3679078	47.6		95.1	293286	
29 Perfluorod			0.010	1 000	(7000	0.05/4		05 (	747	
613.00 > 569.0			0.010	1.000	67208	0.9564		95.6	716	
31 Perfluorotr 663.00 > 619.0		acid 4.471	0.014	1.000	62850	0.9046		90.5	1953	
D 32 13C2-PF		4.471	0.014	1.000	02030	0.7040		70.5	1755	
715.00 > 670.0		4.718	0.013		8073104	47.3		94.6	1649808	8
33 Perfluorote										
712.50 > 668.9		4.721	0.010	1.000	130108	0.99		99.4	401	
713.00 > 169.0	0 4.731	4.721	0.010	1.000	24192		5.38(0.00-0.00)	99.4	4944	
D 34 13C2-PFI										
815.00 > 770.0		5.143	0.015		4453082	47.2		94.4	286043	
35 Perfluoroh			0.021	1 000	110 <i>4</i> 0E	0.0045		00.4	242	M
813.00 > 769.0			0.021	1.000	118495	0.9865		98.6	362	М
36 Perfluoroo 913.00 > 869.0		oic acid 5.537	0.021	1.000	81153	1.02		102	279	
713.00 / 007.0	0 0.000	5.557	0.021	1.000	01100	1.02		102	21/	

Report Date: 14-Nov-2016 16:27:49 Chrom Revision: 2.2 17-Oct-2016 09:27:18

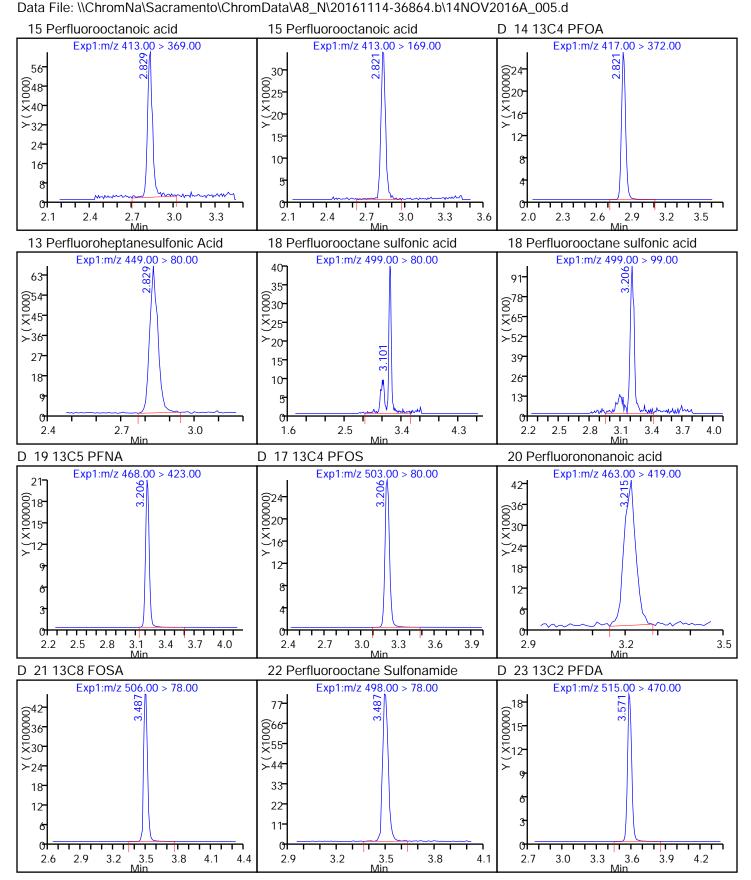
QC Flag Legend Review Flags

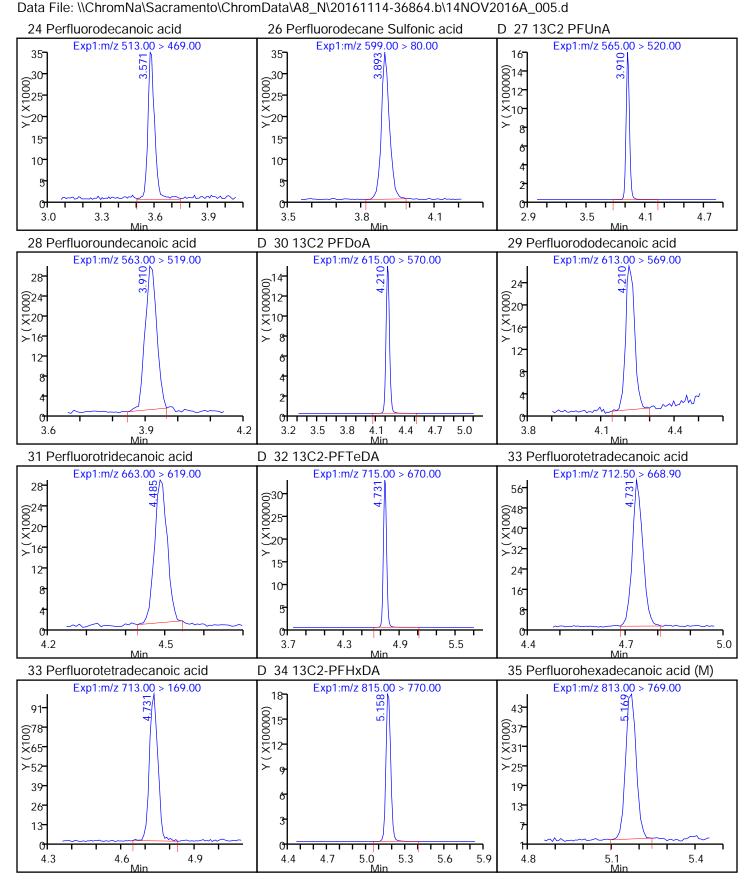
M - Manually Integrated

Reagents:

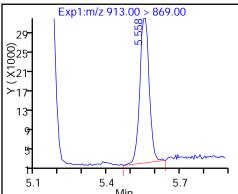
LCPFC-L2\_00022 Units: mL Amount Added: 1.00

Report Date: 14-Nov-2016 16:27:49 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: 14-Nov-2016 11:49:56 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 <u>@</u>36 63 0 0 5 4 <u>661</u> 830 ×24-<del>×</del>51<sup>•</sup> ×45 ≻<sub>36</sub>-**≻**41 18 31 27 12 21 18 11 1.7 1.9 1.4 2.0 0.9 1.8 1.3 1.6 2.2 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00Exp1:m/z 267.90 > 223.0035 12 49 80 0030 0025 Y (X10000) ∑<sub>20</sub> **∑**28 15 21 2.0 1.2 1.8 2.1 2.4 2.7 1.7 1.7 2.0 1.5 1.4 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 28 63 49 0024**-**00024-20-<u>0</u>42 0054 ×45 ×35 \_ ≻16<del>-</del> ≻<sub>28</sub>-**≻**36 12 27 21 18 2.0 2.3 1.8 2.1 2.4 2.7 2.0 2.6 1.5 1.4 3.2 1.7 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 56 (35 0030 X25 00001 0020 (0001× (00040-∑<sub>16</sub> <u></u>32− ≻20 24 15 16<del>-</del> 10 0 1.8 2.1 2.4 2.7 3.0 2.0 Page 47/3h of 842 2.9 2.0 2.3 2.6 1.5 1.7





36 Perfluorooctadecanoic acid



Report Date: 14-Nov-2016 16:27:49 Chrom Revision: 2.2 17-Oct-2016 09:27:18 Manual Integration/User Assign Peak Report

### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_005.d

Injection Date: 14-Nov-2016 11:49:56 Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

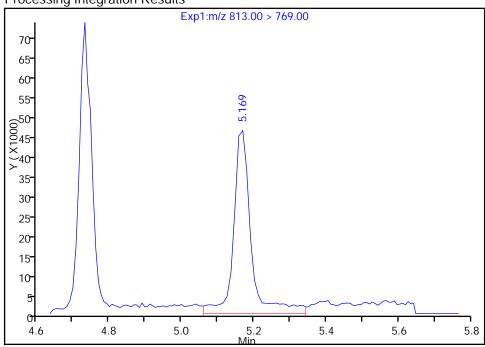
Column: Detector EXP1

### 35 Perfluorohexadecanoic acid, CAS: 67905-19-5

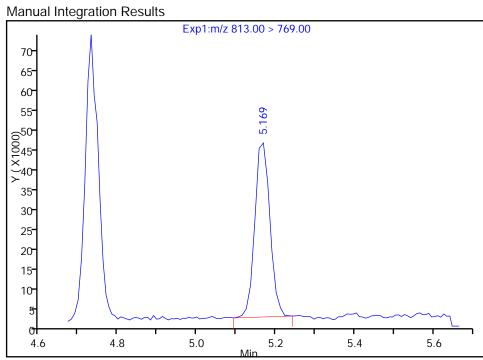
Signal: 1

RT: 5.17
Area: 157243
Amount: 1.076056
Amount Units: ng/ml

**Processing Integration Results** 



RT: 5.17
Area: 118495
Amount: 0.986468
Amount Units: ng/ml



Reviewer: chandrasenas, 14-Nov-2016 16:05:49

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 477 of 842

Report Date: 17-Nov-2016 13:13:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_006.d

Lims ID: IC L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 14-Nov-2016 11:57:25 ALS Bottle#: 39 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 17-Nov-2016 13:13:37 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK032

First Level Reviewer: phomsophat Date: 17-Nov-2016 13:13:37

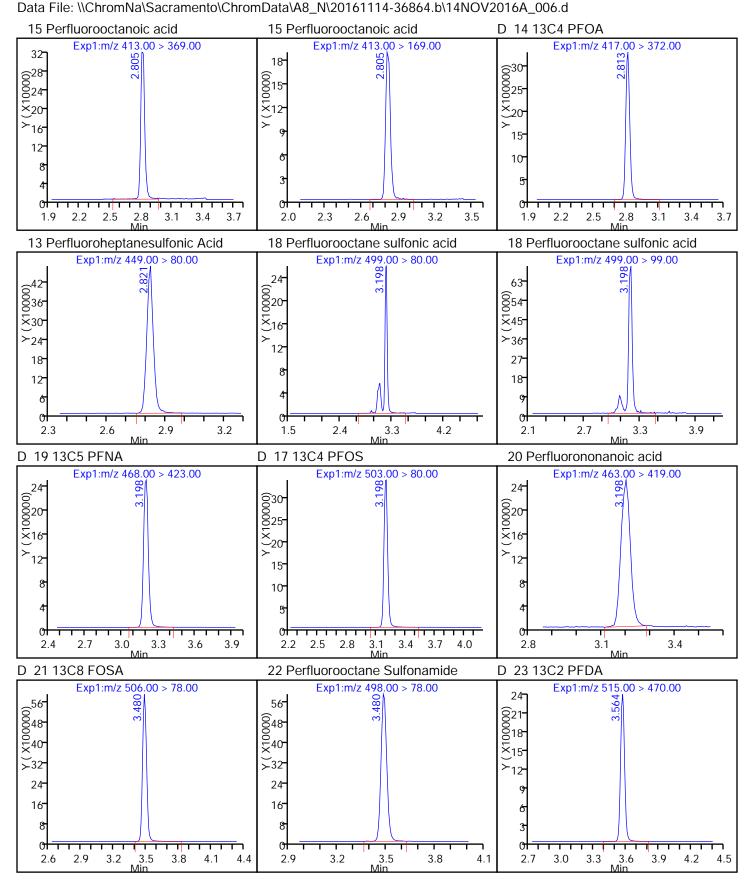
First Level Reviewer: phomsophat					Date:		17-Nov-2016 13:13:37			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	•	1.517	0.001	1.000	1065307	5.18		104	10477	
D 213C4 PFBA	١									
217.00 > 172.00	1.518	1.517	0.001		11823267	59.8		120	100146	8
3 Perfluoropentanoic acid										
262.90 > 219.00		1.795	-0.004	1.000	1003791	4.95		99.1	13312	
D 4 13C5-PFPe										
267.90 > 223.00			-0.004		9749845	61.0		122	142116	1
5 Perfluorobut			0.002	1 000	177/071	4.04		110		
298.90 > 80.00 298.90 > 99.00		1.833 1.833	-0.003 -0.003	1.000 1.000	1776071 717629	4.84	2.47(0.00-0.00)	110 110		
298.90 > 99.00										
313.00 > 269.00		2.094	0.0	1.000	830262	4.98		99.6	16884	
D 6 13C2 PFHx										
315.00 > 270.00		2.094	0.0		8819643	60.7		121	767294	
9 Perfluorohex	anesulfo	onic acid								
399.00 > 80.00	2.379	2.399	-0.020	1.000	1183129	4.62		101		
D 11 13C4-PFH	•									
367.00 > 322.00	2.443	2.437	0.006		8157939	62.1		124	614076	
12 Perfluorohe	•									
363.00 > 319.00		2.440	0.003	1.000	815572	4.88		97.7	8530	
D 10 1802 PFH:		0.455	0.000		4444400	F / /		100		
403.00 > 84.00		2.455	0.003		11441433	56.6		120	649292	
15 Perfluorooct 413.00 > 369.00		2.811	-0.006	1.000	883601	4.95		99.0	15701	
413.00 > 369.00		2.811	-0.006	1.000	508541	4.93	1.74(0.90-1.10)	99.0 99.0	20219	
D 14 13C4 PFO		2.011	0.000	1.000	000071		(0.70 1.10)	, ,	20217	
417.00 > 372.00		2.811	0.002		P8502278 Page 478 of 8	62.3		125	541304	1/0046
					Page 4/8 of 8	542			12/08	5/2016

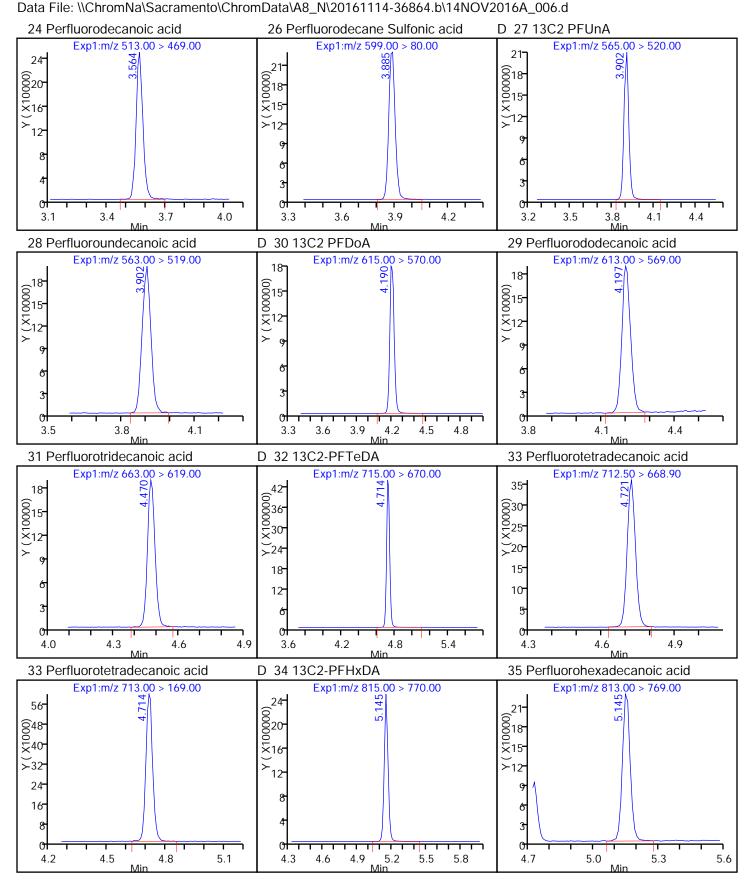
Report Date: 17-Nov-2016 13:13:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_006.d

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161114-36864.b\14NOV2016A_006.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	•		0.002	1.000	1090716	5.02		105		
				1.000	1070710	3.02		103		
18 Perfluorooc 499.00 > 80.00		3.154	u 0.044	1.000	937530	4.53		97.6	129936	
499.00 > 99.00		3.154	0.044	1.000	217317	4.55	4.31(0.90-1.10)	97.6	17339	
D 19 13C5 PFN		J. 134	0.044	1.000	217317		4.51(0.70 1.10)	77.0	17337	
468.00 > 423.00		3.197	0.001		6806053	62.2		124	306182	
D 17 13C4 PFO		5.177	0.001		0000033	02.2		127	300102	
503.00 > 80.00		3.197	0.001		9098857	58.4		122	421314	
			0.001		7070037	30.4		122	421314	
20 Perfluorono 463.00 > 419.00		3.198	0.0	1.000	653846	4.89		97.8	10035	
		3.170	0.0	1.000	033640	4.07		97.0	10033	
D 21 13C8 FOS		2 401	0.001		1520/472	/10		100	721022	
506.00 > 78.00		3.481			15286472	61.0		122	731922	
22 Perfluorooc				1 000	4.455740	F 00		10/	00074	
498.00 > 78.00		3.484	-0.004	1.000	1455748	5.28		106	83271	
D 23 13C2 PFD										
515.00 > 470.00		3.561	0.003		6169615	61.6		123	293648	
24 Perfluorode										
513.00 > 469.00	3.564	3.562	0.002	1.000	600149	4.90		98.0	17392	
26 Perfluorode										
599.00 > 80.00	3.885	3.881	0.004	1.000	571908	4.94		103		
D 27 13C2 PFU										
565.00 > 520.00	3.902	3.900	0.002		4942276	63.0		126	290109	
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00	3.902	3.900	0.002	1.000	477157	4.70		93.9	14597	
D 30 13C2 PFD	oΑ									
615.00 > 570.00	4.190	4.195	-0.005		4768854	61.7		123	253572	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.197	4.200	-0.003	1.000	452538	4.97		99.4	5153	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.470	4.471	-0.001	1.000	454838	5.05		101	15513	
D 32 13C2-PFT	eDA									
715.00 > 670.00		4.718	-0.004		10604178	62.1		124	217142	5
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90		4.721	0.0	1.000	837693	4.94		98.8	4954	
713.00 > 169.00		4.721	-0.007	0.998	145834		5.74(0.00-0.00)	98.8	29824	
D 34 13C2-PFH	хDА						, ,			
815.00 > 770.00		5.143	0.002		5732841	60.8		122	352561	
35 Perfluorohe										
813.00 > 769.00		5.148		1.000	561675	4.96		99.2	1554	
36 Perfluorooc			2.300		33.070	,0				
913.00 > 869.00			0.002	1.000	560518	5.46		109	1516	
	0.007	5.557	0.002	1.000	300310	J.40		107	1310	
Reagents:	0			lma······ ^	ddod: 100	1 1! -	mol			
LCPFC-L3_0001	9		P	amount A	dded: 1.00	Units	: INL			

Report Date: 17-Nov-2016 13:13:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_006.d **Injection Date:** 14-Nov-2016 11:57:25 Instrument ID: A8\_N Lims ID: IC L3 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 49 6<sup>42</sup> 6 8 8 8 ×30-∑30 ∑28<del>-</del> 21 18 18 14 12 12 1.3 1.9 1.0 1.9 1.9 1.0 1.6 1.3 1.6 2.2 1.3 1.6 2.2 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0042 000036 X 24 630 60 25 0066-X55-\_ ≻44 15 18 33 10 12 22 11 2.0 2.3 1.6 1.9 2.2 1.5 2.1 2.4 1.1 1.4 1.7 1.3 1.2 1.8 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 40 35 294 635 630 6<sup>35</sup> 830 ≥25-× × >20-×25 ×25 **≻**20 ≻<sub>20</sub> 15 15 15 10 10 10 2.0 2.3 1.9 2.2 2.5 2.0 2.6 1.6 2.8 1.4 3.2 1.7 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 642 0036 ×30 30-0025-628 0024 <del>∑</del>20 ×<sub>20</sub> ≻16<del>-</del> **≻**24 15 12 18 10 12 0 0 0 2.0 2.6 3.2 2.1 2.7 1.9 2.2 2.5 1.4 1.6 Page 4800hof 842

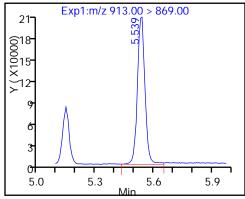




Report Date: 17-Nov-2016 13:13:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161114-36864.b\14NOV2016A\_006.d}}$ 

## 36 Perfluorooctadecanoic acid



Report Date: 14-Nov-2016 16:27:54 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_007.d

Lims ID: IC L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 14-Nov-2016 12:04:54 ALS Bottle#: 40 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:27:54 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:06:52

riisi Level Revie	wei. Ciia	nurasen	ias	Date.			14-1107-2010 10.00.32					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
1 Perfluorobuty 212.90 > 169.00	•	1.517	0.001	1.000	3907232	21.4		107	47789			
		1.517	0.001	1.000	3707232	21. <del>4</del>		107	4//07			
D 213C4 PFBA		1 [17	0.001		10475700	F2.0		10/	1470/0	0		
217.00 > 172.00		1.517	0.001		10475703	53.0		106	147363	U		
3 Perfluoropen				1 000	0504004	00.0		101				
262.90 > 219.00		1.795	-0.004	1.000	3501981	20.3		101	59357			
D 4 13C5-PFPe												
267.90 > 223.00	1.791	1.795	-0.004		8319267	52.0		104	185029	2		
5 Perfluorobuta	anesulfo	nic acid										
298.90 > 80.00	1.829	1.833	-0.004	1.000	6294518	19.3		109				
298.90 > 99.00	1.829	1.833	-0.004	1.000	2581223		2.44(0.00-0.00)	109				
7 Perfluorohex	anoic ac	id										
313.00 > 269.00	2.087	2.094	-0.007	1.000	3035352	20.8		104	78981			
D 6 13C2 PFHx	A											
315.00 > 270.00		2.094	-0.007		7739058	53.3		107	390246			
9 Perfluorohex	anesulfo	nic acid										
399.00 > 80.00			-0.028	1.000	4211405	18.5		102				
D 11 13C4-PFH <sub>I</sub>												
367.00 > 322.00		2.437	-0.005		6983820	53.1		106	449557			
			0.000		0700020	00.1		100	117007			
12 Perfluorohej 363.00 > 319.00			-0.008	1.000	2904421	20.3		102	32522			
		2.440	-0.000	1.000	2704421	20.3		102	32322			
D 10 18O2 PFH:		0.455	0.000		101/01/5	F0.0		10/	E00111			
403.00 > 84.00		2.455	-0.008		10160165	50.3		106	590111			
15 Perfluorooct												
413.00 > 369.00		2.811	-0.003	1.000	3032598	20.1		101	48976			
413.00 > 169.00		2.811	-0.003	1.000	1831110		1.66(0.90-1.10)	101	67633			
D 14 13C4 PFOA												
417.00 > 372.00	2.808	2.811	-0.003		Page 484 of 8	52.6 542		105	545390	3/2016		
									, 00			

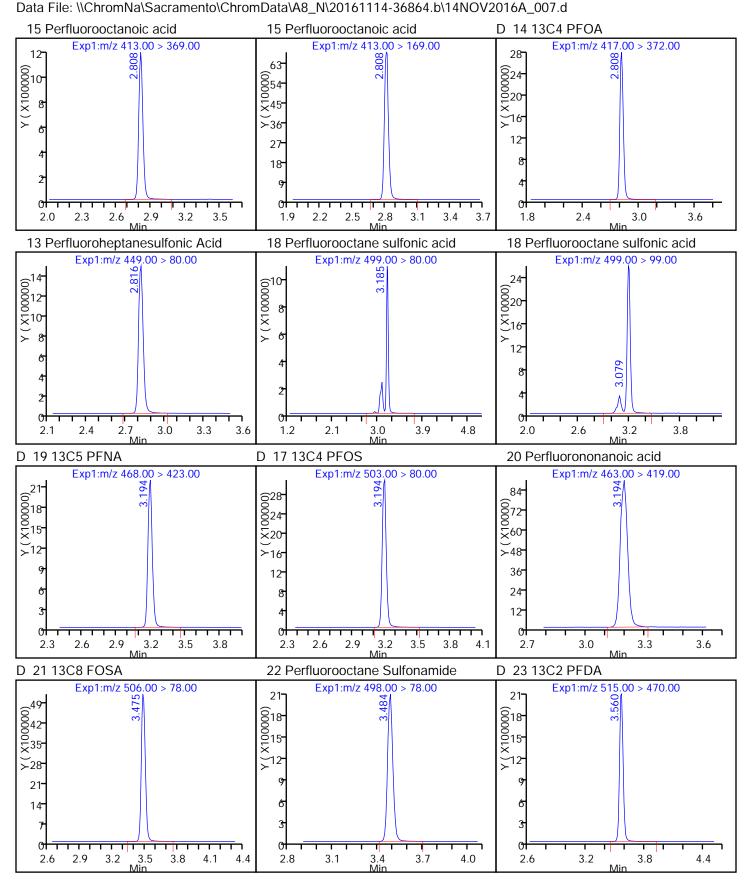
**FXP REL** DLT Amount Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.816 2.819 -0.003 1.000 3759299 20.0 105 18 Perfluorooctane sulfonic acid 18.9 7093 499.00 > 80.00 3.185 3.154 0.031 1.000 3393561 102 499.00 > 99.00 3.079 3.154 -0.075 0.967 770905 4.40(0.90-1.10) 6095 102 D 19 13C5 PFNA 468.00 > 423.00 3.194 3.197 -0.003 5673546 51.9 104 423095 D 17 13C4 PFOS 503.00 > 80.00 3.194 3.197 -0.0037878720 50.6 106 334482 20 Perfluorononanoic acid 463.00 > 419.00 3.194 3.198 -0.004 2380645 21.4 107 35836 1.000 D 21 13C8 FOSA 506.00 > 78.00 3.475 3.481 -0.006 13373430 53.3 107 513088 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.484 3.484 21.4 0.0 1.000 5169777 107 231466 D 23 13C2 PFDA 515.00 > 470.00 3.560 3.561 -0.0015223539 52.1 104 333651 24 Perfluorodecanoic acid 513.00 > 469.00 3.560 3.562 -0.002 20.0 99.9 59414 1.000 2071411 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.872 3.881 -0.009 1.000 2005394 20.0 104 D 27 13C2 PFUnA 3.900 565.00 > 520.00 3.889 -0.011 4160080 53.0 106 339403 28 Perfluoroundecanoic acid 563.00 > 519.00 3.889 3.900 -0.011 49951 1.000 1738635 20.3 102 D 30 13C2 PFDoA 615.00 > 570.00 4.186 4.195 -0.009 3967844 51.3 103 304418 29 Perfluorododecanoic acid 613.00 > 569.00 4.19320.8 16453 4.200 -0.007 1.000 1574822 104 31 Perfluorotridecanoic acid 663.00 > 619.00 4.466 70018 4.471 -0.005 1.000 1582837 21.1 106 D 32 13C2-PFTeDA 715.00 > 670.00 4.715 4.718 -0.003 8828960 51.7 103 594035 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.715 4.721 -0.0061.000 2941630 20.8 104 19812 713.00 > 169.00 4.708 4.721 -0.013 0.998 5.71(0.00-0.00) 73663 515194 104 D 34 13C2-PFHxDA 815.00 > 770.00 5.135 5.143 -0.008 4792086 50.8 102 325975 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.135 5.148 -0.013 1.000 1774997 20.3 101 5920 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.525 5.537 -0.012 1.000 1452122 17.0 85.0 4623 Reagents:

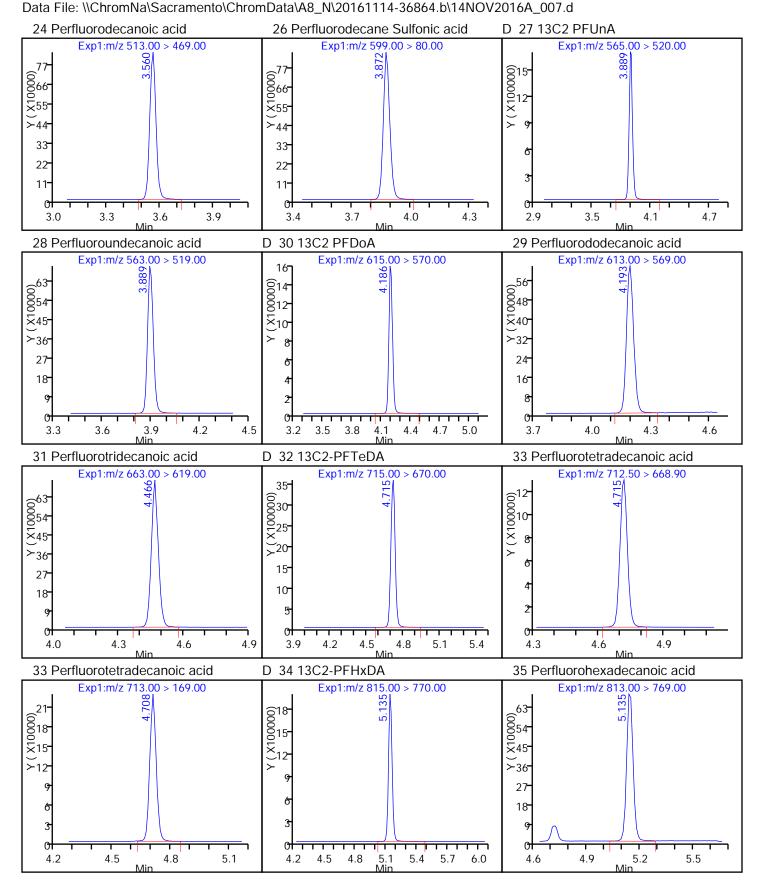
Units: mL

Amount Added: 1.00

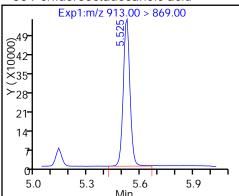
LCPFC-L4\_00022

Report Date: 14-Nov-2016 16:27:54 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: 14-Nov-2016 12:04:54 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 18 15 \tau \( \tau \) <del>-</del>24 18 12 1.7 2.0 1.0 2.2 8.0 1.1 0.4 1.6 1.4 2.0 2.3 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0012 (00030 X25 628 624 (X100000) X (X1000000) ×20 <sup>-</sup>20 ≻16<del>-</del> 15 12 1.2 1.8 2.1 2.4 2.7 1.5 2.1 2.4 1.2 1.5 2.1 1.5 1.2 1.8 1.8 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 32 14 (12 (X) X (X 787 (000001X) x ©28**-**0024**-**×20 ≻<sub>16</sub>-12 1.8 2.1 1.9 2.2 2.5 1.9 1.5 2.4 2.7 1.3 1.6 2.8 1.3 2.5 3.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 12 42 (X100000) 8 (000001 30-30-024-0020-18 12 <del>0|</del> 0 1.8 2.1 2.4 2.7 3.0 3.3 1.9 Page 486 of 842 2.8 1.9 2.2 2.5 1.5 1.6





36 Perfluorooctadecanoic acid



Report Date: 14-Nov-2016 16:27:56 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_008.d

Lims ID: IC L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 14-Nov-2016 12:12:25 ALS Bottle#: 41 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:27:56 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 15:39:44

First Level Revie	wer: cha	ndrasen	as		Date:	14-Nov-2016 15:39:44				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	yric acid									
212.90 > 169.00	1.518	1.517	0.001	1.000	7771826	50.0		100	86807	
D 213C4 PFBA		4 547	0.007		0004000	45.0		00.4	05.4000	
217.00 > 172.00		1.517	-0.007		8936233	45.2		90.4	954930	
3 Perfluoropen 262.90 > 219.00		cid 1.795	-0.004	1.000	7062509	48.1		96.1	102855	
D 4 13C5-PFPe		1.775	0.004	1.000	7002307	70.1		70.1	102000	
267.90 > 223.00		1.795	-0.004		7071703	44.2		88.5	101662	6
5 Perfluorobuta	anesulfo	nic acid								
298.90 > 80.00		1.833	-0.003	1.000	12278449	43.4		98.1		
	1.830	1.833	-0.003	1.000	5384801		2.28(0.00-0.00)	98.1		
7 Perfluorohex 313.00 > 269.00		id 2.094	-0.007	1.000	6072771	49.5		99.0	165020	
D 6 13C2 PFHx		2.074	-0.007	1.000	0072771	47.3		77.0	103020	
315.00 > 270.00		2.094	-0.007		6495105	44.7		89.5	419639	
9 Perfluorohex	anesulfo	nic acid								
399.00 > 80.00	2.367	2.399	-0.032	1.000	8438680	42.7		93.8		
D 11 13C4-PFH <sub>I</sub>										
367.00 > 322.00		2.437	-0.013		5856487	44.6		89.1	450078	
12 Perfluorohej 363.00 > 319.00		acid 2.440	-0.009	1.000	5965596	49.8		99.5	60799	
D 10 1802 PFH		2.440	-0.009	1.000	3903390	49.0		99.5	00799	
403.00 > 84.00		2.455	-0.008		8829789	43.7		92.4	513531	
15 Perfluorooct			0.000		0027707			7=	0.000.	
413.00 > 369.00		2.811	-0.012	1.000	6192971	49.8		99.6	124641	
413.00 > 169.00	2.807	2.811	-0.004	1.003	3666686		1.69(0.90-1.10)	99.6	175902	
D 14 13C4 PFO										
417.00 > 372.00	2.799	2.811	-0.012		Page 490 of 842	2 43.4		86.7	463237	3/2016

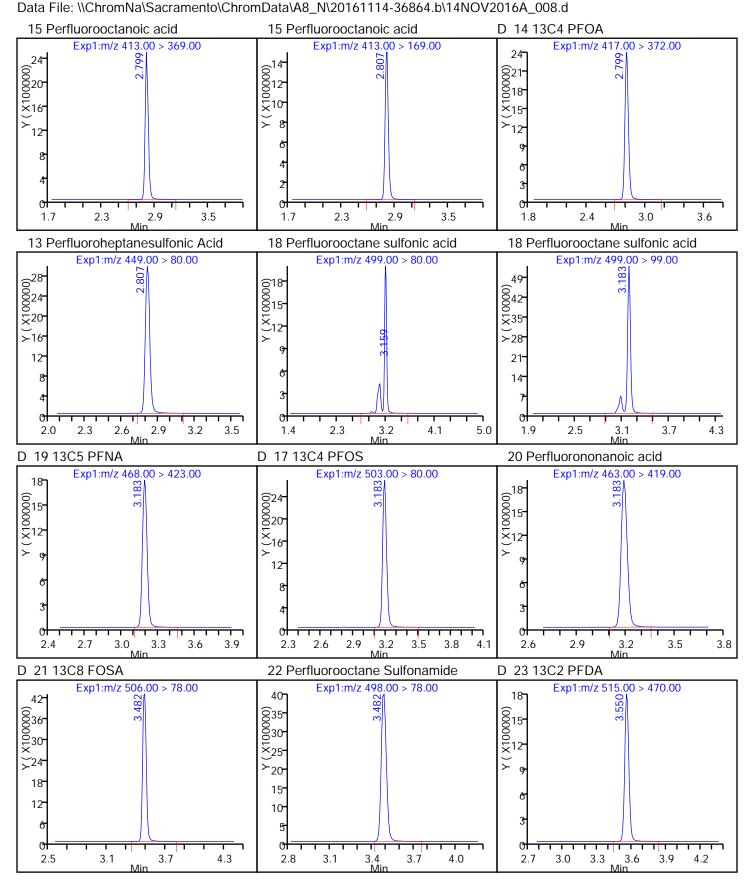
Report Date: 14-Nov-2016 16:27:56 Chrom Revision: 2.2 17-Oct-2016 09:27:18

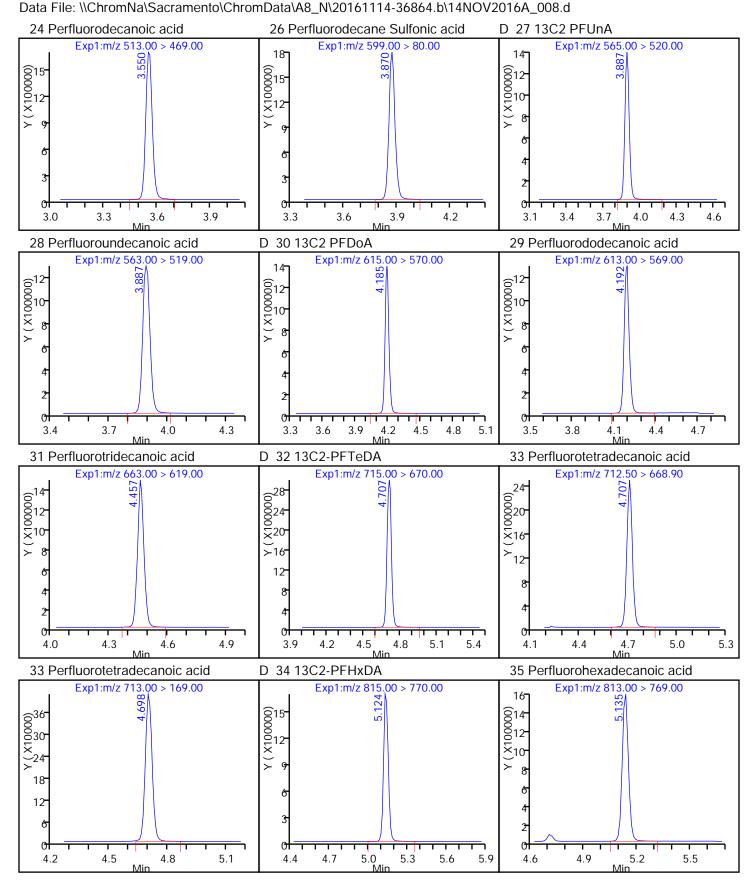
Data File:

Data File:	\\Cnr	JiiiNa\5a	acrameni	O/Chrom	Data\A8_IN\201	01114-3080	4.b\14\\OV2016A_\	JU8.U		
		EXP	DLT	REL		Amount		0.5	0.01	
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ptanesul	lfonic Ac	id							
449.00 > 80.00	2.807	2.819	-0.012	1.000	7582180	47.1		99.1		
18 Perfluorooc	tane sulf	onic acid	t							
	3.159	3.154	0.005	1.000	6812886	44.5		95.8	208650	
499.00 > 99.00	3.183	3.154	0.029	1.008	1555533		4.38(0.90-1.10)	95.8	175141	
D 19 13C5 PFN										
468.00 > 423.00	3.183	3.197	-0.014		4896384	44.8		89.5	359972	
D 17 13C4 PFO										
503.00 > 80.00	3.183	3.197	-0.014		6735234	43.3		90.5	218887	
20 Perfluorono										
463.00 > 419.00	3.183	3.198	-0.015	1.000	4898420	50.9		102	76624	
D 21 13C8 FOS										
506.00 > 78.00	3.482	3.481	0.001		11457517	45.7		91.4	611144	
22 Perfluorooc										
498.00 > 78.00	3.482	3.484	-0.002	1.000	10339396	50.1		100	280778	
D 23 13C2 PFD										
515.00 > 470.00	3.550	3.561	-0.011		4460035	44.5		89.0	194514	
24 Perfluorode										
513.00 > 469.00	3.550	3.562	-0.012	1.000	4246788	48.0		96.0	95669	
26 Perfluorode										
599.00 > 80.00	3.870	3.881	-0.011	1.000	4149841	48.5		101		
D 27 13C2 PFU	nA									
565.00 > 520.00	3.887	3.900	-0.013		3412926	43.5		87.0	270686	
28 Perfluoroun	decanoi									
563.00 > 519.00	3.887	3.900	-0.013	1.000	3374586	48.1		96.2	98248	
D 30 13C2 PFD	οΑ									
615.00 > 570.00	4.185	4.195	-0.010		3408241	44.1		88.1	228100	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.192	4.200	-0.008	1.000	3155550	48.5		97.0	42825	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.457	4.471	-0.014	1.000	3235045	50.3		101	108475	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.707	4.718	-0.011		7480844	43.8		87.7	588353	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90	4.707	4.721	-0.014	1.000	5813985	48.0		95.9	58161	
713.00 > 169.00	4.698	4.721	-0.023	0.998	985591		5.90(0.00-0.00)	95.9	133361	
D 34 13C2-PFH	xDA									
815.00 > 770.00	5.124	5.143	-0.019		4190109	44.4		88.9	273450	
35 Perfluorohe	xadecan	oic acid								
813.00 > 769.00			-0.013	1.000	3758175	50.7		101	12695	
36 Perfluorooc	tadecan	oic acid								
913.00 > 869.00		5.537	-0.021	1.000	4223490	57.6		115	15577	
Reagents:										
LCPFC-L5_0002	20		Д	mount A	dded: 1.00	Units	:: mL			

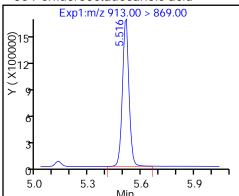
Units: mL Amount Added: 1.00 LCPFC-L5\_00020

Report Date: 14-Nov-2016 16:27:56 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: **Injection Date:** 14-Nov-2016 12:12:25 Instrument ID: A8\_N Lims ID: IC L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212,90 > 169.00 Exp1:m/z 262.90 > 219.00 510 635 600 30 030 025 824 ×25  $\stackrel{\smile}{\times}_{20}$  $\geq 20$ 15 15 12 10 10 1.7 2.0 0.9 1.1 1.4 1.2 1.5 1.8 1.4 2.0 2.3 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00()49<sup>-</sup> 00042<sup>-</sup> 628 0024 <del>∑</del>20 <del>×</del>35<del>-</del> ≻28 12 21 14 1.9 2.1 1.3 2.5 1.5 1.8 2.4 1.5 2.1 0.7 1.2 1.2 1.8 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 24 28 (24<sup>-</sup> (00020-©21<del>-</del> (0024-0000120 × )16-∑<sub>16</sub>-<u>`</u>≥15• 16 12 1.8 2.1 1.7 2.0 2.3 1.8 2.4 3.0 1.5 2.4 2.7 1.4 2.6 1.2 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 24 35 (21-000018-15-0021<del>-</del> 00030 25-∑<sub>15</sub>-<u></u>20− 12 15 10 0 01.8 2.1 2.4 2.7 3.0 1.8 3.0 1.9 2.2 2.5 1.5 2.1 2.4 2.7 Page 49% of 842 1.6





36 Perfluorooctadecanoic acid



Report Date: 14-Nov-2016 16:27:58 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_009.d

Lims ID: IC L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 14-Nov-2016 12:19:54 ALS Bottle#: 42 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:27:58 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

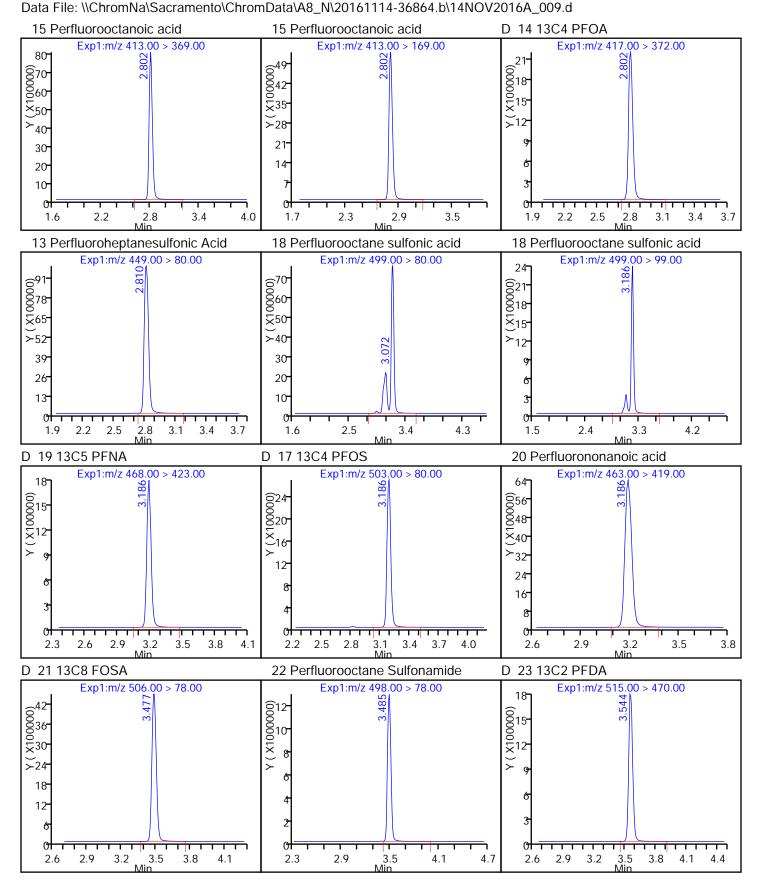
Process Host: XAWRK014

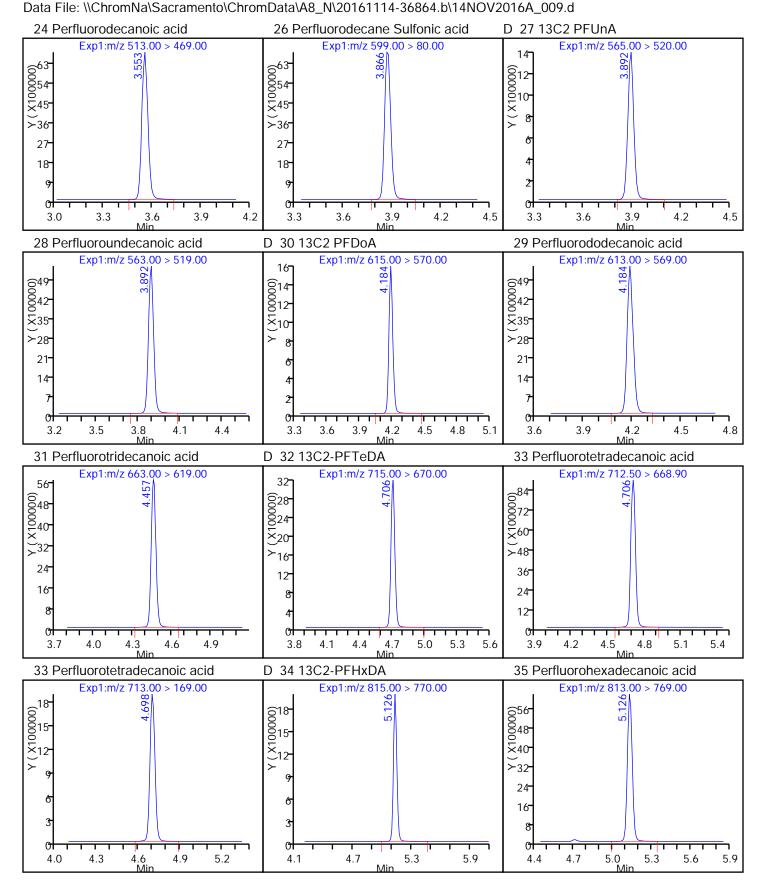
First Level Reviewer: phomsophat Date: 14-Nov-2016 15:52:37

First Level Reviewer: phomsophat					Date:	1	14-Nov-2016 15:52:37					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
1 Perfluorobuty			0.004	1 000	2051751/	172.0		0/ 5	227044			
212.90 > 169.00 D 2 13C4 PFBA		1.517	-0.004	1.000	28517516	172.9		86.5	327944			
217.00 > 172.00		1.517	-0.004		9479214	48.0		95.9	972555			
3 Perfluoropen 262.90 > 219.00		cid 1.795	-0.001	1.000	25429167	162.6		81.3	335006			
D 4 13C5-PFPe		4 705	0.004		7507040	47.4		04.0	70/440			
267.90 > 223.00 5 Perfluorobuta			-0.001		7527340	47.1		94.2	796412			
298.90 > 80.00 298.90 > 99.00	1.832 1.832	1.833 1.833	-0.001 -0.001	1.000 1.000	39816824 21172722	137.3	1.88(0.00-0.00)	77.7 77.7				
7 Perfluorohex			-0.001	1.000	21172722		1.88(0.00-0.00)	11.1				
313.00 > 269.00		2.094	-0.003	1.000	24432332	180.4		90.2	458911			
D 6 13C2 PFHx 315.00 > 270.00		2.094	-0.003		7168880	49.4		98.8	705829			
9 Perfluorohex 399.00 > 80.00		onic acid 2.399	0.050	1.000	33642968	166.2		91.3				
D 11 13C4-PFH <sub>I</sub>		2.577	0.030	1.000	33042700	100.2		71.3				
367.00 > 322.00 12 Perfluorohe		2.437	-0.013		5867935	44.7		89.3	108880	7		
363.00 > 319.00			-0.007	1.000	22836127	190.1		95.1	171572			
D 10 1802 PFHx 403.00 > 84.00		2.455	-0.006		9040925	44.7		94.6	484076			
15 Perfluorooct			-0.000		7040723	44.7		74.0	404070			
413.00 > 369.00 413.00 > 169.00		2.811 2.811	-0.009 -0.009	1.000 1.000	22813929 14561936	183.5	1.57(0.90-1.10)	91.8 91.8	423543 520096			
D 14 13C4 PFO	А		0.007		1.001700			,				
417.00 > 372.00	2.802	2.811	-0.009		Page 496 of 8	342 <sup>43.4</sup>		86.7	424440 12/08	3/2016		

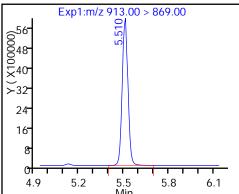
**FXP REL** DLT **Amount** Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.810 2.819 -0.009 89.9 1.000 29561540 171.2 18 Perfluorooctane sulfonic acid 172227 499.00 > 80.00 3.072 3.154 -0.0821.000 30706189 186.6 101 1.037 499.00 > 99.00 3.186 3.154 0.032 7287188 4.21(0.90-1.10) 101 1187568 D 19 13C5 PFNA 468.00 > 423.00 3.186 3.197 -0.011 4871116 44.5 89.1 435081 D 17 13C4 PFOS 503.00 > 80.00 3.186 3.197 -0.0117230705 46.4 97.1 93395 20 Perfluorononanoic acid 463.00 > 419.00 3.186 3.198 -0.012 197.5 98.7 192774 1.000 18895041 D 21 13C8 FOSA 506.00 > 78.00 3.477 3.481 -0.004 12110421 48.3 96.6 402693 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.485 3.484 0.001 1.000 37527381 171.9 86.0 1040263 D 23 13C2 PFDA 515.00 > 470.00 3.544 3.561 95.0 -0.0174758777 47.5 434125 24 Perfluorodecanoic acid 513.00 > 469.00 3.553 3.562 -0.009 192.2 96.1 271902 1.000 18150490 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.866 3.881 -0.015 1.000 18106699 196.9 102 D 27 13C2 PFUnA 565.00 > 520.00 3.892 3.900 -0.008 3497235 44.6 89.2 272305 28 Perfluoroundecanoic acid 563.00 > 519.00 3.892 195.4 3.900 -0.008 1.000 14053548 97.7 359377 D 30 13C2 PFDoA 615.00 > 570.00 4.184 4.195 -0.011 3768909 48.7 97.5 301614 29 Perfluorododecanoic acid 613.00 > 569.00 4.184194.1 167808 4.200 -0.016 1.000 13972115 97.1 31 Perfluorotridecanoic acid 663.00 > 619.00 4.457 203.6 4.471 -0.014 1.000 14492441 102 402234 D 32 13C2-PFTeDA 715.00 > 670.00 4.706 4.718 -0.012 8037332 47.1 94.2 1060901 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.706 4.721 -0.0151.000 24410873 182.1 91.0 332236 713.00 > 169.00 4.698 4.721 -0.023 0.998 4738699 5.15(0.00-0.00) 622800 91.0 D 34 13C2-PFHxDA 49.9 815.00 > 770.00 5.126 5.143 -0.017 4708207 99.9 386143 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.126 5.148 -0.022 1.000 16210200 199.1 99.6 51124 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.510 5.537 -0.027 1.000 16086225 198.3 99.2 52268 Reagents: LCPFC-L6\_00019 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2016 16:27:58 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: 14-Nov-2016 12:19:54 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L6 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 262.90 > 219.00 513 (91<del>-</del> (0078-(0 (91<del>-</del> 51 635<del>-</del> <del>∑</del>65 ×25 ≻52 **≻**52  $\geq 20$ 39 39 15 26 10 26 13 13 2.2 1.9 1.0 1.6 0.9 1.5 1.8 1.3 1.6 2.2 2.5 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0032 ©28-0024-©77<del>-</del> 0066-×55 22 11 1.9 2.2 2.5 1.5 1.8 2.1 2.4 1.0 1.3 1.6 1.2 1.3 1.6 1.9 2.2 2.5 1.0 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 88 88 28 9 077<u>-</u> ©77<u>-</u> 266 824**-**Š<sub>20</sub> ×55 ×55 \_ ≻16<del>-</del> ≻<sub>44</sub>-12 33 33 22 22 11 1.9 2.2 2.0 2.3 1.3 2.5 1.6 2.5 2.8 1.4 1.7 2.6 3.7 0.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 (0000018 (0000015 (X) 12 424 (2000) (2 030 025 ∑<sub>20</sub> ×50 ≻40-30 10 20 10 0 0 3.0 1.9 2.5 3.1 1.8 2.1 2.4 2.7 1.3 1.8 1.5 2.1 Page 49% of 842





36 Perfluorooctadecanoic acid



Report Date: 14-Nov-2016 16:28:57 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_013.d

Lims ID: IC L1 Add-on

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 14-Nov-2016 12:49:53 ALS Bottle#: 46 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:28:57 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:20:34

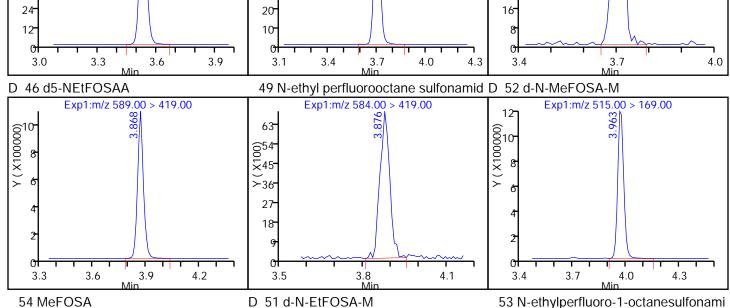
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	6									
429.00 > 409.00	2.766	2.760	0.006		2186782	41.7		87.8		
48 Sodium 1H,		•								
427.00 > 407.00			0.014		19214	0.4892		103		
43 Sodium 1H,		•			10101	0.40/0		04.0		
527.00 > 507.00		3.520	0.011	1.000	18194	0.4360		91.0		
D 42 M2-8:2FTS 529.00 > 509.00		3.520	0.011		2373160	43.5		90.8		
D 45 d3-NMeFC		3.320	0.011		23/3100	43.3		90.6		
573.00 > 419.00		3.689	0.007		2080071	47.8		95.7		
44 N-methyl perfluorooctane sulfonami										
570.00 > 419.00		3.695	0.012	1.003	17150	0.4703		94.1		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.868	3.857	0.011		2379328	48.3		96.6		
49 N-ethyl perf	luoroocta	ane sulfo	namid							
584.00 > 419.00	3.876	3.865	0.011	1.002	16888	0.4496		89.9		
D 52 d-N-MeFO										
515.00 > 169.00	3.963	3.964	-0.001		2776398	45.8		91.6		
54 MeFOSA	0.070	0.070	0.001	1 000	22222	0.4000		00.0		
512.00 > 169.00		3.972	0.001	1.000	23888	0.4939		98.8		
D 51 d-N-EtFOS 531.00 > 169.00		4.148	0.006		2505838	45.8		91.6		
					2000038	43.0		91.0		
53 N-ethylperfl 526.00 > 169.00		4.155	0.006	1.000	21666	0.4904		98.1		
020.00 / 107.00		1.100	3.000	1.000	21000	0.1704		70.1		

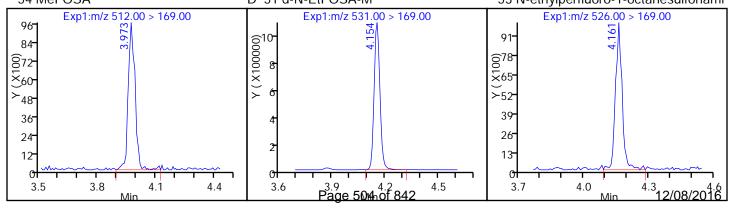
Report Date: 14-Nov-2016 16:28:57 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Reagents:

LCPFC2-L1\_00002 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2016 16:28:57 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: 14-Nov-2016 12:49:53 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L1 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00, > 507.00 77-©72-66<del>5</del> ×55 <del>∑</del>50 <del>∑</del>60 ∑44<del>-</del> **≻**48 ≻40 33 30 36 24 22 20 11 10 12 2.3 2.9 3.2 2.7 3.0 3.5 2.6 2.4 3.8 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0070<del>-</del> 56**-**<u>@</u>48 <del>×</del>40 ×60 <del>∑</del>50 ≻48 **≻**40 **≻**32 30 24 36 24 20 16 10 12 3.9 3.3 3.6 3.4 3.7 4.0 4.3 3.7 3.0 3.1 3.4





Report Date: 14-Nov-2016 16:28:57 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_013.d

Report Date: 14-Nov-2016 16:28:59 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_014.d

Lims ID: IC L2 Add-on

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 14-Nov-2016 12:57:21 ALS Bottle#: 47 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:28:58 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:21:23

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2F	TS									
429.00 > 409.		2.760	0.006		2135389	40.7		85.8		
48 Sodium 1	H,1H,2H,2	2H-perflu	orooctan	е						
427.00 > 407.	00 2.758	2.760	-0.002	1.000	36364	0.9481		100		
43 Sodium 1H,1H,2H,2H-perfluorooctane										
527.00 > 507.		3.520	0.003	1.000	37291	0.9389		98.0		
D 42 M2-8:2F		0.500			00507/0			0.4.4		
529.00 > 509.		3.520	0.003		2258760	41.4		86.4		
D 45 d3-NMe 573.00 > 419.		3.689	0.007		2049410	47.1		94.2		
					2049410	47.1		94.2		
44 N-methyl 570.00 > 419.	•	3.695	0.001	1.000	31177	0.8677		86.8		
D 46 d5-NEtF		0.070	0.001	1.000	01177	0.0077		00.0		
589.00 > 419.		3.857	0.002		2227255	45.2		90.4		
49 N-ethyl p	erfluorooct	ane sulfo	onamid							
584.00 > 419.		3.865	0.003	1.002	35264	1.00		100		
D 52 d-N-Mel	OSA-M									
515.00 > 169.	00 3.963	3.964	-0.001		2863079	47.3		94.5		
54 MeFOSA										
512.00 > 169.	00 3.973	3.972	0.001	1.000	45683	0.9160		91.6		
D 51 d-N-EtF										
531.00 > 169.		4.148			2521340	46.1		92.2		
53 N-ethylpe				1 000	20.450	0.0077		00.0		
526.00 > 169.	00 4.154	4.155	-0.001	1.000	39458	0.8877		88.8		

Report Date: 14-Nov-2016 16:28:59 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Reagents:

LCPFC2-L2\_00002 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2016 16:28:59 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_014.d **Injection Date:** 14-Nov-2016 12:57:21 Instrument ID: A8\_N Lims ID: IC L2 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane D 47 M2-6:2FTS Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 (77<del>-</del> ×55 33 22 2.3 2.9 3.2 2.9 3.4 3.7 2.6 2.3 2.6 3.2 3.1 4.0 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0070 10 666 Y (X1000) <del>∑</del>50 ≻40<del>-</del> 30 33 20 22 10 3.8 3.6 3.9 3.2 3.5 3.8 3.2 3.5 4.1 4.1 3.3 2.9 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 584.00 > 419.00 Exp1:m/z 589.00 > 419.00 14 (000001X) (0001x) × 8 (0066-X55-33 22 3.9 4.2 3.5 3.8 4.4 3.7 4.0 3.6 3.2 4.1 4.3 3.3 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 12 18 18 (X100000) 8 (000 X 12 (15) 0015 ×12 0 0 3.9 Page 508 of 842 3.9 4.2 3.6 4.5 3.7 4.0 3.6 4.3

Report Date: 14-Nov-2016 16:28:59 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_014.d

Report Date: 14-Nov-2016 16:29:00 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_015.d

Lims ID: IC L3 Add-on

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 14-Nov-2016 13:04:50 ALS Bottle#: 48 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:29:00 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:22:30

= 0					2 4.0.	•					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 47 M2-6:2FTS	;										
429.00 > 409.00	2.760	2.760	0.0		2271427	43.3		91.2			
48 Sodium 1H,											
427.00 > 407.00				1.000	162096	3.97		83.8			
43 Sodium 1H, 527.00 > 507.00		•		e 1.000	176239	4.26		88.9			
D 42 M2-8:2FTS		3.320	0.004	1.000	170237	4.20		00.7			
529.00 > 509.00		3.520	0.004		2354945	43.2		90.1			
D 45 d3-NMeFO	SAA										
573.00 > 419.00	3.689	3.689	0.0		2044718	47.0		94.0			
44 N-methyl pe											
570.00 > 419.00		3.695	0.004	1.003	154205	4.30		86.0			
D 46 d5-NEtFOS 589.00 > 419.00		3.857	0.004		2391408	48.5		97.0			
49 N-ethyl perfl					2371400	40.5		77.0			
584.00 > 419.00			-0.004	1.000	149588	3.96		79.2			
D 52 d-N-MeFO	SA-M										
515.00 > 169.00	3.965	3.964	0.001		2883849	47.6		95.2			
54 MeFOSA											
512.00 > 169.00		3.972	0.003	1.000	206706	4.11		82.3			
D 51 d-N-EtFOS 531.00 > 169.00		/ 1/Q	0.0		2612591	47.8		95.5			
53 N-ethylperflu					2012371	47.0		70.0			
526.00 > 169.00		4.155		1.000	192199	4.17		83.5			

Report Date: 14-Nov-2016 16:29:00 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Reagents:

LCPFC2-L3\_00002 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2016 16:29:00 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_015.d **Injection Date:** 14-Nov-2016 13:04:50 Instrument ID: A8\_N Lims ID: IC L3 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 56<del>-</del> 84 63 ©72 0648<del>-</del> 0648<del>-</del> 0648<del>-</del> 0648<del>-</del> 054 ×45 <del>×</del>60 ∑ >32 <del>-</del>48 **≻**36' 24 36 27 16 18 12 2.8 3.4 2.7 3.4 3.7 2.2 3.0 3.1 4.0 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0056 70<del>-</del> 648<del>-</del> 540-×60 <del>∑</del>50 <del>-</del>32 ≻48 **≻**40 30 36 16 24 20 10 12 3.8 3.2 3.5 3.8 3.5 4.1 3.5 3.8 4.1 3.2 3.2 4.1 2.9 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 861 (000001X) 91 49 0078 ×65 <u>6</u>42 ×35 <sup>-</sup>52 ≻28-39 21 26 13 3.9 4.2 3.7 4.0 4.3 3.8 4.1 3.6 4.5 3.4 3.3 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 12 (X100000) 8 77-<u>666</u> 666 ×55 ×55 **≻**44 33 33 22 22 11 11 0 0 0 4.3 12/08/201 3.9 4.2 3.7 Page 51/2hof 842 4.6 3.7 4.0 3.6

Chrom Revision: 2.2 17-Oct-2016 09:27:18

Report Date: 14-Nov-2016 16:29:02 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_016.d

Lims ID: IC L4 Add-on

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 14-Nov-2016 13:12:21 ALS Bottle#: 49 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:29:01 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:19:03

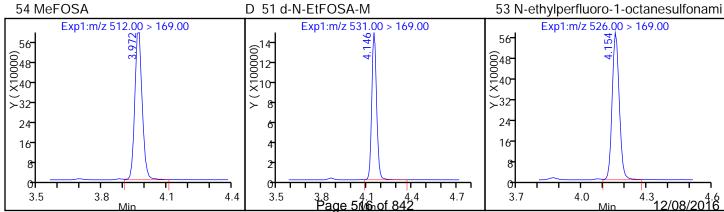
_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Ī	D 47 M2-6:2FTS	<u> </u>									
	429.00 > 409.00	2.758	2.760	-0.002		3167233	60.4		127		
	48 Sodium 1H,		•								
	427.00 > 407.00					1142424	20.1		106		
	43 Sodium 1H,		•			1000/0/	22.0		445		
	527.00 > 507.00		3.520	-0.006	0.998	1223686	22.0		115		
	O 42 M2-8:2FTS 529.00 > 509.00		3.520	0.002		3169967	58.1		121		
	027.00 > 007.00 D 45 d3-NMeFO		0.020	0.002		3107707	50.1		121		
	573.00 > 419.00		3.689	-0.003		2740100	63.0		126		
	44 N-methyl pe	rfluoroo	ctane su	lfonami							
	570.00 > 419.00	3.696	3.695	0.001	1.003	1050550	21.9		109		
	O 46 d5-NEtFOS										
	589.00 > 419.00					3009967	61.1		122		
	49 N-ethyl perfl				1 000	10/1004	20.2		110		
	584.00 > 419.00		3.865	-0.006	1.002	1061824	22.3		112		
	D 52 d-N-MeFO: 515.00 > 169.00		3.964	-0.001		3736883	61.7		123		
	54 MeFOSA	3.703	5.704	-0.001		3730003	01.7		125		
	512.00 > 169.00	3.972	3.972	0.0	1.000	1428691	21.9		110		
۱	D 51 d-N-EtFOS	A-M									
	531.00 > 169.00	4.146	4.148	-0.002		3396758	62.1		124		
	53 N-ethylperflu	uoro-1-o	ctanesu	lfonami							
	526.00 > 169.00	4.154	4.155	-0.001	1.000	1320019	22.0		110		

Report Date: 14-Nov-2016 16:29:02 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Reagents:

LCPFC2-L4\_00003 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 17-Oct-2016 09:27:18 Report Date: 14-Nov-2016 16:29:02 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_016.d **Injection Date:** 14-Nov-2016 13:12:21 Instrument ID: A8\_N Lims ID: IC L4 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 (12 (0000010 (X) X 8 42 6<sup>42</sup> 636 0036-30- $\times_{30}$ <del>-</del>24 18 18 12 2.8 2.9 3.3 3.9 2.2 2.5 3.1 3.4 2.3 2.6 3.2 3.0 3.6 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00Y (X100000) (X100000) X (X100000) 35 0030 ×25 <u></u>20 15 10 3.9 3.5 3.8 3.3 3.6 3.2 4.1 3.5 3.8 3.0 3.2 4.1 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 Exp1:m/z 515.00 > 169.0012 16 42 0014 0012 (S) 10 **36**-Y (X100 ×30 ×10 C<sub>24</sub>-18 12 3.5 3.8 4.4 3.7 4.0 3.7 4.0 3.2 4.1 3.4 4.3 4.3 3.1



Chrom Revision: 2.2 17-Oct-2016 09:27:18

Report Date: 14-Nov-2016 16:29:03 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_017.d

Lims ID: IC L5 Add-on

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 14-Nov-2016 13:19:51 ALS Bottle#: 50 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:29:03 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:23:52

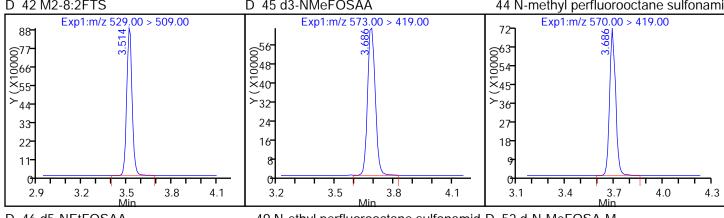
=======										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	6									
429.00 > 409.00	2.758	2.760	-0.002		2110736	40.3		84.8		
48 Sodium 1H,		•								
427.00 > 407.00					2043932	53.9		114		
43 Sodium 1H, 527.00 > 507.00		•		e 1.000	2156480	54.6		114		
D 42 M2-8:2FTS		3.320	-0.000	1.000	2130400	34.0		114		
529.00 > 509.00		3.520	-0.006		2246539	41.2		85.9		
D 45 d3-NMeFC	SAA									
573.00 > 419.00	3.686	3.689	-0.003		1736199	39.9		79.8		
44 N-methyl pe										
570.00 > 419.00		3.695	-0.009	1.000	1848003	60.7		121		
D 46 d5-NEtFOS 589.00 > 419.00		3 957	-0.007		2030246	41.2		82.4		
49 N-ethyl perf					2030240	41.2		02.4		
584.00 > 419.00		3.865	0.003	1.005	1881272	58.7		117		
D 52 d-N-MeFO	SA-M									
515.00 > 169.00	3.963	3.964	-0.001		2514383	41.5		83.0		
54 MeFOSA										
512.00 > 169.00		3.972	0.0	1.000	2557821	58.4		117		
D 51 d-N-EtFOS 531.00 > 169.00		1110	0.002		2302830	42.1		84.2		
53 N-ethylperfl					2302030	4Z. I		04.2		
526.00 > 169.00		4.155		1.000	2393631	59.0		118		
								-		

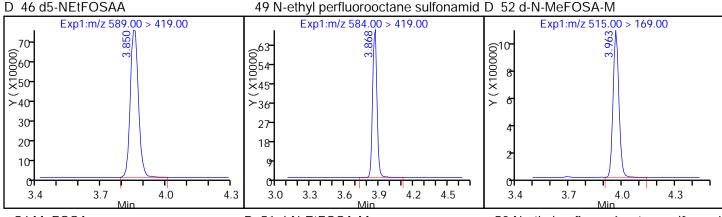
Report Date: 14-Nov-2016 16:29:03 Chrom Revision: 2.2 17-Oct-2016 09:27:18

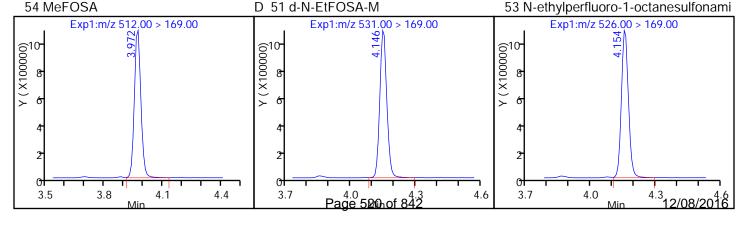
Reagents:

LCPFC2-L5\_00002 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 17-Oct-2016 09:27:18 Report Date: 14-Nov-2016 16:29:03 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_017.d **Injection Date:** 14-Nov-2016 13:19:51 Instrument ID: A8\_N Lims ID: IC L5 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 <sub>ලි</sub>70 860 860 ×50 ×<sub>50</sub> ≻<sub>40</sub> ≻<sub>40</sub>-33 30 30 22 20 20 10 11 10 2.8 3.0 3.3 3.2 3.5 2.2 2.5 3.1 3.4 2.4 3.8 D 45 d3-NMeFOSAA D 42 M2-8:2FTS 44 N-methyl perfluorooctane sulfonami Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00Exp1:m/z 570.00 > 419.0072 (56<sup>-</sup> (00048-63<sup>63</sup> 677-666-×40 ×55 ≻<sub>36</sub> ≻32 24 33 27 16 18 22 3.5 3.8 3.2 3.8 4.1 4.1 3.4 3.7 4.0 3.2







Chrom Revision: 2.2 17-Oct-2016 09:27:18

Report Date: 14-Nov-2016 16:29:05 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Lims ID: IC L6 Add-on

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 14-Nov-2016 13:27:19 ALS Bottle#: 51 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:29:05 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK014

First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:24:16

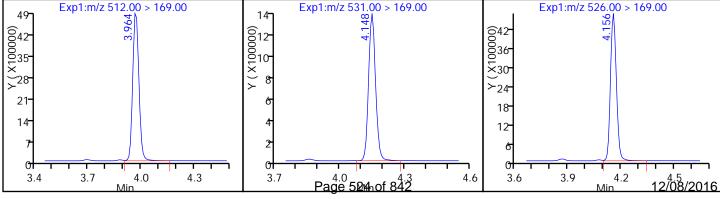
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags			
D 47 M2-6:2FT	S												
429.00 > 409.00		2.760	-0.010		3069884	58.6		123					
48 Sodium 1H		•											
427.00 > 407.00					9756112	176.9		93.3					
43 Sodium 1H 527.00 > 507.00		•		e 1.002	10344377	179.3		93.6					
D 42 M2-8:2FT		3.320	-0.005	1.002	10344377	179.3		93.0					
529.00 > 509.00		3.520	-0.013		3281047	60.1		126					
D 45 d3-NMeF0													
573.00 > 419.00		3.689	-0.011		2396215	55.1		110					
44 N-methyl pe	erfluoroo	ctane su	lfonami										
570.00 > 419.00	3.688	3.695	-0.007	1.003	8600829	204.7		102					
D 46 d5-NEtFO													
589.00 > 419.00					2746746	55.7		111					
49 N-ethyl peri 584.00 > 419.00		ane sulfo 3.865		1.002	8801345	202.9		101					
D 52 d-N-MeFC		3.003	-0.003	1.002	0001343	202.7		101					
515.00 > 169.00		3.964	0.0		3402541	56.2		112					
54 MeFOSA													
512.00 > 169.00	3.964	3.972	-0.008	1.000	11946092	201.6		101					
D 51 d-N-EtFOS	SA-M												
531.00 > 169.00	4.148	4.148	0.0		3069915	56.1		112					
53 N-ethylperfl													
526.00 > 169.00	) 4.156	4.155	0.001	1.000	10993287	203.1		102					

Report Date: 14-Nov-2016 16:29:05 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Reagents:

LCPFC2-L6\_00002 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 17-Oct-2016 09:27:18 Report Date: 14-Nov-2016 16:29:05 TestAmerica Sacramento Data File: **Injection Date:** 14-Nov-2016 13:27:19 Instrument ID: A8\_N Lims ID: IC L6 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 (0100001X) X ©35<del>-</del>  $\stackrel{\smile}{\times}_{25}$ ≻20 15<del>-</del> 15 10 10 3.0 3.3 2.8 2.9 3.2 3.5 3.8 2.4 2.2 2.5 3.1 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00507 (X100000) X (X100000) 628 624 624 684<del>-</del> <del>×</del>20 ×60 **≻**16 ≻48<del>-</del> 12 36 24 12 4.0 3.9 3.2 3.5 3.8 3.4 3.7 4.3 4.2 2.9 4.1 3.0 3.3 3.1 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M D 46 d5-NEtFOSAA Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 35 Y (X100000) (000012 X) <u>8</u>30 8<sub>25</sub> Ç<sub>20</sub> 15 10 3.6 3.9 4.2 3.4 3.7 4.0 3.8 4.1 3.3 4.3 3.1 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 14



Report Date: 14-Nov-2016 16:29:05 Chrom Revision: 2.2 17-Oct-2016 09:27:18

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

### LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A8\_N

GC Column: Acquity

ID: 2.1(mm)

Heated Purge: (Y/N) N

### Calibration Files:

	LAB SAMPLE ID:	LAB FILE ID:
1	IC 320-140382/4	02DEC2016A 004.d
2	IC 320-140382/14	02DEC2016A 014.d
3	IC 320-140382/5	02DEC2016A 005.d
4	IC 320-140382/15	02DEC2016A 015.d
5	IC 320-140382/6	02DEC2016A 006.d
6	IC 320-140382/16	02DEC2016A 016.d
7	IC 320-140382/7	02DEC2016A 007.d
8	IC 320-140382/17	02DEC2016A 017.d
9	IC 320-140382/8	02DEC2016A 008.d
10	IC 320-140382/18	02DEC2016A 018.d
11	IC 320-140382/9	02DEC2016A 009.d
12	IC 320-140382/19	02DEC2016A 019.d
13	IC 320-140382/10	02DEC2016A 010.d
14	IC 320-140382/20	02DEC2016A_020.d
	1 2 3 4 5 6 7 8 9 10 11 12 13	1 IC 320-140382/4 2 IC 320-140382/14 3 IC 320-140382/5 4 IC 320-140382/15 5 IC 320-140382/6 6 IC 320-140382/7 8 IC 320-140382/7 9 IC 320-140382/7 9 IC 320-140382/8 10 IC 320-140382/18 11 IC 320-140382/9 12 IC 320-140382/19 13 IC 320-140382/10

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3 LVL 13	LVL 4 LVL 14	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.630 1.610		1.622		1.622		1.614		1.614		1.367 - 1.867	1.619
Perfluoropentanoic acid (PFPeA)	1.944 1.910		1.916		1.926		1.916		1.916		1.670 - 2.170	1.921
Perfluorobutanesulfonic acid (PFBS)	1.983 1.949		1.964		1.964		1.954		1.945		1.781 - 2.141	1.960
Perfluorohexanoic acid (PFHxA)	2.281 2.225		2.239		2.247		2.239		2.226		1.991 - 2.491	2.243
Perfluoroheptanoic acid (PFHpA)	2.648 2.578		2.604		2.600		2.593		2.593		2.350 - 2.850	2.603
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.601		2.619 2.598		2.616		2.608		2.608		2.365 - 2.865	2.608
6:2FTS		+++++ 2.904		2.920		2.910		2.914		2.919	2.663 - 3.163	2.913
Perfluorooctanoic acid (PFOA)	+++++ 2.958		2.993 2.967		2.981		2.982		2.972		2.734 - 3.234	2.976
Perfluoroheptanesulfonic Acid (PFHpS)	3.032 2.966		2.993		2.989		2.982		2.972		2.736 - 3.236	2.989
Perfluorooctane Sulfonate (PFOS)	+++++ 3.340		3.380 3.345		3.366		3.362		3.352		3.116 - 3.616	3.358
Perfluorononanoic acid (PFNA)	3.416 3.348		3.380		3.383		3.371		3.361		3.123 - 3.623	3.377
Perfluorooctane Sulfonamide (FOSA)	3.686 3.643		3.657 ++++		3.652		3.648		3.648		3.406 - 3.906	3.656
8:2FTS		3.668 3.667		3.684		3.673		3.678		3.674	3.424 - 3.924	3.674

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3 LVL 13	LVL 4 LVL 14	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorodecanoic acid (PFDA)	3.786		3.746		3.740		3.738		3.727		3.488 - 3.988	3.743
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	3.721	3.851 3.832		3.857 3.849		3.847		3.843		3.847	3.597 - 4.097	3.847
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		4.020 4.009		4.026 4.018		4.015		4.011		4.016	3.766 - 4.266	4.016
Perfluorodecanesulfonic acid (PFDS)	4.096 4.028		4.061 4.028		4.046		4.048		4.039		3.799 - 4.299	4.049
Perfluoroundecanoic acid (PFUnA)	4.120 4.054		4.086		4.071		4.065		4.056		3.821 - 4.321	4.075
MeFOSA		4.115 4.102		4.114 4.118		4.104		4.112		4.108	3.860 - 4.360	4.110
N-EtFOSA-M		4.293 4.296		4.301 4.309		4.297		4.302		4.295	4.049 - 4.549	4.299
Perfluorododecanoic acid (PFDoA)	4.420 4.343		4.381		4.376		4.365		4.354		4.120 - 4.620	4.373
Perfluorotridecanoic Acid (PFTriA)	4.681 4.613		4.653		4.637		4.631		4.629		4.386 - 4.886	4.641
Perfluorotetradecanoic acid (PFTeA)	4.935 4.864		4.893		4.888		4.883		4.867		4.634 - 5.134	4.888
Perfluoro-n-hexadecanoic acid (PFHxDA)	5.370 5.290		5.334		5.326		5.315		5.306		5.070 - 5.570	5.324
Perfluoro-n-octadecanoic acid (PFODA)	5.784 5.688		5.738 5.682		5.726		5.717		5.702		5.470 - 5.970	5.720
13C4 PFBA	1.630		1.614 1.609		1.622		1.614		1.614		1.365 - 1.865	1.615
13C5-PFPeA	1.944		1.916		1.916		1.916		1.916		1.668 - 2.168	1.920
13C2 PFHxA	2.281		2.239		2.239		2.231		2.226		1.989 - 2.489	2.240
13C4-PFHpA	2.641		2.604		2.600		2.593		2.593		2.349 - 2.849	2.602
1802 PFHxS	2.656		2.619 2.598		2.616		2.608		2.608		2.364 - 2.864	2.614
M2-6:2FTS		2.925 2.912		2.912 2.917		2.918		2.906		2.911	2.665 - 3.165	2.914
13C4 PFOA	3.032 2.966		2.993		2.989		2.974		2.972		2.734 - 3.234	2.983
13C4 PFOS	3.416 3.340		3.371 3.345		3.366		3.362		3.352		3.115 - 3.615	3.365
13C5 PFNA	3.425		3.380		3.375		3.371		3.361		3.124 - 3.624	3.378
13C8 FOSA	3.686		3.648		3.652		3.648		3.648		3.401 - 3.901	3.653

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A8\_N

GC Column: Acquity

ID: 2.1(mm)

Heated Purge: (Y/N) N

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12	LVL 13	LVL 14								
M2-8:2FTS		3.678		3.684		3.673		3.678		3.674	3.426 - 3.926	3.676
		3.667		3.676								
13C2 PFDA	3.786		3.746		3.740		3.738		3.727		3.488 - 3.988	3.741
	3.710		+++++									
d3-NMeFOSAA		3.843		3.848		3.838		3.843		3.839	3.589 - 4.089	3.839
		3.824		3.841								
d5-NEtFOSAA		4.011		4.017		4.006		4.011		4.007	3.759 - 4.259	4.009
		4.000		4.009								
13C2 PFUnA	4.120		4.078		4.079		4.065		4.056		3.820 - 4.320	4.074
	4.045		+++++									
d-N-MeFOSA-M		4.108		4.106		4.104		4.104		4.100	3.855 - 4.355	4.105
		4.102		4.110								
d-N-EtFOSA-M		4.293		4.292		4.287		4.293		4.285	4.040 - 4.540	4.291
		4.286		4.299								
13C2 PFDoA	4.420		4.381		4.376		4.365		4.354		4.120 - 4.620	4.373
	4.343		+++++									
13C2-PFTeDA	4.935		4.893		4.880		4.883		4.867		4.632 - 5.132	4.882
	4.855		4.860						, , , , ,			
13C2-PFHxDA	5.370		5.334		5.326		5.315		5.306		5.070 - 5.570	5.320
1002 111111111	5.290		5.300		3.320		0.010		3.330		0.070 0.070	3.320

## LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

### Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-140382/4	02DEC2016A 004.d	
Level 2	IC 320-140382/14	02DEC2016A 014.d	
Level 3	IC 320-140382/5	02DEC2016A 005.d	
Level 4	IC 320-140382/15	02DEC2016A 015.d	
Level 5	IC 320-140382/6	02DEC2016A 006.d	
Level 6	IC 320-140382/16	02DEC2016A 016.d	
Level 7	IC 320-140382/7	02DEC2016A 007.d	
Level 8	IC 320-140382/17	02DEC2016A 017.d	
Level 9	IC 320-140382/8	02DEC2016A 008.d	
Level 10	IC 320-140382/18	02DEC2016A 018.d	
Level 11	IC 320-140382/9	02DEC2016A 009.d	
Level 12	IC 320-140382/19	02DEC2016A 019.d	
Level 13	IC 320-140382/10	02DEC2016A 010.d	
Level 14	IC 320-140382/20	02DEC2016A 020.d	

ANALYTE		C	CF		CURVE		COEFFICIENT	#	MIN CF	%RSD			# MIN R^2
	LVL 1 LVL 5 LVL 9 LVL 13	LVL 2 LVL 6 LVL 10 LVL 14	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TYPE	В	M1	M2			%RS	OR COD	OR COD
13C4 PFBA	315621 417432 329797 296657		338632 378720 305244		Ave		340300.229			12.7	50.	0	
13C5-PFPeA	252783 331097 252000 +++++		264694 302516 218073		Ave		270193.930			14.9	50.	0	
13C2 PFHxA	230991 294886 230866 +++++		246623 269968 205545		Ave		246479.820			12.9	50.	0	
13C4-PFHpA	202776 256831 196027 +++++		215578 228495 163352		Ave		210510.050			15.0	50.	0	
1802 PFHxS	293951 366456 304899 239385		310687 347463 254328		Ave		302452.643			15.1	50.	0	

Note: The ml coefficient is the same as Ave CF for an Ave curve type.

