

Off-Base Drinking Water Sample Results, Level 2 Laboratory Report, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Figure, SDG J18704-1

Naval Air Station Oceana Virginia Beach, Virginia

July 2019



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: 320-18704-1

Client Project/Site: NAS Oceana, VA - 9000 CTO-WE01

For:

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

Attn: Tiffany Hill

2 G. Tyn

Authorized for release by: 5/26/2016 5:17:02 PM

Laura Turpen, Project Manager I (916)374-4414

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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.

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Definitions/Glossary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Toxicity Equivalent Factor (Dioxin)

Toxicity Equivalent Quotient (Dioxin)

TestAmerica Job ID: 320-18704-1

Qualifiers

LCMS

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

Glossary

TEF

TEQ

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

Case Narrative

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Job ID: 320-18704-1

Laboratory: TestAmerica Sacramento

Narrative

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: NAS Oceana, VA - 9000 CTO-WE01

Report Number: 320-18704-1

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

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

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

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

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

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

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

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

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

RECEIPT

The samples were received on 05/06/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.9 C.

PFC

Samples OF-RW44-0516 (320-18704-1), OF-FB44-0516 (320-18704-2), OF-RW42B2-0516 (320-18704-3), OF-FB42B2-0516 (320-18704-4), OF-RW42A-0516 (320-18704-5), OF-FB42A-0516 (320-18704-6), OF-RW42B-0516 (320-18704-7), OF-FB42B-0516 (320-18704-8), OF-RW42C-516 (320-18704-9), OF-RW42CD-0516 (320-18704-10) and OF-FB42C-0516 (320-18704-11) were analyzed for PFC in accordance with PFC. The samples were prepared on 05/09/2016 and analyzed on 05/25/2016 and 05/26/2016.

Perfluorooctanesulfonic acid (PFOS) was detected in method blank MB 320-109334/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported

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Case Narrative

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Job ID: 320-18704-1 (Continued)

Laboratory: TestAmerica Sacramento (Continued)

a result above the MDL and/or RL, the result has been flagged.

Perfluorohexanesulfonic acid (PFHxS) exceeded the RPD limit for LCSD 320-109334/3-A in preparation batch 109334. The percent recoveries were in control for the LCS and LCSD.

Sample OF-RW44-0516 (320-18704-1)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The level 1 standard from the ICAL is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5 amu, so detection of the analyte serves as verification that the assigned mass is within +/- 0.5 amu of the true value, which meets the DOD tune criterion. (ICV 320-111182/12) and (ICV 320-111390/13)

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-109334.

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

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Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Lab Sample ID: 320-18704-2

Lab Sample ID: 320-18704-3

Lab Sample ID: 320-18704-4

Lab Sample ID: 320-18704-5

Lab Sample ID: 320-18704-6

Lab Sample ID: 320-18704-7

Lab Sample ID: 320-18704-8

Client Sample ID: OF-RW44-0516 Lab Sample ID: 320-18704-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.014		0.0024	0.00075	ug/L		_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.36	M	0.0024	0.00070	ug/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.0038		0.0024	0.00062	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.013		0.0024	0.00086	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.32	Q	0.0024	0.00082	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	0.80	DMQ	0.075	0.024	ug/L	20		WS-LC-0025	Total/NA

Client Sample ID: OF-FB44-0516

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Analyte	Result Qualifier	LOQ	DL Unit	Dil Fac D Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.0037 J M	0.0039	0.0012 ug/L	1 WS-LC-0025	Total/NA

Client Sample ID: OF-RW42B2-0516

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.013		0.0024	0.00078	ug/L	1	_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.18	M	0.0024	0.00073	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.058		0.0024	0.00090	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.43	Q	0.0024	0.00085	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.018	M	0.0039	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB42B2-0516

Analyte	Result Qualifier	LOQ	DL Unit	Dil Fac D Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.00097 J M Q	0.0024	0.00085 ug/L	1 WS-LC-0025	Total/NA

Client Sample ID: OF-RW42A-0516

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Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0024	0.00071	ug/L		_	WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0067	M Q	0.0024	0.00082	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB42A-0516

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.0014	J	0.0039	0.0012	ug/L	1	_	WS-LC-0025	Total/NA

Client Sample ID: OF-RW42B-0516

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.013		0.0023	0.00074	ug/L		_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.19	M	0.0023	0.00069	ug/L	1		WS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.0014	J	0.0023	0.00061	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0023	0.00085	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.38	Q	0.0023	0.00081	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.013	M	0.0037	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB42B-0516

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

5/26/2016

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Detection Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-RW42C-516

TestAmerica Job ID: 320-18704-1

Lab Sample ID: 320-18704-9

Lab Sample ID: 320-18704-11

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.0050		0.0023	0.00074	ug/L		_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.093	M	0.0023	0.00069	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.016		0.0023	0.00085	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.26	MQ	0.0023	0.00080	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) -	0.020	M	0.0037	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-RW42CD-0516	Lab Sample ID: 320-18704-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.0045		0.0023	0.00075	ug/L		_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.087	M	0.0023	0.00070	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.017		0.0023	0.00086	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.28	MQ	0.0023	0.00081	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) -	0.023	M	0.0037	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB42C-0516

_										
Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Pre	р Туре
Perfluorohexanesulfonic acid (PFHxS)	0.0011	J M Q	0.0027	0.00095	ug/L		_	WS-LC-0025	Tot	al/NA

TestAmerica Job ID: 320-18704-1

Client Sample ID: OF-RW44-0516

Date Collected: 05/04/16 09:12 Date Received: 05/06/16 09:50

Lab Sample ID: 320-18704-1

Matrix: Water

Method: WS-LC-0025 - Perfluct Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.014		0.0024	0.00075	ug/L		05/09/16 16:04	05/25/16 21:29	1
Perfluorooctanoic acid (PFOA)	0.36	M	0.0024	0.00070	ug/L		05/09/16 16:04	05/25/16 21:29	1
Perfluorononanoic acid (PFNA)	0.0038		0.0024	0.00062	ug/L		05/09/16 16:04	05/25/16 21:29	1
Perfluorobutanesulfonic acid (PFBS)	0.013		0.0024	0.00086	ug/L		05/09/16 16:04	05/25/16 21:29	1
Perfluorohexanesulfonic acid (PFHxS)	0.32	Q	0.0024	0.00082	ug/L		05/09/16 16:04	05/25/16 21:29	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	99		25 - 150				05/09/16 16:04	05/25/16 21:29	1
13C5 PFNA	78		25 - 150				05/09/16 16:04	05/25/16 21:29	1
13C4 PFOA	98		25 - 150				05/09/16 16:04	05/25/16 21:29	1
13C4-PFHpA	99		25 - 150				05/09/16 16:04	05/25/16 21:29	1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - DL											
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac		
Perfluorooctanesulfonic acid (PFOS)	0.80	D M Q	0.075	0.024	ug/L		05/09/16 16:04	05/26/16 12:24	20		
Isotope Dilution 13C4 PFOS	%Recovery 145	Qualifier	Limits 25 - 150				Prepared 05/09/16 16:04	Analyzed 05/26/16 12:24	Dil Fac		

Client Sample ID: OF-FB44-0516 Lab Sample ID: 320-18704-2

Date Collected: 05/04/16 09:00 **Matrix: Water** Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	UMQ	0.0024	0.00084	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorooctanesulfonic acid (PFOS)	0.0037	J M	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 21:51	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	126		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C4 PFOS	85		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C5 PFNA	137		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C4 PFOA	136		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C4-PFHpA	137		25 - 150				05/00/46 46:04	05/25/16 21:51	1

Client Sample ID: OF-RW42B2-0516 Lab Sample ID: 320-18704-3

Date Collected: 05/05/16 09:44 **Matrix: Water** Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons										
	Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Perfluoroheptanoic acid (PFHpA)	0.013		0.0024	0.00078	ug/L		05/09/16 16:04	05/25/16 22:12	1
	Perfluorooctanoic acid (PFOA)	0.18	M	0.0024	0.00073	ug/L		05/09/16 16:04	05/25/16 22:12	1
	Perfluorononanoic acid (PFNA)	0.0020	U	0.0024	0.00064	ug/L		05/09/16 16:04	05/25/16 22:12	1

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Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Lab Sample ID: 320-18704-3

Client Sample ID: OF-RW42B2-0516

Date Collected: 05/05/16 09:44 Date Received: 05/06/16 09:50 Matrix: Water

Lab Sample ID: 320-18704-4

TestAmerica Job ID: 320-18704-1

Matrix: W

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	0.058		0.0024	0.00090	ug/L		05/09/16 16:04	05/25/16 22:12	1
Perfluorohexanesulfonic acid (PFHxS)	0.43	Q	0.0024	0.00085	ug/L		05/09/16 16:04	05/25/16 22:12	1
Perfluorooctanesulfonic acid (PFOS)	0.018	M	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 22:12	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
18O2 PFHxS	86		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C4 PFOS	101		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C5 PFNA	84		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C4 PFOA	92		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C4-PFHpA	89		25 - 150				05/00/16 16:04	05/25/16 22:12	1

Client Sample ID: OF-FB42B2-0516

Date Collected: 05/05/16 09:35 Matrix: Water

Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00078	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00073	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00064	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorohexanesulfonic acid (PFHxS)	0.00097	J M Q	0.0024	0.00085	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 22:33	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	122		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C4 PFOS	93		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C5 PFNA	132		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C4 PFOA	135		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C4-PFHpA	130		25 - 150				05/09/16 16:04	05/25/16 22:33	1

Client Sample ID: OF-RW42A-0516 Lab Sample ID: 320-18704-5

Date Collected: 05/05/16 09:23
Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00076	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0024	0.00071	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00062	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00087	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorohexanesulfonic acid (PFHxS)	0.0067	M Q	0.0024	0.00082	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0038	0.0012	ug/L		05/09/16 16:04	05/25/16 22:54	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	141		25 - 150				05/09/16 16:04	05/25/16 22:54	1
13C4 PFOS	138		25 - 150				05/09/16 16:04	05/25/16 22:54	1
13C5 PFNA	111		25 - 150				05/09/16 16:04	05/25/16 22:54	1

TestAmerica Sacramento

Matrix: Water

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Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Lab Sample ID: 320-18704-5

Matrix: Water

Client Sample ID: OF-RW42A-0516

Date Collected: 05/05/16 09:23 Date Received: 05/06/16 09:50

	Method: WS-LC-0025	 Perfluorinated Hy 	ydrocarbons ((Continued)
- 1	Landania Billadian	0/5		1 1 14

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared Analyzed	Dil Fac
13C4 PFOA	107		25 - 150	05/09/16 16:04 05/25/16 22:54	1
13C4-PFHpA	102		25 - 150	05/09/16 16:04 05/25/16 22:54	1

Client Sample ID: OF-FB42A-0516 Lab Sample ID: 320-18704-6

Date Collected: 05/05/16 09:20 **Matrix: Water**

Date Received: 05/06/16 09:50

Method: WS-I C-0025 - Perfluorinated Hydrocarbons

Analyte	Result C	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019 U	J -	0.0024	0.00077	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorooctanoic acid (PFOA)	0.0019 U	J	0.0024	0.00072	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorononanoic acid (PFNA)	0.0019 U	J	0.0024	0.00063	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorobutanesulfonic acid (PFBS)	0.0019 U	j	0.0024	0.00089	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019 U	J Q	0.0024	0.00084	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorooctanesulfonic acid (PFOS)	0.0014 J	l	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 23:15	1

· /					
Isotope Dilution	%Recovery Qualif	ier Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	132	25 - 150	05/09/16 16:04	05/25/16 23:15	1
13C4 PFOS	141	25 - 150	05/09/16 16:04	05/25/16 23:15	1
13C5 PFNA	129	25 - 150	05/09/16 16:04	05/25/16 23:15	1
13C4 PFOA	131	25 - 150	05/09/16 16:04	05/25/16 23:15	1
13C4-PFHpA	125	25 - 150	05/09/16 16:04	05/25/16 23:15	1
<u></u>					

Client Sample ID: OF-RW42B-0516

Lab Sample ID: 320-18704-7 Date Collected: 05/05/16 09:07 **Matrix: Water**

Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.013		0.0023	0.00074	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorooctanoic acid (PFOA)	0.19	M	0.0023	0.00069	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorononanoic acid (PFNA)	0.0014	J	0.0023	0.00061	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0023	0.00085	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.38	Q	0.0023	0.00081	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorooctanesulfonic acid (PFOS)	0.013	M	0.0037	0.0012	ug/L		05/09/16 16:04	05/25/16 23:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	90		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C4 PFOS	130		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C5 PFNA	70		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C4 PFOA	80		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C4-PFHpA	77		25 - 150				05/09/16 16:04	05/25/16 23:37	1

TestAmerica Job ID: 320-18704-1

Client Sample ID: OF-FB42B-0516

Date Collected: 05/05/16 09:05 Date Received: 05/06/16 09:50 Lab Sample ID: 320-18704-8

Matrix: Water

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00079	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00073	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00064	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00090	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U Q	0.0025	0.00085	ug/L		05/09/16 16:04	05/26/16 01:01	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	129		25 - 150				05/09/16 16:04	05/26/16 01:01	1
13C5 PFNA	131		25 - 150				05/09/16 16:04	05/26/16 01:01	1
13C4 PFOA	130		25 - 150				05/09/16 16:04	05/26/16 01:01	1
13C4-PFHpA	130		25 - 150				05/09/16 16:04	05/26/16 01:01	1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RA										
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac	
Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0039	0.0013	ug/L		05/09/16 16:04	05/25/16 01:37	1	
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
13C4 PFOS	120		25 - 150				05/09/16 16:04	05/25/16 01:37	1	

Client Sample ID: OF-RW42C-516 Lab Sample ID: 320-18704-9

Date Collected: 05/05/16 10:02 Matrix: Water Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0050		0.0023	0.00074	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorooctanoic acid (PFOA)	0.093	M	0.0023	0.00069	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00060	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorobutanesulfonic acid (PFBS)	0.016		0.0023	0.00085	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorohexanesulfonic acid (PFHxS)	0.26	M Q	0.0023	0.00080	ug/L		05/09/16 16:04	05/26/16 01:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	107		25 - 150				05/09/16 16:04	05/26/16 01:22	1
13C5 PFNA	87		25 - 150				05/09/16 16:04	05/26/16 01:22	1
13C4 PFOA	97		25 - 150				05/09/16 16:04	05/26/16 01:22	1
13C4-PFHpA	96		25 - 150				05/09/16 16:04	05/26/16 01:22	1

Method: WS-LC-0025 - Perfl	uorinated Hy	drocarbon	s - RA						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.020	M	0.0037	0.0012	ug/L		05/09/16 16:04	05/25/16 01:58	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	124		25 - 150				05/09/16 16:04	05/25/16 01:58	1

Client Sample ID: OF-RW42CD-0516

Date Collected: 05/05/16 10:04

Lab Sample ID: 320-18704-10

Matrix: Water

Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluo	rinated Hydrocarbons						
Analyte	Result Qualifier	LOQ	DL Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0045	0.0023	0.00075 ug/L		05/09/16 16:04	05/26/16 01:44	1

TestAmerica Sacramento

tiont Sample ID: OF PW42CD 0546

Client Sample ID: OF-RW42CD-0516

Date Collected: 05/05/16 10:04 Date Received: 05/06/16 09:50 Lab Sample ID: 320-18704-10

TestAmerica Job ID: 320-18704-1

Matrix: Water

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.087	M	0.0023	0.00070	ug/L		05/09/16 16:04	05/26/16 01:44	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0023	0.00061	ug/L		05/09/16 16:04	05/26/16 01:44	1
Perfluorobutanesulfonic acid (PFBS)	0.017		0.0023	0.00086	ug/L		05/09/16 16:04	05/26/16 01:44	1
Perfluorohexanesulfonic acid (PFHxS)	0.28	M Q	0.0023	0.00081	ug/L		05/09/16 16:04	05/26/16 01:44	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	98		25 - 150				05/09/16 16:04	05/26/16 01:44	1
13C5 PFNA	95		25 - 150				05/09/16 16:04	05/26/16 01:44	1
13C4 PFOA	102		25 - 150				05/09/16 16:04	05/26/16 01:44	1
13C4-PFHpA	96		25 - 150				05/09/16 16:04	05/26/16 01:44	1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons - RA Result Qualifier LOQ Analyte DL Unit Prepared **Analyzed** Dil Fac Perfluorooctanesulfonic acid 0.023 M 0.0037 0.0012 ug/L 05/09/16 16:04 05/25/16 02:20 (PFOS) Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C4 PFOS 124 25 - 150 05/09/16 16:04 05/25/16 02:20

Client Sample ID: OF-FB42C-0516

Date Collected: 05/05/16 09:55

Date Received: 05/06/16 09:50

13C4 PFOS

Lab Sample ID	: 320-18704-11
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Matrix: Water

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0022	U	0.0027	0.00087	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorooctanoic acid (PFOA)	0.0022	U	0.0027	0.00081	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorononanoic acid (PFNA)	0.0022	U	0.0027	0.00071	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorobutanesulfonic acid (PFBS)	0.0022	U	0.0027	0.0010	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorohexanesulfonic acid (PFHxS)	0.0011	JMQ	0.0027	0.00095	ug/L		05/09/16 16:04	05/26/16 02:05	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	115		25 - 150				05/09/16 16:04	05/26/16 02:05	1
13C5 PFNA	127		25 - 150				05/09/16 16:04	05/26/16 02:05	1
13C4 PFOA	129		25 - 150				05/09/16 16:04	05/26/16 02:05	1
13C4-PFHpA	123		25 - 150				05/09/16 16:04	05/26/16 02:05	1
Method: WS-LC-0025 - Perfluc	orinated Hyd	drocarbon	s - RA						
Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.0033	U M	0.0044	0.0014	ug/L		05/09/16 16:04	05/25/16 02:41	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac

25 - 150

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05/09/16 16:04 05/25/16 02:41

Isotope Dilution Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water Prep Type: Total/NA

_			Perce	nt Isotope	Dilution Re	covery (Ac
		BO2 PFHx	3C4 PFOS	3C5 PFN/	3C4 PFO/	3C4-PFHp
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-18704-1	OF-RW44-0516	99		78	98	99
320-18704-1 - DL	OF-RW44-0516		145			
320-18704-2	OF-FB44-0516	126	85	137	136	137
320-18704-3	OF-RW42B2-0516	86	101	84	92	89
320-18704-4	OF-FB42B2-0516	122	93	132	135	130
320-18704-5	OF-RW42A-0516	141	138	111	107	102
320-18704-6	OF-FB42A-0516	132	141	129	131	125
320-18704-7	OF-RW42B-0516	90	130	70	80	77
320-18704-8 - RA	OF-FB42B-0516		120			
320-18704-8	OF-FB42B-0516	129		131	130	130
320-18704-9 - RA	OF-RW42C-516		124			
320-18704-9	OF-RW42C-516	107		87	97	96
320-18704-10 - RA	OF-RW42CD-0516		124			
320-18704-10	OF-RW42CD-0516	98		95	102	96
320-18704-11 - RA	OF-FB42C-0516		114			
320-18704-11	OF-FB42C-0516	115		127	129	123
LCS 320-109334/2-A	Lab Control Sample	131	115	129	123	129
LCSD 320-109334/3-A	Lab Control Sample Dup	120	109	120	118	120
MB 320-109334/1-A	Method Blank	130	126	129	133	131

Surrogate Legend

1802 PFHxS = 1802 PFHxS

13C4 PFOS = 13C4 PFOS

13C5 PFNA = 13C5 PFNA

13C4 PFOA = 13C4 PFOA

13C4-PFHpA = 13C4-PFHpA

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TestAmerica Job ID: 320-18704-1

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Client Sample ID: Method Blank Lab Sample ID: MB 320-109334/1-A **Matrix: Water Prep Type: Total/NA** Analysis Batch: 111390 Prep Batch: 109334

ı		IVIB	MR							
	Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		05/09/16 16:04	05/25/16 20:26	1
	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		05/09/16 16:04	05/25/16 20:26	1
	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		05/09/16 16:04	05/25/16 20:26	1
	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		05/09/16 16:04	05/25/16 20:26	1
	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		05/09/16 16:04	05/25/16 20:26	1
	Perfluorooctanesulfonic acid (PFOS)	0.00149	J	0.0040	0.0013	ug/L		05/09/16 16:04	05/25/16 20:26	1
		MB	MB							

Isotope Dilution	%Recovery Qual	ifier Limits	Prepared	Analyzed	Dil Fac
1802 PFHxS	130	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C4 PFOS	126	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C5 PFNA	129	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C4 PFOA	133	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C4-PFHpA	131	25 - 150	05/09/16 16:04	05/25/16 20:26	1

Lab Sample ID: LCS 320-109334/2-A

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Sample ID: LCS 320-109334/2-A				Clie	ent Sar	nple ID): Lab Control Sample
rix: Water							Prep Type: Total/NA
lysis Batch: 111390							Prep Batch: 109334
	Spike	LCS	LCS				%Rec.
yte	Added	Result	Qualifier	Unit	D	%Rec	Limits
oroheptanoic acid (PFHpA)	0.0400	0.0340		ug/L		85	60 - 140

Analyte	Added	Result Qualifier	Unit D	%Rec	Limits
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0340	ug/L	85	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0325	ug/L	81	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0313	ug/L	78	60 - 140
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0261	ug/L	74	50 - 150
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0229	ug/L	63	60 - 140
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0310 M	ug/L	83	60 - 140

	LCS L	CS	
Isotope Dilution	%Recovery Q	ualifier	Limits
18O2 PFHxS	131		25 - 150
13C4 PFOS	115		25 - 150
13C5 PFNA	129		25 - 150
13C4 PFOA	123		25 - 150
13C4-PFHpA	129		25 - 150

Lab Sample ID: LCSD 320-109334/3-A **Client Sample ID: Lab Control Sample Dup Matrix: Water Prep Type: Total/NA**

Analysis Potoby 111200					Prep Batch: 109334					
Analysis Batch: 111390	Spike	LCSD LCSD			%Rec.	iten. it	RPD			
Analysis	•		l lm!4	D 9/ Baa		DDD				
Analyte	Added	Result Qualifier	Unit	D %Rec	Limits	RPD	Limit			
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0330	ug/L	83	60 - 140	3	30			
Perfluorooctanoic acid (PFOA)	0.0400	0.0309	ug/L	77	60 - 140	5	30			
Perfluorononanoic acid (PFNA)	0.0400	0.0338	ug/L	85	60 - 140	8	30			
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0270	ug/L	76	50 - 150	3	30			
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0313 MQ	ug/L	86	60 - 140	31	30			
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0330 M	ug/L	89	60 - 140	6	30			

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QC Sample Results

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

LCSD LCSD

Isotope Dilution	%Recovery	Qualifier	Limits
1802 PFHxS	120		25 - 150
13C4 PFOS	109		25 - 150
13C5 PFNA	120		25 - 150
13C4 PFOA	118		25 - 150
13C4-PFHpA	120		25 - 150

TestAmerica Job ID: 320-18704-1

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QC Association Summary

Client: CH2M Hill Constructors, Inc. Project/Site: NAS Oceana, VA - 9000 CTO-WE01 TestAmerica Job ID: 320-18704-1

LCMS

Prep Batch: 109334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18704-1	OF-RW44-0516	Total/NA	Water	3535	
320-18704-1 - DL	OF-RW44-0516	Total/NA	Water	3535	
320-18704-2	OF-FB44-0516	Total/NA	Water	3535	
320-18704-3	OF-RW42B2-0516	Total/NA	Water	3535	
320-18704-4	OF-FB42B2-0516	Total/NA	Water	3535	
320-18704-5	OF-RW42A-0516	Total/NA	Water	3535	
320-18704-6	OF-FB42A-0516	Total/NA	Water	3535	
320-18704-7	OF-RW42B-0516	Total/NA	Water	3535	
320-18704-8	OF-FB42B-0516	Total/NA	Water	3535	
320-18704-8 - RA	OF-FB42B-0516	Total/NA	Water	3535	
320-18704-9	OF-RW42C-516	Total/NA	Water	3535	
320-18704-9 - RA	OF-RW42C-516	Total/NA	Water	3535	
320-18704-10	OF-RW42CD-0516	Total/NA	Water	3535	
320-18704-10 - RA	OF-RW42CD-0516	Total/NA	Water	3535	
320-18704-11	OF-FB42C-0516	Total/NA	Water	3535	
320-18704-11 - RA	OF-FB42C-0516	Total/NA	Water	3535	
LCS 320-109334/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-109334/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-109334/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 111182

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18704-8 - RA	OF-FB42B-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-9 - RA	OF-RW42C-516	Total/NA	Water	WS-LC-0025	109334
320-18704-10 - RA	OF-RW42CD-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-11 - RA	OF-FB42C-0516	Total/NA	Water	WS-LC-0025	109334