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE		CI	?		CURVE		COEFFICIENT	#	MIN CF	%RSD			# MIN R^2
	LVL 1 LVL 5 LVL 9 LVL 13	LVL 2 LVL 6 LVL 10 LVL 14	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TYPE -	В	M1	M2			%R	SD OR COD	OR COD
M2-6:2FTS		124739 140185 117602 164705		120558 166448 140694	Ave		139275.699			14.4	50	.0	
13C4 PFOA	223843 294113 211325 144514		246973 252700 162409		Ave		219410.943			23.8	50	.0	
13C4 PFOS	227748 298992 246737 190884		263387 280702 203865		Ave		244616.441			16.2	50	.0	
13C5 PFNA	167208 216529 165500 +++++		188629 194611 136179		Ave		178109.173			15.7	50	.0	
13C8 FOSA	366949 471533 404926 +++++		431176 451020 359915		Ave		414252.957			10.9	50	.0	
M2-8:2FTS		117628 124671 122166 166617		108840 154273 140315			133501.446			15.7	50	.0	
13C2 PFDA	151221 196057 159286 +++++		168367 182254 139218		Ave		166066.990			12.5	50	.0	
d3-NMeFOSAA		77601 82804 68846 79183		72124 99067 80331	Ave		79993.7857			12.1	50	. 0	
d5-NEtFOSAA		89291 89787 77393 89956		82682 104841 89500	Ave		89064.1286			9.5	50	.0	

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE		Cl	₹		CURVE TYPE		COEFFICIENT		#	MIN CF	%RSD	#	MAX R^2 # MIN R^2 %RSD OR COD OR COD
	LVL 1 LVL 5 LVL 9 LVL 13	LVL 2 LVL 6 LVL 10 LVL 14	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TIPE	В	M1	M2					SRSD OR COD OR COD
13C2 PFUnA	122340 154918 114588 +++++		133394 138267 91167		Ave		125779.243				17.4		50.0
d-N-MeFOSA-M		93620 107246 99342 124175		103638 117800 98551	Ave		106338.894				10.4		50.0
d-N-EtFOSA-M		86581 104104 97144 118377		100979 112224 93938	Ave		101906.806				10.6		50.0
13C2 PFDoA	108677 140992 109985 +++++		119003 126396 96377		Ave		116904.873				13.3		50.0
13C2-PFTeDA	221880 299085 231293 207930		259139 271923 202045		Ave		241899.200				14.8		50.0
13C2-PFHxDA	113226 160713 124217 120034		135127 148580 110713		Ave		130372.880				14.3		50.0

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

#### CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIEN	1T	# MIN RRF	%RSD	#	MAX	R^2	#	MIN R^2
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RSD	OR COD		OR COD
	LVL 6	LVL 2		LVL 4			В	MI	IM∠							
	-		LVL 8	_	LVL 10											
	LVL 11	LVL 12	LVL 13	LVL 14												
Perfluorobutanoic acid (PFBA)	287036		298633		387562	AveID		0.8853			10.0		35.0			
		371759		294183												
	219376		+++++													
Perfluoropentanoic acid (PFPeA)	321460		290628		336046	AveID		1.0408			15.3		35.0			
		327954		249486												
	171488		+++++													
Perfluorobutanesulfonic acid (PFBS)	481176		500216		668327	AveID		1.6135			15.6		50.0			
		642971		491581												
	291824		+++++													
Perfluorohexanoic acid (PFHxA)	235306		236370		291709	AveID		0.9559			8.0		35.0			
		274051		217418												
	166899		+++++													
Perfluoroheptanoic acid (PFHpA)	233630		216223		259601	AveID		1.0342			8.4		35.0			
<u> </u>		250282		204959												
	146715		+++++													
Perfluorohexanesulfonic acid (PFHxS)	+++++		376003		406797	AveID		1.0596			10.2		35.0			
		380131		323081												
	251770		213929													
6:2FTS		+++++		93245		AveID		0.8391			14.3		35.0			
	103949		152954		118849											
		105654		+++++												
Perfluorooctanoic acid (PFOA)	+++++		290666		312182	AveID		1.0203			12.7		35.0			
,		280154		218968												
	148950		118726													
Perfluoroheptanesulfonic Acid (PFHpS)	277206		299283		372775	AveID		1.1690			9.7		50.0			
-1		364908		279830												
	199679		+++++													
Perfluorooctane Sulfonate (PFOS)	+++++		275533		316788	AveID		1.0873			3.0		35.0			
TOTTIAGTOCCOMIC DATIONAGE (TTOE)		309544		265826	010700	111 012		12.0070			0.0		00.0			
	225419		216190													
Perfluorononanoic acid (PFNA)	170148		184877		217102	AveID		0.9912			3.7	+	35.0			
TOTTIGOTORIOTO GOTA (TIMI)	1,0110	200322	1010//	164187	21,102	1110010		3.3312			"."		55.0			
	126022	200022	+++++	101107												
Perfluorooctane Sulfonamide (FOSA)	360690		403791		474054	AveID		0.9353			12.5	+	35.0			
101114010000ano barronamiao (100m)		468609		379917	1,1001	1110010		3.3333			1		55.0			

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

#### CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIE	NT #	MIN RRF	%RSD	#	MAX	R^2		IIN R^2
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8 LVL 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10	TYPE	В	M1	M2				%RSD	OR COD	(	OR COD
8:2FTS	90169	91935 101586	146110	98719	120115	AveID		0.8444			13.7		35.0			
Perfluorodecanoic acid (PFDA)	155778 128074	183568	159778	151623	187771	AveID		0.9693			4.2		35.0			
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	57976	61790 68867		59295 71812	73940	AveID		0.8686			13.5		35.0			
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	56792	60032 70327	94072	70891	70934	AveID		0.7671			14.6		35.0			
Perfluorodecanesulfonic acid (PFDS)	138425 126426	189172	107269	162158	201706			0.6271			6.9		50.0			
Perfluoroundecanoic acid (PFUnA)	152116 89994	145410	+++++	111549	152861			1.0596			9.9		35.0			
MeFOSA	72052	74554 79073	106455	89254	96734	AveID		0.7963			13.8		35.0			
N-EtFOSA-M	73147	71070 82751	109355	78846 88734	100899	AveID		0.8497			14.4		35.0			
Perfluorododecanoic acid (PFDoA)	109058 88491	122257	109023	101710	133861	AveID		0.9465			3.6		35.0			
Perfluorotridecanoic Acid (PFTriA)	109674 92748	141902	126175	114082	147998	AveID		1.0402			5.1		50.0			
Perfluorotetradecanoic acid (PFTeA)	228612 159620	259265	237250	206027	270118	AveID		1.9323			8.3		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	267566 93727	142551	218894	113089	160135		0.8109	0.9850						0.9990		0.9900
Perfluoro-n-octadecanoic acid (PFODA)	80380 68360	72886	118037 77747	107852	105867	AveID		0.7863			19.0		50.0			

Note: The ml coefficient is the same as Ave RRF for an Ave curve type.

## LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

### Calibration Files:

LEVEL:		LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-140382/4	02DEC2016A 004.d
Level	2	IC 320-140382/14	02DEC2016A 014.d
Level	3	IC 320-140382/5	02DEC2016A 005.d
Level	4	IC 320-140382/15	02DEC2016A 015.d
Level	5	IC 320-140382/6	02DEC2016A 006.d
Level	6	IC 320-140382/16	02DEC2016A 016.d
Level	7	IC 320-140382/7	02DEC2016A 007.d
Level	8	IC 320-140382/17	02DEC2016A 017.d
Level	9	IC 320-140382/8	02DEC2016A 008.d
Level	10	IC 320-140382/18	02DEC2016A 018.d
Level	11	IC 320-140382/9	02DEC2016A 009.d
Level	12	IC 320-140382/19	02DEC2016A 019.d
Level	13	IC 320-140382/10	02DEC2016A 010.d
Level	14	IC 320-140382/20	02DEC2016A_020.d

ANALYTE	CURVE			RESPONSE			CONCENTRATION (NG/ML)					
	TYPE -	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8 LVL 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8 LVL 13	LVL 4 LVL 9 LVL 14	LVL 5 LVL 10	
13C4 PFBA	Ave	15781027 15262180	18935985	16931601 14832847	16489860	20871580	50.0	50.0	50.0	50.0	50.0	
13C5-PFPeA	Ave	12639170 10903650	15125796	13234715	12600012	16554836	50.0	50.0	50.0	50.0	50.0	
13C2 PFHxA	Ave	11549542	13498378	12331127	11543313	14744313	50.0	50.0	50.0	50.0	50.0	
13C4-PFHpA	Ave	10138817 8167611	11424765	10778897	9801352	12841573	50.0	50.0	50.0	50.0	50.0	
1802 PFHxS	Ave	13903865	16435009	14695505 11322930	14421709	17333346	47.3	47.3	47.3 47.3	47.3	47.3	
M2-6:2FTS	Ave	6658764	5925112 6682949	7906261	5726516 7823475	5586093	47.5	47.5 47.5	47.5	47.5 47.5	47.5	
13C4 PFOA	Ave	11192131 8120442	12634984	12348635 7225722	10566267	14705649	50.0	50.0	50.0	50.0	50.0	

# LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	CURVE			RESPONSE				CONCE	NTRATION (N	G/ML)	
	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
		LVL 11	LVL 12	LVL 13	LVL 14		LVL 11	LVL 12	LVL 13	LVL 14	
13C4 PFOS	Ave	10886366	13417569	12589922	11794026	14291797	47.8	47.8	47.8	47.8	47.8
		9744748		9124233			47.8		47.8		
13C5 PFNA	Ave	8360391	9730546	9431435	8274989	10826461	50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	6808930 18347473		+++++ 21558794		23576629	50.0		+++++ 50.0		50.0
13C0 FUSA	Ave	17995728	22550983	+++++	20246280	23376629	50.0	50.0	+++++	50.0	30.0
M2-8:2FTS	Ave	11993120	5634375	TTTTT	5213436		30.0	47.9	TTTTT	47.9	
		5971752	6721067	7389674	7980965	5851766	47.9	47.9	47.9	47.9	47.9
13C2 PFDA	Ave	7561029	9112679	8418346	7964307	9802839	50.0	50.0	50.0	50.0	50.0
		6960897		+++++			50.0		+++++		
d3-NMeFOSAA	Ave	4140205	3880040	4953346	3606216	3442292	50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	7		4016571 4464530		3959155 4134123			50.0 50.0		50.0	
CO-NECFOSAA	Ave	4489327	4474975	5242030	4497788	3869672	50.0	50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	6117015	6913372	6669716	5729423	7745917	50.0	50.0	50.0	50.0	50.0
		4558330		+++++			50.0		+++++		
d-N-MeFOSA-M	Ave	5362314	4681022	5889991	5181881	4967092	50.0	50.0	50.0	50.0	50.0
1 7 7 7002 7			4927555		6208758			50.0		50.0	
d-N-EtFOSA-M	Ave	5205212	4329074	5611197	5048951	4857179	50.0	50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5433841	4696896	5950161	5918873	7049582	50.0	50.0	50.0	50.0	50.0
1002 115011	1100	4818858	6319787	+++++	5499233	7013302	50.0	50.0	+++++	50.0	30.0
13C2-PFTeDA	Ave	11093975		12956938		14954236	50.0		50.0		50.0
		10102255	13596161	10396514	11564641		50.0	50.0	50.0	50.0	
13C2-PFHxDA	Ave	5661315	7428976	6756331	6210852	8035665	50.0	50.0	50.0	50.0	50.0
		5535655		6001714			50.0		50.0		

### LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento	Job No.: <u>320-23542-1</u>	Analy Batch No.: 140382
SDG No.:		
Instrument ID: A8_N	GC Column: Acquity ID: 2.1(mm)	Heated Purge: (Y/N) N
Calibration Start Date: <u>12/02/2016</u> 10:29	Calibration End Date: <u>12/02/2016</u> 12:29	Calibration ID: 26849

Curve Type Legend:
Ave = Average

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8\_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

### Calibration Files:

LEVEL:	:	LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-140382/4	02DEC2016A 004.d
Level	2	IC 320-140382/14	02DEC2016A 014.d
Level	3	IC 320-140382/5	02DEC2016A 005.d
Level	4	IC 320-140382/15	02DEC2016A 015.d
Level	5	IC 320-140382/6	02DEC2016A 006.d
Level	6	IC 320-140382/16	02DEC2016A 016.d
Level	7	IC 320-140382/7	02DEC2016A 007.d
Level	8	IC 320-140382/17	02DEC2016A 017.d
Level	9	IC 320-140382/8	02DEC2016A 008.d
Level	10	IC 320-140382/18	02DEC2016A 018.d
Level	11	IC 320-140382/9	02DEC2016A 009.d
Level	12	IC 320-140382/19	02DEC2016A 019.d
Level	13	IC 320-140382/10	02DEC2016A 010.d
Level	14	IC 320-140382/20	02DEC2016A 020.d

ANALYTE		CURVE			RESPONSE				CONCE	NTRATION (N	G/ML)	
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
			LVL 11	LVL 12	LVL 13	LVL 14		LVL 11	LVL 12	LVL 13	LVL 14	
Perfluorobutanoic acid (PFBA)		AveID	143518		298633		1937809	0.500		1.00		5.00
				7435187		14709131			20.0		50.0	
			43875101		+++++			200		+++++		
Perfluoropentanoic acid (PFPeA)		AveID	160730		290628		1680231	0.500		1.00		5.00
				6559082		12474289			20.0		50.0	
			34297516		+++++			200		+++++		
Perfluorobutanesulfonic acid (PFBS)		AveID	212680		442191		2954006	0.442		0.884		4.42
				11367724		21727893			17.7		44.2	
			51594571		+++++			177		+++++		
Perfluorohexanoic acid (PFHxA)		AveID	117653		236370		1458544	0.500		1.00		5.00
				5481010		10870881			20.0		50.0	
			33379792		+++++			200		+++++		
Perfluoroheptanoic acid (PFHpA)		AveID	116815		216223		1298003	0.500		1.00		5.00
				5005633		10247953			20.0		50.0	
			29343029		+++++			200		+++++		
Perfluorohexanesulfonic acid		AveID	++++		342163		1850926	+++++		0.910		4.55
(PFHxS)				6918390		14700167			18.2		45.5	
			45822208		77870104			182		364		
6:2FTS		AveID		+++++		88396			+++++		0.948	
			492719		2900008		5633441	4.74		19.0		47.4
				20031946		+++++			190		+++++	

### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID:  $\underline{A8}\underline{N}$  GC Column:  $\underline{Acquity}$  ID:  $\underline{2.1}$  (mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE			RESPONSE				CONCE	NTRATION (N	IG/ML)	
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
			LVL 11	LVL 12	LVL 13	LVL 14		LVL 11	LVL 12	LVL 13	LVL 14	
Perfluorooctanoic acid (PFOA)		AveID	+++++		290666		1560911	++++		1.00		5.00
			0000000	5603089	15100515	10948383			20.0		50.0	
Perfluoroheptanesulfonic Acid		AveID	29789966 131950		47490545 284917		1774408	200 0.476		400 0.952		4.76
(PFHpS)		AVEID	131330	6947857	204717	13319919	1//4400	0.470	19.0	0.552	47.6	4.70
			38018954		+++++			190		+++++		
Perfluorooctane Sulfonate (PFOS)		AveID	+++++		255695		1469896	+++++		0.928		4.64
			41007700	5745134	00040040	12334342		100	18.6	251	46.4	
Perfluorononanoic acid (PFNA)		AveID	41837729 85074		80249842 184877		1085508	186 0.500		371 1.00		5.00
Terridorononanore acid (IFNA)		AVEID	03074	4006430	104077	8209339	1003300	0.500	20.0	1.00	50.0	3.00
			25204338		+++++			200		+++++		
Perfluorooctane Sulfonamide (FOSA)		AveID	180345		403791		2370271	0.500		1.00		5.00
			54400554	9372172		18995833			20.0		50.0	
8:2FTS		AveID	51108754	44037	+++++	94573		200	0.479	+++++	0.958	
0.2113		Avein	431909	44037	2799477	94373	5753486	4.79	0.479	19.2	0.938	47.9
			101303	19463965	2,331,,	+++++	0700100	1.75	192	13.2	+++++	17.0
Perfluorodecanoic acid (PFDA)		AveID	77889		159778		938853	0.500		1.00		5.00
				3671358		7581125			20.0		50.0	
N-methyl perfluorooctane		AveID	25614867	30895	+++++	59295		200	0.500	++++	1.00	
sulfonamidoacetic acid (NMeFOSAA)		Aveid	289882	30893	1829869	39293	3696988	5.00	0.500	20.0	1.00	50.0
(,			203002	13773335	1023003	28724886	3030300	3.00	200	20.0	400	30.0
N-ethyl perfluorooctane		AveID		30016		56004			0.500		1.00	
sulfonamidoacetic acid (NEtFOSAA)			283960		1881436		3546696	5.00		20.0		50.0
Perfluorodecanesulfonic acid (PFDS)		AveID	66721	14065497	150902	28356327	972225	0.482	200	0.964	400	4.82
Perliuorodecanesulionic acid (PFDS)		Aveid	00/21	3647236	150902	7816007	9/2223	0.482	19.3	0.964	48.2	4.82
			24374906	3017230	41362935	7010007		193	13.3	386	10.2	
Perfluoroundecanoic acid (PFUnA)		AveID	76058		148792		764307	0.500		1.00		5.00
				2908196		5577456			20.0		50.0	
V 7003		7	17998762	27277	++++	72207		200	0.500	++++	1 00	
MeFOSA		AveID	360259	37277	2129108	73327	4836683	5.00	0.500	20.0	1.00	50.0
			300239	15814534	2129100	35701676	4030003	3.00	200	20.0	400	30.0
N-EtFOSA-M		AveID		35535		78846			0.500		1.00	
			365734		2187091		5044937	5.00		20.0		50.0
				16550291		35493503			200		400	

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 Analy Batch No.: 140382

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE			RESPONSE			CONCENTRATION (NG/ML)				
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
			LVL 11	LVL 12	LVL 13	LVL 14	101 10	LVL 11	LVL 12	LVL 13	LVL 14	пуп то
Perfluorododecanoic acid (PFDoA)		AveID	54529		109023		669306	0.500		1.00		5.00
			17698276	2445148	+++++	5085511		200	20.0	++++	50.0	
Perfluorotridecanoic Acid (PFTriA)		AveID	54837		126175		739992	0.500		1.00		5.00
			18549592	2838032	+++++	5704096		200	20.0	+++++	50.0	
Perfluorotetradecanoic acid (PFTeA)		AveID	114306		237250		1350591	0.500		1.00		5.00
			31923969	5185293	+++++	10301361		200	20.0	+++++	50.0	
Perfluoro-n-hexadecanoic acid		L1ID	133783		218894		800676	0.500		1.00		5.00
(PFHxDA)			10745470	2851018		5654463		200	20.0		50.0	
Perfluoro-n-octadecanoic acid		AveID	18745470 40190		++++ 118037		529337	0.500		1.00		5.00
(PFODA)		111010	10130	1457725	110057	5392609	323337	3.300	20.0	1.00	50.0	3.00
			13671969		31098706			200		400		

Curve Type Legend:

AveID = Average isotope dilution

L1ID = Linear 1/conc IsoDil

Report Date: 02-Dec-2016 14:51:29 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_004.d

Lims ID: IC L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 02-Dec-2016 10:29:38 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:29 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:37:48

First Level Revie	wer: cha	ındrasen	as		Date:	C	)2-Dec-2016 13:37:4	18		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.615	0.015		15781027	46.4		92.7	173670	9
1 Perfluorobut 212.90 > 169.00	1.630	1.617	0.013	1.000	143518	0.5136		103	1140	
D 4 13C5-PFPe 267.90 > 223.00 3 Perfluoroper	1.944	1.918	0.026		12639170	46.8		93.6	942300	
262.90 > 219.00 5 Perfluorobut	1.944	1.920	0.024	1.000	160730	0.6109		122	1551	
298.90 > 80.00	1.983 1.983	1.961 1.961	0.022 0.022	1.000 1.000	212680 94809	0.4484	2.24(0.00-0.00)	101 101		
D 6 13C2 PFHx 315.00 > 270.00	2.281	2.239	0.042		11549542	46.9		93.7	865664	
7 Perfluorohex 313.00 > 269.00	2.281	2.241	0.040	1.000	117653	0.5329		107	3266	
D 11 13C4-PFH 367.00 > 322.00 12 Perfluorohe	2.641	2.599	0.042		10138817	48.2		96.3	926585	
363.00 > 319.00 D 10 1802 PFH	2.648	2.600	0.048	1.000	116815	0.5570		111	2490	
403.00 > 84.00 9 Perfluorohex	2.656	2.614	0.042		13903865	46.0		97.2	129794	4
399.00 > 80.00 15 Perfluorooci	2.656	2.615	0.041	1.000	196748	0.6317		139		
413.00 > 369.00 413.00 > 169.00	3.032	2.984 2.984	0.048 0.048	1.000 1.000	158739 89616	0.6950	1.77(0.90-1.10)	139 139	1573 8158	
D 14 13C4 PFO. 417.00 > 372.00		2.984	0.048		11192131 Page 540 of 8	342 <sup>51.0</sup>		102	103714	) 2016

**FXP REL** DLT **Amount** Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 3.032 2.986 0.046 1.000 131950 0.4956 104 D 17 13C4 PFOS 503.00 > 80.00 3.416 3.365 0.051 10886366 44.5 93.1 481501 18 Perfluorooctane sulfonic acid 499.00 > 80.00 3.416 3.366 0.050 1.000 120361 0.4860 105 16520 499.00 > 99.00 3.425 3.366 0.059 1.003 28366 4.24(0.90-1.10) 105 2029 20 Perfluorononanoic acid 463.00 > 419.00 3.416 3.373 0.043 1.000 85074 0.5133 103 1441 D 19 13C5 PFNA 468.00 > 423.00 3.425 46.9 93.9 601596 3.374 0.051 8360391 D 21 13C8 FOSA 506.00 > 78.00 3.686 3.651 0.035 18347473 44.3 88.6 659525 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.686 3.656 0.030 1.000 180345 0.5254 105 13418 24 Perfluorodecanoic acid 513.00 > 469.00 3.786 3.738 77889 106 2050 0.048 1.000 0.5314 D 23 13C2 PFDA 515.00 > 470.00 3.786 3.738 0.048 7561029 45.5 91.1 167715 26 Perfluorodecane Sulfonic acid 4.049 599.00 > 80.00 4.096 0.047 1.000 66721 0.4671 96.9 D 27 13C2 PFUnA 565.00 > 520.00 4.120 4.070 0.050 6117015 48.6 97.3 398481 28 Perfluoroundecanoic acid 563.00 > 519.00 4.120 76058 4.071 0.049 1.000 0.5867 117 2233 D 30 13C2 PFDoA 615.00 > 570.00 4.420 4.370 0.050 5433841 46.5 93.0 245704 29 Perfluorododecanoic acid 613.00 > 569.00 4.42074.3 4.370 0.050 1.000 54529 0.5301 106 31 Perfluorotridecanoic acid 663.00 > 619.00 4.681 0.4851 97.0 4.636 0.045 1.000 54837 81.1 D 32 13C2-PFTeDA 715.00 > 670.00 4.935 599425 4.882 0.053 11093975 45.9 91.7 33 Perfluorotetradecanoic acid Μ 712.50 > 668.90 4.935 4.884 0.051 1.000 114306 0.5443 109 74.0 713.00 > 169.00 4.918 4.884 0.034 0.997 5.39(0.00-0.00) 2088 21224 109 M D 34 13C2-PFHxDA 815.00 > 770.00 5.370 129845 5.320 0.050 5661315 43.4 86.8 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.370 5.320 0.050 1.000 133783 0.4265 85.3 239 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.784 5.720 0.064 1.000 40190 0.4703 94.1 105

Report Date: 02-Dec-2016 14:51:29 Chrom Revision: 2.2 14-Nov-2016 08:15:18

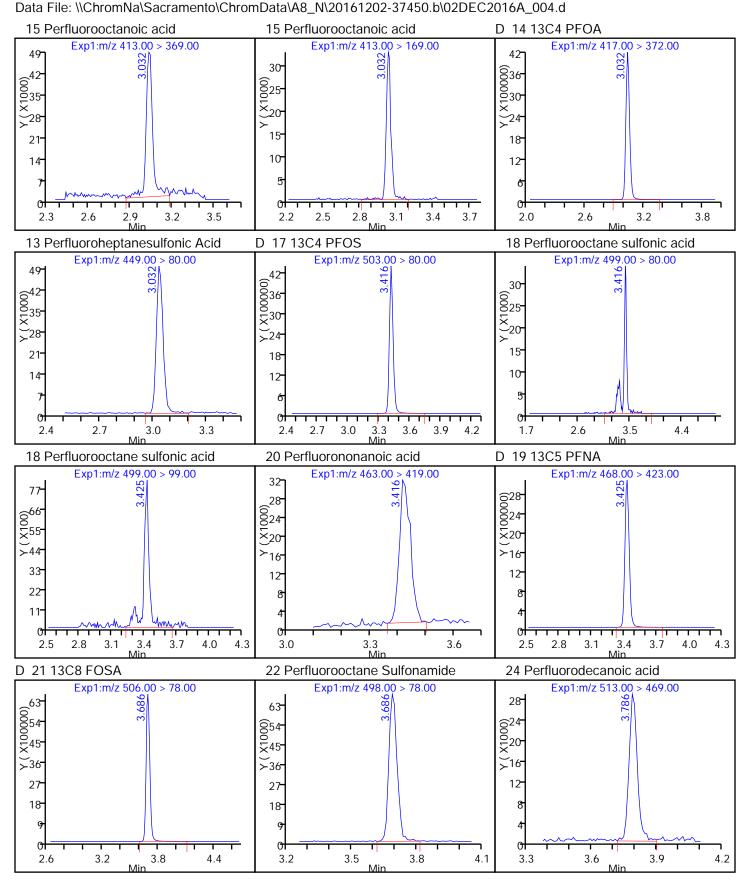
QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1\_00021 Units: mL Amount Added: 1.00

Report Date: 02-Dec-2016 14:51:29 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: 02-Dec-2016 10:29:38 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L1 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 49 642 636 642 835 X35 ×30 <u></u>28<del>-</del> ≻28 21 21 18 14 12 2.2 2.8 2.0 1.0 1.6 1.4 1.7 0.9 1.5 2.1 2.7 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00Exp1:m/z 262.90 > 219.00 64 40 84 56**-**35<del>-</del> 872-×40 ×60 ≻<sub>48</sub>-≻<sub>20</sub> 36 24 15 24 10 16 12 2.4 1.9 2.2 2.5 1.8 2.1 1.8 2.1 1.5 1.5 2.4 1.3 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 (35 (00030 (25 (35) (0000130° ×) 24° 42 636<del>-</del> ×30 ≻20 18 15 18 12 12 10 1.7 2.0 2.3 2.9 2.3 2.0 2.3 2.6 2.9 3.2 2.6 2.0 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 (00042 (00042 (35 63 42 <u>6</u>54 836 <del>-</del>45 ₹30-<del>-</del>28 **≻24 ≻**36 21 18 27 14 12 18 0 0 2.5 2.8 1.7 2.0 Page 3.2 3.5 2.2 2.5 2.8 2.2 1.9



Report Date: 02-Dec-2016 14:51:29 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_004.d 26 Perfluorodecane Sulfonic acid Exp1:m/z 515.00 > 470.00 Exp1:m/z 599.00 > 80.00 Exp1:m/z 565.00 > 520.00 28 (00001X) 16 ©21**-**∑<sub>16</sub>-12 12 3.7 4.2 3.1 3.4 4.0 4.3 3.6 3.9 4.5 3.0 3.6 4.2 4.8 29 Perfluorododecanoic acid 28 Perfluoroundecanoic acid D 30 13C2 PFDoA Exp1:m/z 563.00 > 519.00 Exp1:m/z 615.00 > 570.00 Exp1:m/z 613.00 > 569.00 28 (21-00018-15-21 ©24**-**×20-**≻**16 4.9 4.0 4.3 4.3 5.5 4.3 3.1 3.7 4.0 4.6 31 Perfluorotridecanoic acid D 32 13C2-PFTeDA 33 Perfluorotetradecanoic acid Exp1:m/z 663.00 > 619.00 Exp1:m/z 715.00 > 670.00 Exp1:m/z 712.50 > 668.90 42 21 000001 42 0018 ×15 ∑30-⊝36-**≻**24 18 18 12 12 4.7 3.9 4.5 5.1 5.7 4.8 5.1 4.5 4.4 D 34 13C2-PFHxDA 35 Perfluorohexadecanoic acid 33 Perfluorotetradecanoic acid (M) Exp1:m/z 713.00 > 169.00 Exp1:m/z 815.00 > 770.00 Exp1:m/z 813.00 > 769.0021-49 (018-0000015-12-77 (0001× )28 666 <del>∑</del>55<del>-</del> **≻**44 21 33 22

11

4.6

4.9

5.2

4.4

4.7

5.0

5.3

5.6

5.9

4.9

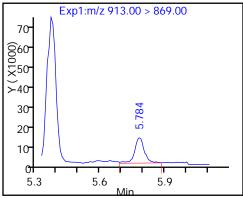
5.2

5.5

Report Date: 02-Dec-2016 14:51:29 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A\_004.d}}$ 

### 36 Perfluorooctadecanoic acid



Report Date: 02-Dec-2016 14:51:29 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_004.d

Injection Date: 02-Dec-2016 10:29:38 Instrument ID: A8\_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

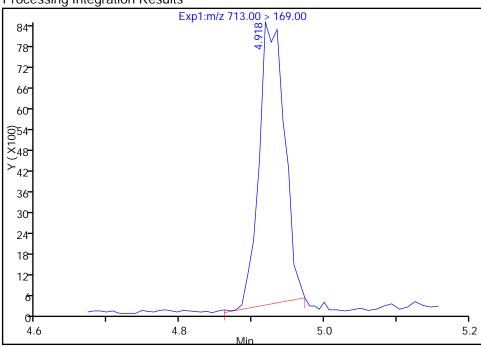
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

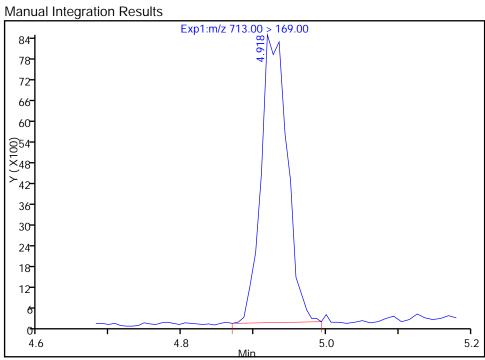
### 33 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 2

RT: 4.92 Area: 20090 Amount: 0.574454 Amount Units: ng/ml **Processing Integration Results** 



RT: 4.92 Area: 21224 Amount: 0.544327 Amount Units: ng/ml



Reviewer: chandrasenas, 02-Dec-2016 13:37:48

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 547 of 842

Report Date: 02-Dec-2016 14:51:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_005.d

Lims ID: IC L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 02-Dec-2016 10:37:07 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:31 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:38:35

First Level Revie	wer: cha	ındrasen	nas		Date:	C	02-Dec-2016 13:38:35				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 213C4 PFBA 217.00 > 172.00	1.614	1.615	-0.001		16931601	49.8		99.5	861260		
1 Perfluorobuty 212.90 > 169.00	1.622	1.617	0.005	1.000	298633	1.00		99.6	2205		
D 4 13C5-PFPe 267.90 > 223.00 3 Perfluoropen	1.916	1.918	-0.002		13234715	49.0		98.0	166880	2	
262.90 > 219.00	1.916	1.920	-0.004	1.000	290628	1.05		105	2905		
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00		1.961 1.961	0.003 -0.007	1.000 0.995	442191 183888	0.8821	2.40(0.00-0.00)	99.8 99.8			
D 6 13C2 PFHx 315.00 > 270.00	2.239	2.239	0.0		12331127	50.0		100	116024	5	
7 Perfluorohex 313.00 > 269.00	2.239	2.241	-0.002	1.000	236370	1.00		100	7007		
D 11 13C4-PFH <sub> </sub> 367.00 > 322.00	2.604	2.599	0.005		10778897	51.2		102	103373	2	
12 Perfluorohe 363.00 > 319.00	2.604	2.600	0.004	1.000	216223	0.9699		97.0	3288		
D 10 18O2 PFH: 403.00 > 84.00	2.619	2.614	0.005		14695505	48.6		103	816827		
	2.619	2.615	0.004	1.000	342163	1.04		114			
15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.993 2.993	2.984 2.984	0.009 0.009	1.000 1.000	290666 166261	1.15	1.75(0.90-1.10)	115 115	3791 12537		
D 14 13C4 PFO 417.00 > 372.00		2.984	0.009		12348635 Page 548 of 8	342 <sup>56.3</sup>		113	146408 12/08	3/2016	

Data File:

**FXP REL** DLT **Amount** Signal **RT** RT RT **RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.993 2.986 0.007 97.2 1.000 284917 0.9254 D 17 13C4 PFOS 793078 503.00 > 80.00 3.371 3.365 0.006 12589922 51.5 108 18 Perfluorooctane sulfonic acid M 499.00 > 80.00 3.380 3.366 0.014 1.000 255695 0.8928 96.2 33794 499.00 > 99.00 3.371 3.366 0.005 0.997 58595 4.36(0.90-1.10) 96.2 6167 M 20 Perfluorononanoic acid 463.00 > 419.00 3.380 3.373 0.007 1.000 184877 0.9888 98.9 3375 D 19 13C5 PFNA 468.00 > 423.00 3.380 53.0 106 1129875 3.374 0.006 9431435 D 21 13C8 FOSA 506.00 > 78.00 3.648 3.651 -0.00321558794 52.0 104 974406 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.657 3.656 0.001 1.000 403791 1.00 100 30165 24 Perfluorodecanoic acid 513.00 > 469.00 3.746 3.738 0.008 0.9790 97.9 5715 1.000 159778 D 23 13C2 PFDA 515.00 > 470.00 3.746 3.738 0.008 8418346 50.7 101 248297 26 Perfluorodecane Sulfonic acid 4.049 599.00 > 80.00 4.061 0.012 1.000 150902 0.9136 94.8 D 27 13C2 PFUnA 565.00 > 520.00 4.078 4.070 0.008 6669716 53.0 106 287118 28 Perfluoroundecanoic acid 563.00 > 519.00 4.086 105 3690 4.071 0.015 1.000 148792 1.05 D 30 13C2 PFDoA 615.00 > 570.00 4.381 4.370 0.011 5950161 50.9 102 144810 29 Perfluorododecanoic acid 613.00 > 569.00 + 4.3810.9679 130 4.370 0.011 1.000 109023 96.8 31 Perfluorotridecanoic acid 663.00 > 619.00 4.653 142 4.636 0.017 1.000 126175 1.02 102 D 32 13C2-PFTeDA 715.00 > 670.00 4.893 632063 4.882 0.011 12956938 53.6 107 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.893 4.884 0.009 1.000 237250 1.03 103 104 713.00 > 169.00 4.885 4.884 0.001 0.998 5.78(0.00-0.00) 4184 41035 103 D 34 13C2-PFHxDA 815.00 > 770.00 5.334 147007 5.320 0.014 6756331 51.8 104 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.334 5.320 0.014 1.000 218894 1.04 104 287 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.738 5.720 0.018 1.000 118037 1.26 126 233

Report Date: 02-Dec-2016 14:51:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18

QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2\_00022 Units: mL Amount Added: 1.00

Report Date: 02-Dec-2016 14:51:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_005.d **Injection Date:** 02-Dec-2016 10:37:07 Instrument ID: A8\_N Lims ID: IC L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC\_DOD ICAL Method:  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 V (X10000) (000001 (000001 (000001 (000001) 614 000042 X 35 <del>\_</del>28 21 21 14 2.0 0.9 1.2 1.5 1.8 2.1 1.1 1.4 1.7 8.0 1.4 2.0 2.6 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0012 80 18 70 × (×10000) 00015<del>-</del> ×12-660 660 ×50 ≻<sub>40</sub>-30 20 10 2.3 1.8 2.0 1.7 2.0 2.3 2.4 1.7 2.1 1.4 1.4 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 42 84 042 0036 00030<del>-</del> <del>∑</del>60  $\times$ 30 ×24 **≻**48 18 36 18 12 24 12 1.9 2.2 2.2 2.5 2.0 2.3 2.9 2.8 1.9 2.6 3.2 1.6 2.5 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 12 56 84 (000001X (X10000) 8 ©72 <del>×</del>60 <del>\_</del>32− <del>-</del>48 24 36 16<del>-</del> 24 12 0 0 2.0 Page 2.6 2.9 3.5 2.1 2.4 2.7 2.3 1.7 3.2 1.8

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_005.d 15 Perfluorooctanoic acid 15 Perfluorooctanoic acid Exp1:m/z 413.00 > 369.00 Exp1:m/z 413.00 > 169.00 Exp1:m/z 417.00 > 372.00 (000036-30-30-56<del>-</del> 84 6 6 48 ×40 ≥60 <u>~</u>24 ><sub>48</sub> 18 36 24 12 16 24 12 3.0 2.4 2.7 3.0 3.3 3.6 2.2 2.5 2.8 3.1 3.4 3.7 1.8 2.4 3.6 4.2 2.1 13 Perfluoroheptanesulfonic Acid D 17 13C4 PFOS 18 Perfluorooctane sulfonic acid Exp1:m/z 449,00 > 80.00 Exp1:m/z 503.00 > 80.00 Exp1:m/z 499.00 > 80.00 Y (X10000) 48 37, 63 042 036 054**-**√45**-** $\times_{30}$ **≻**36 ≻<sub>24</sub>-27 18 18 12 3.9 2.8 3.1 2.7 3.3 4.5 2.7 4.5 3.4 1.8 3.6 Min 20 Perfluorononanoic acid 18 Perfluorooctane sulfonic acid (M) D 19 13C5 PFNA Exp1:m/z 499.00 > 99.00 Exp1:m/z 463.00 > 419.00 Exp1:m/z 468.00 > 423.00 18 63 015 ×12 0654<del>-</del> 1545<del>-</del> ×<sub>20</sub> **≻**36 15 27 10 18 2.9 3.5 4.1 3.3 3.6 2.9 3.5 2.3 3.0 2.3 4.1 Min D 21 13C8 FOSA 22 Perfluorooctane Sulfonamide 24 Perfluorodecanoic acid Exp1:m/z 506.00 > 78.00 Exp1:m/z 498.00 > 78.00 Exp1:m/z 513.00 > 469.00 16 (070 0060 (014<sup>-</sup> 0012<sup>-</sup> 56<del>-</del> (6) 48 ×50 ∑<sub>10</sub>-×40 ≻40 ≻32 30 24 20 16 10

3.7

4.0

3.3

3.6

0

3.1

3.4

3.0

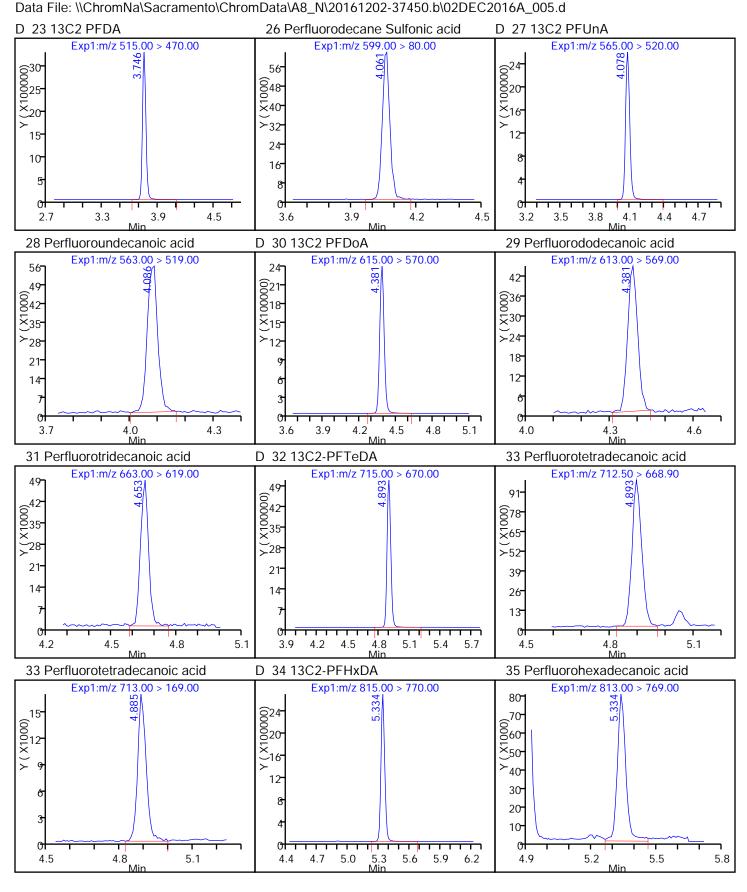
2.4

3.6 Min 4.2

4.8

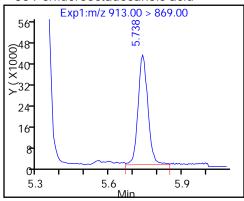
4.2

3.9



Report Date: 02-Dec-2016 14:51:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A\_005.d}}$ 



Report Date: 02-Dec-2016 14:51:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_005.d

Injection Date: 02-Dec-2016 10:37:07 Instrument ID: A8\_N

Lims ID: IC L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

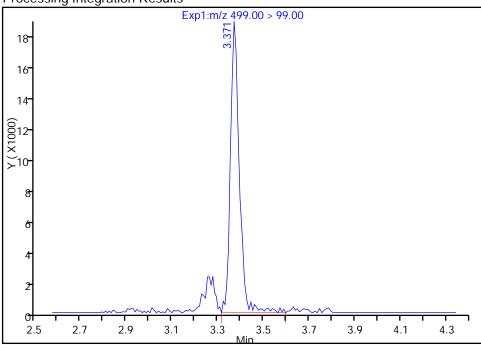
Column: Detector EXP1

### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

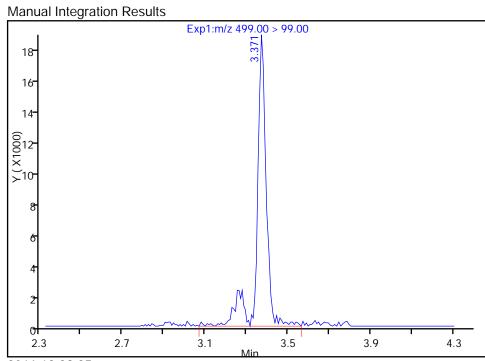
Signal: 2

RT: 3.37
Area: 50423
Amount: 0.892814
Amount Units: ng/ml

**Processing Integration Results** 



RT: 3.37
Area: 58595
Amount: 0.892814
Amount Units: ng/ml



Reviewer: chandrasenas, 02-Dec-2016 13:38:35

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 555 of 842

Report Date: 02-Dec-2016 14:51:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_006.d

Lims ID: IC L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 02-Dec-2016 10:44:37 ALS Bottle#: 39 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:32 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

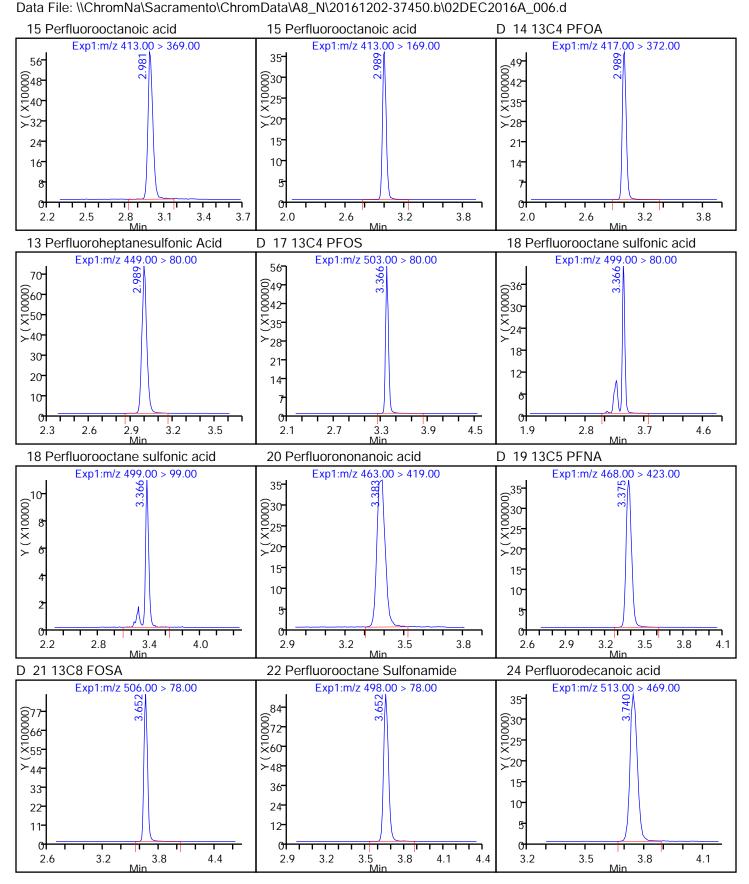
Process Host: XAWRK011

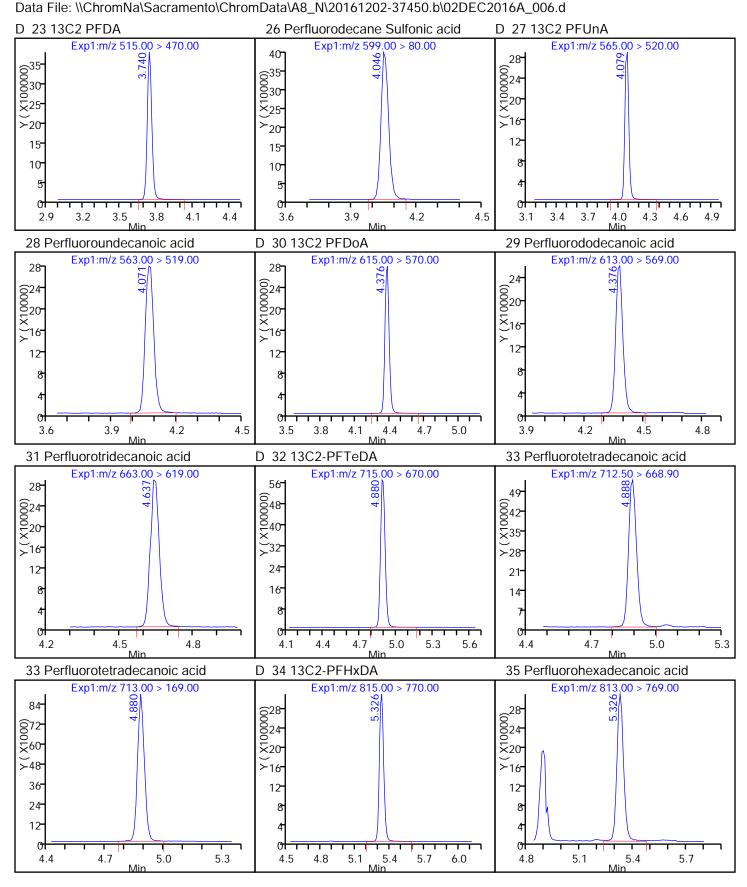
First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:38:56

First Level Revie	wer: cha	ndrasen	as		Date:	02-Dec-2016 13:38:56				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.615	0.007		20871580	61.3		123	127090	2
1 Perfluorobuty 212.90 > 169.00	yric acid	1.617	0.005	1.000	1937809	5.24		105	16704	
D 4 13C5-PFPe 267.90 > 223.00		1.918	-0.002		16554836	61.3		123	125185	7
3 Perfluoropen 262.90 > 219.00		cid 1.920	0.006	1.000	1680231	4.88		97.5	18184	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00		nic acid 1.961 1.961	0.003	1.000 0.995	2954006 1239873	5.00	2.38(0.00-0.00)	113 113		
D 6 13C2 PFHx 315.00 > 270.00	Α	2.239	-0.001	0.773	14744313	59.8	2.30(0.00 0.00)	120	182155!	5
7 Perfluorohex 313.00 > 269.00		cid 2.241	0.006	1.000	1458544	5.17		103	41938	
D 11 13C4-PFH <sub>1</sub> 367.00 > 322.00	2.600	2.599	0.001		12841573	61.0		122	826915	
12 Perfluorohe 363.00 > 319.00	2.600	acid 2.600	0.0	1.000	1298003	4.89		97.7	25441	
D 10 18O2 PFH: 403.00 > 84.00	2.616	2.614	0.002		17333346	57.3		121	108824	3
9 Perfluorohex 399.00 > 80.00	2.616	2.615	0.001	1.000	1850926	4.77		105		
15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.981	2.984 2.984	-0.003 0.005	1.000 1.003	1560911 958311	5.20	1.63(0.90-1.10)	104 104	22497 88434	
D 14 13C4 PFO		2.984	0.005		14705649 Page 556 of 8	42 <sup>67.0</sup>		134	862824 12708	3/2016

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61202-3745	0.b\02DEC2016A_(	)06.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
12 Dorfluorobo	ntanosu	Ifonic Ac	id			ı				
13 Perfluorohe 449.00 > 80.00	•	2.986	0.003	1.000	1774408	5.08		107		
D 17 13C4 PFO		2.700	0.000			0.00				
503.00 > 80.00		3.365	0.001		14291797	58.4		122	925059	
18 Perfluorooc	tane sulf	onic acid	d							
499.00 > 80.00		3.366	0.0	1.000	1469896	4.52		97.4	134789	
499.00 > 99.00	3.366	3.366	0.0	1.000	312360		4.71(0.90-1.10)	97.4	26246	
20 Perfluorono	nanoic a	ıcid								
463.00 > 419.00	3.383	3.373	0.010	1.000	1085508	5.06		101	19854	
D 19 13C5 PFN										
468.00 > 423.00	3.375	3.374	0.001		10826461	60.8		122	367418	
D 21 13C8 FOS										
506.00 > 78.00		3.651	0.001		23576629	56.9		114	722968	
22 Perfluorooc				1 000	0070074	F 0.7		407	005040	
498.00 > 78.00			-0.004	1.000	2370271	5.37		107	305013	
24 Perfluorode			0.000	1 000	020052	4.04		00.0	20225	
513.00 > 469.00		3.738	0.002	1.000	938853	4.94		98.8	39325	
D 23 13C2 PFD		2 720	0.002		000000	E0.0		110	240174	
515.00 > 470.00		3.738	0.002		9802839	59.0		118	248176	
26 Perfluorode 599.00 > 80.00			-0.003	1.000	972225	5.18		108		
D 27 13C2 PFU		4.047	-0.003	1.000	712223	5.10		100		
565.00 > 520.00		4.070	0.009		7745917	61.6		123	312996	
28 Perfluoroun			0.007		7743717	01.0		123	312770	
563.00 > 519.00		4.071	0.0	1.000	764307	4.66		93.1	21162	
D 30 13C2 PFD			0.0		, 6 , 66 ,			70		
615.00 > 570.00		4.370	0.006		7049582	60.3		121	194268	
29 Perfluorodo	decanoi									
613.00 > 569.00			0.006	1.000	669306	5.02		100	638	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00		4.636	0.001	1.000	739992	5.05		101	761	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.880	4.882	-0.002		14954236	61.8		124	563118	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90	4.888	4.884	0.004	1.000	1350591	4.96		99.1	554	
713.00 > 169.00	4.880	4.884	-0.004	0.998	220454		6.13(0.00-0.00)	99.1	17882	
D 34 13C2-PFH	xDA									
815.00 > 770.00	5.326	5.320	0.006		8035665	61.6		123	159038	
35 Perfluorohe										
813.00 > 769.00	5.326	5.320	0.006	1.000	800676	4.94		98.8	999	
36 Perfluorooc										
913.00 > 869.00	5.726	5.720	0.006	1.000	529337	4.77		95.5	857	
Reagents:										
LCPFC-L3_0001	9		P	Amount A	dded: 1.00	Units	:: mL			

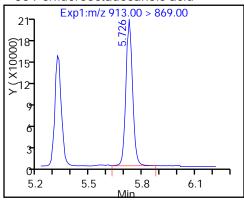
Report Date: 02-Dec-2016 14:51:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_006.d **Injection Date:** 02-Dec-2016 10:44:37 Instrument ID: A8\_N Lims ID: IC L3 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC\_DOD ICAL Method:  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 ©56 00 00 48 056 0848 656<sup>-</sup> 648<sup>-</sup>  $\stackrel{\smile}{\times}_{40}$ ×40 ≻<sub>32</sub>-≻<sub>32</sub> 24 24 16 16 1.5 1.9 0.9 1.2 1.8 2.1 1.3 1.6 2.2 0.9 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 56 63 00054 ×10000 ×15 0648<del>-</del> 0648<del>-</del> 0640-0640-<del>></del>36′ <u></u> 32 24 27 18 16 2.1 1.7 1.8 2.4 2.0 2.3 1.7 2.0 1.4 2.3 1.5 1.4 D 11 13C4-PFHpA D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 49 049 0042 0042 (049-0042-0042 0035 × ×35-×35 C<sub>28</sub> ≻28 ≻28-21 21 1.9 2.2 2.0 2.3 2.0 2.3 2.9 3.2 2.5 2.8 1.7 2.6 2.6 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 63-(000054-×45-49 56<del>-</del> 0042 X35 0048 ×40 <del>\_</del>36<del>-</del> <sup>−</sup>28 <del>-</del>32 27 21 24 18 14 16 0 0 2.4 2.7 3.0 2.0 2.3 2.6 2.9 Page 55% of 842 3.2 3.5 2.0 2.3 2.9 2.1 1.7 1.7 2.6





Report Date: 02-Dec-2016 14:51:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016A\_006.d}}$ 



Report Date: 02-Dec-2016 14:51:35 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_007.d

Lims ID: IC L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 02-Dec-2016 10:52:06 ALS Bottle#: 40 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:34 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

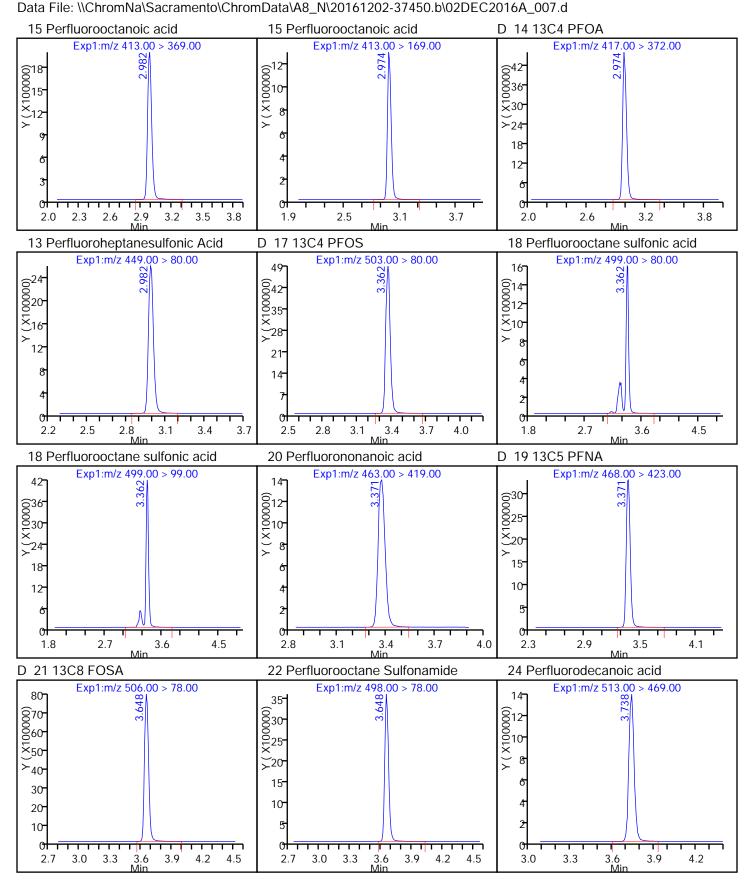
Process Host: XAWRK011

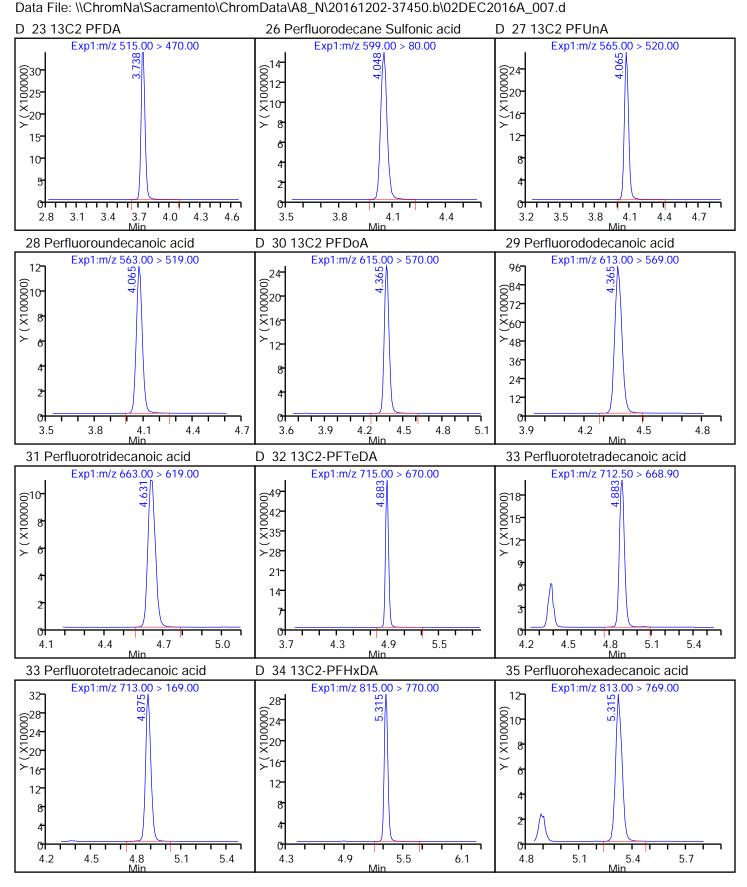
First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:36:08

First Level Revie	wer: cha	ndrasen	as		Date:	C	02-Dec-2016 13:36:08			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.615	-0.001		18935985	55.6		111	140602	1
1 Perfluorobuty 212.90 > 169.00	1.614	1.617	-0.003	1.000	7435187	22.2		111	60389	
D 4 13C5-PFPe 267.90 > 223.00 3 Perfluoropen	1.916		-0.002		15125796	56.0		112	118251	5
262.90 > 219.00	1.916	1.920	-0.004	1.000	6559082	20.8		104	50558	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.954	nic acid 1.961 1.961	-0.007 -0.007	1.000 1.000	11367724 4784706	20.3	2.38(0.00-0.00)	115 115		
D 6 13C2 PFHx 315.00 > 270.00	2.231	2.239	-0.008		13498378	54.8		110	127628	6
7 Perfluorohex 313.00 > 269.00		2.241	-0.002	1.000	5481010	21.2		106	245929	
D 11 13C4-PFH <sub>I</sub> 367.00 > 322.00		2.599	-0.006		11424765	54.3		109	435428	9
12 Perfluorohej 363.00 > 319.00	2.593	acid 2.600	-0.007	1.000	5005633	21.2		106	82737	
D 10 18O2 PFH: 403.00 > 84.00		2.614	-0.006		16435009	54.3		115	202989	0
9 Perfluorohex 399.00 > 80.00			-0.007	1.000	6918390	18.8		103		
15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.982 2.974	2.984 2.984 2.984	-0.002 -0.010	1.000 0.997	5603089 3413139	21.7	1.64(0.90-1.10)	109 109	76131 244664	
D 14 13C4 PFO 417.00 > 372.00		2.984	-0.010		12634984 Page 562 of 8	<sup>57.6</sup>		115	112943 12/08	1 3/2016

**FXP REL** DLT **Amount** Signal **RT** RT RT **RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.982 2.986 -0.004 1.000 6947857 21.2 111 D 17 13C4 PFOS 54.9 503.00 > 80.00 3.362 3.365 -0.003 115 370037 13417569 18 Perfluorooctane sulfonic acid 499.00 > 80.00 3.362 3.366 -0.004 1.000 5745134 18.8 101 258473 499.00 > 99.00 3.362 3.366 -0.004 1.000 1279643 4.49(0.90-1.10) 101 205142 20 Perfluorononanoic acid 463.00 > 419.00 3.371 3.373 -0.002 1.000 4006430 20.8 104 50680 D 19 13C5 PFNA 468.00 > 423.00 3.371 54.6 109 1069619 3.374 -0.003 9730546 D 21 13C8 FOSA 506.00 > 78.00 3.648 3.651 -0.00322550983 54.4 109 565745 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.648 3.656 22.2 -0.008 1.000 9372172 111 355431 24 Perfluorodecanoic acid 513.00 > 469.00 3.738 3.738 0.0 20.8 104 97996 1.000 3671358 D 23 13C2 PFDA 515.00 > 470.00 3.738 3.738 0.0 9112679 54.9 235961 110 26 Perfluorodecane Sulfonic acid 4.049 -0.001 599.00 > 80.00 4.048 1.000 3647236 20.7 107 D 27 13C2 PFUnA 565.00 > 520.00 4.065 4.070 -0.005 6913372 55.0 110 380701 28 Perfluoroundecanoic acid 563.00 > 519.00 4.065 19.8 99.2 75091 4.071 -0.006 1.000 2908196 D 30 13C2 PFDoA 615.00 > 570.00 4.365 4.370 -0.005 6319787 54.1 108 160074 29 Perfluorododecanoic acid 613.00 > 569.00 4.3654.370 -0.005 2507 1.000 2445148 20.4 102 31 Perfluorotridecanoic acid 663.00 > 619.00 4.631 3011 4.636 -0.005 1.000 2838032 21.6 108 D 32 13C2-PFTeDA 715.00 > 670.00 4.883 4.882 0.001 13596161 56.2 112 754431 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.883 4.884 -0.001 1.000 5185293 21.2 106 2202 713.00 > 169.00 4.875 4.884 -0.009 0.998 789160 6.57(0.00-0.00) 63701 106 D 34 13C2-PFHxDA 57.0 815.00 > 770.00 5.315 5.320 -0.005 7428976 114 148527 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.315 5.320 -0.0051.000 2851018 22.1 110 3329 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.717 5.720 -0.003 1.000 1457725 14.7 73.3 2373 Reagents: LCPFC-L4\_00022 Amount Added: 1.00 Units: mL

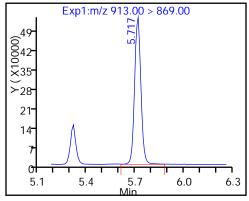
Report Date: 02-Dec-2016 14:51:35 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 10:52:06 Instrument ID: A8\_N Lims ID: IC L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56**-**24 <u>8</u>48 00 40 × **≻**32 24 24 16 16 2.2 2.8 .5 1.0 1.6 0.9 1.8 2.1 0.9 1.5 2.1 2.7 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 48 (518 (5000015 (512 (518) 024 0020 042 0036 ×30 ≻<sub>24</sub>-18 12 2.2 2.5 1.7 2.0 2.3 1.7 2.0 2.3 1.3 1.6 1.4 1.4 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 367.00 > 322.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 (000042 (000001×35 42 593 (21-000018-15-X30-<u>></u>24 ×28 21 18 12 1.9 2.2 2.1 2.7 2.1 3.3 2.5 2.8 1.5 1.8 2.4 1.5 2.7 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 21<del>-</del> 000018-15-(000001 (18-0000015-<del>\</del> 40 **≻**32 24 16 0 0 02.0 2.3 2.6 2.9 3.2 1.5 2.1 2.7 1.6 12/08/2016





Report Date: 02-Dec-2016 14:51:35 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_007.d



Report Date: 02-Dec-2016 14:51:36 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_008.d

Lims ID: IC L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 02-Dec-2016 10:59:32 ALS Bottle#: 41 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:36 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

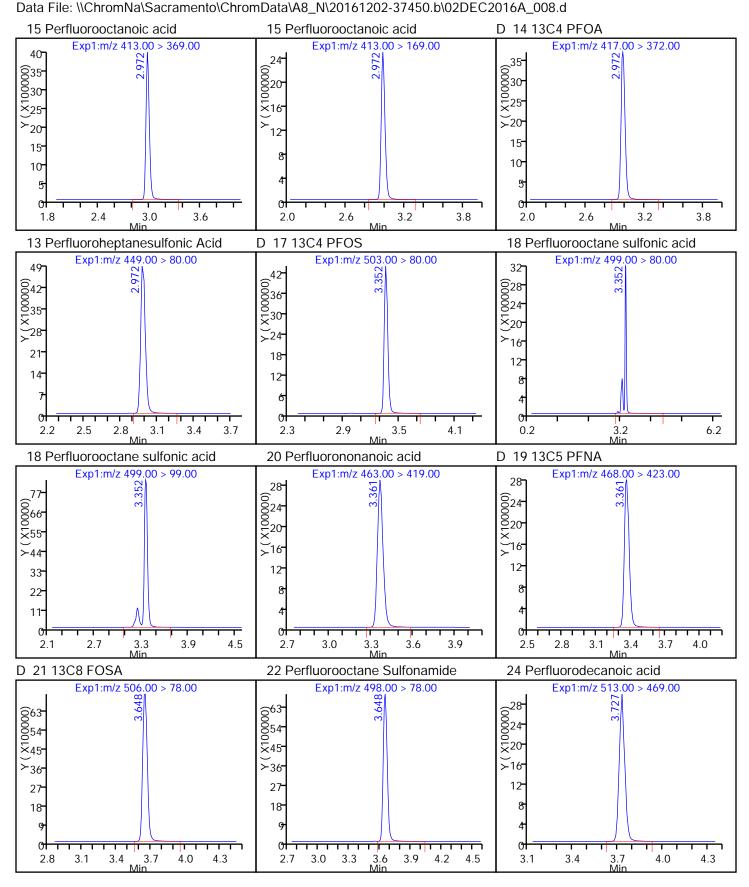
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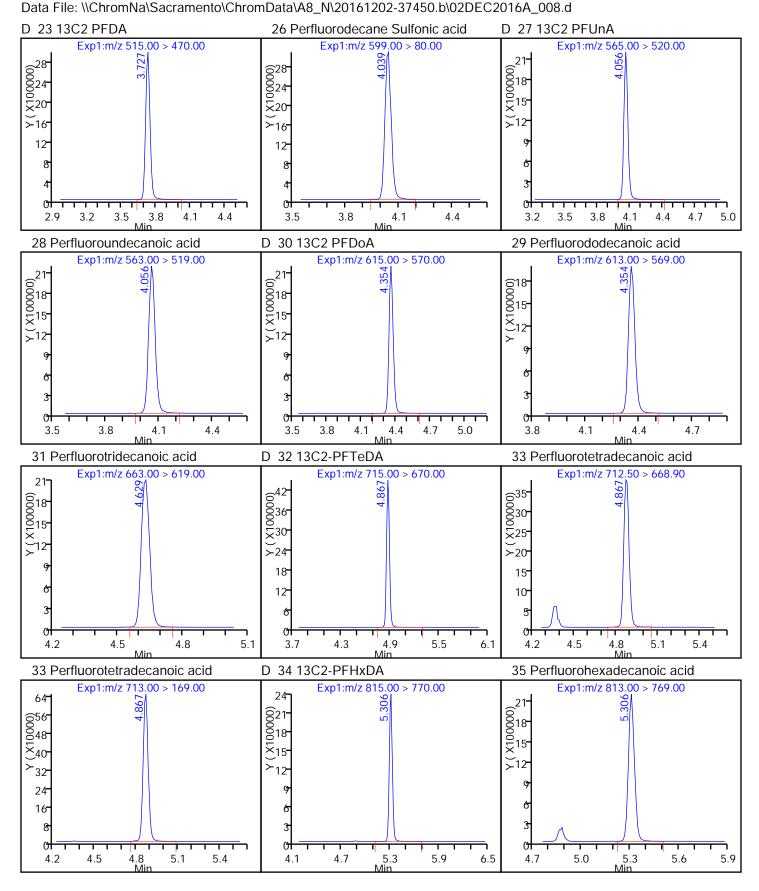
First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:39:38