Analysis Batch: 111390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18704-1	OF-RW44-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-1 - DL	OF-RW44-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-2	OF-FB44-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-3	OF-RW42B2-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-4	OF-FB42B2-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-5	OF-RW42A-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-6	OF-FB42A-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-7	OF-RW42B-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-8	OF-FB42B-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-9	OF-RW42C-516	Total/NA	Water	WS-LC-0025	109334
320-18704-10	OF-RW42CD-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-11	OF-FB42C-0516	Total/NA	Water	WS-LC-0025	109334
LCS 320-109334/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	109334
LCSD 320-109334/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	109334
MB 320-109334/1-A	Method Blank	Total/NA	Water	WS-LC-0025	109334

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Matrix: Water

Matrix: Water

Matrix: Water

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Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-RW44-0516 Lab Sample ID: 320-18704-1

Date Collected: 05/04/16 09:12 Matrix: Water Date Received: 05/06/16 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			531.5 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	531.5 mL	1.00 mL	111390	05/25/16 21:29	JRB	TAL SAC
Total/NA	Prep	3535	DL		531.5 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	20	531.5 mL	1.00 mL	111390	05/26/16 12:24	JRB	TAL SAC

Client Sample ID: OF-FB44-0516 Lab Sample ID: 320-18704-2

Date Collected: 05/04/16 09:00 Date Received: 05/06/16 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			517.8 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	517.8 mL	1.00 mL	111390	05/25/16 21:51	JRB	TAL SAC

Client Sample ID: OF-RW42B2-0516

Date Collected: 05/05/16 09:44

Lab Sample ID: 320-18704-3

Matrix: Water

Date Collected: 05/05/16 09:44 Date Received: 05/06/16 09:50

Initial Batch Batch **Batch** Dil Final Prepared Method Number **Prep Type** Type Run **Factor Amount** Amount or Analyzed Analyst Lab Total/NA 3535 109334 05/09/16 16:04 JER TAL SAC Prep 510.9 mL 1.00 mL Total/NA Analysis WS-LC-0025 510.9 mL 1.00 mL 111390 05/25/16 22:12 JRB TAL SAC

Client Sample ID: OF-FB42B2-0516 Lab Sample ID: 320-18704-4

Date Collected: 05/05/16 09:35 Date Received: 05/06/16 09:50

Γ	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			513.3 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	513.3 mL	1.00 mL	111390	05/25/16 22:33	JRB	TAL SAC

Client Sample ID: OF-RW42A-0516 Lab Sample ID: 320-18704-5

Date Collected: 05/05/16 09:23 Date Received: 05/06/16 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			530.2 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	530.2 mL	1.00 mL	111390	05/25/16 22:54	JRB	TAL SAC

TestAmerica Sacramento

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Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-FB42A-0516

Date Collected: 05/05/16 09:20 Date Received: 05/06/16 09:50

Lab Sample ID: 320-18704-6

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			518.5 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	518.5 mL	1.00 mL	111390	05/25/16 23:15	JRB	TAL SAC

Client Sample ID: OF-RW42B-0516

Date Collected: 05/05/16 09:07 Date Received: 05/06/16 09:50

Lab Sample ID: 320-18704-7 **Matrix: Water**

> **Analyst** Lab

Batch **Batch** Dil Initial Final Batch Prepared **Prep Type** Type Method Run **Factor Amount Amount** Number or Analyzed Total/NA Prep 3535 539.8 mL 1.00 mL 109334 05/09/16 16:04 JER TAL SAC Total/NA Analysis WS-LC-0025 539.8 mL 1.00 mL 111390 05/25/16 23:37 JRB TAL SAC

Client Sample ID: OF-FB42B-0516

Date Collected: 05/05/16 09:05 Date Received: 05/06/16 09:50

Lab Sample ID: 320-18704-8

Lab Sample ID: 320-18704-9

Lab Sample ID: 320-18704-10

Matrix: Water

Matrix: Water

Matrix: Water

Initial Batch Batch Dil Final Batch Prepared **Prep Type** Type Method Run **Factor** Amount Amount Number or Analyzed **Analyst** Lab Total/NA 3535 509 mL 1.00 mL 109334 05/09/16 16:04 JER TAL SAC Prep Total/NA Analysis WS-LC-0025 509 mL 1.00 mL 111390 05/26/16 01:01 JRB TAL SAC 1 Total/NA 109334 TAL SAC Prep 3535 RA 509 mL 1.00 mL 05/09/16 16:04 JER Total/NA Analysis WS-LC-0025 RA 509 mL 1.00 mL 111182 05/25/16 01:37 JRB TAL SAC

Client Sample ID: OF-RW42C-516

Date Collected: 05/05/16 10:02

Date Received: 05/06/16 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			540.6 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	540.6 mL	1.00 mL	111390	05/26/16 01:22	JRB	TAL SAC
Total/NA	Prep	3535	RA		540.6 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	RA	1	540.6 mL	1.00 mL	111182	05/25/16 01:58	JRB	TAL SAC

Client Sample ID: OF-RW42CD-0516

Date Collected: 05/05/16 10:04

Date Received: 05/06/16 09:50

Γ	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			535.1 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	535.1 mL	1.00 mL	111390	05/26/16 01:44	JRB	TAL SAC
Total/NA	Prep	3535	RA		535.1 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	RA	1	535.1 mL	1.00 mL	111182	05/25/16 02:20	JRB	TAL SAC

TestAmerica Sacramento

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Lab Chronicle

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-FB42C-0516

TestAmerica Job ID: 320-18704-1

Lab Sample ID: 320-18704-11

Date Collected: 05/05/16 09:55 Matrix: Water

Date Received: 05/06/16 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			458.9 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	458.9 mL	1.00 mL	111390	05/26/16 02:05	JRB	TAL SAC
Total/NA	Prep	3535	RA		458.9 mL	1.00 mL	109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	RA	1	458.9 mL	1.00 mL	111182	05/25/16 02:41	JRB	TAL SAC

Laboratory References:

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

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Certification Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

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

Laboratory: TestAmerica Denver

The certifications listed below are applicable to this report.

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

TestAmerica Job ID: 320-18704-1

Method Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

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

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

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

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Sample Summary

Client: CH2M Hill Constructors, Inc. Project/Site: NAS Oceana, VA - 9000 CTO-WE01 TestAmerica Job ID: 320-18704-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-18704-1	OF-RW44-0516	Water	05/04/16 09:12 05	5/06/16 09:50
320-18704-2	OF-FB44-0516	Water	05/04/16 09:00 05	5/06/16 09:50
320-18704-3	OF-RW42B2-0516	Water	05/05/16 09:44 05	5/06/16 09:50
320-18704-4	OF-FB42B2-0516	Water	05/05/16 09:35 05	5/06/16 09:50
320-18704-5	OF-RW42A-0516	Water	05/05/16 09:23 05	5/06/16 09:50
320-18704-6	OF-FB42A-0516	Water	05/05/16 09:20 05	5/06/16 09:50
320-18704-7	OF-RW42B-0516	Water	05/05/16 09:07 05	5/06/16 09:50
320-18704-8	OF-FB42B-0516	Water	05/05/16 09:05 05	5/06/16 09:50
320-18704-9	OF-RW42C-516	Water	05/05/16 10:02 05	5/06/16 09:50
320-18704-10	OF-RW42CD-0516	Water	05/05/16 10:04 05	5/06/16 09:50
320-18704-11	OF-FB42C-0516	Water	05/05/16 09:55 05	5/06/16 09:50

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Temperature on Receipt Color TestAmerica

WEBI

THE LEADER IN ENVIRONMENTAL TESTING

Drinking Water? Yes∯ No□

Chain of Custody Record

TAL	TAL-4124 (1007)										
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18	Address		Telephor.	ne Number (Area C	ode)/Fax Number			Lab Nun	Infloer /	7 -	
53	Clargiand St Suite 2003		753-	1-169-6	0223					Page	_ of _
3 ->	State	7 341,2	Site Contact	taci	Lab Confact			Analysis (Attach list if more space is needed,	ffach list if is needed)		
رَ عَالِ	<u>.</u> اع	9	Carner/V	Carner/Waybill Number					-	Special	Special (netructions/
3 68 ,	Contract Purchase Order/Quote No.			Matrix	Containers & Preservatives					Conditio	Conditions of Receipt
હૈ	Sample I D. No. and Description (Containers for each sample may be combined on one line)	Date	Тіте	snoenby	IOH EONH POSZH saudun	HOBN HOBN	2=18				
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な	0F-FB44- OS(6	→	03/20	メ	メ		7				l
Pa	14282-0516	17 PO 21/20/20	14 FO	7	メ		7		320-18704 Chain of Custody	ain of Custody	 ■
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23 0	- RW42A-0516		0923	メ	メ		7			-	
f 24	\$0F-FH12A-0516		0420	メ	ナ		7	-			
S)	OF-RW42B-0516		4107	2	×		7				
Q.	OF-FR42B- Ø516		7905	ヌ	メ		7				
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2	OF- RWY2CD-OSILE	!	1004	シ	メ		7				
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& □	Possible Hazard Identification Non-Hazard	☐ Poison B	П Ипкпомп	Sample Disposal Return To Client	ent 🔲 Disposal By Lab		Archive For	Months		(A fee may be assessed if samples are retained fonger than 1 month)	retained
½ □	9 Required 7 Days 14 Do	75 🗆 21 Days	vs Other		i i	ents (Specify)				}	
~	Han John			file. 11.3	1. Received By	N.	i B	1	ļ	Date (5/0/05/16)	Time OUSO
*	2 Reinquished By		Dark	Time	2 Received B					Date	Тите
5 26/20	3 Relinquished By		Date	Time	3. Received By	4				Date	Тіте
•	Comments				}		!			<u></u>	

Login Sample Receipt Checklist

Client: CH2M Hill Constructors, Inc.

Job Number: 320-18704-1

Login Number: 18704 List Source: TestAmerica Sacramento

List Number: 1

Creator: Nelson, Kym D

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

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ANALYTICAL REPORT

Job Number: 320-18704-1

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

For:

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

Attention: Tiffany Hill

Approved for release Laura Turpen Project Manager I 5/26/2016 5:17 PM

Laura Turpen, Project Manager I 880 Riverside Parkway, West Sacramento, CA, 95605 (916)374-4414 laura.turpen@testamericainc.com 05/26/2016

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

The Lab Certification ID# is 4025.

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

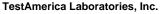






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Definitions/Glossary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

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LCMS

Qualifiers

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

Glossary

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

TestAmerica Job ID: 320-18704-1

CASE NARRATIVE

Client: CH2M Hill Constructors, Inc.

Project: NAS Oceana, VA - 9000 CTO-WE01

Report Number: 320-18704-1

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

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

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

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

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

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

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

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

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

RECEIPT

The samples were received on 05/06/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.9 C.

PFC

Samples OF-RW44-0516 (320-18704-1), OF-FB44-0516 (320-18704-2), OF-RW42B2-0516 (320-18704-3), OF-FB42B2-0516 (320-18704-4), OF-RW42A-0516 (320-18704-5), OF-FB42A-0516 (320-18704-6), OF-RW42B-0516 (320-18704-7), OF-FB42B-0516 (320-18704-8), OF-RW42C-516 (320-18704-9), OF-RW42CD-0516 (320-18704-10) and OF-FB42C-0516 (320-18704-11) were analyzed for PFC in accordance with PFC. The samples were prepared on 05/09/2016 and analyzed on 05/25/2016 and 05/26/2016.

Perfluorooctanesulfonic acid (PFOS) was detected in method blank MB 320-109334/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Perfluorohexanesulfonic acid (PFHxS) exceeded the RPD limit for LCSD 320-109334/3-A in preparation batch 109334. The percent recoveries were in control for the LCS and LCSD.

Sample OF-RW44-0516 (320-18704-1)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The level 1 standard from the ICAL is used to evaluate the tune criteria. The instrument mass windows are set at +/- 0.5 amu, so detection of the analyte serves as verification that the assigned mass is within +/- 0.5 amu of the true value, which meets the DOD tune criterion. (ICV 320-11182/12) and (ICV 320-111390/13)

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 320-109334.

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

Detection Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Client Sample ID: OF-RW44	-0516					Lab S	Sam	iple ID: 32	20-18704
Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D N	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.014		0.0024	0.00075	ug/L	1	$\overline{}$	VS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.36	M	0.0024	0.00070	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.0038		0.0024	0.00062	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.013		0.0024	0.00086	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.32	Q	0.0024	0.00082	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	0.80	DMQ	0.075	0.024	ug/L	20	V	VS-LC-0025	Total/NA
Client Sample ID: OF-FB44-	0516					Lab S	Sam	ple ID: 32	20-18704
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D N	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.0037	J M	0.0039	0.0012	ug/L	1	_ V	VS-LC-0025	Total/NA
Client Sample ID: OF-RW42	B2-0516)				Lab S	Sam	ple ID: 32	20-18704
- Analyte	Result	Qualifier	LOQ		Unit	Dil Fac	D N	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.013		0.0024	0.00078	ug/L	1	_ V	VS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.18	M	0.0024	0.00073	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.058		0.0024	0.00090	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.43	Q	0.0024	0.00085	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.018	M	0.0039	0.0012	ug/L	1	V	VS-LC-0025	Total/NA
Client Sample ID: OF-FB42E	32-0516					Lab S	Sam	nple ID: 32	20-18704
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D N	/lethod	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.00097	JMQ	0.0024	0.00085	ug/L	1	_ v	VS-LC-0025	Total/NA
Client Sample ID: OF-RW42	A-0516					Lab S	Sam	ple ID: 32	20-18704
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D N	Method	Prep Type
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0024	0.00071	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.0067	M Q	0.0024	0.00082	ug/L	1	V	VS-LC-0025	Total/NA
Client Sample ID: OF-FB42A	A-0516					Lab S	Sam	ple ID: 32	20-18704
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D N	Method	Prep Type
Perfluorooctanesulfonic acid (PFOS)	0.0014	J	0.0039	0.0012	ug/L	1	_ V	VS-LC-0025	Total/NA
Client Sample ID: OF-RW42	B-0516					Lab S	Sam	ple ID: 32	20-18704
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac			Prep Type
Perfluoroheptanoic acid (PFHpA)	0.013		0.0023	0.00074	ug/L	1	_ V	VS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.19	M	0.0023	0.00069	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorononanoic acid (PFNA)	0.0014	J	0.0023	0.00061	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0023	0.00085	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.38	Q	0.0023	0.00081	ug/L	1	V	VS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.013	М	0.0037	0.0012	ug/L	1	V	VS-LC-0025	Total/NA

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Client Sample	ID: OF-RW42C-516
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Lab Sam	ple ID:	320-1	8704-9
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Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.0050		0.0023	0.00074	ug/L		_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.093	M	0.0023	0.00069	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.016		0.0023	0.00085	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.26	MQ	0.0023	0.00080	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RA	0.020	М	0.0037	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-RW42CD-0516

Lab Sample ID: 320-18704-10

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanoic acid (PFHpA)	0.0045		0.0023	0.00075	ug/L		_	WS-LC-0025	Total/NA
Perfluorooctanoic acid (PFOA)	0.087	M	0.0023	0.00070	ug/L	1		WS-LC-0025	Total/NA
Perfluorobutanesulfonic acid (PFBS)	0.017		0.0023	0.00086	ug/L	1		WS-LC-0025	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.28	M Q	0.0023	0.00081	ug/L	1		WS-LC-0025	Total/NA
Perfluorooctanesulfonic acid (PFOS) - RA	0.023	М	0.0037	0.0012	ug/L	1		WS-LC-0025	Total/NA

Client Sample ID: OF-FB42C-0516

Lab Sample ID: 320-18704-11

Analyte	Result Qualifier	LOQ	DL Unit	Dil Fac D Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.0011 J M Q	0.0027	0.00095 ug/L	1 WS-LC-0025	Total/NA

Client: CH2M Hill Constructors, Inc.

Analyte

13C4-PFHpA

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Result Qualifier

Client Sample ID: OF-RW44-0516 Lab Sample ID: 320-18704-1

Date Collected: 05/04/16 09:12 **Matrix: Water**

LOQ

DL Unit

Date Received: 05/06/16 09:50

Perfluoroheptanoic acid (PFHpA)	0.014		0.0024	0.00075	ug/L	05/09/16 16:04	05/25/16 21:29	1
Perfluorooctanoic acid (PFOA)	0.36	M	0.0024	0.00070	ug/L	05/09/16 16:04	05/25/16 21:29	1
Perfluorononanoic acid (PFNA)	0.0038		0.0024	0.00062	ug/L	05/09/16 16:04	05/25/16 21:29	1
Perfluorobutanesulfonic acid (PFBS)	0.013		0.0024	0.00086	ug/L	05/09/16 16:04	05/25/16 21:29	1
Perfluorohexanesulfonic acid (PFHxS)	0.32	Q	0.0024	0.00082	ug/L	05/09/16 16:04	05/25/16 21:29	1
Isotope Dilution	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
1802 PFHxS	99		25 - 150			05/09/16 16:04	05/25/16 21:29	1
13C5 PFNA	78		25 - 150			05/09/16 16:04	05/25/16 21:29	1
13C4 PFOA	98		25 - 150			05/09/16 16:04	05/25/16 21:29	1
13C4-PFHpA	99		25 - 150			05/09/16 16:04	05/25/16 21:29	1

Method: WS-LC-0025 - Perflu	orinated Hy	drocarbon	s - DL						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.80	D M Q	0.075	0.024	ug/L		05/09/16 16:04	05/26/16 12:24	20
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	145		25 - 150				05/09/16 16:04	05/26/16 12:24	20

Client Sample ID: OF-FB44-0516 Lab Sample ID: 320-18704-2

Date Collected: 05/04/16 09:00 **Matrix: Water** Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluct Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	UMQ	0.0024	0.00084	ug/L		05/09/16 16:04	05/25/16 21:51	1
Perfluorooctanesulfonic acid (PFOS)	0.0037	J M	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 21:51	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	126		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C4 PFOS	85		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C5 PFNA	137		25 - 150				05/09/16 16:04	05/25/16 21:51	1
13C4 PFOA	136		25 - 150				05/09/16 16:04	05/25/16 21:51	1

Client Sample ID: OF-RW42B2-0516 Lab Sample ID: 320-18704-3

25 - 150

137

Date Collected: 05/05/16 09:44 **Matrix: Water** Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons											
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac		
Perfluoroheptanoic acid (PFHpA)	0.013		0.0024	0.00078	ug/L		05/09/16 16:04	05/25/16 22:12	1		
Perfluorooctanoic acid (PFOA)	0.18	M	0.0024	0.00073	ug/L		05/09/16 16:04	05/25/16 22:12	1		
Perfluorononanoic acid (PFNA)	0.0020	U	0.0024	0.00064	ug/L		05/09/16 16:04	05/25/16 22:12	1		

05/09/16 16:04 05/25/16 21:51

TestAmerica Job ID: 320-18704-1

Analyzed

Prepared

Dil Fac

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-RW42B2-0516

Date Collected: 05/05/16 09:44 **Matrix: Water**

Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	0.058		0.0024	0.00090	ug/L		05/09/16 16:04	05/25/16 22:12	1
Perfluorohexanesulfonic acid (PFHxS)	0.43	Q	0.0024	0.00085	ug/L		05/09/16 16:04	05/25/16 22:12	1
Perfluorooctanesulfonic acid (PFOS)	0.018	M	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 22:12	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	86		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C4 PFOS	101		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C5 PFNA	84		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C4 PFOA	92		25 - 150				05/09/16 16:04	05/25/16 22:12	1
13C4-PFHpA	89		25 - 150				05/00/16 16:04	05/25/16 22:12	1

Client Sample ID: OF-FB42B2-0516

Lab Sample ID: 320-18704-4 Date Collected: 05/05/16 09:35 **Matrix: Water**

Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00078	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00073	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00064	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorohexanesulfonic acid (PFHxS)	0.00097	J M Q	0.0024	0.00085	ug/L		05/09/16 16:04	05/25/16 22:33	1
Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 22:33	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	122		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C4 PFOS	93		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C5 PFNA	132		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C4 PFOA	135		25 - 150				05/09/16 16:04	05/25/16 22:33	1
13C4-PFHpA	130		25 - 150				05/09/16 16:04	05/25/16 22:33	1

Client Sample ID: OF-RW42A-0516 Lab Sample ID: 320-18704-5

Date Collected: 05/05/16 09:23 **Matrix: Water** Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00076	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorooctanoic acid (PFOA)	0.0031	M	0.0024	0.00071	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00062	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00087	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorohexanesulfonic acid (PFHxS)	0.0067	M Q	0.0024	0.00082	ug/L		05/09/16 16:04	05/25/16 22:54	1
Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0038	0.0012	ug/L		05/09/16 16:04	05/25/16 22:54	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	141	-	25 - 150				05/09/16 16:04	05/25/16 22:54	1
13C4 PFOS	138		25 - 150				05/09/16 16:04	05/25/16 22:54	1
13C5 PFNA	111		25 - 150				05/09/16 16:04	05/25/16 22:54	1

TestAmerica Sacramento

05/26/2016

TestAmerica Job ID: 320-18704-1

Lab Sample ID: 320-18704-3

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Client Sample ID: OF-RW42A-0516

Lab Sample ID: 320-18704-5 Date Collected: 05/05/16 09:23

Matrix: Water

Matrix: Water

Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluc	brinated Hydrocarbons	s (Continued)		
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed
13C4 PFOA	107	25 - 150	05/09/16 16:04	05/25/16 22:54

13C4-PFHpA 102 25 - 150 05/09/16 16:04 05/25/16 22:54

Client Sample ID: OF-FB42A-0516

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: 320-18704-6 Date Collected: 05/05/16 09:20 **Matrix: Water**

Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.00077	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.00072	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.00063	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.00089	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorohexanesulfonic acid (PFHxS)	0.0019	UQ	0.0024	0.00084	ug/L		05/09/16 16:04	05/25/16 23:15	1
Perfluorooctanesulfonic acid (PFOS)	0.0014	J	0.0039	0.0012	ug/L		05/09/16 16:04	05/25/16 23:15	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	132		25 - 150				05/09/16 16:04	05/25/16 23:15	1
13C4 PFOS	141		25 - 150				05/09/16 16:04	05/25/16 23:15	1
13C5 PFNA	129		25 - 150				05/09/16 16:04	05/25/16 23:15	1
13C4 PFOA	131		25 - 150				05/09/16 16:04	05/25/16 23:15	1
13C4-PFHpA	125		25 - 150				05/09/16 16:04	05/25/16 23:15	1

Client Sample ID: OF-RW42B-0516 Lab Sample ID: 320-18704-7

Date Collected: 05/05/16 09:07 Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.013		0.0023	0.00074	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorooctanoic acid (PFOA)	0.19	M	0.0023	0.00069	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorononanoic acid (PFNA)	0.0014	J	0.0023	0.00061	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorobutanesulfonic acid (PFBS)	0.057		0.0023	0.00085	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorohexanesulfonic acid (PFHxS)	0.38	Q	0.0023	0.00081	ug/L		05/09/16 16:04	05/25/16 23:37	1
Perfluorooctanesulfonic acid (PFOS)	0.013	M	0.0037	0.0012	ug/L		05/09/16 16:04	05/25/16 23:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	90		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C4 PFOS	130		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C5 PFNA	70		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C4 PFOA	80		25 - 150				05/09/16 16:04	05/25/16 23:37	1
13C4-PFHpA	77		25 - 150				05/09/16 16:04	05/25/16 23:37	1

Client Sample Results

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Tojectrone: TVAO Oceana, VA - 3000 OTO-VVEOT

Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluct Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00079	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00073	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00064	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00090	ug/L		05/09/16 16:04	05/26/16 01:01	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	UQ	0.0025	0.00085	ug/L		05/09/16 16:04	05/26/16 01:01	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	129	-	25 - 150				05/09/16 16:04	05/26/16 01:01	1
13C5 PFNA	131		25 - 150				05/09/16 16:04	05/26/16 01:01	1
13C4 PFOA	130		25 - 150				05/09/16 16:04	05/26/16 01:01	1
13C4-PFHpA	130		25 - 150				05/09/16 16:04	05/26/16 01:01	1

Method: WS-LC-0025 - Perfluc									
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0039	0.0013	ug/L		05/09/16 16:04	05/25/16 01:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	120		25 - 150				05/09/16 16:04	05/25/16 01:37	

Client Sample ID: OF-RW42C-516 Lab Sample ID: 320-18704-9

Date Collected: 05/05/16 10:02 Matrix: Water Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0050		0.0023	0.00074	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorooctanoic acid (PFOA)	0.093	M	0.0023	0.00069	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00060	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorobutanesulfonic acid (PFBS)	0.016		0.0023	0.00085	ug/L		05/09/16 16:04	05/26/16 01:22	1
Perfluorohexanesulfonic acid (PFHxS)	0.26	M Q	0.0023	0.00080	ug/L		05/09/16 16:04	05/26/16 01:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	107		25 - 150				05/09/16 16:04	05/26/16 01:22	1
13C5 PFNA	87		25 - 150				05/09/16 16:04	05/26/16 01:22	1
13C4 PFOA	97		25 - 150				05/09/16 16:04	05/26/16 01:22	1
13C4-PFHpA	96		25 - 150				05/09/16 16:04	05/26/16 01:22	1