First Level Revie	wer: cha	ındrasen	ias		Date:	C	02-Dec-2016 13:39:38			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.615	-0.001		16489860	48.5		96.9	163877.	2
1 Perfluorobut 212.90 > 169.00	1.614	1.617	-0.003	1.000	14709131	50.4		101	160438	
D 4 13C5-PFPe 267.90 > 223.00 3 Perfluoroper	1.916	1.918	-0.002		12600012	46.6		93.3	943576	
262.90 > 219.00 5 Perfluorobut	1.916	1.920	-0.004	1.000	12474289	47.6		95.1	93266	
298.90 > 99.00 298.90 > 99.00	1.945	1.961 1.961	-0.016 -0.016	1.000 1.000	21727893 10461832	44.2	2.08(0.00-0.00)	99.9 99.9		
D 6 13C2 PFHx 315.00 > 270.00	2.226	2.239	-0.013		11543313	46.8		93.7	142984	9
7 Perfluorohex 313.00 > 269.00	2.226	2.241	-0.015	1.000	10870881	49.3		98.5	324820	
D 11 13C4-PFH 367.00 > 322.00 12 Perfluorohe	2.593	2.599	-0.006		9801352	46.6		93.1	119443	8
363.00 > 319.00 D 10 1802 PFH	2.593	2.600	-0.007	1.000	10247953	50.6		101	131961	
403.00 > 84.00 9 Perfluorohex	2.608	2.614	-0.006		14421709	47.7		101	804399	
399.00 > 80.00 15 Perfluorooci	2.608	2.615		1.000	14700167	45.5		100		
413.00 > 369.00 413.00 > 169.00	2.972 2.972	2.984 2.984	-0.012 -0.012	1.000 1.000	10948383 6763939	50.8	1.62(0.90-1.10)	102 102	135691 350881	
D 14 13C4 PFO 417.00 > 372.00		2.984	-0.012		10566267 Page 568 of 8	42 <sup>48.2</sup>		96.3	121029 12/08	2 7/2016

**FXP REL** DLT **Amount** Signal **RT** RT RT **RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.972 2.986 -0.014 97.0 1.000 13319919 46.2 D 17 13C4 PFOS 503.00 > 80.00 3.352 3.365 -0.013 48.2 334101 11794026 101 18 Perfluorooctane sulfonic acid 499.00 > 80.00 3.352 3.366 -0.014 1.000 12334342 46.0 99.1 3198173 499.00 > 99.00 3.352 3.366 -0.014 1.000 2699806 4.57(0.90-1.10) 99.1 276987 20 Perfluorononanoic acid 463.00 > 419.00 3.361 3.373 -0.012 1.000 8209339 50.0 100 106298 D 19 13C5 PFNA 468.00 > 423.00 3.361 92.9 3.374 -0.013 8274989 46.5 464531 D 21 13C8 FOSA 506.00 > 78.00 3.648 3.651 -0.00348.9 97.7 412589 20246280 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.648 3.656 50.2 525604 -0.008 1.000 18995833 100 24 Perfluorodecanoic acid 513.00 > 469.00 3.727 3.738 -0.011 49.1 1.000 7581125 98.2 195732 D 23 13C2 PFDA 515.00 > 470.00 3.727 3.738 -0.011 7964307 48.0 95.9 183252 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 4.039 4.049 -0.010 1.000 7816007 50.5 105 D 27 13C2 PFUnA 565.00 > 520.00 4.056 4.070 -0.014 5729423 45.6 91.1 366101 28 Perfluoroundecanoic acid 563.00 > 519.00 4.056 4.071 -0.015 89442 1.000 5577456 45.9 91.9 D 30 13C2 PFDoA 615.00 > 570.00 4.354 4.370 -0.016 5499233 47.0 94.1 178583 29 Perfluorododecanoic acid 613.00 > 569.00 4.3545770 4.370 -0.016 1.000 5085511 48.8 97.7 31 Perfluorotridecanoic acid 663.00 > 619.00 4.629 49.9 99.7 5914 4.636 -0.007 1.000 5704096 D 32 13C2-PFTeDA 715.00 > 670.00 4.867 4.882 -0.015 11564641 47.8 95.6 896262 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.867 4.884 -0.017 10301361 48.5 96.9 4268 1.000 713.00 > 169.00 4.867 4.884 -0.017 6.21(0.00-0.00) 129903 1.000 1659281 96.9 D 34 13C2-PFHxDA 815.00 > 770.00 5.306 5.320 -0.014 6210852 47.6 95.3 147641 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.306 5.320 -0.014 1.000 5654463 51.4 103 6481 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.702 5.720 -0.018 1.000 5392609 62.4 125 9388 Reagents: LCPFC-L5\_00020 Amount Added: 1.00 Units: mL

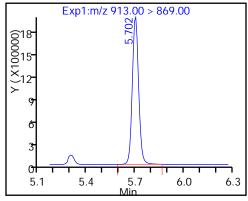
Report Date: 02-Dec-2016 14:51:36 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_008.d 02-Dec-2016 10:59:32 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 42 61 (000001 30-30-000042 X 642 636  $\times_{30}$ <u></u> ≥28-21 18 18 12 12 0.9 2.1 2.7 1.1 1.4 1.7 2.0 0.9 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0048 (42<sup>-</sup> 00036<sup>-</sup> 130<sup>-</sup> (77-0066 ×55-042 036 ×30 -44**-**33 18 18 22 12 11-1.8 2.1 2.0 2.4 1.7 2.3 1.7 2.0 2.3 2.6 1.5 1.4 1.4 D 11 13C4-PFHpA D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 35 42 635<del>-</del> 6030-836 <u>8</u>30 ≥30 × × ×24 8 25 × ×25  $\mathcal{L}_{20}$ ≻20 18 15 15 12 10 1.8 3.0 2.1 2.7 1.9 2.2 2.5 2.8 1.2 2.4 1.8 2.4 3.1 1.5 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 399.00 > 80.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 56 642 0036 ×30 635 0030 (00000) 100000 100000 ×25 <u></u>32− ≻20 **≻**24 24 18 15 16 12 0 0 0 2.0 2.3 2.6 2.9 Page 5 Mh of 84 1.9 2.2 2.5 2.8 3.1 1.7 3.2 2.0 2.6 1.4





Report Date: 02-Dec-2016 14:51:36 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_008.d



Report Date: 02-Dec-2016 14:51:38 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_009.d

Lims ID: IC L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 02-Dec-2016 11:07:02 ALS Bottle#: 42 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:37 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

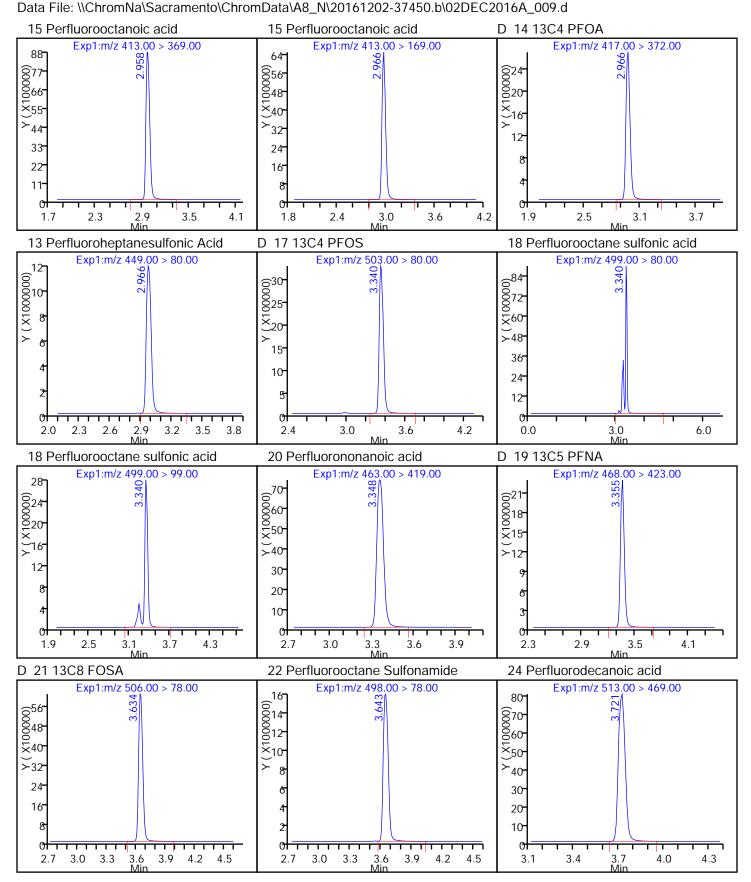
Process Host: XAWRK011

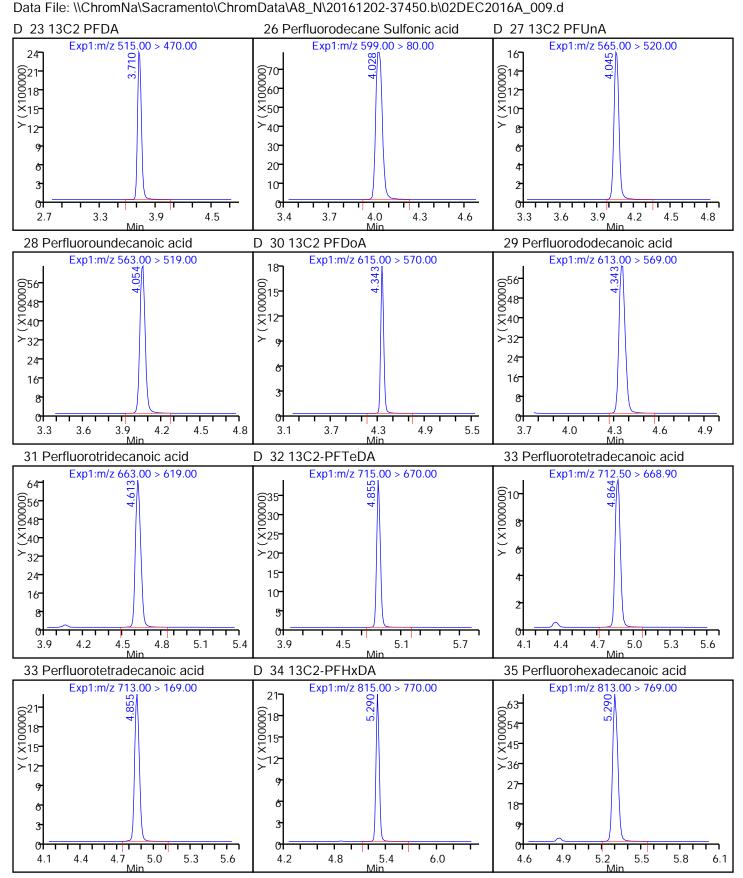
First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:41:33

	ilst read Keale	wei. cila	nurasen	as		Date.	02-Det-2010 13.41.33				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Е	2 13C4 PFBA										
2	217.00 > 172.00	1.602	1.615	-0.013		15262180	44.8		89.7	765913	
	1 Perfluorobuty	•									
2	212.90 > 169.00	1.610	1.617	-0.007	1.000	43875101	162.4		81.2	412834	
	4 13C5-PFPe										_
2	267.90 > 223.00			-0.008		10903650	40.4		80.7	136525	3
	3 Perfluoropen			0.040	1 000	0.400754.4	454.4		<b>7</b>	070050	
2	262.90 > 219.00			-0.010	1.000	34297516	151.1		75.6	270259	
,	5 Perfluorobuta			0.010	1 000	E1E04E71	105.7		71 1		
	298.90 > 80.00 298.90 > 99.00		1.961 1.961	-0.012 -0.022	1.000 0.995	51594571 28882906	125.7	1.79(0.00-0.00)	71.1 71.1		
	2		1.701	-0.022	0.773	20002700		1.77(0.00-0.00)	/ 1.1		
	315.00 > 270.00		2.239	-0.014		10277273	41.7		83.4	928195	
•	7 Perfluorohex			0.011		. 52. , 2, 5	,		55.1	,_3.,0	
3	313.00 > 269.00		2.241	-0.016	1.000	33379792	169.9		84.9	455453	
	) 11 13C4-PFH <sub>I</sub>										
	367.00 > 322.00		2.599	-0.021		8167611	38.8		77.6	101073	7
	12 Perfluorohe	otanoic a	ncid								
3	363.00 > 319.00		2.600	-0.022	1.000	29343029	173.7		86.8	246277	
	10 18O2 PFH	κS									
4	403.00 > 84.00	2.594	2.614	-0.020		12029706	39.8		84.1	822262	
	9 Perfluorohex										
(	399.00 > 80.00	2.601	2.615	-0.014	1.000	45822208	170.0		93.4		
	15 Perfluorooct										
	413.00 > 369.00		2.984	-0.026	1.000	29789966	179.8	4 40/0 00 4 45	89.9	348106	
	413.00 > 169.00		2.984	-0.018	1.003	20146226		1.48(0.90-1.10)	89.9	805973	
	14 13C4 PFO		0.001	0.046		0100110	07.0		740	0/0/60	
4	417.00 > 372.00	2.966	2.984	-0.018		Page 574 of 8	37.0 342		74.0	869612	3/2016

**FXP** DLT REL **Amount** Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.966 2.986 -0.020 1.000 38018954 159.5 83.8 D 17 13C4 PFOS 503.00 > 80.00 3.340 3.365 -0.025 39.8 9744748 83.3 81434 18 Perfluorooctane sulfonic acid 499.00 > 80.00 3.340 3.366 -0.026 1.000 41837729 188.7 102 8979223 499.00 > 99.00 3.340 3.366 -0.026 1.000 9665788 4.33(0.90-1.10) 102 925115 20 Perfluorononanoic acid 463.00 > 419.00 3.348 3.373 -0.025 1.000 25204338 186.7 93.4 245903 D 19 13C5 PFNA 468.00 > 423.00 3.355 6808930 38.2 3.374 -0.019 76.5 557624 D 21 13C8 FOSA 506.00 > 78.00 3.634 3.651 -0.017 17995728 43.4 430609 86.9 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.643 3.656 -0.013 1.000 51108754 151.8 75.9 319115 24 Perfluorodecanoic acid 513.00 > 469.00 3.721 3.738 -0.017 94.9 1.000 189.8 333805 25614867 D 23 13C2 PFDA 515.00 > 470.00 3.710 3.738 -0.028 6960897 41.9 83.8 168207 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 4.028 4.049 -0.021 1.000 24374906 190.6 98.9 D 27 13C2 PFUnA 565.00 > 520.00 4.045 4.070 -0.025 4558330 36.2 72.5 316100 28 Perfluoroundecanoic acid 563.00 > 519.00 4.054 4.071 -0.017 1.000 17998762 186.3 93.2 327205 D 30 13C2 PFDoA 615.00 > 570.00 4.343 4.370 -0.027 4818858 41.2 82.4 222562 29 Perfluorododecanoic acid 613.00 > 569.00 4.343194.0 23046 4.370 -0.027 1.000 17698276 97.0 31 Perfluorotridecanoic acid 663.00 > 619.00 4.613 33008 4.636 -0.023 1.000 18549592 185.0 92.5 D 32 13C2-PFTeDA 715.00 > 670.00 4.855 4.882 -0.027 10102255 41.8 83.5 643461 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.864 4.884 -0.020 1.000 31923969 171.4 85.7 17512 713.00 > 169.00 4.855 4.884 -0.029 0.998 5.27(0.00-0.00) 373056 6059732 85.7 D 34 13C2-PFHxDA 815.00 > 770.00 5.290 5.320 -0.030 5535655 42.5 84.9 147627 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.290 5.320 -0.030 1.000 18745470 196.6 98.3 24259 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.688 5.720 -0.032 1.000 13671969 180.4 90.2 26246 Reagents: LCPFC-L6\_00019 Amount Added: 1.00 Units: mL

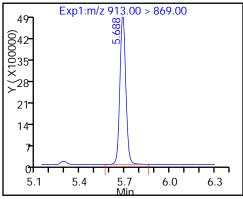
Report Date: 02-Dec-2016 14:51:38 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_009.d **Injection Date:** 02-Dec-2016 11:07:02 Instrument ID: A8\_N Lims ID: IC L6 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (X1000000) X (X1000000) 642 00036 830 <del>∑</del>30 18 18 1.9 1.9 1.0 1.6 0.7 1.0 1.3 1.6 8.0 1.4 2.0 2.6 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 (X1000000) (X1000000) (X1000000) (X1000000) Y (X1000000) X 2.1 2.0 2.3 2.6 1.5 2.7 1.8 2.1 1.4 1.7 1.2 1.8 2.4 1.2 1.5 2.4 2.7 1.1 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 Y (X1000000) (35-00030-X25-628 0024 ×20 ≻20 15 12 10 1.9 2.2 1.9 2.5 2.8 2.5 2.8 2.1 2.7 1.6 1.6 3.3 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 42 (X1000000) 8 084 0072 <u>8</u>36-<u>6</u>30 ×60 <u>~</u>24 ≻48 18 36 12 24 0 2.1 2.4 2.7 3.0 3.3 0.6 1.5 2.4 3.3 1.8





Report Date: 02-Dec-2016 14:51:38 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_009.d



Report Date: 02-Dec-2016 14:51:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_010.d

Lims ID: IC L7

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 02-Dec-2016 11:14:32 ALS Bottle#: 43 Worklist Smp#: 10

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L7\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:51:39 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:42:13

First Level Reviewer: chandrasenas			Date:			02-Dec-2016 13:42:13				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.615	-0.006		14832847	43.6		87.2	714054	
1 Perfluorobuty 212.90 > 169.00	•	1.617	0 008	1.000	69781585	265.7		66.4	349641	
D 4 13C5-PFPe		1.017	-0.000	1.000	07701303	203.7		00.4	347041	
267.90 > 223.00		1.918	-0.008		10386976	38.4		76.9	960901	
3 Perfluoropen	tanoic a	cid								
262.90 > 219.00	1.910	1.920	-0.010	1.000	50360659	232.9		58.2	296264	
5 Perfluorobuta										
298.90 > 80.00 298.90 > 99.00		1.961 1.961	0.007	1.000 0.990	41429650 44560969	107.3	0.93(0.00-0.00)	30.3 30.3		
D 6 13C2 PFHx		1.901	-0.013	0.990	44300909		0.93(0.00-0.00)	30.3		
315.00 > 270.00		2.239	-0.009		9976646	40.5		81.0	859246	
7 Perfluorohex	anoic ac	id								
313.00 > 269.00	2.230	2.241	-0.011	1.000	51025463	267.5		66.9	759942	
D 11 13C4-PFH										
367.00 > 322.00		2.599	-0.019		7479568	35.5		71.1	874763	
12 Perfluorohey 363.00 > 319.00			0.000	1.000	45250010	202.2		70.0	220002	
D 10 1802 PFH		2.600	-0.020	1.000	45359019	293.2		73.3	320883	
403.00 > 84.00		2.614	-0.016		11322930	37.4		79.1	1230464	4
9 Perfluorohex	anesulfo	nic acid								
399.00 > 80.00	2.598	2.615	-0.017	1.000	77870104	307.0		84.3		
15 Perfluorooct										
413.00 > 369.00				1.000	47490545	322.1	4.44/0.00.4.40\	80.5	2406009	
413.00 > 169.00		2.984	-0.017	1.000	33779619		1.41(0.90-1.10)	80.5	3107357	l
D 14 13C4 PFO 417.00 > 372.00		2.984	-0.026		_7225722	32.9		65.9	438119	
117.00 > 372.00	2.700	2.70-1	0.020		Page 580 of 8	342 <sup>32.7</sup>		00.7	438119 12/08	3/2016

**FXP REL** DLT **Amount** Signal **RT** RT RT **RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.967 2.986 -0.019 69.9 59371135 266.1 1.000 D 17 13C4 PFOS 503.00 > 80.00 3.345 3.365 -0.020 37.3 67315 9124233 78.0 18 Perfluorooctane sulfonic acid 499.00 > 80.00 3.345 3.366 -0.021 1.000 80249842 386.6 104 13058140 499.00 > 99.00 3.345 3.366 -0.021 1.000 19443677 4.13(0.90-1.10) 104 690162 20 Perfluorononanoic acid 463.00 > 419.00 3.353 3.373 -0.020 1.000 41884345 335.5 83.9 392400 D 19 13C5 PFNA 468.00 > 423.00 3.353 35.4 70.7 371230 3.374 -0.021 6297115 D 21 13C8 FOSA 506.00 > 78.00 3.642 3.651 -0.00944.4 88.88 592069 18384094 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.660 3.656 0.004 1.000 73164187 212.7 53.2 145203 24 Perfluorodecanoic acid 513.00 > 469.00 3.709 3.738 -0.029 1.000 42979124 313.4 78.4 353734 D 23 13C2 PFDA 515.00 > 470.00 3.720 3.738 -0.018 7073000 42.6 85.2 160460 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 4.028 4.049 -0.021 1.000 41362935 345.5 89.6 D 27 13C2 PFUnA 565.00 > 520.00 4.045 4.070 -0.025 4373854 34.8 69.5 211760 28 Perfluoroundecanoic acid 563.00 > 519.00 4.045 4.071 -0.026 1.000 31200994 336.6 84.2 378305 D 30 13C2 PFDoA 615.00 > 570.00 4.353 4.370 -0.017 5148784 44.0 88.1 149077 29 Perfluorododecanoic acid 613.00 > 569.00 4.353 44886 4.370 -0.017 1.000 32927149 337.8 84.5 31 Perfluorotridecanoic acid M 663.00 > 619.00 4.610 59163 4.636 -0.026 1.000 34277350 320.0 0.08 M D 32 13C2-PFTeDA 969333 715.00 > 670.00 4.860 4.882 -0.02210396514 43.0 86.0 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.860 4.884 -0.0241.000 50372831 253.2 63.3 26628 713.00 > 169.00 4.851 4.884 -0.033 0.998 4.05(0.00-0.00) 473842 12426058 63.3 D 34 13C2-PFHxDA 815.00 > 770.00 5.300 5.320 -0.020 6001714 46.0 92.1 121116 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.300 5.320 -0.020 1.000 35113710 345.4 86.3 34228 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.682 5.720 -0.038 1.000 31098706 384.1 96.0 54097

Report Date: 02-Dec-2016 14:51:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

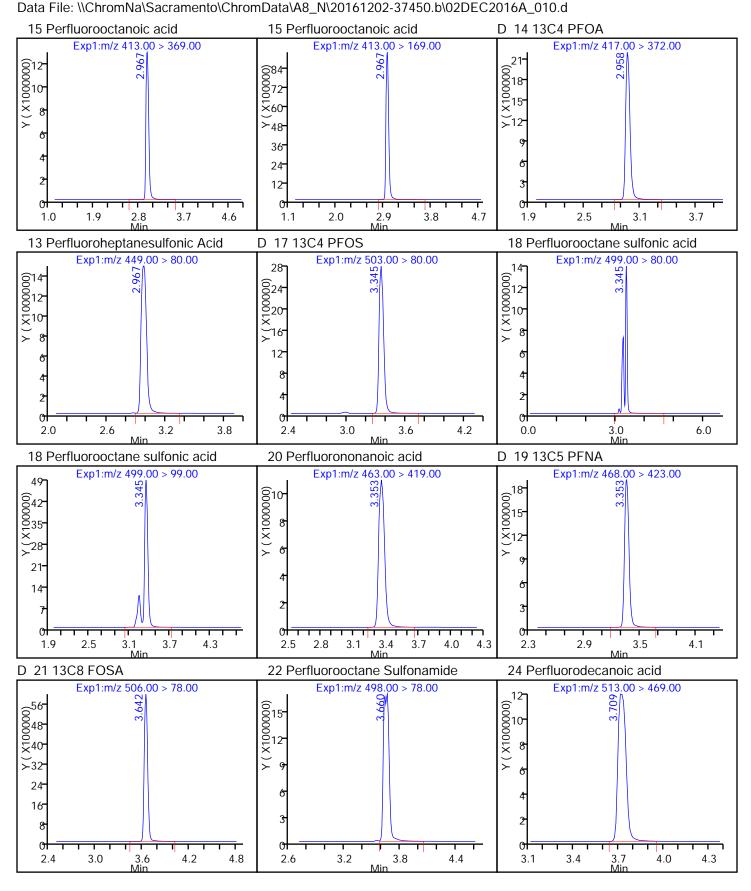
QC Flag Legend Review Flags

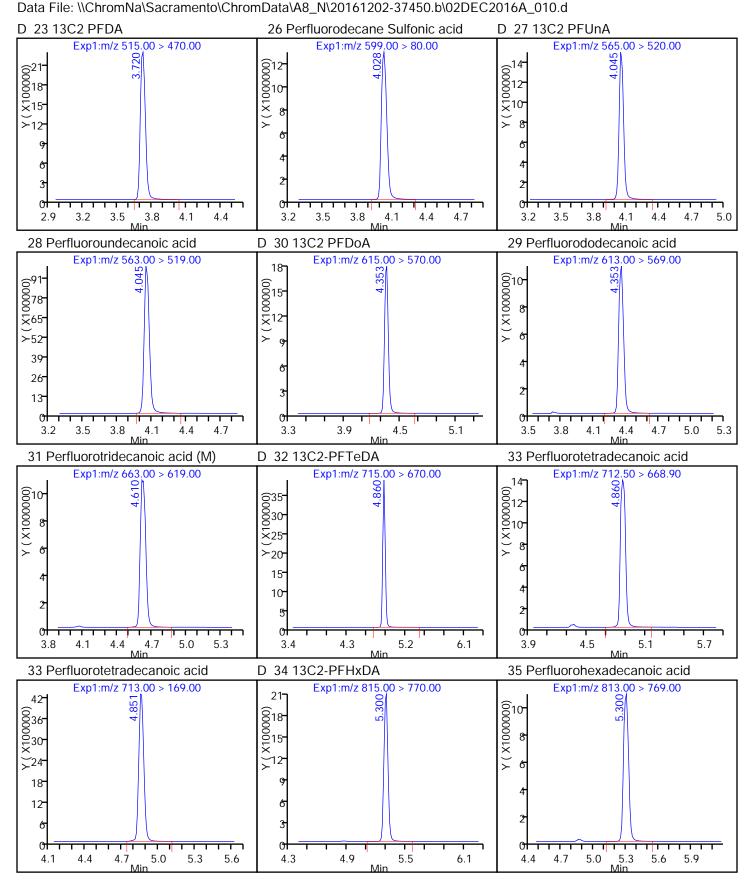
M - Manually Integrated

Reagents:

LCPFC-L7\_00019 Units: mL Amount Added: 1.00

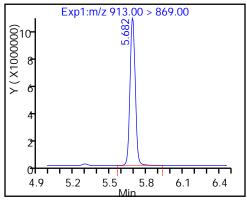
Report Date: 02-Dec-2016 14:51:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_010.d Data File: **Injection Date:** 02-Dec-2016 11:14:32 Instrument ID: A8\_N Lims ID: IC L7 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 43 Worklist Smp#: 10 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (X100000) X1000000 635 630 630  $\succ$ 20 18 15 12 10 1.5 1.0 1.3 1.6 1.9 2.2 0.9 1.8 2.1 0.9 1.5 2.1 2.7 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 14 (X1000000) (X1000000) (X1000000) (0000012 10000010 8 2.0 2.3 1.9 2.2 2.5 2.8 1.7 2.1 2.4 2.7 1.3 1.6 1.4 2.6 1.2 1.5 1.8 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 35<del>-</del> (X) X (X1000000) X (X) X 024 0020 020 830 <u>8</u>25 ∑<sub>20</sub> ×<sub>16</sub>-15 10 1.9 2.2 1.8 2.4 3.0 2.1 2.5 2.8 1.2 1.5 2.7 1.6 3.3 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 598 (X1000000) (X1000000) 8 (014<sup>-</sup> 0000012<sup>-</sup> 10<sup>-</sup> <u></u>20⁻ 15<del>-</del> 10 0 0 1.8 2.1 2.4 2.7 3.0 3.3 3.4 0.6 1.5 2.4 3.3 1.6 Page 586 of 842





Report Date: 02-Dec-2016 14:51:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_010.d



Report Date: 02-Dec-2016 14:51:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_010.d

Injection Date: 02-Dec-2016 11:14:32 Instrument ID: A8\_N

Lims ID: IC L7

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 43 Worklist Smp#: 10

Injection Vol: 2.0 ul Dil. Factor: 1.0000

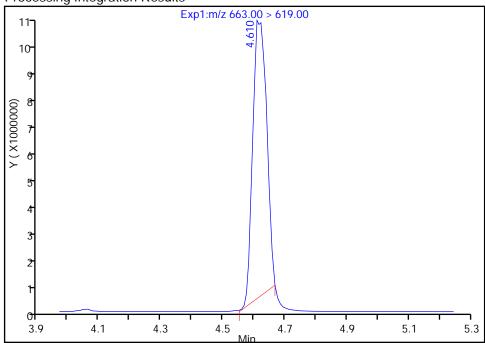
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

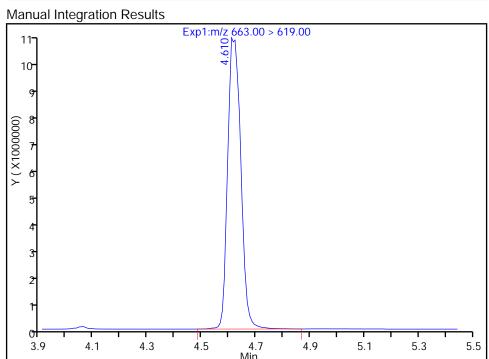
### 31 Perfluorotridecanoic acid, CAS: 72629-94-8

Signal: 1

RT: 4.61 Area: 30068675 Amount: 293.1955 Amount Units: ng/ml **Processing Integration Results** 



RT: 4.61 Area: 34277350 Amount: 319.9934 Amount Units: ng/ml



Reviewer: chandrasenas, 02-Dec-2016 13:42:13

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 587 of 842

Report Date: 02-Dec-2016 14:52:41 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_014.d

Lims ID: IC L1 Add-on

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 02-Dec-2016 11:44:30 ALS Bottle#: 46 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:41 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:56:57

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
48 Sodium 1H,1H,2H,2H-perfluorooctane										
427.00 > 407.00	2.909	2.913	-0.004	1.000	51838	0.4953		104		
O 47 M2-6:2FTS										
429.00 > 409.00	2.925	2.915	0.010		5925112	42.5		89.6		
43 Sodium 1H,		•								
527.00 > 507.00	3.668	3.674	-0.006	0.997	44037	0.4434		92.6		
O 42 M2-8:2FTS										
529.00 > 509.00	3.678	3.676	0.002		5634375	42.2		88.1		
O 45 d3-NMeFO										
573.00 > 419.00	3.843	3.839	0.004		3880040	48.5		97.0		
44 N-methyl pe										
570.00 > 419.00	3.851	3.847	0.004	1.002	30895	0.4583		91.7		
D 46 d5-NEtFOS										
589.00 > 419.00	4.011	4.009	0.002		4464530	50.1		100		
49 N-ethyl perfl										
584.00 > 419.00		4.016	0.004	1.002	30016	0.4382		87.6		
D 52 d-N-MeFO										
515.00 > 169.00	4.108	4.105	0.003		4681022	44.0		88.0		
54 MeFOSA										
512.00 > 169.00		4.110	0.005	1.000	37277	0.5000		100		
D 51 d-N-EtFOS										
531.00 > 169.00		4.290	0.003		4329074	42.5		85.0		
53 N-ethylperflu										
526.00 > 169.00	4.293	4.299	-0.006	1.000	35535	0.4830		96.6		

Report Date: 02-Dec-2016 14:52:41 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L1\_00002 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:41 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 11:44:30 Instrument ID: A8\_N Lims ID: IC L1 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 14 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 43 Sodium 1H,1H,2H,2H-perfluorooctane 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS Exp1:m/z 427.00 > 407.00 Exp1:m/z 429.00 > 409.00 Exp1:m/z 527.00 > 507.00 21-(000018-(000015-(000018-(0000018-(0000018-(0000018-(0000018-(0000018-(00 18 0015 X 12 2.8 2.3 2.9 3.2 3.7 2.5 3.1 3.5 3.4 4.0 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0012 (0000018-(000001X) > 12-14 (X100000) X (X100000) X (X1000000) Y (X1000) 3.9 4.2 3.9 4.2 3.7 3.3 3.3 3.6 4.0 3.0 3.4 4.3 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 Exp1:m/z 515.00 > 169.0018 12 21 Y (X1000) 000015-× © 15 00012 X) ≻ • 3.8 4.1 3.7 4.0 4.3 3.9 4.2 3.5 4.4 3.4 4.5 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 (0000015<sup>-</sup> 12<sup>-</sup> 15 (00012-X) > 9

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Page 590hof 842

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Report Date: 02-Dec-2016 14:52:43 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_015.d

Lims ID: IC L2 Add-on

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 02-Dec-2016 11:52:00 ALS Bottle#: 47 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:42 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:57:07

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
	427.00 > 407.00	2.920	2.913	0.007	1.000	88396	0.8738		92.2		
	O 47 M2-6:2FTS										
	429.00 > 409.00					5726516	41.1		86.6		
	43 Sodium 1H,					0.4570	4.00		407		
	527.00 > 507.00		3.674	0.010	1.000	94573	1.03		107		
	D 42 M2-8:2FTS		2 / 7 /	0.000		F242427	20.1		01.5		
	529.00 > 509.00		3.676	0.008		5213436	39.1		81.5		
	D 45 d3-NMeFO 573.00 > 419.00		3.839	0.009		3606216	45.1		90.2		
						3000210	43.1		90.2		
	44 N-methyl pe 570.00 > 419.00		3.847	0.010	1.002	59295	0.9465		94.6		
	O 46 d5-NEtFOS		3.047	0.010	1.002	37273	0.7400		74.0		
	589.00 > 419.00		4.009	0.008		4134123	46.4		92.8		
	49 N-ethyl perfl	luoroocta	ane sulfo	namid							
	584.00 > 419.00		4.016	0.010	1.002	56004	0.8830		88.3		
I	D 52 d-N-MeFO	SA-M									
	515.00 > 169.00	4.106	4.105	0.001		5181881	48.7		97.5		
	54 MeFOSA										
	512.00 > 169.00	4.114	4.110	0.004	1.000	73327	0.8885		88.8		
I	D 51 d-N-EtFOS	A-M									
	531.00 > 169.00	4.292	4.290	0.002		5048951	49.5		99.1		
	53 N-ethylperflu										
	526.00 > 169.00	4.301	4.299	0.002	1.000	78846	0.9189		91.9		

Report Date: 02-Dec-2016 14:52:43 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L2\_00002 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:43 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_015.d **Injection Date:** 02-Dec-2016 11:52:00 Instrument ID: A8\_N Lims ID: IC L2 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 15 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: 43 Sodium 1H,1H,2H,2H-perfluorooctane 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 2.91 30 (30° (0025 (×) ©25 S18 15 15 10 10 3.0 3.3 2.3 2.9 3.9 2.7 2.0 3.2 3.5 3.3 3.6 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0021-(000015-X)12-618 00 15 × 3.7 3.9 4.2 3.7 4.0 3.3 3.6 4.0 3.4 4.3 3.1 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M D 46 d5-NEtFOSAA Exp1:m/z 589.00 > 419.00 21-(015 000012 X Y (21<sup>-</sup> 00018 ×15 (00015-X) 12-3.8 4.1 3.8 4.1 3.5 4.4 3.5 4.4 3.7 4.0 4.3 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 21-(0000018-15-35 28 630 25-× (000120 × 200 × 16 <u></u>20− 15 10

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Page 594h of 842

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Report Date: 02-Dec-2016 14:52:44 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_016.d

Lims ID: IC L3 Add-on

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 02-Dec-2016 11:59:31 ALS Bottle#: 48 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:44 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:57:18

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
4	27.00 > 407.00	2.910	2.913	-0.003	1.000	492719	4.19		88.4		
	47 M2-6:2FTS										
	29.00 > 409.00			0.003		6658764	47.8		101		
	43 Sodium 1H,					404000	4.40		05.7		
	27.00 > 507.00		3.674	-0.001	1.000	431909	4.10		85.7		
	42 M2-8:2FTS 29.00 > 509.00		2 474	-0.003		5971752	44.7		93.4		
	29.00 > 509.00 45 d3-NMeFO		3.070	-0.003		5971752	44.7		93.4		
	73.00 > 419.00		3 839	-0.001		4140205	51.8		104		
	44 N-methyl pe					1110200	01.0		101		
	70.00 > 419.00		3.847		1.002	289882	4.03		80.6		
D	46 d5-NEtFOS	SAA									
5	89.00 > 419.00	4.006	4.009	-0.003		4489327	50.4		101		
	49 N-ethyl perfl	luoroocta	ane sulfo	onamid							
5	84.00 > 419.00	4.015	4.016	-0.001	1.002	283960	4.12		82.5		
	52 d-N-MeFO										
	15.00 > 169.00	4.104	4.105	-0.001		5362314	50.4		101		
	54 MeFOSA			0.007	1 000	0.40050	4.00				
	12.00 > 169.00		4.110	-0.006	1.000	360259	4.22		84.4		
	51 d-N-EtFOS		4 200	0.003		F20F212	Г1 1		100		
	31.00 > 169.00		4.290			5205212	51.1		102		
	53 N-ethylperflu 26.00 > 169.00		ctanesu 4.299		1.000	365734	4.13		82.7		
S	20.00 > 109.00	4.271	4.277	-0.002	1.000	303734	4.13		02.7		

Report Date: 02-Dec-2016 14:52:44 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L3\_00002 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:44 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: 02-Dec-2016 11:59:31 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L3 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS 43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 427.00 > 407.00 Exp1:m/z 429.00 > 409.00 Exp1:m/z 527,00 > 507.00 18 (00001 ×16 (014° 0012° 00015 X12 2.9 3.2 1.9 3.1 3.7 3.2 3.5 3.8 2.6 3.5 2.5 4.1 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00673 16 12 (21<sup>-</sup> 00018 ×15 014<del>-</del>0012-Y (X10000) ∑<sub>10</sub> 3.7 3.9 4.2 3.7 3.4 4.0 3.3 3.6 4.0 3.1 4.3 3.4 4.3 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 Exp1:m/z 515.00 > 169.0018 24 Y (X10000) © 15 ©21<del>-</del> 0218-00012 X) ≻ • 3.7 4.0 4.3 3.7 4.0 4.3 3.5 3.8 4.1 3.4 4.6 3.4 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 16 16 (0000018 (0000015 (14<sup>-</sup> (00012<sup>-</sup> X10<sup>-</sup> (0014 (00012 (X)10 0 0 <sup>4.5</sup> 1<u>2/08/2016</u>

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Page 598h of 842

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Report Date: 02-Dec-2016 14:52:46 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_017.d

Lims ID: IC L4 Add-on

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 02-Dec-2016 12:07:00 ALS Bottle#: 49 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:46 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:56:04

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	e						
4	427.00 > 407.00	2.914	2.913	0.001	1.000	2900008	20.8		110		
	47 M2-6:2FTS										
2	129.00 > 409.00		2.915			7906261	56.8		120		
	43 Sodium 1H,	•			0700477	04.5		440			
	527.00 > 507.00		3.674	0.004	1.000	2799477	21.5		112		
	)  42 M2-8:2FTS 529.00 > 509.00		3.676	0.002		7389674	55.4		116		
	) 45 d3-NMeFO		3.070	0.002		7307074	55.4		110		
	573.00 > 419.00		3.839	0.004		4953346	61.9		124		
	44 N-methyl pe										
Ę	570.00 > 419.00				1.000	1829869	21.3		106		
Е	46 d5-NEtFOS	SAA									
Ę	589.00 > 419.00	4.011	4.009	0.002		5242030	58.9		118		
	49 N-ethyl perf	luoroocta	ane sulfo	namid							
Ę	584.00 > 419.00	4.011	4.016	-0.005	1.000	1881436	23.4		117		
	52 d-N-MeFO										
Ę	515.00 > 169.00	4.104	4.105	-0.001		5889991	55.4		111		
	54 MeFOSA	4 4 4 0	4.110	0.000	1 000	0100100	20.7		440		
	512.00 > 169.00		4.110	0.002	1.000	2129108	22.7		113		
	) 51 d-N-EtFOS 531.00 > 169.00		4.290	0.003		5611197	55.1		110		
(						5011197	JJ. I		110		
F	53 N-ethylperfl 526.00 > 169.00		4.299	0.003	1.000	2187091	22.9		115		
•	220.00 / 107.00			5.000		210/0/1	,		110		

Report Date: 02-Dec-2016 14:52:46 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L4\_00003 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:46 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_017.d **Injection Date:** 02-Dec-2016 12:07:00 Instrument ID: A8\_N Lims ID: IC L4 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 17 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS 43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429,00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 Y (X100000) (X100000) 8 **≻**16 12 2.9 3.2 2.5 3.0 3.3 3.9 2.6 3.5 2.2 2.8 3.1 3.4 3.7 4.2 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00Exp1:m/z 570.00 > 419.00(0000015-(0000015-28 63 000024 20 00054 ×45 ∑16<sup>°</sup> <u>~</u>36 18 3.7 3.9 4.2 4.0 3.3 3.6 3.5 3.4 4.3 3.2 3.8 4.1 3.1 4.4 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M D 46 d5-NEtFOSAA Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 21 .01 (24<sup>-</sup> 00020 63 0054 <u>8</u>18 0015 X )12 ×45<del>-</del> <u>`</u>216 ×36• 27 18 3.9 2.9 4.1 4.7 3.8 4.2 3.5 3.5 4.1 3.6 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 24 084**-**84 0021<del>-</del> 0 0 0 72 <del>∑</del>60 <del>×</del>60 ≻48 ≻48 36 36 24 24 0 0 3.9 4.2 4.5 3.7 4.0 Page 602h of 842 4.9 3.8 4.1 4.4 3.6 4.6 12/08/2016

Report Date: 02-Dec-2016 14:52:47 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_018.d

Lims ID: IC L5 Add-on

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 02-Dec-2016 12:14:30 ALS Bottle#: 50 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:47 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:57:38

_											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
4	427.00 > 407.00	2.919	2.913	0.006	1.000	5633441	57.1		120		
	) 47 M2-6:2FTS										
4	429.00 > 409.00	2.911	2.915	-0.004		5586093	40.1		84.4		
	43 Sodium 1H,		•								
	527.00 > 507.00		3.674	0.0	1.000	5753486	55.8		116		
	) 42 M2-8:2FTS										
	529.00 > 509.00		3.676	-0.002		5851766	43.8		91.5		
	0 45 d3-NMeFO		0.000	0.0		0.4.40000	40.0		0/4		
,	573.00 > 419.00		3.839			3442292	43.0		86.1		
	44 N-methyl pe				1 000	2/0/000	/1.0		104		
	570.00 > 419.00		3.847	0.0	1.002	3696988	61.8		124		
	) 46 d5-NEtFOS 589.00 > 419.00		4.000	-0.002		3869672	43.4		86.9		
•						3009072	43.4		00.9		
ı	49 N-ethyl perfl 584.00 > 419.00		ane suito 4.016		1.002	3546696	59.7		119		
	52 d-N-MeFO		4.010	0.0	1.002	3340070	37.7		117		
	515.00 > 169.00		<i>4</i> 105	-0.005		4967092	46.7		93.4		
•	54 MeFOSA	4.100	4.103	-0.003		4707072	40.7		75.4		
į	512.00 > 169.00	4 108	4 110	-0.002	1.000	4836683	61.1		122		
	) 51 d-N-EtFOS			0.002	1.000	1000000	01.1				
	531.00 > 169.00		4.290	-0.005		4857179	47.7		95.3		
•	53 N-ethylperflu					.557,			, 5.5		
ĺ	526.00 > 169.00		4.299		1.000	5044937	61.1		122		

Report Date: 02-Dec-2016 14:52:47 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L5\_00002 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:48 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_018.d **Injection Date:** 02-Dec-2016 12:14:30 Instrument ID: A8\_N Lims ID: IC L5 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 18 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS 43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 2,911 (0000015 X ) 12 (00018 (000015 15 <u>@</u>18 0015<sup>-</sup> 12 2.5 2.8 2.9 3.5 3.0 3.3 3.9 3.1 3.4 1.7 2.3 3.6 4.2 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0014 (0000018-(000001X) > 12-(012 (0100000) (0100000) (0100 3.7 4.0 3.2 3.5 4.1 4.4 3.6 3.9 4.2 3.4 4.3 3.3 3.1 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 14 14 (012 X ) X 8 (00018 (000015 (000015 (00018) (00018 (00018) <u>8</u>12 0010° × (×1000 × (×1000 3.7 4.0 4.3 3.9 4.2 4.5 3.9 4.2 3.4 4.6 3.3 3.6 4.5 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 21 21 21<del>-</del> 000018-15-(018 X) X X) X 0000015-X 0 0 0 3.9 4.0 Page 606 of 842 4.2 4.5 3.7 4.6 3.8 4.1 4.4 3.6 12/08/2016

Report Date: 02-Dec-2016 14:52:49 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_019.d

Lims ID: IC L6 Add-on

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 02-Dec-2016 12:22:00 ALS Bottle#: 51 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:49 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:57:48

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	48 Sodium 1H,		-								
	427.00 > 407.00	2.904	2.913	-0.009	1.000	20031946	169.7		89.5		
	O 47 M2-6:2FTS										
	429.00 > 409.00	2.912	2.915	-0.003		6682949	48.0		101		
	43 Sodium 1H,		•								
	527.00 > 507.00		3.674	-0.007	1.000	19463965	164.3		85.7		
	0 42 M2-8:2FTS										
	529.00 > 509.00		3.676	-0.009		6721067	50.3		105		
	O 45 d3-NMeFO										
	573.00 > 419.00		3.839			4016571	50.2		100		
	44 N-methyl pe				1 000	1077000	407.4		00.7		
	570.00 > 419.00		3.847	-0.015	1.002	13773335	197.4		98.7		
	0 46 d5-NEtFOS		4.000	0.000		4.47.4075	F0.0		100		
	589.00 > 419.00		4.009			4474975	50.2		100		
	49 N-ethyl perfl				1 000	140/5407	204.0		100		
	584.00 > 419.00		4.016	-0.007	1.002	14065497	204.9		102		
	52 d-N-MeFO		4 105	0.000		4007555	47.0		00.7		
	515.00 > 169.00	4.102	4.105	-0.003		4927555	46.3		92.7		
	54 MeFOSA	4 100	4 110	0.000	1 000	15014524	201 F		101		
	512.00 > 169.00		4.110	-0.008	1.000	15814534	201.5		101		
	51 d-N-EtFOS		4 200	0.004		4/0/00/	47.1		00.0		
	531.00 > 169.00		4.290			4696896	46.1		92.2		
	53 N-ethylperflu				1 000	1/550001	207.2		104		
	526.00 > 169.00	4.296	4.299	-0.003	1.000	16550291	207.3		104		

Report Date: 02-Dec-2016 14:52:49 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L6\_00002 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:49 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 12:22:00 Instrument ID: A8\_N Lims ID: IC L6 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 19 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS 43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 427.00 > 407.00 Exp1:m/z 429.00 > 409.00Exp1:m/z 527.00 > 507.00 (70° (00000) 50° (70°) (000054<sup>-</sup> × 45<sup>-</sup> S18 ×15 \_ ≻40 27 30 20 10 2.5 2.8 1.9 3.1 3.7 3.9 3.1 3.4 2.5 3.3 3.6 4.2 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00 Exp1:m/z 570.00 > 419.0014 48 24 824 (X100000) X (X100000) X (X100000) (00001 ×16 042 0036 ×30 ≻<sub>24</sub> 18 12 3.7 3.9 4.2 4.0 3.3 3.6 3.6 3.9 4.2 3.4 4.3 3.3 3.1 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 Exp1:m/z 515.00 > 169.0018 217 90 000042 ×35 000015-× © 15 ) X12 **≻28** 21 14 3.7 4.0 4.3 2.8 4.0 3.9 4.2 3.4 4.6 3.4 4.6 5.2 4.5 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 64 63<sup>-</sup> 000054<sup>-</sup> ×45<sup>-</sup> (18-0000015-056 0648 ×40  $\succ_{32}$ 27 24 18 0 0 3.8 4.1 4.4 4.7 3.7 4.0 Page 6Mh of 842 4.6 3.9 4.2 4.5 3.5 3.6

Report Date: 02-Dec-2016 14:52:50 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Lims ID: IC L7 Add-on

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 02-Dec-2016 12:29:29 ALS Bottle#: 52 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L7 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub3

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:52:50 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 13:58:03

-											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
	427.00 > 407.00	2.917	2.913	0.004	1.000	37224925	269.4		71.0		
	0 47 M2-6:2FTS										
	429.00 > 409.00		2.915	0.002		7823475	56.2		118		
	43 Sodium 1H, 527.00 > 507.00		-		e 1.000	37119838	263.9		68.9		
	327.00 > 307.00 D 42 M2-8:2FTS		3.074	0.002	1.000	37117030	203.7		00.7		
	529.00 > 509.00		3.676	0.0		7980965	59.8		125		
[	O 45 d3-NMeFO	SAA									
	573.00 > 419.00	3.841	3.839	0.002		3959155	49.5		99.0		
	44 N-methyl pe										
	570.00 > 419.00		3.847	0.002	1.002	28724886	417.6		104		
	O 46 d5-NEtFOS		4.000	0.0		4407700	FO F		101		
	589.00 > 419.00		4.009			4497788	50.5		101		
	49 N-ethyl perfl 584.00 > 419.00		4.016	0.002	1.002	28356327	410.9		103		
	D 52 d-N-MeFO			0.002							
	515.00 > 169.00		4.105	0.005		6208758	58.4		117		
	54 MeFOSA										
	512.00 > 169.00	4.118	4.110	0.008	1.000	35701676	361.0		90.3		
	51 d-N-EtFOS										
	531.00 > 169.00		4.290	0.009		5918873	58.1		116		
	53 N-ethylperflu 526.00 > 169.00		ctanesul 4.299	lfonami 0.010	1.000	35493503	352.9		88.2		
	JZU.UU > 109.UU	4.309	4.299	0.010	1.000	33493303	352.9		88.2		

Report Date: 02-Dec-2016 14:52:50 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC2-L7\_00002 Amount Added: 1.00 Units: mL

Report Date: 02-Dec-2016 14:52:50 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d 02-Dec-2016 12:29:29 **Injection Date:** Instrument ID: A8\_N Lims ID: IC L7 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 52 Worklist Smp#: 20 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS 43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 28 X (X1000000) × (X1000000) (X1000000) / (X1000000) 9 2.5 3.1 1.9 3.1 3.7 2.9 3.2 3.8 2.8 3.4 3.7 2.5 3.5 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00Exp1:m/z 570.00 > 419.0014 X (X100000) X (X100000) 8 684 672 ©24 00 00 20 ×60 ≻48 36 24 12 3.9 4.2 3.9 4.2 3.3 3.3 3.6 3.7 4.0 4.3 3.0 3.6 3.4 3.1 4.6 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 600072 ×60 (0000012 ×) > 9 () 0020 ×16 ≻48 36 24 12 3.7 4.0 4.3 4.0 3.5 3.8 3.4 4.6 2.8 3.4 4.6 5.2 4.1 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 (X1000000) (0000010-8) (00020-0020-×16 12 0 0 3.7 4.0 4.3 4.6 3.7 4.0 Page 6Mhof 842 4.6 3.8 4.1 4.4 3.4 12/08/2016

## FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: <u>ICV 320-137684/11</u> Calibration Date: <u>11/14/2016</u> 12:34

Instrument ID: A8\_N Calib Start Date: 11/14/2016 11:42

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 11/14/2016 13:27

Lab File ID: 14NOV2016A\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8697	0.9540		54.8	50.0	9.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.039	1.079		51.9	50.0	3.9	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.517	1.593		46.5	44.3	5.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9448	1.069		56.6	50.0	13.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.023	1.157		56.5	50.0	13.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.059	1.079		48.1	47.3	1.9	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.050	1.112		53.0	50.0	5.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.141	1.152		48.1	47.6	1.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9823	1.086		55.3	50.0	10.6	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.088	1.032		45.3	47.8	-5.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9011	0.9585		53.2	50.0	6.4	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9922	1.021		51.5	50.0	2.9	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6079	0.6646		52.8	48.3	9.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.028	1.057		51.4	50.0	2.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9550	1.009		52.8	50.0	5.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9443	1.048		55.5	50.0	11.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.779	1.879		52.8	50.0	5.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.171		53.8	50.0	7.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.076	1.405		65.3	50.0	30.5*	25.0
13C4 PFBA	Ave	197654	212837		53.8	50.0	7.7	50.0
13C5-PFPeA	Ave	159887	168015		52.5	50.0	5.1	50.0
13C2 PFHxA	Ave	145191	149038		51.3	50.0	2.6	50.0
13C4-PFHpA	Ave	131410	140045		53.3	50.0	6.6	50.0
1802 PFHxS	Ave	202083	220444		51.6	47.3	9.1	50.0
13C4 PFOA	Ave	136481	143610		52.6	50.0	5.2	50.0
13C4 PFOS	Ave	155727	169673		52.1	47.8	9.0	50.0
13C5 PFNA	Ave	109384	112819		51.6	50.0	3.1	50.0
13C8 FOSA	Ave	250790	266530		53.1	50.0	6.3	50.0
13C2 PFDA	Ave	100216	101416		50.6	50.0	1.2	50.0
13C2 PFUnA	Ave	78435	82651		52.7	50.0	5.4	50.0
13C2 PFDoA	Ave	77339	81937		53.0	50.0	5.9	50.0
13C2-PFTeDA	Ave	170624	179744		52.7	50.0	5.3	50.0
13C2-PFHxDA	Ave	94300	97063		51.5	50.0	2.9	50.0

Report Date: 14-Nov-2016 16:30:26 Chrom Revision: 2.2 17-Oct-2016 09:27:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_011.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 14-Nov-2016 12:34:53 ALS Bottle#: 44 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: ICV\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist:

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 14-Nov-2016 16:30:25 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

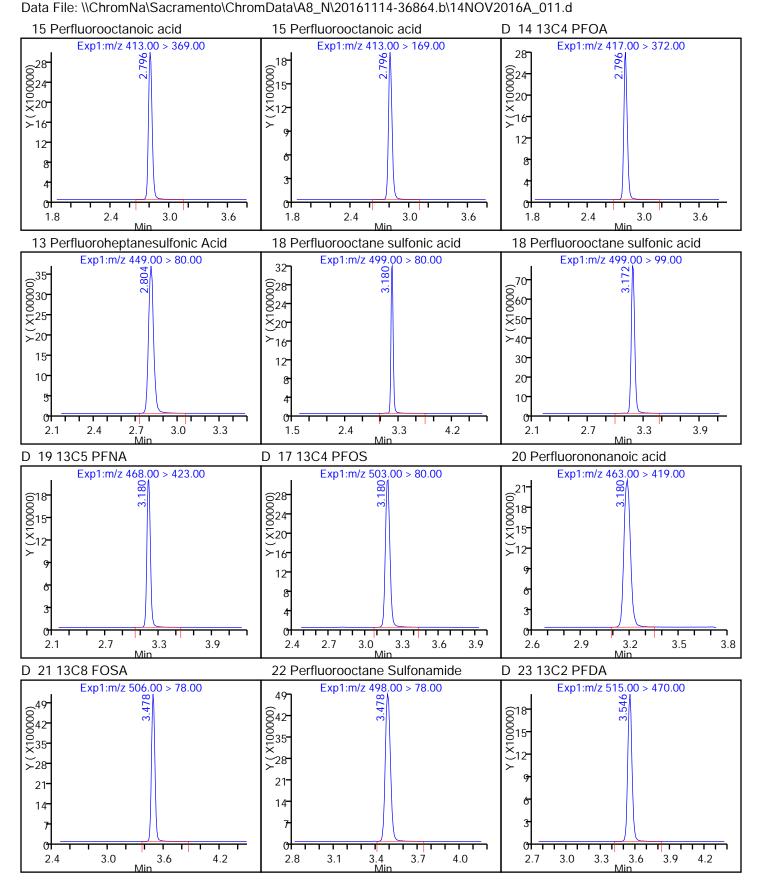
Process Host: XAWRK014

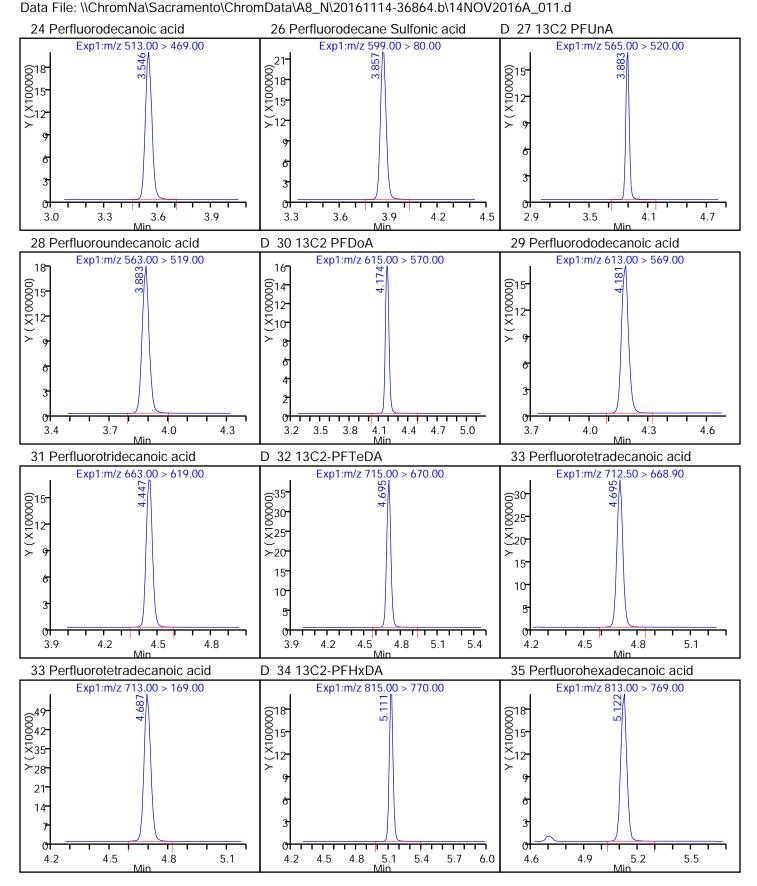
First Level Reviewer: chandrasenas Date: 14-Nov-2016 16:18:03

First Level Reviewer: chandrasenas				Date:	1	4-Nov-2016 16:18:03				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty 212.90 > 169.00	•	1.517	0.001	1.000	10152701	54.8			109973	
D 2 13C4 PFBA 217.00 > 172.00		1.517	0.001		10641827	53.8		108	221092	9
3 Perfluoropen 262.90 > 219.00	1.791	cid 1.795	-0.004	1.000	9066177	51.9			127920	
D 4 13C5-PFPe 267.90 > 223.00	1.791	1.795	-0.004		8400738	52.5		105	948441	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	anesulfo 1.829 1.829	nic acid 1.833 1.833	-0.004 -0.004	1.000 1.000	15534302 6966484	46.5	2.23(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00		id 2.094	-0.010	1.000	7969006	56.6			155092	
D 6 13C2 PFHx 315.00 > 270.00	2.084	2.094	-0.010		7451918	51.3		103	729045	
9 Perfluorohex 399.00 > 80.00	2.445	nic acid 2.399	0.046	1.000	11239116	48.1				
D 11 13C4-PFH <sub>j</sub> 367.00 > 322.00	2.423	2.437	-0.014		7002238	53.3		107	546754	
12 Perfluorohej 363.00 > 319.00	2.430	2.440	-0.010	1.000	8099215	56.5			89814	
D 10 18O2 PFH; 403.00 > 84.00 15 Perfluorooct	2.445	2.455	-0.010		10427000	51.6		109	132505	8
413.00 > 369.00 413.00 > 169.00	2.796	2.811 2.811	-0.015 -0.015	1.000 1.000	7985804 4795897	53.0	1.67(0.90-1.10)		176141 187277	
D 14 13C4 PFO/ 417.00 > 372.00		2.811	-0.015		7180498 Page 617 of 84	12 <sup>52.6</sup>		105	<sup>5574</sup> %	3/2016

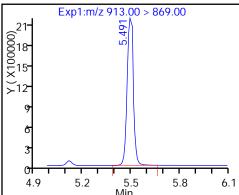
**FXP REL** DLT Amount Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.804 2.819 -0.015 9308070 48.1 1.000 18 Perfluorooctane sulfonic acid 499.00 > 80.00 3.180 3.154 0.026 45.3 1552927 1.000 8359643 499.00 > 99.00 3.172 3.154 0.018 0.997 1998187 4.18(0.90-1.10) 152636 D 19 13C5 PFNA 468.00 > 423.00 3.180 3.197 -0.017 5640939 51.6 103 664302 D 17 13C4 PFOS 503.00 > 80.00 3.180 3.197 -0.017 8110393 52.1 109 192299 20 Perfluorononanoic acid 463.00 > 419.00 3.180 3.198 -0.018 55.3 77807 1.000 6127980 D 21 13C8 FOSA 506.00 > 78.00 3.478 3.481 -0.003 53.1 106 854551 13326506 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.478 3.484 53.2 -0.006 1.000 12773309 323249 D 23 13C2 PFDA 515.00 > 470.00 3.546 50.6 3.561 -0.015 5070805 101 216928 24 Perfluorodecanoic acid 513.00 > 469.00 3.546 3.562 -0.016 51.5 142131 1.000 5177594 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.857 3.881 -0.024 1.000 5440579 52.8 D 27 13C2 PFUnA 565.00 > 520.00 3.883 3.900 -0.017 4132567 52.7 105 325281 28 Perfluoroundecanoic acid 563.00 > 519.00 3.883 3.900 -0.017 76042 1.000 4368220 51.4 D 30 13C2 PFDoA 615.00 > 570.00 4.174 4.195 -0.021 4096857 53.0 106 255880 29 Perfluorododecanoic acid 613.00 > 569.00 4.181 52.8 48899 4.200 -0.019 1.000 4133854 31 Perfluorotridecanoic acid 663.00 > 619.00 4.447 4.471 -0.024 1.000 4292165 55.5 105715 D 32 13C2-PFTeDA 715.00 > 670.00 4.695 4.718 -0.023 8987224 52.7 105 1247069 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.695 4.721 -0.0261.000 7696924 52.8 147236 713.00 > 169.00 4.687 -0.034 0.998 5.78(0.00-0.00) 4.721 1332392 182857 D 34 13C2-PFHxDA 815.00 > 770.00 5.111 5.143 -0.032 4853129 51.5 103 382142 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.122 5.148 -0.026 1.000 4797279 53.8 16625 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.491 5.537 -0.046 1.000 5754295 65.3 18133 Reagents: LCPFCIC\_00019 Amount Added: 1.00 Units: mL

Report Date: 14-Nov-2016 16:30:26 Chrom Revision: 2.2 17-Oct-2016 09:27:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_011.d **Injection Date:** 14-Nov-2016 12:34:53 Instrument ID: A8\_N Lims ID: **ICV** Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 (00000 36-130-51 (X100000) X1000000 636 036 036 ∑<sub>24</sub> <del>-</del>24 18 18 18 12 12 1.3 1.9 1.8 1.0 1.6 2.2 0.4 1.0 1.6 2.2 1.2 1.5 2.1 4 13C5-PFPeA D 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00(35-0030-125-63 00054 ×45 630 60 60 625 ×<sub>20</sub> <sup>-</sup>20 -36<del>-</del> 15 27 15 10 18 1.9 2.2 2.5 1.5 2.1 2.4 1.5 2.1 1.0 1.3 1.6 1.2 1.8 1.2 1.8 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 28-000024-1×20-42 (30<sup>-</sup> (000025 X30-<u></u> ∠24 ×16 15 18 10 12 1.8 2.1 1.7 2.0 1.9 2.5 1.5 2.4 2.7 1.4 2.3 2.6 1.3 3.1 1.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 28 40 630 60 60 625 (000001X) X 035<u>-</u> ×<sub>20</sub> ×25 ≻20 15 12 15 10 10 0 1.9 1.8 2.1 2.4 2.7 3.0 2.0 Page 6M9h of 842 2.9 2.5 1.5 1.7 1.3 12/08/2016





36 Perfluorooctadecanoic acid



## FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: <u>CCV 320-138811/2</u> Calibration Date: <u>11/20/2016 17:25</u>

Instrument ID: A8\_N Calib Start Date: 11/14/2016 11:42

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 11/14/2016 13:27

Lab File ID: 20NOV2016C\_003.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8697	0.8374		0.963	1.00	-3.7	50.0
Perfluoropentanoic acid (PFPeA)	AveID	1.039	1.116		1.07	1.00	7.4	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.517	1.486		0.866	0.884	-2.0	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9448	0.9217		0.976	1.00	-2.4	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.023	1.179		1.15	1.00	15.2	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.059	1.185		1.02	0.910	11.8	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.050	1.195		1.14	1.00	13.8	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.141	1.191		0.994	0.952	4.4	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9823	1.073		1.09	1.00	9.2	50.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.088	1.143		0.975	0.928	5.1	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9011	0.8771		0.973	1.00	-2.7	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9922	0.9762		0.984	1.00	-1.6	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6079	0.6320		1.00	0.964	4.0	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.028	1.079		1.05	1.00	5.0	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9550	1.136		1.19	1.00	19.0	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9443	0.9234		0.978	1.00	-2.2	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.779	1.646		0.925	1.00	-7.5	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.727		1.10	1.00	9.5	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.076	1.253		1.16	1.00	16.4	50.0
13C4 PFBA	Ave	197654	176118		44.6	50.0	-10.9	50.0
13C5-PFPeA	Ave	159887	143427		44.9	50.0	-10.3	50.0
13C2 PFHxA	Ave	145191	136383		47.0	50.0	-6.1	50.0
13C4-PFHpA	Ave	131410	119248		45.4	50.0	-9.3	50.0
1802 PFHxS	Ave	202083	170837		40.0	47.3	-15.5	50.0
13C4 PFOA	Ave	136481	123233		45.1	50.0	-9.7	50.0
13C4 PFOS	Ave	155727	111871		34.3	47.8	-28.2	50.0
13C5 PFNA	Ave	109384	96932		44.3	50.0	-11.4	50.0
13C8 FOSA	Ave	250790	208191		41.5	50.0	-17.0	50.0
13C2 PFDA	Ave	100216	87495		43.7	50.0	-12.7	50.0
13C2 PFUnA	Ave	78435	70811		45.1	50.0	-9.7	50.0
13C2 PFDoA	Ave	77339	70524		45.6	50.0	-8.8	50.0
13C2-PFTeDA	Ave	170624	157319		46.1	50.0	-7.8	50.0
13C2-PFHxDA	Ave	94300	90102		47.8	50.0	-4.5	50.0

Report Date: 22-Nov-2016 17:05:24 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37096.b\20NOV2016C\_003.d

Lims ID: CCV L2

Client ID:

Sample Type: CCVL

Inject. Date: 20-Nov-2016 17:25:19 ALS Bottle#: 38 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L2

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37096.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 22-Nov-2016 17:05:23 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK032

First Level Reviewer: chandrasenas Date: 21-Nov-2016 12:08:36

That Edvor Neviewer, characters			us		Date.		1 1101 2010 12.00.0	<u> </u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	ric acid									
212.90 > 169.00		1.493	0.009	1.000	147484	0.9628		96.3	2636	
D 213C4 PFBA										
217.00 > 172.00	1.502	1.493	0.009		8805924	44.6		89.1	104195	0
3 Perfluoropen	tanoic a	cid								
262.90 > 219.00	1.772	1.762	0.010	1.000	159998	1.07		107	2127	
D 413C5-PFPe										
267.90 > 223.00	1.772	1.762	0.010		7171357	44.9		89.7	756565	
5 Perfluorobuta										
298.90 > 80.00		1.800	0.010	1.000	224463	0.8661	2 24(0 00 0 00)	98.0		
298.90 > 99.00		1.800	0.010	1.000	96038		2.34(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00		aa 2.046	0.020	1.000	125705	0.9755		97.6	3780	
D 6 13C2 PFHx		2.040	0.020	1.000	123703	0.7733		77.0	3700	
315.00 > 270.00		2.046	0.014		6819138	47.0		93.9	467058	
12 Perfluoroher										
363.00 > 319.00		2.389	0.015	1.000	140615	1.15		115	898	
D 11 13C4-PFH <sub>k</sub>	ρA									
367.00 > 322.00	2.404	2.389	0.015		5962380	45.4		90.7	494699	
9 Perfluorohex	anesulfo	nic acid								
399.00 > 80.00	2.419	2.400	0.019	1.000	184157	1.02		112		
D 10 18O2 PFH	κS									
403.00 > 84.00	2.419	2.405	0.014		8080596	40.0		84.5	688436	
D 14 13C4 PFO										
417.00 > 372.00	2.768	2.754	0.014		6161673	45.1		90.3	403937	

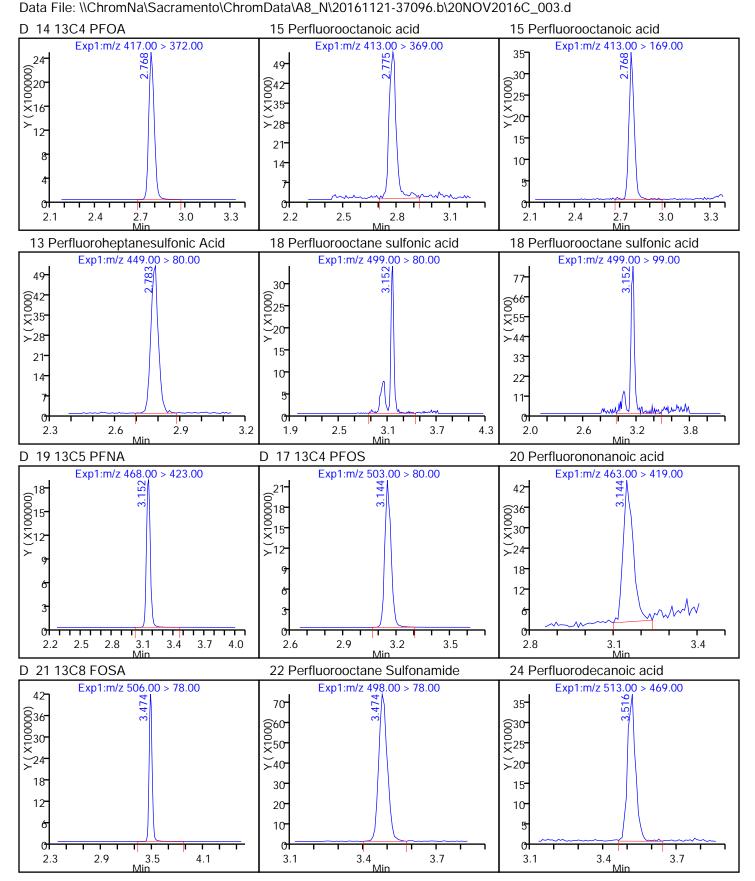
Data File: \\Cn		miva\Sa	icrameni	O/Cnrom	Data\A8_N\201	61121-3709	6.D\20NOV2016C_(	JU3.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct										
413.00 > 369.00 413.00 > 169.00		2.754 2.754	0.021 0.014	1.000 0.997	147312 85888	1.14	1.72(0.90-1.10)	114	1847 4982	
13 Perfluorohe				0.777	00000		2(6.766)		1702	
449.00 > 80.00				1.000	126885	0.99		104		
18 Perfluorooct 499.00 > 80.00		onic acid 3.121	l 0.031	1.000	118671	0.9754		105	8423	
499.00 > 99.00		3.121	0.031	1.000	27994		4.24(0.90-1.10)		2067	
D 19 13C5 PFN/ 468.00 > 423.00		3.129	0.023		4846588	44.3		88.6	365586	
D 17 13C4 PFO		5.127	0.025		4040000	44.0		00.0	303300	
503.00 > 80.00		3.129	0.015		5347451	34.3		71.8	243686	
20 Perfluoronoi 463.00 > 419.00	3.144	cid 3.129	0.015	1.000	103970	1.09		109	426	
D 21 13C8 FOS		3.460	0.014		10409546	41.5		83.0	832885	
22 Perfluorooct 498.00 > 78.00			0.006	1.000	182611	0.9734		97.3	18388	
24 Perfluorode 513.00 > 469.00		cid 3.492	0.024	1.000	85408	0.9838		98.4	3674	
D 23 13C2 PFD/ 515.00 > 470.00		3.492	0.016		4374751	43.7		87.3	423362	
26 Perfluorodeo 599.00 > 80.00		lfonic aci 3.802		1.000	68157	1.00		104		
D 27 13C2 PFUr 565.00 > 520.00		3.819	0.025		3540562	45.1		90.3	301224	
28 Perfluoround 563.00 > 519.00			0.025	1.000	76431	1.05		105	2295	
D 30 13C2 PFD										
615.00 > 570.00		4.113	0.021		3526201	45.6		91.2	241722	
29 Perfluorodo 613.00 > 569.00	4.134	4.113	0.021	1.000	80127	1.19		119	367	
31 Perfluorotrid 663.00 > 619.00		acid 4.380	0.026	1.000	65120	0.9779		97.8	2207	
D 32 13C2-PFT6 715.00 > 670.00		4.614	0.030		7865970	46.1		92.2	755833	
33 Perfluoroteti 712.50 > 668.90		oic acid 4.614	0.030	1.000	116055	0.9252		92.5	2743	
713.00 > 169.00		4.614	0.030	1.000	20734		5.60(0.00-0.00)		9709	
D 34 13C2-PFH: 815.00 > 770.00		5.026	0.032		4505095	47.8		95.5	378036	
35 Perfluorohe: 813.00 > 769.00		oic acid 5.026	0.032	1.000	121827	1.10		110	726	
36 Perfluorooct 913.00 > 869.00			0.031	1.000	88358	1.16		116	412	