Method: WS-LC-0025 - Perfluc	orinated Hy	drocarbon	s - RA						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.020	M	0.0037	0.0012	ug/L		05/09/16 16:04	05/25/16 01:58	1
Isotope Dilution 13C4 PFOS	%Recovery	Qualifier	25 - 150				Prepared 05/09/16 16:04	Analyzed 05/25/16 01:58	Dil Fac

Client Sample ID: OF-RW42CD-0516 Lab Sample ID: 320-18704-10

Date Collected: 05/05/16 10:04 Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluo	rinated Hyd	drocarbon	S							
Analyte	Result	Qualifier	LOQ	DL	Unit	D	P	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0045		0.0023	0.00075	ug/L		05/0	09/16 16:04	05/26/16 01:44	1

TestAmerica Sacramento

TestAmerica Job ID: 320-18704-1

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05/26/2016

Matrix: Water

Client Sample Results

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-RW42CD-0516 Lab Sample ID: 320-18704-10

Date Collected: 05/05/16 10:04 **Matrix: Water**

Date Received: 05/06/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanoic acid (PFOA)	0.087	M	0.0023	0.00070	ug/L		05/09/16 16:04	05/26/16 01:44	1
Perfluorononanoic acid (PFNA)	0.0019	U	0.0023	0.00061	ug/L		05/09/16 16:04	05/26/16 01:44	1
Perfluorobutanesulfonic acid (PFBS)	0.017		0.0023	0.00086	ug/L		05/09/16 16:04	05/26/16 01:44	1
Perfluorohexanesulfonic acid (PFHxS)	0.28	M Q	0.0023	0.00081	ug/L		05/09/16 16:04	05/26/16 01:44	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	98		25 - 150				05/09/16 16:04	05/26/16 01:44	1
13C5 PFNA	95		25 - 150				05/09/16 16:04	05/26/16 01:44	1
13C4 PFOA	102		25 - 150				05/09/16 16:04	05/26/16 01:44	1
13C4-PFHpA	96		25 - 150				05/09/16 16:04	05/26/16 01:44	1
Method: WS-LC-0025 - Perflu	uorinated Hyd	drocarbon	s - RA						
Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.023	M	0.0037	0.0012	ug/L		05/09/16 16:04	05/25/16 02:20	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	124		25 - 150				05/09/16 16:04	05/25/16 02:20	

Client Sample ID: OF-FB42C-0516

Lab Sample ID: 320-18704-11 Date Collected: 05/05/16 09:55 **Matrix: Water**

Date Received: 05/06/16 09:50

Method: WS-LC-0025 - Perfluction Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0022	U	0.0027	0.00087	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorooctanoic acid (PFOA)	0.0022	U	0.0027	0.00081	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorononanoic acid (PFNA)	0.0022	U	0.0027	0.00071	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorobutanesulfonic acid (PFBS)	0.0022	U	0.0027	0.0010	ug/L		05/09/16 16:04	05/26/16 02:05	1
Perfluorohexanesulfonic acid (PFHxS)	0.0011	JMQ	0.0027	0.00095	ug/L		05/09/16 16:04	05/26/16 02:05	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	115		25 - 150				05/09/16 16:04	05/26/16 02:05	1
13C5 PFNA	127		25 - 150				05/09/16 16:04	05/26/16 02:05	1
13C4 PFOA	129		25 - 150				05/09/16 16:04	05/26/16 02:05	1
13C4-PFHpA	123		25 - 150				05/09/16 16:04	05/26/16 02:05	1
Method: WS-LC-0025 - Perflu	orinated Hy	drocarbon	s - RA						
Analyte	•	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.0033	U M	0.0044	0.0014	ug/L		05/09/16 16:04	05/25/16 02:41	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFOS	114		25 - 150				05/09/16 16:04	05/25/16 02:41	1

Default Detection Limits

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Prep: 3535

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

Isotope Dilution Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Matrix: Water Prep Type: Total/NA

_			Perce	ent Isotope	Dilution Re	covery (Ac
		3O2 PFHx	3C4 PFOS	3C5 PFN/	3C4 PFO	3C4-PFHp
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-18704-1	OF-RW44-0516	99		78	98	99
320-18704-1 - DL	OF-RW44-0516		145			
320-18704-2	OF-FB44-0516	126	85	137	136	137
320-18704-3	OF-RW42B2-0516	86	101	84	92	89
320-18704-4	OF-FB42B2-0516	122	93	132	135	130
320-18704-5	OF-RW42A-0516	141	138	111	107	102
320-18704-6	OF-FB42A-0516	132	141	129	131	125
320-18704-7	OF-RW42B-0516	90	130	70	80	77
20-18704-8 - RA	OF-FB42B-0516		120			
20-18704-8	OF-FB42B-0516	129		131	130	130
20-18704-9 - RA	OF-RW42C-516		124			
20-18704-9	OF-RW42C-516	107		87	97	96
20-18704-10 - RA	OF-RW42CD-0516		124			
320-18704-10	OF-RW42CD-0516	98		95	102	96
320-18704-11 - RA	OF-FB42C-0516		114			
320-18704-11	OF-FB42C-0516	115		127	129	123
CS 320-109334/2-A	Lab Control Sample	131	115	129	123	129
_CSD 320-109334/3-A	Lab Control Sample Dup	120	109	120	118	120
MB 320-109334/1-A	Method Blank	130	126	129	133	131

Surrogate Legend

1802 PFHxS = 1802 PFHxS

13C4 PFOS = 13C4 PFOS

13C5 PFNA = 13C5 PFNA

13C4 PFOA = 13C4 PFOA

13C4-PFHpA = 13C4-PFHpA

QC Sample Results

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Method: WS-LC-0025 - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-109334/1-A

Matrix: Water

Analysis Batch: 111390

Client Sample ID: Method Blank

	Prep Type: 1 Prep Batch:	
Propared	Analyzod	Dil Eac

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		05/09/16 16:04	05/25/16 20:26	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		05/09/16 16:04	05/25/16 20:26	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		05/09/16 16:04	05/25/16 20:26	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		05/09/16 16:04	05/25/16 20:26	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		05/09/16 16:04	05/25/16 20:26	1
Perfluorooctanesulfonic acid (PFOS)	0.00149	J	0.0040	0.0013	ug/L		05/09/16 16:04	05/25/16 20:26	1
	MB	MB							

MR MR

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
1802 PFHxS	130	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C4 PFOS	126	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C5 PFNA	129	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C4 PFOA	133	25 - 150	05/09/16 16:04	05/25/16 20:26	1
13C4-PFHpA	131	25 - 150	05/09/16 16:04	05/25/16 20:26	1

Lab Sample ID: LCS 320-109334/2-A

Lab Sample ID: LCSD 320-109334/3-A

Matrix: Water

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analysis Batch: 111390 Prep Batch: 109334 LCS LCS Spike %Rec. Added Result Qualifier Unit D %Rec Limits Perfluoroheptanoic acid (PFHpA) 0.0400 0.0340 ug/L 85 60 - 140

Perfluorooctanoic acid (PFOA) 0.0400 0.0325 ug/L 81 60 - 140 Perfluorononanoic acid (PFNA) 0.0400 0.0313 ug/L 78 60 - 140 0.0354 0.0261 ug/L 74 50 - 150 Perfluorobutanesulfonic acid (PFBS) Perfluorohexanesulfonic acid 0.0364 0.0229 ug/L 63 60 - 140 (PFHxS) 0.0371 0.0310 M ug/L 83 60 - 140 Perfluorooctanesulfonic acid (PFOS)

LCS LCS

Isotope Dilution	%Recovery C	Qualifier	Limits
18O2 PFHxS	131		25 - 150
13C4 PFOS	115		25 - 150
13C5 PFNA	129		25 - 150
13C4 PFOA	123		25 - 150
13C4-PFHpA	129		25 - 150

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA Prep Batch: 109334

Matrix: Water Analysis Batch: 111390 ICSD ICSD

	Spike	LCSD LCSD				%Rec.		RPD
Analyte	Added	Result Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0330	ug/L		83	60 - 140	3	30
Perfluorooctanoic acid (PFOA)	0.0400	0.0309	ug/L		77	60 - 140	5	30
Perfluorononanoic acid (PFNA)	0.0400	0.0338	ug/L		85	60 - 140	8	30
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0270	ug/L		76	50 - 150	3	30
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0313 M Q	ug/L		86	60 - 140	31	30
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0330 M	ug/L		89	60 - 140	6	30

TestAmerica Sacramento

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QC Sample Results

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

O-WE01

LCSD

Qualifier Limits

25 150

	LCSD	LCSD	
Isotope Dilution	%Recovery	Qualifier	Limits
1802 PFHxS	120		25 - 150
13C4 PFOS	109		25 - 150
13C5 PFNA	120		25 - 150
13C4 PFOA	118		25 - 150
13C4-PFHpA	120		25 - 150

QC Association Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

LCMS

Prep Batch: 109334

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18704-1	OF-RW44-0516	Total/NA	Water	3535	-
320-18704-1 - DL	OF-RW44-0516	Total/NA	Water	3535	
320-18704-2	OF-FB44-0516	Total/NA	Water	3535	
320-18704-3	OF-RW42B2-0516	Total/NA	Water	3535	
320-18704-4	OF-FB42B2-0516	Total/NA	Water	3535	
320-18704-5	OF-RW42A-0516	Total/NA	Water	3535	
320-18704-6	OF-FB42A-0516	Total/NA	Water	3535	
320-18704-7	OF-RW42B-0516	Total/NA	Water	3535	
320-18704-8	OF-FB42B-0516	Total/NA	Water	3535	
320-18704-8 - RA	OF-FB42B-0516	Total/NA	Water	3535	
320-18704-9	OF-RW42C-516	Total/NA	Water	3535	
320-18704-9 - RA	OF-RW42C-516	Total/NA	Water	3535	
320-18704-10	OF-RW42CD-0516	Total/NA	Water	3535	
320-18704-10 - RA	OF-RW42CD-0516	Total/NA	Water	3535	
320-18704-11	OF-FB42C-0516	Total/NA	Water	3535	
320-18704-11 - RA	OF-FB42C-0516	Total/NA	Water	3535	
LCS 320-109334/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-109334/3-A	Lab Control Sample Dup	Total/NA	Water	3535	
MB 320-109334/1-A	Method Blank	Total/NA	Water	3535	

Analysis Batch: 111182

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18704-8 - RA	OF-FB42B-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-9 - RA	OF-RW42C-516	Total/NA	Water	WS-LC-0025	109334
320-18704-10 - RA	OF-RW42CD-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-11 - RA	OF-FB42C-0516	Total/NA	Water	WS-LC-0025	109334

Analysis Batch: 111390

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-18704-1	OF-RW44-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-1 - DL	OF-RW44-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-2	OF-FB44-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-3	OF-RW42B2-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-4	OF-FB42B2-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-5	OF-RW42A-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-6	OF-FB42A-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-7	OF-RW42B-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-8	OF-FB42B-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-9	OF-RW42C-516	Total/NA	Water	WS-LC-0025	109334
320-18704-10	OF-RW42CD-0516	Total/NA	Water	WS-LC-0025	109334
320-18704-11	OF-FB42C-0516	Total/NA	Water	WS-LC-0025	109334
LCS 320-109334/2-A	Lab Control Sample	Total/NA	Water	WS-LC-0025	109334
LCSD 320-109334/3-A	Lab Control Sample Dup	Total/NA	Water	WS-LC-0025	109334
MB 320-109334/1-A	Method Blank	Total/NA	Water	WS-LC-0025	109334

Lab Chronicle

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-RW44-0516 Lab Sample ID: 320-18704-1

Date Collected: 05/04/16 09:12 **Matrix: Water**

Date Received: 05/06/16 09:50

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/25/16 21:29	JRB	TAL SAC
Total/NA	Prep	3535	DL		109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	DL	20	111390	05/26/16 12:24	JRB	TAL SAC

Client Sample ID: OF-FB44-0516 Lab Sample ID: 320-18704-2

Date Collected: 05/04/16 09:00 **Matrix: Water**

Date Received: 05/06/16 09:50

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/25/16 21:51	JRB	TAL SAC

Client Sample ID: OF-RW42B2-0516 Lab Sample ID: 320-18704-3

Date Collected: 05/05/16 09:44 **Matrix: Water**

Date Received: 05/06/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/25/16 22:12	JRB	TAL SAC

Client Sample ID: OF-FB42B2-0516 Lab Sample ID: 320-18704-4

Date Collected: 05/05/16 09:35 **Matrix: Water**

Date Received: 05/06/16 09:50

<u> </u>	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/25/16 22:33	JRB	TAL SAC

Client Sample ID: OF-RW42A-0516 Lab Sample ID: 320-18704-5

Date Collected: 05/05/16 09:23 **Matrix: Water**

Date Received: 05/06/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/25/16 22:54	JRB	TAL SAC

Lab Chronicle

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-FB42A-0516 Lab Sample ID: 320-18704-6

Date Collected: 05/05/16 09:20 Date Received: 05/06/16 09:50

Matrix: Water

Batch Batch Dilution **Batch** Prepared Type Method Run Number or Analyzed Analyst **Prep Type Factor** Lab Total/NA 3535 05/09/16 16:04 **JER** TAL SAC Prep 109334 111390 05/25/16 23:15 JRB Total/NA Analysis WS-LC-0025 1 TAL SAC

Client Sample ID: OF-RW42B-0516 Lab Sample ID: 320-18704-7

Date Collected: 05/05/16 09:07 Date Received: 05/06/16 09:50

Batch Batch Dilution Batch **Prepared Prep Type** Type Method **Factor** Number or Analyzed Analyst Run Lab Total/NA Prep 3535 109334 05/09/16 16:04 JER TAL SAC 111390 05/25/16 23:37 JRB TAL SAC Total/NA Analysis WS-LC-0025 1

Client Sample ID: OF-FB42B-0516 Lab Sample ID: 320-18704-8

Date Collected: 05/05/16 09:05 Date Received: 05/06/16 09:50

Prep

3535

Batch Batch Dilution Batch Prepared Method **Prep Type** Run Factor Number or Analyzed Type Analyst Lab TAL SAC Total/NA Prep 3535 109334 05/09/16 16:04 JER Total/NA Analysis WS-LC-0025 1 111390 05/26/16 01:01 .IRR TAL SAC

RΑ TAL SAC Total/NA Analysis WS-LC-0025 1 111182 05/25/16 01:37 JRB

RA

Client Sample ID: OF-RW42C-516 Lab Sample ID: 320-18704-9 Date Collected: 05/05/16 10:02 **Matrix: Water**

109334 05/09/16 16:04 JER

Date Received: 05/06/16 09:50

Total/NA

Batch Batch Dilution Batch **Prepared** Number Type Method or Analyzed Analyst **Prep Type** Run **Factor** Lab Total/NA 3535 109334 05/09/16 16:04 JER TAL SAC Prep Total/NA WS-LC-0025 111390 05/26/16 01:22 JRB TAL SAC Analysis 1 TAL SAC Total/NA Prep 3535 RA 109334 05/09/16 16:04 JER RA 111182 05/25/16 01:58 JRB TAL SAC Total/NA Analysis WS-LC-0025 1

Client Sample ID: OF-RW42CD-0516 Lab Sample ID: 320-18704-10

Date Collected: 05/05/16 10:04

Date Received: 05/06/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/26/16 01:44	JRB	TAL SAC
Total/NA	Prep	3535	RA		109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	RA	1	111182	05/25/16 02:20	JRB	TAL SAC

TestAmerica Job ID: 320-18704-1

Matrix: Water

Matrix: Water

Matrix: Water

TAL SAC

Lab Chronicle

Client: CH2M Hill Constructors, Inc.

TestAmerica Job ID: 320-18704-1 Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Client Sample ID: OF-FB42C-0516

Lab Sample ID: 320-18704-11 Date Collected: 05/05/16 09:55 **Matrix: Water**

Date Received: 05/06/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025		1	111390	05/26/16 02:05	JRB	TAL SAC
Total/NA	Prep	3535	RA		109334	05/09/16 16:04	JER	TAL SAC
Total/NA	Analysis	WS-LC-0025	RA	1	111182	05/25/16 02:41	JRB	TAL SAC

Laboratory References:

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

Certification Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

Laboratory: TestAmerica Sacramento

The certifications listed below are applicable to this report.

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

Laboratory: TestAmerica Denver The certifications listed below are applicable to this report.

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

Method Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

TestAmerica Job ID: 320-18704-1

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

Protocol References:

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

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

Sample Summary

Client: CH2M Hill Constructors, Inc.

Project/Site: NAS Oceana, VA - 9000 CTO-WE01

Lab Sample ID Client Sample ID Matrix Collected Received 320-18704-1 OF-RW44-0516 Water 05/04/16 09:12 05/06/16 09:50 Water 320-18704-2 OF-FB44-0516 05/04/16 09:00 05/06/16 09:50 05/05/16 09:44 05/06/16 09:50 320-18704-3 OF-RW42B2-0516 Water 320-18704-4 OF-FB42B2-0516 Water 05/05/16 09:35 05/06/16 09:50 320-18704-5 OF-RW42A-0516 Water 05/05/16 09:23 05/06/16 09:50 320-18704-6 OF-FB42A-0516 Water 05/05/16 09:20 05/06/16 09:50 320-18704-7 OF-RW42B-0516 Water 05/05/16 09:07 05/06/16 09:50 320-18704-8 OF-FB42B-0516 Water 05/05/16 09:05 05/06/16 09:50 320-18704-9 OF-RW42C-516 Water 05/05/16 10:02 05/06/16 09:50 320-18704-10 OF-RW42CD-0516 Water 05/05/16 10:04 05/06/16 09:50 320-18704-11 OF-FB42C-0516 Water 05/05/16 09:55 05/06/16 09:50

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Instrument ID: A4 Analysis Batch Number: 111390

Lab Sample ID: LCS 320-109334/2-A Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	westendor fc	05/26/16 08:18
Perfluorooctanesulfonic acid (PFOS)	11.46	Isomers	westendor fc	05/26/16 08:18

Lab Sample ID: LCSD 320-109334/3-A Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	westendor fc	05/26/16 08:21
Perfluorooctanesulfonic acid (PFOS)	11.46	Isomers	westendor fc	05/26/16 08:21

Lab Sample ID: 320-18704-1 Client Sample ID: OF-RW44-0516

COMPOUND NAME	RETENTION	MANUAL INTE	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE		
Perfluorohexanesulfonic acid	9.41	Isomers	westendor	05/26/16 08:27		
(PFHxS)			fc			
Perfluorooctanoic acid (PFOA)	10.50	Isomers	westendor	05/26/16 08:27		
			fc			

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Instrument ID: A4 Analysis Batch Number: 111390

Lab Sample ID: 320-18704-2 Client Sample ID: OF-FB44-0516

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	barnettj	05/26/16 10:46
Perfluorooctanesulfonic acid (PFOS)	11.47	Isomers	westendor fc	05/26/16 08:30

Lab Sample ID: 320-18704-3 Client Sample ID: OF-RW42B2-0516

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	fc	05/26/16 08:31
Perfluorooctanoic acid (PFOA)	10.50	Isomers	westendor fc	05/26/16 08:31
Perfluorooctanesulfonic acid (PFOS)	11.11	Isomers	westendor fc	05/26/16 08:31

Lab Sample ID: 320-18704-4 Client Sample ID: OF-FB42B2-0516

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	barnettj	05/26/16 10:48

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Instrument ID: A4 Analysis Batch Number: 111390

Lab Sample ID: 320-18704-5 Client Sample ID: OF-RW42A-0516

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	westendor fc	05/26/16 08:32
Perfluorooctanoic acid (PFOA)	10.51	Isomers	westendor fc	05/26/16 08:32

Lab Sample ID: 320-18704-7 Client Sample ID: OF-RW42B-0516

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid (PFHxS)	9.42	Isomers	westendor fc	
Perfluorooctanoic acid (PFOA)	10.50	Isomers	westendor fc	05/26/16 08:36
Perfluorooctanesulfonic acid (PFOS)	11.11	Isomers	westendor fc	05/26/16 08:36

Lab Sample ID: 320-18704-9 Client Sample ID: OF-RW42C-516

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorohexanesulfonic acid	9.41	Isomers	westendor	05/26/16 09:28
(PFHxS)			fc	
Perfluorooctanoic acid (PFOA)	10.50	Isomers	westendor	05/26/16 09:26
			fc	

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 SDG No.: Instrument ID: A4 Analysis Batch Number: 111390 Lab Sample ID: 320-18704-10 Client Sample ID: OF-RW42CD-0516 Date Analyzed: 05/26/16 01:44 Lab File ID: 25MAY2016B4A 030.d GC Column: Acquity ID: 2.1 (mm) COMPOUND NAME RETENTION MANUAL INTEGRATION TIME REASON ANALYST DATE Perfluorohexanesulfonic acid 9.42 | Isomers westendor 05/26/16 09:29 (PFHxS) fc Perfluorooctanoic acid (PFOA) 10.50 Isomers westendor 05/26/16 09:29 Lab Sample ID: 320-18704-11 Client Sample ID: OF-FB42C-0516 Date Analyzed: 05/26/16 02:05 Lab File ID: 25MAY2016B4A 031.d GC Column: Acquity ID: 2.1 (mm)COMPOUND NAME RETENTION MANUAL INTEGRATION REASON ANALYST DATE TIME Perfluorohexanesulfonic acid 05/26/16 10:56 9.41 Isomers barnettj (PFHxS) Lab Sample ID: 320-18704-1 DL Client Sample ID: OF-RW44-0516 DL Lab File ID: 25MAY2016B4A 060.d Date Analyzed: 05/26/16 12:24 GC Column: Acquity ID: 2.1 (mm) COMPOUND NAME MANUAL INTEGRATION RETENTION REASON ANALYST DATE TIME 05/26/16 15:02 Perfluorooctanesulfonic acid 11.45 Isomers barnettj (PFOS)

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 111182

Lab Sample ID: STD 320-111182/4 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluoropentanoic acid (PFPeA)	6.95	Missed Peak	barnettj	05/24/16 17:44		
Perfluorohexanoic acid (PFHxA)	8.21	Missed Peak	barnettj	05/24/16 17:44		
Perfluoroheptanoic acid (PFHpA)	9.46	Missed Peak	barnettj	05/24/16 17:44		
Perfluorooctanoic acid (PFOA)	10.56	Missed Peak	barnettj	05/24/16 17:44		
Perfluorononanoic acid (PFNA)	11.53	Missed Peak	barnettj	05/24/16 17:44		
Perfluorooctanesulfonic acid (PFOS)	11.53	Missed Peak	barnettj	05/24/16 17:44		
Perfluorodecanoic acid (PFDA)	12.37	Missed Peak	barnettj	05/24/16 17:44		

Lab Sample ID: STD 320-111182/5 IC Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorobutanoic acid (PFBA)	5.79	Missed Peak	_	05/24/16 18:11		
Perfluorohexanoic acid (PFHxA)	8.23	Missed Peak	barnettj	05/24/16 18:11		
Perfluorooctanesulfonic acid (PFOS)	11.53	Missed Peak	barnettj	05/24/16 18:11		
Perfluorononanoic acid (PFNA)	11.55	Assign Peak	westendor fc	05/25/16 08:46		

Lab Sample ID: 320-18704-9 RA Client Sample ID: OF-RW42C-516 RA

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorooctanesulfonic acid (PFOS)	11.18	Isomers	barnettj	05/25/16 11:20		

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Instrument ID: A6 Analysis Batch Number: 111182

Lab Sample ID: 320-18704-10 RA Client Sa

Client Sample ID: OF-RW42CD-0516 RA

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorooctanesulfonic acid (PFOS)	11.17	Isomers	barnettj	05/25/16 13:52		

Lab Sample ID: 320-18704-11 RA Client Sample ID: OF-FB42C-0516 RA

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorooctanesulfonic acid (PFOS)	11.53	Isomers	barnettj	05/25/16 13:53		

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Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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				Reagent	Parent Reage:	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFCSU_00039	11/05/16	05/05/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00005	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00006	200 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00006	200 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00006	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00006	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005		13C5 PFNA	1 ug/mL
					LCMPFOA 00010	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00007	200 uL	13C2 PFUnA	1 ug/mL
.LCM2PFHxDA 00005	01/07/21	Wellingt	on Laboratories, Lot M2F	FHxDA1112	(Purchased Read	gent)	13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA 00005	12/07/20	Wellingt	on Laboratories, Lot M2F	FTeDA1115	(Purchased Read	gent)	13C2-PFTeDA	50 ug/mL
.LCM4PFHPA 00005	05/22/20		on Laboratories, Lot M4		(Purchased Read	gent)	13C4-PFHpA	50 ug/mL
.LCM5PFPEA 00006	05/22/20	Wellingt	ton Laboratories, Lot M5	PFPeA0515	(Purchased Read	gent)	13C5-PFPeA	50 ug/mL
.LCM8FOSA 00009	12/22/17		ton Laboratories, Lot M8		(Purchased Read		13C8 FOSA	50 ug/mL
.LCMPFBA 00006	10/31/19		ton Laboratories, Lot M		(Purchased Read	gent)	13C4 PFBA	50 ug/mL
.LCMPFDA 00007	08/19/20		ton Laboratories, Lot M		(Purchased Read		13C2 PFDA	50 ug/mL
.LCMPFDoA 00006	07/17/19		ton Laboratories, Lot MF		(Purchased Read		13C2 PFDoA	50 ug/mL
.LCMPFHxA 00008	04/09/20		ton Laboratories, Lot ME		(Purchased Read	gent)	13C2 PFHxA	50 ug/mL
.LCMPFHxS 00006	10/23/20	Welling	ton Laboratories, Lot ME	FHxS1015	(Purchased Read	gent)	1802 PFHxS	47.3 ug/mL
.LCMPFNA 00005	04/13/19		ton Laboratories, Lot M		(Purchased Read	gent)	13C5 PFNA	50 ug/mL
.LCMPFOA 00010	01/22/21	Welling	gton Laboratories, Lot M	PFOA0116	(Purchased Read		13C4 PFOA	50 ug/mL
.LCMPFOS 00012	01/22/21		ton Laboratories, Lot M		(Purchased Read	gent)	13C4 PFOS	47.8 ug/mL
.LCMPFUdA 00007	10/31/19		ton Laboratories, Lot MF		(Purchased Read	gent)	13C2 PFUnA	50 ug/mL
LCPFC-L1_00018	06/29/16		MeOH/H2O, Lot 90285		LCMPFCSU 00024		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 00040	25 117	Perfluorobutyric acid	0.5 ng/mL
					12011001_00040	25 41	Perfluorobutanesulfonic acid	0.442 ng/mL
							(PFBS)	
							Perfluorodecanoic acid	0.5 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1	
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				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
-					_		Perfluorododecanoic acid	0.5 ng/mL
							Perfluorodecane Sulfonic acid	0.482 ng/mL
							Perfluoroheptanoic acid	0.5 ng/mL
							(PFHpA)	0.0 119/1112
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid	0.473 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctandecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid	0.478 ng/mL
							(PFOS) Perfluorooctane Sulfonamide	0 5 /
								0.5 ng/mL
							Perfluoropentanoic acid Perfluorotetradecanoic acid	0.5 ng/mL 0.5 ng/mL
							Perfluorotridecanoic acid	0.5 ng/mL
							Perfluoroundecanoic acid	0.5 ng/mL
.LCMPFCSU 00024	06/29/16	12/29/15	Methanol, Lot Baker	1.0 mT	LCM2PFHxDA 00003	0 2 mT	13C2-PFHxDA	1 ug/mL
. LCMI FC50_00024	00/23/10	12/23/13	115491	10 1111	LCM21FIIADA_00005	0.2 1111	13C2 IFIIADA	I ug/iiii
			110131		LCM2PFTeDA 00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00003		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA 00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA 00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00004		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003		13C5 PFNA	1 ug/mL
					LCMPFOA_00007		13C4 PFOA	1 ug/mL
					LCMPFOS 00009		13C4 PFOS	0.956 ug/mL
	11/00/15				LCMPFUdA_00005		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00003			on Laboratories, Lot M		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00003	11/29/17		on Laboratories, Lot M		(Purchased Read	-	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00003 LCM5PFPEA_00004	05/22/20		on Laboratories, Lot N		(Purchased Read (Purchased Read		13C4-PFHpA 13C5-PFPeA	50 ug/mL
	05/22/20		on Laboratories, Lot Mon Laboratories, Lot M		(Purchased Read		13C5-PFPEA 13C8 FOSA	50 ug/mL 50 ug/mL
LCM8FOSA 00006	12/15/16		on Laboratories, Lot E ton Laboratories, Lot		(Purchased Read		13C8 FOSA 13C4 PFBA	50 ug/mL 50 ug/mL
LCMPFDA 00004	04/13/19		ton Laboratories, Lot		(Purchased Read		13C4 PFDA	50 ug/mL
LCMPFDoA 00004	07/17/19		ton Laboratories, Lot		(Purchased Read	-	13C2 PFDOA	50 ug/mL
LCMPFHxA 00005	04/13/19		on Laboratories, Lot		(Purchased Read	-	13C2 PFHxA	50 ug/mL
LCMPFHxS 00004	07/25/18		on Laboratories, Lot		(Purchased Read		1802 PFHxS	47.3 ug/mL
LCMPFNA 00003	04/13/19		ton Laboratories, Lot		(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA 00007	04/10/20		ton Laboratories, Lot		(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00009	05/15/20		ton Laboratories, Lot		(Purchased Read		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00005	10/31/19		on Laboratories, Lot		(Purchased Read		13C2 PFUnA	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-18704-1

			Reagent	Parent Reag	ent		
	Exp Prep	Dilutant	Final		Volume		
Reagent ID	Date Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
.LCPFCSP 00040	06/30/16 12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP 00039	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
		,				Perfluorobutanesulfonic acid	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
						(PFHpA)	
						Perfluoroheptanesulfonic Acid	0.0952 ug/mL
						Perfluorohexanoic acid	0.1 ug/mL
						Perfluorohexadecanoic acid	0.1 ug/mL
						Perfluorohexanesulfonic acid	0.0946 ug/mL
						(PFHxS)	
						Perfluorononanoic acid (PFNA)	0.1 ug/mL
						Perfluorooctanoic acid (PFOA)	0.1 ug/mL
						Perfluorooctandecanoic acid	0.1 ug/mL
						Perfluorooctanesulfonic acid	0.0956 ug/mL
						(PFOS) Perfluorooctane Sulfonamide	0 1 110 /mT
						Perfluoropentanoic acid	0.1 ug/mL 0.1 ug/mL
						Perfluorotetradecanoic acid	0.1 ug/mL
						Perfluorotridecanoic acid	0.1 ug/mL
						Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP 00039	06/30/16 12/30/15	Methanol, Lot 090285	5 mT.	LCPFBA 00003	0 1 mT.	Perfluorobutyric acid	1 ug/mL
	00/30/10 12/30/13	rechanor, not 030203	J 1111	LCPFBSA 00001		Perfluorobutanesulfonic acid	0.884 ug/mL
					0.1 1112	(PFBS)	0.001 49/1112
				LCPFDA 00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
				LCPFDoA 00003		Perfluorododecanoic acid	1 ug/mL
				LCPFDSA 00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
				LCPFHpA_00004		Perfluoroheptanoic acid	1 ug/mL
						(PFHpA)	
				LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
				LCPFHxA_00003		Perfluorohexanoic acid	1 ug/mL
				LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
				LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
				LCPFNA 00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
				LCPFOA 00004		Perfluorooctanoic acid (PFOA)	1 ug/mL
				LCPFODA 00004		Perfluorooctandecanoic acid	1 ug/mL
				LCPFOS_00004		Perfluorooctanesulfonic acid	0.956 ug/mL
				T GD TO G T	0 1 -	(PFOS)	1 / -
				LCPFOSA_00005		Perfluorooctane Sulfonamide	1 ug/mL
				LCPFPeA_00003		Perfluoropentanoic acid	1 ug/mL
				LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
				LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
T 07777 00000	02/05/10			LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003		gton Laboratories, Lot PI		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19 Welling	gton Laboratories, Lot LP	'FBS1014	(Purchased Rea	agent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

						Parent Reagen	t		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Reagent Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFDA 00003	06/18/18		gton Laboratories,	T o t		(Purchased Reage		Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00003	01/03/18		gton Laboratories,			(Purchased Reage		Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18		ton Laboratories,			(Purchased Reage		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA 00004	05/09/19		ton Laboratories,			(Purchased Reage		Perfluoroheptanoic acid	50 ug/mL
Delflipa_00004	03/03/13	Welling	den laboratories,	пос 1	rnpausia	(Turchased Reage	5110)	(PFHpA)	JU ug/IIII
LCPFHpSA 00001	11/21/17	Welling	ton Laboratories,	Lot. L	PFHpS1112	(Purchased Reage	ent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		ton Laboratories,			(Purchased Reage		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17		ton Laboratories,			(Purchased Reage		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		ton Laboratories,			(Purchased Reage		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories,			(Purchased Reage	ent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00004	10/11/18	Wellin	gton Laboratories,	Lot	PFOA1013	(Purchased Reage	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17		gton Laboratories,			(Purchased Reage		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19	Welling	ton Laboratories,	Lot I	LPFOS0614	(Purchased Reage	ent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00005	07/31/18		ston Laboratories,			(Purchased Reage		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00003	01/03/18		ton Laboratories,			(Purchased Reage		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18		ton Laboratories,			(Purchased Reage		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18		ton Laboratories,			(Purchased Reage		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18	Welling	ton Laboratories,	Lot I	PFUdA0613	(Purchased Reage	ent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L1 00019	09/08/16	04/18/16	MeOH/H2O, Lot 902	85	5 mL	LCMPFCSU 00036	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_00045	25 uL	Perfluorobutyric acid	0.5 ng/mL
								Perfluorobutanesulfonic acid	0.442 ng/mL
								(PFBS)	0.5./-
								Perfluorodecanoic acid	0.5 ng/mL
								Perfluorododecanoic acid	0.5 ng/mL
								Perfluorodecane Sulfonic acid	0.482 ng/mL
								Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
								Perfluoroheptanesulfonic Acid	0.476 ng/mL
								Perfluorohexanoic acid	0.5 ng/mL
								Perfluorohexadecanoic acid	0.5 ng/mL
								Perfluorohexanesulfonic acid	0.473 ng/mL
								(PFHxS) Perfluorononanoic acid (PFNA)	0.5 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-18704-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Doogont ID	Date	Date	Used	Volume	Dongert ID	Added	Analyte	Concentration
Reagent ID	Date	Date	used	vorune	Reagent ID	Added	=	
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctandecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid	0.478 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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
			1 1 2 3 3 3		LCM2PFTeDA 00004	2.00 117.	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00008		13C8 FOSA	1 ug/mL
				:	LCMPFBA 00005		13C4 PFBA	1 ug/mL
				:	LCMPFDA 00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDOA 00007	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008		13C2 PFHXA	1 ug/mL
					LCMPFHxS 00005		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005		13C5 PFNA	1 ug/mL
					LCMPFOA 00009		13C4 PFOA	1 ug/mL
					LCMPFOS_00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00006		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00004			on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00004			on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00004	05/22/20		on Laboratories, Lot M4P		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00005	05/22/20		on Laboratories, Lot M5P		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00008	12/22/17		on Laboratories, Lot M8F		(Purchased Rea	gent)	13C8 FOSA	50 ug/mL
LCMPFBA_00005	10/31/19		gton Laboratories, Lot MP		(Purchased Rea	gent)	13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20		gton Laboratories, Lot MP		(Purchased Rea	gent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00005	07/17/19	Welling	ton Laboratories, Lot MPI	FDoA0714	(Purchased Rea	gent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00008	04/09/20	Welling	ton Laboratories, Lot MP1	HxA0415	(Purchased Rea	gent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00005	08/23/20	Welling	ton Laboratories, Lot MP1	HxS1015	(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19	Welling	ton Laboratories, Lot MP	FNA0414	(Purchased Rea	gent)	13C5 PFNA	50 ug/mL
LCMPFOA 00009	01/22/21	Welling	gton Laboratories, Lot MP	FOA0116	(Purchased Rea	gent)	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		gton Laboratories, Lot MP		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00006	10/31/19		ton Laboratories, Lot MP1		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00045			Methanol, Lot 090285		LCPFCSP 00044			0.1 ug/mL
		, ,, = -	,				Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	2 39/1111
							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
							(PFHpA)	J.1 49/1111
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
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Lab	Name:	TestAmerica	Sacramento	Job No.:	: 320-18704-1
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				Reagent	Parent Reag	ent		
Reagent ID	Exp Prep Date Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration	
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003		Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001		Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
	00/05/10				LCPFUdA 00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18		gton Laboratories, Lot I		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	-	gton Laboratories, Lot L		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00004	07/02/20		gton Laboratories, Lot B		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18		gton Laboratories, Lot L		(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19		gton Laboratories, Lot P		(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00001	11/21/17		ton Laboratories, Lot LI		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00003	05/09/19		gton Laboratories, Lot P		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004 LCPFHxSA_00001	11/28/17 05/09/19		ton Laboratories, Lot Pl ton Laboratories, Lot Ll		(Purchased Rea (Purchased Rea		Perfluorohexadecanoic acid Perfluorohexanesulfonic acid	50 ug/mL 47.3 ug/mL
TCLLUYOW_00001	03/09/19	метттид	con naboracorres, not hi	- FICUCARI	(ruiCilaseu Rea	igenc)	(PFHxS)	47.3 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 3	320-18704-1

				Reagent	Parent Reager	ıt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFNA 00004	05/09/19	Wellin	l gton Laboratories, Lot	DENIA 0.5.1.4	(Purchased Reag		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20		gton Laboratories, Lot		(Purchased Reag		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17		ton Laboratories, Lot		(Purchased Reag		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		ton Laboratories, Lot		(Purchased Reag		Perfluorooctanesulfonic acid	47.8 ug/mL
	00/20/19	Welling	geon Edbordeorres, Eoc .	BIIODOOII	(Turellabea Reag	CIIC)	(PFOS)	17.0 dg/101
LCPFOSA 00006	09/02/17	Welling	ton Laboratories, Lot	FOSA0815I	(Purchased Reag	ent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20	Welling	ton Laboratories, Lot	PFPeA0115	(Purchased Reag	ent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00003	06/19/18		ton Laboratories, Lot F		(Purchased Reag		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00003	12/10/18		ton Laboratories, Lot F		(Purchased Reag	ent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00003	06/19/18	Welling	ton Laboratories, Lot	PFUdA0613	(Purchased Reag	ent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2_00018	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mT.	LCMPFCSU 00024	250 uT	13C2-PFHxDA	50 ng/mL
20110 22_00010	00/23/10	12/30/13	110011/1120, 1100 030203	2 1111		250 41	13C2-FFHXDA 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 00040	50 uT	Perfluorobutyric acid	1 ng/mL
							Perfluorobutanesulfonic acid	0.884 ng/mL
							(PFBS)]
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid	1 ng/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.946 ng/mL
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid	0.956 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
							Perfluoroundecanoic acid	1 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1	
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
			110101		LCM2PFTeDA 00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00003	0.2 mL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00004	0.2 mL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00006	0.2 mL	13C8 FOSA	1 ug/mL
					LCMPFBA 00004	0.2 mL	13C4 PFBA	1 ug/mL
					LCMPFDA 00004	0.2 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00004	0.2 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00005	0.2 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00004	0.2 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00003	0.2 mL	13C5 PFNA	1 ug/mL
					LCMPFOA 00007	0.2 mL	13C4 PFOA	1 ug/mL
					LCMPFOS 00009	0.2 mL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00005	0.2 mL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00003	11/29/17	Wellingt	on Laboratories, Lot M	12PFHxDA1112	(Purchased Read	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00003	11/29/17		on Laboratories, Lot M		(Purchased Read	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00003	05/22/20	Wellingt	on Laboratories, Lot M	M4PFHpA0515	(Purchased Read	gent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00004	05/22/20	Wellingt	on Laboratories, Lot N	M5PFPeA0515	(Purchased Read	gent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00006	12/15/16		on Laboratories, Lot N		(Purchased Read	gent)	13C8 FOSA	50 ug/mL
LCMPFBA 00004	10/31/19	Welling	ston Laboratories, Lot	MPFBA1014	(Purchased Read	gent)	13C4 PFBA	50 ug/mL
LCMPFDA 00004	04/13/19	Welling	gton Laboratories, Lot	MPFDA0414	(Purchased Read	gent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00004	07/17/19	Welling	ton Laboratories, Lot	MPFDoA0714	(Purchased Read	gent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00005	04/13/19	Welling	ton Laboratories, Lot	MPFHxA0414	(Purchased Read	gent)	13C2 PFHxA	50 ug/mL
LCMPFHxS_00004	07/25/18		ton Laboratories, Lot		(Purchased Read	gent)	1802 PFHxS	47.3 ug/mL
LCMPFNA_00003	04/13/19		gton Laboratories, Lot		(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA 00007	04/10/20	Welling	gton Laboratories, Lot	MPFOA0415	(Purchased Read	gent)	13C4 PFOA	50 ug/mL
LCMPFOS_00009	05/15/20	Welling	ston Laboratories, Lot	MPFOS0515	(Purchased Read		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00005	10/31/19		ton Laboratories, Lot		(Purchased Read	-	13C2 PFUnA	50 ug/mL
.LCPFCSP_00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP_00039	0.5 mL		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
							(PFHpA)	0.0050 / 7
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0956 ug/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	0.1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

				Reagent	Parent Reage	ent		
Reagent ID		Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP 00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA 00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
_					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00003	0.1 mL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00003	0.1 mL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001	0.1 mL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	0.1 mL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	0.1 mL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00004	0.1 mL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	0.1 mL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003	0.1 mL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003	0.1 mL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00003	03/05/18		gton Laboratories, Lot F		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	Welling	gton Laboratories, Lot L	PFBS1014	(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00003	06/18/18		gton Laboratories, Lot F		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00003	01/03/18		gton Laboratories, Lot Pi		(Purchased Rea	gent)	Perfluorododecanoic acid	50 ug/mL
LCPFDSA_00001	09/13/18		gton Laboratories, Lot L		(Purchased Rea	gent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19		gton Laboratories, Lot P		(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00001	11/21/17		ton Laboratories, Lot LF		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00003	05/09/19		gton Laboratories, Lot Pi		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot PF		(Purchased Rea	gent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		ton Laboratories, Lot LF		(Purchased Rea	gent)	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories, Lot F		(Purchased Rea	<i>y</i> ,	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00004	10/11/18		gton Laboratories, Lot F		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17		gton Laboratories, Lot Pi		(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		gton Laboratories, Lot L	PFOS0614	(Purchased Rea	gent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA 00005	07/31/18	Welling	gton Laboratories, Lot F	OSA0714I	(Purchased Rea	gent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00003	01/03/18	Welling	gton Laboratories, Lot P		(Purchased Rea	gent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18	Welling	ton Laboratories, Lot PF	TeDA0613	(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18		ton Laboratories, Lot PF		(Purchased Rea	gent)	Perfluorotridecanoic acid	50 ug/mL

Lab N	ame:	TestAmerica	Sacramento	Job No.:	320-187		
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFUdA 00003	06/19/18	Welling	gton Laboratories, Lot F	FUdA0613	(Purchased Rea	gent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L2 00020	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00036	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 00045	50 uL	Perfluorobutyric acid	1 ng/mL
					_		Perfluorobutanesulfonic acid	0.884 ng/mL
							(PFBS)	
							Perfluorodecanoic acid	1 ng/mL
							Perfluorododecanoic acid	1 ng/mL
							Perfluorodecane Sulfonic acid	0.964 ng/mL
							Perfluoroheptanoic acid	1 ng/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.952 ng/mL
							Perfluorohexanoic acid	1 ng/mL
							Perfluorohexadecanoic acid	1 ng/mL
							Perfluorohexanesulfonic acid	0.946 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	1 ng/mL
							Perfluorooctanoic acid (PFOA)	1 ng/mL
							Perfluorooctandecanoic acid	1 ng/mL
							Perfluorooctanesulfonic acid	0.956 ng/mL
							(PFOS)	1 / 7
							Perfluorooctane Sulfonamide	1 ng/mL
							Perfluoropentanoic acid	1 ng/mL
							Perfluorotetradecanoic acid	1 ng/mL
							Perfluorotridecanoic acid	1 ng/mL
T. 01/17 T. 0.0.0.0.0	10/07/16	04/07/16	27 12 2 2 2 2	10000 -	7.01/0.777 77 0.0004	000 -	Perfluoroundecanoic acid	1 ng/mL
.LCMPFCSU_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00008		13C8 FOSA	1 ug/mL
					LCMPFBA 00005		13C4 PFBA	1 ug/mL
					LCMPFDA 00007		13C2 PFDA	1 ug/mL
					LCMPFDoA 00005		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008		13C2 PFHxA	1 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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					Parent Read	gent		
				Reagent				
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCMPFHxS 00005	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00004	01/07/21	Wellingt.	on Laboratories, Lot M2P	FH×DA1112	(Purchased Re		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00004			on Laboratories, Lot M2P		(Purchased Re	,	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00004	05/22/20		on Laboratories, Lot M4F		(Purchased Re	,	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00005	05/22/20		on Laboratories, Lot M5F		(Purchased Re	,	13C5-PFPeA	50 ug/mL
LCM8FOSA 00008	12/22/17		on Laboratories, Lot M8E		(Purchased Re		13C8 FOSA	50 ug/mL
LCMPFBA 00005	10/31/19		ton Laboratories, Lot ME		(Purchased Re	,	13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20		ton Laboratories, Lot ME		(Purchased Re		13C2 PFDA	50 ug/mL
LCMPFDoA 00005	07/17/19		ton Laboratories, Lot MP		(Purchased Re	,	13C2 PFDoA	50 ug/mL
LCMPFHxA 00008	04/09/20		ton Laboratories, Lot MP		(Purchased Re		13C2 PFHxA	50 ug/mL
LCMPFHxS 00005	08/23/20		ton Laboratories, Lot MP		(Purchased Re		1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19		ton Laboratories, Lot MI		(Purchased Re		13C5 PFNA	50 ug/mL
LCMPFOA 00009	01/22/21		ton Laboratories, Lot ME		(Purchased Re	,	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		ton Laboratories, Lot ME		(Purchased Re		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00006	10/31/19		ton Laboratories, Lot MP		(Purchased Re	,	13C2 PFUnA	50 ug/mL
.LCPFCSP 00045		04/18/16	Methanol, Lot 090285	5 mL			Perfluorobutyric acid	0.1 ug/mL
. ECT COT _00045	0 3 / 0 0 / 1 0	04/10/10	Mechanor, Loc 090203	J 1111	LCIFCSI_00044	0.5 1111	Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	0.0004 ug/IIII
							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
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.0946 ug/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid	0.0956 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_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003		Perfluorobutyric acid	1 ug/mL
_					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 117	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
T .	l .	l	I	T	120112011_00001	200 ub	ICITION OUCCOME DUTIONIC ACTU	I 0.704 ug/IIII

Lab Name: TestAmerica Sacramento Job	bb No.: 320-18704-1
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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001		Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
7.00000	02/05/10			1 0010	LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18	Welling	gton Laboratories, Lot F ton Laboratories, Lot L	PEDG1014	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001					(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00004	07/02/20		gton Laboratories, Lot F		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		ton Laboratories, Lot P.		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18		ton Laboratories, Lot L		(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	_	ton Laboratories, Lot P		(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00001	11/21/17		ton Laboratories, Lot LF		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFH×A_00003	05/09/19		ton Laboratories, Lot P		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17	Welling	ton Laboratories, Lot PF	'HXDA0707	(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		ton Laboratories, Lot LF		(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories, Lot F		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00005	11/06/20		gton Laboratories, Lot F		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17	Welling	ton Laboratories, Lot P. ton Laboratories, Lot L.	FODAU8U/	(Purchased Rea		Perfluorooctandecanoic acid Perfluorooctanesulfonic acid	50 ug/mL
LCPFOS_00004	06/20/19	_			(Purchased Rea		(PFOS)	47.8 ug/mL
LCPFOSA 00006	09/02/17		ton Laboratories, Lot F		(Purchased Rea		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20 06/19/18		ton Laboratories, Lot Pi ton Laboratories, Lot PF		(Purchased Rea		Perfluoropentanoic acid Perfluorotetradecanoic acid	50 ug/mL 50 ug/mL
LCPFTeDA 00003		welling	ton Laboratories, Lot PF ton Laboratories, Lot PF	TEDAU613	(Purchased Rea (Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00003	12/10/18 06/19/18		ton Laboratories, Lot Pr		(Purchased Rea		Perfluoroundecanoic acid	50 ug/mL
			•					
LCPFC-L3_00016	06/29/16	12/30/15	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00024	250 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA 13C2 PFDA	50 ng/mL
							13C2 PFDA 13C2 PFDoA	50 ng/mL 50 ng/mL
I				I	I	I	1302 11000	J0 119/11111