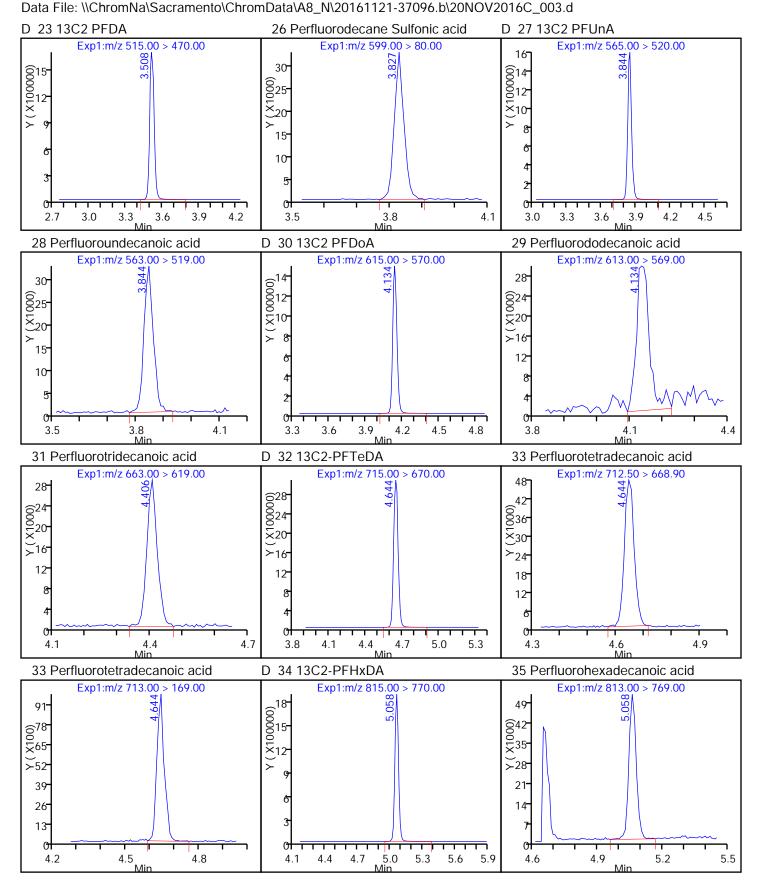
Report Date: 22-Nov-2016 17:05:24 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC-L2\_00022 Amount Added: 1.00 Units: mL

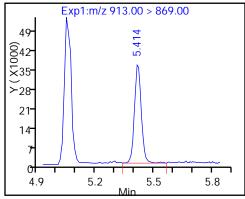
Report Date: 22-Nov-2016 17:05:24 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 17:25:19 Instrument ID: A8\_N Lims ID: CCV L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 262.90 > 219.00 42 63 65 0 0 5 4 656 856 <u>830</u> ×45 ≻<sub>36</sub>-38 18 27 29 12 18 20 1.9 1.7 0.9 1.8 1.4 1.2 1.5 1.3 1.6 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 99.00Exp1:m/z 267.90 > 223.00Exp1:m/z 298.90 > 80.00Y (X10000) 42 628 0024 ×30-<del>∑</del>20 ∑24<sup>.</sup> 18 12 1.9 1.9 1.3 1.9 2.2 2.5 1.6 2.2 2.2 1.0 1.6 1.3 1.3 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 28 56 49 824**-**0642 √35 048 048 ×40 S<sub>20</sub> \_ ≻16<del>-</del> ≻28 <del>-</del>32 24 21 14 16 2.0 2.3 1.5 1.8 2.1 2.3 2.4 2.6 1.7 2.0 9 Perfluorohexanesulfonic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 35<del>-</del> 64 (000001 |X16 ©30-0025-56 648<u>-</u> ×40- $^{20}$ 32 12 15 24 10 16 0 0 1.8 2.1 2.4 2.7 Page 627nof 842 2.0 2.3 2.6 2.9 3.0 3.3 2.0 2.3 2.6 1.7 1.5 1.7





Report Date: 22-Nov-2016 17:05:24 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37096.b\20NOV2016C\_003.d



Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: CCV 320-138814/2 Calibration Date: 11/20/2016 20:48

Instrument ID: A8\_N Calib Start Date: 11/14/2016 11:42

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 11/14/2016 13:27

Lab File ID: 20NOV2016D\_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8697	0.8775		50.4	50.0	0.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.039	1.010		48.6	50.0	-2.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.517	1.615		47.1	44.2	6.5	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9448	0.996		52.7	50.0	5.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.023	1.016		49.6	50.0	-0.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.059	1.005		43.2	45.5	-5.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.141	1.250		52.1	47.6	9.5	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.050	1.007		48.0	50.0	-4.1	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9823	0.997		50.8	50.0	1.5	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.088	1.031		44.0	46.4	-5.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9011	0.9236		51.2	50.0	2.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9922	0.9919		50.0	50.0	-0.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6079	0.6370		50.5	48.2	4.8	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.028	0.9639		46.9	50.0	-6.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9550	0.9505		49.8	50.0	-0.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9443	0.9451		50.0	50.0	0.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.779	1.608		45.2	50.0	-9.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.307		60.2	50.0	20.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.076	1.232		57.3	50.0	14.5	25.0
13C4 PFBA	Ave	197654	146883		37.2	50.0	-25.7	50.0
13C5-PFPeA	Ave	159887	120140 107243		37.6	50.0	-24.9	50.0
13C2 PFHxA 13C4-PFHpA	Ave	145191 131410	95383		36.9 36.3	50.0	-26.1 -27.4	50.0
1802 PFHxS	Ave	202083	135816		31.8	47.3	-32.8	50.0
13C4 PFOA	Ave	136481	96758		35.4	50.0	-29.1	50.0
13C4 PFOS	Ave	155727	98159		30.1	47.8	-37.0	50.0
13C5 PFNA	Ave	109384	75621		34.6	50.0	-30.9	50.0
13C8 FOSA	Ave	250790	170035		33.9	50.0	-32.2	50.0
13C2 PFDA	Ave	100216	69337		34.6	50.0	-30.8	50.0
13C2 PFUnA	Ave	78435	56563		36.1	50.0	-27.9	50.0
13C2 PFDoA	Ave	77339	52677		34.1	50.0	-31.9	50.0
13C2-PFTeDA	Ave	170624	109296		32.0	50.0	-35.9	50.0
13C2-PFHxDA	Ave	94300	74027		39.3	50.0	-21.5	50.0

Report Date: 23-Nov-2016 15:03:42 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_002.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 20-Nov-2016 20:48:16 ALS Bottle#: 41 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:03:41 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

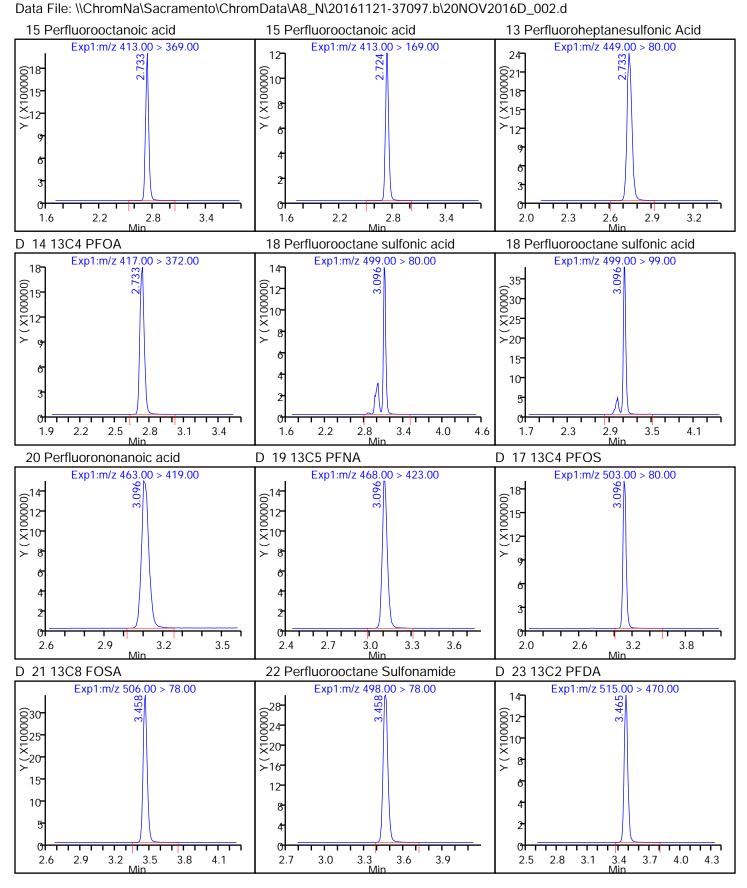
Process Host: XAWRK008

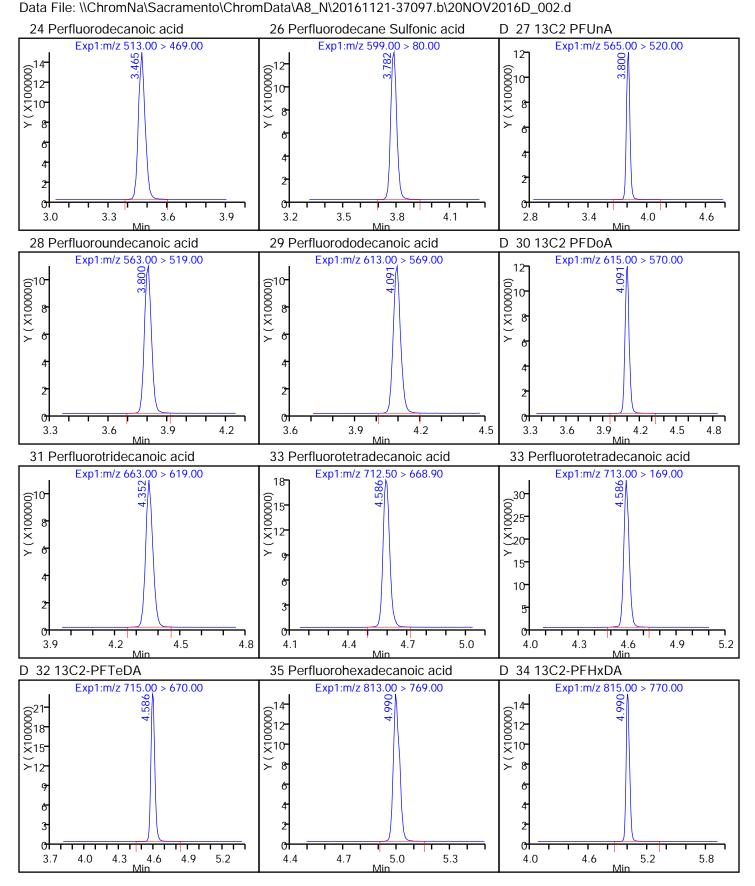
First Level Reviewer: changnoit Date: 23-Nov-2016 15:03:41

First Level Revie	wer: cha	ingnoit			Date:	2				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobut 212.90 > 169.00	•	1.493	0.0	1.000	6444212	50.4		101	74484	
D 2 13C4 PFBA		1.493	0.0	1.000	0444212	30.4		101	74404	
217.00 > 172.00		1.493	0.0		7344165	37.2		74.3	663213	
D 4 13C5-PFP6 267.90 > 223.00		1.752	0.0		6006983	37.6		75.1	860108	
3 Perfluoroper			0.0		0000703	37.0		73.1	000100	
262.90 > 219.00		1.762	0.0	1.000	6067432	48.6		97.2	72289	
5 Perfluorobut 298.90 > 80.00	anesulfo 1.791	nic acid 1.791	0.0	1.000	9697459	47.1		106		
	1.791	1.791	0.0	1.000	4062071	77.1	2.39(0.00-0.00)	100		
7 Perfluorohex										
313.00 > 269.00		2.040	0.0	1.000	5342038	52.7		105	211663	
D 6 13C2 PFHx 315.00 > 270.00		2.040	0.0		5362158	36.9		73.9	336412	
D 11 13C4-PFH	рА									
367.00 > 322.00	2.366	2.366	0.0		4769133	36.3		72.6	322826	
12 Perfluorohe	•			1 000	4045055	40.7			05507	
363.00 > 319.00		2.372	0.0	1.000	4845355	49.6		99.3	35527	
D 10 18O2 PFH 403.00 > 84.00		2.382	0.0		6424085	31.8		67.2	534126	
9 Perfluorohex	anesulfo	onic acid	l							
399.00 > 80.00	2.387	2.387	0.0	1.000	6210088	43.2		94.9		
15 Perfluorooc										
413.00 > 369.00 413.00 > 169.00		<ul><li>2.733</li><li>2.733</li></ul>	0.0 -0.009	1.000 0.997	4873041 3012840	48.0	1.62(0.90-1.10)	95.9	115647 117442	
				0.771	3012040		1.02(0.70-1.10)		11/442	
13 Perfluorohe 449.00 > 80.00		2.733		1.000	5839288 Page 632 of 8	52.1		110	12/08	3/2016
					1 age 032 01 0	774			12/00	<i>,,</i> 2010

Data File:	\\Chr	omNa\S	acrame	nto\Chrom	Data\A8_N\201	61121-3709	7.b\20NOV2016D_0	J02.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	٨									
417.00 > 372.00		2.733	0.0		4837897	35.4		70.9	299705	
18 Perfluorooc					1007077	00.1		70.7	2,,,,,,	
499.00 > 80.00		3.096		1.000	4695529	44.0		94.8	455188	
	3.096	3.096	0.0	1.000	1102784	11.0	4.26(0.90-1.10)	,	126597	
20 Perfluorono							,			
463.00 > 419.00		3.096	0.0	1.000	3770251	50.8		102	32756	
D 19 13C5 PFN										
468.00 > 423.00		3.096	0.0		3781027	34.6		69.1	242453	
D 17 13C4 PFO										
503.00 > 80.00		3.096	0.0		4691990	30.1		63.0	227891	
D 21 13C8 FOS										
506.00 > 78.00		3.458	0.0		8501762	33.9		67.8	422505	
22 Perfluorooc					0001702	00.7		07.0	122000	
498.00 > 78.00		3.458		1.000	7852212	51.2		102	427989	
D 23 13C2 PFD		0.100	0.0	1.000	7002212	01.2		102	127707	
515.00 > 470.00		3.465	0.0		3466859	34.6		69.2	230230	
24 Perfluorode			0.0		3400037	34.0		07.2	230230	
513.00 > 469.00		3.465	0.0	1.000	3438847	50.0		100.0	109294	
				1.000	3430047	30.0		100.0	107274	
26 Perfluorode 599.00 > 80.00		3.782		1.000	3013591	50.5		105		
		3.702	0.0	1.000	3013371	50.5		103		
D 27 13C2 PFU 565.00 > 520.00		3.800	0.0		2828127	36.1		72.1	371765	
			0.0		2020127	30.1		12.1	3/1/03	
28 Perfluoroun 563.00 > 519.00		3.800	0.0	1.000	2724152	46.9		93.8	76914	
			0.0	1.000	2726152	40.9		93.0	70914	
29 Perfluorodo			0.0	1 000	2502275	40.0		00.5	F24F0	
613.00 > 569.00		4.091	0.0	1.000	2503375	49.8		99.5	52459	
D 30 13C2 PFD		4.004	0.0		0/2202/	24.1		.01	157500	
615.00 > 570.00			0.0		2633836	34.1		68.1	157508	
31 Perfluorotrio				1 000	0.4000.40	50.0		400	00007	
663.00 > 619.00		4.352	0.0	1.000	2489248	50.0		100	82827	
33 Perfluorotet										
712.50 > 668.90		4.586	0.0	1.000	4236325	45.2	F 70/0 00 0 00)	90.4	134826	
713.00 > 169.00		4.586	0.0	1.000	739952		5.73(0.00-0.00)		160308	
D 32 13C2-PFT										
715.00 > 670.00		4.586			5464787	32.0		64.1	455209	
35 Perfluorohe										
813.00 > 769.00	4.990	4.990	0.0	1.000	3442320	60.2		120	73786	
D 34 13C2-PFH	xDA									
815.00 > 770.00	4.990	4.990	0.0		3701372	39.3		78.5	490356	
36 Perfluorooc	tadecan	oic acid								
913.00 > 869.00	5.344	5.344	0.0	1.000	3245904	57.3		115	36508	
Reagents:										
LCPFC-L5_0002	20			Amount A	dded: 1.00	Units	:: mL			

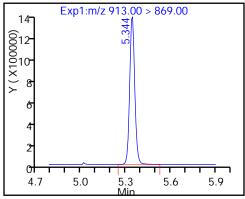
Report Date: 23-Nov-2016 15:03:42 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 20:48:16 Instrument ID: A8\_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 (28-(00024-120-120-<u>@</u>30 825 ∑<sub>20</sub>-<del>-</del>16 15<del>-</del> 12 10 2.0 0.9 1.1 1.7 1.2 1.5 1.8 1.1 2.0 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 28 42 (0000 30-30-00024 0020 18 12 1.9 2.2 1.6 1.5 2.1 1.5 1.3 1.2 1.8 1.2 1.8 2.1 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 24 24 940 (018 000015 X )12 ©21<del>-</del> ©21<del>-</del> ×15 <u>×</u>15 1.7 2.0 2.3 1.5 1.8 2.1 1.9 2.2 2.5 2.6 1.2 2.4 2.7 2.8 3.1 1.4 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 024 0020 ×<sub>16</sub> 0 0 1.8 2.1 2.4 2.7 3.0 1.5 3.0 1.8 2.1 2.4 1.5





Report Date: 23-Nov-2016 15:03:42 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_002.d



Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: <u>CCV 320-138814/11</u> Calibration Date: <u>11/20/2016</u> 21:55

Instrument ID: A8\_N Calib Start Date: 11/14/2016 11:42

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 11/14/2016 13:27

Lab File ID: 20NOV2016D\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8697	0.8611		49.5	50.0	-1.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.039	0.9825		47.3	50.0	-5.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.517	1.662		48.4	44.2	9.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9448	0.9182		48.6	50.0	-2.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.023	1.013		49.5	50.0	-1.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.059	1.010		43.4	45.5	-4.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.141	1.158		48.3	47.6	1.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.050	1.050		50.0	50.0	-0.0	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.088	1.044		44.5	46.4	-4.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9823	1.038		52.8	50.0	5.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9011	0.8902		49.4	50.0	-1.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9922	0.9746		49.1	50.0	-1.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6079	0.6245		49.5	48.2	2.7	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.028	1.026		49.9	50.0	-0.2	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9550	0.9408		49.3	50.0	-1.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9443	0.9684		51.3	50.0	2.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.779	1.566		44.0	50.0	-12.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.347		62.0	50.0	24.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.076	1.263		58.7	50.0	17.4	25.0
13C4 PFBA	Ave	197654	147972		37.4	50.0	-25.1	50.0
13C5-PFPeA	Ave	159887	121453		38.0	50.0	-24.0	50.0
13C2 PFHxA	Ave	145191	112651		38.8	50.0	-22.4	50.0
13C4-PFHpA	Ave	131410	92113		35.0	50.0	-29.9	50.0
1802 PFHxS	Ave	202083	131666		30.8	47.3	-34.8	50.0
13C4 PFOA	Ave	136481	91520		33.5	50.0	-32.9	50.0
13C4 PFOS	Ave	155727	97020		29.8	47.8	-37.7	50.0
13C5 PFNA	Ave	109384	74345		34.0	50.0	-32.0	50.0
13C8 FOSA	Ave	250790	172784		34.4	50.0	-31.1	50.0
13C2 PFDA	Ave	100216	67411		33.6	50.0	-32.7	50.0
13C2 PFUnA	Ave	78435	53896		34.4	50.0	-31.3	50.0
13C2 PFDoA	Ave	77339	52252		33.8	50.0	-32.4	50.0
13C2-PFTeDA	Ave	170624	108402		31.8	50.0	-36.5	50.0
13C2-PFHxDA	Ave	94300	75144		39.8	50.0	-20.3	50.0

Report Date: 23-Nov-2016 15:44:43 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_011.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 20-Nov-2016 21:55:50 ALS Bottle#: 41 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:44:42 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

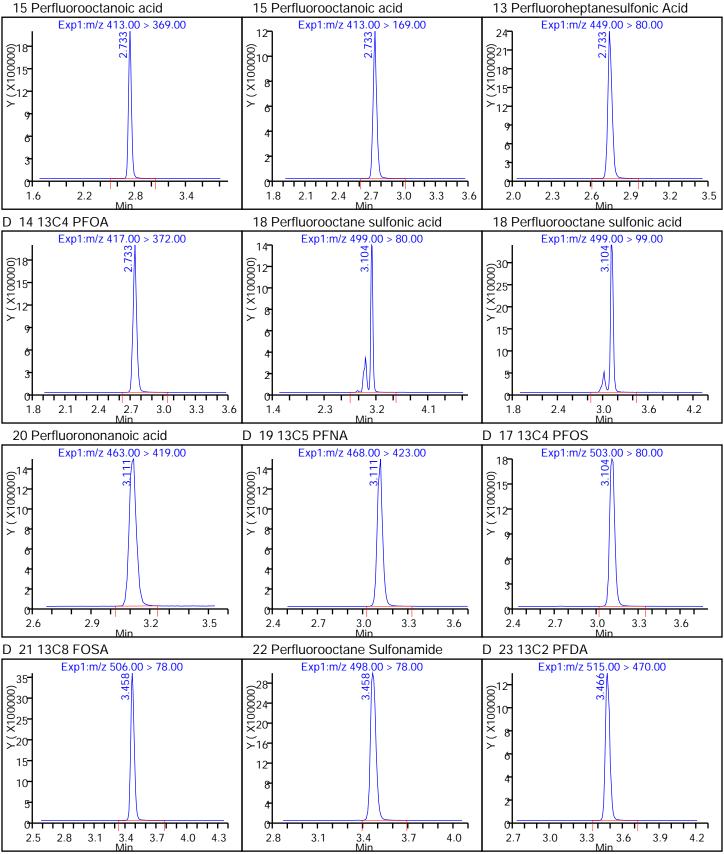
Process Host: XAWRK008

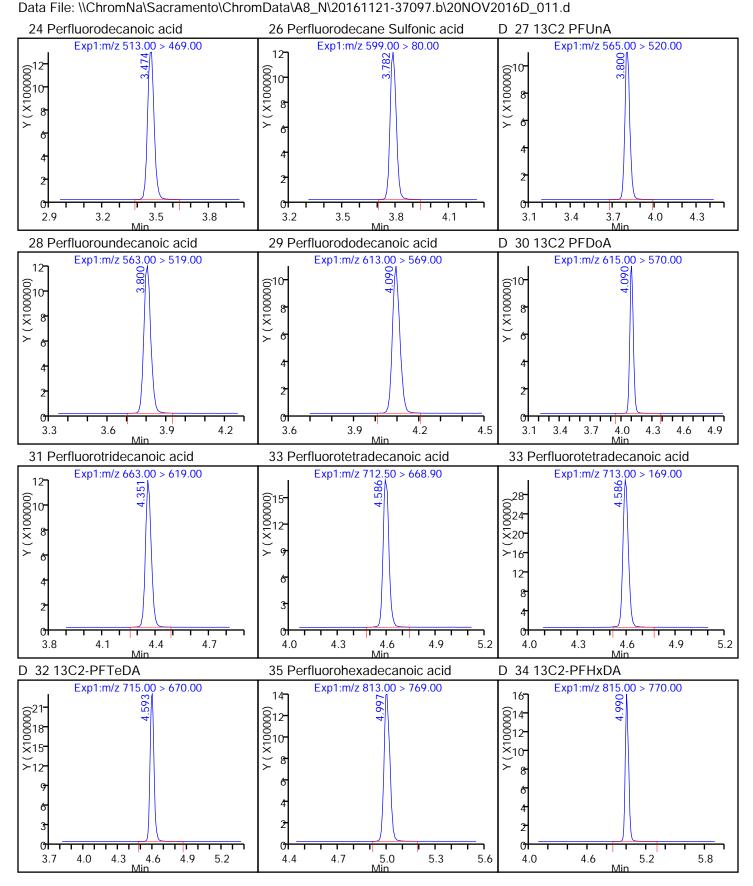
First Level Reviewer: changnoit Date: 23-Nov-2016 15:41:51

First Level Revie	wer: cha	ngnoit			Date:	2	23-Nov-2016 15:41:5	.1		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobut 212.90 > 169.00	,	1.493	0.0	1.000	6370903	49.5		99.0	68094	
D 2 13C4 PFBA 217.00 > 172.00		1.493	0.0		7398624	37.4		74.9	570248	
D 4 13C5-PFP6 267.90 > 223.00		1.752	0.0		6072628	38.0		76.0	1322600	)
3 Perfluoroper 262.90 > 219.00		cid 1.762	0.0	1.000	5966031	47.3		94.6	96268	
5 Perfluorobut 298.90 > 80.00	1.800	1.791	0.009	1.000	9673076	48.4	0.04/0.00.0.00	110		
298.90 > 99.00 7 Perfluorohex 313.00 > 269.00		1.791 cid 2.040	0.009	1.000	4126410 5171656	48.6	2.34(0.00-0.00)	97.2	155288	
D 6 13C2 PFHx 315.00 > 270.00	A	2.040	0.0	1.000	5632546	38.8		77.6	354772	
D 11 13C4-PFH 367.00 > 322.00	рА	2.366	0.006		4605647	35.0		70.1	483226	
12 Perfluorohe 363.00 > 319.00	ptanoic a			1.000	4666043	49.5		99.0	25659	
D 10 1802 PFH 403.00 > 84.00		2.382	0.005		6227795	30.8		65.2	586774	
9 Perfluorohex 399.00 > 80.00		onic acid 2.387		1.000	6051452	43.4		95.4		
15 Perfluorooci 413.00 > 369.00	2.733	2.733	0.0	1.000	4803453	50.0		100.0	92519	
413.00 > 169.00 13 Perfluorohe	ptanesul			1.000	2790757		1.72(0.90-1.10)		132269	
449.00 > 80.00	2.733	2.733	0.0	1.000	Page 639 of 84	42 <sup>48.3</sup>		101	12/08	3/2016

**EXP REL** DLT **Amount** Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags D 14 13C4 PFOA 417.00 > 372.00 2.733 2.733 0.0 4575982 33.5 327407 67.1 18 Perfluorooctane sulfonic acid 3.096 44.5 499.00 > 80.00 3.104 0.008 1.000 4699369 96.0 333294 499.00 > 99.00 3.104 3.096 0.008 1.000 4.53(0.90-1.10) 113067 1037758 20 Perfluorononanoic acid 463.00 > 419.00 3.111 3.096 0.015 1.000 3858640 52.8 106 37604 D 19 13C5 PFNA 468.00 > 423.00 3.111 3.096 0.015 3717256 34.0 68.0 248180 D 17 13C4 PFOS 503.00 > 80.00 3.104 3.096 29.8 175411 0.008 4637571 62.3 D 21 13C8 FOSA 506.00 > 78.00 3.458 3.458 0.0 8639220 34.4 502754 68.9 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.458 3.458 49.4 1.000 7690266 98.8 207653 D 23 13C2 PFDA 515.00 > 470.00 3.466 3.465 0.001 3370546 33.6 67.3 214814 24 Perfluorodecanoic acid 513.00 > 469.00 3.474 3.465 3284946 49.1 98.2 156664 0.009 1.000 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.782 3.782 0.0 1.000 2920463 49.5 103 D 27 13C2 PFUnA 565.00 > 520.00 3.800 3.800 0.0 2694817 34.4 68.7 151637 28 Perfluoroundecanoic acid 563.00 > 519.00 3.800 49.9 99.8 84982 3.800 0.0 1.000 2764031 29 Perfluorododecanoic acid 613.00 > 569.00 4.090 4.091 -0.001 1.000 2457839 49.3 98.5 60305 D 30 13C2 PFDoA 615.00 > 570.00 4.090 -0.001215076 4.091 2612613 33.8 67.6 31 Perfluorotridecanoic acid 663.00 > 619.00 4.351 91788 4.352 -0.001 1.000 2530150 51.3 103 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.586 4.586 0.0 1.000 4090556 44.0 88.0 114812 713.00 > 169.00 4.586 4.586 0.0 1.000 729063 5.61(0.00-0.00) 153970 D 32 13C2-PFTeDA 4.586 715.00 > 670.00 4.593 5420097 559436 0.007 31.8 63.5 35 Perfluorohexadecanoic acid 813.00 > 769.00 4.997 4.990 0.007 1.000 3519672 62.0 124 92329 D 34 13C2-PFHxDA 815.00 > 770.00 4.990 4.990 0.0 3757206 39.8 79.7 522298 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.337 5.344 -0.007 1.000 3300316 58.7 117 35104 Reagents: LCPFC-L5\_00020 Amount Added: 1.00 Units: mL

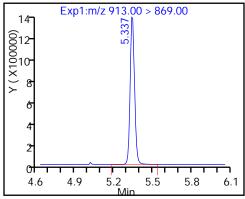
Report Date: 23-Nov-2016 15:44:43 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 21:55:50 Instrument ID: A8\_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 35 28 (000001 20 ©24 00 020 8<sub>25</sub>-15 12 10 2.0 1.0 1.9 1.9 1.1 1.4 1.7 0.7 1.3 1.6 0.7 1.3 2.5 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 42 (518 (500015 (512 (518) (0000 30-30-024 0020 18 12 1.3 1.9 2.2 2.5 1.5 1.8 2.1 2.4 1.5 1.0 1.6 1.2 1.2 1.8 2.1 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00Exp1:m/z 367.00 > 322.00 040 (018 000015 X )12 (000001 ×16 12 1.7 2.0 1.5 1.8 2.1 2.0 2.3 2.3 2.6 2.4 2.7 1.7 2.9 1.2 2.6 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 (28-(000024-1) 20 (0000015<del>-</del> X)12-**≻**16 12 0<del>|</del> 0 1.9 1.9 2.2 2.5 2.8 1.4 1.7 2.5 1<u>2/08/2016</u> 1.3





Report Date: 23-Nov-2016 15:44:43 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_011.d



Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: CCV 320-138814/22 Calibration Date: 11/20/2016 23:18

Instrument ID: A8\_N Calib Start Date: 11/14/2016 11:42

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 11/14/2016 13:27

Lab File ID: 20NOV2016D\_022.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8697	0.8557		49.2	50.0	-1.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.039	0.995		47.9	50.0	-4.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.517	1.595		46.5	44.2	5.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9448	0.9183		48.6	50.0	-2.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.023	1.030		50.3	50.0	0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.059	1.014		43.5	45.5	-4.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.050	0.9813		46.7	50.0	-6.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.141	1.187		49.5	47.6	4.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9823	1.000		50.9	50.0	1.8	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.088	1.053		44.9	46.4	-3.2	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9922	0.9804		49.4	50.0	-1.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9011	0.8792		48.8	50.0	-2.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6079	0.5817		46.1	48.2	-4.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.028	0.9666		47.0	50.0	-6.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9550	0.9459		49.5	50.0	-0.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9443	0.9432		49.9	50.0	-0.1	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.779	1.676		47.1	50.0	-5.8	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.340		61.7	50.0	23.4	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.076	1.282		59.6	50.0	19.2	25.0
13C4 PFBA	Ave	197654	144753		36.6	50.0	-26.8	50.0
13C5-PFPeA	Ave	159887	120780		37.8	50.0	-24.5	50.0
13C2 PFHxA	Ave	145191	106709		36.7	50.0	-26.5	50.0
13C4-PFHpA	Ave	131410	89963		34.2	50.0	-31.5	50.0
1802 PFHxS	Ave	202083	134562		31.5	47.3	-33.4	50.0
13C4 PFOA	Ave	136481	98036		35.9	50.0	-28.2	50.0
13C4 PFOS	Ave	155727	98098		30.1	47.8	-37.0	50.0
13C5 PFNA	Ave	109384	75085		34.3	50.0	-31.4	50.0
13C8 FOSA	Ave	250790	169990		33.9	50.0	-32.2	50.0
13C2 PFDA	Ave	100216	66347		33.1	50.0	-33.8	50.0
13C2 PFUnA	Ave	78435	51818		33.0	50.0	-33.9	50.0
13C2 PFDoA	Ave	77339	50070		32.4	50.0	-35.3	50.0
13C2-PFTeDA	Ave	170624	108432		31.8	50.0	-36.4	50.0
13C2-PFHxDA	Ave	94300	73838		39.2	50.0	-21.7	50.0

Report Date: 23-Nov-2016 16:23:50 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_022.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 20-Nov-2016 23:18:21 ALS Bottle#: 41 Worklist Smp#: 22

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 16:23:49 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

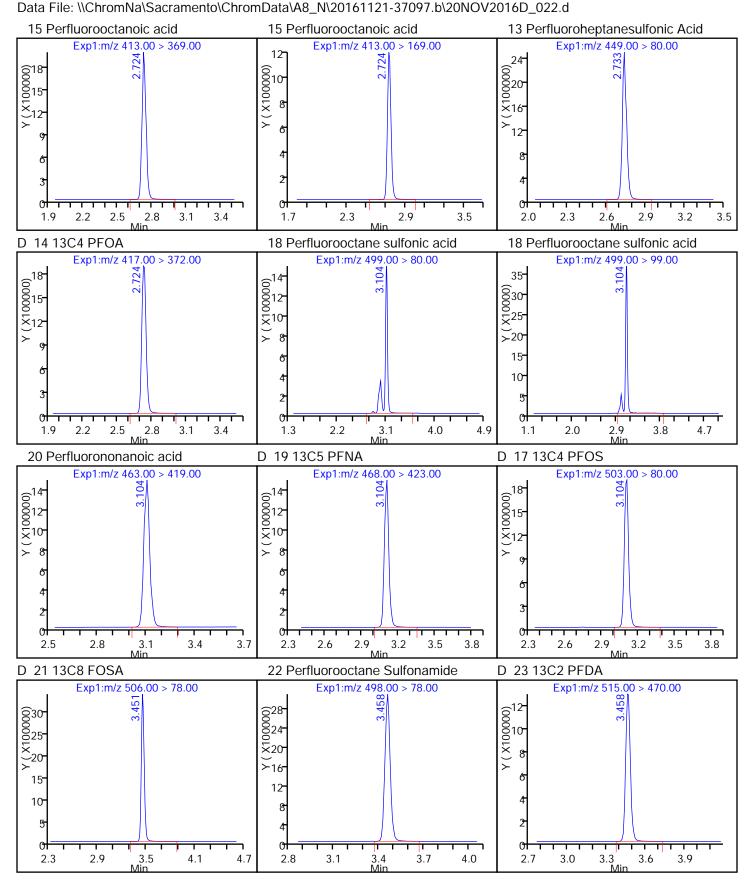
Process Host: XAWRK008

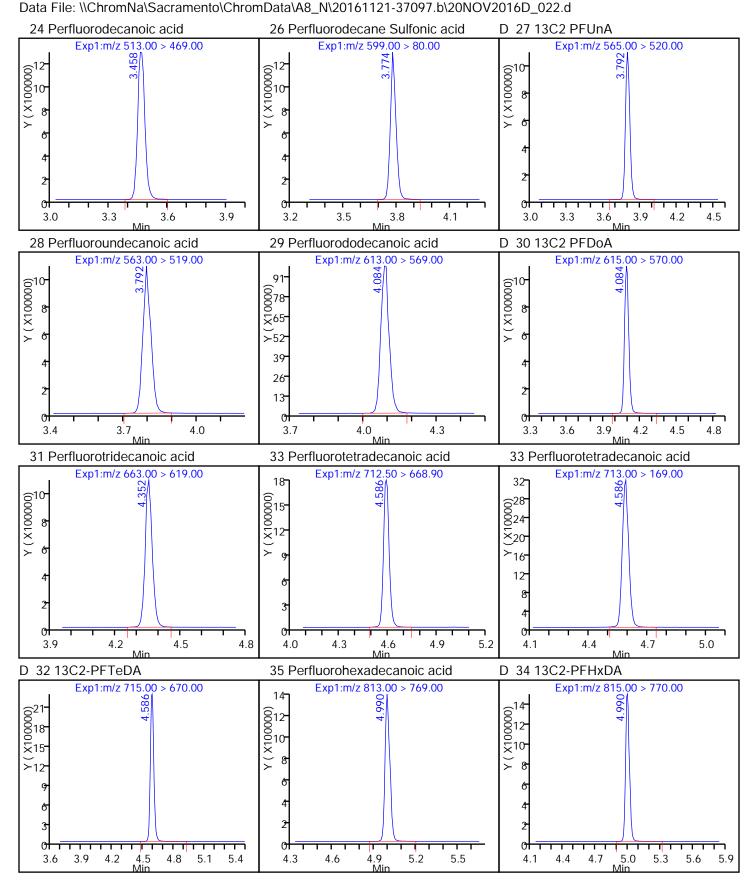
First Level Reviewer: changnoit Date: 23-Nov-2016 16:23:49

First Level Revie	wer: cha	ingnoit			Date:	2	23-Nov-2016 16:23:4			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	•									
212.90 > 169.00		1.493	0.0	1.000	6192921	49.2		98.4	60637	
D 2 13C4 PFBA 217.00 > 172.00		1.493	0.0		7237625	36.6		73.2	653704	
D 4 13C5-PFPe		4 750				07.0			077044	
267.90 > 223.00		1.752	0.0		6039008	37.8		75.5	877046	
3 Perfluoropen 262.90 > 219.00		1.762	-0.010	1.000	6009353	47.9		95.8	64936	
5 Perfluorobuta 298.90 > 80.00	anesulfo 1.791	nic acid 1.791	0.0	1.000	9484998	46.5		105		
	1.791	1.791	0.0	1.000	4107442	40.5	2.31(0.00-0.00)	103		
7 Perfluorohex										
313.00 > 269.00		2.040	-0.006	1.000	4899606	48.6		97.2	151941	
D 6 13C2 PFHx 315.00 > 270.00		2.040	-0.006		5335453	36.7		73.5	475486	
D 11 13C4-PFH <sub>j</sub> 367.00 > 322.00		2.366	0.0		4400150	24.2		/ O. F	319272	
12 Perfluorohe			0.0		4498158	34.2		68.5	319212	
363.00 > 319.00			-0.006	1.000	4633345	50.3		101	33465	
D 10 18O2 PFH		2 202	0.0		/ 3/ 4005	21 5		///	45/255	
403.00 > 84.00 9 Perfluorohex		2.382	0.0		6364805	31.5		66.6	456255	
399.00 > 80.00		2.387		1.000	6205731	43.5		95.7		
15 Perfluorooct										
413.00 > 369.00 413.00 > 169.00		<ul><li>2.733</li><li>2.733</li></ul>	-0.009 -0.009	1.000 1.000	4810293 2865130	46.7	1.68(0.90-1.10)	93.5	97278 123600	
13 Perfluoroher				1.000	2000100				.20000	
	2.733	2.733		1.000	Page 646 of 8	42 <sup>49.5</sup>		104	12/08	3/2016

**EXP** DLT REL **Amount** Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags D 14 13C4 PFOA 417.00 > 372.00 2.724 2.733 -0.009 4901816 35.9 71.8 227918 18 Perfluorooctane sulfonic acid 3.096 44.9 350000 499.00 > 80.00 3.104 0.008 1.000 4791963 96.8 1094661 499.00 > 99.00 3.104 3.096 0.008 1.000 4.38(0.90-1.10) 366148 20 Perfluorononanoic acid 463.00 > 419.00 3.104 3.096 0.008 1.000 3755684 50.9 102 44240 D 19 13C5 PFNA 468.00 > 423.00 3.104 3.096 0.008 3754258 34.3 68.6 292317 D 17 13C4 PFOS 503.00 > 80.00 3.104 3.096 4689095 30.1 0.008 63.0 186358 D 21 13C8 FOSA 506.00 > 78.00 3.451 3.458 -0.007 8499488 33.9 67.8 848414 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.458 3.458 48.8 300024 0.0 1.000 7472892 97.6 D 23 13C2 PFDA 515.00 > 470.00 3.458 3.465 -0.007 3317331 33.1 66.2 213897 24 Perfluorodecanoic acid 513.00 > 469.00 3.458 3.465 -0.007 3252194 49.4 98.8 123191 1.000 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.774 3.782 -0.008 1.000 2750558 46.1 95.7 D 27 13C2 PFUnA 565.00 > 520.00 3.792 3.800 -0.0082590898 33.0 66.1 204301 28 Perfluoroundecanoic acid 563.00 > 519.00 3.792 47.0 3.800 -0.008 1.000 2504329 94.0 77749 29 Perfluorododecanoic acid 613.00 > 569.00 4.084 4.091 -0.007 1.000 2368129 49.5 99.1 57534 D 30 13C2 PFDoA 615.00 > 570.00 4.084 -0.007201406 4.091 2503504 32.4 64.7 31 Perfluorotridecanoic acid 663.00 > 619.00 4.352 1.000 49.9 99.9 78661 4.352 0.0 2361282 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.586 94.2 4.586 0.0 1.000 4196312 47.1 122514 713.00 > 169.00 4.586 4.586 0.0 1.000 739930 5.67(0.00-0.00) 159602 D 32 13C2-PFTeDA 4.586 0.0 715.00 > 670.00 4.586 1128468 5421612 31.8 63.6 35 Perfluorohexadecanoic acid 813.00 > 769.00 4.990 4.990 0.0 1.000 3354136 61.7 123 106071 D 34 13C2-PFHxDA 815.00 > 770.00 4.990 4.990 0.0 3691918 39.2 78.3 367948 36 Perfluorooctadecanoic acid 5.344 -0.007 913.00 > 869.00 5.337 1.000 3210569 59.6 119 39896 Reagents: LCPFC-L5\_00020 Amount Added: 1.00 Units: mL

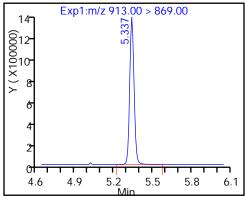
Report Date: 23-Nov-2016 16:23:50 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 23:18:21 Instrument ID: A8\_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 22 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 <u>@</u>24 ©24 00 020 00020-×)16-×<sub>20</sub> 15 12 10 1.7 2.0 0.9 1.8 0.9 1.2 1.8 1.1 1.2 1.5 1.5 2.1 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 21-(42<sup>-</sup> 00036<sup>-</sup> 130<sup>-</sup> (000015 X ) 024 0020 ∑24<sup>.</sup> 18 12 1.9 2.2 1.6 1.2 1.5 2.1 1.5 1.8 1.3 1.8 1.2 2.1 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 24 (000018 (000018 X) > 12 (018 000015 X )12 ©21<del>-</del> ×15 12 01 1.8 2.2 2.8 2.0 2.3 2.9 1.5 2.1 2.4 1.0 1.6 1.7 2.6 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 21 28 000024<del>-</del> ×16-12 0 0 1.8 2.1 2.4 2.7 Page 64/8h of 842 1.9 1.8 2.1 2.4 2.7 1.5 3.0 3.3 1.3 2.5 1<u>2/08/2016</u>





Report Date: 23-Nov-2016 16:23:50 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_022.d



Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: <u>ICV 320-140382/12</u> Calibration Date: <u>12/02/2016</u> 11:29

Instrument ID: A8\_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016A\_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8586		48.5	50.0	-3.0	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9596		46.1	50.0	-7.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.563		42.9	44.3	-3.1	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9142		47.8	50.0	-4.4	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	0.9597		46.4	50.0	-7.2	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	0.9737		43.4	47.3	-8.1	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	0.9852		48.3	50.0	-3.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.153		47.0	47.6	-1.4	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	0.9062		39.8	47.8	-16.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.9578		48.3	50.0	-3.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9322		49.8	50.0	-0.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9099		46.9	50.0	-6.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.5941		45.7	48.3	-5.3	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9368		44.2	50.0	-11.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.8975		47.4	50.0	-5.2	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9223		44.3	50.0	-11.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.845		47.7	50.0	-4.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.014		50.7	50.0	1.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.026		65.3	50.0	29.6*	25.0
13C4 PFBA	Ave	340300	315108		46.3	50.0	-7.4	50.0
13C5-PFPeA	Ave	270194	250588		46.4	50.0	-7.3	50.0
13C2 PFHxA	Ave	246480	226803		46.0	50.0	-8.0	50.0
13C4-PFHpA	Ave	210510	197868		47.0	50.0	-6.0	50.0
1802 PFHxS	Ave	302453	298386		46.7	47.3	-1.3	50.0
13C4 PFOA	Ave	219411	208024		47.4	50.0	-5.2	50.0
13C4 PFOS	Ave	244616	241692		47.2	47.8	-1.2	50.0
13C5 PFNA	Ave	178109	162087		45.5	50.0	-9.0	50.0
13C8 FOSA	Ave	414253	389267		47.0	50.0	-6.0	50.0
13C2 PFDA	Ave	166067	160722		48.4	50.0	-3.2	50.0
13C2 PFUnA	Ave	125779	115580		45.9	50.0	-8.1	50.0
13C2 PFDoA	Ave	116905	110755		47.4	50.0	-5.3	50.0
13C2-PFTeDA	Ave	241899	239157		49.4	50.0	-1.1	50.0
13C2-PFHxDA	Ave	130373	130244		50.0	50.0	-0.1	50.0

Report Date: 02-Dec-2016 16:10:34 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_012.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 02-Dec-2016 11:29:31 ALS Bottle#: 44 Worklist Smp#: 12

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: ICV\_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist:

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 16:10:33 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

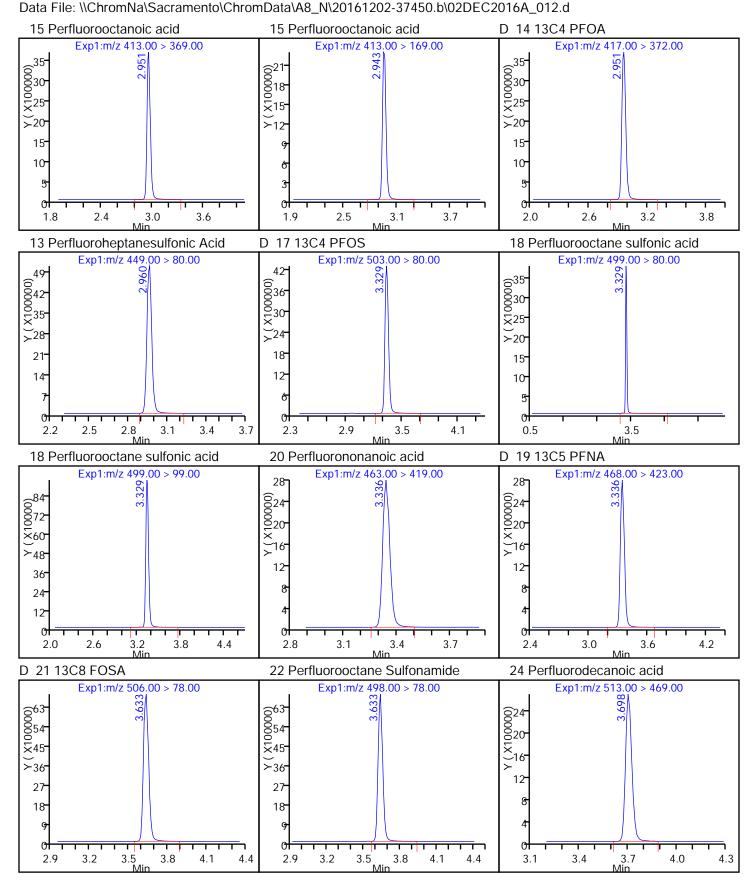
Process Host: XAWRK025

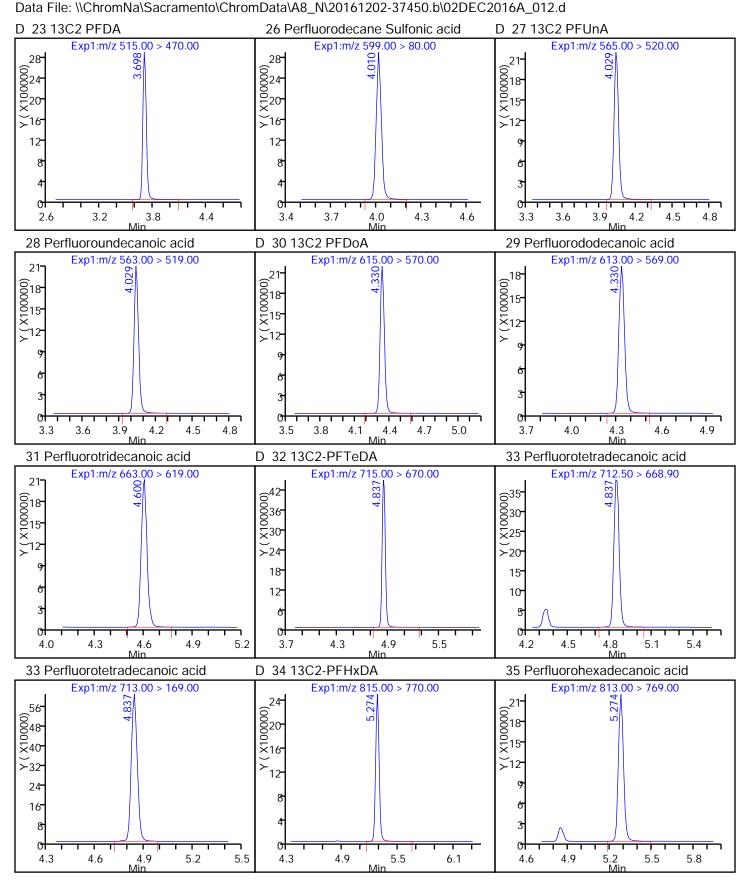
First Level Reviewer: barnettj Date: 02-Dec-2016 16:10:33

_	First Level Revie	wer: bar	nettj			Date:	C	)2-Dec-2016 16:10:3	3		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 2 13C4 PFBA 217.00 > 172.00		1.615	-0.017		15755416	46.3		92.6	122646	3
	1 Perfluorobuty 212.90 > 169.00	,	1.617	-0.011	1.000	13527367	48.5			149480	
	O 4 13C5-PFPe 267.90 > 223.00	1.897	1.918	-0.021		12529404	46.4		92.7	998019	
	3 Perfluoropen 262.90 > 219.00	1.897	1.920	-0.023	1.000	12023152	46.1			109623	
	5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.936	1.961 1.961	-0.025 -0.025	1.000 1.000	20638621 9604105	42.9	2.15(0.00-0.00)			
	O 6 13C2 PFHx 315.00 > 270.00		2.239	-0.026		11340128	46.0		92.0	872752	
	7 Perfluorohex 313.00 > 269.00	2.213	2.241	-0.028	1.000	10367089	47.8			388218	
	O 11 13C4-PFH <sub>I</sub> 367.00 > 322.00	2.566	2.599	-0.033		9893393	47.0		94.0	126313	3
	12 Perfluorohe <sub>l</sub> 363.00 > 319.00 D 10 18O2 PFH:	2.573	2.600	-0.027	1.000	9494636	46.4			159398	
	403.00 > 84.00	2.589	2.614	-0.025		14113680	46.7		98.7	888579	
	9 Perfluorohex 399.00 > 80.00	2.589	2.615	-0.026	1.000	13727834	43.4				
	15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.951	2.984 2.984	-0.033 -0.041	1.000 0.997	10247185 6439506	48.3	1.59(0.90-1.10)		136835 319423	
	D 14 13C4 PFO 417.00 > 372.00		2.984	-0.033		10401182 Page 653 of 8	42 <sup>47.4</sup>		94.8	602068 12/08	3/2016

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61202-3745	0.b\02DEC2016A_0	)12.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
12 Dorflyorobo	ntanacu	Ifonio Ao	id				•			
13 Perfluorohe 449.00 > 80.00	•		-0.026	1.000	13266199	47.0				
D 17 13C4 PFO		2.700	-0.020	1.000	13200177	47.0				
503.00 > 80.00		3 365	-0.036		11552855	47.2		98.8	248324	
18 Perfluorooc					11002000	77.2		70.0	240024	
499.00 > 80.00			-0.037	1.000	10458074	39.8			188710	2
499.00 > 99.00		3.366	-0.037	1.000	2551302	37.0	4.10(0.90-1.10)		466085	
20 Perfluorono							,			
463.00 > 419.00			-0.037	1.000	7761968	48.3			97406	
D 19 13C5 PFN										
468.00 > 423.00		3.374	-0.038		8104346	45.5		91.0	462400	
D 21 13C8 FOS										
506.00 > 78.00		3.651	-0.018		19463355	47.0		94.0	341722	
22 Perfluorooc										
498.00 > 78.00			-0.023	1.000	18143701	49.8			283379	
24 Perfluorode			0.020			.,,,				
513.00 > 469.00			-0.040	1.000	7312192	46.9			156765	
D 23 13C2 PFD		0.700	0.0.0		7012172	1017				
515.00 > 470.00		3 738	-0.040		8036093	48.4		96.8	321643	
26 Perfluorode					0000070	10.1		70.0	021010	
599.00 > 80.00			-0.039	1.000	6928568	45.7				
D 27 13C2 PFU		1.017	0.007	1.000	0720000	10.7				
565.00 > 520.00		4.070	-0.041		5778978	45.9		91.9	312840	
28 Perfluoroun			0.041		3770770	40.7		71.7	312040	
563.00 > 519.00			-0.042	1.000	5413472	44.2			130245	
D 30 13C2 PFD		4.071	0.042	1.000	3413472	77.2			100240	
615.00 > 570.00		4.370	-0.040		5537768	47.4		94.7	163474	
29 Perfluorodo			0.040		3337700	77.7		74.7	100474	
613.00 > 569.00			-0.040	1 000	4970310	47.4			6635	
			-0.040	1.000	4970310	47.4			0033	
31 Perfluorotrio 663.00 > 619.00			-0.036	1.000	5107276	44.3			7225	
		4.030	-0.030	1.000	3107270	44.3			1223	
D 32 13C2-PFT 715.00 > 670.00		1 002	0.045		11057040	40.4		00.0	420007	
			-0.045		11957860	49.4		98.9	638807	
33 Perfluorotet			0.047	1 000	10010574	47.7			F00F	
712.50 > 668.90 713.00 > 169.00			-0.04 <i>7</i> -0.047	1.000 1.000	10218574 1568084	47.7	6.52(0.00-0.00)		5085 100324	
		4.004	-0.047	1.000	1300004		0.52(0.00-0.00)		100324	
D 34 13C2-PFH		F 220	0.047		/ [10177	F0 0		00.0	100170	
815.00 > 770.00			-0.046		6512177	50.0		99.9	123170	
35 Perfluorohe			0.047	1 000	F/47400	F0.7			<b>/ F 0 0</b>	
813.00 > 769.00			-0.046	1.000	5617133	50.7			6502	
36 Perfluorooc			0.657	4.000	E / 00 100	<b></b>			7/00	
913.00 > 869.00	5.664	5.720	-0.056	1.000	5682438	65.3			7600	
Reagents:	_						_			
LCPFCIC_00020	)		Α	mount A	dded: 1.00	Units	: mL			

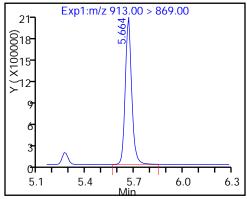
Report Date: 02-Dec-2016 16:10:34 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: 02-Dec-2016 11:29:31 **Injection Date:** Instrument ID: A8\_N Lims ID: **ICV** Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 12 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 42 000042 X 00042 X <u>8</u>36-<u>8</u>30-<u></u> ∠28-28 18 21 21 12 14 2.2 1.0 1.6 2.8 1.1 1.4 1.7 2.0 0.9 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 42 (77<del>-</del> 000042 0035 00001 00030-<del>-</del>55<del>-</del> 24 **≻44** 18 21 33 22 11 1.9 1.7 2.2 2.5 2.0 2.3 2.2 2.5 1.6 1.3 1.6 1.3 1.4 D 11 13C4-PFHpA D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313,00 > 269.00 Exp1:m/z 367.00 > 322.00 (35-0030-1×25-(0000130° ×) 24° 635<del>-</del> 6030-×25 ≻20 ≻20 18 15 15<del>-</del> 12 10 10 01 1.9 2.2 1.8 2.1 2.4 3.0 1.9 2.2 2.5 2.8 2.5 2.8 2.7 3.1 1.6 1.5 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403,00 > 84.00 Exp1:m/z 399.00 > 80.00 35 49 649 0042 0042 00000 25-X 00042 0005 00042 ×35-<del>\_</del>28− **≻28**-15 21 21 10 14 0 0 1.9 2.2 2.5 2.8 3.1 0.9 1.8 2.7 1.8 12/08/2016





Report Date: 02-Dec-2016 16:10:34 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_012.d



Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: CCV 320-140382/33 Calibration Date: 12/02/2016 14:07

Instrument ID: A8\_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016B\_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	0.8853	0.8758		49.5	50.0	-1.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	1.005		48.3	50.0	-3.4	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.603		43.9	44.2	-0.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9174		48.0	50.0	-4.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.049		50.7	50.0	1.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.043		44.8	45.5	-1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.180		48.1	47.6	1.0	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.039		50.9	50.0	1.8	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.085		46.3	46.4	-0.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	1.021		51.5	50.0	3.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9330		49.9	50.0	-0.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9515		49.1	50.0	-1.8	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6724		51.7	48.2	7.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9696		45.8	50.0	-8.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9177		48.5	50.0	-3.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9138		43.9	50.0	-12.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.787		46.2	50.0	-7.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9916		49.5	50.0	-1.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.066		67.8	50.0	34.7*	25.0
13C4 PFBA	Ave	340300	335757		49.3	50.0	-1.3	50.0
13C5-PFPeA	Ave	270194	250425		46.3	50.0	-7.3	50.0
13C2 PFHxA	Ave	246480	227356		46.1	50.0	-7.8	50.0
13C4-PFHpA	Ave	210510	191867		45.6	50.0	-8.9	50.0
1802 PFHxS	Ave	302453	308064		48.2	47.3	1.9	50.0
13C4 PFOA	Ave	219411	210600		48.0	50.0	-4.0	50.0
13C4 PFOS	Ave	244616	241592		47.2	47.8	-1.2	50.0
13C5 PFNA	Ave	178109	156864		44.0	50.0	-11.9	50.0
13C8 FOSA	Ave	414253	386173		46.6	50.0	-6.8	50.0
13C2 PFDA	Ave	166067	158308		47.7	50.0	-4.7	50.0
13C2 PFUnA	Ave	125779	115394		45.9	50.0	-8.3	50.0
13C2 PFDoA	Ave	116905	108732		46.5	50.0	-7.0	50.0
13C2-PFTeDA	Ave	241899	215271		44.5	50.0	-11.0	50.0
13C2-PFHxDA	Ave	130373	117574		45.1	50.0	-9.8	50.0

Report Date: 02-Dec-2016 15:04:49 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_010.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 02-Dec-2016 14:07:05 ALS Bottle#: 41 Worklist Smp#: 33

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 15:04:48 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 15:04:48

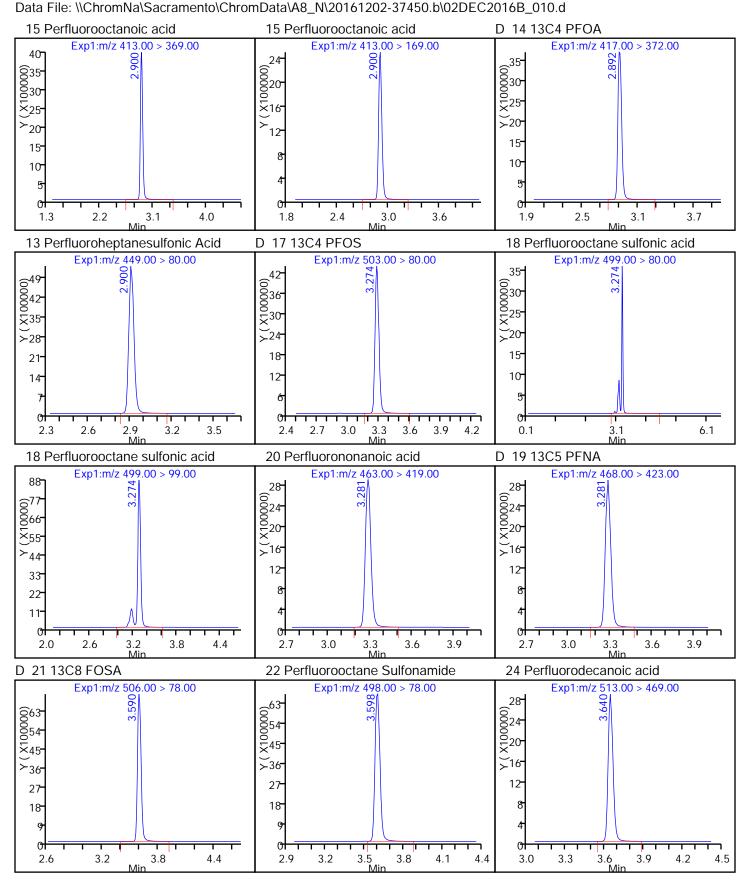
First Level Revie	wer: cha	ındrasen	nas		Date:	C	)2-Dec-2016 15:04:4	-8		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.615	-0.033		16787846	49.3		98.7	132750	9
1 Perfluorobuty 212.90 > 169.00	1.582	1.617	-0.035	1.000	14702345	49.5		98.9	166796	
D 413C5-PFPe 267.90 > 223.00	1.868		-0.050		12521264	46.3		92.7	1675930	0
3 Perfluoropen 262.90 > 219.00 5 Perfluorobuta	1.868	1.920	-0.052	1.000	12586784	48.3		96.6	88011	
298.90 > 80.00 298.90 > 99.00	1.906	1.961 1.961	-0.055 -0.055	1.000 1.000	21833339 10244154	43.9	2.13(0.00-0.00)	99.4		
D 6 13C2 PFHx 315.00 > 270.00	2.172	2.239	-0.067		11367780	46.1		92.2	151454	8
7 Perfluorohex 313.00 > 269.00	2.172	2.241	-0.069	1.000	10429102	48.0		96.0	270544	
D 11 13C4-PFH <sub> </sub> 367.00 > 322.00	2.526	2.599	-0.073		9593340	45.6		91.1	892349	
12 Perfluorohe 363.00 > 319.00 D 10 1802 PFH:	2.526		-0.074	1.000	10065809	50.7		101	140348	
403.00 > 84.00 9 Perfluorohex	2.541	2.614			14571442	48.2		102	142370	8
399.00 > 80.00 15 Perfluorooct	2.541	2.615	-0.074	1.000	14622567	44.8		98.5		
413.00 > 369.00 413.00 > 169.00	2.900	2.984 2.984	-0.084 -0.084	1.000 1.000	10938486 6667737	50.9	1.64(0.90-1.10)	102	392497 410935	
D 14 13C4 PFO 417.00 > 372.00		2.984	-0.092		10529992 Page 660 of 84	42 <sup>48.0</sup>		96.0	906338	3/2016

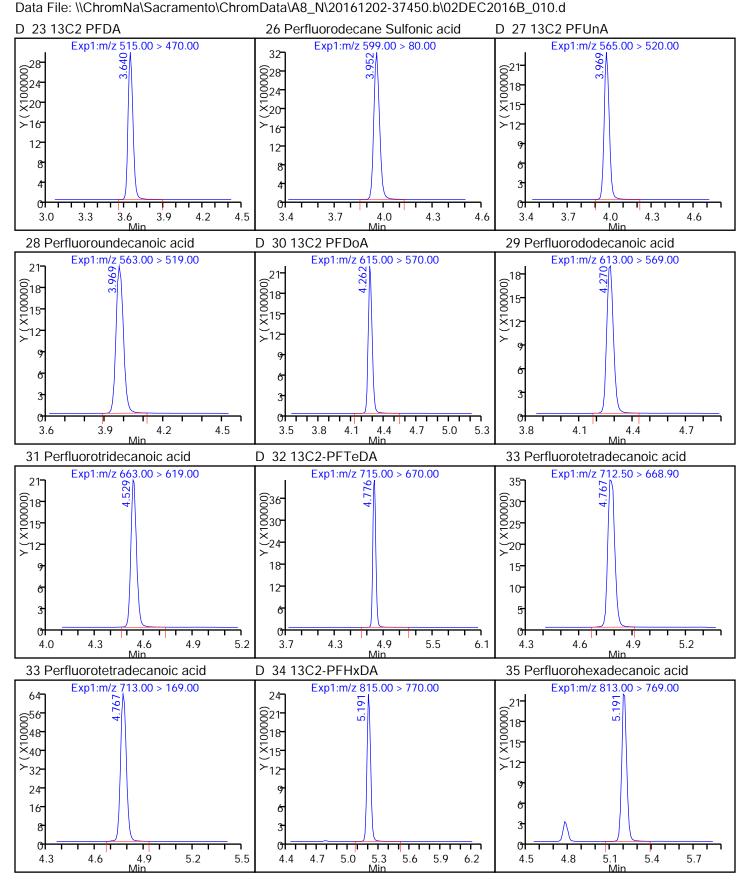
Data File:

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016B_010.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluoroheptanesulfonic Acid										
449.00 > 80.00	•		-0.086	1.000	13574840	48.1		101		
		2.700	-0.000	1.000	13374640	40.1		101		
D 17 13C4 PFO 503.00 > 80.00		3 365	-0.091		11548097	47.2		98.8	254963	
18 Perfluorooc					11340077	47.2		70.0	234703	
499.00 > 80.00			и -0.092	1.000	12164104	46.3		99.8	28493	
499.00 > 99.00		3.366	-0.092	1.000	2727438	40.5	4.46(0.90-1.10)	77.0	291526	
20 Perfluorononanoic acid										
463.00 > 419.00			-0.092	1.000	8006257	51.5		103	97570	
D 19 13C5 PFN		0.070	0.072	1.000	0000207	01.0		100	,,,,,	
468.00 > 423.00		3 374	-0.093		7843210	44.0		88.1	317462	
D 21 13C8 FOS		0.071	0.070		7010210	11.0		00.1	017102	
506.00 > 78.00		3 651	-0.061		19308659	46.6		93.2	639742	
22 Perfluorooc					17300037	40.0		75.2	037742	
498.00 > 78.00			-0.058	1.000	18014002	49.9		99.7	389523	
			-0.030	1.000	10014002	47.7		77.1	307323	
24 Perfluorode 513.00 > 469.00			-0.098	1.000	7531221	49.1		98.2	219436	
		3.730	-0.096	1.000	7551221	47.1		90.2	219430	
D 23 13C2 PFD		2 720	0.000		7015270	47 7		OE 2	104207	
515.00 > 470.00			-0.098		7915378	47.7		95.3	186307	
26 Perfluorode				1 000	7020240	F4 7		107		
599.00 > 80.00		4.049	-0.097	1.000	7830349	51.7		107		
D 27 13C2 PFU		4 070	0.404		F7/0744	45.0		0.4 7	004/05	
565.00 > 520.00		4.070	-0.101		5769711	45.9		91.7	281625	
28 Perfluoroun										
563.00 > 519.00		4.071	-0.102	1.000	5594487	45.8		91.5	104753	
D 30 13C2 PFD										
615.00 > 570.00	4.262	4.370	-0.108		5436616	46.5		93.0	179792	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.270	4.370	-0.100	1.000	4989134	48.5		97.0	81181	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.529	4.636	-0.107	1.000	4967689	43.9		87.8	10121	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.776	4.882	-0.106		10763542	44.5		89.0	582824	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90	4.767	4.884	-0.117	1.000	9716718	46.2		92.5	4110	
713.00 > 169.00	4.767	4.884	-0.117	1.000	1605923		6.05(0.00-0.00)		157680	
D 34 13C2-PFH	xDA									
815.00 > 770.00	5.191	5.320	-0.129		5878718	45.1		90.2	102017	
35 Perfluorohe	xadecan	ioic acid								
813.00 > 769.00			-0.129	1.000	5390790	49.5		99.0	4857	
36 Perfluorooc										
913.00 > 869.00			-0.143	1.000	5794530	67.8		136	8072	
Reagents:										
LCPFC-L5_0002	20		Δ	mount Δ	dded: 1.00	Units	:· ml			
_0110				ouiit A	4404. I.00	Office				

Page 661 of 842

Report Date: 02-Dec-2016 15:04:49 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 14:07:05 Instrument ID: A8\_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 33 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 649 00042 642 636 000042 X 35 <del>∑</del>35  $\approx$ 30 <u></u>∠28 ≻28  $\succ_{24}$ 21 21 18 12 14 2.3 1.9 1.1 1.7 1.0 1.3 1.6 8.0 1.4 2.0 2.6 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 88 42 (000042 35 (0000 30-30-©77<del>-</del> 0066-×55 ∑28<del>-</del> ∑24<sup>·</sup> ><sub>44</sub>-21 18 33 12 22 11 2.3 1.7 1.7 2.0 2.0 2.3 2.2 2.5 1.3 1.6 1.4 D 11 13C4-PFHpA D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 35 (000001 36-30-036<del>-</del> 0030 0025 × ×<sub>24</sub>- $\mathcal{L}_{20}$ ≻24 18 15 18 12 10 12 1.9 2.2 1.9 2.5 2.8 2.1 2.5 2.8 1.5 2.7 3.3 1.6 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 56 (35-0030-1×25-642 0036 ×30 <del>-</del>20 **≻**24 24 15 18 16 10 12 0 0 0 2.0 2.3 2.6 2.9 Page 66@of 842 2.0 2.3 2.6 2.9 3.2 1.7 3.2 1.5 2.1 2.7 12/08/2016

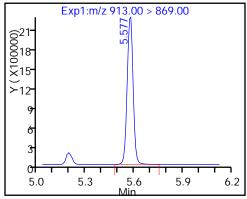




Report Date: 02-Dec-2016 15:04:49 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_010.d

### 36 Perfluorooctadecanoic acid



## FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: CCV 320-140429/2 Calibration Date: 12/02/2016 14:37

Instrument ID: A8\_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016B\_014.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8936		50.5	50.0	0.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9928		47.7	50.0	-4.6	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.603		43.9	44.2	-0.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9446		49.4	50.0	-1.2	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.038		50.2	50.0	0.4	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.067		45.8	45.5	0.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.035		50.7	50.0	1.5	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.172		47.7	47.6	0.2	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.084		46.3	46.4	-0.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.9755		49.2	50.0	-1.6	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9066		48.5	50.0	-3.1	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9463		48.8	50.0	-2.4	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6643		51.1	48.2	5.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9661		45.6	50.0	-8.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9288		49.1	50.0	-1.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9649		46.4	50.0	-7.2	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.864		48.2	50.0	-3.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9713		48.5	50.0	-3.0	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.043		66.3	50.0	31.7*	25.0
13C4 PFBA	Ave	340300	339545		49.9	50.0	-0.2	50.0
13C5-PFPeA	Ave	270194	261302		48.4	50.0	-3.3	50.0
13C2 PFHxA	Ave	246480	229526		46.6	50.0	-6.9	50.0
13C4-PFHpA	Ave	210510	202011		48.0	50.0	-4.0	50.0
1802 PFHxS	Ave	302453	317474		49.6	47.3	5.0	50.0
13C4 PFOA	Ave	219411	216146		49.3	50.0	-1.5	50.0
13C4 PFOS	Ave	244616	251364		49.1	47.8	2.8	50.0
13C5 PFNA	Ave	178109	169399		47.6	50.0	-4.9	50.0
13C8 FOSA	Ave	414253	402881		48.6	50.0	-2.7	50.0
13C2 PFDA	Ave	166067	161124		48.5	50.0	-3.0	50.0
13C2 PFUnA	Ave	125779	118770		47.2	50.0	-5.6	50.0
13C2 PFDoA	Ave	116905	109471		46.8	50.0	-6.4	50.0
13C2-PFTeDA	Ave	241899	223925		46.3	50.0	-7.4	50.0
	1							

Report Date: 04-Dec-2016 18:06:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\02DEC2016B\_014.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 02-Dec-2016 14:37:03 ALS Bottle#: 41 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 04-Dec-2016 18:06:11 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 04-Dec-2016 18:06:11

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	1 Perfluorobuty	yric acid									
2	12.90 > 169.00	1.574	1.574	0.0	1.000	15171458	50.5		101	155330	
	2 13C4 PFBA										
2	17.00 > 172.00	1.574	1.574	0.0		16977232	49.9		99.8	277143	5
_	3 Perfluoropen				4 000	10070074	4		05.4	100571	
	62.90 > 219.00		1.868	0.0	1.000	12970874	47.7		95.4	120574	
	4 13C5-PFPe		1.0/0	0.0		120/5075	40.4		0/ 7	25/25/	0
2	67.90 > 223.00		1.868	0.0		13065075	48.4		96.7	256856	3
2	5 Perfluorobuta 98.90 > 80.00		1.907	0.0	1.000	22493915	43.9		99.4		
		1.907	1.907	0.0	1.000	10590632	43.7	2.12(0.00-0.00)	77.4		
_	7 Perfluorohex			0.0	1.000	10070002		2.12(0.00 0.00)			
3	13.00 > 269.00		2.173	0.0	1.000	10840520	49.4		98.8	348131	
D	6 13C2 PFHx	A									
3	15.00 > 270.00	2.173	2.173	0.0		11476282	46.6		93.1	919645	
	12 Perfluorohe	ptanoic a	acid								
3	63.00 > 319.00	2.519	2.519	0.0	1.000	10487509	50.2		100	129458	
	11 13C4-PFH <sub>I</sub>										
3	67.00 > 322.00	2.519	2.519	0.0		10100555	48.0		96.0	962415	
	9 Perfluorohex										
			2.534	0.0	1.000	15406543	45.8		101		
											_
			2.534	0.0		15016500	49.6		105	117246	Ü
			2.007	0.0		10007004	40.2		00.5	770050	
4	17.00 > 3/2.00	2.886	2.886	0.0		10807294	49.3		98.5	112353	
3 D 3 D 4 D	15.00 > 270.00 12 Perfluorohe 63.00 > 319.00 11 13C4-PFH <sub>I</sub> 67.00 > 322.00	2.173 ptanoic a 2.519 pA 2.519 anesulfo 2.534 xS 2.534 A	2.519 2.519	0.0	1.000	10487509	50.2		100	129458	0

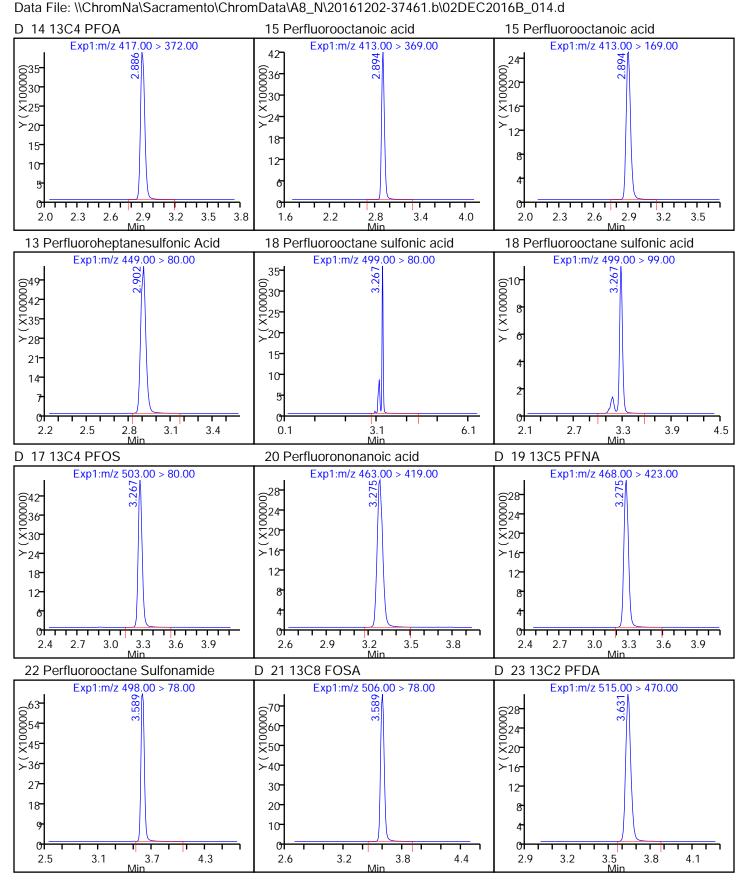
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161202-37461.b\\02DEC2016B_014.d										
6.	БТ	EXP	DLT	REL		Amount	D !! (1. !! )	0/ D	0/01	E1
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct										
413.00 > 369.00 413.00 > 169.00		2.894 2.894	0.0 0.0	1.000 1.000	11190759 6841143	50.7	1.64(0.90-1.10)	101	205894 311496	
13 Perfluoroher				1.000	0041143		1.04(0.90-1.10)		311490	
449.00 > 80.00		2.902		1.000	14021365	47.7		100		
18 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00		3.267	0.0	1.000	12644938	46.3		99.7	53281	
499.00 > 99.00		3.267	0.0	1.000	2940349		4.30(0.90-1.10)		339746	
D 17 13C4 PFOS		2 2 / 7	0.0		10015100	40.1		100	075554	
503.00 > 80.00		3.267	0.0		12015188	49.1		103	275554	
20 Perfluoronor 463.00 > 419.00		3.275	0.0	1.000	8262291	49.2		98.4	153747	
D 19 13C5 PFNA		5.275	0.0	1.000	0202271	77.2		70.4	133747	
468.00 > 423.00		3.275	0.0		8469930	47.6		95.1	605451	
22 Perfluorooct	ane Sul	fonamid	е							
498.00 > 78.00	3.589	3.589	0.0	1.000	18261930	48.5		96.9	733539	
D 21 13C8 FOSA										
506.00 > 78.00		3.589	0.0		20144056	48.6		97.3	630987	
D 23 13C2 PFD/		2 / 21	0.0		005/001	40 F		07.0	100000	
515.00 > 470.00		3.631	0.0		8056201	48.5		97.0	192938	
24 Perfluorodeo 513.00 > 469.00		3.631	0.0	1.000	7623608	48.8		97.6	194009	
26 Perfluorodeo				1.000	7023000	40.0		77.0	174007	
599.00 > 80.00		3.941		1.000	8048082	51.1		106		
28 Perfluoround	decanoi	c acid								
563.00 > 519.00	3.959	3.959	0.0	1.000	5737327	45.6		91.2	103207	
D 27 13C2 PFUr										
565.00 > 520.00		3.967	0.0		5938511	47.2		94.4	310740	
29 Perfluorodoo			0.0	1 000	E002/44	40.1		00.1	71041	
613.00 > 569.00 D 30 13C2 PFDo		4.259	0.0	1.000	5083644	49.1		98.1	71841	
615.00 > 570.00		4.259	0.0		5473570	46.8		93.6	186491	
31 Perfluorotrid			0.0		0170070	10.0		70.0	100171	
663.00 > 619.00			0.0	1.000	5281655	46.4		92.8	6905	
33 Perfluorotetr	radecan	oic acid								
712.50 > 668.90		4.772		1.000	10203271	48.2		96.5	4031	
713.00 > 169.00		4.772	-0.009	0.998	1624426		6.28(0.00-0.00)		120314	
D 32 13C2-PFT6					44404054	4.4.0		00 (	070000	
715.00 > 670.00		4.772	0.0		11196256	46.3		92.6	372028	
D 34 13C2-PFHx 815.00 > 770.00		5.184	0.0		5940244	45.6		91.1	99394	
35 Perfluorohe					5/40244	45.0		71.1	77374	
813.00 > 769.00		5.194		1.000	5316696	48.5		97.0	3968	
36 Perfluorooct										
913.00 > 869.00		5.562	0.0	1.000	5707122	66.3		133	7784	

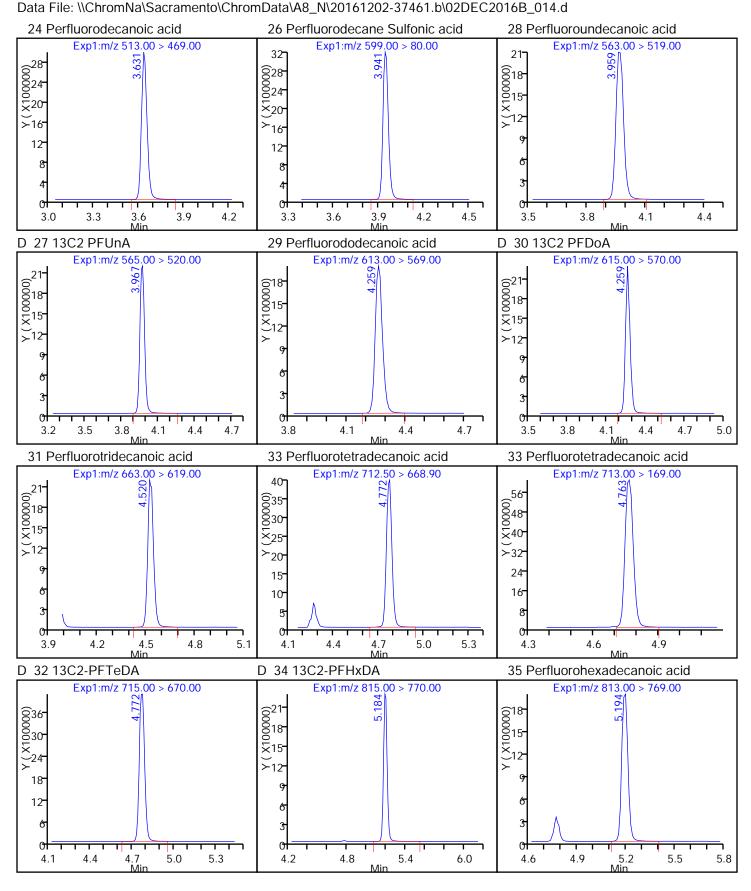
Report Date: 04-Dec-2016 18:06:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

LCPFC-L5\_00020 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2016 18:06:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 14:37:03 Instrument ID: A8\_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 262.90 > 219.00 56 (00000 00042 000042 X <del>∑</del>35 ×35 <u></u> ≥28-≻28 ≻<sub>28</sub>-21 21 21 14 14 1.9 2.2 2.2 2.0 1.0 1.3 1.6 0.4 1.0 1.6 1.4 1.7 2.3 4 13C5-PFPeA D 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 88 (000042 (00001X)35 (42<sup>-</sup> 00036<sup>-</sup> 130<sup>-</sup> ©77<del>-</del> 0066-×55 <del>-</del>28 <del>-</del>24 ><sub>44</sub> 21 18 33 14 22 11 1.3 1.9 1.9 2.5 2.2 2.5 1.9 2.2 1.6 1.3 1.6 2.5 0.7 1.3 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 (000001 36-1 30-(000001 36-1 30-036-036- $\stackrel{\cdot}{\sim}_{24}$ ≻24 ≻24 18 18 18 12 12 12 2.0 2.3 2.9 1.9 2.2 2.7 1.7 2.6 1.6 2.5 1.8 2.1 2.4 3.0 1.3 9 Perfluorohexanesulfonic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 399.00 > 80.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 48 (56<del>-</del> (0048-(00001) (0048-( 635 0030 042 0036 ×25 ×30 <del>\_</del>32 ≻20 ≻<sub>24</sub>· 24 15 18 16 10 12 0 0 2.1 2.7 3.3 1.9 Page 67/0h of 842 3.1 3.7 1.5 2.1 2.7 1.5 1.3 12/08/2016

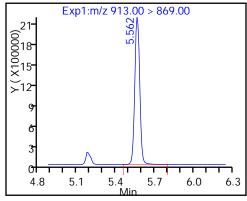




Report Date: 04-Dec-2016 18:06:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\02DEC2016B\_014.d

#### 36 Perfluorooctadecanoic acid



## FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Lab Sample ID: CCV 320-140429/16 Calibration Date: 12/02/2016 16:22

Instrument ID: A8\_N Calib Start Date: 12/02/2016 10:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/02/2016 12:29

Lab File ID: 02DEC2016C\_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8853	0.8804		49.7	50.0	-0.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	1.041	0.9809		47.1	50.0	-5.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.613	1.597		43.7	44.2	-1.0	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9559	0.9395		49.1	50.0	-1.7	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	1.034	1.019		49.3	50.0	-1.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.060	1.063		45.6	45.5	0.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.169	1.129		46.0	47.6	-3.4	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.020	1.019		49.9	50.0	-0.1	25.0
Perfluorooctane Sulfonate (PFOS)	AveID	1.087	1.065		45.5	46.4	-2.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9912	0.996		50.2	50.0	0.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9353	0.9267		49.5	50.0	-0.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9693	0.9593		49.5	50.0	-1.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.6271	0.6357		48.9	48.2	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.060	0.9840		46.4	50.0	-7.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9465	0.9295		49.1	50.0	-1.8	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.040	0.9397		45.2	50.0	-9.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.932	1.767		45.7	50.0	-8.6	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9637		48.1	50.0	-3.8	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	0.7915	1.054		67.0	50.0	33.2*	25.0
13C4 PFBA	Ave	340300	332191		48.8	50.0	-2.4	50.0
13C5-PFPeA	Ave	270194	252615		46.7	50.0	-6.5	50.0
13C2 PFHxA	Ave	246480	228018		46.3	50.0	-7.5	50.0
13C4-PFHpA	Ave	210510	196748		46.7	50.0	-6.5	50.0
1802 PFHxS	Ave	302453	307137		48.0	47.3	1.5	50.0
13C4 PFOA	Ave	219411	211412		48.2	50.0	-3.6	50.0
13C4 PFOS	Ave	244616	252256		49.3	47.8	3.1	50.0
13C5 PFNA	Ave	178109	159978		44.9	50.0	-10.2	50.0
13C8 FOSA	Ave	414253	392650		47.4	50.0	-5.2	50.0
13C2 PFDA	Ave	166067	151711		45.7	50.0	-8.6	50.0
13C2 PFUnA	Ave	125779	110399		43.9	50.0	-12.2	50.0
13C2 PFDoA	Ave	116905	109030		46.6	50.0	-6.7	50.0
13C2-PFTeDA	Ave	241899	217472		45.0	50.0	-10.1	50.0
13C2-PFHxDA	Ave	130373	114036		43.7	50.0	-12.5	50.0

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\02DEC2016C\_012.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 02-Dec-2016 16:22:13 ALS Bottle#: 41 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Sublist: chrom-A8\_N\*sub1

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 04-Dec-2016 18:06:22 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 04-Dec-2016 18:06:22

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	yric acid									
212.90 > 169.00	1.574	1.574	0.0	1.000	14622963	49.7		99.4	136701	
D 213C4 PFBA										
217.00 > 172.00	1.574	1.574	0.0		16609540	48.8		97.6	176056	4
3 Perfluoropen			0.000	1 000	10000/05	47.4		04.0	4 40000	
262.90 > 219.00		1.868	-0.009	1.000	12389685	47.1		94.2	143388	
D 413C5-PFPe		1.0/0	0.000		12/207/2	4/ 7		02.5	100100	0
267.90 > 223.00		1.868	-0.009		12630763	46.7		93.5	123123	9
5 Perfluorobuta 298.90 > 80.00		1.907	0.0	1.000	21678790	43.7		99.0		
	1.897	1.907	-0.010	0.995	10208437	43.7	2.12(0.00-0.00)	77.0		
7 Perfluorohex							(			
313.00 > 269.00		2.173	-0.003	1.000	10711219	49.1		98.3	288186	
D 6 13C2 PFHx	Α									
315.00 > 270.00	2.171	2.173	-0.003		11400916	46.3		92.5	222090	8
12 Perfluorohe	otanoic a	acid								
363.00 > 319.00	2.516	2.519	-0.003	1.000	10025294	49.3		98.5	148580	
D 11 13C4-PFH <sub>I</sub>										
367.00 > 322.00	2.516	2.519	-0.003		9837421	46.7		93.5	979084	
9 Perfluorohex										
399.00 > 80.00		2.534	-0.002	1.000	14850728	45.6		100		
D 10 1802 PFH		0.504	0.000		4.4507570	40.0		400	7/4047	
403.00 > 84.00		2.534	-0.002		14527568	48.0		102	761217	
D 14 13C4 PFO 417.00 > 372.00		2.886	0.004		10570593	48.2		04.4	786274	
417.00 > 372.00	2.890	2.000	0.004		10570593	40.2		96.4	100214	

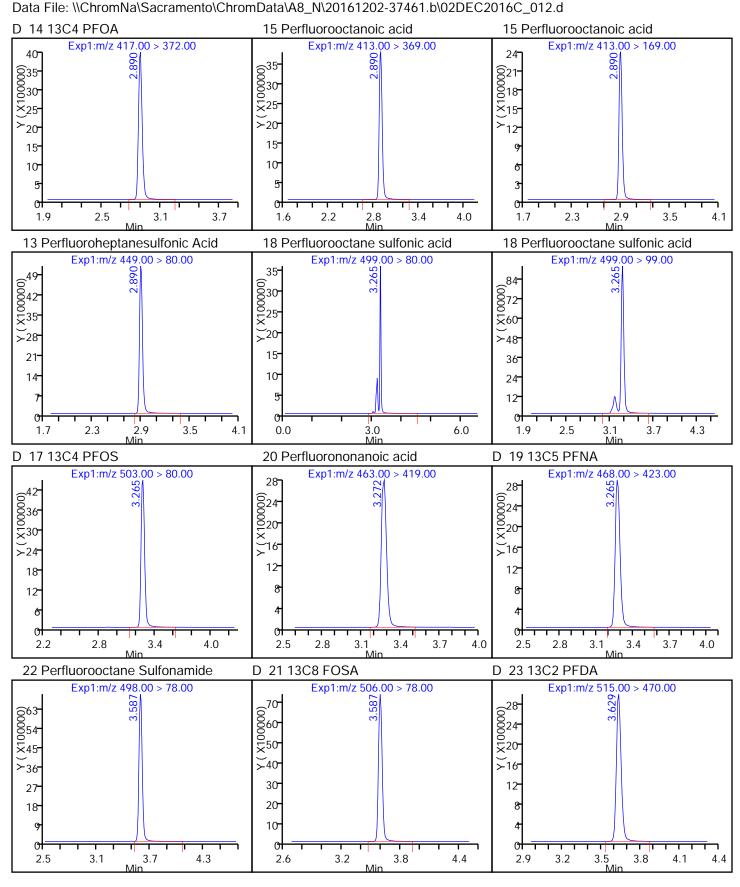
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Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	tanois as	sid								
413.00 > 369.00			-0.004	1.000	10770410	49.9		99.9	198921	
413.00 > 369.00			-0.004	1.000	6718323	47.7	1.60(0.90-1.10)	77.7	592810	
				1.000	0710323		1.00(0.70-1.10)		372010	
13 Perfluorohe				4 000	405/0/54	47.0		0//		
449.00 > 80.00				1.000	13560651	46.0		96.6		
18 Perfluorooct										
499.00 > 80.00			-0.002	1.000	12467043	45.5		98.0	352592	
499.00 > 99.00	3.265	3.267	-0.002	1.000	2716230		4.59(0.90-1.10)		228232	
D 17 13C4 PFO	S									
503.00 > 80.00	3.265	3.267	-0.002		12057843	49.3		103	232224	
20 Perfluorono										
463.00 > 419.00			-0.003	1.000	7963240	50.2		100	144737	
		3.273	-0.003	1.000	7903240	30.2		100	144737	
D 19 13C5 PFN/										
468.00 > 423.00	3.265	3.275	-0.010		7998877	44.9		89.8	353617	
22 Perfluorooct	ane Sul	fonamid	е							
498.00 > 78.00	3.587	3.589	-0.002	1.000	18194106	49.5		99.1	536694	
D 21 13C8 FOS	Δ									
506.00 > 78.00		3 589	-0.002		19632521	47.4		94.8	564736	
		3.307	0.002		17002021	77.7		74.0	304730	
D 23 13C2 PFD/		0 / 0 /			7505540			0.1.1		
515.00 > 470.00	3.629	3.631	-0.002		7585560	45.7		91.4	208800	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.629	3.631	-0.002	1.000	7277017	49.5		99.0	199518	
26 Perfluorode	cane Su	lfonic ac	id							
599.00 > 80.00			-0.003	1.000	7729327	48.9		101		
			0.000		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.0.7				
28 Perfluoround			0.000	1 000	E 424E40	47.4		00.0	110110	
563.00 > 519.00		3.959	-0.003	1.000	5431519	46.4		92.9	112110	
D 27 13C2 PFUr										
565.00 > 520.00	3.956	3.967	-0.011		5519927	43.9		87.8	528013	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00			-0.004	1.000	5067396	49.1		98.2	77314	
D 30 13C2 PFD										
		4.050	0.010		F4F4F00	47.7		00.0	157005	
615.00 > 570.00			-0.013		5451503	46.6		93.3	157285	
31 Perfluorotrio		acid								
663.00 > 619.00	4.521	4.520	0.001	1.000	5122725	45.2		90.3	11584	
33 Perfluoroteti	radecan	oic acid								
712.50 > 668.90			-0.015	1.000	9633033	45.7		91.4	4134	
713.00 > 169.00			-0.024	0.998	1613548		5.97(0.00-0.00)		215079	
			0.02	0.770			0.77 (0.00 0.00)		,	
D 32 13C2-PFT		4 770	0.015		10072500	45.0		00.0	F701.41	
715.00 > 670.00		4.//2	-0.015		10873598	45.0		89.9	570141	
D 34 13C2-PFH										
815.00 > 770.00	5.173	5.184	-0.011		5701819	43.7		87.5	107923	
35 Perfluorohe	xadecan	oic acid								
813.00 > 769.00				1.000	5253333	48.1		96.2	4932	
36 Perfluorooct			0.017	1 000	E747404	47.0		101	4724	
913.00 > 869.00	5.545	0.002	-0.017	1.000	5747404	67.0		134	6736	

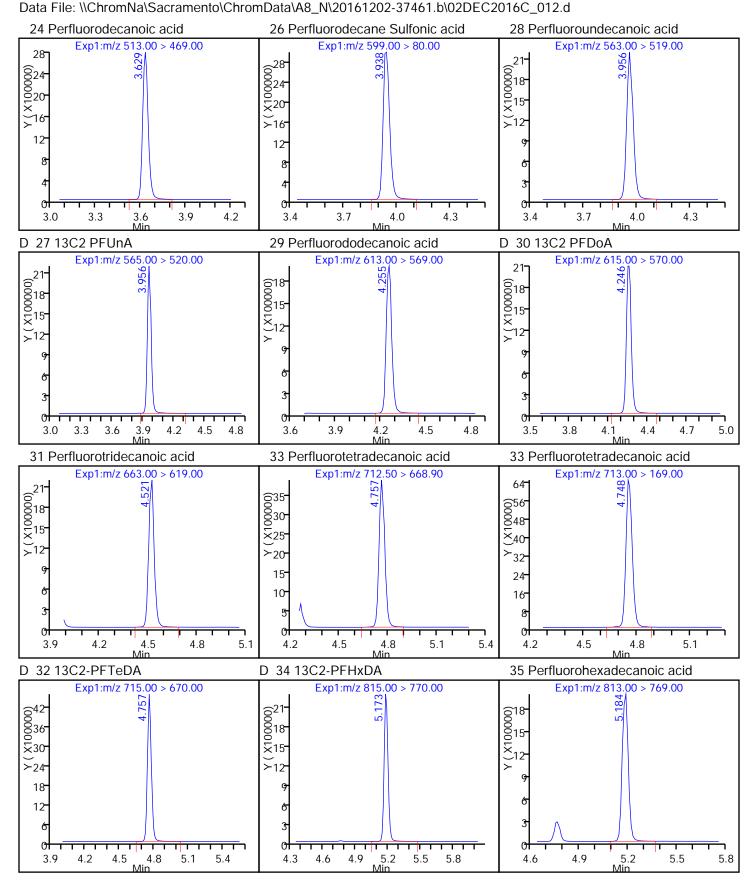
Report Date: 04-Dec-2016 18:06:22 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Reagents:

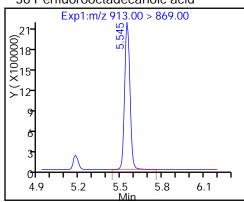
LCPFC-L5\_00020 Amount Added: 1.00 Units: mL

Report Date: 04-Dec-2016 18:06:23 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 16:22:13 Instrument ID: A8\_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 (49<sup>-</sup> 00042<sup>-</sup> ×35<sup>-</sup> 042 0036 642 636 ×30  $\times_{30}$ ≻<sub>24</sub>-≻28 21 18 18 14 12 1.9 2.2 1.0 1.3 1.6 2.2 0.4 1.0 1.6 2.8 1.3 1.6 1.9 2.2 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0042 00042 × × × 28 677 666 (0000 30-30-×55<del>-</del> ∑24<sup>·</sup> **≻**44 21 18 33 12 22 11 2.5 1.8 2.1 2.4 2.2 1.9 2.2 1.2 1.5 2.7 1.6 1.3 1.6 2.5 1.3 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 363.00 > 319.00 (000001 X30 (000001X) >24 ©36-**≻24** 18 18 18 12 12 12 1.8 2.1 Min 2.7 0.9 2.1 2.7 2.9 2.4 1.5 2.0 2.3 2.6 1.5 D 11 13C4-PFHpA 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 399.00 > 80.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403,00 > 84.00 40 516 (42<sup>-</sup> 00036<sup>-</sup> ()49 ()000 42 ()49 035 030 30 <del>∑</del>30-×35 ∑25<del>-</del> ×28 **≻**24  $\succ_{20}$ 18 21 15 12 14 10 0 0 2.1 2.7 3.3 3.6 1.5 2.1 2.7 12/08/2016 1.5 1.2 1.8 Page 67/86 of 842





36 Perfluorooctadecanoic acid



## FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1					
SDG No.:						
Client Sample ID:	Lab Sample ID: MB 320-138217/1-A					
Matrix: Water	Lab File ID: 20NOV2016D_014.d					
Analysis Method: 537 (Modified)	Date Collected:					
Extraction Method: 3535	Date Extracted: 11/17/2016 08:49					
Sample wt/vol: 250(mL)	Date Analyzed: 11/20/2016 22:18					
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1 (mm)					
% Moisture:	GPC Cleanup: (Y/N) N					
Analysis Batch No.: 138814	Units: ug/L					

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0030	Ū	0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	117		25-150
STL00991	13C4 PFOS	105		25-150
STL00994	1802 PFHxS	108		25-150

Report Date: 23-Nov-2016 15:45:54 Chrom Revision: 2.2 14-Nov-2016 08:15:18

> TestAmerica Sacramento **Target Compound Quantitation Report**

\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_014.d Data File:

Lims ID: MB 320-138217/1-A

Client ID:

Sample Type: MB

Inject. Date: 20-Nov-2016 22:18:19 ALS Bottle#: 19 Worklist Smp#: 14

Injection Vol: Dil. Factor: 2.0 ul 1.0000

Sample Info: mb 320-138217/1-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: 

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:44:42 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: **Isotopic Dilution** Quant By: **Initial Calibration** 

Last ICal File: 

Column 1: Det: EXP1

**Process Host:** XAWRK008

First Level Revie	wer: cha	ngnoit			Date: 23-Nov-2016 15:45:53					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	yric acid									
212.90 > 169.00	•	1.493	0.025	1.000	16834	0.0834			85.2	
D 213C4 PFBA										
217.00 > 172.00	1.494	1.493	0.001		11607551	58.7		117	875052	
D 413C5-PFPe										
267.90 > 223.00	1.762	1.752	0.010		9940960	62.2		124	876893	
3 Perfluoropen										
262.90 > 219.00		1.762	-0.010	1.000	16171	0.0783			151	
5 Perfluorobuta										
298.90 > 80.00 298.90 > 99.00	1.800	1.791	0.009	1.000 1.000	7644 3037	0.0230	2 52/0 00 0 00)			
		1.791	0.009	1.000	3037		2.52(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00		2.040	0.002	1.000	9521	0.0577			321	
D 6 13C2 PFHx		2.040	0.002	1.000	7JZ I	0.0377			JZ 1	
315.00 > 270.00		2.040	0.002		8737716	60.2		120	539994	
D 11 13C4-PFH <sub>I</sub>		2.010	0.002		0707710	00.2		120	00///1	
367.00 > 322.00		2.366	0.012		8048972	61.3		123	112468	2
D 10 18O2 PFH	xS									
403.00 > 84.00		2.382	0.006		10345810	51.2		108	441420	
9 Perfluorohex	anesulfo	onic acid								
399.00 > 80.00	2.388	2.387	0.001	1.000	41175	0.1777				
D 47 M2-6:2FTS	;									
429.00 > 409.00	2.706	2.704	0.002		2694	0.0514		0.0		
48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
427.00 > 407.00	2.690	2.713	-0.023	1.000	2339	NR				
D 14 13C4 PFO	A									
417.00 > 372.00	2.734	2.733	0.001		7963295	58.3		117	319311	
20 Perfluoronoi										
463.00 > 419.00	3.105	3.096	0.009	1.000	Pa <del>gle</del> 6683 of 8	8420.0307			38172/08	3/2016

Report Date: 23-Nov-2016 15:45:54 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \ChromNa\Sacramento\ChromData\A8 N\20161121-37097 b\20NOV2016D 014.d

Data File:	Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161121-37097.b\20NOV2016D_014.d									
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 19 13C5 PFN	A									
468.00 > 423.00		3.096	0.017		6669569	61.0		122	523276	
D 17 13C4 PFO		0.007	0.047		7704700	F0.4		405	000/70	
503.00 > 80.00		3.096	0.017		7794723	50.1		105	292678	
43 Sodium 1H, 527.00 > 507.00		•			914	NR				
D 42 M2-8:2FTS 529.00 > 509.00	3.467	3.456	0.011		2024	0.0371		0.0		
D 21 13C8 FOS. 506.00 > 78.00		3.458	0.002		4427865	17.7		35.3	176957	
22 Perfluorooc	tane Sul	fonamid	е							
498.00 > 78.00		3.458	0.002	1.000	13959	0.1749			564	
D 23 13C2 PFD. 515.00 > 470.00		3.465	0.010		5704782	56.9		114	400480	
24 Perfluorode			0.010		3704702	30.7		114	400400	
513.00 > 469.00		3.465	0.010	1.000	6318	0.0558			171	
D 45 d3-NMeFC 573.00 > 419.00		3.623	-0.005		5293	0.1217		0.0		
44 N-methyl pe	erfluoroo	ctane su	ılfonami							
570.00 > 419.00				1.002	1366	NR				
26 Perfluorode 599.00 > 80.00	3.774		-0.008	1.000	2749	0.0277				
D 46 d5-NEtFOS 589.00 > 419.00		3.789	0.012		8912	0.1808		0.0		
49 N-ethyl perf										
584.00 > 419.00		3.798	0.003	1.000	2542	NR				
D 27 13C2 PFU 565.00 > 520.00		3.800	0.001		4580673	58.4		117	239059	
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00	3.810	3.800	0.010	1.000	15506	0.1646			429	
D 52 d-N-MeFO 515.00 > 169.00		3.963	-0.006		2904	0.0479		0.0		
54 MeFOSA										
512.00 > 169.00			-0.101	1.000	1231	NR				
29 Perfluorodo 613.00 > 569.00		c acid 4.091	0.008	1.000	14245	0.1730			313	
D 30 13C2 PFD					1010/55				107100	
615.00 > 570.00		4.091	0.0		4310655	55.7		111	197439	
D 51 d-N-EtFOS 531.00 > 169.00		4.153	0.003		3142	0.0574		0.0		
53 N-ethylperflo										
526.00 > 169.00			-0.005	1.000	553	NR				
31 Perfluorotric 663.00 > 619.00		acid 4.352	0.011	1.000	17333	0.2129			672	
33 Perfluorotet			0.011	1.000	17333	0.2127			012	
712.50 > 668.90		4.586	0.008	1.000	26012	0.1696			677	
713.00 > 169.00	4.588	4.586	0.002	0.999	7254		3.59(0.00-0.00)		1455	
Page 684 of 842								12/08	3/2016	

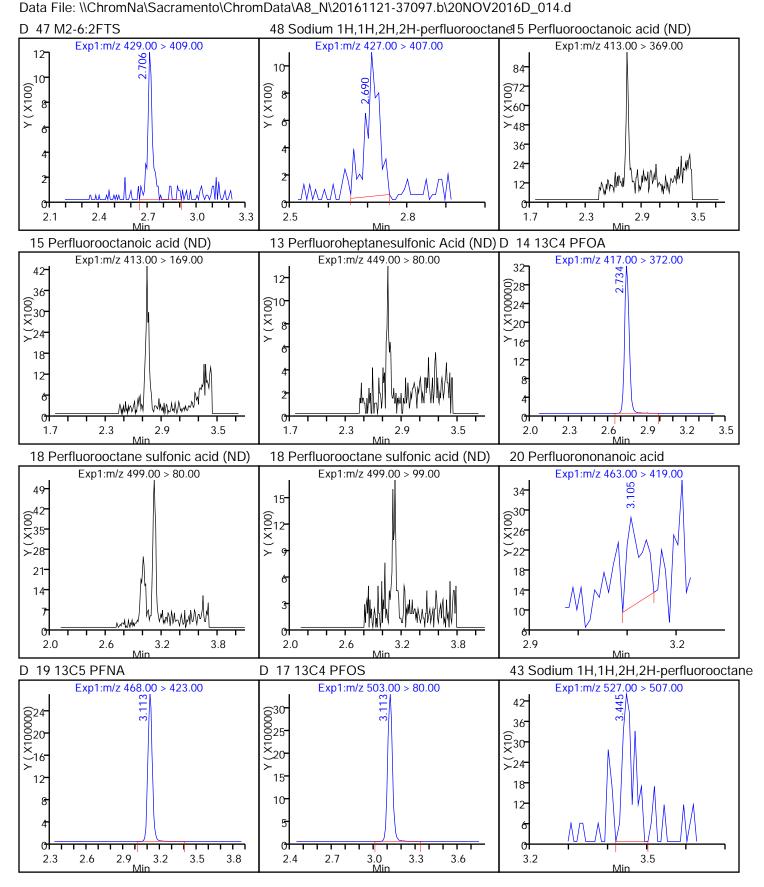
Report Date: 23-Nov-2016 15:45:54 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

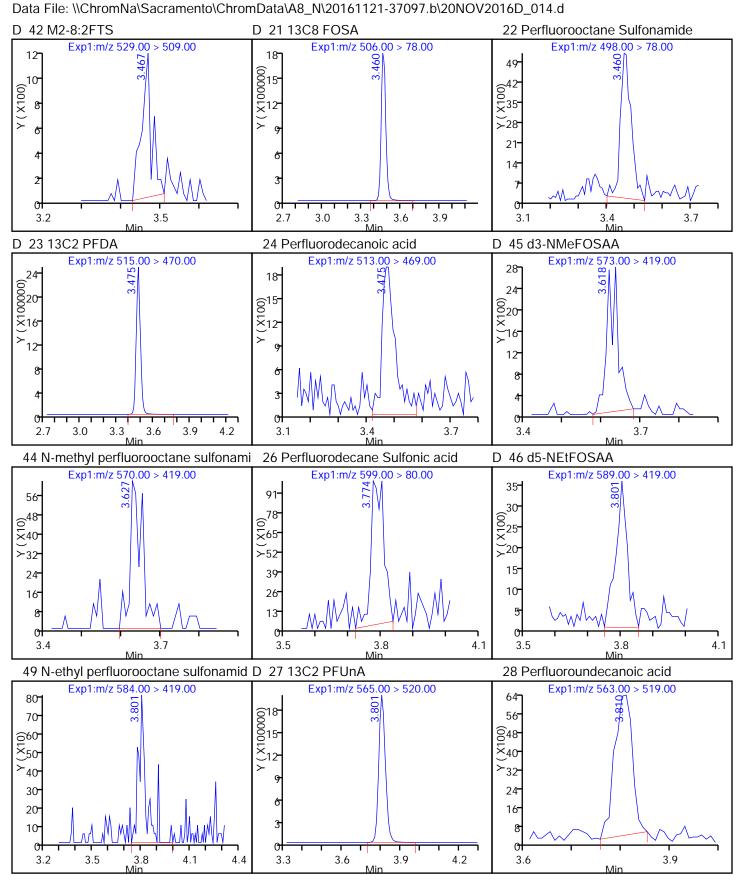
Dat	a 1 1101	110111	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		0,0	2 ata :: 10_: 1120 :	0.12.0.07				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	32 13C2-PFTe 5.00 > 670.00		4.586	0.008		10228588	59.9		120	631633	
_	5 Perfluorohe: 3.00 > 769.00		oic acid 4.990	0.008	1.000	76586	0.3162			1563	
	34 13C2-PFH; 5.00 > 770.00		4.990	0.008		6237366	66.1		132	828326	
_	6 Perfluorooct 3.00 > 869.00			0.008	1.000	6181	0.0666			33.8	

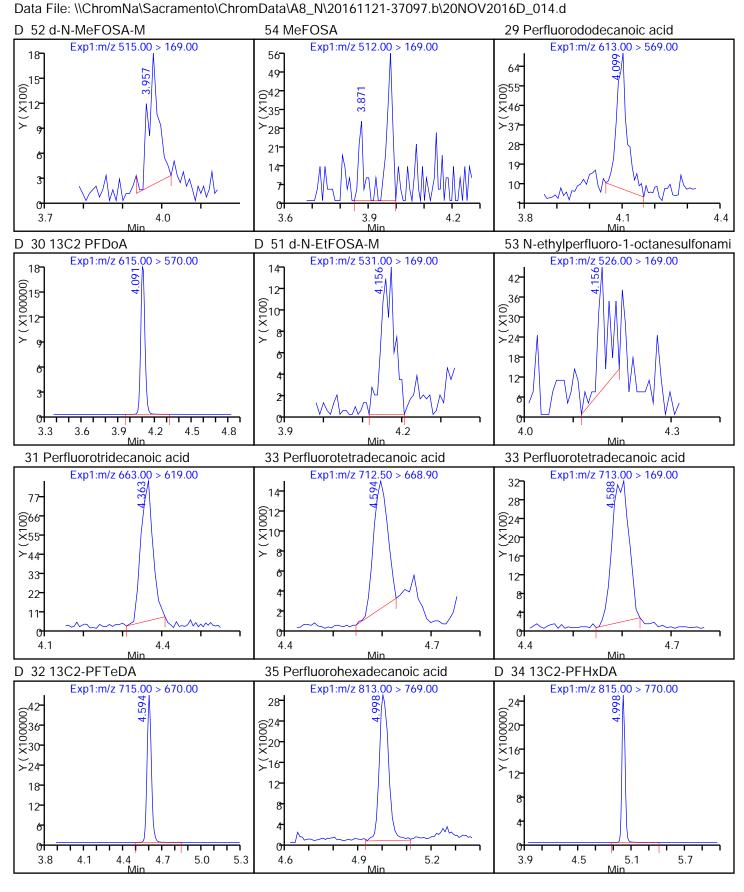
# QC Flag Legend Processing Flags

NR - Missing Quant Standard

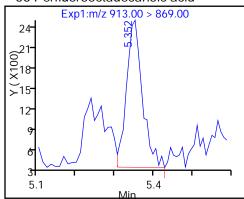
Report Date: 23-Nov-2016 15:45:54 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 22:18:19 Instrument ID: A8\_N Lims ID: MB 320-138217/1-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 19 Worklist Smp#: 14 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC\_DOD ICAL Method:  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 X 30 30 36 68 859  $\stackrel{\smile}{\times}_{50}$ **≻28** 18 21 32 14 12 23 1.0 1.9 2.2 1.4 1.7 0.7 1.3 1.6 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 101-77 21 93 0018 ×15 85 33 61 22 53 45 11 2.0 1.7 1.8 1.8 2.1 1.5 1.4 1.5 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 (35 00030 X25 52 ©30 0 0 25 6<sup>45</sup> ×38  $\stackrel{\cdot}{\succeq}_{20}$ <del>-</del>31 >20 15 24 15 10 17 10 10 2.1 2.0 1.7 2.3 2.9 3.5 1.4 1.7 2.3 2.6 1.8 1.1 12 Perfluoroheptanoic acid (ND) D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399,00 > 80.00 (00000 36-30-24 15 (00012 X) <u>@</u>20 ∑<sub>16</sub> 12 18 12 0 0 <u>12/08/20</u>16 1.9 2.5 3.1 1.9 2.2 2.5 Page 686 of 84 1.4 2.0 2.6 1.3 1.6







36 Perfluorooctadecanoic acid



#### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1	JOD NO.: 32U-23542-1				
SDG No.:						
Client Sample ID:	Lab Sample ID: MB 320-1	38291/1-A				
Matrix: Solid	Lab File ID: 20NOV2016D	_005.d				
Analysis Method: 537 (Modified)	Date Collected:					
Extraction Method: SHAKE	Date Extracted: 11/17/2016 12:49					
Sample wt/vol: 4.98(g)	Date Analyzed: 11/20/2016 21:10					
Con. Extract Vol.: 1.0(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: Acquity	ID: 2.1 (mm)				
% Moisture:	GPC Cleanup:(Y/N) N					
Analysis Batch No.: 138814	Units: ug/Kg					

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.30	U	0.50	0.30	0.10
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.30	U	0.50	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.30	U	0.40	0.30	0.10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	111		25-150
STL00991	13C4 PFOS	89		25-150
STL00994	1802 PFHxS	94		25-150

Report Date: 23-Nov-2016 15:07:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_005.d

Lims ID: MB 320-138291/1-A

Client ID:

Sample Type: MB

Inject. Date: 20-Nov-2016 21:10:45 ALS Bottle#: 14 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-138291/1-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:04:15 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:07:1

First Level Reviewer: changnoit					Date: 23-Nov-2016 15:07:11					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobutyric acid										
212.90 > 169.00	-	1.493	0.0	1.000	38475	0.2018			339	
D 213C4 PFBA	4									
217.00 > 172.00	1.493	1.493	0.0		10959398	55.4		111	975087	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.762	1.752	0.010		8931579	55.9		112	633992	
3 Perfluoroper		cid								
262.90 > 219.00	1.762	1.762	0.0	1.000	20229	0.1090			131	
5 Perfluorobut										
298.90 > 80.00		1.791	0.009	1.000	6974	0.0242	- (-( )			
298.90 > 99.00		1.791	-0.001	0.995	1239		5.63(0.00-0.00)			
7 Perfluorohex			0.0	1 000	(000	0.0470			040	
313.00 > 269.00		2.040	0.0	1.000	6932	0.0478			219	
D 613C2 PFHx		2.040	0.0		7/70452	F2 0		10/	F 4 4 7 0 1	
315.00 > 270.00		2.040	0.0		7670452	52.8		106	544721	
D 11 13C4-PFH 367.00 > 322.00	•	2.366	0.010		7742238	58.9		118	551433	
			0.010		1142230	30.9		110	551455	
12 Perfluorohe 363.00 > 319.00	•		-0.007	1.000	6696	0.0423			62.1	
D 10 1802 PFH		2.372	-0.007	1.000	0070	0.0423			02.1	
403.00 > 84.00		2.382	0.004		8995157	44.5		94.1	769596	
9 Perfluorohex					0770107	11.0		7 1. 1	707070	
399.00 > 80.00		2.387		1.000	36455	0.1810				
D 47 M2-6:2FTS		2.007	0.00.		00.00	0.1010				
429.00 > 409.00		2.704	0.018		3378	0.0644		0.0		
48 Sodium 1H,				e						
427.00 > 407.00		•		1.000	2241	NR				
D 14 13C4 PFO										
417.00 > 372.00		2.733	-0.001		P4980892 of 8	842 55.5		111	38 <b>92⁄0</b>	3/2016
					. 490 002 01	<b>-</b>			, 50	0.0

Data File.	NCIIIO	iiiiva\3a	iciameni	OCHION	IDaiaiA6_IN201	01121-3709	7.b\20\\0\v20\\0\_\	J05.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
20 Perfluoronon	nanoic a	cid								
463.00 > 419.00		3.096	0.013	1.000	1576	0.0139			15.9	
D 19 13C5 PFNA	١									
468.00 > 423.00	3.101	3.096	0.005		5785244	52.9		106	557900	
D 17 13C4 PFOS										
503.00 > 80.00		3.096	0.013		6638157	42.6		89.2	405875	
D 42 M2-8:2FTS		0.457	0.007		2070	0.0574		0.0		
529.00 > 509.00		3.456	0.006		3078	0.0564		0.0		
D 21 13C8 FOSA 506.00 > 78.00		3.458	0.004		5642761	22.5		45.0	378202	
		3.456	0.004		3042701	22.5		45.0	3/8202	
D 23 13C2 PFDA 515.00 > 470.00		3.465	0.005		4881688	48.7		97.4	370437	
24 Perfluorodec			0.003		4001000	40.7		77.4	370437	
513.00 > 469.00		3.465	0.005	1.000	3991	0.0412			188	
D 45 d3-NMeFOS		0.100	0.000	1.000	0771	0.0112			100	
573.00 > 419.00		3.623	-0.010		2678	0.0616		0.0		
44 N-methyl per										
570.00 > 419.00				1.005	1175	NR				
26 Perfluorodec	ane Sul	fonic aci	id							
599.00 > 80.00		3.782		1.000	702	0.008316				
D 46 d5-NEtFOS	AA									
589.00 > 419.00	3.796	3.789	0.007		7255	0.1472		0.0		
49 N-ethyl perflu	uoroocta	ne sulfo	namid							
584.00 > 419.00	3.796	3.798	-0.002	1.000	1808	NR				
D 27 13C2 PFUn	ıΑ									
565.00 > 520.00	3.796	3.800	-0.004		3660494	46.7		93.3	230179	
28 Perfluoround										
563.00 > 519.00	3.796	3.800	-0.004	1.000	9389	0.1247			320	
D 52 d-N-MeFOS	SA-M									
515.00 > 169.00	3.961	3.963	-0.002		2898	0.0478		0.0		
54 MeFOSA										
512.00 > 169.00	3.961	3.972	-0.011	1.000	1178	NR				
D 30 13C2 PFDo										
615.00 > 570.00	4.095	4.091	0.004		2435458	31.5		63.0	112703	
D 51 d-N-EtFOS										
531.00 > 169.00		4.153	0.007		4015	0.0734		0.0		
53 N-ethylperflu										
526.00 > 169.00		4.161	-0.001	1.000	1169	NR				
D 32 13C2-PFTe					0.1.00000	10.4		0.4.0	0/7475	
715.00 > 670.00		4.586	0.005		3138390	18.4		36.8	267175	
35 Perfluorohex			0.007	1 000	201.42	0.4047			272	
813.00 > 769.00		4.990	0.006	1.000	20143	-0.1246			373	
D 34 13C2-PFHx		4.000	0.007		1505100	1/ 0		22.0	204150	
815.00 > 770.00		4.990	0.006		1595189	16.9		33.8	304150	
36 Perfluoroocta			0.000	1 000	2441	0.0500			25.2	
913.00 > 869.00	ე.აან	5.344	-0.008	1.000	2666	0.0509			25.2	

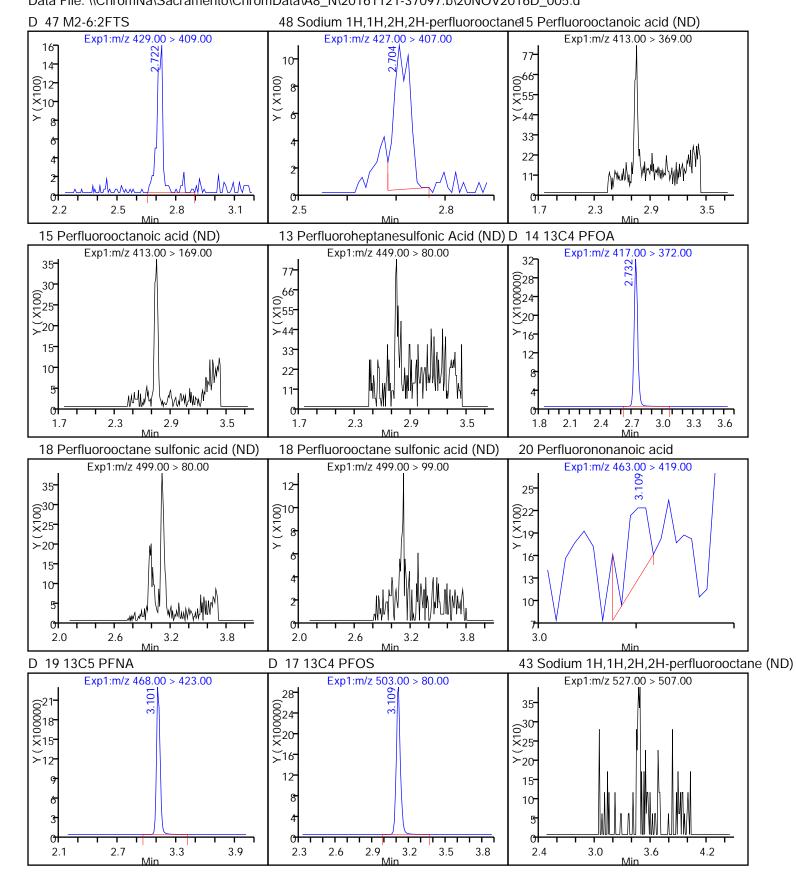
Report Date: 23-Nov-2016 15:07:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18

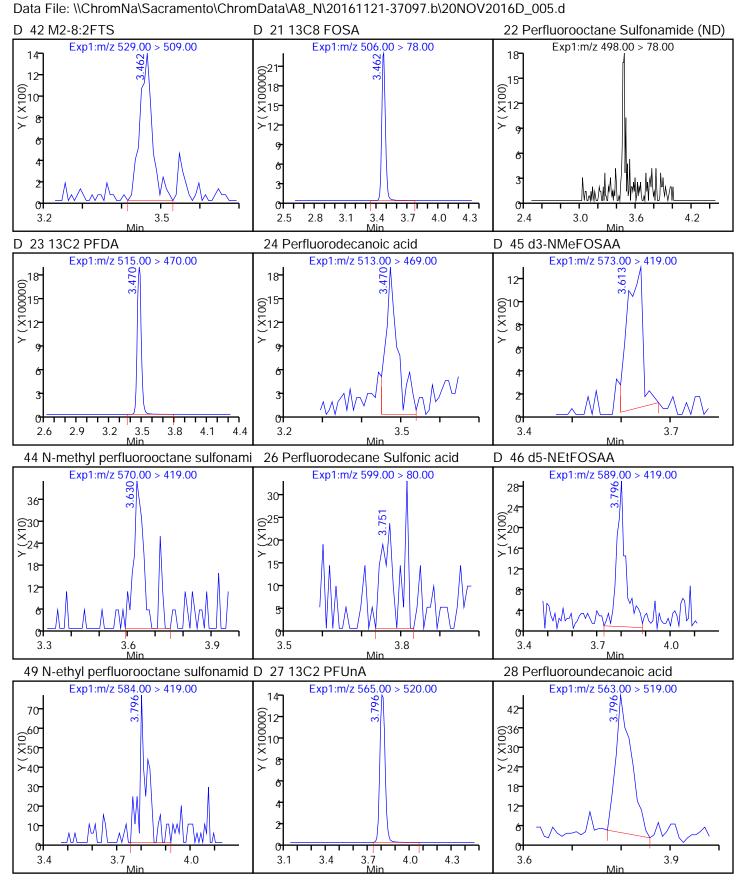
OC Flag Legend
Processing Flags

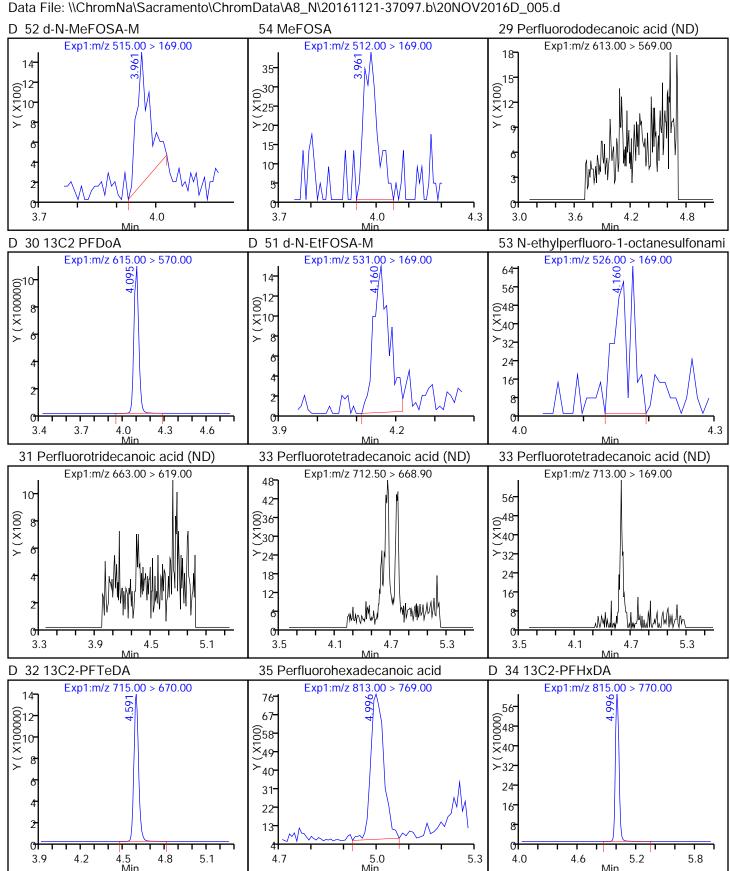
NR - Missing Quant Standard

Report Date: 23-Nov-2016 15:07:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 21:10:45 Instrument ID: A8\_N Lims ID: MB 320-138291/1-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 14 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 49 635 630 630 0015 X12 > <u>8</u>35 , <u>\$</u>  $\succ$ 20 21 15 10 2.3 1.8 1.0 1.3 1.6 1.9 0.5 1.1 1.7 1.2 1.5 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 298.90 > 80.00 91-85 24 6 20 80 674<del>-</del> 263<del>-</del> 69 ×69 ∑<sub>16</sub>-\_ ≻58 ≻52 12 30 36 25 2.2 1.9 2.2 1.9 1.3 1.6 1.3 1.6 1.9 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 45<del>-</del> ×33 039  $\stackrel{\cdot}{\succeq}_{20}$ <sup>-</sup>27 15<del>-</del> 15 21 10 10 15 1.9 2.2 2.5 2.0 2.3 2.1 1.3 1.6 1.7 2.6 2.9 1.8 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 45 635<del>-</del> 00012 X ×25 ≻20 21 15<del>-</del> 15 10 3 0 0 2.2 2.5 1.5 1.8 2.1 2.4 Page 695 of 84 3.0 2.0 2.3 2.6 12/08/2016 1.7

Min

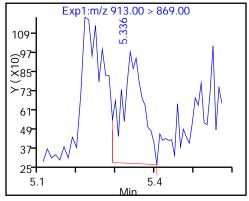






Report Date: 23-Nov-2016 15:07:12 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromDataA8_N\20161121-37097.b\20NOV2016D\_005.d}}$ 



## FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-23542-1</u>					
SDG No.:						
Client Sample ID:	Lab Sample ID: LCS 320-138217/2-A					
Matrix: Water	Lab File ID: 20NOV2016D_015.d					
Analysis Method: 537 (Modified)	Date Collected:					
Extraction Method: 3535	Date Extracted: 11/17/2016 08:49					
Sample wt/vol: 250(mL)	Date Analyzed: 11/20/2016 22:25					
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1 (mm)					
% Moisture:	GPC Cleanup:(Y/N) N					
Analysis Batch No.: 138814	Units: ug/L					

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0392		0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.0347		0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0365		0.0025	0.0020	0.00092

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	78		25-150
STL00991	13C4 PFOS	72		25-150
STL00994	1802 PFHxS	74		25-150

Report Date: 23-Nov-2016 15:47:15 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_015.d

Lims ID: LCS 320-138217/2-A

Client ID:

Sample Type: LCS

Inject. Date: 20-Nov-2016 22:25:49 ALS Bottle#: 20 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-138217/2-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:44:42 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:47:14

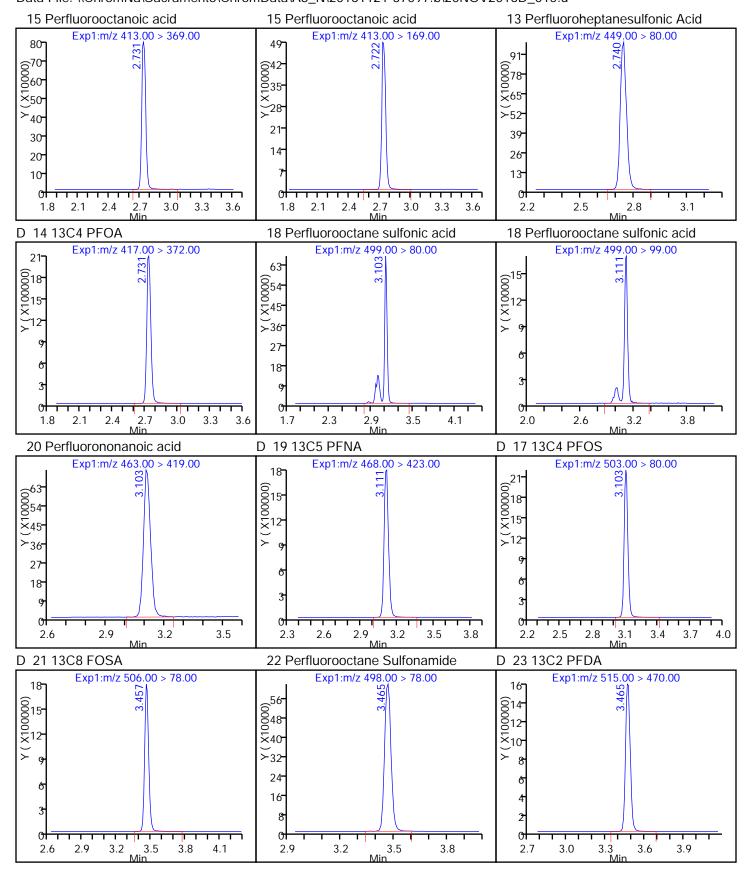
First Level Reviewer: changnoit					Date: 23			23-Nov-2016 15:47:14			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	1 Perfluorobuty	ric acid									
	212.90 > 169.00		1.493	0.001	1.000	2833757	20.0		100	27104	
	D 213C4 PFBA										
	217.00 > 172.00	1.494	1.493	0.001		8127054	41.1		82.2	712616	
	D 413C5-PFPe		4 750	0.004		700000	40.0		07.4	10/010	
	267.90 > 223.00		1.752	0.001		7000009	43.8		87.6	106219	4
	3 Perfluoropen 262.90 > 219.00		cid 1.762	0.0	1.000	2654057	18.2		91.2	33652	
	5 Perfluorobuta			0.0	1.000	2034037	10.2		71.2	33032	
	298.90 > 80.00	1.791	1.791	0.0	1.000	4154709	18.2		103		
		1.791	1.791	0.0	1.000	1713468		2.42(0.00-0.00)			
	7 Perfluorohex	anoic ac	id								
	313.00 > 269.00	2.040	2.040	0.0	1.000	2328553	20.2		101	89499	
	D 613C2 PFHx										
	315.00 > 270.00		2.040	-0.006		6097788	42.0		84.0	460217	
	D 11 13C4-PFH <sub>2</sub> 367.00 > 322.00		2 244	0.004		E2E4700	40.8		81.5	466734	
			2.366	0.004		5356708	40.8		81.5	400/34	
	12 Perfluorohey 363.00 > 319.00		2.372	-0.002	1.000	2200533	20.1		100	13890	
	D 10 1802 PFH		2.072	0.002	1.000	2200000	20.1		100	10070	
	403.00 > 84.00		2.382	-0.002		7098938	35.1		74.3	440913	
	9 Perfluorohex	anesulfo	nic acid								
	399.00 > 80.00	2.386	2.387	-0.001	1.000	2663390	16.8		92.1		
	15 Perfluorooct										
	413.00 > 369.00		2.733	-0.002	1.000	2193596	19.6	4 (7(0.00.4.40)	98.1	39571	
	413.00 > 169.00		2.733	-0.011	0.997	1314127		1.67(0.90-1.10)		69307	
	13 Perfluoroher 449.00 > 80.00		tonic Ac 2.733	id 0.007	1.000	2426828	19.0		99.8		
	447.00 > 00.00	2.740	2.133	0.007	1.000	Page 701 of 8			77.0	40/00	8/2016
						Page /UT Of 8	747			12/08	ハイひづり

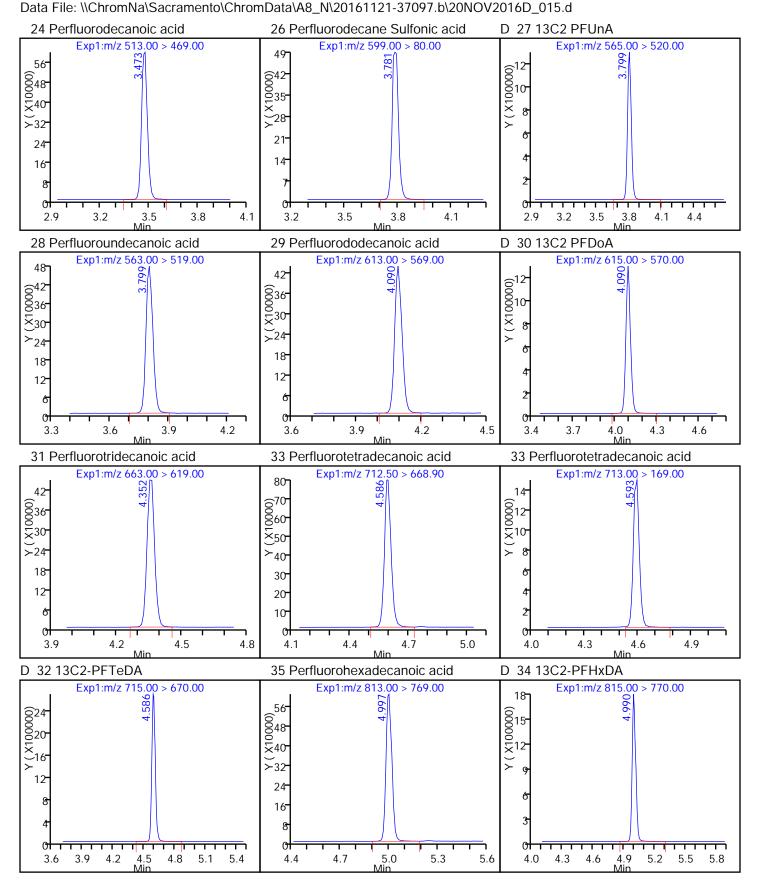
Page 701 of 842

12/08/2016

**EXP REL** DLT **Amount** Signal **RT** RT **RT RT** Response ng/ml Ratio(Limits) %Rec S/N Flags D 14 13C4 PFOA 417.00 > 372.00 2.731 39.0 2.733 -0.002 5323964 78.0 402866 18 Perfluorooctane sulfonic acid 3.096 499.00 > 80.00 3.103 0.007 1.000 2113695 17.4 93.6 133322 499.00 > 99.00 3.111 3.096 0.015 1.003 471808 4.48(0.90-1.10) 27752 20 Perfluorononanoic acid 17112 463.00 > 419.00 3.103 3.096 0.007 1.000 1790871 20.0 100 D 19 13C5 PFNA 468.00 > 423.00 3.111 3.096 0.015 4556875 41.7 83.3 252776 D 17 13C4 PFOS 503.00 > 80.00 3.103 3.096 71.9 313346 0.007 5349402 34.4 D 21 13C8 FOSA 506.00 > 78.00 3.457 3.458 -0.001 17.1 34.2 248070 4283317 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.465 3.458 20.4 0.007 1.000 1578612 102 76462 D 23 13C2 PFDA 515.00 > 470.00 3.465 40.0 80.1 3.465 0.0 4011164 222561 24 Perfluorodecanoic acid 513.00 > 469.00 3.473 3.465 0.008 1520086 19.1 95.5 54039 1.000 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.781 3.782 -0.001 1.000 1236270 18.2 94.3 D 27 13C2 PFUnA 565.00 > 520.00 3.799 39.9 3.800 -0.001 3133261 79.9 321475 28 Perfluoroundecanoic acid 563.00 > 519.00 3.799 31845 3.800 -0.001 1.000 1193848 18.5 92.6 29 Perfluorododecanoic acid 613.00 > 569.00 4.090 4.091 -0.001 1.000 1041632 19.7 98.6 22948 D 30 13C2 PFDoA 615.00 > 570.00 4.090 -0.00135.8 150129 4.091 2766290 71.5 31 Perfluorotridecanoic acid 663.00 > 619.00 4.352 1.000 1094728 40092 4.352 0.0 21.0 105 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.586 19.4 97.1 4.586 0.0 1.000 1911375 44245 713.00 > 169.00 4.593 4.586 0.007 1.001 352743 5.42(0.00-0.00) 73729 D 32 13C2-PFTeDA 715.00 > 670.00 4.586 4.586 37.7 538763 0.0 6440405 75.5 35 Perfluorohexadecanoic acid 813.00 > 769.00 4.997 4.990 0.007 1.000 1546425 25.4 127 46639 D 34 13C2-PFHxDA 815.00 > 770.00 4.990 4.990 0.0 4124827 43.7 87.5 567609 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.345 5.344 0.001 1.000 1435438 24.1 121 15349

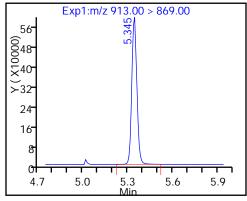
Report Date: 23-Nov-2016 15:47:15 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 22:25:49 Instrument ID: A8\_N Lims ID: LCS 320-138217/2-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 20 Worklist Smp#: 15 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 35 <u>8</u>30 0010 X (X1000 8 25-× <del>∠</del>20 15<del>-</del> 10 1.7 1.0 1.9 2.0 0.7 1.3 1.6 2.2 1.1 2.0 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 12 18-(0000015-12-X (X100000) 0066 X55 33 22 11 1.5 1.8 2.1 1.5 1.8 2.1 1.5 1.2 1.2 2.4 1.2 1.8 2.1 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 28 24 940 Y (X100000) ©21**-**0218-824<del>-</del> <u>8</u>20-∑<sub>16</sub>-×15 12 1.7 2.0 1.5 1.8 2.1 2.4 2.0 2.3 2.3 2.6 2.7 1.7 2.9 1.2 2.6 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 380 91-91-628 6024 ©78 078<del>-</del> <del>×</del>65 <del>∑</del>65 <del>×</del>20-<del>-</del>52− ≻16<del>-</del> **≻**52 39 12 39 26 26 13 13 0 0 1.8 2.1 2.4 2.7 Page 706nof 842 1.9 1.9 2.2 2.5 2.8 1.5 3.0 2.5 1.3 12/08/2016





Report Date: 23-Nov-2016 15:47:15 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_015.d



## FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1					
SDG No.:						
Client Sample ID:	Lab Sample ID: LCS 320-138291/2-A					
Matrix: Solid	Lab File ID: 20NOV2016D_006.d					
Analysis Method: 537 (Modified)	Date Collected:					
Extraction Method: SHAKE	Date Extracted: 11/17/2016 12:49					
Sample wt/vol: 5.03(g)	Date Analyzed: 11/20/2016 21:18					
Con. Extract Vol.: 1.0 (mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)					
% Moisture:	GPC Cleanup: (Y/N) N					
Analysis Batch No.: 138814	Units: ug/Kg					

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	4.37		0.50	0.30	0.10
1763-23-1	Perfluorooctane Sulfonate (PFOS)	3.90		0.50	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.70		0.40	0.30	0.10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	107		25-150
STL00991	13C4 PFOS	92		25-150
STL00994	1802 PFHxS	91		25-150

Report Date: 23-Nov-2016 15:10:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_006.d

Lims ID: LCS 320-138291/2-A

Client ID:

Sample Type: LCS

Inject. Date: 20-Nov-2016 21:18:17 ALS Bottle#: 15 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-138291/2-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:04:15 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:10:08

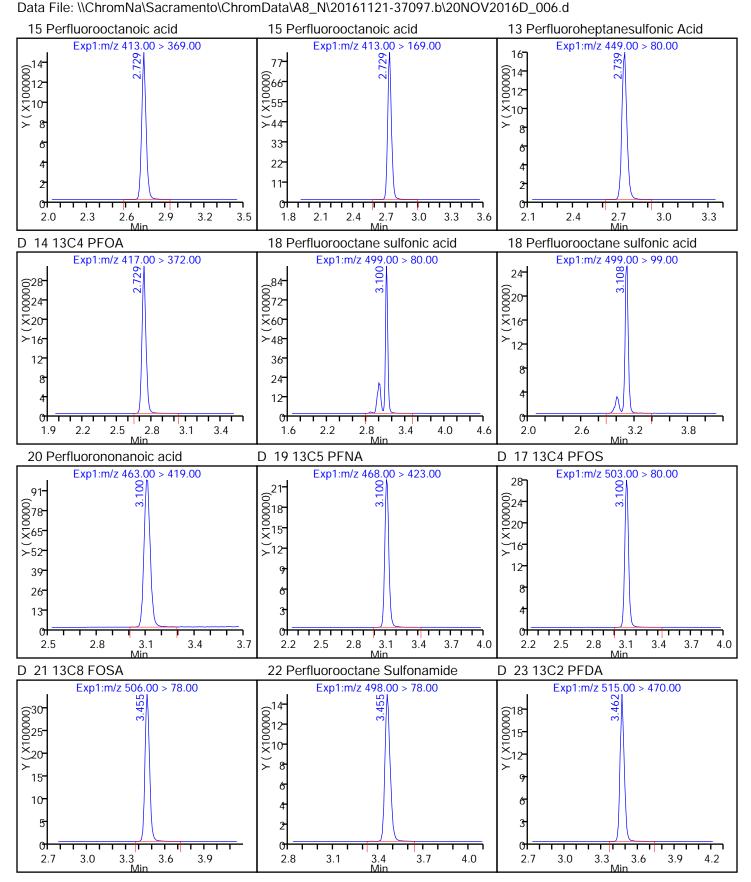
First Level Reviewer: changnoit				Date: 23-Nov-2016 15:10:08							
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
1 Perfluorobuty	1 Perfluorobutyric acid										
212.90 > 169.00	•	1.493	-0.005	1.000	4571780	24.9		124	45143		
D 213C4 PFBA											
217.00 > 172.00	1.488	1.493	-0.005		10574918	53.5		107	769809		
D 4 13C5-PFPe											
267.90 > 223.00		1.752	0.003		9076395	56.8		114	975678		
3 Perfluoropen 262.90 > 219.00		cid 1.762	0.007	1.000	4204976	22.3		111	47093		
5 Perfluorobuta			-0.007	1.000	4204976	22.3		111	47093		
298.90 > 80.00		1.791	0.002	1.000	6631343	23.7		134			
298.90 > 99.00		1.791	0.002	1.000	2729895	2017	2.43(0.00-0.00)				
7 Perfluorohex	anoic ac	id									
313.00 > 269.00	2.037	2.040	-0.003	1.000	3391930	23.0		115	90160		
D 6 13C2 PFHx.											
315.00 > 270.00		2.040	-0.003		7817718	53.8		108	504889		
D 11 13C4-PFH <sub>k</sub>		2.277	0.000		710111/	E4.2		100	F02020		
367.00 > 322.00		2.366	0.002		7131116	54.3		109	583828		
12 Perfluoroher 363.00 > 319.00			-0.004	1.000	3413808	23.4		117	24795		
D 10 18O2 PFH		2.572	-0.004	1.000	3413000	25.4		117	24773		
403.00 > 84.00		2.382	0.002		8741558	43.3		91.5	468575		
9 Perfluorohex											
399.00 > 80.00		2.387		1.000	4052284	20.7		114			
15 Perfluorooct	anoic ac	cid									
413.00 > 369.00		2.733	-0.004	1.000	3381339	22.0		110	65556		
413.00 > 169.00			-0.004	1.000	1994439		1.70(0.90-1.10)		102216		
13 Perfluoroher				1 000	2/0277/	22.7		110			
449.00 > 80.00	2.739	2.733	0.006	1.000	3683776	22.6		119			
					Page 708 of	842			12/08	3/2016	

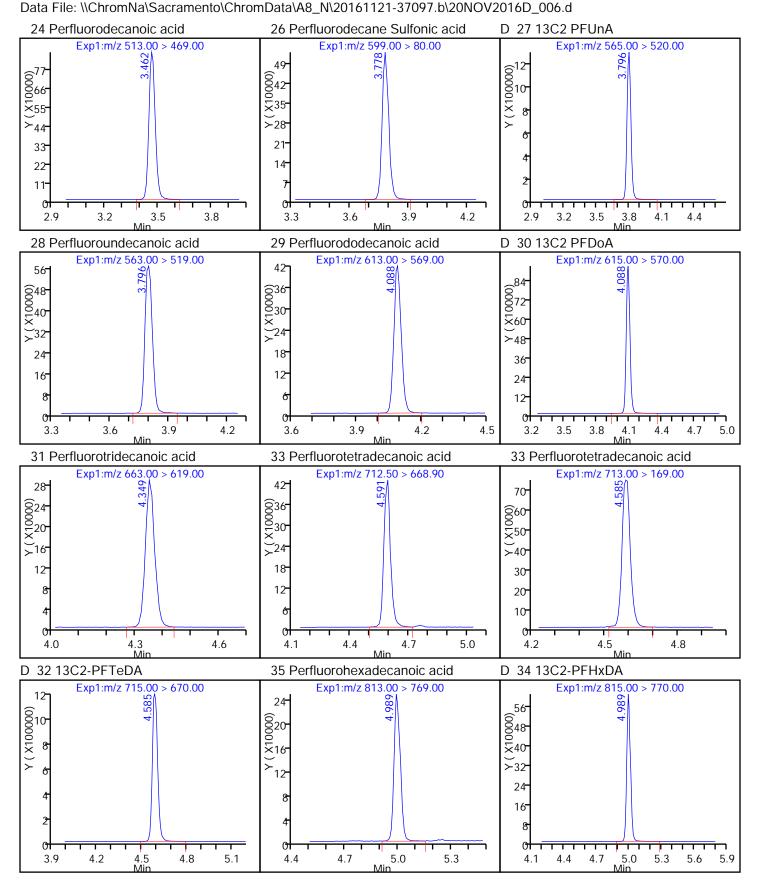
Page 708 of 842

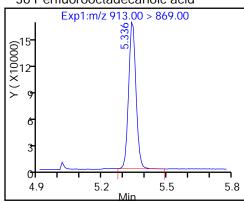
12/08/2016

Data File:	\\Chrc	miva\Sa	acrament	olChrom	Data\A8_IN\201	61121-3709	7.b\20NOV2016D_0	JU6.d		_
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 14 13C4 PFO	۸	-								
417.00 > 372.00		2.733	-0.004		7329802	53.7		107	607361	
18 Perfluorooct										
499.00 > 80.00		3.096	0.004	1.000	3048651	19.6		106	461241	
499.00 > 99.00	3.108	3.096	0.012	1.003	715038		4.26(0.90-1.10)		48812	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.100	3.096	0.004	1.000	2617373	23.7		118	27081	
D 19 13C5 PFN	A									
468.00 > 423.00	3.100	3.096	0.004		5627444	51.4		103	424882	
D 17 13C4 PFO	S									
503.00 > 80.00	3.100	3.096	0.004		6834275	43.9		91.8	307214	
D 21 13C8 FOS	A									
506.00 > 78.00	3.455	3.458	-0.003		7904857	31.5		63.0	267480	
22 Perfluorooct										
498.00 > 78.00	3.455	3.458	-0.003	1.000	3493458	24.5		123	204571	
D 23 13C2 PFD										
515.00 > 470.00	3.462	3.465	-0.003		4673837	46.6		93.3	244503	
24 Perfluorode										
513.00 > 469.00				1.000	2193324	23.6		118	78782	
26 Perfluorode										
599.00 > 80.00		3.782	-0.004	1.000	1255265	14.4		74.9		
D 27 13C2 PFU		0.000	0.004		0000015	44.0		00.0	050047	
565.00 > 520.00		3.800	-0.004		3290265	41.9		83.9	258046	
28 Perfluoroun			0.004	1 000	15000/5	22.2		110	40004	
563.00 > 519.00			-0.004	1.000	1509265	22.3		112	43204	
29 Perfluorodo			0.002	1 000	1002207	22.4		117	20070	
613.00 > 569.00		4.091	-0.003	1.000	1002287	23.4		117	29869	
D 30 13C2 PFD		4.001	0.002		2242270	20.0		F0.0	152770	
615.00 > 570.00			-0.003		2242270	29.0		58.0	153778	
31 Perfluorotric 663.00 > 619.00			0.002	1.000	470704	16.0		00.1	22225	
		4.352	-0.003	1.000	678704	10.0		80.1	22225	
33 Perfluoroteti 712.50 > 668.90		4.586	0.005	1.000	1016181	12.7		63.7	32566	
713.00 > 169.00		4.586	-0.003	0.999	179877	12.1	5.65(0.00-0.00)	03.7	74360	
D 32 13C2-PFT		1.000	0.001	0.777	177077		0.00(0.00 0.00)		7 1000	
715.00 > 670.00		4.586	-0.001		2765406	16.2		32.4	183809	
35 Perfluorohe:			0.001		2700100	10.2		02.1	100007	
813.00 > 769.00		4.990	-0.001	1.000	616468	12.3		61.3	13035	
D 34 13C2-PFH:		,,0	0.001		3.3.30	12.0		51.5	.0000	
815.00 > 770.00		4.990	-0.001		1453403	15.4		30.8	201438	
36 Perfluorooct			0.001					55.0	_0.100	
913.00 > 869.00		5.344	-0.008	1.000	387735	8.03		40.2	7064	
/10.00 / 00/.00	0.000	5.577	0.000	1.000	307733	0.00		70.2	, 004	

Report Date: 23-Nov-2016 15:10:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 21:18:17 Instrument ID: A8\_N Lims ID: LCS 320-138291/2-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 15 Worklist Smp#: Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 042 0036 <u>@</u>18 635 630 00015<sup>-</sup> √X ×1000  $\times$ 30  $\stackrel{\smile}{\times}_{25}$  $\succ_{24}$ 18 15 12 10 1.2 1.5 1.8 0.9 1.8 1.9 1.2 1.5 1.0 1.3 1.6 2.5 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0032 (X100000) (X1200000) (12° (200000) (10° (12° (12°) ©28**-**×20 ≻<sub>16</sub>-12 1.5 1.9 1.8 2.1 1.2 1.5 1.8 2.1 1.6 2.2 1.2 1.3 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 16 35 28 0024 0024 20 000012 <u>8</u>30 Ö<sub>25</sub>-∑10•  $\mathcal{L}_{20}$ ~16<del>-</del> 15 1.8 2.1 2.4 1.5 1.8 2.1 2.4 2.7 2.0 2.3 1.2 1.7 2.6 2.9 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 16 (35<del>-</del> 00012 00012 ∑<sub>10</sub> <del>-</del>25 <del>-</del>20 15 10 0 0 12/08/2016 1.8 2.1 2.4 2.7 1.4 2.0 2.6 1.6







### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-05-GW-17-21-MS MS Lab Sample ID: 320-23542-2 MS