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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				Reagent	ent	Parent Reagent			
	Exp	Prep	Dilutant				Volume		
Reagent ID	Date	Date	Used	Volu	ıme	Reagent ID	Added	Analyte	Concentration
								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 00040	250 uL	Perfluorobutyric acid	5 ng/mL
						_		Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
								Perfluorodecanoic acid	5 ng/mL
								Perfluorododecanoic acid	5 ng/mL
								Perfluorodecane Sulfonic acid	4.82 ng/mL
								Perfluoroheptanoic acid	5 ng/mL
								(PFHpA)	3 11g/11ll
								Perfluoroheptanesulfonic Acid	4.76 ng/mL
								Perfluorohexanoic acid	5 ng/mL
								Perfluorohexadecanoic acid	5 ng/mL
								Perfluorohexanesulfonic acid	4.73 ng/mL
								(PFHxS)	J.
								Perfluorononanoic acid (PFNA)	5 ng/mL
								Perfluorooctanoic acid (PFOA)	5 ng/mL
								Perfluorooctandecanoic acid	5 ng/mL
								Perfluorooctanesulfonic acid (PFOS)	4.78 ng/mL
								Perfluorooctane Sulfonamide	5 ng/mL
								Perfluoropentanoic acid	5 ng/mL
								Perfluorotetradecanoic acid	5 ng/mL
								Perfluorotridecanoic acid	5 ng/mL
								Perfluoroundecanoic acid	5 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot B 115491	aker 10) mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
						LCM2PFTeDA 00003	0.2 mL	13C2-PFTeDA	1 ug/mL
						LCM4PFHPA 00003		13C4-PFHpA	1 ug/mL
						LCM5PFPEA 00004		13C5-PFPeA	1 ug/mL
						LCM8FOSA 00006	0.2 mL	13C8 FOSA	1 ug/mL
						LCMPFBA 00004	0.2 mL	13C4 PFBA	1 ug/mL
						LCMPFDA 00004	0.2 mL	13C2 PFDA	1 ug/mL
						LCMPFDoA_00004		13C2 PFDoA	1 ug/mL
						LCMPFHxA 00005	0.2 mL	13C2 PFHxA	1 ug/mL
						LCMPFHxS_00004	0.2 mL	1802 PFHxS	0.946 ug/mL
						LCMPFNA_00003	0.2 mL	13C5 PFNA	1 ug/mL
						LCMPFOA 00007		13C4 PFOA	1 ug/mL
						LCMPFOS_00009		13C4 PFOS	0.956 ug/mL
						LCMPFUdA_00005		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00003			on Laboratories,			(Purchased Rea	igent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00003			on Laboratories,			(Purchased Rea	igent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00003	05/22/20		on Laboratories,			(Purchased Rea	igent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00004	05/22/20	Wellingt	on Laboratories,	Lot M5PFPeA05	515	(Purchased Rea	igent)	13C5-PFPeA	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCM8FOSA_00006	12/15/16	Wellingt	on Laboratories, Lot M8F	OSA1214I	(Purchased Read	gent)	13C8 FOSA	50 ug/mI
LCMPFBA 00004	10/31/19	Welling	gton Laboratories, Lot MF	FBA1014	(Purchased Read	gent)	13C4 PFBA	50 ug/m
.LCMPFDA 00004	04/13/19	Welling	gton Laboratories, Lot MF	FDA0414	(Purchased Read	gent)	13C2 PFDA	50 ug/m
.LCMPFDoA 00004	07/17/19	Welling	ton Laboratories, Lot MP	FDoA0714	(Purchased Read	gent)	13C2 PFDoA	50 ug/m
.LCMPFHxA 00005	04/13/19	Welling	ton Laboratories, Lot MP	FHxA0414	(Purchased Read	gent)	13C2 PFHxA	50 ug/m
.LCMPFHxS 00004	07/25/18	Welling	ton Laboratories, Lot MP:	FHxS0713	(Purchased Read	gent)	1802 PFHxS	47.3 ug/m
.LCMPFNA 00003	04/13/19	Welling	gton Laboratories, Lot MF	FNA0414	(Purchased Read	gent)	13C5 PFNA	50 ug/m
.LCMPFOA 00007	04/10/20	Welling	gton Laboratories, Lot MF	FOA0415	(Purchased Read	gent)	13C4 PFOA	50 ug/m
.LCMPFOS 00009	05/15/20	Welling	ton Laboratories, Lot MF	FOS0515	(Purchased Read	gent)	13C4 PFOS	47.8 ug/m
.LCMPFUdA 00005	10/31/19	Welling	ton Laboratories, Lot MP	FUdA1014	(Purchased Read	gent)	13C2 PFUnA	50 ug/m
LCPFCSP 00040	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFCSP 00039	0.5 mL	Perfluorobutyric acid	0.1 ug/m
-			·		_		Perfluorobutanesulfonic acid	0.0884 ug/m
							(PFBS)	
							Perfluorodecanoic acid	0.1 ug/m
							Perfluorododecanoic acid	0.1 ug/m
							Perfluorodecane Sulfonic acid	0.0964 ug/m
							Perfluoroheptanoic acid	0.1 ug/m
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	0.0952 ug/m
							Perfluorohexanoic acid	0.1 ug/m
							Perfluorohexadecanoic acid	0.1 ug/m
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/ml
							Perfluorononanoic acid (PFNA)	0.1 ug/mI
							Perfluorooctanoic acid (PFOA)	0.1 ug/ml
							Perfluorooctandecanoic acid	0.1 ug/m
							Perfluorooctanesulfonic acid	0.0956 ug/m
							(PFOS)	
							Perfluorooctane Sulfonamide	0.1 ug/m
							Perfluoropentanoic acid	0.1 ug/m
							Perfluorotetradecanoic acid	0.1 ug/m
							Perfluorotridecanoic acid	0.1 ug/m
							Perfluoroundecanoic acid	0.1 ug/m
.LCPFCSP_00039	06/30/16	12/30/15	Methanol, Lot 090285	5 mL	LCPFBA_00003		Perfluorobutyric acid	1 ug/m
					LCPFBSA_00001	0.1 mL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/ml
					LCPFDA 00003	0.1 mL	Perfluorodecanoic acid	1 ug/ml
					LCPFDoA 00003		Perfluorododecanoic acid	1 ug/ml
					LCPFDSA 00001		Perfluorodecane Sulfonic acid	0.964 ug/m
					LCPFHpA_00004		Perfluoroheptanoic acid	1 ug/ml
					LCPFHpSA 00001	0.1 mL	(PFHpA) Perfluoroheptanesulfonic Acid	0.952 ug/mI
					LCPFHxA 00003		Perfluorohexanoic acid	1 ug/ml
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/m
					LCPFHxSA_00001		Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/ml
					LCPFNA 00004	0.1 mT	Perfluorononanoic acid (PFNA)	1 ug/mi
					LCPFOA 00004		Perfluorooctanoic acid (PFOA)	1 ug/m
					LCPFODA 00004		Perfluorooctandecanoic acid	1 ug/m

Lab Name: Test	America Sacramento	Job No.: 320-18704-1	
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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_00004	0.1 mL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00003	0.1 mL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18	Wellin	gton Laboratories, Lot P	FBA0313	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	_	ton Laboratories, Lot Ll		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00003	06/18/18		gton Laboratories, Lot P		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00003	01/03/18		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDSA_00001	09/13/18		ton Laboratories, Lot Ll		(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	_	ton Laboratories, Lot PI	-	(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00001	11/21/17		ton Laboratories, Lot LP		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00003	05/09/19		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot PF		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		ton Laboratories, Lot LP		(Purchased Rea	_	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories, Lot P		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00004	10/11/18		gton Laboratories, Lot P		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		ton Laboratories, Lot L		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00005	07/31/18		ton Laboratories, Lot FO		(Purchased Rea		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00003	01/03/18		ton Laboratories, Lot Pl		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18		ton Laboratories, Lot PF		(Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18		ton Laboratories, Lot Pl	'UdAU613	(Purchased Rea		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L3_00017	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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
					T CDECCD 00045	250 +	13C2 PFUnA Perfluorobutyric acid	50 ng/mL
					LCPFCSP_00045	250 uL	Perfluorobutyric acid Perfluorobutanesulfonic acid	5 ng/mL
							(PFBS)	4.42 ng/mL
							Perfluorodecanoic acid	5 ng/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1	
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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorododecanoic acid	5 ng/mL
							Perfluorodecane Sulfonic acid	4.82 ng/mL
							Perfluoroheptanoic acid	5 ng/mL
							(PFHpA)	
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.73 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctandecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid	4.78 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	5 ng/mL
							Perfluoropentanoic acid	5 ng/mL
							Perfluorotetradecanoic acid	5 ng/mL
							Perfluorotridecanoic acid	5 ng/mL
T. C. (7) T. C. (1) C.	10/07/16	04/07/16	16 11 1 7 1 7 1	10000 -	7.0140.0001	000 -	Perfluoroundecanoic acid	5 ng/mL
.LCMPFCSU_00036	10/0//16	04/0//16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
			115935		LCM2PFTeDA 00004	200 11T	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00008		13C8 FOSA	1 ug/mL
					LCMPFBA 00005		13C4 PFBA	1 ug/mL
					LCMPFDA 00007		13C2 PFDA	1 ug/mL
					LCMPFDoA 00005		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008		13C2 PFHxA	1 ug/mL
					LCMPFHxS 00005		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005		13C5 PFNA	1 ug/mL
					LCMPFOA 00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006	200 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00004			on Laboratories, Lot M2P		(Purchased Rea	-	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00004			on Laboratories, Lot M2P		(Purchased Rea	,	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00004	05/22/20		on Laboratories, Lot M41		(Purchased Rea	-	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00005	05/22/20		on Laboratories, Lot M51		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00008	12/22/17		on Laboratories, Lot M81		(Purchased Rea	-	13C8 FOSA	50 ug/mL
LCMPFBA_00005	10/31/19		ton Laboratories, Lot MF		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00007	08/19/20		ton Laboratories, Lot MI		(Purchased Rea	-	13C2 PFDA	50 ug/mL
LCMPFDoA_00005	07/17/19		ton Laboratories, Lot MP		(Purchased Rea	-	13C2 PFDoA	50 ug/mL
LCMPFHxA_00008	04/09/20		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00005	08/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00005	04/13/19	_	ton Laboratories, Lot MI		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00009	01/22/21		ton Laboratories, Lot MI		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		ton Laboratories, Lot MI		(Purchased Rea	-	13C4 PFOS	47.8 ug/mL
LCMPFUdA_00006	10/31/19	Melling.	ton Laboratories, Lot MP	F.ndV1014	(Purchased Rea	igent)	13C2 PFUnA	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-18704-1
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	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Parent Reagent			
Reagent ID					Reagent ID	Volume Added	Analyte	Concentration
.LCPFCSP 00045	09/08/16	04/18/16	Methanol, Lot 090285	5 mL	LCPFCSP 00044	0.5 mL	Perfluorobutyric acid	0.1 ug/mL
_					_		Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							Perfluorodecane Sulfonic acid	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.0946 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctandecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0956 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							Perfluoropentanoic acid	0.1 ug/mL
							Perfluorotetradecanoic acid	0.1 ug/mL
							Perfluorotridecanoic acid	0.1 ug/mL
							Perfluoroundecanoic acid	0.1 ug/mL
LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003		Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA_00001		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18		gton Laboratories, Lot E				Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001 10/09/19 Wellington Laboratories, Lot LPFBS1014				(Purchased Reagent)		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL	

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

					Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFDA 00004	07/02/20	Wellin	gton Laboratories,	Lot	PFDA0615	(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20	Welling	ton Laboratories,	Lot	PFDoA0115	(Purchased Rea	agent)	Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18	Welling	ton Laboratories,	Lot	LPFDS0913	(Purchased Rea	agent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	Welling	ton Laboratories,	Lot	PFHpA0514	(Purchased Rea	agent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA 00001	11/21/17	Welling	ton Laboratories,	Lot	LPFHpS1112	(Purchased Rea	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19	Welling	ton Laboratories,	Lot	PFHxA0514	(Purchased Rea	agent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories,	Lot	PFHxDA0707	(Purchased Rea	agent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19	-	ton Laboratories,			(Purchased Rea	agent)	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA 00004	05/09/19	Wellin	gton Laboratories,	, Lot	PFNA0514	(Purchased Rea	agent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20	Wellin	gton Laboratories,	, Lot	PFOA1115	(Purchased Rea	agent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17	Welling	ston Laboratories,	Lot	PFODA0807	(Purchased Rea	agent)	Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19	Welling	ton Laboratories,	Lot	LPFOS0614	(Purchased Rea	agent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00006	09/02/17	Welling	gton Laboratories,	Lot	FOSA0815I	(Purchased Rea	agent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20		gton Laboratories,			(Purchased Rea	agent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18		ton Laboratories,			(Purchased Rea	agent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18	Welling	ton Laboratories,	Lot	PFTrDA1213	(Purchased Rea	agent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18	Welling	ston Laboratories,	Lot	PFUdA0613	(Purchased Rea	agent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4 00018	08/11/16	03/02/16	MeOH/H2O, Lot 090	285	5 mL	LCMPFCSU 00029	250 uI	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_00041	100 uI	Perfluorobutyric acid	20 ng/mL
								Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
								Perfluorodecanoic acid	20 ng/mL
								Perfluorododecanoic acid	20 ng/mL
								Perfluorodecane Sulfonic acid	19.28 ng/mL
								Perfluoroheptanoic acid (PFHpA)	20 ng/mL
								Perfluoroheptanesulfonic Acid	19.04 ng/mL
								Perfluorohexanoic acid	20 ng/mL
								Perfluorohexadecanoic acid	20 ng/mL
								Perfluorohexanesulfonic acid (PFHxS)	18.92 ng/mL
					[Perfluorononanoic acid (PFNA)	20 ng/mL

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				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid	19.12 ng/mL
							(PFOS)	
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
							Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00029	08/29/16	02/29/16	Methanol, Lot Baker 115491	10000 uL	LCM2PFHxDA_00003	200 uL	13C2-PFHxDA	1 ug/mL
			110191		LCM2PFTeDA 00003	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00003		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00004		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00007		13C8 FOSA	1 ug/mL
					LCMPFBA 00004		13C4 PFBA	1 ug/mL
					LCMPFDA 00006	2.00 111	13C2 PFDA	1 ug/mL
					LCMPFDoA 00004	2.00 111	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00007		13C2 PFHxA	1 ug/mL
					LCMPFHxS 00004		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00004		13C5 PFNA	1 ug/mL
					LCMPFOA 00008		13C4 PFOA	1 ug/mL
					LCMPFOS 00010		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00005		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00003	11/29/17	Wellingto	on Laboratories, Lot M2P1	HxDA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00003	11/29/17		on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00003	05/22/20	Wellingt	on Laboratories, Lot M4P	FHpA0515	(Purchased Rea	agent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00004	05/22/20	Wellingt	on Laboratories, Lot M5P	FPeA0515	(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00007	12/15/16		on Laboratories, Lot M8F		(Purchased Rea	agent)	13C8 FOSA	50 ug/mL
LCMPFBA 00004	10/31/19		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00006	08/19/20	Welling	ton Laboratories, Lot MP	FDA0815	(Purchased Rea	agent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00004	07/17/19	Welling	ton Laboratories, Lot MP1	FDoA0714	(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00007	04/09/20		ton Laboratories, Lot MP1		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00004	07/25/18	Welling	ton Laboratories, Lot MP1	FHxS0713	(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00004	04/13/19	Welling	ton Laboratories, Lot MP	FNA0414	(Purchased Rea	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00008	04/10/20	Welling	ton Laboratories, Lot MP	FOA0415	(Purchased Rea	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00010	05/15/20	Welling	ton Laboratories, Lot MP	FOS0515	(Purchased Rea	agent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00005	10/31/19	Welling	ton Laboratories, Lot MP1	FUdA1014	(Purchased Rea	agent)	13C2 PFUnA	50 ug/mL
.LCPFCSP 00041	08/11/16		Methanol, Lot 090285		LCPFBA 00003	0.1 mL	Perfluorobutyric acid	1 ug/mL
_					LCPFBSA 00001	0.1 mL	Perfluorobutanesulfonic acid	0.884 ug/mL
					_		(PFBS)	_
					LCPFDA_00003		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	0.1 mL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	0.1 mT.	Perfluoroheptanesulfonic Acid	0.952 ug/mL
I .					LCPFHxA 00003	0.1 1112	Perfluorohexanoic acid	1 ug/mL

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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18		gton Laboratories, Lot		(Purchased Rea	J ,	Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	-	gton Laboratories, Lot		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00003	06/18/18		gton Laboratories, Lot		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00003	01/03/18		gton Laboratories, Lot		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDSA_00001	09/13/18	Welling	gton Laboratories, Lot	LPFDS0913	(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	Welling	gton Laboratories, Lot	PFHpA0514	(Purchased Rea	igent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA 00001	11/21/17		ton Laboratories, Lot		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		gton Laboratories, Lot		(Purchased Rea	igent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories, Lot	PFHxDA0707	(Purchased Rea	igent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19	Welling	ton Laboratories, Lot	LPFHxS0514	(Purchased Rea	igent)	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19	Wellin	gton Laboratories, Lot	PFNA0514	(Purchased Rea	igent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00004	10/11/18		gton Laboratories, Lot		(Purchased Rea	igent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17		gton Laboratories, Lot		(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19	Welling	gton Laboratories, Lot	LPFOS0614	(Purchased Rea	igent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00005	07/31/18		gton Laboratories, Lot		(Purchased Rea	igent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00003	01/03/18		gton Laboratories, Lot		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18	Welling	ton Laboratories, Lot	PFTeDA0613	(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18	Welling	ton Laboratories, Lot	PFTrDA1213	(Purchased Rea	igent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18	Welling	gton Laboratories, Lot	PFUdA0613	(Purchased Rea	igent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L4 00020	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mI	LCMPFCSU 00036	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/mI
							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

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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C4 PFOS	47.8 ng/mL
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00044	100 uL	Perfluorobutyric acid	20 ng/mL
					_		Perfluorobutanesulfonic acid	17.68 ng/mL
							(PFBS)	
							Perfluorodecanoic acid	20 ng/mL
							Perfluorododecanoic acid	20 ng/mL
							Perfluorodecane Sulfonic acid	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid	18.92 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctandecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	19.12 ng/mL
							Perfluorooctane Sulfonamide	20 ng/mL
							Perfluoropentanoic acid	20 ng/mL
							Perfluorotetradecanoic acid	20 ng/mL
							Perfluorotridecanoic acid	20 ng/mL
		/ /					Perfluoroundecanoic acid	20 ng/mL
.LCMPFCSU_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00004		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008		13C8 FOSA	1 ug/mL
					LCMPFBA_00005		13C4 PFBA	1 ug/mL
					LCMPFDA_00007	200 uL	13C2 PFDA 13C2 PFDoA	1 ug/mL
					LCMPFDoA_00005 LCMPFHxA 00008		13C2 PFDOA 13C2 PFHxA	1 ug/mL
					LCMPFHxA_00008		1802 PFHXS	1 ug/mL 0.946 ug/mL
					LCMPFNA 00005		13C5 PFNA	1 ug/mL
					LCMPFOA 00009		13C4 PFOA	1 ug/mL
					LCMPFOS 00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00004	01/07/21	Wellingt	l on Laboratories, Lot M2PB	HxDA1112	(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00004			on Laboratories, Lot M2PA		(Purchased Rea	<i>,</i>	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00004	05/22/20		on Laboratories, Lot M4P		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00005	05/22/20		on Laboratories, Lot M5P		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA 00008	12/22/17		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00005	10/31/19		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00007	08/19/20		gton Laboratories, Lot MP	FDA0815	(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00005	07/17/19	Welling	ton Laboratories, Lot MPH	FDoA0714	(Purchased Rea		13C2 PFDoA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFHxA 00008	04/09/20	Welling	ton Laboratories, Lot	MPFHxA0415	(Purchased Rea	agent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00005	08/23/20	Welling	ton Laboratories, Lot	MPFHxS1015	(Purchased Rea	agent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19	Welling	ton Laboratories, Lot	MPFNA0414	(Purchased Rea	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00009	01/22/21		ton Laboratories, Lot		(Purchased Rea	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21	Welling	ton Laboratories, Lot	MPFOS0116	(Purchased Rea	agent)	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00006	10/31/19	Welling	ton Laboratories, Lot	MPFUdA1014	(Purchased Rea	agent)	13C2 PFUnA	50 ug/mL
.LCPFCSP 00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA 00003	200 uL	Perfluorobutyric acid	1 ug/mL
_					LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001	200 uL	Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003	200 uL	Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00003	03/05/18	Welling	gton Laboratories, Lo	t PFBA0313	(Purchased Rea	agent)	Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19		ton Laboratories, Lot		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00004	07/02/20	Welling	gton Laboratories, Lo	t PFDA0615	(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20	Welling	ton Laboratories, Lot	: PFDoA0115	(Purchased Rea	agent)	Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18	Welling	ton Laboratories, Lot	: LPFDS0913	(Purchased Rea	agent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	_	ton Laboratories, Lot	-	(Purchased Rea	igent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA_00001	11/21/17	Welling	ton Laboratories, Lot	LPFHpS1112	(Purchased Rea	igent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		ton Laboratories, Lot		(Purchased Rea	agent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17	Welling	ton Laboratories, Lot	PFHxDA0707	(Purchased Rea	igent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19	Welling	ton Laboratories, Lot	LPFHxS0514	(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA 00004	05/09/19		gton Laboratories, Lo		(Purchased Rea	igent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20	Wellin	gton Laboratories, Lo	t PFOA1115	(Purchased Rea	igent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17		ton Laboratories, Lot		(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		ton Laboratories, Lot		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00006	09/02/17	Welling	ton Laboratories, Lot	FOSA0815I	(Purchased Rea	igent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20	Welling	ton Laboratories, Lot	PFPeA0115	(Purchased Rea	agent)	Perfluoropentanoic acid	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-18704-1

				Reag	an+	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Fin Volu	al	eagent ID	Volume Added	Analyte	Concentration
LCPFTeDA 00003	06/19/18	Welling	ton Laboratories,	Lot PFTeDA06	13 (Purchased Rea	gent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA 00003	12/10/18		ton Laboratories,			Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00003	06/19/18		gton Laboratories,			Purchased Rea		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5_00017	08/11/16	03/02/16	MeOH/H2O, Lot 09	0285	mL LCMPFC	SII NNN29	250 117.	13C2-PFHxDA	50 ng/mL
ECFFC E3_00017	00/11/10	03/02/10	112011/ 1120 , 100 030	0203	MIL BOTH I C	00023	250 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 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
					LCPFCS	00041	250 111	Perfluorobutyric acid	50 ng/mL
								Perfluorobutanesulfonic acid	44.2 ng/mL
								(PFBS)	
								Perfluorodecanoic acid	50 ng/mL
								Perfluorododecanoic acid	50 ng/mL
								Perfluorodecane Sulfonic acid	48.2 ng/mL
								Perfluoroheptanoic acid	50 ng/mL
								(PFHpA)	
								Perfluoroheptanesulfonic Acid	47.6 ng/mL
								Perfluorohexanoic acid	50 ng/mL
								Perfluorohexadecanoic acid	50 ng/mL
								Perfluorohexanesulfonic acid (PFHxS)	47.3 ng/mL
								Perfluorononanoic acid (PFNA)	50 ng/mL
								Perfluorooctanoic acid (PFOA)	50 ng/mL
								Perfluorooctandecanoic acid	50 ng/mL
								Perfluorooctanesulfonic acid (PFOS)	47.8 ng/mL
								Perfluorooctane Sulfonamide	50 ng/mL
								Perfluoropentanoic acid	50 ng/mL
								Perfluorotetradecanoic acid	50 ng/mL
								Perfluorotridecanoic acid	50 ng/mL
								Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00029	08/29/16	02/29/16	Methanol, Lot Bal 115491	ker 10000	uL LCM2PF	1xDA_00003	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PF	TeDA 00003	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PF	HPA 00003	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PF	PEA 00004	200 uL	13C5-PFPeA	1 ug/mL
						SA 00007		13C8 FOSA	1 ug/mL
					LCMPFB.	A_00004	200 uL	13C4 PFBA	1 ug/mL
					LCMPFD.	<u>00006</u>	200 uL	13C2 PFDA	1 ug/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-18704-1	

				Reagent	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCMPFDoA 00004	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00007		13C2 PFHxA	1 ug/mL
					LCMPFHxS 00004	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00004	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00008		13C4 PFOA	1 ug/mL
					LCMPFOS 00010		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00005	200 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00003	11/29/17		on Laboratories, Lot		(Purchased Rea	igent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00003	11/29/17	Wellingt	on Laboratories, Lot	M2PFTeDA1112	(Purchased Rea	igent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00003	05/22/20		on Laboratories, Lot		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00004	05/22/20	Wellingt	on Laboratories, Lot	M5PFPeA0515	(Purchased Rea	igent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00007	12/15/16		on Laboratories, Lot		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00004	10/31/19		ton Laboratories, Lo		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00006	08/19/20		gton Laboratories, Lo		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00004	07/17/19		ton Laboratories, Lot		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00007	04/09/20		ton Laboratories, Lot		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00004	07/25/18		ton Laboratories, Lot		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00004	04/13/19		ton Laboratories, Lo		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00008	04/10/20		ton Laboratories, Lo		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00010	05/15/20		ton Laboratories, Lo		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00005	10/31/19		ton Laboratories, Lot		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00041		,	Methanol, Lot 090285			0.1 mL		1 ug/mL
		, ,	,		LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00003	0.1 mT	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00003		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001		Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00004		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00005	0.1 mL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00003		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00003	03/05/18	Wellin	gton Laboratories, Lo	ot PFBA0313	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19		gton Laboratories, Lo		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00003	06/18/18	Wellin	gton Laboratories, Lo	ot PFDA0613	(Purchased Rea	igent)	Perfluorodecanoic acid	50 ug/mL