Matrix: Water Lab File ID: 20NOV2016D\_018.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 11:45

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 251.3(mL) Date Analyzed: 11/20/2016 22:48

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.244	4	0.0025	0.0020	0.00074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.43	E 4	0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.107	JМ	0.0025	0.0020	0.00091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	43		25-150
STL00991	13C4 PFOS	59		25-150
STL00994	1802 PFHxS	76		25-150

Report Date: 23-Nov-2016 15:59:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_018.d

Lims ID: 320-23542-A-2-B MS Client ID: DPT-16-05-GW-17-21-MS

Sample Type: MS

Inject. Date: 20-Nov-2016 22:48:20 ALS Bottle#: 23 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-2-b ms Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:59:08 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:59:08

First Level Reviewer: changnoit				Date: 23-Nov-2016 15:59:			:3-Nov-2016 15:59:0	)8			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	1 Perfluorobutyric acid										
	212.90 > 169.00	•	1.493	0.003	1.000	2670418	42.4		212	21903	
	D 213C4 PFBA										
	217.00 > 172.00		1.493	0.003		3618152	18.3		36.6	340558	
	D 413C5-PFPe	Α									
	267.90 > 223.00	1.765	1.752	0.013		4124554	25.8		51.6	401485	
	3 Perfluoropen		cid								
	262.90 > 219.00	1.765	1.762	0.003	1.000	4659778	54.4		272	27792	
	5 Perfluorobuta										M
	298.90 > 80.00		1.791	0.012	1.000	12496232	53.7	2 25 (0 00 0 00)	304		M
		1.803	1.791	0.012	1.000	5563922		2.25(0.00-0.00)			
	7 Perfluorohex 313.00 > 269.00		2.040	0.009	1.000	12870831	193.8		969	141300	
	D 6 13C2 PFHx		2.040	0.007	1.000	12070031	173.0		707	141300	
	315.00 > 270.00		2.040	0.003		3515245	24.2		48.4	315994	
	D 11 13C4-PFH <sub>I</sub>			0.000		00.02.0				0.077.	
	367.00 > 322.00		2.366	0.008		2244992	17.1		34.2	209419	
	12 Perfluorohe	otanoic a	acid								
	363.00 > 319.00		2.372	0.002	1.000	1908959	41.5		208	5633	
	D 10 1802 PFH	κS									
	403.00 > 84.00	2.390	2.382	0.008		7251903	35.9		75.9	564928	
	9 Perfluorohex	anesulfo	nic acid								E
	399.00 > 80.00	2.390	2.387	0.003	1.000	71773376	442.0		2429		E
	D 47 M2-6:2FTS										
	429.00 > 409.00		2.704	-0.002		18086	0.3450		0.0		
	48 Sodium 1H,		•			000004	ND		0.0		
	427.00 > 407.00	2.711	2.713	-0.002	1.000	328224	NR		0.0		

Report Date: 23-Nov-2016 15:59:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_018.d

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61121-3709	7.b\20NOV2016D_0	018.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc	tanais as	sid.								
413.00 > 369.00		2.733	0.006	1.000	7513690	122.5		613	133228	
413.00 > 369.00		2.733	0.006	1.000	5172533	122.5	1.45(0.90-1.10)	013	147358	
				1.000	3172333		1.43(0.70-1.10)		147330	
13 Perfluorohe	•			1 000	F120102	40.0		250		
449.00 > 80.00		2.733	0.015	1.000	5130183	49.2		258		
D 14 13C4 PFO										
417.00 > 372.00	2.739	2.733	0.006		2919646	21.4		42.8	237579	
18 Perfluorooc	tane sulf	onic acid	b							E
499.00 > 80.00		3.096	0.012	1.000	121321387	1221.2		6580	0.0	E
499.00 > 99.00	3.108	3.096	0.012	1.000	33105200		3.66(0.90-1.10)		0.0	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.116	3.096	0.020	1.000	629101	23.8		119	3826	
D 19 13C5 PFN	Δ									
468.00 > 423.00		3.096	0.020		1343697	12.3		24.6	86069	
		0.070	0.020		1010077	12.0		21.0	00007	
D 17 13C4 PFO		2.007	0.010		42//202	20.0		F0.7	7/024	
503.00 > 80.00		3.096	0.012		4366393	28.0		58.7	76934	
43 Sodium 1H,		•								
527.00 > 507.00	3.462	3.456	0.006	0.998	128887	NR		0.0		
D 42 M2-8:2FTS	3									
529.00 > 509.00	3.470	3.456	0.014		8215	0.1505		0.0		
D 21 13C8 FOS	Α									
506.00 > 78.00		3.458	0.004		947461	3.78		7.6	56770	
					717101	0.70		7.0	00770	
22 Perfluorooci				1.000	204472	22.4		110	2172	
498.00 > 78.00		3.458	0.004	1.000	386473	22.6		113	3173	
D 23 13C2 PFD										
515.00 > 470.00	3.478	3.465	0.013		2483891	24.8		49.6	194339	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.470	3.465	0.005	1.000	955537	19.4		96.9	12129	
D 45 d3-NMeFC	SAA									
573.00 > 419.00		3.623	0.015		6272	0.1442		0.0		
					0272	0.1112		0.0		
44 N-methyl pe				0.005	2257	ND		0.0		
570.00 > 419.00		3.632		0.995	2256	NR		0.0		
26 Perfluorode										
599.00 > 80.00	3.787	3.782	0.005	1.000	1634598	29.4		153		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.796	3.789	0.007		14067	0.2854		0.0		
49 N-ethyl perf	luoroocta	ane sulfo	namid							
584.00 > 419.00		3.798	0.007	1.002	4017	NR		0.0		
		3.770	0.007	1.002	4017	1414		0.0		
D 27 13C2 PFU		2.000	0.005		0400050	07.0		FF /	177010	
565.00 > 520.00	3.805	3.800	0.005		2182252	27.8		55.6	177818	
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00	3.805	3.800	0.005	1.000	784266	17.5		87.4	13751	
D 52 d-N-MeFO	SA-M									
515.00 > 169.00		3.963	-0.011		1161	0.0192		0.0		
29 Perfluorodo						-		-		
613.00 > 569.00		4.091	0.011	1.000	772418	18.4		92.0	19490	
		4.071	0.011	1.000	112410	10.4		7Z.U	17470	
D 30 13C2 PFD		4.00:	0.05:		0407075	20 :		F	400=55	
615.00 > 570.00	4.095	4.091	0.004		Page 716 of 8	342 <sup>28.4</sup>		56.8	123799	3/2016
					-					

Report Date: 23-Nov-2016 15:59:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

Data Tilot World Market Company to 1121 0707 No 2010 D 2010 I									
RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
A-M									
4.152	4.153	-0.001		1175	0.0215		0.0		
ecanoic	acid								
4.359	4.352	0.007	1.000	913549	22.0		110	27504	
adecan	oic acid								
4.598	4.586	0.012	1.000	1825731	23.4		117	53227	
4.591	4.586	0.005	0.999	323209		5.65(0.00-0.00)		68254	
eDA									
4.598	4.586	0.012		6695013	39.2		78.5	480005	
kadecan	oic acid								
5.002	4.990	0.012	1.000	1594229	33.2		166	39329	
κDA									
4.996	4.990	0.006		4772194	50.6		101	619046	
adecand	oic acid								
5.344	5.344	0.0	1.000	1579654	33.4		167	9754	
	A-M 4.152 ecanoic 4.359 adecano 4.598 4.591 eDA 4.598 kadecano 5.002 kDA 4.996 adecano	A-M 4.152 4.153 ecanoic acid 4.359 4.352 adecanoic acid 4.598 4.586 4.591 4.586 eDA 4.598 4.586 adecanoic acid 5.002 4.990 adecanoic acid adecanoic acid	A-M 4.152 4.153 -0.001 ecanoic acid 4.359 4.352 0.007 adecanoic acid 4.598 4.586 0.012 4.591 4.586 0.005 aDA 4.598 4.586 0.012 adecanoic acid 5.002 4.990 0.012 adecanoic acid 5.004 4.990 0.006 adecanoic acid	A-M 4.152 4.153 -0.001 ecanoic acid 4.359 4.352 0.007 1.000 adecanoic acid 4.598 4.586 0.012 1.000 4.591 4.586 0.005 0.999 eDA 4.598 4.586 0.012 adecanoic acid 5.002 4.990 0.012 1.000 kDA 4.996 4.990 0.006 adecanoic acid	A-M 4.152 4.153 -0.001 1175 ecanoic acid 4.359 4.352 0.007 1.000 913549 adecanoic acid 4.598 4.586 0.012 1.000 1825731 4.591 4.586 0.005 0.999 323209 adecanoic acid 4.598 4.586 0.012 6695013 adecanoic acid 5.002 4.990 0.012 1.000 1594229 adecanoic acid 4.996 4.990 0.006 4772194 adecanoic acid	A-M 4.152 4.153 -0.001 1175 0.0215 ecanoic acid 4.359 4.352 0.007 1.000 913549 22.0 adecanoic acid 4.598 4.586 0.012 1.000 1825731 23.4 4.591 4.586 0.005 0.999 323209 eDA 4.598 4.586 0.012 6695013 39.2 cadecanoic acid 5.002 4.990 0.012 1.000 1594229 33.2 cDA 4.996 4.990 0.006 4772194 50.6 adecanoic acid	A-M 4.152 4.153 -0.001 1175 0.0215 ecanoic acid 4.359 4.352 0.007 1.000 913549 22.0 adecanoic acid 4.598 4.586 0.012 1.000 1825731 23.4 4.591 4.586 0.005 0.999 323209 5.65(0.00-0.00) eDA 4.598 4.586 0.012 6695013 39.2 cadecanoic acid 5.002 4.990 0.012 1.000 1594229 33.2 cDA 4.996 4.990 0.006 4772194 50.6 adecanoic acid	A-M 4.152	A-M 4.152

## QC Flag Legend Processing Flags

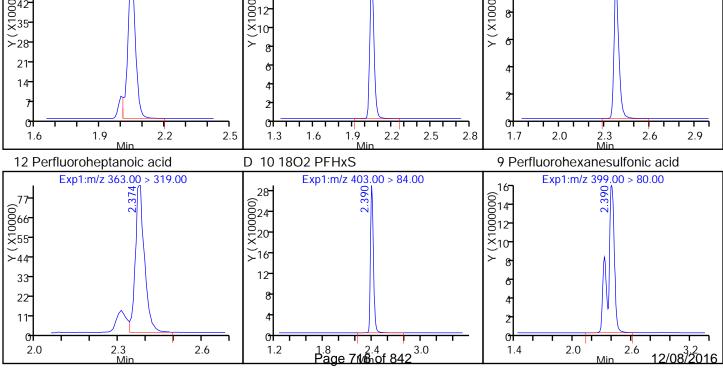
NR - Missing Quant Standard

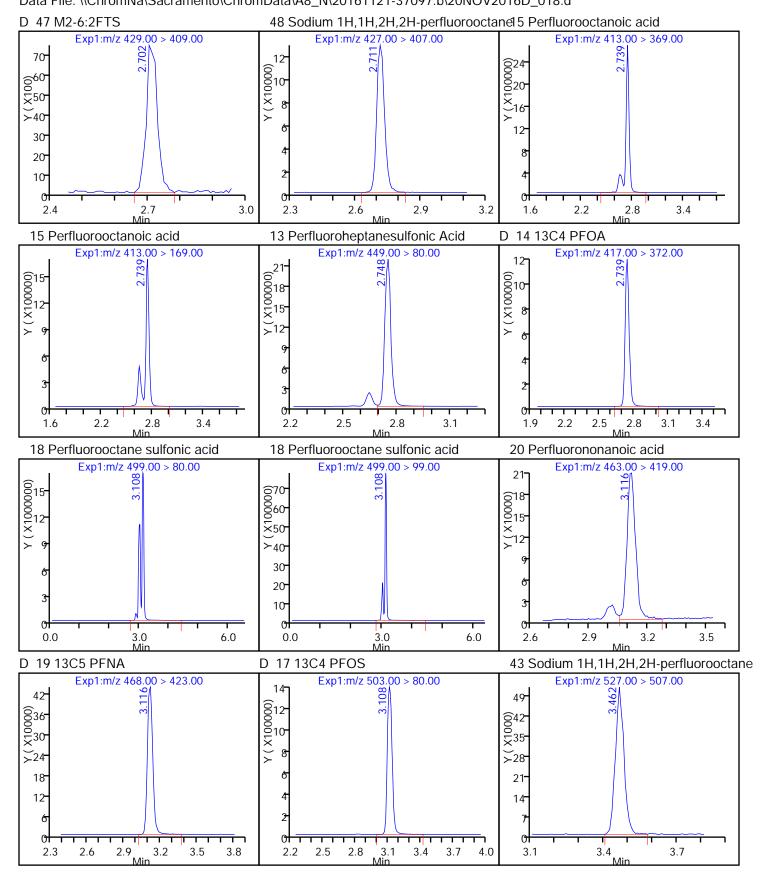
E - Exceeded Maximum Amount

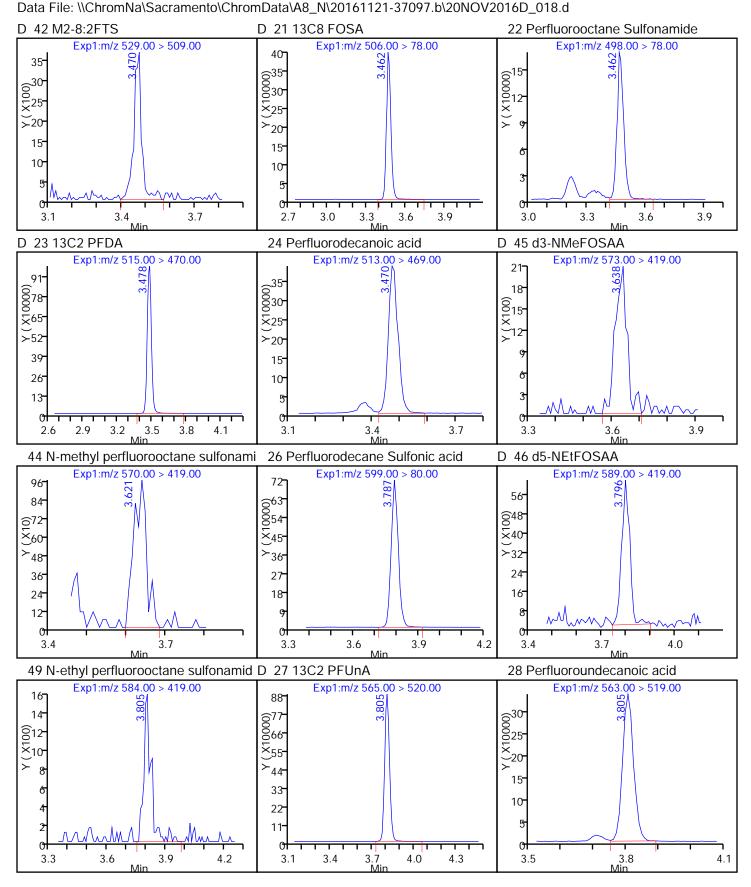
Review Flags

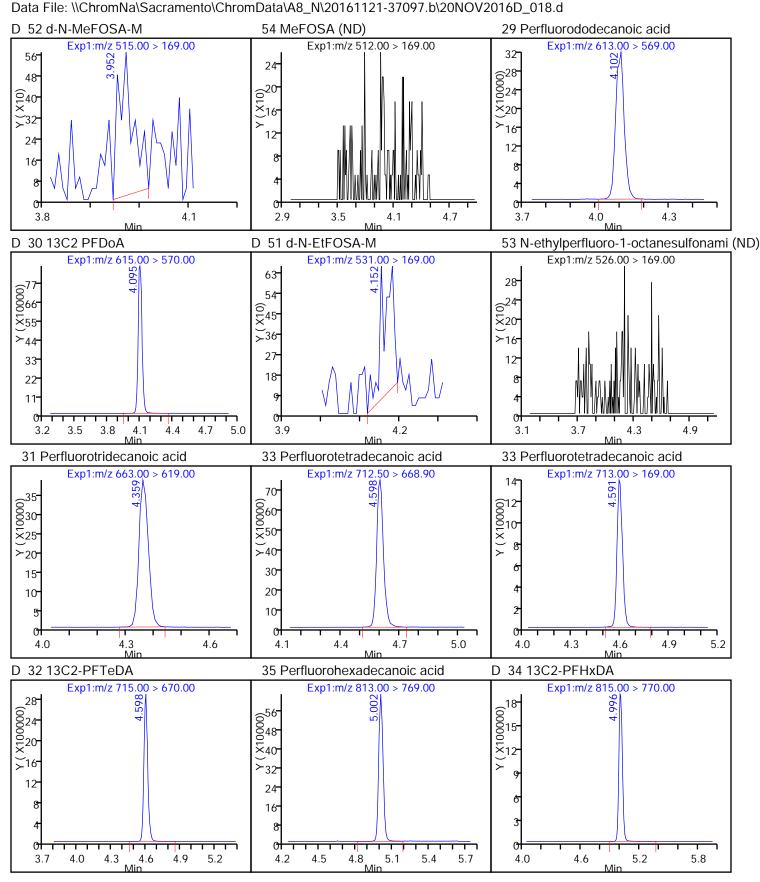
M - Manually Integrated

Report Date: 23-Nov-2016 15:59:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 22:48:20 Instrument ID: A8\_N Lims ID: 320-23542-A-2-B MS Client ID: DPT-16-05-GW-17-21-MS Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 18 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 18 (12 (0000010 (X) X 00015 00015 12 0015 1.2 1.0 1.5 1.8 0.7 1.3 1.6 1.9 0.9 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid (M) 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0021-(0000018-15-X ] 56 (000048<del>-</del> 000040<del>-</del> ©24 00 20 <u></u> 32⁻ 24 16 1.9 2.2 1.9 2.2 1.5 1.8 1.3 1.6 1.3 1.6 1.2 2.1 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 16 (X100000) (00042 (00042 (35 0014<del>-</del> 0012<del>-</del> ×10 <del>-</del>28 21 14 01



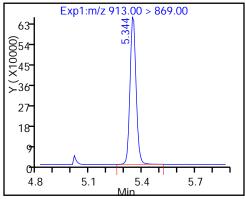






Report Date: 23-Nov-2016 15:59:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_018.d



Report Date: 23-Nov-2016 15:59:08 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_018.d

Injection Date: 20-Nov-2016 22:48:20 Instrument ID: A8\_N

Lims ID: 320-23542-A-2-B MS Client ID: DPT-16-05-GW-17-21-MS

Operator ID: A8-PC\A8 ALS Bottle#: 23 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

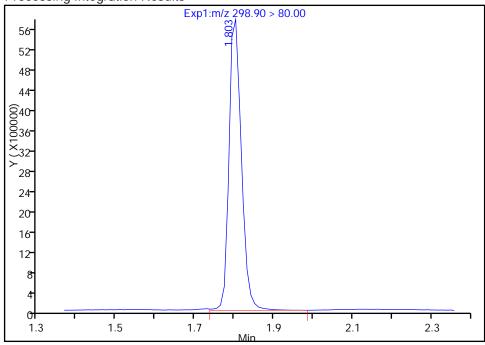
Column: Detector EXP1

#### 5 Perfluorobutanesulfonic acid, CAS: 375-73-5

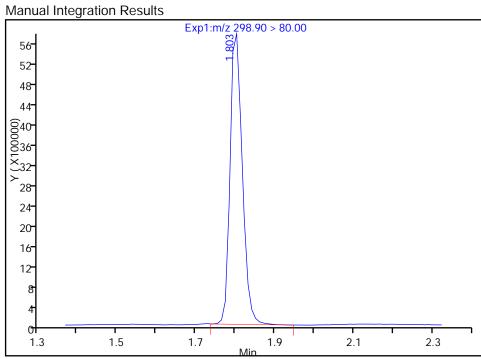
Signal: 1

RT: 1.80
Area: 12651033
Amount: 54.395039
Amount Units: ng/ml

**Processing Integration Results** 



RT: 1.80
Area: 12496232
Amount: 53.729448
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:59:08

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 723 of 842

#### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab File ID: 02DEC2016B\_002.d

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-05-GW-17-21-MS MS Lab Sample ID: 320-23542-2 MS DL

Matrix: Water

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 11:45

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 251.3(mL) Date Analyzed: 12/02/2016 13:06

Con. Extract Vol.: 0.5(mL) Dilution Factor: 100

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 140382 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.268	4 D	0.25	0.20	0.074
1763-23-1	Perfluorooctane Sulfonate (PFOS)	3.08	4 D	0.40	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.20	U	0.25	0.20	0.091

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	78		25-150
STL00991	13C4 PFOS	145		25-150
STL00994	1802 PFHxS	156	Q	25-150

Report Date: 02-Dec-2016 14:56:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_002.d

Lims ID: 320-23542-A-2-B MS Client ID: DPT-16-05-GW-17-21-MS

Sample Type: MS

Inject. Date: 02-Dec-2016 13:06:59 ALS Bottle#: 2 Worklist Smp#: 25

Injection Vol: 2.0 ul Dil. Factor: 100.0000

Sample Info: 320-23542-A-2-B MS 100X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:55:36 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 14:56:31

First Level Reviewer: chandrasenas			Date: 02-Dec-2016 14:56:3			3 1				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00 1 Perfluorobuty	1.593	1.615	-0.022		122994	0.3614		0.7	22350	
212.90 > 169.00	1.593	1.617	-0.024	1.000	80578	0.3700		185	827	
D 4 13C5-PFPe 267.90 > 223.00	1.890	1.918	-0.028		89458	0.3311		0.7	12910	
3 Perfluoropen 262.90 > 219.00	1.890	1.920	-0.030	1.000	101937	0.5474		274	878	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.929	nic acid 1.961 1.961	-0.032 -0.032	1.000 1.000	267992 116457	0.3529	2.30(0.00-0.00)	200		
D 6 13C2 PFHx 315.00 > 270.00	2.192	2.239	-0.047		78785	0.3196		0.6	17653	
7 Perfluorohex 313.00 > 269.00		2.241	-0.049	1.000	311012	2.06		1032	11900	
D 11 13C4-PFH <sub>I</sub> 367.00 > 322.00		2.599	-0.052		72441	0.3441		0.7	15646	
12 Perfluorohej 363.00 > 319.00			-0.046	1.000	59715	0.3985		199	969	
D 10 18O2 PFH: 403.00 > 84.00		2.614	-0.044		222640	0.7361		1.6	89737	
9 Perfluorohex 399.00 > 80.00	2.562	2.615	-0.053	1.000	2996602	6.01		3301		
48 Sodium 1H, 427.00 > 407.00	2.914	•	orooctan 0.001	e 1.000	26716	NR		0.0		
D 47 M2-6:2FTS 429.00 > 409.00		2.915	-0.009		2699	0.0194		0.0		

 Report Date: 02-Dec-2016 14:56:31
 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 Data File:
 \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_002.d

Data File.	NCIIIC	JIIIVa\36	acramen	OCHIOIII	Dala/Ao_IN/201	01202-37430	0.D/02DEC2010B_C	102.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	id:								
413.00 > 369.00		2.984	-0.062	1.000	234199	1.35		673	2151	
413.00 > 169.00	2.922	2.984	-0.062	1.000	144233		1.62(0.90-1.10)		11097	
D 14 13C4 PFO	А									
417.00 > 372.00	2.930	2.984	-0.054		85261	0.3886		8.0	16295	
13 Perfluorohe	ptanesul	fonic Ac	id							
449.00 > 80.00	2.930	2.986	-0.056	1.000	112037	0.2694		141		
D 17 13C4 PFO	S									
503.00 > 80.00	3.302	3.365	-0.063		170079	0.6953		1.5	23954	
18 Perfluorooct	ane sulfo	onic acio	t							
499.00 > 80.00		3.366	-0.064	1.000	5984463	15.5		8334	597179	
499.00 > 99.00	3.302	3.366	-0.064	1.000	1226506		4.88(0.90-1.10)		143763	
20 Perfluoronoi	nanoic a	cid								
463.00 > 419.00	3.302	3.373	-0.071	1.000	32149	0.2524		126	572	
D 19 13C5 PFN/	Д									
468.00 > 423.00	3.302	3.374	-0.072		64245	0.3607		0.7	11804	
D 21 13C8 FOS	A									
506.00 > 78.00	3.619	3.651	-0.032		24836	0.0600		0.1	2278	
22 Perfluorooct	ane Sulf	onamide	Э							
498.00 > 78.00	3.627	3.656	-0.029	1.000	10245	0.2205		110	466	
43 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
527.00 > 507.00	3.644	3.674	-0.030	1.000	5116	NR		0.0		
D 42 M2-8:2FTS	;									
529.00 > 509.00	3.644	3.676	-0.032		1435	0.0107		0.0		
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00	3.779	3.738	0.041	1.000	1252	0.0108		5.4	25.1	
D 23 13C2 PFD/	4									
515.00 > 470.00	3.662	3.738	-0.076		59535	0.3585		0.7	1803	
D 45 d3-NMeFO	SAA									
573.00 > 419.00	3.834	3.839	-0.005		3581	0.0448		0.0		
44 N-methyl pe	rfluorood	ctane su	lfonami							
570.00 > 419.00			-0.040	0.993	2985	NR		0.0		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00		4.009	-0.017		8611	0.0967		0.0		
49 N-ethyl perfl	uoroocta	ane sulfo	namid							
584.00 > 419.00				1.002	4704	NR		0.0		
26 Perfluorodeo	cane Sul	fonic ac	id							
599.00 > 80.00			-0.076	1.000	36446	0.1633		84.7		
D 27 13C2 PFUr										
565.00 > 520.00		4.070	-0.078		47380	0.3767		0.8	9900	
28 Perfluoround										
563.00 > 519.00		4.071	-0.079	1.000	15334	0.1527		76.4	442	
D 52 d-N-MeFO		1.071	0.077	1.000	10001	0.1027		, 0. 1		
515.00 > 169.00		4.105	-0.022		891	0.008379		0.0		
54 MeFOSA	1.000	1.100	0.022		071	0.000017		5.0		
512.00 > 169.00	4 097	4 110	-0.013	1.000	1353	NR		0.0		
		7.110	0.013	1.000	1333	INIX		5.0		
D 51 d-N-EtFOS 531.00 > 169.00		/ 20N	-0.005		_ 1305	O 0127		0.0		
551.00 / 109.00	4.200	4.270	-0.005		Page 726 of	842 <sup>0.013</sup> /		0.0	12/08	/2016

Report Date: 02-Dec-2016 14:56:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

Data File. //CITOTINA/Sacramento/CITOTIData/Ao_N/20101202-37450.b/02DEC2010B_002.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
53 N-ethylperflu	uoro-1-o	ctanesul	fonami							
526.00 > 169.00	4.294	4.299	-0.005	1.000	1372	NR		0.0		
D 30 13C2 PFD										
615.00 > 570.00			-0.076		51241	0.4383		0.9	1896	
29 Perfluorodoo 613.00 > 569.00			-0.076	1.000	14789	0.1525		76.2	318	
31 Perfluorotrid			-0.070	1.000	14709	0.1323		70.2	310	
663.00 > 619.00		4.636	-0.082	1.000	17135	0.1607		80.4	306	
D 32 13C2-PFTe	eDA									
715.00 > 670.00	4.803	4.882	-0.079		127231	0.5260		1.1	16986	
33 Perfluorotetr	adecan	oic acid								
712.50 > 668.90		4.884	-0.081	1.000	41461	0.2094	7.01(0.00.0.00)	105	489	
713.00 > 169.00		4.884	-0.088	0.998	5913		7.01(0.00-0.00)		2471	
D 34 13C2-PFH) 815.00 > 770.00		5.320	-0.091		83950	0.6439		1.3	6930	
35 Perfluorohe			0.071		03730	0.0437		1.5	0730	
813.00 > 769.00		5.320	0.017	1.000	1588	-0.8075		-403.8	35.5	
36 Perfluorooct	adecano	oic acid								
913.00 > 869.00	5.788	5.720	0.068	1.000	268	0.003326		1.7	9.9	

# QC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 02-Dec-2016 14:56:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 13:06:59 Instrument ID: A8\_N Lims ID: 320-23542-A-2-B MS Client ID: DPT-16-05-GW-17-21-MS Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 25 Injection Vol: 2.0 ul Dil. Factor: 100.0000 Limit Group: LC PFC\_DOD ICAL Method:  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 32 28 ×30 830 6 824 ×25 ×20 <del>-</del>24  $\succ$ 20 16 18 15 12 10 1.7 1.9 2.0 2.3 1.3 1.6 1.5 1.8 2.1 2.4 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 12 49 46 Y (X10000) () 640 <del>∑</del>34 ≻28 21 22 16 10 2.2 2.0 1.9 1.8 2.1 1.5 2.4 1.7 1.6 Min D 11 13C4-PFHpA D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 12 32 35 ۲ ( X10000) م 28 **⊝**30 © 824 ) 25-× >20-×20 ≻<sub>16</sub>-15 10 2.1 2.4 2.7 2.1 2.4 2.7 1.8 2.4 2.7 3.0 1.8 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 28 84 91<del>-</del> (000120 × × 16 ©72 ×60 <del>×</del>65 <del>-</del>48 ≻52 12 36**-**39 24 26 13

0

1.9

3.1

2.2 Page 72% of 842 2.0

2.3

2.6

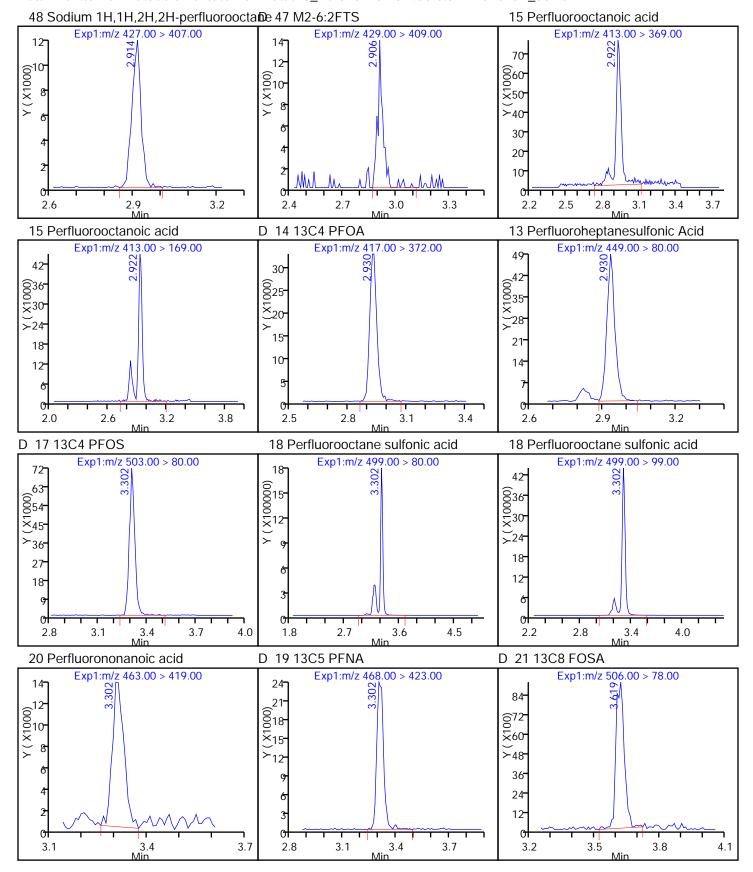
2.9

2.9

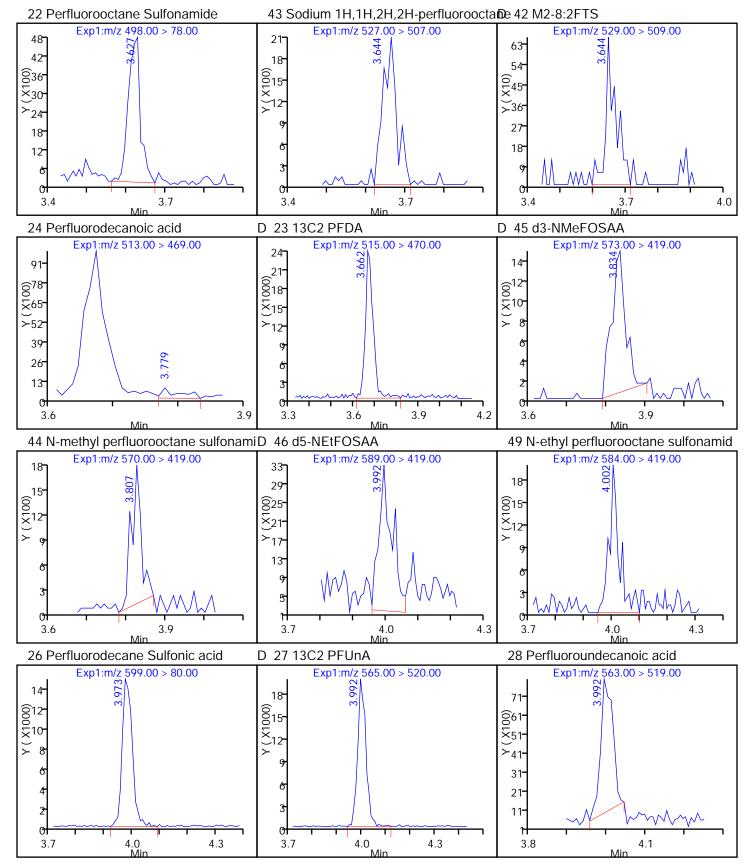
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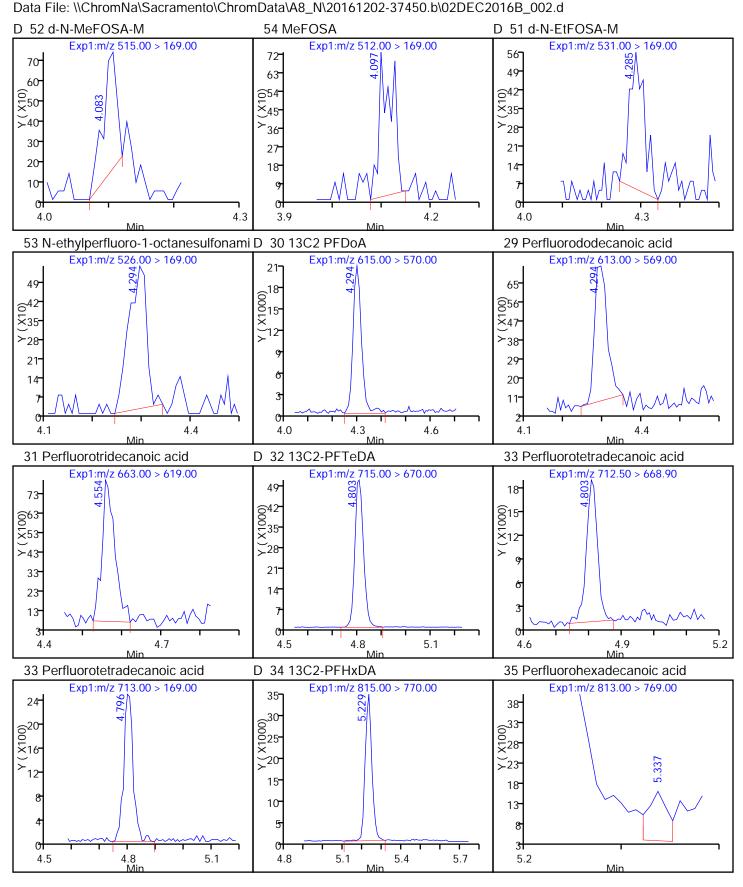
2.3

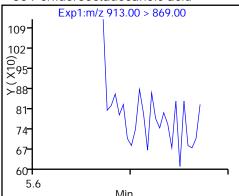
2.6



Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_002.d







#### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-SO-14-15 MS Lab Sample ID: 320-23542-3 MS

Matrix: Solid Lab File ID: 20NOV2016D\_008.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 13:25

Extraction Method: SHAKE Date Extracted: 11/17/2016 12:49

Sample wt/vol: 4.99(g) Date Analyzed: 11/20/2016 21:33

Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 20.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	12.2	МЈ	0.63	0.38	0.13
1763-23-1	Perfluorooctane Sulfonate (PFOS)	67.4	E 4	0.63	0.38	0.16
375-73-5	Perfluorobutanesulfonic acid (PFBS)	6.08		0.50	0.38	0.13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	86		25-150
STL00991	13C4 PFOS	54		25-150
STL00994	1802 PFHxS	72		25-150

Report Date: 23-Nov-2016 15:37:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_008.d

Lims ID: 320-23542-A-3-B MS

Client ID:

Sample Type: MS

Inject. Date: 20-Nov-2016 21:33:19 ALS Bottle#: 17 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-3-b ms Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 15:37:27 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 15:37:39

i iist Level Keviewel. Changholt						Date.		.3-1107-2010 13.37.3	17		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
_	1 Perfluorobut	yric acid									
:	212.90 > 169.00	•	1.493	0.0	1.000	3759565	26.0		130	36100	
	2 13C4 PFBA	\									
	217.00 > 172.00		1.493	0.0		8326360	42.1		84.3	608652	
	0 4 13C5-PFPe		4 750	0.0		7040400	40.5		00.0	4 ( 70 70	_
•	267.90 > 223.00		1.752	0.0		7912439	49.5		99.0	167372	5
	3 Perfluoropen 262.90 > 219.00		cia 1.762	0.0	1.000	3634269	22.1		111	36620	
•	5 Perfluorobuta			0.0	1.000	3034207	22.1			30020	
:	298.90 > 80.00		1.791	0.0	1.000	5343808	24.1		136		
:	298.90 > 99.00	1.800	1.791	0.009	1.005	2181554		2.45(0.00-0.00)			
	7 Perfluorohex	anoic ac	id								
	313.00 > 269.00		2.040	0.0	1.000	3291377	24.7		123	84133	
	0 6 13C2 PFHx										
	315.00 > 270.00		2.040	0.0		7053531	48.6		97.2	600686	
	) 11 13C4-PFH <sub> </sub> 367.00 > 322.00		2.366	0.006		6423393	48.9		97.8	572074	
•				0.000		0423393	40.9		97.0	372074	М
	12 Perfluorohe <sub> </sub> 363.00 > 319.00		2.372	0.0	1.000	3129934	23.8		119	21369	
	0 10 18O2 PFH			0.0		0.2770.	20.0		,	,	
	403.00 > 84.00		2.382	0.005		6910411	34.2		72.3	502978	
	9 Perfluorohex	anesulfo	onic acid								
;	399.00 > 80.00	2.387	2.387	0.0	1.000	4065346	26.3		144		
	0 47 M2-6:2FTS	5									
4	429.00 > 409.00	2.705	2.704	0.001		4490	0.0856		0.0		
	48 Sodium 1H,										
4	427.00 > 407.00	2.705	2.713	-0.008	1.000	55813	NR		0.0		

Report Date: 23-Nov-2016 15:37:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File:				o\Chrom			7.b\20NOV2016			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorood 413.00 > 369.00 413.00 > 169.00	2.733 2.733	2.733 2.733	0.0	1.000 1.000	5938361 3957716	48.4	1.50(0.90-1.10)	242	113956 150384	M M
13 Perfluorohe 449.00 > 80.00	•			1.000	2790420	29.0		152		
D 14 13C4 PFC 417.00 > 372.00		2.733	0.0		5846405	42.8		85.7	311711	
18 Perfluorood 499.00 > 80.00 499.00 > 99.00	3.104	onic aci 3.096 3.096	d 0.008 0.008	1.000 1.000	24542657 5748026	267.3	4.27(0.90-1.10)	1440	123606 540583	
20 Perfluorono 463.00 > 419.00		cid 3.096	0.008	1.000	1954556	24.6		123	17051	
D 19 13C5 PFN 468.00 > 423.00		3.096	0.008		4051816	37.0		74.1	221741	
D 17 13C4 PFC 503.00 > 80.00		3.096	0.008		4035969	25.9		54.2	202429	
43 Sodium 1H 527.00 > 507.00		•	orooctan 0.002		12583	NR		0.0		
D 42 M2-8:2FT: 529.00 > 509.00		3.456	0.017		2008	0.0368		0.0		
D 21 13C8 FOS 506.00 > 78.00		3.458	0.0		5839340	23.3		46.6	573393	
22 Perfluorood 498.00 > 78.00	tane Sulf		е	1.000	8522339	81.0		405	1278	
D 23 13C2 PFD 515.00 > 470.00	Α		0.001		3364516	33.6		67.1	162747	
24 Perfluorode	ecanoic a	cid		1 000						
513.00 > 469.00 D 45 d3-NMeF0	DSAA			1.000	1557168	23.3		117	19248	
573.00 > 419.00 44 N-methyl pe	erfluoroo	ctane su	ılfonami		1263	0.0290		0.0		
570.00 > 419.00 26 Perfluorode				1.007	1865	NR		0.0		
599.00 > 80.00 D 46 d5-NEtFO		3.782	0.0	1.000	720213	14.0		72.8		
589.00 > 419.00 D 27 13C2 PFU	3.773	3.789	-0.016		1529	0.0310		0.0		
565.00 > 520.00	3.800	3.800	0.0		2229138	28.4		56.8	180520	
28 Perfluorour 563.00 > 519.00	3.791		-0.009	1.000	1017122	22.2		111	17158	
D 52 d-N-MeFC 515.00 > 169.00		3.963	0.011		1657	0.0273		0.0		
54 MeFOSA 512.00 > 169.00	3.947	3.972	-0.025	1.000	1791	NR		0.0		
29 Perfluorodo 613.00 > 569.00			-0.001	1.000	698433	23.0		115	15715	
D 30 13C2 PFD 615.00 > 570.00		4.091	-0.001		Page 735 of 8	842 <sup>20.5</sup>		41.1	100012	3/2016
						<del>-</del>			, 50	

Report Date: 23-Nov-2016 15:37:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 51 d-N-EtFOS	A-M									
531.00 > 169.00	4.140	4.153	-0.013		823	0.0150		0.0		
53 N-ethylperflu	uoro-1-o	ctanesul	fonami							
526.00 > 169.00	4.314	4.161	0.153	1.000	505	NR		0.0		
31 Perfluorotrid										
663.00 > 619.00		4.352	0.0	1.000	696972	23.2		116	29978	
33 Perfluorotetr			0.007	1 000	1054417	10.7		00.0	07005	
712.50 > 668.90 713.00 > 169.00		4.586 4.586	0.007 0.0	1.000 0.999	1054417 188517	18.7	5.59(0.00-0.00)	93.3	27335 38865	
D 32 13C2-PFTe		4.500	0.0	0.777	100317		3.37(0.00-0.00)		30003	
715.00 > 670.00		4.586	0.007		2979457	17.5		34.9	245120	
35 Perfluorohex	xadecan	oic acid								
813.00 > 769.00		4.990	0.007	1.000	765005	21.9		109	18411	
D 34 13C2-PFH	хDА									
815.00 > 770.00	4.997	4.990	0.007		1856299	19.7		39.4	186623	
36 Perfluorooct	adecano	oic acid								
913.00 > 869.00	5.344	5.344	0.0	1.000	428279	12.5		62.7	6813	

### OC Flag Legend Processing Flags

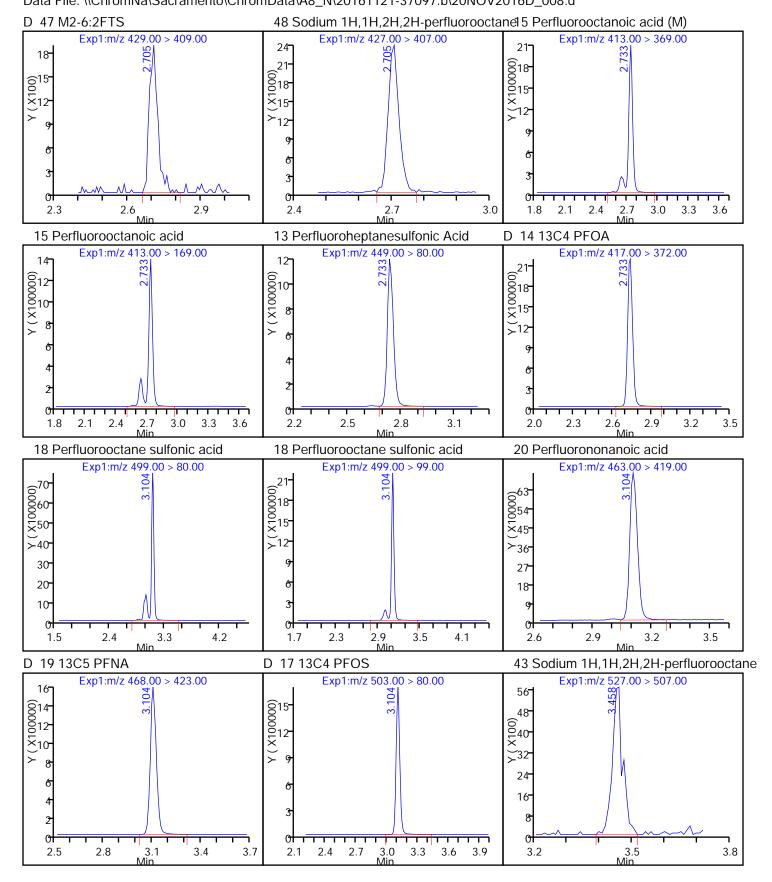
NR - Missing Quant Standard

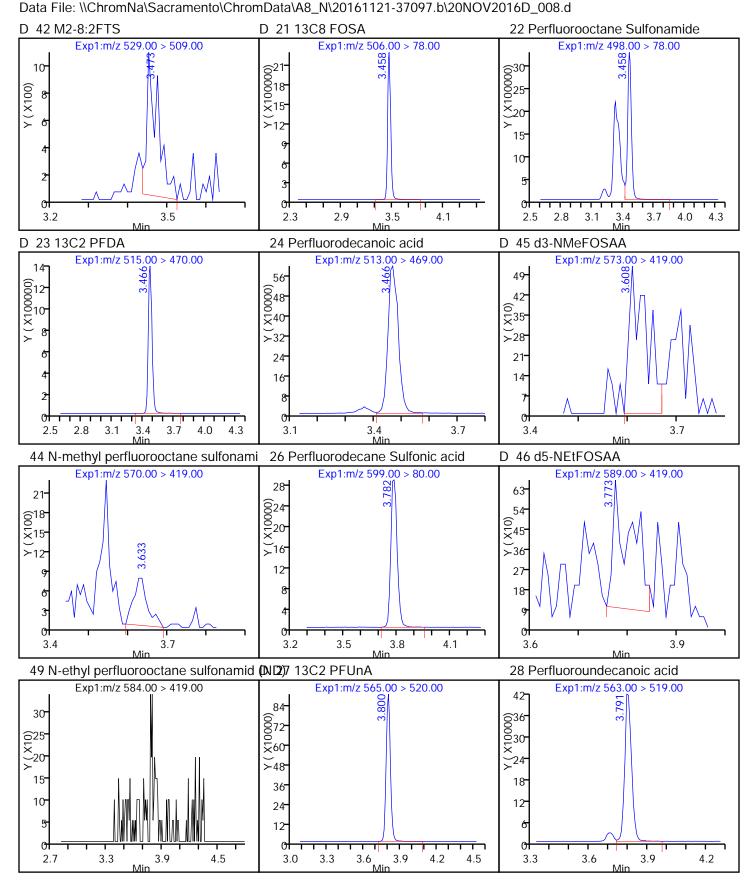
E - Exceeded Maximum Amount

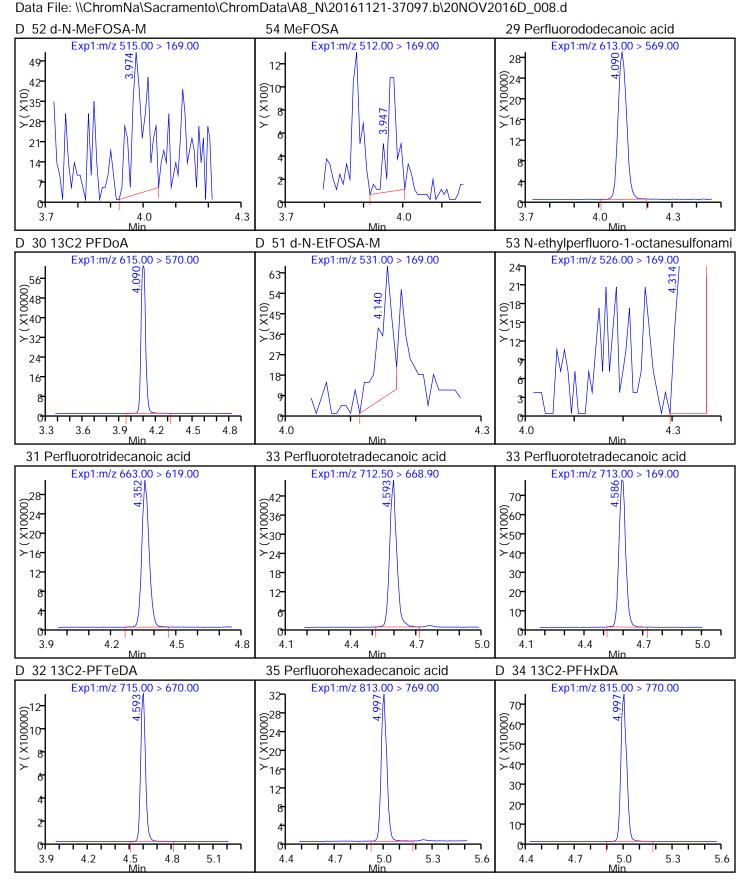
Review Flags

M - Manually Integrated

Report Date: 23-Nov-2016 15:37:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 21:33:19 Instrument ID: A8\_N Lims ID: 320-23542-A-3-B MS Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 17 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 35-0030-25-(015-000012-) > 9 030 0025 \(\S\_{20}\) ∑20<sup>-</sup> 15 15<del>-</del> 10 10 1.2 1.8 1.0 1.9 2.0 1.5 2.1 0.7 1.3 1.6 2.2 1.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 18 24 (X100000) Y (00020 ×16 (0000015<sup>-</sup>12<sup>-</sup>2 × 9 1.9 2.2 1.5 1.8 2.1 2.4 1.6 1.5 1.8 1.2 1.3 1.2 2.1 2.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 16 040 28 (28-00024-×20-000012 0024 00024 20 ∑10• \_ ≻16 12 1.8 1.7 2.0 1.8 2.1 2.4 2.1 2.4 1.4 2.3 2.6 2.7 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid (M) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 628 6024 <del>×</del>20-≻16<del>-</del> 12 0 0 1.9 2.2 2.5 2.8 1.9 2.2 2.5 Page 787nof 842 2.8 1.3 1.9 2.5 1.6 12/08/2016



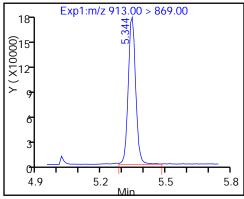




Report Date: 23-Nov-2016 15:37:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_008.d

### 36 Perfluorooctadecanoic acid



Report Date: 23-Nov-2016 15:37:39 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_008.d

Injection Date: 20-Nov-2016 21:33:19 Instrument ID: A8\_N

Lims ID: 320-23542-A-3-B MS

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 17 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

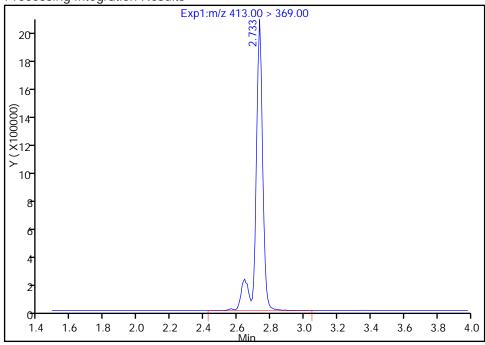
Column: Detector EXP1

### 15 Perfluorooctanoic acid, CAS: 335-67-1

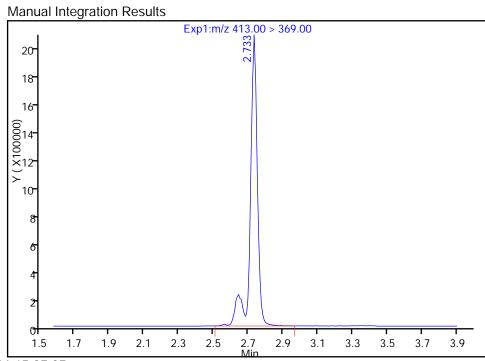
Signal: 1

RT: 2.73
Area: 5961012
Amount: 48.547992
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.73
Area: 5938361
Amount: 48.363516
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 15:37:27

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 742 of 842

#### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-SO-14-15 MS DL Lab Sample ID: 320-23542-3 MS DL

Matrix: Solid

Analysis Method: 537 (Modified)

Extraction Method: SHAKE

Sample wt/vol: 4.99(g)

Con. Extract Vol.: 1.0(mL)

Injection Volume: 2(uL)

% Moisture: 20.5

Analysis Batch No.: 140382

Lab File ID: 02DEC2016B\_007.d

Date Collected: 11/14/2016 13:25

Date Extracted: 11/17/2016 12:49

Date Analyzed: 12/02/2016 13:44

Dilution Factor: 10

GC Column: Acquity ID: 2.1(mm)

GPC Cleanup: (Y/N) N

Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	12.7	JD	6.3	3.8	1.3
1763-23-1	Perfluorooctane Sulfonate (PFOS)	69.2	4 D	6.3	3.8	1.6
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.90	JD	5.0	3.8	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	110		25-150
STL00991	13C4 PFOS	63		25-150
STL00994	1802 PFHxS	84		25-150

Report Date: 02-Dec-2016 15:03:10 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_007.d

Lims ID: 320-23542-A-3-B MS

Client ID:

Sample Type: MS

Inject. Date: 02-Dec-2016 13:44:33 ALS Bottle#: 7 Worklist Smp#: 30

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-23542-A-3-B MS 10X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 15:02:58 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 15:03:10

FIISt Level Revie	nurasen	ias	Date: 02-Dec-2016 15:03:10				0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 213C4 PFBA 217.00 > 172.00 1 Perfluorobuty	1.582	1.615	-0.033		1416278	4.16		8.3	228018	
212.90 > 169.00	1.582	1.617	-0.035	1.000	619310	2.47		123	5950	
D 4 13C5-PFPe 267.90 > 223.00		1.918	-0.050		1234556	4.57		9.1	247928	
3 Perfluoropen 262.90 > 219.00		cid 1.920	-0.042	1.000	579987	2.26		113	6102	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.916	nic acid 1.961 1.961	-0.045 -0.054	1.000 0.995	793125 331116	1.94	2.40(0.00-0.00)	110		
D 6 13C2 PFHx 315.00 > 270.00	2.188	2.239	-0.051		1097415	4.45		8.9	151464	
7 Perfluorohex 313.00 > 269.00		id 2.241	-0.062	1.000	493561	2.35		118	15643	
D 11 13C4-PFH <sub>1</sub> 367.00 > 322.00		2.599	-0.068		1056750	5.02		10.0	203643	
12 Perfluorohej 363.00 > 319.00			-0.062	1.000	518090	2.37		119	6714	
D 10 18O2 PFH: 403.00 > 84.00	2.546	2.614			1196887	3.96		8.4	243810	
9 Perfluorohex 399.00 > 80.00	2.546	2.615	-0.069	1.000	704852	2.63		144		
48 Sodium 1H, 427.00 > 407.00	2.880			e 1.000	20743	NR		0.0		
D 47 M2-6:2FTS 429.00 > 409.00		2.915	-0.027		1431	0.0103		0.0		

Data File:	\\Cnrc	omiva\Sa	acrament	:o\Cnrom	Data\A8_IN\201	61202-37450	J.D\02DEC2016B_C	U7.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	rid.								
413.00 > 369.00			-0.080	1.000	1242112	5.06		253	20533	
413.00 > 169.00			-0.080	1.000	769475	3.00	1.61(0.90-1.10)	200	53048	
D 14 13C4 PFO		2.701	0.000	1.000	707170		1.01(0.70 1.10)		00010	
417.00 > 372.00		2.984	0.072		1203412	5.48		11.0	235214	
					1203412	3.40		11.0	233214	
13 Perfluorohe; 449.00 > 80.00			.0.074	1.000	473102	2.62		138		
		2.900	-0.074	1.000	4/3102	2.02		130		
D 17 13C4 PFOS		0.045	0.007		70747/	0.04			100000	
503.00 > 80.00			-0.087		737476	3.01		6.3	100003	
18 Perfluorooct									_,	
499.00 > 80.00			-0.080	1.000	4606300	27.5	10/(0.00.1.10)	1479	760557	
499.00 > 99.00		3.366	-0.088	0.998	1080030		4.26(0.90-1.10)		133247	
20 Perfluoronor										
463.00 > 419.00	3.286	3.373	-0.087	1.000	359134	2.34		117	5972	
D 19 13C5 PFNA	4									
468.00 > 423.00	3.286	3.374	-0.088		772870	4.34		8.7	104119	
D 21 13C8 FOSA	Д									
506.00 > 78.00	3.593	3.651	-0.058		1022176	2.47		4.9	81869	
22 Perfluorooct	ane Sulf	fonamide	Ż.							
498.00 > 78.00			-0.055	1.000	1479943	7.74		387	1302	
43 Sodium 1H,										
527.00 > 507.00		•			3016	NR		0.0		
		3.074	-0.047	0.773	3010	IVIX		0.0		
D 42 M2-8:2FTS		2/7/	0.022		720	0.005537		0.0		
529.00 > 509.00		3.676	-0.033		739	0.005536		0.0		
24 Perfluorodeo										
513.00 > 469.00	3.643	3.738	-0.095	1.000	252302	2.33		116	8059	
D 23 13C2 PFD/	4									
515.00 > 470.00	3.652	3.738	-0.086		558622	3.36		6.7	23773	
D 45 d3-NMeFO	SAA									
573.00 > 419.00	3.796	3.839	-0.043		759	0.009488		0.0		
44 N-methyl pe	rfluoroo	ctane su	lfonami							
570.00 > 419.00			-0.061	0.997	344	NR		0.0		
D 46 d5-NEtFOS	<b>ΣΔΔ</b>									
589.00 > 419.00		4.009	-0.020		1253	0.0141		0.0		
49 N-ethyl perfl					.200	0.0		0.0		
584.00 > 419.00				1.000	2456	NR		0.0		
				1.000	2430	IVIX		0.0		
26 Perfluorodeo				1 000	105/00	1.00		(7.4		
599.00 > 80.00		4.049	-0.088	1.000	125689	1.30		67.4		
D 27 13C2 PFUr										
565.00 > 520.00	3.970	4.070	-0.100		341139	2.71		5.4	44370	
28 Perfluoround	decanoio	c acid								
563.00 > 519.00	3.980	4.071	-0.091	1.000	151913	2.10		105	3597	
D 52 d-N-MeFOS	SA-M									
515.00 > 169.00		4.105	-0.047		334	0.003141		0.0		
54 MeFOSA										
512.00 > 169.00	4.109	4.110	-0.001	1.000	515	NR		0.0		
			0.001		3.10	7411		0.0		
D 51 d-N-EtFOS 531.00 > 169.00		4.290	0.134		242	U UU330E		0.0		
331.00 / 107.00	7.724	T.∠ 7U	0.134		Page 745 of	842.002303		0.0	12/08	3/2016

Report Date: 02-Dec-2016 15:03:10 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File:

	,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					0.0.022220102_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFD	οA									
615.00 > 570.00	4.274	4.370	-0.096		240827	2.06		4.1	10580	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00	4.274	4.370	-0.096	1.000	103218	2.26		113	2635	
31 Perfluorotrid	lecanoic	acid								
663.00 > 619.00	4.534	4.636	-0.102	1.000	94789	1.89		94.6	869	
D 32 13C2-PFT6										
715.00 > 670.00			-0.103		459742	1.90		3.8	97156	
33 Perfluorotetr			0.105	1 000	100510	0.14		107	100/	
712.50 > 668.90 713.00 > 169.00				1.000	199512 28674	2.14	6.96(0.00-0.00)	107	1086 12359	
D 34 13C2-PFH		4.004	-0.112	0.770	20074		0.70(0.00-0.00)		12337	
815.00 > 770.00		5.320	-0.112		202721	1.55		3.1	14761	
35 Perfluorohex			0					<b>0.</b> .		
813.00 > 769.00			0.047	1.000	5441	-0.7086		-35.4	13.8	
36 Perfluorooct	adecano	oic acid								
913.00 > 869.00			-0.020	1.000	618	0.0163		8.0	10.3	

## OC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 02-Dec-2016 15:03:11 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 02-Dec-2016 13:44:33 Instrument ID: A8\_N Lims ID: 320-23542-A-3-B MS Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 30 Injection Vol: 2.0 ul Dil. Factor: 10.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 21 6036 0036 0018-00015-×) 042 035 × <del>∑</del>30 28 21 18 1.9 2.0 1.0 1.3 1.6 2.2 1.1 1.4 1.7 0.9 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 35 24 0020 ×16 030 025 × 15 10 1.8 2.1 2.4 1.8 2.1 1.8 2.1 2.4 1.5 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 21 (000015-X)12-630-636-(00036 ×30 **≻**24 18 18 12 12 1.9 2.8 2.1 2.4 2.7 2.1 2.7 2.5 1.8 2.4 3.0 3.3 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 49 21 24 (000015 15 12 642 62 635 0 20 ×16 <u>\_\_28</u>-12 21 14 0 2.6 2.9 2.2 Page 7.4/7n of 84 3.4 2.1 2.4 2.7 2.3 1.8

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016B\_007.d 48 Sodium 1H,1H,2H,2H-perfluoroocta De 47 M2-6:2FTS 15 Perfluorooctanoic acid Exp1:m/z 427.00 > 407.00 Exp1:m/z 429.00 > 409.00 Exp1:m/z 413.00 > 369.00 80 35 70 ×30-860 ×25 **≥**50 ><sub>40</sub> ≻20 ≻24 18 15 30 12 20 10 10 2.9 3.2 3.0 2.5 2.4 2.7 3.3 1.9 3.1 3.7 2.6 15 Perfluorooctanoic acid D 14 13C4 PFOA 13 Perfluoroheptanesulfonic Acid Exp1:m/z 449.00 > 80.00 Exp1:m/z 413.00 > 169.00 Exp1:m/z 417.00 > 372.00 48 904 (18<sup>-</sup> (00015<sup>-</sup> (12<sup>-</sup> (24<sup>-</sup> 0020 642 636  $\times_{30}$ 12 18 12 2.5 3.1 3.7 2.5 2.9 3.2 2.8 3.1 3.4 18 Perfluorooctane sulfonic acid D 17 13C4 PFOS 18 Perfluorooctane sulfonic acid Exp1:m/z 499.00 > 99.00 Exp1:m/z 503.00 > 80.00Exp1:m/z 499.00 > 80.00 16 40 28 0014<del>-</del> 0012-635<u>-</u> 630<u>-</u> (00024 ×20 <u>×</u>10 ×25 ≻16 ≻<sub>20</sub>-15<del>-</del> 10 2.9 3.2 3.5 3.8 1.9 2.8 3.7 4.6 2.7 3.3 3.9 4.1 2.1 4.5 2.6 D 19 13C5 PFNA D 21 13C8 FOSA 20 Perfluorononanoic acid Exp1:m/z 463.00 > 419.00 Exp1:m/z 468.00 > 423.00 Exp1:m/z 506.00 > 78.00 32 14 (36<sup>-</sup> (00030 × )24<sup>-</sup> 628 624 (00012-10-10-10-8 ×20 ≻<sub>16</sub>-18

0

3.1

3.4 Min

3.7

2.6

2.9

3.2

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3.8

4.1

2.8

3.1

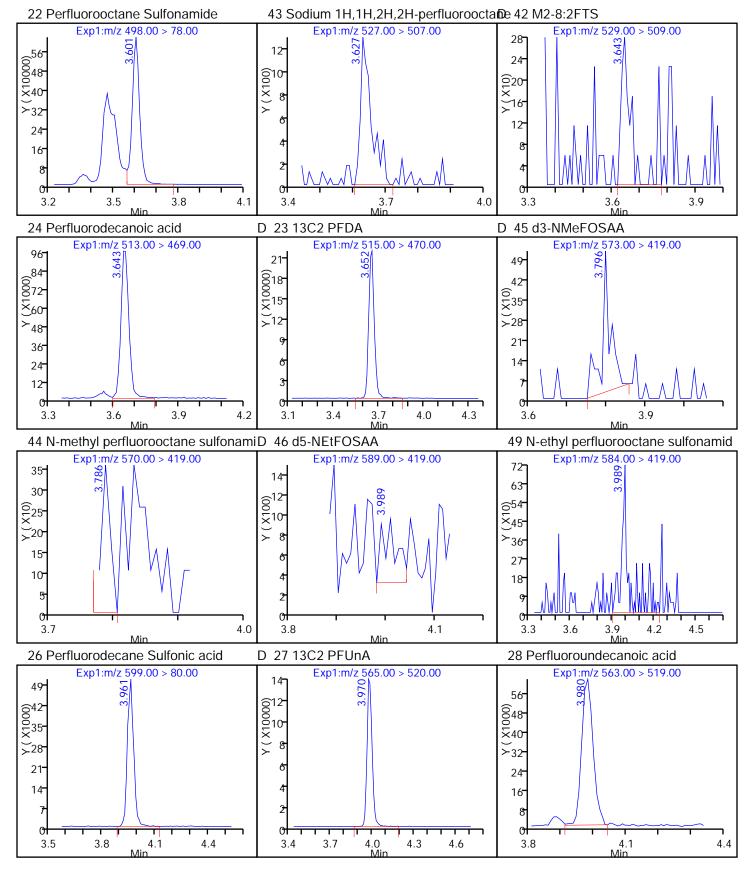
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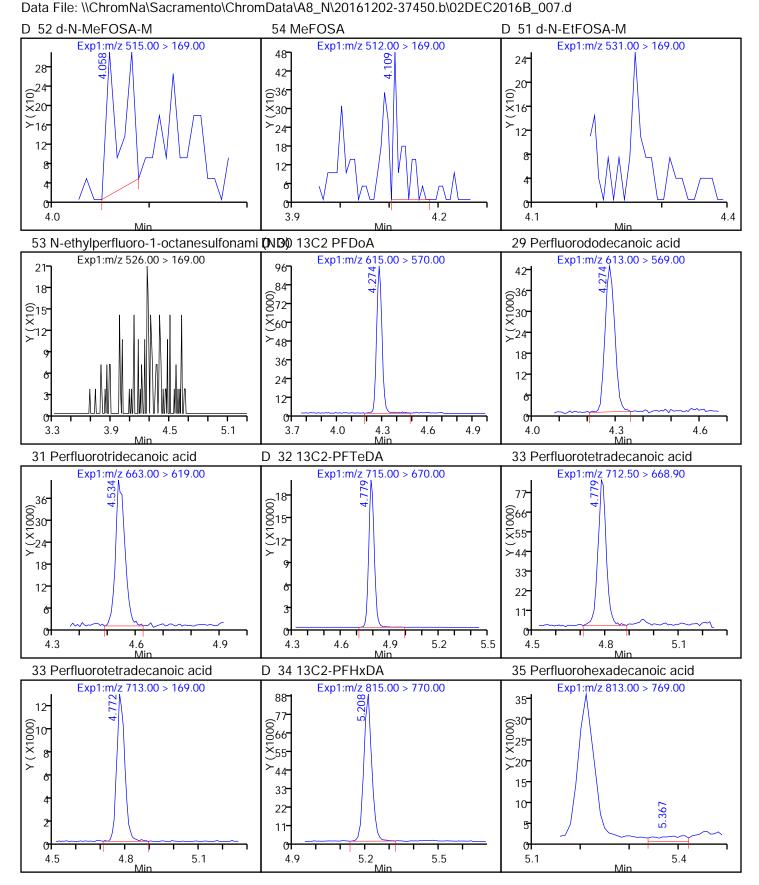
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4.0

4.3

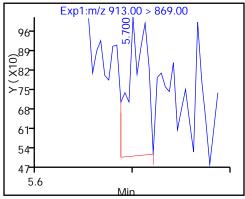
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_007.d





Report Date: 02-Dec-2016 15:03:11 Chrom Revision: 2.2 14-Nov-2016 08:15:18

### 36 Perfluorooctadecanoic acid



#### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-05-GW-17-21-MSD Lab Sample ID: 320-23542-2 MSD

Matrix: Water Lab File ID: 20NOV2016D\_019.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 11:45

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 247.8(mL) Date Analyzed: 11/20/2016 22:55

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.210	4 M	0.0025	0.0020	0.00075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.05	E 4	0.0040	0.0030	0.0013
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0881	М	0.0025	0.0020	0.00093

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	80		25-150
STL00991	13C4 PFOS	65		25-150
STL00994	1802 PFHxS	82		25-150

Report Date: 23-Nov-2016 16:15:21 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_019.d

Lims ID: 320-23542-A-2-C MSD
Client ID: DPT-16-05-GW-17-21-MSD

Sample Type: MSD

Inject. Date: 20-Nov-2016 22:55:50 ALS Bottle#: 24 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-2-c msd Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 23-Nov-2016 16:15:19 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK008

First Level Reviewer: changnoit Date: 23-Nov-2016 16:15:19

	115t Ecvel Itevie	Wor. ond	rigiloit			Bate.		0 110			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	1 Perfluorobuty	yric acid									
	212.90 > 169.00		1.493	0.009	1.000	4257949	41.6		208	22221	
	2 13C4 PFBA		4 400	0.004		5070400	00.7		F0 F	E40000	
	217.00 > 172.00		1.493	0.001		5878138	29.7		59.5	519930	
	D 4 13C5-PFPe 267.90 > 223.00		1.752	0.010		6494281	40.6		81.2	419493	
•	3 Perfluoropen			0.010		0171201	10.0		01.2	117170	
	262.90 > 219.00		1.762	0.0	1.000	6315626	46.8		234	43107	
	5 Perfluorobuta	anesulfo	nic acid								М
	298.90 > 80.00		1.791	0.010	1.000	11008448	43.7	(	247		M
		1.801	1.791	0.010	1.000	4996456		2.20(0.00-0.00)			
	7 Perfluorohex 313.00 > 269.00		2.040	0.006	1.000	17879153	145.7		728	131872	
	O 6 13C2 PFHx		2.040	0.000	1.000	17079133	145.7		720	131072	
	315.00 > 270.00		2.040	0.006		6495858	44.7		89.5	561128	
	D 11 13C4-PFH <sub>I</sub>										
	367.00 > 322.00		2.366	0.005		4457196	33.9		67.8	510945	
	12 Perfluorohe										
	363.00 > 319.00	2.371	2.372	-0.001	1.000	3382687	37.1		185	7499	
	0 10 18O2 PFH:		0.000	0.040		70/4000	00.0		00.0	E04/00	
•	403.00 > 84.00		2.382	0.010		7861802	38.9		82.2	521690	_
	9 Perfluorohex 399.00 > 80.00		onic acid 2.387	0.005	1.000	66810124	379.5		2085		E E
	0		2.507	0.000	1.000	00010124	377.3		2005		_
	429.00 > 409.00		2.704	0.001		18809	0.3588		0.0		
	48 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
	427.00 > 407.00		2.713	0.001	1.000	310686	NR		0.0		

 Report Date: 23-Nov-2016 16:15:21
 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 Data File:
 \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_019.d

Data File:	\\Cnrc	omiva\Sa	acrament	:o\Cnrom	Data\A8_IN\201	161121-3709	7.b\20NOV2016D_C	119.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct			0.001	1 000	11002120	104.0		F20	180557	M
413.00 > 369.00 413.00 > 169.00	2.732	2.733	-0.001	1.000 1.000	11902120 8027603	104.0	1.48(0.90-1.10)	520	210574	
13 Perfluorohe 449.00 > 80.00		fonic Ac 2.733		1.000	5181451	44.5		234		
D 14 13C4 PFO		2 733	-0 001		5447569	39.9		79.8	258716	
18 Perfluorooct					3447307	37.7		77.0		E
499.00 > 80.00 499.00 > 99.00		3.096 3.096	0.015 0.015	1.000 1.000	112669220 30200397	1016.5	3.73(0.90-1.10)	5477	716237 0.0	E
20 Perfluoronor			0.015	1.000	1194902	22.4		118	4959	
463.00 > 419.00 D 19 13C5 PFNA		3.096	0.015	1.000	1194902	23.6		110	4959	
468.00 > 423.00		3.096	0.015		2575147	23.5		47.1	138352	
D 17 13C4 PFOS 503.00 > 80.00		3.096	0.015		4871771	31.3		65.4	68491	
43 Sodium 1H, 527.00 > 507.00		•	orooctan 0.001	e 1.004	81208	NR		0.0		
D 42 M2-8:2FTS										
529.00 > 509.00 D 21 13C8 FOSA		3.456	-0.014		4546	0.0833		0.0		
506.00 > 78.00		3.458	0.007		1593037	6.35		12.7	113965	
22 Perfluorooct 498.00 > 78.00			e 0.007	1.000	629427	21.9		110	4576	
D 23 13C2 PFD	Д									
515.00 > 470.00 24 Perfluorodeo			0.0		3792607	37.8		75.7	252479	
513.00 > 469.00	3.473	3.465	0.008	1.000	1587451	21.1		105	18451	
D 45 d3-NMeFO 573.00 > 419.00		3.623	0.001		5439	0.1251		0.0		
44 N-methyl pe										
570.00 > 419.00 26 Perfluorodeo		3.632		0.998	1347	NR		0.0		
599.00 > 80.00	3.781	3.782		1.000	1817939	29.3		152		
D 46 d5-NEtFOS 589.00 > 419.00		3.789	-0.008		8802	0.1786		0.0		
49 N-ethyl perfl				1 000	2512	ND		0.0		
584.00 > 419.00 D 27 13C2 PFUr		3.798	0.018	1.009	3513	NR		0.0		
565.00 > 520.00		3.800	-0.001		2791882	35.6		71.2	232066	
28 Perfluoround 563.00 > 519.00		3.800	-0.001	1.000	1111118	19.4		96.8	21401	
D 52 d-N-MeFOS 515.00 > 169.00		3.963	-0.008		908	0.0150		0.0		
29 Perfluorodoo 613.00 > 569.00		acid 4.091	-0.001	1.000	982244	20.2		101	22062	
D 30 13C2 PFD	Ac									
615.00 > 570.00	4.090	4.091	-0.001		Page 754 of	842 32.9		65.8	118838 12/08	3/2016

Report Date: 23-Nov-2016 16:15:21 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 51 d-N-EtFOSA-M										
531.00 > 169.00	4.351	4.153	0.198		741	0.0135		0.0		
53 N-ethylperflu	uoro-1-o	ctanesul	fonami							
526.00 > 169.00	4.203	4.161	0.042	1.000	308	NR		0.0		
31 Perfluorotrid										
663.00 > 619.00			0.009	1.000	1116082	23.2		116	36124	
33 Perfluorotetr			0.012	1 000	227/227	25.2		10/	7/000	
712.50 > 668.90 713.00 > 169.00		4.586 4.586	0.013 0.006	1.000 0.999	2276327 400964	25.2	5.68(0.00-0.00)	126	76239 83938	
D 32 13C2-PFTe		4.000	0.000	0.777	400704		3.00(0.00 0.00)		03730	
715.00 > 670.00		4.586	0.013		7381469	43.3		86.5	508262	
35 Perfluorohex	xadecan	oic acid								
813.00 > 769.00		4.990	0.007	1.000	1992159	35.8		179	52158	
D 34 13C2-PFH	хDА									
815.00 > 770.00	4.997	4.990	0.007		5453901	57.8		116	697454	
36 Perfluorooct	adecano	oic acid								
913.00 > 869.00	5.344	5.344	0.0	1.000	1958237	35.8		179	11544	

### OC Flag Legend Processing Flags

NR - Missing Quant Standard

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 23-Nov-2016 16:15:21 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 22:55:50 Instrument ID: A8\_N Lims ID: 320-23542-A-2-C MSD Client ID: DPT-16-05-GW-17-21-MSD Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 19 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC\_DOD ICAL  $A8_N$ Limit Group: 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 (18 0000) 15 0000 ∑<sub>16</sub>-\_ ≻16 12 1.7 1.0 1.3 1.9 1.9 2.0 0.7 1.6 1.0 1.3 1.6 2.5 5 Perfluorobutanesulfonic acid (M) 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 298.90 > 80.00Exp1:m/z 262.90 > 219.00Exp1:m/z 298.90 > 99.0028 24 (00001 20-20-()49 ()42 ()42 ×35 ∑16<sup>-</sup> ≻<sub>28</sub>-21 14 1.9 2.2 2.1 1.6 1.8 1.2 1.5 1.3 1.5 1.8 2.1 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 217 28 046 63 00054 ×45 00018-000015-× 12-824**-**Š<sub>20</sub> \_\_\_\_16<del>-</del> 27 18 1.7 2.0 2.0 1.8 2.1 2.4 2.3 2.6 1.4 1.7 2.3 2.6 2.7 1.1 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 32 16 (X100000) (X1000012) 00014 00012 ©28**-**×20 ≻<sub>16</sub>-0 0

2.0

2.3

Min

2.6

1.4

Page 7566 of 842

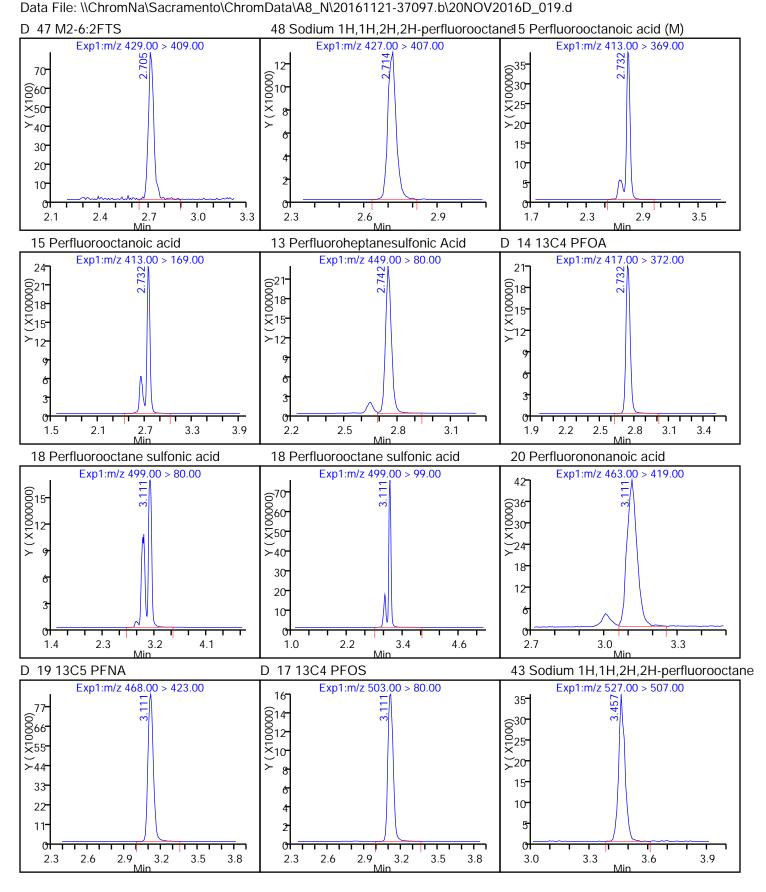
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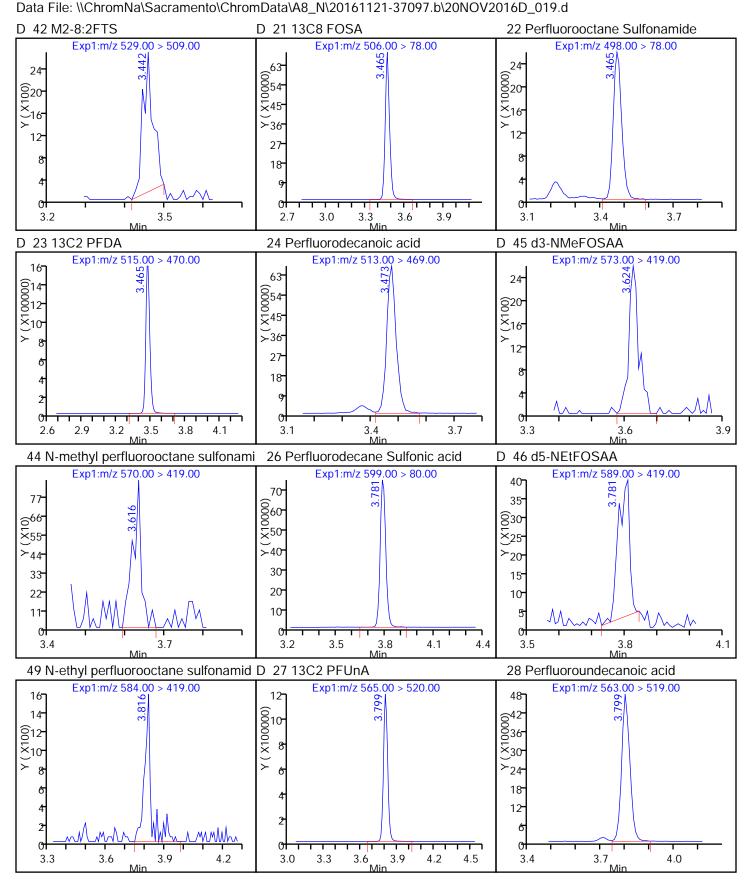
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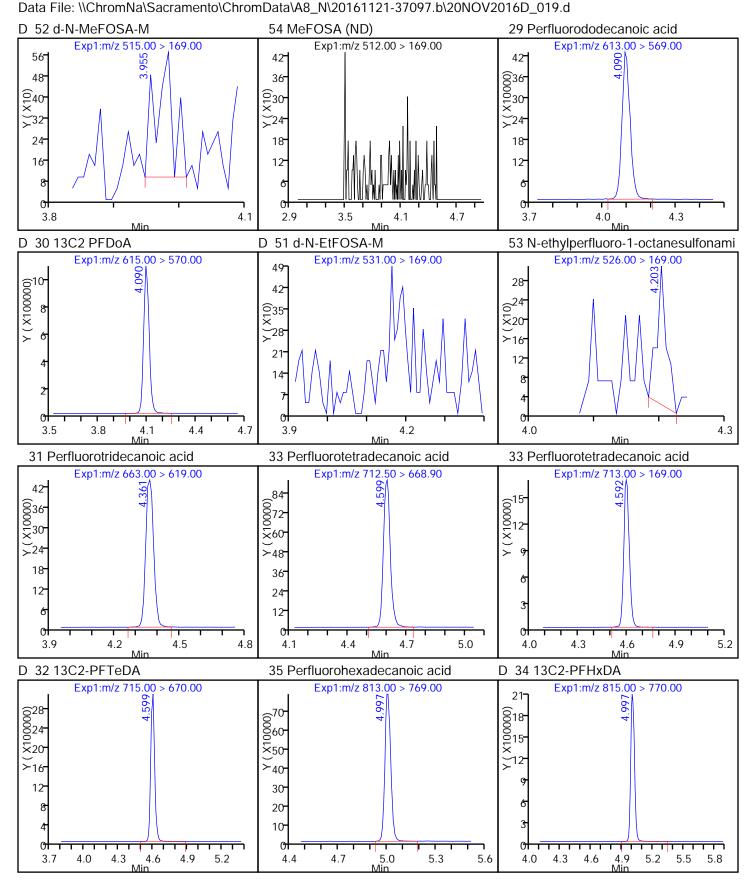
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2.5

12/08/2016

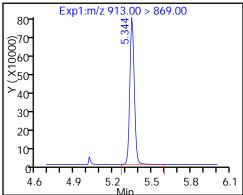






Report Date: 23-Nov-2016 16:15:21 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_019.d

### 36 Perfluorooctadecanoic acid



Report Date: 23-Nov-2016 16:15:21 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_019.d

Injection Date: 20-Nov-2016 22:55:50 Instrument ID: A8\_N

Lims ID: 320-23542-A-2-C MSD
Client ID: DPT-16-05-GW-17-21-MSD

Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

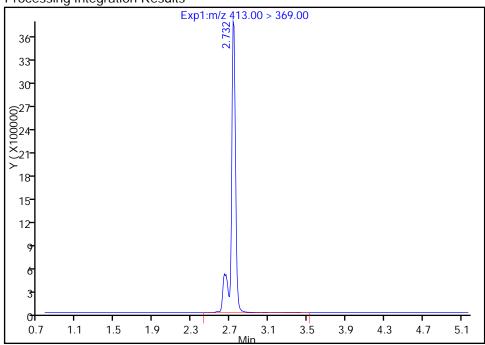
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

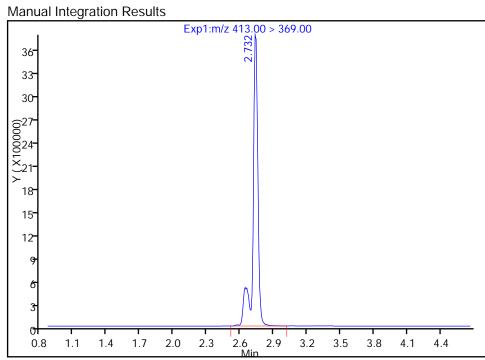
### 15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.73 Area: 12014885 Amount: 105.0164 Amount Units: ng/ml **Processing Integration Results** 



RT: 2.73
Area: 11902120
Amount: 104.0308
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 16:15:19

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 761 of 842

Report Date: 23-Nov-2016 16:15:21 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_019.d

Injection Date: 20-Nov-2016 22:55:50 Instrument ID: A8\_N

Lims ID: 320-23542-A-2-C MSD
Client ID: DPT-16-05-GW-17-21-MSD

Operator ID: A8-PC\A8 ALS Bottle#: 24 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

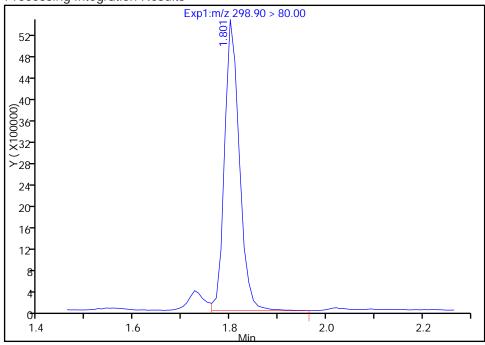
Method: A8\_N Limit Group: LC PFC\_DOD ICAL

Column: Detector EXP1

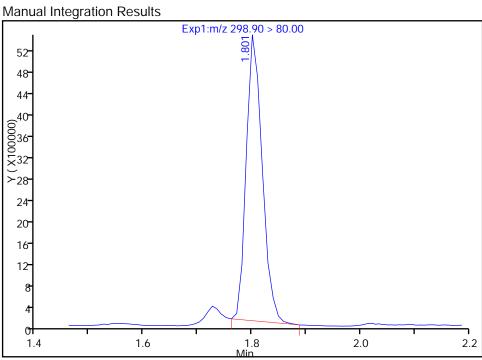
### 5 Perfluorobutanesulfonic acid, CAS: 375-73-5

Signal: 1

RT: 1.80 Area: 11625537 Amount: 46.107992 Amount Units: ng/ml **Processing Integration Results** 



RT: 1.80
Area: 11008448
Amount: 43.660558
Amount Units: ng/ml



Reviewer: changnoit, 23-Nov-2016 16:15:19

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 762 of 842

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-05-GW-17-21-MSD Lab Sample ID: 320-23542-2 MSD DL

Matrix: Water Lab File ID: 02DEC2016B\_003.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 11:45

Extraction Method: 3535 Date Extracted: 11/17/2016 08:49

Sample wt/vol: 247.8(mL) Date Analyzed: 12/02/2016 13:14

Con. Extract Vol.: 0.5(mL) Dilution Factor: 100

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 140382 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.214	J 4 D	0.25	0.20	0.075
1763-23-1	Perfluorooctane Sulfonate (PFOS)	2.79	4 D	0.40	0.30	0.13
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.20	U	0.25	0.20	0.093

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	101		25-150
STL00991	13C4 PFOS	99		25-150
STL00994	1802 PFHxS	116		25-150

Report Date: 02-Dec-2016 15:01:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_003.d

Lims ID: 320-23542-A-2-C MSD
Client ID: DPT-16-05-GW-17-21-MSD

Sample Type: MSD

Inject. Date: 02-Dec-2016 13:14:29 ALS Bottle#: 3 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 100.0000

Sample Info: 320-23542-A-2-C MSD 100X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 14:55:36 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1 : Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 15:01:17

Signal RT RT RT REL Response Amount ng/ml Ratio(Limits) %Res	S/N	Flags
		_
D 2 13C4 PFBA 217.00 > 172.00 1.590 1.615 -0.025 136790 0.4020 0.8	22816	
1 Perfluorobutyric acid 212.90 > 169.00 1.590 1.617 -0.027 1.000 86006 0.3551 178	819	
D 4 13C5-PFPeA 267.90 > 223.00 1.887 1.918 -0.031 111611 0.4131 0.8	16054	
3 Perfluoropentanoic acid 262.90 > 219.00 1.887 1.920 -0.033 1.000 137988 0.5939 297	1401	
5 Perfluorobutanesulfonic acid         298.90 > 80.00       1.926       1.961       -0.035       1.000       183380       0.3232       183         298.90 > 99.00       1.926       1.961       -0.035       1.000       77727       2.36(0.00-0.00)		
D 6 13C2 PFHxA 315.00 > 270.00 2.196 2.239 -0.043 102420 0.4155 0.8	22077	
7 Perfluorohexanoic acid 313.00 > 269.00 2.196 2.241 -0.045 1.000 316845 1.62 809	6775	
D 11 13C4-PFHpA 367.00 > 322.00 2.544 2.599 -0.055 95867 0.4554 0.9	19844	
12 Perfluoroheptanoic acid 363.00 > 319.00 2.551 2.600 -0.049 1.000 70244 0.3543 177	943	
D 10 18O2 PFHxS 403.00 > 84.00 2.567 2.614 -0.047 166337 0.5500 1.2	67216	
9 Perfluorohexanesulfonic acid 399.00 > 80.00 2.567 2.615 -0.048 1.000 1838726 4.93 2711		
48 Sodium 1H,1H,2H,2H-perfluorooctane 427.00 > 407.00 2.902 2.913 -0.011 1.000 8648 NR 0.0		
D 47 M2-6:2FTS 429.00 > 409.00 2.910 2.915 -0.005 1622 0.0116 0.0		

Data File:	\\Cnrc	ภาเพลเจล	acrameni	lo/Chrom	Data\A8_N\201	61202-37450	J.D\02DEC2016B_C	03.0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	hi.								
413.00 > 369.00			-0.058	1.000	240600	1.06		530	2608	
413.00 > 169.00			-0.066	0.997	153596	1.00	1.57(0.90-1.10)	330	11818	
D 14 13C4 PFO		2.701	0.000	0.777	100070		1.07 (0.70 1.10)		11010	
417.00 > 372.00		2 094	-0.066		111296	0.5072		1.0	22430	
					111270	0.3072		1.0	22430	
13 Perfluoroher 449.00 > 80.00				1 000	05524	0.2000		150		
		2.980	-0.060	1.000	85524	0.3008		158		
D 17 13C4 PFOS		0.045	0.050		44/0/0	0.4750		4.0	00.40	
503.00 > 80.00			-0.059		116260	0.4753		1.0	9243	
18 Perfluorooct										
499.00 > 80.00			-0.060	1.000	3659326	13.8		7455	209749	
499.00 > 99.00	3.306	3.366	-0.060	1.000	745523		4.91(0.90-1.10)		85538	
20 Perfluoronor	nanoic a	cid								
463.00 > 419.00	3.306	3.373	-0.067	1.000	33480	0.2295		115	524	
D 19 13C5 PFNA	4									
468.00 > 423.00	3.298	3.374	-0.076		73575	0.4131		8.0	14862	
D 21 13C8 FOSA	Д									
506.00 > 78.00		3.651	-0.036		31397	0.0758		0.2	2492	
22 Perfluorooct										
498.00 > 78.00		3.656		1.000	11588	0.1973		98.6	963	
					11300	0.1773		70.0	703	
43 Sodium 1H,		•			2222	ND		0.0		
527.00 > 507.00		3.674	-0.025	0.998	2322	NR		0.0		
D 42 M2-8:2FTS										
529.00 > 509.00	3.658	3.676	-0.018		616	0.004614		0.0		
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00	3.658	3.738	-0.080	1.000	23915	0.2046		102	881	
D 23 13C2 PFDA	4									
515.00 > 470.00	3.677	3.738	-0.061		60302	0.3631		0.7	2042	
D 45 d3-NMeFO	SAA									
573.00 > 419.00		3.839	-0.046		1496	0.0187		0.0		
44 N-methyl pe										
570.00 > 419.00			-0.019	1.009	1845	NR		0.0		
		3.047	-0.017	1.007	1043	INIX		0.0		
D 46 d5-NEtFOS		4 000	0.000		1010	0.0401		0.0		
589.00 > 419.00			-0.023		6062	0.0681		0.0		
49 N-ethyl perfl										
584.00 > 419.00	3.986	4.016	-0.030	1.000	3234	NR		0.0		
26 Perfluorodeo	cane Sul	lfonic ac	id							
599.00 > 80.00	3.977	4.049	-0.072	1.000	28956	0.1898		98.5		
D 27 13C2 PFUr	nΑ									
565.00 > 520.00	3.996	4.070	-0.074		40903	0.3252		0.7	7622	
28 Perfluoround	decanoio	acid								
563.00 > 519.00		4.071	-0.075	1.000	18267	0.2107		105	411	
		1.071	0.070	1.000	10207	0.2107		100		
D 52 d-N-MeFOS		/ 10F	0.027		1002	0.000422		0.0		
515.00 > 169.00	4.U/8	4.105	-0.027		1003	0.009432		0.0		
54 MeFOSA										
512.00 > 169.00	4.092	4.110	-0.018	1.000	763	NR		0.0		
D 51 d-N-EtFOS	A-M									
531.00 > 169.00	4.279	4.290	-0.011		Page 765 of	842 <sup>0.0112</sup>		0.0	12/08	3/2016
									, 50	5 . 5

Report Date: 02-Dec-2016 15:01:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

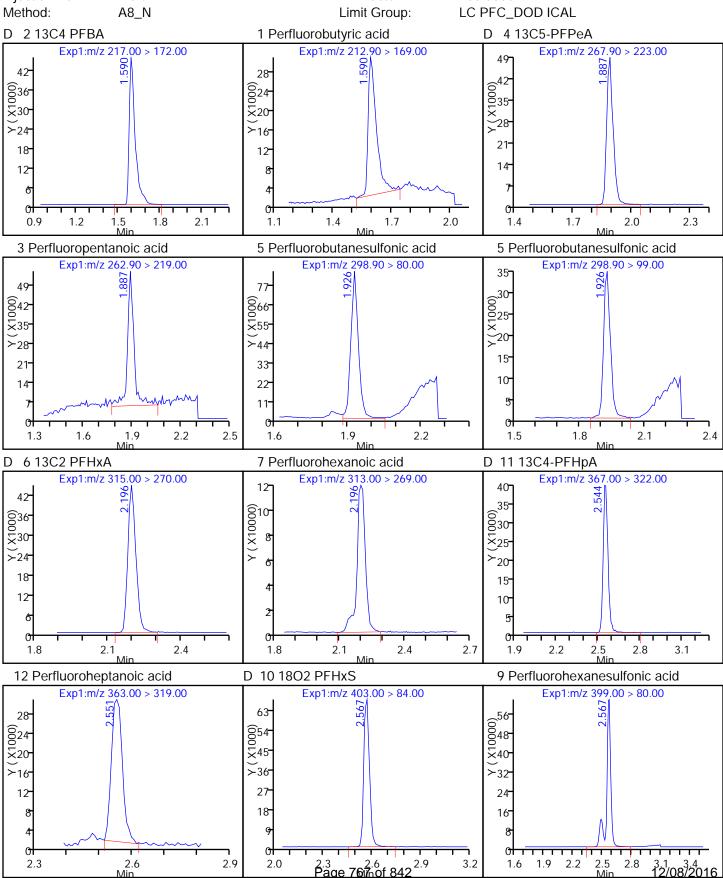
	Data File: \(\(\circ\)\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\										
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	53 N-ethylperfluoro-1-octanesulfonami										
	526.00 > 169.00	4.279	4.299	-0.020	1.000	1189	NR		0.0		
	0 30 13C2 PFD										
	615.00 > 570.00			-0.073		41284	0.3531		0.7	1458	
	29 Perfluorodo 613.00 > 569.00			-0.073	1.000	16165	0.2068		103	319	
	31 Perfluorotrio			-0.073	1.000	10103	0.2000		103	317	
	663.00 > 619.00			-0.080	1.000	14170	0.1650		82.5	211	
[	O 32 13C2-PFT	eDA									
	715.00 > 670.00	4.798	4.882	-0.084		97613	0.4035		0.8	15022	
	33 Perfluoroteti				1 000	00457	0.0007		405	405	
	712.50 > 668.90 713.00 > 169.00		4.884 4.884	-0.086 -0.086	1.000 1.000	33457 4773	0.2097	7.01(0.00-0.00)	105	405 2152	
	7 13:00 × 107:00 D 34 13C2-PFH;		7.007	-0.000	1.000	4773		7.01(0.00-0.00)		2102	
	815.00 > 770.00		5.320	-0.099		60773	0.4661		0.9	4723	
	35 Perfluorohe	xadecan	oic acid								
	813.00 > 769.00	5.329	5.320	0.009	1.000	739	-0.8142		-407.1	15.5	
	36 Perfluorooct										
	913.00 > 869.00	5.729	5.720	0.009	1.000	389	0.005992		3.0	13.8	

# QC Flag Legend Processing Flags

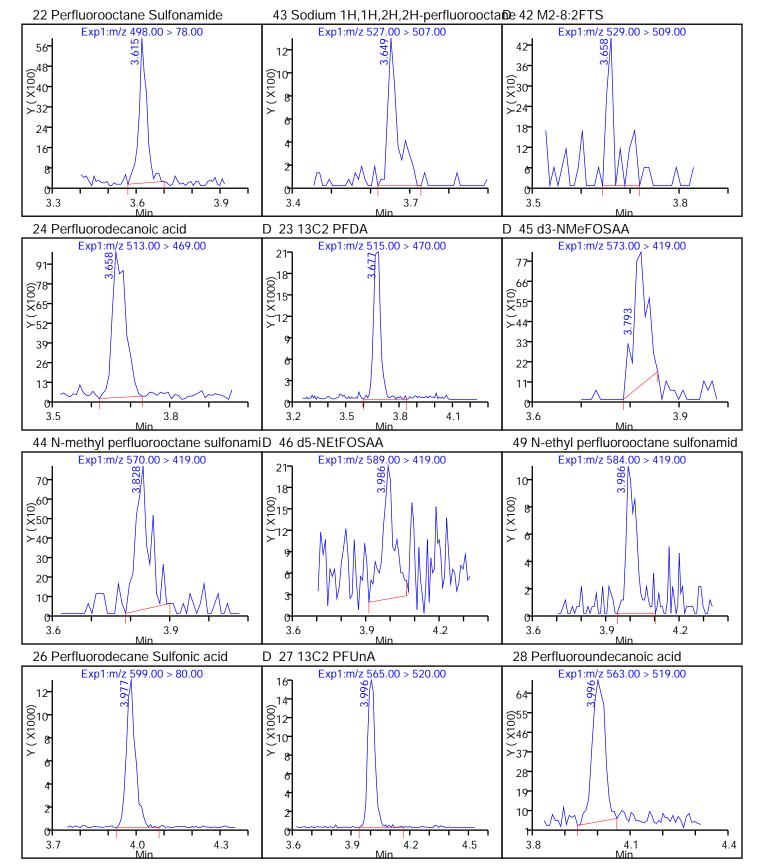
NR - Missing Quant Standard

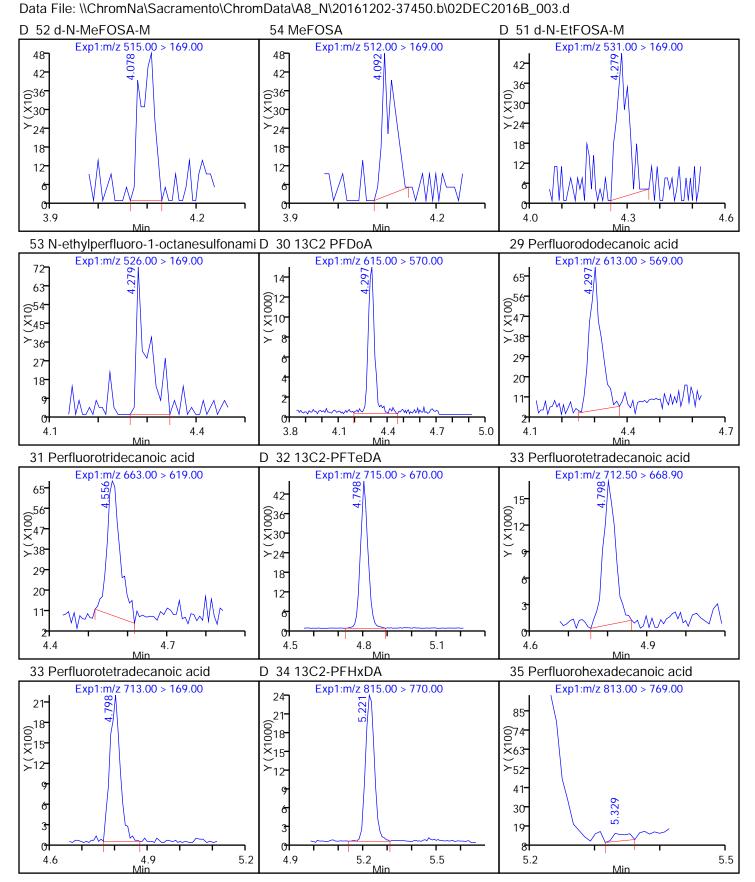
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 26

Injection Vol: 2.0 ul Dil. Factor: 100.0000



48 Sodium 1H,1H,2H,2H-perfluorooctabe 47 M2-6:2FTS 15 Perfluorooctanoic acid Exp1:m/z 427.00 > 407.00 Exp1:m/z 429.00 > 409.00 Exp1:m/z 413.00 > 369.00 80 56 660 660 (36<sup>-</sup> ×30<sup>-</sup> ×24<sup>-</sup> <del>6</del>48 ×40 ×50 ≻<sub>32</sub> ≻<sub>40</sub> 18 24 30 12 16 20 10 3.0 2.7 2.6 2.9 3.2 2.1 2.4 2.7 3.0 3.3 3.6 3.9 15 Perfluorooctanoic acid D 14 13C4 PFOA 13 Perfluoroheptanesulfonic Acid Exp1:m/z 417.00 > 372.00 Exp1:m/z 449.00 > 80.00 Exp1:m/z 413.00 > 169.00 35 42 42 630 25-©36-836  $\Sigma_{30}$ <del>∑</del>20 **≻24** 15<del>-</del> 18 18 10 12 12 3.2 3.8 2.8 3.1 2.9 3.2 2.6 3.4 18 Perfluorooctane sulfonic acid D 17 13C4 PFOS 18 Perfluorooctane sulfonic acid Exp1:m/z 499.00 > 80.00 Exp1:m/z 499.00 > 99.00 Exp1:m/z 503.00 > 80.00 (X100000) 24 42 0 0 20 ×30-**≻**24 18 12 0 3.4 3.7 3.2 3.8 2.8 4.0 2.8 3.1 2.0 2.6 4.4 2.2 3.4 D 19 13C5 PFNA D 21 13C8 FOSA 20 Perfluorononanoic acid Exp1:m/z 506.00 > 78.00 Exp1:m/z 463.00 > 419.00 Exp1:m/z 468.00 > 423.00 28 12 12 (X1000) X (X1000) ©24-×20-(X1000) Y ∑16<del>-</del> 3.1 3.4 3.7 2.9 3.2 3.5 3.8 3.0 3.3 3.9 4.2

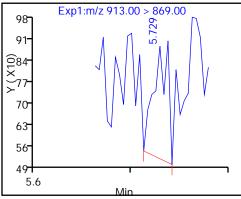




Report Date: 02-Dec-2016 15:01:18 Chrom Revision: 2.2 14-Nov-2016 08:15:18

 $\dot{\text{Data File: $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016B\_003.d}}$ 

### 36 Perfluorooctadecanoic acid



## FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-SO-14-15 MSD Lab Sample ID: 320-23542-3 MSD

Matrix: Solid Lab File ID: 20NOV2016D\_009.d

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 13:25

Extraction Method: SHAKE Date Extracted: 11/17/2016 12:49

Sample wt/vol: 5.03(g) Date Analyzed: 11/20/2016 21:40

Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 20.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 138814 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	13.1	МЈ	0.63	0.38	0.13
1763-23-1	Perfluorooctane Sulfonate (PFOS)	59.2	E 4	0.63	0.38	0.16
375-73-5	Perfluorobutanesulfonic acid (PFBS)	5.82		0.50	0.38	0.13

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	84		25-150
STL00991	13C4 PFOS	60		25-150
STL00994	1802 PFHxS	71		25-150

Report Date: 28-Nov-2016 16:10:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_009.d

Lims ID: 320-23542-A-3-C MSD

Client ID:

Sample Type: MSD

Inject. Date: 20-Nov-2016 21:40:49 ALS Bottle#: 18 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23542-a-3-c msd

Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 28-Nov-2016 16:10:32 Calib Date: 14-Nov-2016 13:27:19

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161114-36864.b\14NOV2016A\_018.d

Column 1: Det: EXP1

Process Host: XAWRK018

First Level Reviewer: changnoit Date: 23-Nov-2016 15:40:12

First Level Revie	wer: cha	ingnoit			Date:	2	:3-Nov-2016 15:40:1	2		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobuty	ric acid									
212.90 > 169.00	•	1.493	0.0	1.000	3924602	25.3		127	28486	
D 213C4 PFBA										
217.00 > 172.00		1.493	0.0		8914419	45.1		90.2	676825	
D 4 13C5-PFPe	Α									
267.90 > 223.00	1.762	1.752	0.010		7889404	49.3		98.7	680913	
3 Perfluoropen		cid								
262.90 > 219.00	1.762	1.762	0.0	1.000	3679804	22.4		112	42582	
5 Perfluorobuta										
	1.791	1.791	0.0	1.000	5054313	23.3	2 22 (2 22 2 22)	132		
	1.791	1.791	0.0	1.000	2120854		2.38(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00		2.040	0.006	1.000	3310086	25.0		125	59541	
D 6 13C2 PFHx		2.040	0.000	1.000	3310000	25.0		123	39341	
315.00 > 270.00		2.040	0.0		7006202	48.3		96.5	420794	
D 11 13C4-PFH <sub>I</sub>		2.040	0.0		7000202	40.5		70.5	420774	
367.00 > 322.00		2.366	0.006		6057044	46.1		92.2	510636	
12 Perfluoroher	otanoic a	acid								
363.00 > 319.00		2.372	0.0	1.000	2991013	24.1		121	23409	
D 10 18O2 PFH)	κS									
403.00 > 84.00	2.393	2.382	0.011		6769959	33.5		70.8	390301	
9 Perfluorohex	anesulfo	onic acid								
399.00 > 80.00	2.393	2.387	0.006	1.000	4021663	26.5		146		
D 47 M2-6:2FTS	;									
429.00 > 409.00	2.705	2.704	0.001		4706	0.0898		0.0		
48 Sodium 1H,		•								
427.00 > 407.00	2.697	2.713	-0.016	1.000	66749	NR		0.0		

Data File:	\\Chr	mNa\S	acrament	o\Chrom	Data\A8_N\201	61121-3709	7.b\20NOV2016D_0	009.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooci 413.00 > 369.00 413.00 > 169.00	2.733	2.733 2.733	0.0 0.0	1.000 1.000	6274817 4083088	52.3	1.54(0.90-1.10)	261	82921 119504	M M
13 Perfluorohe 449.00 > 80.00	2.733	fonic Ac 2.733		1.000	2804556	26.3		138		
D 14 13C4 PFO. 417.00 > 372.00	2.733	2.733			5712769	41.9		83.7	462739	
18 Perfluorooci 499.00 > 80.00 499.00 > 99.00	3.112 3.112	3.096 3.096	0.016 0.016	1.000 1.000	24076053 5710876	236.8	4.22(0.90-1.10)	1276	143295 214353	
20 Perfluorono 463.00 > 419.00	3.104	3.096	0.008	1.000	2014160	23.6		118	17588	
D 19 13C5 PFN, 468.00 > 423.00 D 17 13C4 PFO	3.104	3.096	0.008		4350577	39.8		79.5	314904	
503.00 > 80.00 43 Sodium 1H,	3.104	3.096 H-perflu	0.008	e	4467929	28.7		60.0	213463	
527.00 > 507.00 D 42 M2-8:2FTS	3.458	•		1.002	15655	NR		0.0		
529.00 > 509.00 D 21 13C8 FOS	3.451	3.456	-0.005		2433	0.0446		0.0		
506.00 > 78.00 22 Perfluorooct	3.458	3.458 fonamid			5098184	20.3		40.7	261784	
498.00 > 78.00 D 23 13C2 PFD		3.458	0.0	1.000	9516362	103.6		518	1565	
515.00 > 470.00 24 Perfluorode		3.465 cid	0.009		3899805	38.9		77.8	296535	
513.00 > 469.00 D 45 d3-NMeFO		3.465	0.001	1.000	1783949	23.1		115	21182	
573.00 > 419.00 44 N-methyl pe	erfluoroo	ctane su			623	0.0143		0.0		
570.00 > 419.00 26 Perfluorode	cane Sul	lfonic ac		1.005	3077	NR		0.0		
599.00 > 80.00 D 46 d5-NEtFOS	SAA	3.782		1.000	762185	13.4		69.6		
589.00 > 419.00 49 N-ethyl perfl	luoroocta	ane sulfo			966	0.0196		0.0		
584.00 > 419.00 D 27 13C2 PFUI	nA	3.798	0.002	1.005	1425	NR		0.0		
565.00 > 520.00 28 Perfluoround	decanoio		0.0	1 000	2577031	32.9		65.7	137754	
563.00 > 519.00 D 52 d-N-MeFO	SA-M	3.800	-0.009	1.000	1172115	22.1		111	10947	
515.00 > 169.00 54 MeFOSA		3.963	0.011	1 000	1907	0.0315		0.0		
512.00 > 169.00 29 Perfluorodo	decanoio		-0.007	1.000	1424	NR		0.0	170/0	
613.00 > 569.00	4.090	4.091	-0.001	1.000	Page 774 of	842 <sup>22.9</sup>		114	1796308	3/2016

Report Date: 28-Nov-2016 16:10:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

Data File.	1101110	Jiiii Va 100	acramon	0101110111	Bata # 10_11201	01121 0707	7.8120110 12010B_0	, o , . u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 30 13C2 PFD	Ac									
615.00 > 570.00	4.090	4.091	-0.001		1672443	21.6		43.2	98859	
D 51 d-N-EtFOS	A-M									
531.00 > 169.00	4.140	4.153	-0.013		1374	0.0251		0.0		
31 Perfluorotrio										
663.00 > 619.00			0.0	1.000	584194	18.5		92.5	19236	
33 Perfluoroteti			0.007	1 000	100257/	1/ 0		04.2	210/2	
712.50 > 668.90 713.00 > 169.00		4.586 4.586	0.007 0.0	1.000 0.999	1003576 176962	16.9	5.67(0.00-0.00)	84.3	31062 36085	
D 32 13C2-PFT		1.000	0.0	0.777	170702		0.07 (0.00 0.00)		00000	
715.00 > 670.00		4.586	0.0		2840436	16.6		33.3	301029	
35 Perfluorohe	xadecan	oic acid								
813.00 > 769.00	4.993	4.990	0.003	1.000	737996	20.0		99.9	17114	
D 34 13C2-PFH	xDA									
815.00 > 770.00	4.993	4.990	0.003		1781288	18.9		37.8	185360	
36 Perfluorooct										
913.00 > 869.00	5.339	5.344	-0.005	1.000	503907	14.0		70.0	9848	

## OC Flag Legend Processing Flags

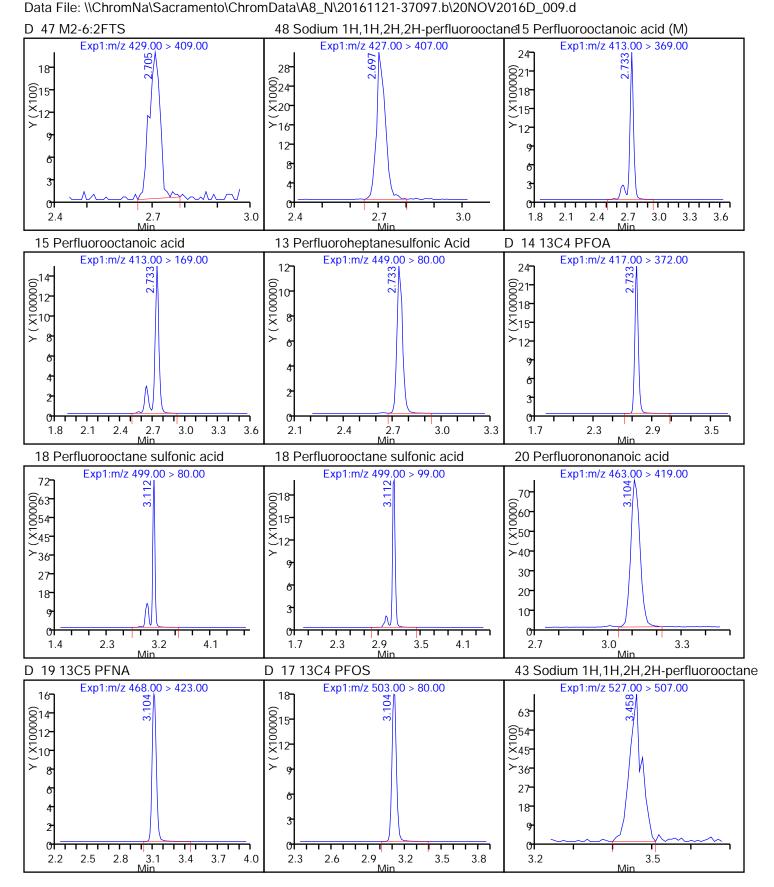
NR - Missing Quant Standard

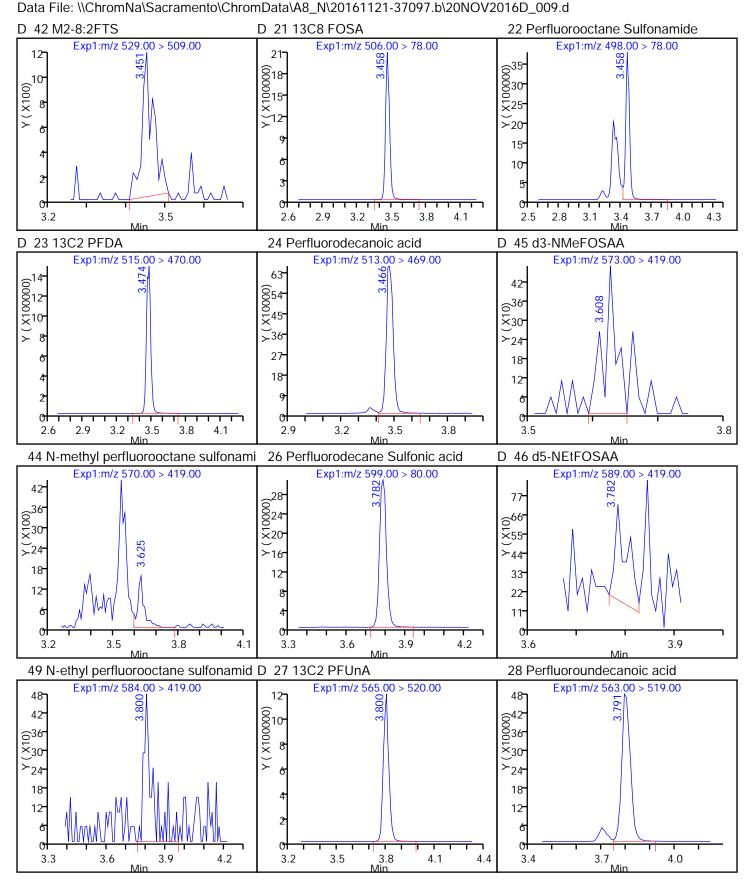
E - Exceeded Maximum Amount

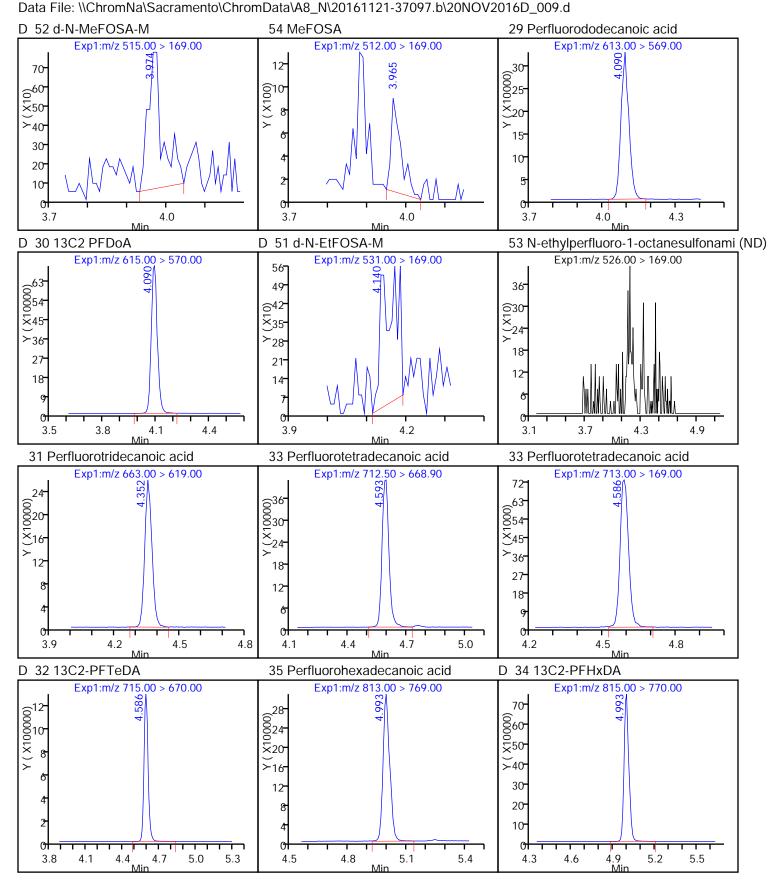
Review Flags

M - Manually Integrated

Report Date: 28-Nov-2016 16:10:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: **Injection Date:** 20-Nov-2016 21:40:49 Instrument ID: A8\_N Lims ID: 320-23542-A-3-C MSD Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 18 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA D 413C5-PFPeA Exp1:m/z 212.90 > 169.00Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 35 (0000015<sup>-1</sup> ) × (9 <u>@</u>36 830 18 15 12 10 1.2 1.8 0.9 1.5 1.2 1.5 1.8 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.00 24 (015<sup>-</sup> (0000012<sup>-</sup> ) × 9 91 ©21<del>-</del> 0078 ×65 ×15 **≻**52 39 26 13 1.9 2.2 1.9 1.5 2.1 1.6 1.6 2.2 1.2 1.8 1.3 1.3 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 14 (28-(000001 X) (28-(00001 X) (X100000) X (X1000000) X (X1000000) X <u>≻</u>16• ×16 1.8 1.9 2.2 1.9 2.5 1.5 2.1 2.4 2.5 2.2 2.8 1.3 1.6 1.6 3.1 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 28 14 (012 X) <u>24</u> 8<sub>20</sub> <u>~</u>16 0 0 1.8 2.1 2.4 2. Page 77/6hof 84 1.9 1.9 2.2 2.5 2.8 1.5 3.0 1.3 2.5 1<u>2/08/2016</u>



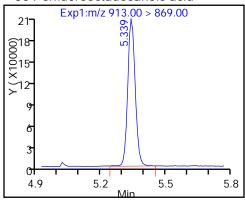




Report Date: 28-Nov-2016 16:10:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_009.d

### 36 Perfluorooctadecanoic acid



Report Date: 28-Nov-2016 16:10:33 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b\20NOV2016D\_009.d

Injection Date: 20-Nov-2016 21:40:49 Instrument ID: A8\_N

Lims ID: 320-23542-A-3-C MSD

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 18 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8\_N Limit Group: LC PFC\_DOD ICAL

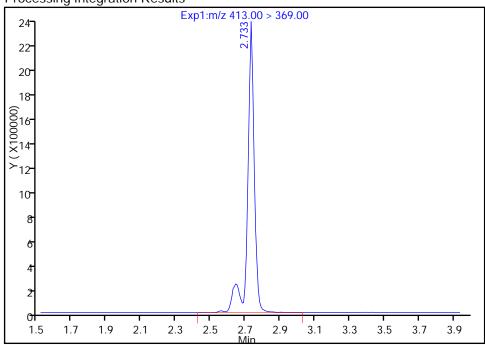
Column: Detector EXP1

### 15 Perfluorooctanoic acid, CAS: 335-67-1

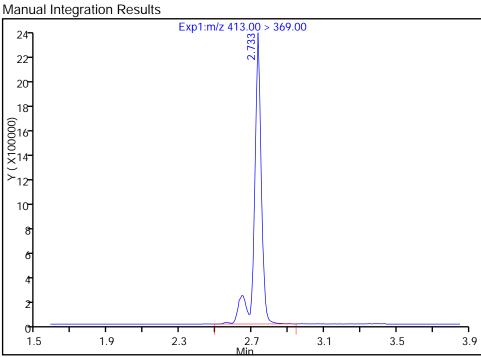
Signal: 1

RT: 2.73
Area: 6297827
Amount: 52.490926
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.73
Area: 6274817
Amount: 52.299143
Amount Units: ng/ml



Reviewer: westendorfc, 28-Nov-2016 16:10:32

Audit Action: Manually Integrated

Audit Reason: Baseline

Page 781 of 842

## FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab File ID: 02DEC2016B\_008.d

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Client Sample ID: DPT-16-34-SO-14-15 MSD DL Lab Sample ID: 320-23542-3 MSD DL

Matrix: Solid

Analysis Method: 537 (Modified) Date Collected: 11/14/2016 13:25

Extraction Method: SHAKE Date Extracted: 11/17/2016 12:49

Sample wt/vol: 5.03(g) Date Analyzed: 12/02/2016 13:52

Con. Extract Vol.:  $1.0 \, (mL)$  Dilution Factor: 10

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 20.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 140382 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	13.1	JD	6.3	3.8	1.3
1763-23-1	Perfluorooctane Sulfonate (PFOS)	63.2	4 D	6.3	3.8	1.6
375-73-5	Perfluorobutanesulfonic acid (PFBS)	4.97	JD	5.0	3.8	1.3

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00990	13C4 PFOA	108		25-150
STL00991	13C4 PFOS	67		25-150
STL00994	1802 PFHxS	82		25-150

Report Date: 02-Dec-2016 15:03:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_008.d

Lims ID: 320-23542-A-3-C MSD

Client ID:

Sample Type: MSD

Inject. Date: 02-Dec-2016 13:52:05 ALS Bottle#: 8 Worklist Smp#: 31

Injection Vol: 2.0 ul Dil. Factor: 10.0000

Sample Info: 320-23542-A-3-C MSD 10X

Misc. Info.: Plate: 1 Rack: 3

Operator ID: A8-PC\A8 Instrument ID: A8\_N

Method: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\A8\_N.m

Limit Group: LC PFC\_DOD ICAL

Last Update: 02-Dec-2016 15:02:58 Calib Date: 02-Dec-2016 12:29:29

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016A\_020.d

Column 1: Det: EXP1

Process Host: XAWRK011

First Level Reviewer: chandrasenas Date: 02-Dec-2016 15:03:30

FILST Level Revie	wer: cha	nurasen	ias		Date:	Ü	2-Dec-2016 15:03:3	U		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00	1.582	1.615	-0.033		1456494	4.28		8.6	239031	
1 Perfluorobuty 212.90 > 169.00	1.582	1.617	-0.035	1.000	638967	2.48		124	5741	
D 4 13C5-PFPe 267.90 > 223.00		1.918	-0.050		1193194	4.42		8.8	510377	
3 Perfluoropen 262.90 > 219.00			-0.052	1.000	561453	2.26		113	5113	
5 Perfluorobuta 298.90 > 80.00 298.90 > 99.00	1.907	nic acid 1.961 1.961	-0.054 -0.054	1.000 1.000	791728 319091	1.99	2.48(0.00-0.00)	113		
D 6 13C2 PFHx 315.00 > 270.00	A 2.179	2.239			1067043	4.33	,	8.7	241605	
7 Perfluorohex 313.00 > 269.00			-0.062	1.000	477249	2.34		117	15888	
D 11 13C4-PFH <sub>j</sub> 367.00 > 322.00		2.599	-0.069		1007679	4.79		9.6	137506	
12 Perfluorohe 363.00 > 319.00			-0.070	1.000	492634	2.36		118	7231	
D 10 18O2 PFHx 403.00 > 84.00	2.545	2.614			1166617	3.86		8.2	233763	
9 Perfluorohex 399.00 > 80.00	2.545	2.615	-0.070	1.000	691425	2.65		145		
48 Sodium 1H, 427.00 > 407.00	2.879	•			22916	NR		0.0		
D 47 M2-6:2FTS 429.00 > 409.00		2.915	-0.012		1248	0.008961		0.0		

Data File:

Data File:	\\Cnrc	mina\5a	acrament	(O/Chrom	Dala\A8_N\201	61202-3745	0.b\02DEC2016B_0	JU8.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	anoic ac	hir								
413.00 > 369.00			-0.081	1.000	1277290	5.26		263	22319	
413.00 > 169.00		2.984	-0.081	1.000	820186	0.20	1.56(0.90-1.10)	200	46579	
D 14 13C4 PFO							,			
417.00 > 372.00		2.984	-0 081		1190163	5.42		10.8	251143	
					1170103	5.42		10.0	231143	
13 Perfluorohej 449.00 > 80.00	•	2.986		1.000	477110	2.47		130		
		2.900	-0.063	1.000	477113	2.47		130		
D 17 13C4 PFO		2.275	0.000		700704	2.22		, 7	( 4000	
503.00 > 80.00		3.365			788724	3.22		6.7	64982	
18 Perfluorooct										
499.00 > 80.00			-0.082	1.000	4535001	25.3	4.00(0.00.4.40)	1362	387610	
499.00 > 99.00			-0.090	0.998	1032788		4.39(0.90-1.10)		189250	
20 Perfluoronoi										
463.00 > 419.00	3.284	3.373	-0.089	1.000	376887	2.38		119	7503	
D 19 13C5 PFN/	А									
468.00 > 423.00	3.284	3.374	-0.090		797847	4.48		9.0	155389	
D 21 13C8 FOS	Α									
506.00 > 78.00		3.651	-0.060		843534	2.04		4.1	110327	
22 Perfluorooct	ane Sulf	fonamide	ے							
498.00 > 78.00		3.656		1.000	1574853	9.98		499	1504	
43 Sodium 1H,										
527.00 > 507.00		•		1.000	3203	NR		0.0		
			-0.041	1.000	3203	IVIX		0.0		
24 Perfluorodeo			0.045	1 000	1.470	0.0124		0.4	2.0	
513.00 > 469.00		3.738	0.065	1.000	1479	0.0124		0.6	3.0	
D 23 13C2 PFD/		0.700			(47500	0.70		<b>-</b> .	00/70	
515.00 > 470.00					617509	3.72		7.4	28678	
44 N-methyl pe										
570.00 > 419.00	3.812	3.847	-0.035	1.000	1034	NR		0.0		
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.997	4.009	-0.012		1603	0.0180		0.0		
49 N-ethyl perfl	luoroocta	ane sulfo	onamid							
584.00 > 419.00				0.995	1405	NR		0.0		
26 Perfluorodeo	cane Sul	lfonic ac	id							
599.00 > 80.00			-0.098	1.000	132178	1.28		66.3		
D 27 13C2 PFUr			0.070		.02.70	0		00.0		
565.00 > 520.00		4.070	0.002		374417	2.98		6.0	72156	
			-0.072		3/441/	2.70		0.0	72130	
28 Perfluoround			0.000	4 000	4/0540	0.44		407	0004	
563.00 > 519.00		4.071	-0.093	1.000	169512	2.14		107	3894	
D 30 13C2 PFD										
615.00 > 570.00	4.272	4.370	-0.098		249643	2.14		4.3	9359	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00	4.263	4.370	-0.107	1.000	113133	2.39		120	2193	
31 Perfluorotrid	lecanoic	acid								
663.00 > 619.00		4.636	-0.098	1.000	76589	1.47		73.7	832	
D 32 13C2-PFTe										
715.00 > 670.00		4.882	-0.106		417948	1.73		3.5	58569	
, 10.00 > 070.00	1.770	1.002	5.100		117740	1.75		0.0	33307	

Report Date: 02-Dec-2016 15:03:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: 

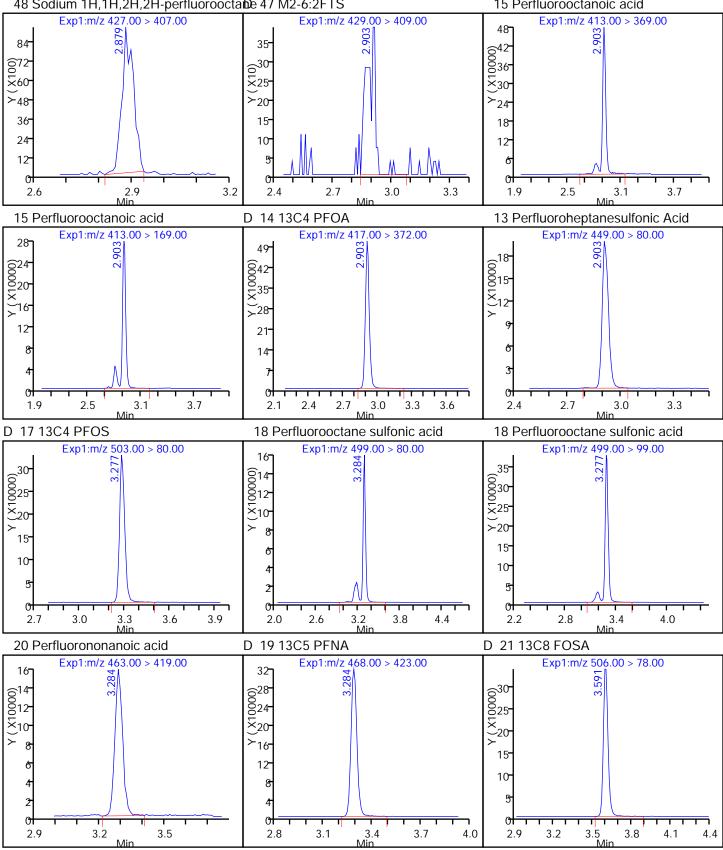
RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
		0.404	1 000	470507	1.00		00.0	1001	
4.783 4.776			1.000 0.998	173506 25932	1.80	6.69(0.00-0.00)	89.9	1001 11692	
xDA 5 201	5 320	-N 119		197723	1 52		3.0	16561	
	0.020	-0.117		177725	1.52		5.0	10301	
	0.020	-0.013	1.000	1425	-0.7943		-39.7	11.6	
	J. G G G. G.	0.094	1.000	410	0.0104		0.5	6.7	
	radecand 4.783 4.776 xDA 5.201 xadecand 5.307	RT RT radecanoic acid 4.783 4.884 4.776 4.884 KDA 5.201 5.320 Kadecanoic acid	radecanoic acid 4.783	radecanoic acid 4.783	radecanoic acid 4.783	RT RT RT RT RT REsponse ng/ml  radecanoic acid 4.783 4.884 -0.101 1.000 173506 1.80 4.776 4.884 -0.108 0.998 25932  KDA 5.201 5.320 -0.119 197723 1.52  radecanoic acid 5.307 5.320 -0.013 1.000 1425 -0.7943  radecanoic acid	RT RT RT RT RT RT Response ng/ml Ratio(Limits)  radecanoic acid 4.783	RT RT RT RT RT Response ng/ml Ratio(Limits) %Rec  radecanoic acid 4.783 4.884 -0.101 1.000 173506 1.80 89.9 4.776 4.884 -0.108 0.998 25932 6.69(0.00-0.00)  RDA 5.201 5.320 -0.119 197723 1.52 3.0  radecanoic acid 5.307 5.320 -0.013 1.000 1425 -0.7943 -39.7  radecanoic acid	RT RT RT RT RT Response ng/ml Ratio(Limits) %Rec S/N  radecanoic acid 4.783 4.884 -0.101 1.000 173506 1.80 89.9 1001 4.776 4.884 -0.108 0.998 25932 6.69(0.00-0.00) 11692  RDA 5.201 5.320 -0.119 197723 1.52 3.0 16561  radecanoic acid 5.307 5.320 -0.013 1.000 1425 -0.7943 -39.7 11.6  radecanoic acid

## QC Flag Legend Processing Flags

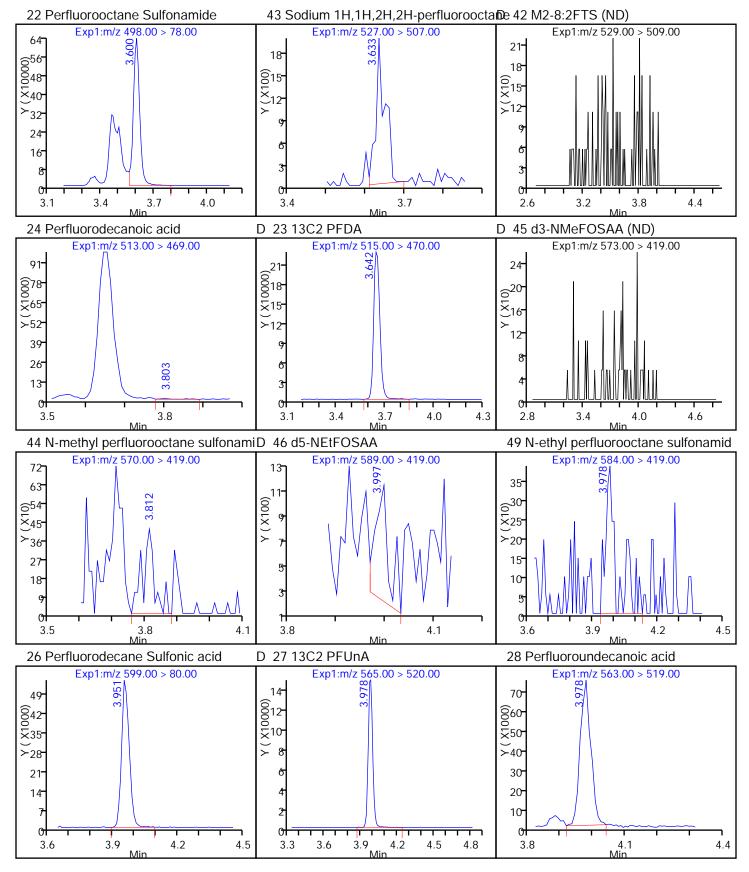
NR - Missing Quant Standard

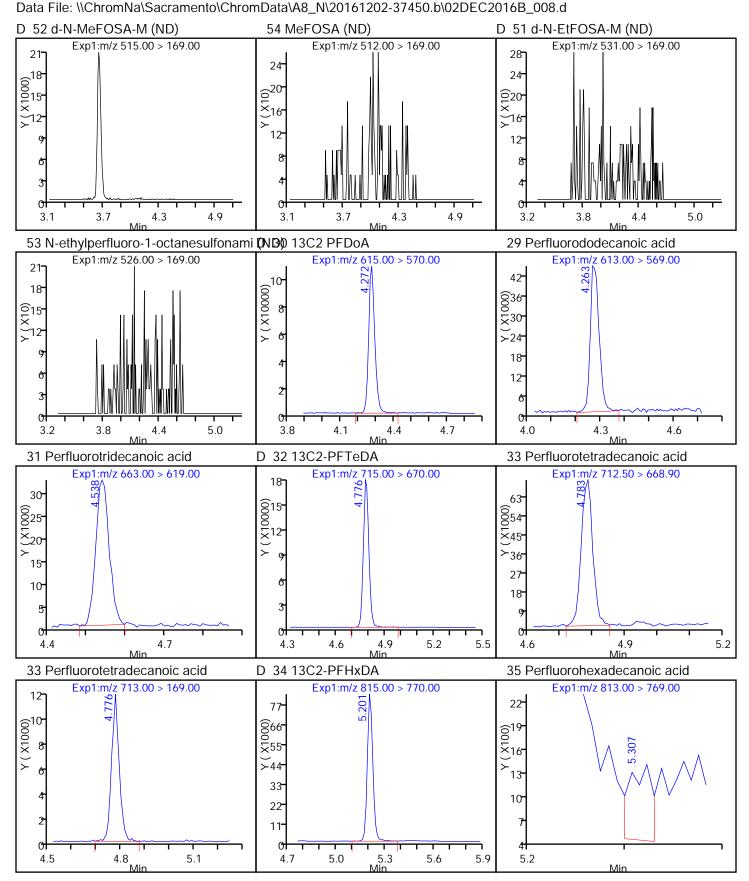
Report Date: 02-Dec-2016 15:03:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_008.d **Injection Date:** 02-Dec-2016 13:52:05 Instrument ID: A8\_N Lims ID: 320-23542-A-3-C MSD Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 8 Worklist Smp#: 31 Injection Vol: 2.0 ul Dil. Factor: 10.0000 Method: Limit Group: LC PFC\_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 21 6<sup>42</sup> 6 8 8 8 (000015-X)12-0642 0842 ×35 ∑30 ) ≻28 21 18 14 1.7 2.0 2.3 1.4 1.7 2.0 0.9 1.5 2.1 2.7 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 24 35 00020 ×16 0030-×25-<u></u>20 15 10 1.8 2.4 1.8 2.1 1.9 2.2 2.1 1.5 1.5 2.4 1.6 D 11 13C4-PFHpA D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 21 42 (000015-X)12-636<u>-</u> 0035-× >28-21 18 1.7 2.0 2.3 2.9 2.1 2.4 2.7 2.3 2.9 2.6 1.8 2.0 2.6 3.2 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 21 24 (42<sup>-</sup> 0036<sup>-</sup> 621<del>-</del> 6218-×30 **≻**24 18 12 0 0 2.5 2.8 2.0 2.3 Page 7866 of 842 3.2 2.1 2.4 2.7 2.2 1.8

Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\\02DEC2016B\_008.d 48 Sodium 1H,1H,2H,2H-perfluorooctabe 47 M2-6:2FTS 15 Perfluorooctanoic acid



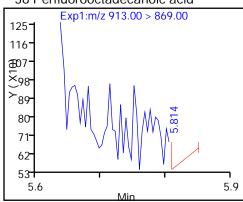
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b\02DEC2016B\_008.d





Report Date: 02-Dec-2016 15:03:31 Chrom Revision: 2.2 14-Nov-2016 08:15:18 Data File:  $\ChromNa\Sacramento\ChromData\A8_N\20161202-37450.b\02DEC2016B_008.d$ 

36 Perfluorooctadecanoic acid



Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 SDG No.:

Instrument ID: A8 N Start Date: 11/14/2016 11:19

Analysis Batch Number: 137684 End Date: 11/14/2016 17:19

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-137684/1 CCB		11/14/2016 11:19	1		Acquity 2.1 (mm)
RB 320-137684/2 CCB		11/14/2016 11:27	1		Acquity 2.1 (mm)
RB 320-137684/3 CCB		11/14/2016 11:34	1		Acquity 2.1(mm)
IC 320-137684/4		11/14/2016 11:42	1	14NOV2016A_004.	Acquity 2.1 (mm)
IC 320-137684/5		11/14/2016 11:49	1	14NOV2016A_005.	Acquity 2.1 (mm)
IC 320-137684/6		11/14/2016 11:57	1	14NOV2016A_006.	Acquity 2.1 (mm)
IC 320-137684/7		11/14/2016 12:04	1	14NOV2016A_007.	Acquity 2.1 (mm)
IC 320-137684/8		11/14/2016 12:12	1	14NOV2016A_008.	Acquity 2.1 (mm)
IC 320-137684/9		11/14/2016 12:19	1	14NOV2016A_009.	Acquity 2.1 (mm)
ICB 320-137684/10		11/14/2016 12:27	1		Acquity 2.1 (mm)
ICV 320-137684/11		11/14/2016 12:34	1	14NOV2016A_011.	Acquity 2.1 (mm)
RB 320-137684/12 CCB		11/14/2016 12:42	1	d.	Acquity 2.1 (mm)
IC 320-137684/13		11/14/2016 12:49	1	14NOV2016A_013.	Acquity 2.1 (mm)
IC 320-137684/14		11/14/2016 12:57	1	14NOV2016A_014.	Acquity 2.1 (mm)
IC 320-137684/15		11/14/2016 13:04	1	14NOV2016A_015.	Acquity 2.1 (mm)
IC 320-137684/16		11/14/2016 13:12	1	14NOV2016A_016.	Acquity 2.1 (mm)
IC 320-137684/17		11/14/2016 13:19	1	14NOV2016A_017.	Acquity 2.1 (mm)
IC 320-137684/18		11/14/2016 13:27	1	14NOV2016A_018.	Acquity 2.1 (mm)
ICB 320-137684/19		11/14/2016 13:34	1		Acquity 2.1 (mm)
ICV 320-137684/20		11/14/2016 13:42	1		Acquity 2.1 (mm)
RB 320-137684/21 CCB		11/14/2016 13:49	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 13:57	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:04	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:12	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:19	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:27	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:34	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:42	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:49	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 14:57	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 15:04	1		Acquity 2.1 (mm)
RB 320-137684/32 CCB		11/14/2016 15:12	1		Acquity 2.1 (mm)
CCV 320-137684/33		11/14/2016 15:19	1		Acquity 2.1 (mm)
CCV 320-137684/34		11/14/2016 15:27	1		Acquity 2.1 (mm)
RB 320-137684/35 CCB		11/14/2016 15:34	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 15:42	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 15:49	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 15:57	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 16:04	1		Acquity 2.1 (mm)

Lab Name: Tes	stAmerica Sacramento	Job No.: <u>320-23542-1</u>
SDG No.:		
Instrument II	D: A8_N	Start Date: 11/14/2016 11:19
Analysis Bato	ch Number: 137684	End Date: 11/14/2016 17:19

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
ZZZZZ		11/14/2016 16:12	1		Acquity 2.1(mm)
ZZZZZ		11/14/2016 16:19	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 16:27	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 16:34	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 16:42	1		Acquity 2.1 (mm)
ZZZZZ		11/14/2016 16:49	1		Acquity 2.1 (mm)
RB 320-137684/46 CCB		11/14/2016 16:57	1		Acquity 2.1 (mm)
CCV 320-137684/47		11/14/2016 17:04	1		Acquity 2.1 (mm)
CCV 320-137684/48		11/14/2016 17:12	1		Acquity 2.1 (mm)
RB 320-137684/49 CCB		11/14/2016 17:19	1		Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-23542-1
SDG No.:	
Instrument ID: A8_N	Start Date: 11/20/2016 17:17
Analysis Batch Number: 138811	End Date: 11/20/2016 20:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
RB 320-138811/1 CCB		11/20/2016 17:17	1		Acquity 2.1 (mm)
CCV 320-138811/2 CCVL		11/20/2016 17:25	1	20NOV2016C_003. d	Acquity 2.1 (mm)
CCV 320-138811/3 CCVL		11/20/2016 17:32	1		Acquity 2.1 (mm)
CCV 320-138811/4		11/20/2016 17:40	1		Acquity 2.1 (mm)
CCV 320-138811/5		11/20/2016 17:47	1		Acquity 2.1 (mm)
RB 320-138811/6 CCB		11/20/2016 17:55	1		Acquity 2.1 (mm)
RB 320-138811/13 CCB		11/20/2016 18:47	1		Acquity 2.1 (mm)
CCV 320-138811/14		11/20/2016 18:55	1		Acquity 2.1 (mm)
CCV 320-138811/15		11/20/2016 19:02	1		Acquity 2.1 (mm)
RB 320-138811/16 CCB		11/20/2016 19:10	1		Acquity 2.1 (mm)
RB 320-138811/24 CCB		11/20/2016 20:10	1		Acquity 2.1 (mm)
CCV 320-138811/25		11/20/2016 20:18	1		Acquity 2.1 (mm)
CCV 320-138811/26		11/20/2016 20:25	1		Acquity 2.1 (mm)
RB 320-138811/27 CCB		11/20/2016 20:33	1		Acquity 2.1 (mm)

Lab 1	Name:	TestAmerica	Sacramento	Job No.:	320-23542-1
SDG 1	No.:				

Instrument ID: A8\_N Start Date: 11/20/2016 20:40

Analysis Batch Number: 138814 End Date: 11/20/2016 23:33

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-138814/1 CCB		11/20/2016 20:40	1		Acquity 2.1 (mm)
CCV 320-138814/2		11/20/2016 20:48	1	20NOV2016D_002. d	Acquity 2.1 (mm)
CCV 320-138814/3		11/20/2016 20:55	1		Acquity 2.1 (mm)
RB 320-138814/4 CCB		11/20/2016 21:03	1		Acquity 2.1 (mm)
MB 320-138291/1-A		11/20/2016 21:10	1	20NOV2016D_005. d	Acquity 2.1 (mm)
LCS 320-138291/2-A		11/20/2016 21:18	1	20NOV2016D_006. d	Acquity 2.1 (mm)
320-23542-3		11/20/2016 21:25	1	20NOV2016D_007. d	Acquity 2.1 (mm)
320-23542-3 MS		11/20/2016 21:33	1	20NOV2016D_008. d	Acquity 2.1 (mm)
320-23542-3 MSD		11/20/2016 21:40	1	20NOV2016D_009. d	Acquity 2.1 (mm)
RB 320-138814/10 CCB		11/20/2016 21:48	1		Acquity 2.1 (mm)
CCV 320-138814/11		11/20/2016 21:55	1	20NOV2016D_011. d	Acquity 2.1 (mm)
CCV 320-138814/12		11/20/2016 22:03	1		Acquity 2.1 (mm)
RB 320-138814/13 CCB		11/20/2016 22:10	1		Acquity 2.1 (mm)
MB 320-138217/1-A		11/20/2016 22:18	1	20NOV2016D_014. d	Acquity 2.1 (mm)
LCS 320-138217/2-A		11/20/2016 22:25	1	20NOV2016D_015. d	Acquity 2.1 (mm)
320-23542-1		11/20/2016 22:33	1	d 20NOV2016D_016. d	Acquity 2.1 (mm)
320-23542-2		11/20/2016 22:40	1	20NOV2016D_017. d	Acquity 2.1 (mm)
320-23542-2 MS		11/20/2016 22:48	1	20NOV2016D_018. d	Acquity 2.1 (mm)
320-23542-2 MSD		11/20/2016 22:55	1	20NOV2016D_019.	Acquity 2.1 (mm)
320-23542-4		11/20/2016 23:03	1	20NOV2016D_020.	Acquity 2.1 (mm)
RB 320-138814/21 CCB		11/20/2016 23:10	1		Acquity 2.1 (mm)
CCV 320-138814/22		11/20/2016 23:18	1	20NOV2016D_022. d	Acquity 2.1 (mm)
CCV 320-138814/23		11/20/2016 23:25	1		Acquity 2.1 (mm)
RB 320-138814/24 CCB		11/20/2016 23:33	1		Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1 SDG No.:

Instrument ID: A8 N Start Date: 12/02/2016 10:06

Analysis Batch Number: 140382 End Date: 12/02/2016 14:22

LAB SAMPLE ID	AB SAMPLE ID CLIENT SAMPLE ID DATE ANALYZ		DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140382/1 CCB		12/02/2016 10:06	1		Acquity 2.1 (mm)
RB 320-140382/2 CCB		12/02/2016 10:14	1		Acquity 2.1 (mm)
RB 320-140382/3 CCB		12/02/2016 10:22	1		Acquity 2.1(mm)
IC 320-140382/4		12/02/2016 10:29	1	02DEC2016A_004.	Acquity 2.1 (mm)
IC 320-140382/5		12/02/2016 10:37	1	02DEC2016A_005.	Acquity 2.1 (mm)
IC 320-140382/6		12/02/2016 10:44	1	02DEC2016A_006.	Acquity 2.1 (mm)
IC 320-140382/7		12/02/2016 10:52	1	02DEC2016A_007.	Acquity 2.1 (mm)
IC 320-140382/8		12/02/2016 10:59	1	02DEC2016A_008.	Acquity 2.1 (mm)
IC 320-140382/9		12/02/2016 11:07	1	02DEC2016A_009.	Acquity 2.1 (mm)
IC 320-140382/10		12/02/2016 11:14	1	02DEC2016A_010.	Acquity 2.1 (mm)
ICB 320-140382/11		12/02/2016 11:22	1	u u	Acquity 2.1 (mm)
ICV 320-140382/12		12/02/2016 11:29	1	02DEC2016A_012.	Acquity 2.1 (mm)
RB 320-140382/13 CCB		12/02/2016 11:37	1	u u	Acquity 2.1 (mm)
IC 320-140382/14		12/02/2016 11:44	1	02DEC2016A_014.	Acquity 2.1 (mm)
IC 320-140382/15		12/02/2016 11:52	1	02DEC2016A_015.	Acquity 2.1 (mm)
IC 320-140382/16		12/02/2016 11:59	1	02DEC2016A_016.	Acquity 2.1 (mm)
IC 320-140382/17		12/02/2016 12:07	1	02DEC2016A_017.	Acquity 2.1 (mm)
IC 320-140382/18		12/02/2016 12:14	1	02DEC2016A_018.	Acquity 2.1 (mm)
IC 320-140382/19		12/02/2016 12:22	1	02DEC2016A_019.	Acquity 2.1 (mm)
IC 320-140382/20		12/02/2016 12:29	1	02DEC2016A_020.	Acquity 2.1 (mm)
ICB 320-140382/21		12/02/2016 12:36	1	u	Acquity 2.1 (mm)
ICV 320-140382/22		12/02/2016 12:44	1		Acquity 2.1 (mm)
RB 320-140382/23 CCB		12/02/2016 12:51	1		Acquity 2.1(mm)
320-23542-2 DL		12/02/2016 12:59	100	02DEC2016B_001. d	
320-23542-2 MS DL		12/02/2016 13:06	100	02DEC2016B_002. d	Acquity 2.1 (mm)
320-23542-2 MSD DL		12/02/2016 13:14	100	02DEC2016B_003.	Acquity 2.1 (mm)
320-23542-1 DL		12/02/2016 13:22	10	02DEC2016B_004.	Acquity 2.1 (mm)
ZZZZZ		12/02/2016 13:29	10		Acquity 2.1 (mm)
320-23542-3 DL		12/02/2016 13:37	10	02DEC2016B_006. d	Acquity 2.1 (mm)
320-23542-3 MS DL		12/02/2016 13:44	10	02DEC2016B_007.	Acquity 2.1 (mm)
320-23542-3 MSD DL		12/02/2016 13:52	10	02DEC2016B_008.	Acquity 2.1 (mm)
RB 320-140382/32 CCB		12/02/2016 13:59	1		Acquity 2.1 (mm)
CCV 320-140382/33		12/02/2016 14:07	1	02DEC2016B_010.	Acquity 2.1 (mm)
CCV 320-140382/34		12/02/2016 14:14	1	-	Acquity 2.1 (mm)
RB 320-140382/35 CCB		12/02/2016 14:22	1		Acquity 2.1 (mm)

Lab Name:	TestAmerica Sacramento	JOD NO.: 320-23542-1
SDG No.:		
Instrument	ID: A8 N	Start Date: 12/02/2016 14:29

Analysis Batch Number: 140429 End Date: 12/02/2016 17:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-140429/1 CCB		12/02/2016 14:29	1		Acquity 2.1 (mm)
CCV 320-140429/2		12/02/2016 14:37	1	02DEC2016B_014.	Acquity 2.1 (mm)
CCV 320-140429/3		12/02/2016 14:44	1		Acquity 2.1 (mm)
RB 320-140429/4 CCB		12/02/2016 14:52	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 14:59	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:07	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:14	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:22	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:29	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:37	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:44	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:52	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 15:59	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 16:07	1		Acquity 2.1 (mm)
320-23542-4 DL		12/02/2016 16:14	10	02DEC2016C_011.	Acquity 2.1 (mm)
CCV 320-140429/16		12/02/2016 16:22	1	02DEC2016C_012.	Acquity 2.1 (mm)
CCV 320-140429/17		12/02/2016 16:29	1		Acquity 2.1 (mm)
RB 320-140429/18 CCB		12/02/2016 16:37	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 16:44	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 16:52	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 16:59	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 17:07	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 17:14	1		Acquity 2.1 (mm)
ZZZZZ		12/02/2016 17:22	1		Acquity 2.1 (mm)
RB 320-140429/25 CCB		12/02/2016 17:29	1		Acquity 2.1 (mm)
CCV 320-140429/26		12/02/2016 17:37	1		Acquity 2.1 (mm)
CCV 320-140429/27		12/02/2016 17:44	1		Acquity 2.1 (mm)
RB 320-140429/28 CCB		12/02/2016 17:52	1		Acquity 2.1 (mm)

### LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Batch Number: 138217 Batch Start Date: 11/17/16 08:49 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 11/18/16 14:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00066
MB 320-138217/1		3535, 537				250 mL	0.5 mL	25 uL	
		(Modified)							
LCS		3535 <b>,</b> 537				250 mL	0.5 mL	25 uL	20 uL
320-138217/2		(Modified)							
320-23542-A-1	DPT-16-01-GW-17-	3535, 537	Т	266.74 g	26.14 g	240.6 mL	0.5 mL	25 uL	
	21	(Modified)			_				
320-23542-A-2	DPT-16-05-GW-17-	3535, 537	Т	284.91 g	26.35 g	258.6 mL	0.5 mL	25 uL	
	21	(Modified)							
320-23542-A-2	DPT-16-05-GW-17-	3535, 537	Т	277.51 g	26.23 g	251.3 mL	0.5 mL	25 uL	20 uL
MS	21-MS	(Modified)		_	_				
320-23542-A-2	DPT-16-05-GW-17-	3535, 537	Т	273.81 g	26.03 g	247.8 mL	0.5 mL	25 uL	20 uL
MSD	21-MSD	(Modified)		-	_				
320-23542-A-4	DPT-16-34-GW-31-	3535, 537	Т	280.63 g	26.42 g	254.2 mL	0.5 mL	25 uL	
	35	(Modified)							

Batch Notes					
Balance ID	QA-070				
Batch Comment	0.1N NaOH/H2O_00026				
H2O ID	11-14-16				
Hexane ID	000146278				
Manifold ID	5				
Methanol ID	769617				
Pipette ID	MD05306				
Analyst ID - Reagent Drop	НЈА				
Analyst ID - SU Reagent Drop	НЈА				
Analyst ID - SU Reagent Drop Witness	NSH				
Solvent Lot #	776672				
Solvent Name	0.3% NH4OH-Me				
SOP Number	WS-LC-0025				
SPE Cartridge Type	WAX 500mg				
Solid Phase Extraction Disk ID	002836112A				

Basis	Basis Description
Т	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.