Lab Name: TestAmerica S	acramento	Job No.: 320-18704-1
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				Reagent	Parent Rea	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFDoA 00003	01/03/18	Welling	ton Laboratories, Lot F	FDoA0113	(Purchased Re	eagent)	Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18	Welling	ton Laboratories, Lot I	PFDS0913	(Purchased Re	eagent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	-	ton Laboratories, Lot F	-	(Purchased Re	eagent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA 00001	11/21/17	Welling	ton Laboratories, Lot L	PFHpS1112	(Purchased Re		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00003	05/09/19		ton Laboratories, Lot P		(Purchased Re		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA_00004	11/28/17		ton Laboratories, Lot P		(Purchased Re		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19	1	ton Laboratories, Lot L		(Purchased Re	_	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories, Lot 1		(Purchased Re	eagent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00004	10/11/18		gton Laboratories, Lot 1		(Purchased Re	eagent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17	Welling	ton Laboratories, Lot F	FODA0807	(Purchased Re		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19	Welling	ton Laboratories, Lot I	PFOS0614	(Purchased Re	eagent)	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00005	07/31/18	Welling	ton Laboratories, Lot F	OSA0714I	(Purchased Re	eagent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00003	01/03/18	Welling	ton Laboratories, Lot F	FPeA0113	(Purchased Re	eagent)	Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18	Welling	ton Laboratories, Lot P	FTeDA0613	(Purchased Re	eagent)	Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18	,	ton Laboratories, Lot P		(Purchased Re	eagent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18	Welling	ton Laboratories, Lot F	FUdA0613	(Purchased Re	eagent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L5 00018	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00036	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_00044	250 uL	Perfluorobutyric acid	50 ng/mL
							Perfluorobutanesulfonic acid (PFBS)	44.2 ng/mL
							Perfluorodecanoic acid	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							Perfluorodecane Sulfonic acid	48.2 ng/mL
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.3 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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				D	Parent Reag	gent		
		D	D'1	Reagent		77.7		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorooctandecanoic acid	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.8 ng/mL
							Perfluorooctane Sulfonamide	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							Perfluorotetradecanoic acid	50 ng/mL
							Perfluorotridecanoic acid	50 ng/mL
							Perfluoroundecanoic acid	50 ng/mL
.LCMPFCSU_00036	10/07/16	04/07/16	Methanol, Lot Baker	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
			110300		LCM2PFTeDA 00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00005		13C4 PFBA	1 ug/mL
					LCMPFDA 00007	200 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00005	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00005	200 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00005		13C5 PFNA	1 ug/mL
					LCMPFOA 00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS_00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00006		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00004			on Laboratories, Lot M		(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00004	12/07/20	Wellingt	on Laboratories, Lot M		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00004	05/22/20		on Laboratories, Lot M		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00005	05/22/20		on Laboratories, Lot M		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00008	12/22/17		on Laboratories, Lot M		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00005	10/31/19		ton Laboratories, Lot		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00007	08/19/20		ton Laboratories, Lot		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA_00005	07/17/19		ton Laboratories, Lot I		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00008	04/09/20		ton Laboratories, Lot I		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00005	08/23/20		ton Laboratories, Lot I		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00005	04/13/19		ton Laboratories, Lot		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA_00009	01/22/21		ton Laboratories, Lot		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS_00012	01/22/21		ton Laboratories, Lot		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00006	10/31/19		ton Laboratories, Lot I		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00044	09/08/16	03/08/16	Methanol, Lot 090285	10000 uL	LCPFBA_00003	200 uL	Perfluorobutyric acid	1 ug/mL
					LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA_00004		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 11T.	Perfluorohexadecanoic acid	1 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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				Reagent	Parent Read	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
	00/05/40				LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18		gton Laboratories, Lot P		(Purchased Re	<u> </u>	Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	_	ton Laboratories, Lot Ll		(Purchased Re		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00004	07/02/20	Wellin	gton Laboratories, Lot P	FDA0615	(Purchased Re		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00004	01/30/20		ton Laboratories, Lot Pl		(Purchased Re		Perfluorododecanoic acid	50 ug/mL
LCPFDSA_00001	09/13/18 05/09/19		ton Laboratories, Lot L		(Purchased Re		Perfluorodecane Sulfonic acid	48.2 ug/mL 50 ug/mL
LCPFHpA_00004			ton Laboratories, Lot Pl		(Purchased Re		Perfluoroheptanoic acid (PFHpA)	_
LCPFHpSA_00001	11/21/17		ton Laboratories, Lot LP		(Purchased Re		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		ton Laboratories, Lot Pl		(Purchased Re		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17		ton Laboratories, Lot PF		(Purchased Re		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		ton Laboratories, Lot LP		(Purchased Re		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories, Lot P		(Purchased Re		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00005	11/06/20		gton Laboratories, Lot P		(Purchased Re		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17	Welling	ton Laboratories, Lot Pl	FODA0807	(Purchased Re		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		ton Laboratories, Lot Ll		(Purchased Re	_	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00006	09/02/17		ton Laboratories, Lot FO		(Purchased Re		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20		ton Laboratories, Lot PI		(Purchased Re		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18		ton Laboratories, Lot PF		(Purchased Re		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18		ton Laboratories, Lot PF		(Purchased Re		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18		ton Laboratories, Lot Pl		(Purchased Re		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L6_00015	06/29/16	12/30/15	MeOH/H2O, Lot 090285	2 mL	LCMPFCSU_00024	100 uL	13C2-PFHxDA	50 ng/mL
							13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							1802 PFHxS	47.3 ng/mL
							13C5 PFNA 13C4 PFOA	50 ng/mL 50 ng/mL
							13C4 PFOS	47.8 ng/mL
	1		l	1	I	I	11001 1100	1 47.0 Hg/III

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
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				Doggont	Parent Reage	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Reagent Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00039	400 uL		200 ng/mL
						100 41	Perfluorobutanesulfonic acid (PFBS)	176.8 ng/mL
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid	200 ng/mL
							(PFHpA)]
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid	189.2 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid	191.2 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_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00003		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006		13C8 FOSA	1 ug/mL
					LCMPFBA_00004		13C4 PFBA	1 ug/mL
					LCMPFDA_00004		13C2 PFDA	1 ug/mL
					LCMPFDoA_00004		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00005		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003		13C5 PFNA	1 ug/mL
					LCMPFOA_00007		13C4 PFOA	1 ug/mL
					LCMPFOS_00009		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00005		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00003	11/29/17		on Laboratories, Lot M2P1		(Purchased Rea	,	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00003	11/29/17		on Laboratories, Lot M2P1		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00003	05/22/20		on Laboratories, Lot M4F		(Purchased Rea	,	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00004	05/22/20		on Laboratories, Lot M5F		(Purchased Rea	,	13C5-PFPeA	50 ug/mL
LCM8FOSA_00006	12/15/16		on Laboratories, Lot M8F		(Purchased Rea	,	13C8 FOSA	50 ug/mL
LCMPFBA_00004	10/31/19		ton Laboratories, Lot MP		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00004	04/13/19		ton Laboratories, Lot MP		(Purchased Rea	,	13C2 PFDA	50 ug/mL
LCMPFDoA_00004	07/17/19		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00005	04/13/19	Wellingt	ton Laboratories, Lot MP	FHxA0414	(Purchased Rea	gent)	13C2 PFHxA	50 ug/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-18704-1	
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				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFHxS 00004	07/25/18	Welling	ton Laboratories, Lot	MPFHxS0713	(Purchased Rea	agent.)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00003	04/13/19		ton Laboratories, Lot		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00007	04/10/20		ton Laboratories, Lot		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00009	05/15/20		ton Laboratories, Lot		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00005	10/31/19		ton Laboratories, Lot		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00039			Methanol, Lot 090285	5 mL		0.1 mL		1 ug/mL
	00,00,10	12/00/10	nechanol, for 030200	J ME	LCPFBSA_00001		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00003	0 1 mT.	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00003		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	0 1 mT.	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001		Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	0 1 mT	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00004	0.1 mT.	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid	0.956 ug/mL
					LCPFOSA 00005	0 1 mT.	(PFOS) Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00003		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003		Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00003	03/05/18	Wellin	Lgton Laboratories, Lot	- DFRAN313	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	Welling	gton Laboratories, Lot	LPFBS1014	(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00003	06/18/18	Wellin	gton Laboratories, Lot	: PFDA0613	(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00003	01/03/18		ton Laboratories, Lot		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18	Welling	gton Laboratories, Lot	LPFDS0913	(Purchased Rea	agent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	Welling	gton Laboratories, Lot	PFHpA0514	(Purchased Rea		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA 00001	11/21/17	Welling	ton Laboratories, Lot	LPFHpS1112	(Purchased Rea	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		ton Laboratories, Lot		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17		ton Laboratories, Lot		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		ton Laboratories, Lot		(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA 00004	05/09/19	Wellin	gton Laboratories, Lot	PFNA0514	(Purchased Rea	agent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00004	10/11/18	Wellin	gton Laboratories, Lot	FFOA1013	(Purchased Rea	agent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17	Welling	gton Laboratories, Lot	PFODA0807	(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19	Welling	gton Laboratories, Lot	LPFOS0614	(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA 00005	07/31/18	Welling	gton Laboratories, Lot	FOSA0714T	(Purchased Rea	agent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00003	01/03/18		ton Laboratories, Lot		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00003	06/19/18		ton Laboratories, Lot		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL

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				Reagent	Parent Re	agent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFTrDA 00003	12/10/18	Welling	l ton Laboratories, Lot PF'	 	(Purchased F	Reagent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA 00003	06/19/18		ton Laboratories, Lot PF		(Purchased F		Perfluoroundecanoic acid	50 ug/mL
_			· · · · · · · · · · · · · · · · · · ·					
LCPFC-L6_00017	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	250 uL	13C2-PFHxDA 13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL 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 00044	1000 uL	Perfluorobutyric acid	200 ng/mL
							Perfluorobutanesulfonic acid	176.8 ng/mL
							(PFBS)	, , , ,
							Perfluorodecanoic acid	200 ng/mL
							Perfluorododecanoic acid	200 ng/mL
							Perfluorodecane Sulfonic acid	192.8 ng/mL
							Perfluoroheptanoic acid (PFHpA)	200 ng/mL
							Perfluoroheptanesulfonic Acid	190.4 ng/mL
							Perfluorohexanoic acid	200 ng/mL
							Perfluorohexadecanoic acid	200 ng/mL
							Perfluorohexanesulfonic acid	189.2 ng/mL
							(PFHxS)	103.11 119, 1111
							Perfluorononanoic acid (PFNA)	200 ng/mL
							Perfluorooctanoic acid (PFOA)	200 ng/mL
							Perfluorooctandecanoic acid	200 ng/mL
							Perfluorooctanesulfonic acid	191.2 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_00036	10/07/16	04/07/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00004	200 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00008	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00005		13C4 PFBA	1 ug/mL
					LCMPFDA 00007		13C2 PFDA	1 ug/mL
					LCMPFDoA_00005	200 uL	13C2 PFDoA	1 ug/mL
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Lab	Name: TestAmerica	Sacramento	Job No.: 320-18704-1

				Decemb	Parent Rea	agent		
	Erro D	Prep	Dilutant	Reagent Final		Volume	1	
Reagent ID	_	rep ate	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCMPFHxA 00008	2.00 111	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00005		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005		13C5 PFNA	1 ug/mL
					LCMPFOA 00009		13C4 PFOA	1 ug/mL
					LCMPFOS 00012		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006		13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00004	01/07/21 Wel	llinata	on Laboratories, Lot M2P	FH×DA1112	(Purchased R		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00004			on Laboratories, Lot M2P		(Purchased R		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00004			on Laboratories, Lot M4F		(Purchased R		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00005			on Laboratories, Lot M5E		(Purchased R		13C5-PFPeA	50 ug/mL
LCM8FOSA 00008			on Laboratories, Lot M8E		(Purchased R		13C8 FOSA	50 ug/mI
LCMPFBA 00005			ton Laboratories, Lot ME		(Purchased R		13C4 PFBA	50 ug/mI
LCMPFDA 00007			ton Laboratories, Lot ME		(Purchased R		13C2 PFDA	50 ug/mL
LCMPFDoA 00005			on Laboratories, Lot MP		(Purchased R	eagent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00008			ton Laboratories, Lot MP		(Purchased R	eagent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00005			ton Laboratories, Lot MP		(Purchased R		1802 PFHxS	47.3 ug/mL
LCMPFNA 00005			ton Laboratories, Lot ME		(Purchased R		13C5 PFNA	50 ug/mL
LCMPFOA 00009	01/22/21 We	elling	ton Laboratories, Lot ME	PFOA0116	(Purchased R	eagent)	13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21 We	elling	ton Laboratories, Lot ME	PFOS0116	(Purchased R	eagent)	13C4 PFOS	47.8 ug/mI
LCMPFUdA 00006	10/31/19 We	ellingt	on Laboratories, Lot MP	FUdA1014	(Purchased R		13C2 PFUnA	50 ug/mL
.LCPFCSP 00044			Methanol, Lot 090285		LCPFBA 00003	200 uL	Perfluorobutyric acid	1 ug/mL
_			•		LCPFBSA_00001		Perfluorobutanesulfonic acid	0.884 ug/mL
							(PFBS)	
					LCPFDA 00004	200 uL	Perfluorodecanoic acid	1 ug/mL
					LCPFDoA 00004	200 uL	Perfluorododecanoic acid	1 ug/mL
					LCPFDSA 00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA 00004	200 uL	Perfluoroheptanoic acid	1 ug/mL
							(PFHpA)	
					LCPFHpSA_00001		Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001		Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00005	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003	200 uL	Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003		Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003	200 uL	Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00003	03/05/18 W	Welling	gton Laboratories, Lot P	FBA0313	(Purchased R		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001			ton Laboratories, Lot LE		(Purchased R	eagent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00004	07/02/20 W	Vellina	gton Laboratories, Lot P	FDA0615	(Purchased R	eagent.)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004			ton Laboratories, Lot PE		(Purchased R		Perfluorododecanoic acid	50 ug/mL

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					Reagent	Parent Reag	rent		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCPFDSA 00001	09/13/18		ton Laboratories,	T o+		(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA 00004	05/09/19		ton Laboratories,			(Purchased Rea		Perfluoroheptanoic acid	50 ug/mL
	**, **, **		,			(- 0.2 0.10 0.0 0.10	5 7	(PFHpA)	1 22 23/
LCPFHpSA 00001	11/21/17	Welling	ton Laboratories,	Lot	LPFHpS1112	(Purchased Rea	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19	Welling	ton Laboratories,	Lot	PFHxA0514	(Purchased Rea	agent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Welling	ton Laboratories,	Lot	PFHxDA0707	(Purchased Rea	agent)	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19	Welling	ton Laboratories,	Lot	LPFHxS0514	(Purchased Rea	agent)	Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19	Wellin	gton Laboratories	, Lot	PFNA0514	(Purchased Rea	agent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00005	11/06/20	Wellin	gton Laboratories	, Lot	: PFOA1115	(Purchased Rea	agent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17		gton Laboratories,			(Purchased Rea	agent)	Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		gton Laboratories,			(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00006	09/02/17		gton Laboratories,			(Purchased Rea		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00004	01/30/20		gton Laboratories,			(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18		ton Laboratories,			(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18		ton Laboratories,			(Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18		gton Laboratories,		PFUdA0613	(Purchased Rea	agent)	Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00015	06/29/16	12/30/15	MeOH/H2O, Lot 09	0285	2 mL	LCMPFCSU_00024	100 uI	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 50 ng/mL
								13C4 PFOA 13C4 PFOS	47.8 ng/mL
								13C2 PFUnA	50 ng/mL
						LCPFCSP 00039	800 117	Perfluorobutyric acid	400 ng/mL
						Lerresi_00039	000 41	Perfluorobutanesulfonic acid	353.6 ng/mL
								(PFBS)	333.0 Hg/III
								Perfluorodecanoic acid	400 ng/mL
								Perfluorododecanoic acid	400 ng/mL
								Perfluorodecane Sulfonic acid	385.6 ng/mL
								Perfluoroheptanoic acid (PFHpA)	400 ng/mL
								Perfluoroheptanesulfonic Acid	380.8 ng/mL
								Perfluorohexanoic acid	400 ng/mL
								Perfluorohexadecanoic acid	400 ng/mL
								Perfluorohexanesulfonic acid (PFHxS)	378.4 ng/mL
								Perfluorononanoic acid (PFNA)	400 ng/mL
								Perfluorooctanoic acid (PFOA)	400 ng/mL
								Perfluorooctandecanoic acid	400 ng/mL

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				Decemb	Parent Reage	ent		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctanesulfonic acid (PFOS)	382.4 ng/mL
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
							Perfluoroundecanoic acid	400 ng/mL
.LCMPFCSU_00024	06/29/16	12/29/15	Methanol, Lot Baker 115491	10 mL	LCM2PFHxDA_00003	0.2 mL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00003	0.2 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00003		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00004		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00006		13C8 FOSA	1 ug/mL
					LCMPFBA_00004		13C4 PFBA	1 ug/mL
					LCMPFDA_00004		13C2 PFDA	1 ug/mL
					LCMPFDoA_00004		13C2 PFDoA	1 ug/mL
					LCMPFHxA 00005		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00004		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003		13C5 PFNA	1 ug/mL
					LCMPFOA_00007		13C4 PFOA	1 ug/mL
					LCMPFOS_00009		13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00005		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00003			on Laboratories, Lot M2P		(Purchased Rea	-	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00003	11/29/17		on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00003	05/22/20		on Laboratories, Lot M4F		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00004	05/22/20		on Laboratories, Lot M5F		(Purchased Rea	-	13C5-PFPeA	50 ug/mL
LCM8FOSA_00006	12/15/16		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00004	10/31/19		ton Laboratories, Lot MF		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00004	04/13/19		ton Laboratories, Lot MF		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA_00004	07/17/19		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFH×A_00005	04/13/19		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00004	07/25/18		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00003	04/13/19		ton Laboratories, Lot MF		(Purchased Rea	, ,	13C5 PFNA	50 ug/mL
LCMPFOA_00007	04/10/20		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS_00009 LCMPFUdA 00005	05/15/20 10/31/19		ton Laboratories, Lot MP		(Purchased Rea (Purchased Rea		13C4 PFOS 13C2 PFUnA	47.8 ug/mL
			ton Laboratories, Lot MP				Perfluorobutyric acid	50 ug/mL
.LCPFCSP_00039	06/30/16	12/30/13	Methanol, Lot 090285	2 1117	LCPFBA 00003	0.1 1111	Perfluorobutanesulfonic acid	1 ug/mL 0.884 ug/mL
					LCPFBSA_00001		(PFBS)	
					LCPFDA_00003		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00003		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
I					LCPFHpSA_00001	0.1 mL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA_00003		Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA_00004	0.1 mL	Perfluorohexadecanoic acid	1 ug/mL

Lab Name: TestAmerica Sacrame	100 NO. 32	0-18704-1
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		Exp Prep Dilutar Date Date Used		Reagent Final Volume	Parent Reage	ent		Concentration
Reagent ID	-		Dilutant Used		Reagent ID	Volume Added	Analyte	
					LCPFHxSA_00001	0.1 mL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA_00004		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00004		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00004		Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004		Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA_00005		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00003		Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003		Perfluorotridecanoic acid	1 ug/mL
	00/05/40				LCPFUdA 00003	0.1 mL	Perfluoroundecanoic acid	1 ug/mL
LCPFBA_00003	03/05/18		gton Laboratories, Lot I		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	=	gton Laboratories, Lot L		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00003	06/18/18		gton Laboratories, Lot I		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
LCPFDoA_00003	01/03/18		gton Laboratories, Lot P		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
LCPFDSA_00001 LCPFHpA_00004	09/13/18 Wellington Laboratories, Lot LPFDS0913 05/09/19 Wellington Laboratories, Lot PFHpA0514				(Purchased Rea (Purchased Rea		Perfluorodecane Sulfonic acid Perfluoroheptanoic acid	48.2 ug/mL 50 ug/mL
_		-	•	-			(PFHpA)	
LCPFHpSA_00001	11/21/17		ton Laboratories, Lot LI		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		gton Laboratories, Lot P		(Purchased Rea		Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17 Wellington Laboratories, Lot PFHxDA0707 05/09/19 Wellington Laboratories, Lot LPFHxS0514				(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19				(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA_00004	05/09/19		gton Laboratories, Lot I		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00004	10/11/18		gton Laboratories, Lot I		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00004	04/25/17		gton Laboratories, Lot P		(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19	-	gton Laboratories, Lot L		(Purchased Rea	-	Perfluorooctanesulfonic acid (PFOS)	47.8 ug/mL
LCPFOSA_00005	07/31/18		gton Laboratories, Lot F		(Purchased Rea		Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA_00003	01/03/18		gton Laboratories, Lot P		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA_00003	06/19/18		ton Laboratories, Lot PI		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL
LCPFTrDA_00003	12/10/18		ton Laboratories, Lot PI		(Purchased Rea		Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18	-	gton Laboratories, Lot P		(Purchased Rea		Perfluoroundecanoic acid	50 ug/mL
LCPFC-L7_00017	09/08/16	04/18/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00036	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 47.8 ng/mL
				1			13C4 PFOS	4/.8 ng/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-18704-1

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							13C2 PFUnA	50 ng/mL
					LCPFCSP 00044	2000 uL		400 ng/mL
						2000 45	Perfluorobutanesulfonic acid	353.6 ng/mL
							(PFBS)	333.0 lig/ lill
							Perfluorodecanoic acid	400 ng/mL
							Perfluorododecanoic acid	400 ng/mL
							Perfluorodecane Sulfonic acid	385.6 ng/mL
							Perfluoroheptanoic acid	400 ng/mL
							(PFHpA)	, , ,
							Perfluoroheptanesulfonic Acid	380.8 ng/mL
							Perfluorohexanoic acid	400 ng/mL
							Perfluorohexadecanoic acid	400 ng/mL
							Perfluorohexanesulfonic acid	378.4 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	400 ng/mL
							Perfluorooctanoic acid (PFOA)	400 ng/mL
							Perfluorooctandecanoic acid	400 ng/mL
							Perfluorooctanesulfonic acid	382.4 ng/mL
							(PFOS)	100 / -
							Perfluorooctane Sulfonamide	400 ng/mL
							Perfluoropentanoic acid	400 ng/mL
							Perfluorotetradecanoic acid	400 ng/mL
							Perfluorotridecanoic acid	400 ng/mL
TOWN DECOME 00000	10/07/16	04/07/16	Methanol, Lot Baker	10000 +	T GMODELL D. 00004	200 +	Perfluoroundecanoic acid	400 ng/mL
.LCMPFCSU_00036	10/0//16	04/0//16	115935	10000 uL	LCM2PFHxDA_00004	200 uL	13C2-PFHxDA	1 ug/mL
			113333		LCM2PFTeDA 00004	200 117	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00004		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00005		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00008		13C8 FOSA	1 ug/mL
					LCMPFBA 00005		13C4 PFBA	1 ug/mL
					LCMPFDA 00007		13C2 PFDA	1 ug/mL
					LCMPFDoA 00005	200 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00008	200 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00005		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00005	200 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00009	200 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00012	200 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00006	200 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00004	01/07/21	Wellingto	on Laboratories, Lot M2PH	HxDA1112	(Purchased Rea	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00004	12/07/20	Wellingto	on Laboratories, Lot M2PH	TeDA1115	(Purchased Rea	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00004	05/22/20		on Laboratories, Lot M4P		(Purchased Rea	gent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA_00005	05/22/20	Wellingt	on Laboratories, Lot M5P	FPeA0515	(Purchased Rea	gent)	13C5-PFPeA	50 ug/mL
LCM8FOSA_00008	12/22/17	Wellingt	on Laboratories, Lot M8F	OSA1215I	(Purchased Rea	gent)	13C8 FOSA	50 ug/mL
LCMPFBA_00005	10/31/19		ton Laboratories, Lot MP	FBA1014	(Purchased Rea	gent)	13C4 PFBA	50 ug/mL
LCMPFDA_00007	08/19/20	Welling	ton Laboratories, Lot MP	FDA0815	(Purchased Rea	gent)	13C2 PFDA	50 ug/mL
LCMPFDoA_00005	07/17/19		ton Laboratories, Lot MPE		(Purchased Rea	gent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00008	04/09/20	Welling	ton Laboratories, Lot MPE	HxA0415	(Purchased Rea	gent)	13C2 PFHxA	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFHxS 00005	08/23/20	Wellingto	on Laboratories, L	ot MPFHxS1015	(Purchased Rea	agent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00005	04/13/19		on Laboratories, I		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00009	01/22/21				(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00012	01/22/21		on Laboratories, I		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00006	10/31/19		on Laboratories, L		(Purchased Rea	, ,	13C2 PFUnA	50 ug/mL
.LCPFCSP 00044			Methanol, Lot 0902		LCPFBA 00003		Perfluorobutyric acid	1 ug/mL
. HCII CDI _ 00044	03/00/10	03/00/10	decidation, hot 0502	05 10000 41	LCPFBSA 00001		Perfluorobutanesulfonic acid	0.884 ug/mL
					_		(PFBS)	
					LCPFDA_00004		Perfluorodecanoic acid	1 ug/mL
					LCPFDoA_00004		Perfluorododecanoic acid	1 ug/mL
					LCPFDSA_00001		Perfluorodecane Sulfonic acid	0.964 ug/mL
					LCPFHpA_00004		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpSA 00001	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00003	200 uL	Perfluorohexanoic acid	1 ug/mL
					LCPFHxDA 00004	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxSA_00001	200 uL	Perfluorohexanesulfonic acid (PFHxS)	0.946 ug/mL
					LCPFNA 00004	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00005		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	200 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS_00004	200 uL	Perfluorooctanesulfonic acid (PFOS)	0.956 ug/mL
					LCPFOSA 00006	200 uL	Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA 00004	200 uL	Perfluoropentanoic acid	1 ug/mL
					LCPFTeDA 00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA 00003	200 uL	Perfluorotridecanoic acid	1 ug/mL
					LCPFUdA 00003	200 uL	Perfluoroundecanoic acid	1 ug/mL
LCPFBA 00003	03/05/18	Welling	ton Laboratories,	Lot. PFBA0313	(Purchased Rea		Perfluorobutyric acid	50 ug/mL
LCPFBSA_00001	10/09/19	Wellingt	on Laboratories, I	Lot LPFBS1014	(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00004	07/02/20	Welling	ton Laboratories,	Lot PFDA0615	(Purchased Rea	agent)	Perfluorodecanoic acid	50 ug/mL
LCPFDoA 00004	01/30/20		on Laboratories, I		(Purchased Rea	agent)	Perfluorododecanoic acid	50 ug/mL
LCPFDSA 00001	09/13/18	Wellingt	on Laboratories, I	Lot LPFDS0913	(Purchased Rea		Perfluorodecane Sulfonic acid	48.2 ug/mL
LCPFHpA_00004	05/09/19	Wellingt	on Laboratories, I	Lot PFHpA0514	(Purchased Rea	agent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpSA 00001	11/21/17	Wellingto	on Laboratories, L	ot LPFHpS1112	(Purchased Rea	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00003	05/09/19		on Laboratories, I		(Purchased Rea	agent)	Perfluorohexanoic acid	50 ug/mL
LCPFHxDA 00004	11/28/17	Wellingto	on Laboratories, L	ot PFHxDA0707	(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxSA_00001	05/09/19		on Laboratories, L		(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	47.3 ug/mL
LCPFNA 00004	05/09/19	Welling	ton Laboratories,	Lot PFNA0514	(Purchased Rea	agent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00005	11/06/20		ton Laboratories,		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00004	04/25/17				(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
LCPFOS_00004	06/20/19		on Laboratories, I		(Purchased Rea		Perfluorooctanesulfonic acid	47.8 ug/mL
	00,20,13	ozzznige	22014601160/ 1		(= == == == = = = = = = = = = = = = = =	J /	(PFOS)	1, 10 ag/mil
LCPFOSA 00006	09/02/17	Wellingt	on Laboratories, I	Lot FOSA0815J	(Purchased Rea	agent)	Perfluorooctane Sulfonamide	50 ug/mL
LCPFPeA 00004	01/30/20		on Laboratories, I		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
LCPFTeDA 00003	06/19/18		on Laboratories, L		(Purchased Rea		Perfluorotetradecanoic acid	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	O . : 3.	20-18	± — 」	