537 (Modified) Page 1 of 1

12/08/2016

### LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Batch Number: 138291 Batch Start Date: 11/17/16 12:46 Batch Analyst: Sharifi, Nooshin

Batch Method: SHAKE Batch End Date: 11/19/16 13:18

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00064	
MB 320-138291/1		SHAKE, 537		4.98 g	1.0 mL	50 uL		
		(Modified)						
LCS		SHAKE, 537		5.03 g	1.0 mL	50 uL	40 uL	
320-138291/2		(Modified)						
320-23542-A-3	DPT-16-34-SO-14-	SHAKE, 537	T	5.05 g	1.0 mL	50 uL		
	15	(Modified)						
320-23542-A-3	DPT-16-34-SO-14-	SHAKE, 537	Т	4.99 g	1.0 mL	50 uL	40 uL	
MS	15	(Modified)						
320-23542-A-3	DPT-16-34-SO-14-	SHAKE, 537	Т	5.03 g	1.0 mL	50 uL	40 uL	
MSD	15	(Modified)						

Batch Notes									
Acetic Acid ID	429065								
Balance ID	QA-070								
Batch Comment	Pipette ID: MD05306, MG05455								
Hexane ID	0000146278								
Manifold ID	4								
Methanol ID	769617								
Methanolic Potassium Hydroxide ID	757037								
Millipore Water Dispense Date	11-14-16								
Sodium Hydroxide ID	758321								
Ammonium Hydroxide/MeOH ID	776672								
Analyst ID - Reagent Drop Witness	NSH								
Blank Sand Lot #	156690								
SPE Cartridge ID	016336091A								
SPE Cartridge Type	WAX150mg								

Basis	Basis Description
Т	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.

537 (Modified) Page 1 of 1

12/08/2016



### West Sacramento

## **HPLC/LCMS Data Review Checklist**

Job Number(s): 23542	Work List ID(s): 3	7097		
Extraction Batch: <u>/38291, /38217</u>	Analysis Batch(es):	138814, 1	138811 (ECV	12)
Delivery Rank 4	Due Date:			
A. Calibration/Instrument Run QC		1 <sup>st</sup> Level	2 <sup>nd</sup> Level	N/A
1. ICAL locked in Chrom and TALS? ICAL Batch# /3766	34	./		
2. ICAL, CCV Frequency & Criteria met.	· -			
RF <sub>average</sub> criteria appropriate for the method.	. "			
Linear Regression criteria appropriate if required (in	> 0.995)			
<ul> <li>Quadratic fit criteria appropriate if required (r² ≥ 0.9</li> </ul>				./
For Linear Regression and Quadratic fit – Does the				Y
½ the reporting limit as described in CA-Q-S-005?	y-intercept support		/	
<ul> <li>All curve points show calculated concentrations.</li> </ul>				
Peaks correctly ID'd by data system.			/	
5. Tune check frequency & criteria met and Tune check re	port attached.			
B. QA/QC				
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?	11120.71121.71484.731486			-
5. Holding Times were met for prep and analytical.	110-4 11:004 11:004 11:120			
IS/Surrogate recoveries meet criteria or properly noted.	<u> </u>	5		
C. Sample Analysis				
Was correct analysis performed and were project instruc-	rtions followed?			
If required, are compounds within RT windows?	Mona followed:	<u> </u>		
3. If required, are positive hits confirmed and >40% RPD fl	anned?			$\overline{}$
Manual Integrations reviewed and appropriate.	agged:			
Management of the weet and appropriate.     All analytes correctly reported. (Primary, secondary, accordance).	ontoble status)			
6. Correct reporting limits used. (based on client request,	epiable status)	V		$\rightarrow$
dilutions)	orepractors, and		<b>✓</b>	
D. Documentation				·
Are all non-conformances documented/attached? NCM:	<i>H</i>			
Do results make sense (e.g. dilutions, etc.)?	+	Y		
Have all flags been reviewed for appropriateness?	<del></del>	_		
		V		
4. For level 3 and 4 reports, have forms and raw data been	reviewed?			
5. Was QC Checker run for this job?		V		
*Upon completion of this checklist, the reviewer must scan a		_	S job.	
1 <sup>st</sup> Level (Analyst):  2 <sup>nd</sup> Level Reviewer:	Date: 11/28	110		
2 <sup>nd</sup> Level Reviewer:	Date:nl2	12016		

### TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

20NOV2016D\_PFC

Worklist Number: 37097

Instrument Name: A8\_N

A8\_N Chrom Method: A8\_N \ChromNa\Sacramento\ChromData\A8\_N\20161121-37097.b

Data Directory: QC Batching:

Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL					
	Raw Batch: 138814	Raw Batch: 138815	Raw Batch: 138816					
#1 RB	#1 RB	#1 RB	#1 RB					
#2 CCV L5	#2 CCV L5		#2 CCV L5					
		#3 CCV L5 Add-on	#3 CCV L5 Add-on					
		#4 RB	#4 RB					
	# 5 MB 320-138291/1-A							
	# 6 LCS 320-138291/2-A							
# 7 320-23542-A-3-A	# 7 320-23542-A-3-A							
#8 320-23542-A-3-B MS								
	# 9 320-23542-A-3-C MSD							
		#10 RB	#10 RB					
		#11 CCV L5	#11 CCV L5					
	#12 CCV L5 Add-on	#12 CCV L5 Add-on	#12 CCV L5 Add-on					
		#13 RB	#13 RB					
	#14 MB 320-138217/1-A							
	#15 LCS 320-138217/2-A							
1 <b>.</b>	#16 320-23542-A-1-A							
	#17 320-23542-A-2-A							
	#18 320-23542-A-2-B MS							
	#19 320-23542-A-2-C MSD		i					
	#20 320-23542-A-4-A							
			#21 RB					
		#22 CCV L5	#22 CCV L5					
			#23 CCV L5 Add-on					
#24 RB	#24 RB		#24 RB					

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

911/02/11 84

Batch Open: 11/17/2016 8:49:00AM

Batch End: 11/18/2016 2:20:00PM

## Solid-Phase Extraction (SPE)

Output Sample Lab ID		MB 320 - 1382 + 711 - A		ML C S 3 2 0 - 1 3 8 2 1 7 7 2 - A		3 2 8 . 2 3 5 4 2 . A . T . A .		III 3 2 6 - 2 3 5 4 2 - A - 2 - A I		11 3 2 6 - 2 3 6 4 2 - A - 2 - B W SI		IIII 3 2 6 . 2 3 5 4 2 A . 2 C M.S.D.IIII		III 3 2 6 - 2 3 5 4 2 - A - 4 - A I
Comments	:				lox PF05 c		loox PFos				->		10x PFOR	PFOS
Div Rank	N/A		N/A		4		4		4		4		4	
Analytical TAT	N/A		N/A		16_Days		16_Days		16_Days		16_Days		16_Days	
Due Date	N/A		N/A		11/19/16		11/19/16		11/19/16		11/19/16		11/19/16	
Adj2		_												
PHs Adj1														
Rcvd														
GrossWt InitAmnt TareWt FinAmnt	250 mL	0.5 mL	250 mL	0.5 mL	240.6 mL	0.5 mL	258.6 mL	0.5 mL	251.3 mL	0.5 mL	247.8 mL	0.5 mL	254.2 mL	0.5 mL
GrossWt TareWt					266.74 g	26.14 g	284.91 g	26.35 g	277.51 g	26.23 g	273.81 g	26.03 g	280.63 g	26.42 g
SDG (Job#)	V/N		N/A		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)	
Input Sample Lab ID (Analytical Method)	MB-320-138217/1 N/A		LCS-320-138217/2 N/A		320-23542-A-1 (PFC_IDA_DOD5)		320-23542-A-2 (PFC_IDA_DOD5)		320-23542-A-2~MS (PFC_IDA_DOD5)		320-23542-A-2-MSD (PFC_IDA_DOD5)		320-23542-A-4 (PFC_IDA_DOD5)	
	τ-		8		ო	P	age 8	01	of 84	2	9		~	

Page 1 of 5

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM

Batch End: 11~8~16 14,20

## Solid-Phase Extraction (SPE)

	Output Sample Lab ID					M 8 3 2 6 - 1 3 8 2 1 7 1 1 A				N 8 8 2 8 2 1 3 8 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		N 8 8 2 7 8 8 2 1 1 3 8 8 2 1 1 3 8 8 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8		M 8 3 2 8 2 1 3 8 2 1 4 A A A A A A A A A A A A A A A A A A		2 8 2 8 8 N N N N N N N N N N N N N N N		L C S 3 2 8 - 1 3 8 2 1 1 2 - A		M 3 2 8 - 2 3 5 4 2 - A - 1 - A		1001 3 2 6 - 2 3 5 4 2 · A - 2 - A 121		MM 3 2 0 - 2 3 5 4 2 - A - 2 - B M STIM		18 4 2 4 5 5 4 5 6 M S D M		IIII 3 2 6 1 2 3 5 4 2 1 A 1 4 1 A IIII
	Comments																													
	Div	¥		AN A		4		4		4		4		4																
	Analytical TAT	N/A		N/A		16_Days		16_Days		16_Days		16_Days		16_Days																
	Due Date	N/A		N/A		11/19/16		11/19/16		11/19/16		11/19/16		11/19/16																
	Adj2																													
	PHs Adj1																													
	Rcvd				T																									
	InitAmnt FinAmnt	250 mL	0.5 mL	250 mL	0.5 mL		0.5 mL	-	0.5 mL		0.5 mL		0.5 mL		0.5 mL															
	GrossWt InitAmnt TareWt FinAmnt					266.74 g		284.91 g		277.51 g		273.81 g		280.63 g																
	SDG (Job#)	N/A		Ψ/N		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)																
	Input Sample Lab ID (Analytical Method)	MB~320-138217/1 N/A		LCS-320-138217/2 N/A		320-23542-A-1 (PFC_IDA_DOD5)		320-23542-A-2 (PFC_IDA_DOD5)		320-23542-A-2~MS (PFC_IDA_DOD5)		320-23542-A-2-MSD (PFC_IDA_DOD5)		320-23542-A-4 (PFC_IDA_DOD5)																
_		<b>—</b>		7		က	Р	age 8	02	of 84	2	9																		

12/08/2016

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Batch Notes	Manifold ID 5	Methanol ID 769617	Hexane ID 000146278	Sodium Hynochlorite ID NA	First Start time NA	First End time NA	Balance ID QA-070	SPE Cartridge Type WAX 500mg	Solid Phase Extraction Disk ID 002836112A	HZO ID 11-14-16	Pipette ID MD05306	Solvent Name 0.3% NH4OH-Me	Solvent Lot # 776672	Analyst ID - Reagent Drop HJA	Analyst ID - SU Reagent Drop HJA	U Reagent Drop	Acid Name NA	Acid ID NA	Reagent ID NA	Reagent Lot Number NA	NaCI ID NA	
				Sodium Hv		Ĭ.		SPE Ca	Solid Phase Extract			ŏ	O)	Analyst ID - Ro	Analyst ID - SU Re	Analyst ID - SU Reagent Drop Witness				Reagent		

Page 2 of 5

TestAmerica Sacramento

<del>12/08/</del>2016

(To Accompany Samples to Instruments) Analyst: Arauz, Horacio J

Batch Comment 0.1N NaOH/H2O\_00026

SOP Number WS-LC-0025

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Comments

Printed: 11/17/2016

Page 3 of 5

Page 4 of 5

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM Batch End:

## Reagent Additions Worksheet

	Witness	11 2/11 11311	in man								7
	Ву	41-11-11 AZH	-								,
	Final Amount	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL
	Amount Added	25 uL	25 uL	20 uL	25 uL	25 uL	25 uL	20 uL	25 uL	20 uL	25 uL
	Reagent Code	LCMPFCSU_00046	LCMPFCSU_00046	LCPFCSP_00066	LCMPFCSU_00046	LCMPFCSU_00046	LCMPFCSU_00046	LCPFCSP_00066	LCMPFCSU_00046	LCPFCSP_00066	LCMPFCSU_00046
4	Lab ID	MB 320-138217/1	LCS 320-138217/2	LCS 320-138217/2	320-23542-A-1	320-23542-A-2	320-23542-A-2 MS	320-23542-A-2 MS	320-23542-A-2 MSD	320-23542-A-2 MSD	320-23542-A-4

### TestAmerica Sacramento

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM Batch End:

Lot#: Other Reagents: **Amount/Units** Reagent

Page 5 of 5

Printed: 11/17/2016



### Sacramento Preparation Data Review Checklist

Freparation Batch Number(s):320 - 138 & F Test: PIC - C		
Earliest Holding Time: 11-21-16		
		<del></del>
	1	
Completion Tel	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Sample List Tab Samples identified to the correct method	Reviewer	Reviewer
All necessary NCMs filed (including holding time)		
Method/sample/login/QAS checked and correct	<b>_</b>	//
Wethod/sample/login/QAS checked and correct		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	NV	N/A
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	TVA	M
All additional information transcribed into TALS is correct and raw data is		
attached Comments are transcribed correctly in TALS		/_
Comments are transcribed correctly in TALS		
	1st Level	2 <sup>nd</sup> Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS		//
All spike amounts correct and added to necessary samples and QC		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Batch Information	Reviewer	Revjewer
Date and time accurate and entered into TALS correctly	TREVIEWE	Treviewei
All necessary 'batch information' complete and entered into TALS correctly		
1100	- 11	
1st Level Reviewer:         H3A         Date:         11-18           2nd Level Reviewer:         VDM         Date:         11-18	1-16	
2 <sup>nd</sup> Level Reviewer:\VPYY Date:	V18/16	
Comments:	<u>,</u>	
Johnnenia.		

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Method Code: 320-Shake\_Bath\_14D-320

Batch Number: 320-138291

Are 11/20/16

Batch Open: 11/17/2016 12:46:00PM Batch End: 11-19-16 13:18p·m

# Shake Extraction with Ultrasonic Bath Extraction

Output Sample Lab ID			13829172		
Comments			lox pros	10x pps	10x PP85
DIv Rank	N/A	A/N	4	4	4
Analytical TAT	N/A	N/A	16_Days	16_Days	16_Days
Due Date	N/A	N/A	11/19/16	11/19/16	11/19/16
Final Amount	1.0 mL	1.0 mL	1.0 mL	1.0 mL	1.0 mL
Initial Amount	4.98 g	5.03 g	5.05 g	4.99 g	5.03 g
SDG (Job#)	N/A	N/A	N/A (320-23542-1)	N/A (320-23542-1)	N/A (320-23542-1)
Input Sample Lab ID (Analytical Method)	Mb~320-138291/1 N/A	LCS~320-138291/2 N/A	320-23542-A-3 (PFC_IDA_DOD5)	320-23542-A-3~MS (PFC_IDA_DOD5)	320-23542-A-3-MSD (PFC_IDA_DOD5)

Page 2 of 3

TestAmerica Sacramento

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138291 Method Code: 320-Shake\_Bath\_14D-320

Analyst: Sharifi, Nooshin

Batch Open: 11/17/2016 12:46:00PM

Batch End:

Batch Notes	Balance ID QA-070	rt # 156690	Filter ID NA	olt olt	מופ	HSN ssi	SPE Cartridge ID 016336091A	MAX150ma		ID 0000146278	Methanol ID 769617		ID 776672	ID 758321	ID 757037	GI .	ID NA	D 42008F	10 428063	Batch Comment Pipette ID: MD05306, MG05455		
	Balance	Blank Sand Lot # 156690	Filter	Millipore Water Dispense Date	מים שניים ליים מים מים מים מים מים מים מים מים מים	Analyst ID - Reagent Drop Witness NSH	SPE Cartridge I	SPE Cartridge Type WAX150mg	46 page 11 12	Hexane ID	Methanol	,	Ammonium Hydroxide/MeOH ID	Sodium Hydroxide ID 758321	Methanolic Potassium Hydroxide ID 757037	Manifold ID	Interference check solution ID NA	Acotto Apply Of Price Acotto		Batch Commer		

Comments

Printed: 11/17/2016

<del>1</del>2/08/2016

### TestAmerica Sacramento

Page 3 of 3

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138291 Method Code: 320-Shake\_Bath\_14D-320

Analyst: Sharifi, Nooshin

Batch Open: 11/17/2016 12:46:00PM

Batch End:

### Reagent Additions Worksheet

LCS 320-138291/1 LCS 320-138291/2 LCS 320-138291/2 320-23542-A-3 MS 320-23542-A-3 MS 320-23542-A-3 MS	Reagent Code  LCMPFCSU_00046  LCMPFCSU_00046  LCMPFCSU_00046  LCMPFCSU_00046  LCMPFCSU_00046  LCMPFCSU_00064	Amount Added 50 uL 40 uL 50 uL 50 uL 40 uL 40 uL	50 uL       1.0 mL         50 uL       1.0 mL         40 uL       1.0 mL         50 uL       1.0 mL         50 uL       1.0 mL         40 uL       1.0 mL         50 uL       1.0 mL         50 uL       1.0 mL	NSH 11-17-16	Witness HSA 11-13-16	
320-23542-A-3 MSD	LCPFCSP_00064	40 uL	1.0 mL		~>	_,

Reagent
---------



### Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 13824 Test: PLC-)		
Earliest Holding Time: 11 - 28 - 16		
Tarries Trestains Time.		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Sample List Tab	Reviewer	Reviewer
Samples identified to the correct method		
All necessary NCMs filed (including holding time)	NA	NN
Method/sample/login/QAS checked and correct		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	NA	NJ
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	VA	NA
All additional information transcribed into TALS is correct and raw data is		
attached		
Comments are transcribed correctly in TALS		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS		
All spike amounts correct and added to necessary samples and QC		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly		/10/10/10/
All necessary 'batch information' complete and entered into TALS correctly		
		<del></del>
et	100 11	
st Level Reviewer:	14-16	
end Level Reviewer: H5A Date: //-/	9-16	
Comments:		



### West Sacramento

### HPLC/LCMS Data Review Checklist

Job Number(s): 23542 - 23651 : 23718 : 23783 Work Li	st ID(s):37450	; 37461
Extraction Batch: 138217; 138291; 139627 Analysis	Batch(es): 14038	2;140429
Delivery Rank Due Date	te: <u>11/19/16; 11</u>	1/25/16
A Calibration/Instrument Run QC	1 <sup>st</sup> Le	
1. ICAL locked in Chrom and TALS? ICAL Batch# (40392;	1	
2. ICAL, CCV Frequency & Criteria met.	<b>√</b>	
RF <sub>average</sub> criteria appropriate for the method.		
<ul> <li>Linear Regression criteria appropriate if required (r ≥ 0.995</li> </ul>		
<ul> <li>Quadratic fit criteria appropriate if required (r<sup>2</sup> ≥ 0.990).</li> </ul>		
For Linear Regression and Quadratic fit – Does the y-interest.	cept support	
½ the reporting limit as described in CA-Q-S-005?	🗸	
All curve points show calculated concentrations.	<b>✓</b>	1
Peaks correctly ID'd by data system.		-
5. Tune check frequency & criteria met and Tune check report atta	iched.	/
B. QA/QC		
Are all QC samples properly linked in TALS?		
2. Method blank, LCS/LCSD and MS/SD frequencies met.	✓	5
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?		/
<ol><li>Holding Times were met for prep and analytical.</li></ol>	V	
IS/Surrogate recoveries meet criteria or properly noted.	<b>✓</b>	
C. Sample Analysis		
1. Was correct analysis performed and were project instructions for	llowed? ✓	~
2. If required, are compounds within RT windows?	$\checkmark$	
<ol><li>If required, are positive hits confirmed and &gt;40% RPD flagged?</li></ol>		
Manual Integrations reviewed and appropriate.	<i></i>	
5. All analytes correctly reported. (Primary, secondary, acceptable		
<ol><li>Correct reporting limits used. (based on client request, prep facilitations)</li></ol>	tors, and	
D. Documentation		
1. Are all non-conformances documented/attached? NCM# 7189	8:71899 V	1
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 review	ved?	
5. Was QC Checker run for this job?		
2 <sup>nd</sup> Level Reviewer: Da	ate: 12/4/16 ate: 12/5//0	TALS job.
NCMs: 71898; 71899; 71937; 719	40	

q:\forms\checklists\qa-570\_lcms\_review ns 2012-09-25.doc

QA-570 Revised NS 9/25/2012

Report Date: 02-Dec-2016 14:45:54

### TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 02DEC2016A\_PFC Worklist Number: 37450
Instrument Name: A8\_N Chrom Method: A8\_N
Data Directory: \ChromNa\Sacramento\ChromData\A8\_N\20161202-37450.b

QC Batching: Disabled Limit Group Batching: Enabled

QC Batch 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
	Raw Batch: 140382	Raw Batch: 140383	Raw Batch 140384
#1 RB	#1 RB		
#2 RB	#2 RB		1
#3 RB	#3 RB		
#4 IC L1		#4 IC L1	#4 IC L1
#5 IC L2	#5 IC L2	#5 IC L2	#5 IC L2
#6 IC L3	#6 IC L3	#6 IC L3	#6 IC L3
#7 IC L4	#7 IC L4	#6 IC L3 #7 IC L4 #8 IC L5 #9 IC L6 #10 IC L7	#7 IC L4
#8 IC L5	#8 IC L5	#8 IC L5	#8 IC L5
#9 IC L6	#9 IC L6	#9 IC L6	#9 IC L6
#10 IC L7	#10 IC L7	#10 IC L7	#10 IC L7
#11 ICB	#11 K'	#11 ICB	#11 ICB
#12 ICV	#12 ICV Tune NCM	#12 ICV	
#13 RB	#13 RB 7-1898	#13 RB	#13 RB
#14 IC L1 Add-on	#14 IC L1 Add-on	#14 IC L1 Add-on	#14 IC L1 Add-on
#15 IC L2 Add-on	#15 IC L2 Add-on	#15 IC L2 Add-on	#15 IC L2 Add-on
#16 IC L3 Add-on	#16 IC L3 Add-on	#16 IC L3 Add-on	#16 IC L3 Add-on
#17 IC L4 Add-on	#17 IC L4 Add-on	#17 IC L4 Add-on	#17 IC L4 Add-on
#18 IC L5 Add-on	#18 IC L5 Add-on	#18 IC L5 Add-on	#18 IC L5 Add-on
#19 IC L6 Add-on		#19 IC L6 Add-on	#19 IC L6 Add-on
#20 IC L7 Add-on		#20 IC L7 Add-on	#20 IC L7 Add-on
#21 ICB		#21 ICB	#21 ICB
#22 ICV Add-on		#22 ICV Add-on	
#23 RB		#23 RB	#23 RB
#24 320-23542-A-2-A	#24 320-23542-A-2-A		
#25 320-23542-A-2-B MS	#25 320-23542-A-2-B MS		
#26 320-23542-A-2-C MSD	#26 320-23542-A-2-C MSD		
#27 320-23542-A-1-A	#27 320-23542-A-1-A	l i	
#28 320-23542-A-4-A	#28 320-23542-A-4-A MisiMe	ft	
#29 320-23542-A-3-A	#29 320-23542-A-3-A		
#30 320-23542-A-3-B MS	#30 320-23542-A-3-B MS		
#31 320-23542-A-3-C MSD	#31 320-23542-A-3-C MSD		1
#32 RB		#32 RB	#32 RB
#33 CCV L5		#33 CCV L5	#33 CCV L5
#34 CCV L5 Add-on		#34 CCV L5 Add-on	#34 CCV L5 Add-on
#35 RB	#35 RB	#35 RB	#35 RB

MS/MSD high trongets NCM 71899

Page: 1

Chrom Revision: 2.2 14-Nov-2016 08:15:16 Report Date: 04-Dec-2016 17:41:55 Page: 1

> TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 02DEC2016B\_PFC Worklist Number: 37461 Instrument Name: A8\_N Chrom Method: A8\_N \\ChromNa\Sacramento\ChromData\A8\_N\20161202-37461.b Data Directory: QC Batching: Disabled Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
E1	Raw Batch: 140429	Raw Batch: 140430	Raw Batch: 140431
#1 RB	# 1 RB	# 1 RB	#1 RB
# 2 CCV L5	#2 CCV L5	#2 CCV L5	#2 CCV L5
#3 CCV L5 Add-on	#3 CCV L5 Add-on	#3 CCV L5 Add-on	#3 CCV L5 Add-on
#4 RB	#4 RB	#4 RB	#4 RB
# 5 MB 320-139627/1-A	# 5 MB 320-139627/1-A		
# 6 LCS 320-139627/2-A	# 6 LCS 320-139627/2-A		
# 7 320-23651-A-2-A	# 7 320-23651-A-2-A	51	
# 8 320-23651-A-3-A	# 8 320-23651-A-3-A		
	# 9 320-23718-A-3-A		
#10 320-23718-A-3-B MS	#10 320-23718-A-3-B MS		
#11 320-23718-A-3-C MSD	#11 320-23718-A-3-C MSD		
#12 320-23783-A-1-A	#12 320-23783-A-1-A		:
#13 320-23783-A-2-A	#13 320-23783-A-2-A		
#14 320-23783-A-5-A	#14 320-23783-A-5-A <b>E (O</b> X	PFOS . Efiag NCM 719:	87
#15 320-23542-A-4-A	# 10 320-23042-A-4-A	· ·	•
		A	#16 CCV L5
#17 CCV L5 Add-on	#17 CCV L5 Add-on	#17 CCV L5 Add-on	#17 CCV L5 Add-on
,·· · - · · -	#18 RB	#18 RB	#18 RB
#19 320-23783-A-6-A	#19 320-23783-A-6-A		
#20 320-23783-A-7-A	#20 320-23783-A-7-A		
#21 320-23783-A-8-A	#21 320-23783-A-8-A		
#22 320-23783-A-9-A	#22 320-23783-A-9-A		
#23 320-23783-A-10-A	#23 320-23783-A-10-A		
	#24 320-23783-A-11-A		
			#25 RB
	i e		#26 CCV L5
,			#27 CCV L5 Add-on
#28 RB	#28 RB	#28 RB	#28 RB

1cV 140382 There + SBC 12/4/16 There NCM 71898

Batch Number: 320-138217

Method Code: 320-3535\_IVWT-320

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horaclo J

AB W/20/16 AB 12/2/16

Batch Open: 11/17/2016 8:49:00AM

Batch End: 11/18/2016 2:20:00PM

### Solid-Phase Extraction (SPE)

										9		ř		
Output Sample Lab ID	in the second se									8 - 2 - 4 - 5 - 9 - 5 - 9 - 5 - 9				Pros ry
Comments					10x 9F05 / C		loox Proc.	>			<b>-&gt;</b>		10x PFOR P.T	PFOS T
Zank	≨		§		4		4		4		4		4	
Analytical TAT	NA		N/A		16_Days		16_Days		16_Days		16_Days		16_Days	
Due Date	¥N		NA		11/19/16		11/19/16		11/19/16		11/19/16		11/19/16	
Adj2														
PHs Adj1														
Revd						_								
GrossWt InitAmnt TareWt FinAmnt Rovd	250 mL	0.5 mL	250 mL	0.5 mL	240.6 mL	0.5 mL	258.6 mL	0.5 mL	251.3 mL	0.5 mL	247.8 mL	0.5 mL	254.2 mL	0.5 mL
GrossWt TareWt					266.74 g	26.14 g	284.91 g	26.35 g	277.51 g	26.23 g	273.81 g	26.03 g	280.63 g	26.42 g
SDG (*fop*)	N/A		N/A		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)		N/A (320-23542-1)	
Input Sample Lab ID (Analytical Method)	MB-320-138217/1 N/A		LCS~320-138217/2 N/A		320-23542-A-1 (PFC_IDA_DOD5)		320-23542-A-2 (PFC_IDA_DOD5)		320-23542-A-2~MS (PFC_IDA_DOD5)		320-23542-A-2"-MSD (PFC_IDA_DOD5)		(PFC_IDA_DODS)	
_	~		Ø		(1)	Р	₹ age 8	315	<b>ம</b> of 84	2	<b>50</b>		^	

12/08/2016

(To Accompany Samples to Instruments)

Analyst: Arauz, Horaclo J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch End: 11~6~16 14!20 Batch Open: 11/17/2016 8:49:00AM

### Solid-Phase Extraction (SPE)

Output Sample Lab iD		N 8 2 4 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						1 2 2 6 2 2 5 C 4 2 - X - Z - X		1 2 2 6 - 2 3 6 4 2 - A - 2 - B - B - B - B - B - B - B - B - B		M 3 2 6 - 2 3 5 4 2 - A - 2 - C - B 51		1 2 2 6 - 2 3 6 6 3 - A - 4 - A
Comments														
	¥		ş		4		4		4		4		4	
Analytical TAT	N/A		N/A		16_Days		16_Days		16_Days		16_Days		16_Days	
Due Date	Α×		NA		11/19/16		11/18/16		11/19/16		11/19/16		11/19/16	
Adiz														
PHs Adj1														
Reve		_		T		_			_					
GrossWt InitAmnt TareWt FinAmnt Revd	250 mL	0.5 mL	250 mL	0.5 mL		0.5 mL	·	0.5 mL		0.5 mL		0.5 mL		0.5 mL
GrossWt					266.74 g		284.91 g		8 12.773		273.81 g		280.63 g	
SDG (Job#)	NA A		ΝΑ		N/A (320-23542-1)		N/A (320-23542-1)		(320-23542-1)		(320-23542-1)		N/A (320-23542-1)	
Input Sample Lab ID (Analytical Method)	MB-320-138217/1 N/A		LCS~320-138217/2 N/A		320-23542-A-1 (PFC_IDA_DOD5)		320-23542-A-2 (PFC_IDA_DOD5)	200 000	(PFC_IDA_DOD5)		(PFC_IDA_DODS)		320-23542-A-4 (PFC_IDA_DODS)	
	+		N		ო	P	<b>₹</b> age 8	16	<b>ம</b> of 84	2	φ		^	

### TestAmerica Sacramento

## Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Printed: 11/17/2016

Page 2 of 5

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J Method Code: 320-3535\_IVWT-320 Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM

Batch End:

Batch Comment 0.1N NaOH/H2O\_00026 SOP Number WS-LC-0025

Comments

Page 3 of 5

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-3535\_IVWT-320

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM

Batch End:

### Reagent Additions Worksheet

Lab ID	Reagent Code	Amount Added	Final Amount	By	Witness
MB 320-138217/1	LCMPFCSU_00046	25 uL	0.5 mL	UTA 11-12-16	
LCS 320-138217/2	LCMPFCSU_00046	25 uL	0.5 mL	0) 1 1 11 11 11 11 11 11 11 11 11 11 11 1	Now 11-4-16
LCS 320-138217/2	LCPFCSP_00066	20 uL	0.5 mL		
320-23542-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2 MS	LCPFCSP_00066	20 uL	0.5 mL		
320-23542-A-2 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23542-A-2 MSD	LCPFCSP_00066	20 uL	0.5 mL		
320-23542-A-4	LCMPFCSU_00046	25 uL	0.5 mL	,	72
					·

Page 4 of 5

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Number: 320-138217

Batch Open: 11/17/2016 8:49:00AM Batch End: Method Code: 320-3535\_IVWT-320

	Lo4:			
Other Reagents:	Amount/Units			
	Reagent			

Printed: 11/17/2016



### Sacramento Preparation Data Review Checklist

Preparation Batch Number(s):320 - 138217 Test: PFC - L		
Earliest Holding Time: 11-21-16		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Sample List Tab	Reviewer	Reviewe
Samples identified to the correct method		
All necessary NCMs filed (including holding time)		//
Method/sample/login/QAS checked and correct		1
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	NA	VA
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 CI Check)		
The pH is transcribed correctly in TALS	TUN	NA
All additional information transcribed into TALS is correct and raw data is		
attached		
Comments are transcribed correctly in TALS		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS	- NOVIEWCI	TONIGMOI
All spike amounts correct and added to necessary samples and QC		<del>//</del> -
Batch Information	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Date and time accurate and entered into TALS correctly	Reviewer	Reviewer
All necessary 'batch information' complete and entered into TALS correctly		//_
An industrial Parent information Complete and entered into TALS conectly		
Level Reviewer: HSA Date: 11-18	C-16	
nd Level Reviewer: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1101110	
	110/14	
Comments:		



### Test America - Sacramento

### Sample Dilution Record

Method ID_PFC_IDA_DoDS	Job #	23542	
Analyst (Print Name) Shyhara Chandrasu	<b>^Analyst Ini</b>	tials 8PC	
Date 12/2/16			

Sample#	Original F.V. (uL)	Aliquot (uL)	Dilution F.V. (uL)	<b>Dilution Factor</b>
1	500	100	1000	IOX
2				
2M5				
2M5D				
<u> </u>				
3MS				
3MSD				
4	4			<b>1</b>
2 k				100x 4
2_MS				100x
2 MSD	4	*	*	100x 1
				100%

Comments:	

### Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Method Code: 320-Shake\_Bath\_14D-320

Batch Number: 320-138291

20 12/2/16 A8 12/2/16

Batch Open: 11/17/2016 12:46:00PM Batch End: 11-19-16 13.18pm

# Shake Extraction with Ultrasonic Bath Extraction

Comments Output Sample Lab ID			(σχ Peas ζ	lox 9705 V	100 OPS / STATE TO STATE THE PROPERTY OF THE PARTY OF THE
DIV Rank	¥ <sub>N</sub>	NA NA	4	4	4
Analytical TAT	N/A	N/A	16_Days	16_Days	16_Days
Due Date	N/A	N/A	11/19/16	11/19/16	11/19/16
Final Amount	1.0 mL	1.0 mL	1.0 mL	1.0 mL	1.0 mL
Initial Amount	4.98 g	5.03 g	5.05 g	4.99 g	5.03 g
SDG (Job#)	<b>ĕ</b> N	V.A	N/A (320-23542-1)	N/A (320-23542-1)	N/A (320-23542-1)
Input Sample Lab ID (Analytical Method)	MB-32L-13629177 N/A	LCS~320-138231/2 N/A	320-23542-A-3 (PFC_IDA_DQD5)	(PFC_IDA_DOD5)	320-23542-A-3~MSD (PFC_IDA_DOD5)

Printed: 11/17/2016

Page 2 of 3

### Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-138291 Method Code: 320-Shake\_Bath\_14D-320

Analyst: Sharifi, Nooshin

Batch Open: 11/17/2016 12:46:00PM

Batch End:

Batch Notes	020-1	0890			±	336091A	X150mg	0000146278	1917	672	321	037			065	Batch Comment Pipette ID: MD05306, MG05455	
	QA-01	15669	N.		NSH HS	01633	WAX	9000	769617	778672	758321	757037		₹	42906	Pipette	
	Balance ID QA-070	Blank Sand Lot # 156690	Filter ID NA	Millipore Water Dispense Date	Analyst ID - Reagent Drop Witness NSH	SPE Cartridge ID 016336091A	SPE Cartridge Type WAX150mg	Hexane ID	Methanol ID	Ammonium Hydroxide/MeOH ID	Sodium Hydroxide ID	Methanolic Potassium Hydroxide ID	Manifold ID	Interference check solution ID NA	Acetic Acid ID 429065	Batch Comment	

### Comments

Printed: 11/17/2016

### TestAmerica Sacramento

Page 3 of 3

### Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Method Code: 320-Shake\_Bath\_14D-320

Batch Number: 320-138291

Batch Open: 11/17/2016 12:46:00PM Batch End:

### Reagent Additions Worksheet

HSON	Lab ID	Reagent Code	Amount Added Final Amount	Final Amount	P.	7471
LCMPFCSU_00046 50 uL 1.0 mL NSH N~17~16  LCMPFCSU_00046 50 uL 1.0 mL	MR 320_13820174			-		WITHESS
LCMPFCSU_00046         50 uL         1.0 mL           LCPFCSP_00064         40 uL         1.0 mL           LCMPFCSU_00046         50 uL         1.0 mL           LCMPFCSU_00046         50 uL         1.0 mL           LCPFCSP_00064         40 uL         1.0 mL           LCPFCSP_00064         50 uL         1.0 mL           LCPFCSP_00064         40 uL         1.0 mL	1 1 6 2001 - 0.20 0 11	LCMPTCSU_00046	50 uL			
LCMPFCSU_00064 40 uL  LCMPFCSU_00046 50 uL  LCMPFCSU_00064 40 uL  LCMPFCSU_00064 40 uL  LCMPFCSU_00066 50 uL	LCS 320-138291/2	LCMPFCSU_00046	50 uL	1.0 mL		+
LCMPFCSU_00046 50 uL  LCMPFCSU_00046 50 uL  LCMPFCSP_00064 40 uL  LCMPFCSU_00064 50 uL  LCPFCSP_00064 40 uL	LCS 320-138291/2	LCPFCSP_00064	40 uL	1.0 mL		
LCMPFCSU_00046 50 ul.  LCPFCSP_00064 40 ul.  LCMPFCSU_00046 50 ul.  LCPFCSP_00064 40 ul.	320-23542-A-3	LCMPFCSU_00046	50 uL	1.0 mL		
LCPFCSP_00064 40 uL  LCMPFCSU_00046 50 uL  LCPFCSP_00064 40 uL	320-23542-A-3 MS	LCMPFCSU 00046	50 ul	200	+	
LCPFCSP_00064 40 uL LCPFCSP_00064 40 uL	320-23542-A-3 MS	10000		3		
LCPFCSP_00064 50 uL		LCFFC3F_00084	40 nF	1.0 mL	<del>., ., .,</del>	
LCPFCSP_00064 40 uL	320-23542-A-3 MSD	LCMPFCSU_00046	50 ul.	1.0 mL		
	320-23542-A-3 MSD	LCPFCSP_00064	40 uL	1.0 mL		

	Lot#:			
Other Reagents:	Amount/Units			
Othe	Reagent			



### Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): [3829] Test: PFC-5		
Earliest Holding Time: 11- 28-14		***************************************
	•	
	1st Level	2 <sup>nd</sup> Level
Sample List Tab	Reviewer	Reviewer
Samples identified to the correct method	-	/
All necessary NCMs filed (including holding time)	NA	MA
Method/sample/login/QAS checked and correct		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Worksheet Tab	Reviewer	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	VA	NI
All additional information transcribed into TALS is correct and raw data is attached	/	/
Comments are transcribed correctly in TALS		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS		/101101101
All spike amounts correct and added to necessary samples and QC		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly	1101101101	1101101101
All necessary 'batch Information' complete and entered into TALS correctly		
tevel Reviewer: NSH Date: 1/-15  Date: 1/-15	19-16	
nd Level Reviewer: HJA Date: //~!"	7-16	
comments:		

### TestAmerica Sacramento

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Method Code: 320-Shake\_Bath\_14D-320

Batch Number: 320-139627

48 12/2/16

Batch Open: 11/28/2016 11:03:00AM

Batch End: 11-30-16 16:30

# Shake Extraction with Ultrasonic Bath Extraction

Outroit Common to In							2	3 2 6 - 2 3 7 1 8 · A · 3 · C M S O D			3 2 6 - 2 3 7 8 3 - A - 5 - A	1 2 2 6 - 2 3 7 8 8 7 7 8 8 7 8 8 8 8 8 8 8 8 8 8 8	3 2 6 - 2 3 7 8 3 - A - A - A - A - A - A - A - A - A -	1 3 2 4 - 2 3 7 8 3 - A - 1 8		
Comments										10x PFOS 581.79						
à d	Kank N/A	₹ X	4	4	4	4	4	4	4	4	4	4	4	4	4	
Analytical	¥ ×	N/A	16_Days	16_Days	16_Days	16_Days	16_Days	11_Day_Rush	11_Day_Rush	11_Day_Rush	11_Day_Rush	11_Day_Rush	11_Day_Rush	11_Day_Rush	11_Day_Rush	_
Due Date	N/A	N/A	11/21/16	11/21/16	11/25/16	11/25/16	11/25/16	11/29/16	11/29/16	11/29/16	11/29/16	11/29/16	11/29/16	11/29/16	11/29/16	<b></b>
Final	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	1.00 mL	-
Initial	5.00 g	5.00 g	5.07 g	5.05 g	5.00 g	5.01 g	5.08 g	5.01 g	5.07 g	5.02 g	5.06 g	5.03 g	5.00 g	5.02 g	5.03 g	-
SDG (A doL)	N/A	N/A	N/A (320-23651-1)	N/A (320-23651-1)	N/A (320-23718-1)	N/A (320-23718-1)	N/A (320-23718-1)	N/A (320-23783-1)	N/A (320-23783-1)	N/A (320-23783-1)	N/A (320-23783-1)	N/A (320-23783-1)	N/A (320-23783-1)	N/A (320-23783-1)	NIA (320-23783-1)	-
Input Sample Lab ID (Analytical Method)	MB~320-139627/1 N/A	LCS~320-139627/2 N/A	320-23651-A-2 (PFC_IDA_DOD5)	320-23651-A-3 (PFC_IDA_DOD5)	320-23718-A-3 (PFC_IDA_DOD5)	320-23718-A-3~MS (PFC_IDA_DOD5)	(PFC_IDA_DOD5)	(PFC_IDA_DOD5)	320-23783-A-2 (PFC_IDA_DOD5)	320-23783-A-5 (PFC_IDA_DOD5)	320-23783-A-6 (PFC_IDA_DOD5)	320-23783-A-7 (PFC_IDA_DOD5)	(PFC_IDA_DODS)	320-23783-A-9 (PFC_IDA_DOD5)	15	-

Printed 11/28/2016

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Open: 11/28/2016 11:03:00AM Analyst: Arauz, Horacio J Method Code: 320-Shake Bath 14D-320 Batch Number: 320-139627

Batch End:				
			4	
			11_Day_Rush	
			11/29/16	
		1	1.00 mL	
		i c	5.05 g	
_baul_14D-320	1	4/X	(320-23783-1)	
בוכל סביטי סבט סוומת בחשור   140-020	250 52705 A 44	11-W-60/67-076	(PFC_IDA_DOD5)	

Batch Comment Pipette MD05306
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Page 2 of 5

### TestAmerica Sacramento

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Method Code: 320-Shake\_Bath\_14D-320 Batch Number: 320-139627

Analyst: Arauz, Horacio J

Batch Open: 11/28/2016 11:03:00AM

Batch End:

### Comments

Page 829 of 842

Printed: 11/28/2016

12/08/2016

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J Method Code: 320-Shake\_Bath\_14D-320

Batch Number: 320-139627

Batch Open: 11/28/2016 11:03:00AM

Batch End:

### Reagent Additions Worksheet

Amount Added Final Amount By	50 uL 1.00 mL HSM (1.2) K-1 K	50 uL 1.00 mL	40 uL 1.00 mL	6 50 uL 1.00 mL	6 50 uL 1.00 mL	6 50 uL 1.00 mL	5 50 uL 1.00 mL	40 uL 1.00 mL	5 50 uL 1.00 mL	40 uL 1.00 mL	5 50 uL 1.00 mL	5 50 uL 1.00 mL	5 50 uL 1.00 mL	5 50 uL 1.00 mL	3 50 uL 1.00 mL	3 50 uL 1.00 mL	5 50 uL 1.00 mL	
Reagent Code Amoun	LCMPFCSU_00046 50	LCMPFCSU_00046 50	LCPFCSP_00070 40	LCMPFCSU_00046 50	LCMPFCSU_00046 50	LCMPFCSU_00046 50	LCMPFCSU_00046 50	LCPFCSP_00070 40	LCMPFCSU_00046 50	LCPFCSP_00070 40	LCMPFCSU_00046 50	CMPECS   00046 FO						
Lab ID	MB 320-139627/1	LCS 320-139627/2	LCS 320-139627/2	320-23651-A-2	320-23651-A-3	320-23718-A-3	320-23718-A-3 MS	320-23718-A-3 MS	320-23718-A-3 MSD	320-23718-A-3 MSD	320-23783-A-1	320-23783-A-2	320-23783-A-5	320-23783-A-6	320-23783-A-7	320-23783-A-8	320-23783-A-9	320-23783-A-10

Page 4 of 5

TestAmerica Sacramento

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Open: 11/28/2016 11:03:00AM **PSY** Batch End: 91-38-1 40x 1.00 mL Analyst: Arauz, Horacio J 50 uL LCMPFCSU\_00046 Method Code: 320-Shake\_Bath\_14D-320 Batch Number: 320-139627 320-23783-A-11

	Lot#:			
Other Reagents:	Amount/Units			
	Reagent			



### Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 320 -139627 Test:	t_1/D0	)h
Earliest Holding Time: 11-29-16		
		<del></del>
	1 <sup>st</sup> Level	2 <sup>nd</sup> Leve
Sample List Tab Samples identified to the correct method	Reviewer	Reviewe
All necessary NCMs filed (including holding time)		
Method/sample/login/QAS checked and correct	NA	NA
Motificarsatiffice/logiff/QAS checked and correct		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	NN	M
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	NM	N.A
All additional information transcribed into TALS is correct and raw data is attached		1 471
Comments are transcribed correctly in TALS		
Comments are transcribed correctly in TALS		
	1 <sup>st</sup> Level	2 <sup>nd</sup> Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS		
All spike amounts correct and added to necessary samples and QC		
	1 <sup>st</sup> Level	ond .
Batch Information	Reviewer	2 <sup>nd</sup> Level
Date and time accurate and entered into TALS correctly	1/CAIGNEL	Reviewer
All necessary 'batch information' complete and entered into TALS correctly	<del></del>	/
St		
st Level Reviewer: HSA Date: 11-30-	-16	
"Level Reviewer: H2A Date: 11-30-	20-110	
Comments:	<u> </u>	
		<del></del>

### GENERAL CHEMISTRY

### COVER PAGE GENERAL CHEMISTRY

Lab Name	: TestAmerica Sacramento	Job Number: 320-23542-1	
SDG No.:			
Project:	Former Bay Head Road Annex (RFP	JU06-01)	
	Client Sample ID DPT-16-34-SO-14-15	Lab Sample ID 320-23542-3	

Comments:

### 9-IN DETECTION LIMITS GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job Number: 320-23542-1

SDG Number:

Matrix: Solid Instrument ID: NOEQUIP

Method: D 2216 LOQ Date: 01/01/2012 08:18

Analyte	Wavelength/ Mass	LOQ (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

### 9-IN CALIBRATION BLANK DETECTION LIMITS GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento

SDG Number:

Matrix: Solid

Method: D 2216

Matrix: Date: 01/01/2012 08:19

Analyte	Wavelength/ Mass	XRL (%)	
Percent Moisture		0.1	
Percent Solids		0.1	

### 13-IN ANALYSIS RUN LOG GENERAL CHEMISTRY

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Instrument ID: NOEQUIP Analysis Method: D 2216

Start Date: 11/22/2016 13:53 End Date: 11/22/2016 13:53

		Т				_				Ā	\na	aly	/te	es						
Lab Sample Id	D/F	У р е	Time		M o i s t															
320-23542-3	1	Т	13:53	Х	Χ															٦
ZZZZZZ			13:53																$\top$	$\neg$
ZZZZZZ			13:53																	٦
ZZZZZZ			13:53																	$\neg$
ZZZZZZ			13:53																	$\neg$
ZZZZZZ			13:53																	$\neg$
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ZZZZZZ			13:53																	

Prep Types:

T = Total/NA

### GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23542-1

SDG No.:

Batch Number: 139136 Batch Start Date: 11/22/16 13:53 Batch Analyst: Yang, Maisee

Batch Method: D 2216 Batch End Date: 11/23/16 10:20

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry	
320-23542-A-3	DPT-16-34-SO-14- 15	D 2216	Т	1	2.00 g	7.32 g	6.23 g	

Batch	Notes
Balance ID	QA-068 No Unit
Date and Time Samples in Desiccator	11/23/16 @9:12
Date and Time Samples out of Desiccator	11/23/16 @10:20
Date samples were placed in the oven	11/22/16
Oven Temp In	110 Degrees C
Time samples were place in the oven	14:25
Date samples were removed from oven	11/23/16
Oven Temp Out	109 Degrees C
Time Samples were removed from oven	9:12
Oven ID	Soil Prep #2
Thermometer ID	151969607

Basis	Basis Description
Т	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.

D 2216



### Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 139/36 Test: %	oist.	uro
Editiest Holding Time: N / Z		
320=23542;-23546;-23559;-2362	7;-236	55/
Sample List Tab Samples identified to the correct method All necessary NCMs filed (including holding time) Method/sample/login/QAS checked and correct	1st Lev Review	el 2 <sup>nd</sup> Level
Worksheet Tab  All samples properly preserved  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  All additional information transcribed into TALS is correct and raw data is attached	1st Leve Reviewe 	Reviewer
Comments are transcribed correctly in TALS		
Reagents Tab  All necessary reagents not expired and entered into TALS  All spike amounts correct and added to necessary samples and QC	1st Level Reviewer N/A-	2 <sup>nd</sup> Level Reviewer NA
Batch Information  Date and time accurate and entered into TALS correctly  All necessary 'batch information' complete and entered into TALS correctly	1 <sup>st</sup> Level Reviewer	2 <sup>nd</sup> Level Reviewer
1 <sup>st</sup> Level Reviewer.  2 <sup>nd</sup> Level Reviewer.  MY  Date: 11/25  Comments:	116	= = = = = = = = = = = = = = = = = = =

### Shipping and Receiving Documents

Custody Record Chain of

Temperature on Receipt 2.0°C Drinking Water? Yes \□ No<

**TestAmerica** 

THE LEADER IN ENVIRONMENTAL TESTING

Conditions of Receipt Special Instructions/ 0560 (A tee-may be assessed if samples are retained Chain of Custody Number 299016 320-23542 Chain of Custody Page Date Months longer than 1 month) Analysis (Attach list if more space is needed) TRANSFER TO FEDEX Lab Number Ao-19 20-19 28-19 ☐ Archive For > > SILL KELLMANA OC Requirements (Specify) HOBN Disposal By Lab Containers & Preservatives HOPN Telephone Number (Area Code)/Fax Number (4 h3) 549-87-8 1. Received By 2. Received By 3. Received By rut Vm Gelder IDH EONH POSZH 2 saudun N 1200 GLINSKI ☐ Unknown ☐ Return To Client Sample Disposal 1105 Time Matrix Carrier/Waybill Number pas Project Manager MIKE Site Contact 114 Other. 1145 1145 1325 1430 145 Date Time 1030 21 Days THE 11/14/16 59444409 Zip Code 27201 □ Poison B Date AECOM Rd Anny 14 Days (Containers for each sample may be combined on one line) DPT-16-05-GW-17-21-MSD Skin Irritant DPT-1634-64-31-35 12-61-MD-10-91-12 3101 WILSON BLYD DPT-16-05-64- 17-21 Sample I.D. No. and Description DPT-16-34-50- 14-15 □ 7 Days Former Bry Herd | Flammable Contract/Purchase Order/Quore No. 2.0.2 ARLINGTON 37607449 Project Name and Location (State) 48 Hours Turn Around Time Required AEcom 1. Relinquished By 12/08/2016 2. Relinquished By 24 Hours TAL-4124 (1007)

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

# **Login Sample Receipt Checklist**

Client: AECOM Technical Services Inc.

Job Number: 320-23542-1

Login Number: 23542 List Source: TestAmerica Sacramento

List Number: 1

Creator: Nelson, Kym D

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	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.	False	Refer to Job Narrative for details.
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.	False	Refer to Job Narrative for details.
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	

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"DPT-16-01-GW-17-21", "537", "11/20/16", "22:33", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid
"DPT-16-01-GW-17-21","537","11/20/16","22:33","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
"DPT-16-01-GW-17-21", "537", "11/20/16", "22:33", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
"DPT-16-01-GW-17-21","537","12/02/16","13:22","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid
"DPT-16-01-GW-17-21", "537", "12/02/16", "13:22", "T", "NA", "DILUTION1", "1763-23-1", "Perfluorooctane Sulfonate
"DPT-16-01-GW-17-21","537","12/02/16","13:22","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid
(PFOA)","0.066","","TRG","No","Y","D","Y","0.0078","0.026","0.026","UG_L","UG_L","","","","","","","","","",""
"DPT-16-05-GW-17-21", "537", "11/20/16", "22:40", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid
... ... ... ... ... ... ... ... ... ... ...
"DPT-16-05-GW-17-21","537","11/20/16","22:40","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
... ... ... ... ... ... ... ... ... ...
"DPT-16-05-GW-17-21", "537", "11/20/16", "22:40", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
"DPT-16-05-GW-17-21","537","12/02/16","12:59","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid
. ... ... ... ... ... ...
"DPT-16-05-GW-17-21", "537", "12/02/16", "12:59", "T", "NA", "DILUTION1", "1763-23-1", "Perfluorooctane Sulfonate
"DPT-16-05-GW-17-21", "537", "12/02/16", "12:59", "T", "NA", "DILUTION1", "335-67-1", "Perfluorooctanoic acid
, , , , , , , , , , , ,
"DPT-16-34-GW-31-35", "537", "11/20/16", "23:03", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid
"DPT-16-34-GW-31-35","537","11/20/16","23:03","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
nn nn
"DPT-16-34-GW-31-35", "537", "11/20/16", "23:03", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
, , , , , , , , , , , , , ,
"DPT-16-34-GW-31-35","537","12/02/16","16:14","T","NA","DILUTION1","375-73-5","Perfluorobutanesulfonic acid
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. ... ... ... ... ... ... ... ... ...
"DPT-16-34-SO-14-15","537","11/20/16","21:25","T","NA","Initial","1763-23-1","Perfluorooctane\ Sulfonate
"DPT-16-34-SO-14-15", "537", "11/20/16", "21:25", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
"DPT-16-34-SO-14-15", "537", "11/20/16", "21:25", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid
"DPT-16-34-SO-14-15", "537", "12/02/16", "13:37", "T", "NA", "DILUTION1", "1763-23-1", "Perfluorooctane Sulfonate
"DPT-16-34-SO-14-15", "537", "12/02/16", "13:37", "T", "NA", "DILUTION1", "335-67-1", "Perfluorooctanoic acid
"DPT-16-34-SO-14-15", "537", "12/02/16", "13:37", "T", "NA", "DILUTION1", "375-73-5", "Perfluorobutanesulfonic acid
"DPT-16-05-GW-17-21-MSDSD", "537", "11/20/16", "22:55", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic
acid
(PFBS)","0.0881","","SC","Yes","Y","M","Y","0.00093","0.0025","0.0025","UG_L","UG_L","","","","0","","","","0.050"
,"0.0357","0.0881","106","19","50","150","30","","","","","","","",""
"DPT-16-05-GW-17-21-MSDSD","537","11/20/16","22:55","T","NA","Initial","1763-23-1","Perfluorooctane
Sulfonate
(PFOS)", "2.05", "", "SC", "No", "Y", "E4", "Y", "0.0013", "0.0040", "0.0040", "UG L", "UG L", "UG L", "", "", "", "", "", "2.2", "0.03
74","2.05","0","17","60","140","30","","*","","","","","",""
"DPT-16-05-GW-17-21-MSDSD", "537", "11/20/16", "22:55", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
(PFOA)", "0.210", "", "SC", "Yes", "Y", "4M", "Y", "0.00075", "0.0025", "0.0025", "UG\_L", "UG\_L", "", "", "", "", "", "", "", "", "0.19", "1.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075", "0.000075"
"0.0404","0.210","59","15","60","140","30","","*","","","","",""
"DPT-16-05-GW-17-21-MSDSD", "537", "12/02/16", "13:14", "T", "NA", "DILUTION1", "335-67-1", "Perfluorooctanoic
acid
(PFOA)","0.214","","SC","No","Y","J4D","Y","0.075","0.25","0.25","UG_L","UG_L","","","","0","","","","0.21","0.0404
","0.214","4","22","60","140","30","","*","","","","","",""
"DPT-16-05-GW-17-21-MSDSD","537","12/02/16","13:14","T","NA","DILUTION1","375-73-
5", "Perfluorobutanesulfonic acid
(PFBS)","","","SC","No","N","U","Y","0.093","0.25","0.25","UG L","UG L","","","","","","","","0.19","0.0357","0","0
","","50","150","30","","","","","","",""
"DPT-16-05-GW-17-21-MSDSD", "537", "12/02/16", "13:14", "T", "NA", "DILUTION1", "1763-23-1", "Perfluorooctane"
Sulfonate
(PFOS)","2.79","","SC","Yes","Y","4D","Y","0.13","0.40","0.40","UG_L","UG_L","","","","","","","","","2.8","0.0374","2.
79","0","10","60","140","30","","*","","","","","",""
"DPT-16-05-GW-17-21-MSMS", "537", "11/20/16", "22:48", "T", "NA", "Initial", "1763-23-1", "Perfluorooctane Sulfonate
(PFOS)","2.43","","SC","No","Y","E4","Y","0.0013","0.0040","0.0040","UG_L","UG_L","","","2.2","0.0369","2.43","
610","0","","","","","60","140","","*","","","","","","",""
"DPT-16-05-GW-17-21-MSMS","537","11/20/16","22:48","T","NA","Initial","335-67-1","Perfluorooctanoic acid
(PFOA)", "0.244", "", "SC", "Yes", "Y", "4", "Y", "0.00074", "0.0025", "0.0025", "UG\_L", "UG\_L", "", "", "0.19", "0.0398", "0.249", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00074", "0.00075", "UG\_L", "UG\_L
44","145","0","","","","","60","140","","*","","","","","","",""
"DPT-16-05-GW-17-21-MSMS","537","11/20/16","22:48","T","NA","Initial","375-73-5","Perfluorobutanesulfonic
(PFBS)","0.107","","SC","Yes","Y","JM","Y","0.00091","0.0025","0.0025","UG_L","UG_L","","","0.050","0.0352","0.0025","0.0025","UG_L","UG_L","","","0.050","0.0352","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0.0025","0
.107","161","0","","","","50","150","","*","","","","","",""
"DPT-16-05-GW-17-21-MSMS","537","12/02/16","13:06","T","NA","DILUTION1","375-73-
```

5", "Perfluorobutanesulfonic acid

```
(PFBS)","","","SC","No","N","U","Y","0.091","0.25","0.25","UG_L","UG_L","","","0.19","0.0352","0","0","0","","","","
","","50","150","","","","","","","","",""
"DPT-16-05-GW-17-21-MSMS","537","12/02/16","13:06","T","NA","DILUTION1","1763-23-1","Perfluorooctane
Sulfonate
(PFOS)", "3.08", "", "SC", "Yes", "Y", "4D", "Y", "0.13", "0.40", "0.40", "UG L", "UG L", "", "", "2.8", "0.0369", "3.08", "749", "
0","","","","","60","140","","*","","","","","","",""
"DPT-16-05-GW-17-21-MSMS","537","12/02/16","13:06","T","NA","DILUTION1","335-67-1","Perfluorooctanoic
acid
(PFOA)","0.268","","SC","No","Y","4D","Y","0.074","0.25","0.25","UG_L","UG_L","","","0.21","0.0398","0.268","1
"DPT-16-34-SO-14-15MS", "537", "11/20/16", "21:33", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)","6.08","","SC","Yes","Y","","Y","0.13","0.50","0.50","UG_KG","UG_KG","","","","0.37","4.46","6.08","136","
0","","","","","50","150","","","","","","","","","",""
"DPT-16-34-SO-14-15MS", "537", "11/20/16", "21:33", "T", "NA", "Initial", "1763-23-1", "Perfluorooctane Sulfonate
(PFOS)","67.4","","SC","No","Y","E4","Y","0.16","0.63","UG_KG","UG_KG","UG_KG","","","34","4.68","67.4","719","
0","","","","","60","140","","*","","","","","",""
"DPT-16-34-SO-14-15MS", "537", "11/20/16", "21:33", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
(PFOA)","12.2","","SC","Yes","Y","MJ","Y","0.13","0.63","0.63","UG_KG","UG_KG","","","3.2","5.04","12.2","179
","0","","","","","60","140","","*","","","","","","","",""
"DPT-16-34-SO-14-15MS", "537", "12/02/16", "13:44", "T", "NA", "DILUTION1", "1763-23-1", "Perfluorooctane"
Sulfonate
(PFOS)","69.2","","SC","Yes","Y","4D","Y","1.6","6.3","6.3","UG_KG","UG_KG","","","35","4.68","69.2","740","0",
"","","","","60","140","","*","","","","","","","",""
"DPT-16-34-SO-14-15MS", "537", "12/02/16", "13:44", "T", "NA", "DILUTION1", "375-73-5", "Perfluorobutanesulfonic
(PFBS)","4.90","","SC","No","Y","JD","Y","1.3","5.0","5.0","UG_KG","UG_KG","","","3.7","4.46","4.90","110","0",
"","","","","50","150","","","","","","","","",""
"DPT-16-34-SO-14-15MS", "537", "12/02/16", "13:44", "T", "NA", "DILUTION1", "335-67-1", "Perfluorooctanoic acid
(PFOA)","12.7","","SC","No","Y","JD","Y","1.3","6.3","UG_KG","UG_KG","UG_KG","","","3.6","5.04","12.7","182","0",
"","","","","60","140","","*","","","","","","",""
"DPT-16-34-SO-14-15SD", "537", "11/20/16", "21:40", "T", "NA", "Initial", "335-67-1", "Perfluorooctanoic acid
(PFOA)","13.1","","SC","Yes","Y","MJ","Y","0.13","0.63","0.63","UG_KG","UG_KG","","","0","","","","3.2","5.00",
"13.1","198","7","60","140","30","","*","","","","","",""
"DPT-16-34-SO-14-15SD","537","11/20/16","21:40","T","NA","Initial","1763-23-1","Perfluorooctane Sulfonate
(PFOS)","59.2","","SC","No","Y","E4","Y","0.16","0.63","UG_KG","UG_KG","UG_KG","","","","","","34","4.64","5
"DPT-16-34-SO-14-15SD", "537", "11/20/16", "21:40", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid
(PFBS)", "5.82", "", "SC", "Yes", "Y", "", "V", "0.13", "0.50", "UG\_KG", "UG\_KG", "UG\_KG", "", "", "0", "", "", "0.37", "4.42", "5.82", "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "1000, "100
"DPT-16-34-SO-14-15SD","537","12/02/16","13:52","T","NA","DILUTION1","335-67-1","Perfluorooctanoic acid
```

- 9.2","549","13","60","140","30","","\*","","","","","","" 82","132","4","50","150","30","","","","","","","",""
- (PFOA)","13.1","","SC","No","Y","JD","Y","1.3","6.3","6.3","UG\_KG","UG\_KG","","","","0","","","","3.6","5.00","13.1 ","191","3","60","140","30","","\*","","","","",""
- "DPT-16-34-SO-14-15SD", "537", "12/02/16", "13:52", "T", "NA", "DILUTION1", "1763-23-1", "Perfluorooctane", "Perflu Sulfonate
- (PFOS)","63.2","","SC","Yes","Y","4D","Y","1.6","6.3","6.3","UG KG","UG KG","","","","0","","","","35","4.64","63.2 ","617","9","60","140","30","","\*","","","","",""
- "DPT-16-34-SO-14-15SD", "537", "12/02/16", "13:52", "T", "NA", "DILUTION1", "375-73-5", "Perfluorobutanesulfonic
- (PFBS)","4.97","","SC","No","Y","JD","Y","1.3","5.0","5.0","UG\_KG","UG\_KG","","","","0","","","","3.7","4.42","4.97 ","113","2","50","150","30","","","","","","","",""
- "LCS 320-138217/2-A", "537", "11/20/16", "22:25", "T", "NA", "Initial", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)","0.0365","","SC","Yes","Y","","Y","0.00092","0.0025","0.0025","UG\_L","UG\_L","","","0","0.0354","0.0365 ","103","0","","","","50","150","","","","","","","","","",""
- "LCS 320-138217/2-A", "537", "11/20/16", "22:25", "T", "NA", "Initial", "1763-23-1", "Perfluorooctane Sulfonate



# **Data Validation Report**

Project:	Former Bay Head Road Annex- Annapolis, MD					
Laboratory:	TestAmerica-West Sacramento, CA					
Job Number:	320-23542-1					
Analyses/Method:	Perfluorinated Compounds (PFCs) in Water, Soils, S Liquid Chromatography/Mass Spectrometry/Mass Sp Revision 1.4 (August 2015)	•				
Validation Level:	Limited					
Resolution Consultants Project Number:	s 60444465-DM.DE					
Prepared by:	Paula DiMattei/Resolution Consultants	Completed on: 12/07/16				
Reviewed by:	Robert Kennedy/Resolution Consultants	Completed on: 12/19/16				
File Name: J23542-1_	PFC memo.docx					

#### **SUMMARY**

The samples listed below were collected by Resolution Consultants from the Former Bay Head Road Annex site in Annapolis, MD on November 14, 2016.

Sample ID	Matrix/Sample Type
DPT-16-01-GW-17-21	Groundwater
DPT-16-05-GW-17-21	Groundwater
DPT-16-34-GW-31-35	Groundwater
DPT-16-34-SO-14-15	Soil

Data validation activities were conducted with reference to:

- TestAmerica-West Sacramento SOP: Perfluorinated Compounds (PFCs) in Water, Soils, Sediments and Tissues by Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS)/Revision 1.4 (August 2015);
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (September 2016);
- USEPA Contract Laboratory Program National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016)
- Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (DoD, July 2013);
   and
- the project-specific Sampling and Analysis Plan.

In the absence of method-specific information, laboratory quality control (QC) limits, project-specific requirements and/or professional judgment were used as appropriate.

Resolution Consultants 2

#### **REVIEW ELEMENTS**

The data were evaluated based on the following review elements (where applicable to the method):

- X Data completeness (chain-of-custody (COC)/sample integrity
- ✓ Holding times/sample preservation
- ✓ Initial calibration/initial and continuing calibration verification
- ✓ Laboratory method blanks/equipment blanks
- Matrix spike (MS) and/or matrix spike duplicate (MSD) results
- ✓ Laboratory control sample (LCS) results
- NA Field duplicate results
- ✓ Labeled compound results
- ✓ Sample results/reporting issues

The symbol ( ) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol ( ) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below). Qualified sample results are presented in Table 1.

### **RESULTS**

#### Data Completeness (chain-of-custody (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

The laboratory noted in the case narrative that all groundwater samples were decanted to new bottles prior to spiking and extraction because of the presence of excessive amounts of sediment present in the sample bottles. In these cases, the sample bottles are not rinsed as required by the method. Consequently, professional judgment was applied to qualify the positive results for all target compounds as estimated (J-) in these samples indicating a potential loss of target compounds that may have remained in the original sample bottle. Qualified sample results are presented in Table 1.

## **Holding Times/Sample Preservation**

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Resolution Consultants 3

# Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r) or coefficient of determination (r²) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method percent difference or percent drift (%D) criteria were met.

All QC acceptance criteria were met.

# **Laboratory Method Blanks/Equipment Blanks**

Laboratory method blanks and equipment blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the laboratory method blanks associated with the samples in this data set. An equipment blank was not submitted with the samples in this data set.

#### MS/MSD Results

The MS/MSD percent recovery (%R) and relative percent difference (RPD) results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met except for the nonconformances summarized below. Nonconformances are not noted below if qualification of the data was not required.

Sample ID	Compound	MS/MSD % R	QC Limits
DPT-16-05-GW-17-21	PFBS	161/ok	50-150
Sample ID	Compound	MS/MSD	QC Limits
		% R	
DPT-16-34-SO-14-15	PFOA	179/198	60-140

The parent sample was qualified as follows: (based on NFG 2016)

Criteria	Actions <sup>1</sup>					
	Detected	Not detected				
RPD >Upper Acceptance Limit	J	No qualification				
%R >Upper Acceptance Limit	J+	No qualification				
%R >10% but < Lower Acceptance Limit	J-	UJ				
<10%	J-	R				
<sup>1</sup> Professional judgment was used to include bias codes as applicable						

Qualified sample results are presented in Table 1.

#### LCS Results

The LCS %Rs were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Resolution Consultants 4

## Field Duplicate Results

Field duplicate samples were not submitted with this data set. Qualification of the data was not required on this basis.

# **Labeled Compound Results**

The labeled compound results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

## Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the LOQ but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias for a sample result is considered to be indeterminate in cases where the cumulative nonconformances do not show a consistent bias or in cases of the presence of a conflicting high and low bias.

#### **QUALIFICATION ACTIONS**

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

### **ATTACHMENTS**

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
DPT-16-01-GW-17-21	WG	Perfluorooctanoic Acid (PFOA)	0.062	0.0021	0.0026	μg/L	J-	si
DPT-16-01-GW-17-21	WG	Perfluorobutanesulfonic Acid (PFBS)	0.011	0.0021	0.0026	μg/L	J-	si
DPT-16-01-GW-17-21	WG	Perfluorooctanesulfonic Acid (PFOS)	0.98	0.031	0.042	μg/L	J-	si
DPT-16-05-GW-17-21	WG	Perfluorooctanoic Acid (PFOA)	0.19	0.0019	0.0024	μg/L	J-	si
DPT-16-05-GW-17-21	WG	Perfluorobutanesulfonic Acid (PFBS)	0.050	0.0019	0.0024	μg/L	J	m,si
DPT-16-05-GW-17-21	WG	Perfluorooctanesulfonic Acid (PFOS)	2.8	0.29	0.39	μg/L	J-	si
DPT-16-34-GW-31-35	WG	Perfluorobutanesulfonic Acid (PFBS)	0.12	0.0020	0.0025	μg/L	J-	si
DPT-16-34-GW-31-35	WG	Perfluorooctanesulfonic Acid (PFOS)	1.4	0.030	0.039	μg/L	J-	si
DPT-16-34-GW-31-35	WG	Perfluorooctanoic Acid (PFOA)	1.0	0.020	0.025	μg/L	J-	si
DPT-16-34-SO-14-15	SO	Perfluorooctanoic Acid (PFOA)	3.2	0.37	0.62	μg/Kg	J+	m

# Attachment A

# **Qualifier Codes and Explanations**

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and is potentially biased high.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample and is potentially biased low.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit.  However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

# **Attachment B**

# **Reason Codes and Explanations**

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
С	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas
k	Estimated Maximum Possible Concentration (EMPC)
I	LCS or OPR recoveries
lc	Labeled compound recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
р	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
S	Surrogate recovery
si	Sample integrity issue
su	Ion suppression
t	Temperature preservation issue
Х	Percent solids
у	Serial dilution results
Z	ICS results

INSTALLATION_ID	SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	SAMPLE_NAME	SAMPLE_MATRIX_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC	SDG
DAVID_TAYLOR_RC	SITE 00003	DPT-16-01	Direct Push/Geoprobe	1474410	496803	DPT-16-01-GW-17-21	Ground water	11/14/2016	Perfluoroalkyl Compounds	320-23542-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-05	Direct Push/Geoprobe	1474350	496710	DPT-16-05-GW-17-21	Ground water	11/14/2016	Perfluoroalkyl Compounds	320-23542-1
DAVID_TAYLOR_RC	SITE 00003	DPT-16-34	Direct Push/Geoprobe	1474530	496331	DPT-16-34-GW-31-35	Ground water	11/14/2016	Perfluoroalkyl Compounds	320-23542-1