				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFTrDA 00003	12/10/18	Welling	ton Laboratories, Lot	PFTrDA1213	(Purchased Rea	ngent)	Perfluorotridecanoic acid	50 ug/mL
LCPFUdA_00003	06/19/18	Welling	gton Laboratories, Lot	PFUdA0613	(Purchased Rea	igent)	Perfluoroundecanoic acid	50 ug/mL
LCPFCIC 00016	06/16/16	12/22/15	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU 00023	250 uL	13C2-PFHxDA	50 ng/mL
					_		13C2-PFTeDA	50 ng/mL
							13C4-PFHpA	50 ng/mL
							13C5-PFPeA	50 ng/mL
							13C8 FOSA	50 ng/mL
							13C4 PFBA	50 ng/mL
							13C2 PFDA	50 ng/mL
							13C2 PFDoA	50 ng/mL
							13C2 PFHxA	50 ng/mL
							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_00008	125 uL	Perfluorobutanesulfonic acid (PFBS)	44.25 ng/mL
							Perfluoroheptanoic acid	50 ng/mL
							(PFHpA)	
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid	47.75 ng/mL
							(PFOS)	' ' '
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00023	06/21/16	12/21/15	Methanol, Lot Baker 115491	5 mL	LCM2PFHxDA_00002	0.1 mL	13C2-PFHxDA	1 ug/mL
			110191		LCM2PFTeDA 00003	0.1 mL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00003		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00004		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00006	0.1 mL	13C8 FOSA	1 ug/mL
					LCMPFBA 00004	0.1 mL	13C4 PFBA	1 ug/mL
					LCMPFDA 00005	0.1 mL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00003	0.1 mL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00006	0.1 mL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00004	0.1 mL	1802 PFHxS	0.946 ug/mL
					LCMPFNA_00003	0.1 mL	13C5 PFNA	1 ug/mL
					LCMPFOA_00007		13C4 PFOA	1 ug/mL
					LCMPFOS_00009		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00004		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00002			on Laboratories, Lot N		(Purchased Rea		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00003	11/29/17		on Laboratories, Lot M		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00003	05/22/20		on Laboratories, Lot		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00004	05/22/20		on Laboratories, Lot		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00006	12/15/16		con Laboratories, Lot		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00004	10/31/19		gton Laboratories, Lot		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00005	04/13/19	Welling	gton Laboratories, Lot	MPFDAU414	(Purchased Rea	igent)	13C2 PFDA	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1

				December	Parent Reage	ent		
	Erm	Dwon	Dilutant	Reagent Final		Volume		
Reagent ID	Exp Date	Prep Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFDoA 00003	07/17/19	Welling	ton Laboratories, Lot MP	FDoA0714	(Purchased Rea	igent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00006	04/13/19		ton Laboratories, Lot MP		(Purchased Rea	igent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00004	07/25/18	Welling	ton Laboratories, Lot MP	FHxS0713	(Purchased Rea	igent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00003	04/13/19		gton Laboratories, Lot Mi		(Purchased Rea	igent)	13C5 PFNA	50 ug/mL
LCMPFOA 00007	04/10/20		gton Laboratories, Lot Mi		(Purchased Rea	igent)	13C4 PFOA	50 ug/mL
LCMPFOS 00009	05/15/20		gton Laboratories, Lot MI		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00004	10/31/19	Welling	ton Laboratories, Lot MP	FUdA1014	(Purchased Rea	igent)	13C2 PFUnA	50 ug/mL
.LCPFACMXB_00008	06/20/19		ton Laboratories, Lot PFA		(Purchased Rea		Perfluorobutanesulfonic acid (PFBS)	1.77 ug/mL
							Perfluoroheptanoic acid (PFHpA)	2 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	1.89 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	1.91 ug/mL
							Perfluorooctanoic acid (PFOA)	2 ug/mL
LCPFCIC 00017	06/16/16	05/14/16	MeOH/H2O, Lot 09285	5 mL	LCMPFCSU 00040	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
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	47.75 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
.LCMPFCSU_00040	11/05/16	05/11/16	Methanol, Lot Baker 115935	10000 uL	LCM2PFHxDA_00005		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00005		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00005	200 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00006		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00009	200 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00006	200 111	13C4 PFBA	1 ug/mL

Lab 1	Name: TestAmerica	Sacramento	Job No.: 320-18/04-1

Reagent ID Date Date Dilutant Final Reagent Final Volume Reagent ID Added Analyte Concentr
Reagent ID
Reagent ID
LCMPFDA 00006
LCMPFHXA 00008
LCMPFHX 00006
LCMPFNA 00005
LCMPFOA_00010
LCMPFOA_00010
LCM2PFHXDA 00005
CLCM2PFHXDA 00005
CLCM2PFTEDA 00005
I.LCM2FFTeDA 00005
LCM4PFHPA 00005
LCM5PFPEA 00006
12/22/17 Wellington Laboratories, Lot M8FOSA12151 (Purchased Reagent) 13C8 FOSA 50
LCMPFDA 00006 10/31/19 Wellington Laboratories, Lot MPFBA1014 (Purchased Reagent) 13C4 PFBA 50LCMPFDA 00007 08/19/20 Wellington Laboratories, Lot MPFDA0815 (Purchased Reagent) 13C2 PFDA 50LCMPFDA 00006 07/17/19 Wellington Laboratories, Lot MPFDA0714 (Purchased Reagent) 13C2 PFDA 50LCMPFHXA 00008 04/09/20 Wellington Laboratories, Lot MPFHXA0415 (Purchased Reagent) 13C2 PFDA 50LCMPFHXS 00006 110/23/20 Wellington Laboratories, Lot MPFHXS1015 (Purchased Reagent) 13C2 PFHXA 50LCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 1802 PFHXS 47.3LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C5 PFNA 50LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8LCMPFUAA 00007 10/31/19 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8LCMPFUAB 00007 10/31/19 Wellington Laboratories, Lot MPFUAB1014 (Purchased Reagent) 13C2 PFUNA 50LCMPFOS 00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) Perfluorobutanesulfonic acid 1.77 (PFBS) Perfluoroheptanoic acid 2 (PFHpA)
LCMPFDA 00007
LCMPFDoA 00006 07/17/19 Wellington Laboratories, Lot MPFDoA0714 (Purchased Reagent) 13C2 PFDoA 50LCMPFHxA 00008 04/09/20 Wellington Laboratories, Lot MPFHxA0415 (Purchased Reagent) 13C2 PFHxA 50LCMPFHxS 00006 10/23/20 Wellington Laboratories, Lot MPFHxS1015 (Purchased Reagent) 1802 PFHxS 47.3LCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8LCMPFUdA 00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50LCMPFUdA 00007 11/06/20 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50LCMPFACMXB_00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) 13C2 PFUnA 50LCMPFBS)LCMPFBS
LCMPFHxA 00008 04/09/20 Wellington Laboratories, Lot MPFHxA0415 (Purchased Reagent) 13C2 PFHxA 50LCMPFHxS 00006 10/23/20 Wellington Laboratories, Lot MPFHxS1015 (Purchased Reagent) 1802 PFHxS 47.3LCMPFNA 00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8LCMPFUdA 00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50LCMPFACMXB_00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) Perfluorobutanesulfonic acid 1.77 (PFBS) Perfluorobeptanoic acid 2 (PFHpA)
1.10mpfix 1.10
LCMPFNA_00005 04/13/19 Wellington Laboratories, Lot MPFNA0414 (Purchased Reagent) 13C5 PFNA 50LCMPFOA_00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50LCMPFOS_00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8LCMPFUdA_00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUNA 50LCMPFACMXB_00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) Perfluorobutanesulfonic acid (PFBS) Perfluoroheptanoic acid 2 (PFHpA)
LCMPFOA 00010 01/22/21 Wellington Laboratories, Lot MPFOA0116 (Purchased Reagent) 13C4 PFOA 50LCMPFOS 00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8LCMPFUdA 00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50LCMPFACMXB 00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) Perfluorobutanesulfonic acid 1.77 (PFBS) Perfluoroheptanoic acid 2 (PFHpA)
LCMPFOS_00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 LCMPFUdA_00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50 .LCPFACMXB_00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) Perfluorobutanesulfonic acid 1.77 (PFBS_00012 01/22/21 Wellington Laboratories, Lot MPFOS0116 (Purchased Reagent) 13C4 PFOS 47.8 (Purchased Reagent) 13C4 PFOS 47.8 Perfluorobutanesulfonic acid 1.77 (PFBS_00007 Perfluoroheptanoic acid 2)
LCMPFUdA 00007 10/31/19 Wellington Laboratories, Lot MPFUdA1014 (Purchased Reagent) 13C2 PFUnA 50 .LCPFACMXB_00007 11/06/20 Wellington Laboratories, Lot PFACMXB1115 (Purchased Reagent) Perfluorobutanesulfonic acid 1.77 (PFBS) Perfluoroheptanoic acid 2 (PFHpA)
.LCPFACMXB_00007
Perfluoroheptanoic acid 2 (PFHpA)
(PFHpA)
Perfluorohexanesulfonic acid 1.89 (PFHxS)
Perfluorononanoic acid (PFNA) 2
Perfluorooctanesulfonic acid 1.91
(PFOS)
Perfluorooctanoic acid (PFOA) 2
LCPFCSP_00046 09/08/16 04/22/16 Methanol, Lot 090285 5000 uL LCPFBA 00004 100 uL Perfluorobutyric acid 1
LCPFBS 00003 100 uL Perfluorobutane Sulfonate 0.884
LCPFBSA_00001 100 uL Perfluorobutanesulfonic acid 0.884 (PFBS)
LCPFDA 00004 100 uL Perfluorodecanoic acid 1
LCPFDoA 00004 100 uL Perfluorododecanoic acid 1
LCPFDoS 00003 100 uL PFDoS 0.968
(Perflouro-1-dodecanesulfonate
LCPFDS 00003 100 uL Perfluorodecane Sulfonate 0.964
LCPFDSA 00001 100 uL Perfluorodecane Sulfonic acid 0.964
LCPFHpA 00004 100 uL Perfluoroheptanoic acid 1
(PFHpA)
LCPFHpS 00005 100 uL Perfluoroheptane Sulfonate 0.952

Lab	Name: TestAmerica	Sacramento	Job No.: 320-18704-1

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHxDA_00004		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br 00001	100 uL	Perfluorohexane Sulfonate	0.91 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00004	100 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFNS_00002	100 uL	PFNS (Perflouro-1-nonanesulfonate)	0.96 ug/mL
					LCPFOA 00005	100 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00004	100 uL	Perfluorooctandecanoic acid	1 ug/mL
					LCPFOS-br_00001	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide	1 ug/mL
					LCPFPeA_00004		Perfluoropentanoic acid	1 ug/mL
					LCPFPeS_00002	100 uL		0.938 ug/mL
							(Perflouro-1-pentanesulfonate)	
					LCPFTeDA_00003		Perfluorotetradecanoic acid	1 ug/mL
					LCPFTrDA_00003		Perfluorotridecanoic acid	1 ug/mL
	/ /				LCPFUdA_00003		Perfluoroundecanoic acid	1 ug/mL
.LCPFBA 00004	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorobutyric acid	50 ug/mL
.LCPFBS 00003	10/09/19		ton Laboratories, Lot LI		(Purchased Rea		Perfluorobutane Sulfonate	44.2 ug/mL
.LCPFBSA_00001	10/09/19	_	ton Laboratories, Lot L		(Purchased Rea	-	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
.LCPFDA_00004	07/02/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorodecanoic acid	50 ug/mL
.LCPFDoA_00004	01/30/20		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
.LCPFDoS_00003	10/06/16	Welling	ton Laboratories, Lot LP	FDoS1011	(Purchased Rea	agent)	PFDoS (Perflouro-1-dodecanesulfonate)	48.4 ug/mL
.LCPFDS 00003	09/13/18	Welling	ton Laboratories, Lot L	PFDS0913	(Purchased Rea	agent)	Perfluorodecane Sulfonate	48.2 ug/mL
.LCPFDSA 00001	09/13/18	Welling	ton Laboratories, Lot L	PFDS0913	(Purchased Rea	agent)	Perfluorodecane Sulfonic acid	48.2 ug/mL
.LCPFHpA_00004	05/09/19	Welling	ton Laboratories, Lot Pl	FHpA0514	(Purchased Rea	agent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS 00005	01/28/19	Welling	ton Laboratories, Lot LP	FHpS0114	(Purchased Rea	agent)	Perfluoroheptane Sulfonate	47.6 ug/mL
.LCPFHpSA 00001	11/21/17		ton Laboratories, Lot LP		(Purchased Rea	agent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA_00003	05/09/19		ton Laboratories, Lot Pl		(Purchased Rea	agent)	Perfluorohexanoic acid	50 ug/mL
.LCPFHxDA_00004	11/28/17	Welling	ton Laboratories, Lot PF	HxDA0707	(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br_00001	07/03/20	Wellingt	on Laboratories, Lot brP	FHxSK0615	(Purchased Rea	agent)	Perfluorohexane Sulfonate	45.5 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA_00004	05/09/19		gton Laboratories, Lot P		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFNS_00002	07/04/17	_	ton Laboratories, Lot L		(Purchased Rea	agent)	PFNS (Perflouro-1-nonanesulfonate)	48 ug/mL
.LCPFOA_00005	11/06/20	Wellin	gton Laboratories, Lot P	FOA1115	(Purchased Rea	agent)	Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA_00004	04/25/17		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorooctandecanoic acid	50 ug/mL
.LCPFOS-br_00001	10/14/20		on Laboratories, Lot br		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
.LCPFOSA_00006	09/02/17		ton Laboratories, Lot F0		(Purchased Rea		Perfluorooctane Sulfonamide	50 ug/mL
.LCPFPeA_00004	01/30/20		ton Laboratories, Lot Pl		(Purchased Rea		Perfluoropentanoic acid	50 ug/mL
.LCPFPeS_00002	07/04/17	Welling	ton Laboratories, Lot LP	FPeS0712	(Purchased Rea	agent)	PFPeS (Perflouro-1-pentanesulfonate)	46.9 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-18704-1
SDG	No.:				

				Reagent	Parent Reagent			
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCPFTeDA 00003	06/19/18	Welling	ton Laboratories, Lot	(Purchased Reagent)		Perfluorotetradecanoic acid	50 ug/mL	
.LCPFTrDA_00003	12/10/18	Welling	ton Laboratories, Lot	(Purchased Reagent)		Perfluorotridecanoic acid	50 ug/mL	
.LCPFUdA 00003	06/19/18	Welling	gton Laboratories, Lo	t PFUdA0613	(Purchased Reagent)		Perfluoroundecanoic acid	50 ug/mL

Page 71 of 776 05/26/2016

Reagent

LCM2PFHxDA_00002

Rec: Gli4/14 SK



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

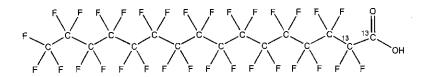
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

816.11

CONCENTRATION:

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) ≥99% ¹³C

(1,2-13C₂)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/29/2012

EXPIRY DATE: (mm/ed/yyyy)

11/29/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/10/2013

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 Weilington Laboratories inc. are for laboratory use only. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

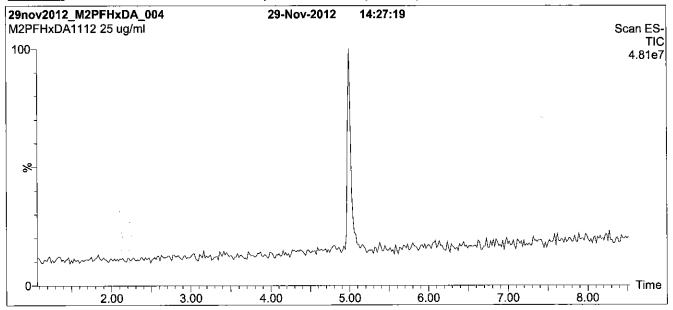
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

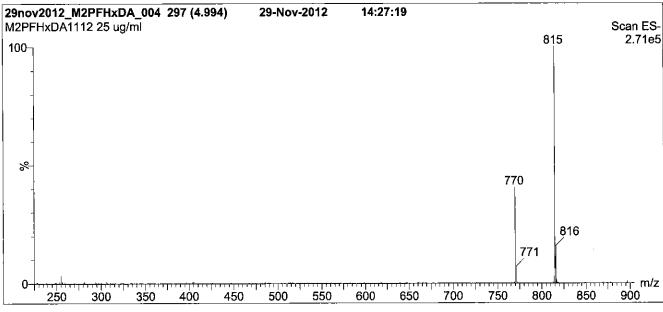




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





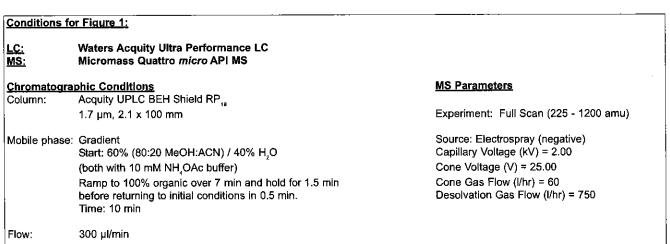
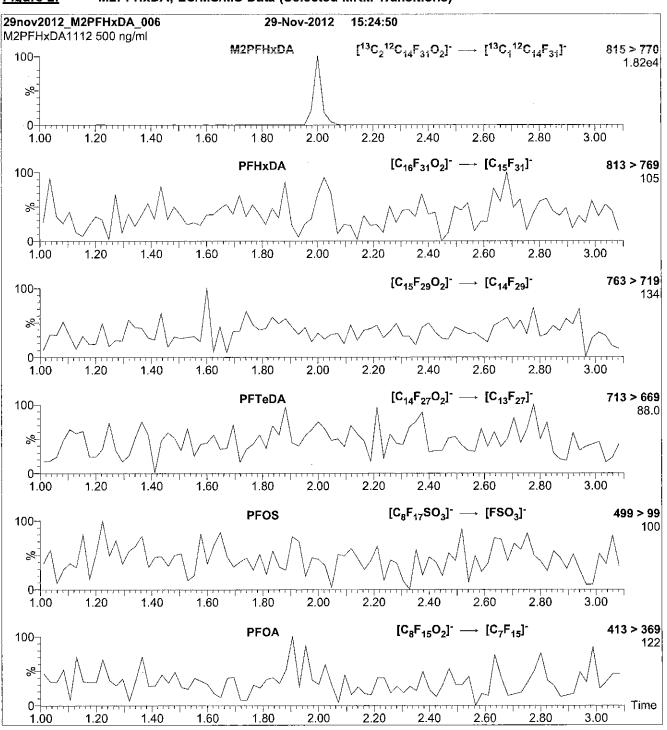
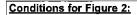


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

(DOTH WITH 10 MIN NH4OAC DU

Flow:

300 µl/min

MS Parameters

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

Reagent

LCM2PFHxDA_00003



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

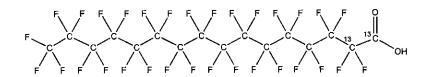
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

MOLECULAR WEIGHT:

816.11

CONCENTRATION:

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

SOLVENT(S):

Methanol

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

ISOTOPIC PURITY:

Water (<1%) ≥99% 13C

CHEMICAL PURITY:

>98%

11/29/2012

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

11/29/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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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

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

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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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:

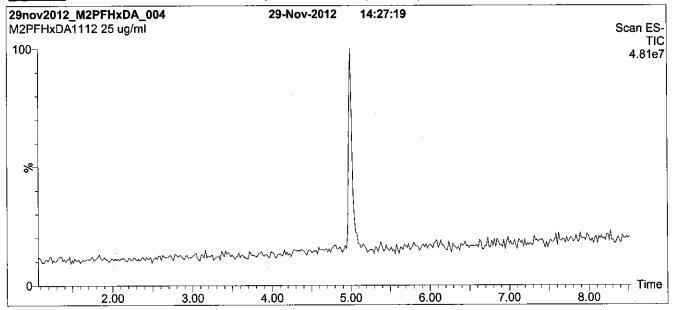
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

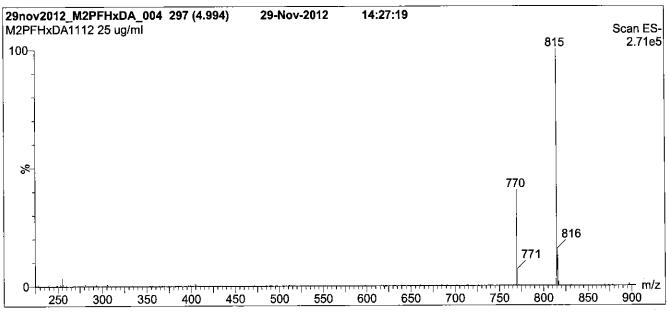




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Figure 1: M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)





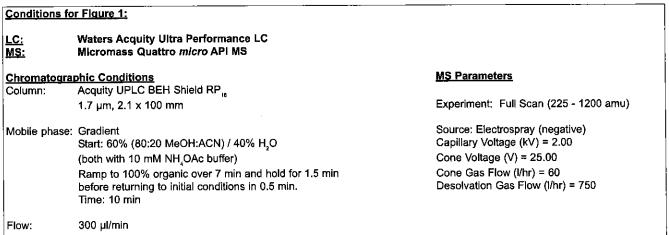
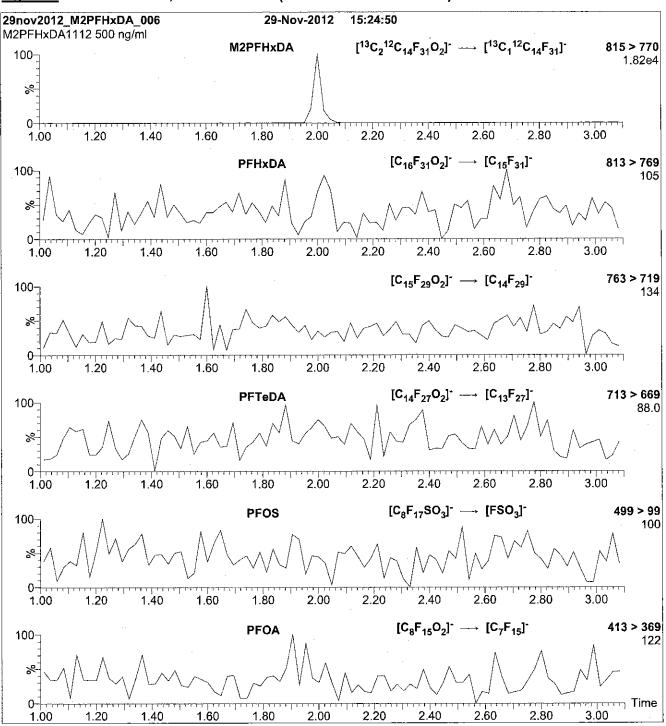


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M2PFHxDA)

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

Collision Energy (eV) =

Reagent

LCM2PFHxDA_00004



591157

ID: LCM2PFHxDA 00004 Exp: 01/07/21 Prpd: CBW 13C2-PFHxDA at 50ug/mL R: 3/3/16 CBW



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

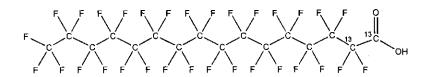
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₄HF₃₁O₂

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

MOLECULAR WEIGHT:

816.11

SOLVENT(\$):

Methanol Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

01/07/2016

EXPIRY DATE: (mm/dd/yyyy)

01/07/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

ISOTOPIC PURITY:

≥99% 13C (1,2-13C₂)

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:

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

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

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

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

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of $\pm 5\%$ (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:

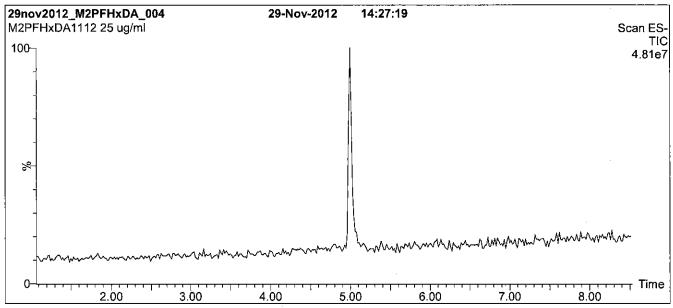
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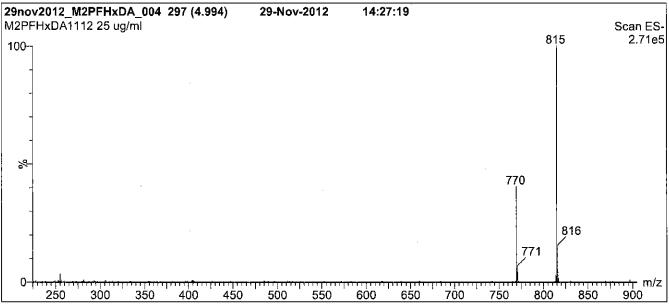




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Figure 1: M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)





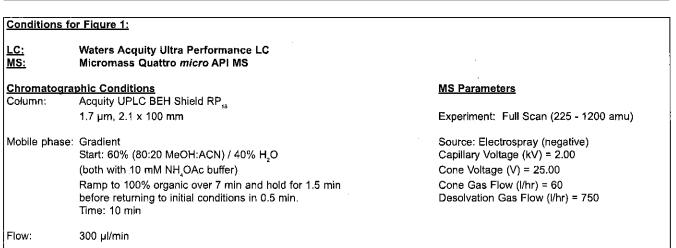
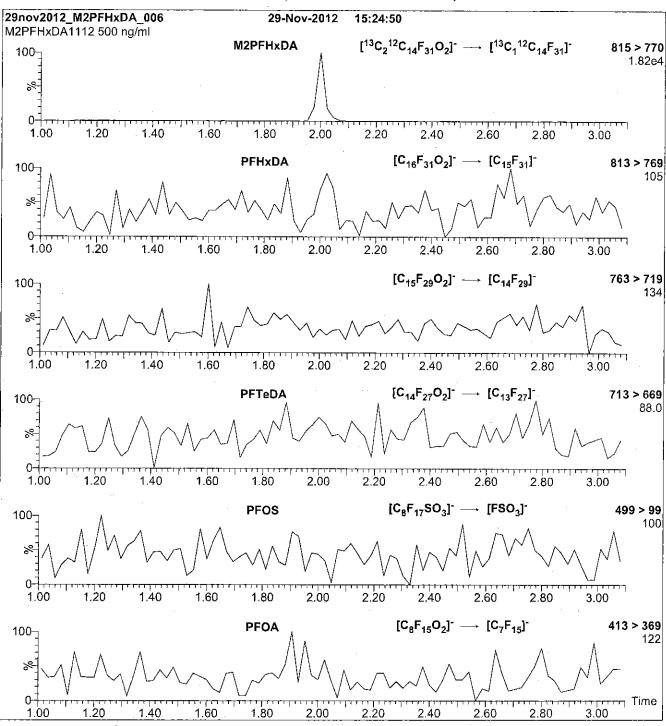


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM2PFHxDA_00005



BORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

LOT NUMBER:

M2PFHxDA1112

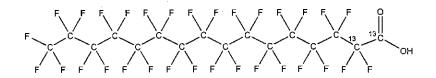
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

13C212C14HF31O2

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

MOLECULAR WEIGHT:

816.11

SOLVENT(S):

Methanol Water (<1%)

ISOTOPIC PURITY:

≥99% ¹³C $(1,2^{-13}C_2)$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/07/2016

EXPIRY DATE: (mm/dd/yyyy)

CONCENTRATION:

01/07/2021

RECOMMENDED STORAGE:

Stere 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.

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

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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.

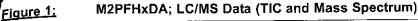
QUALITY MANAGEMENT:

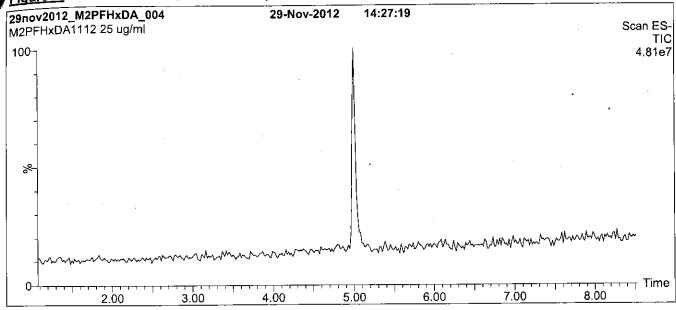
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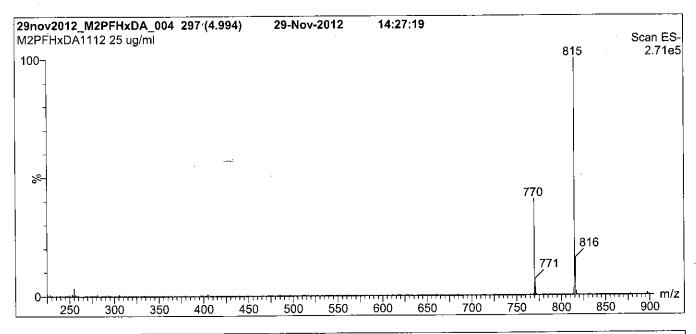


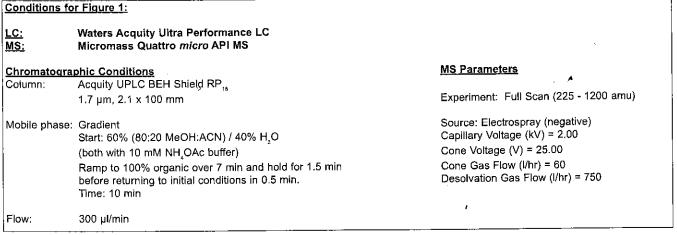


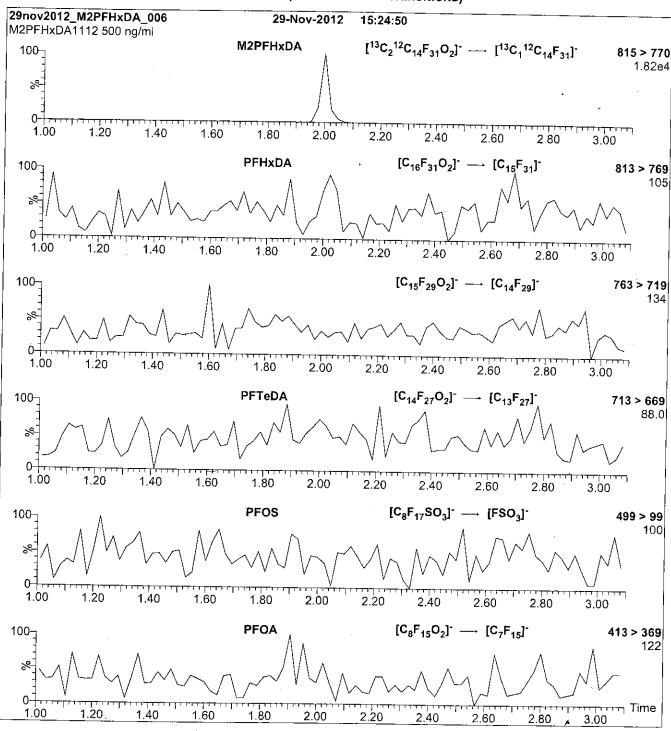
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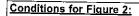












Direct loop injection

10 μl (500 ng/ml M2PFHxDA)

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

LCM2PFTeDA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1112

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₁₂HF₂₇O₂

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

716.10

CONCENTRATION: $50 \pm 2.5 \, \mu g/ml$ SOLVENT(S): Methanol

Water (<1%)

>99% 13C

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/29/2012

EXPIRY DATE: (mm/dd/yyyy)

11/29/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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:

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 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:

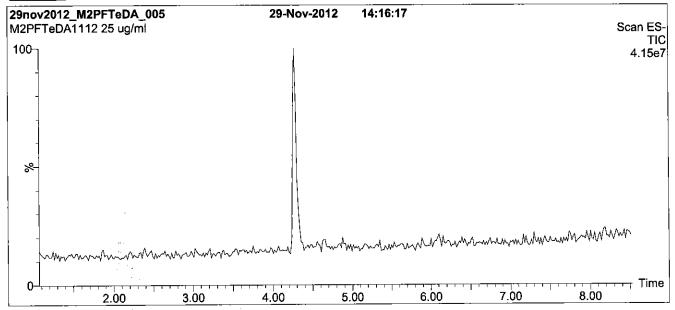
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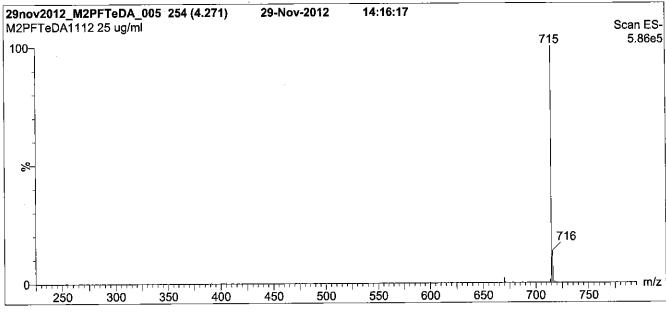




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Figure 1: M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)





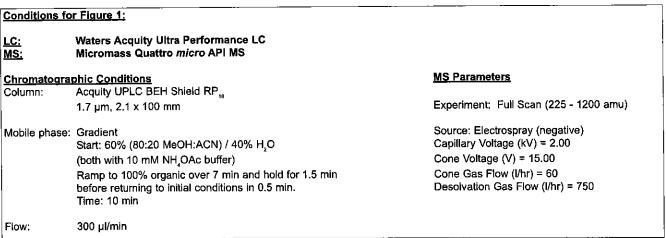
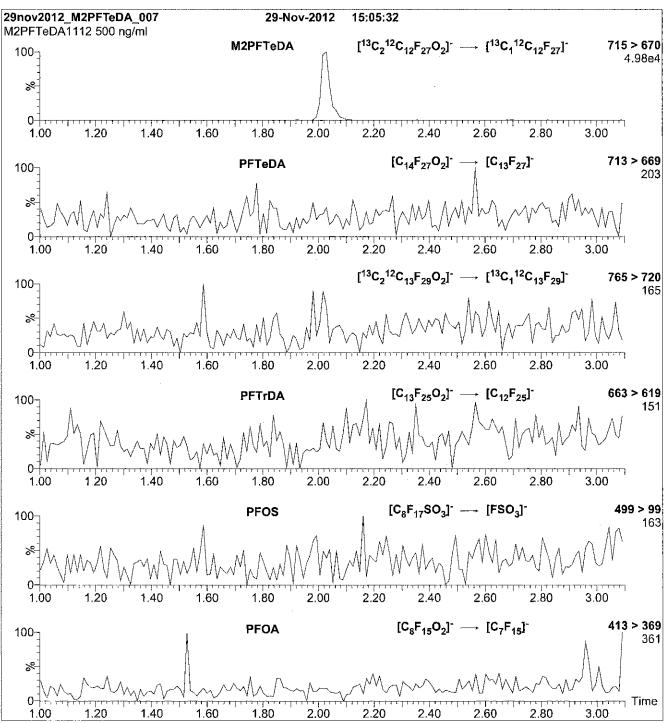
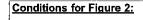


Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μI (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

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

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

LCM2PFTeDA_00004





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

M2PFTeDA1115

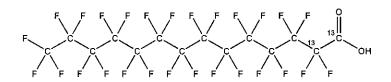
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₂HF₂₇O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

716.10

SOLVENT(S):

Methanol

Water (<1%) ≥99% ¹³C

(1,2-13C₅)

CHEMICAL PURITY: >98%

LAST TESTED: (mm/dd/yyyy)

12/07/2015

EXPIRY DATE: (mm/dd/yyyy)

12/07/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

12/08/2013

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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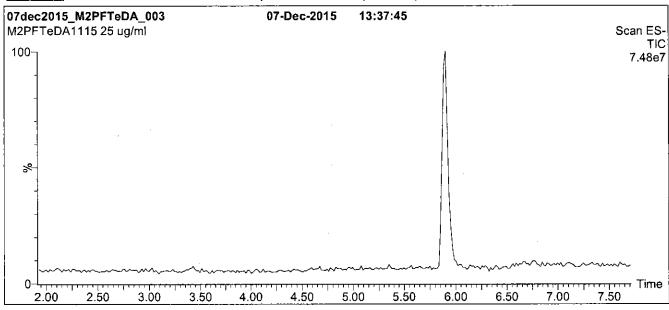
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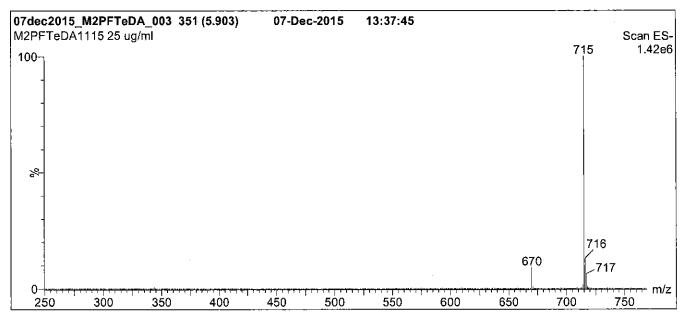




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





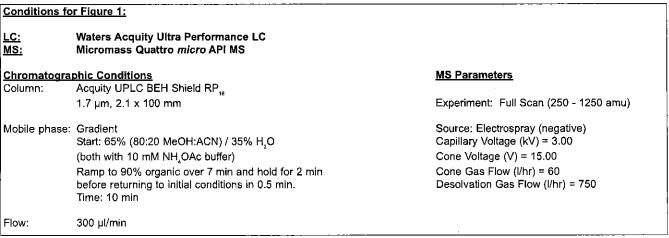
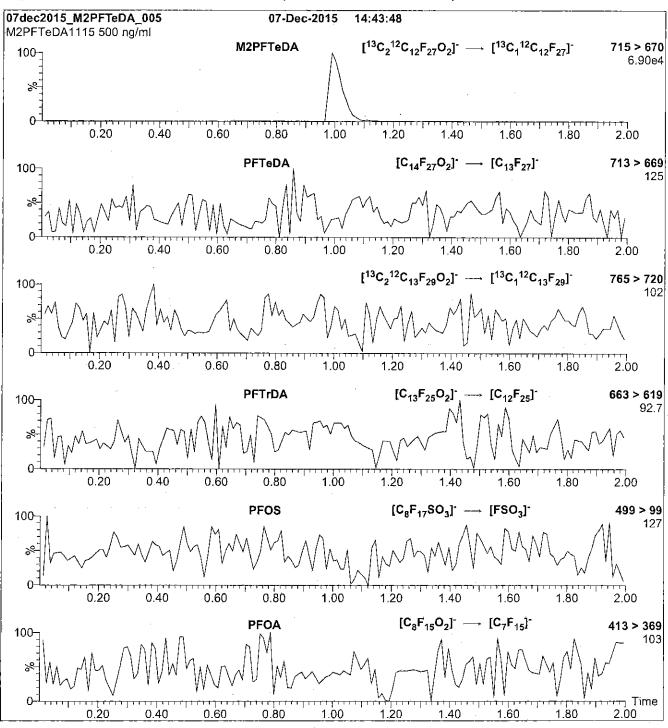


Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM2PFTeDA_00005

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



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFTeDA

LOT NUMBER:

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

SOLVENT(S):

M2PFTeDA1115

COMPOUND:

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

STRUCTURE:

CAS #:

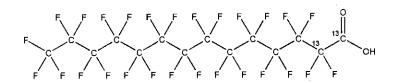
Not available

716.10

Methanol

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

Water (<1%) >99% ¹³C



MOLECULAR FORMULA:

¹³C₂¹²C₁₂HF₂₇O₂

CONCENTRATION:

 $50 \pm 2.5 \,\mu \text{g/ml}$

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/07/2015

EXPIRY DATE: (mm/dd/yyyy)

12/07/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

12/U0/2013

(mm/dd/yyyy)

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, $u_{i}(y)$, of a value y and the uncertainty of the independent parameters

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

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

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 ±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:

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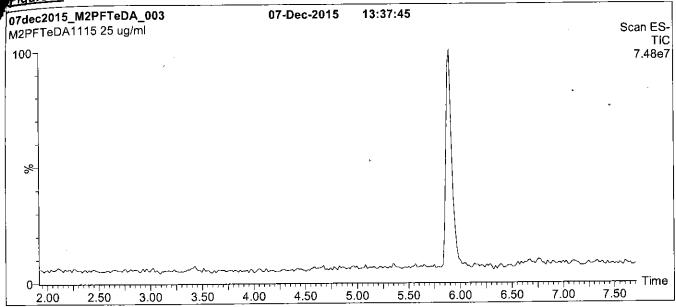


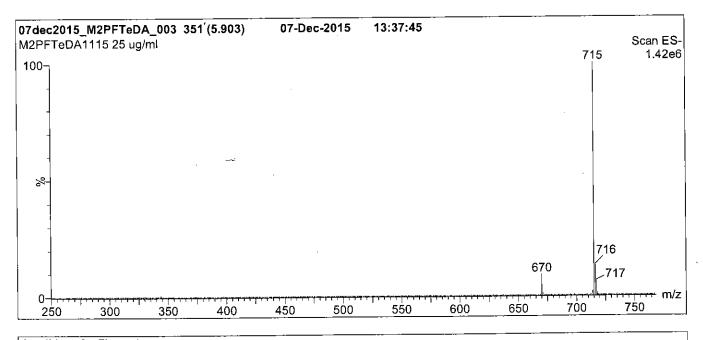


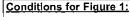
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igure 1:

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







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: 65% (80:20 MeOH:ACN) / 35% H₂O

(both with 10 mM NH, OAc buffer)

Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow:

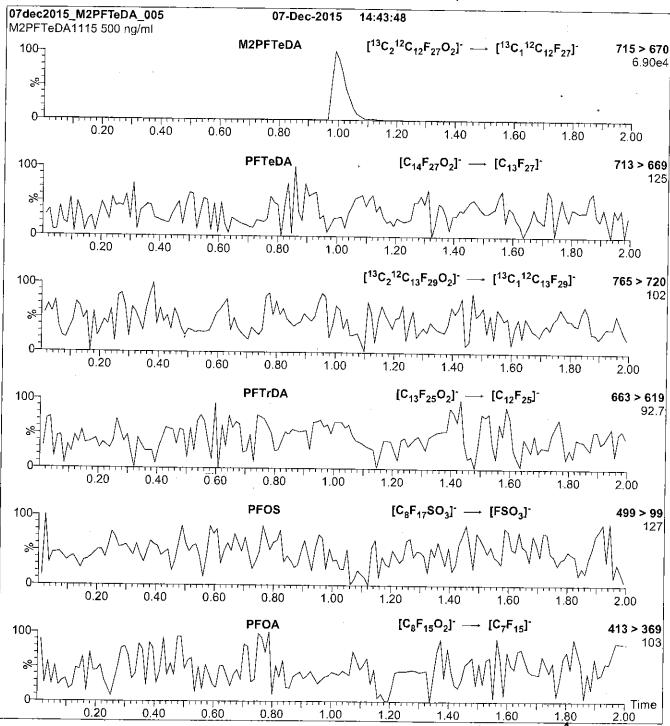
300 µl/min

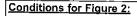
MS Parameters

Experiment: Full Scan (250 - 1250 amu)

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

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





Direct loop injection

10 µl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM4PFHPA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0515

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₂

MOLECULAR WEIGHT:

368.03

CONCENTRATION:

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

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) ≥99%¹³C

(1,2,3,4-13C₂)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/22/2015

EXPIRY DATE: (mm/dd/yyyy)

05/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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:

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

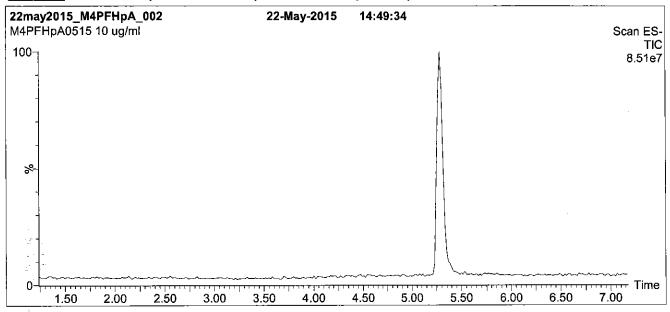
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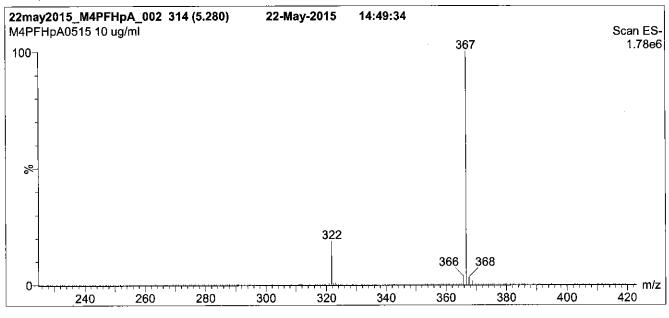




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Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





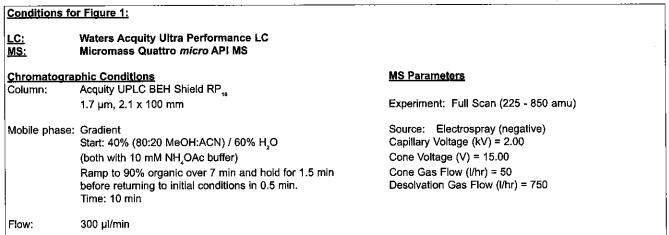
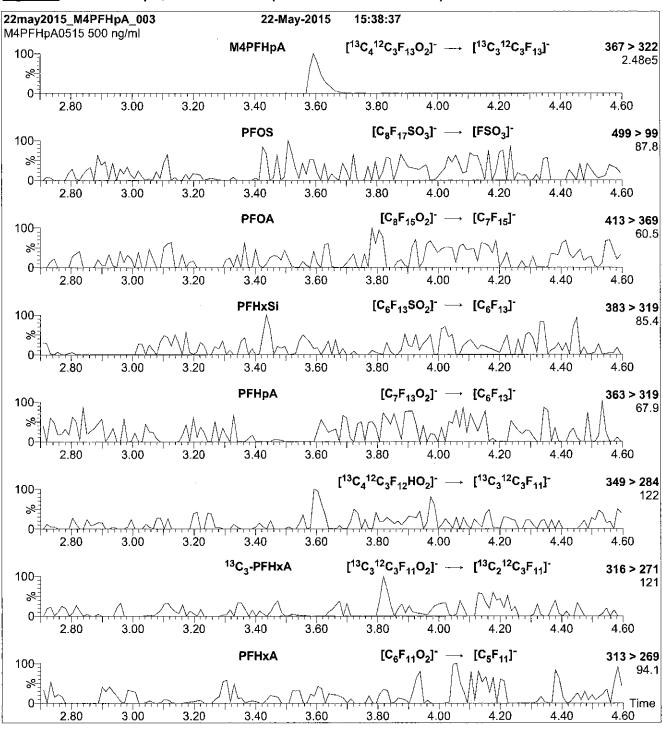
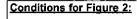


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₂OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM4PFHPA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0515

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

F F F F F F

MOLECULAR FORMULA:

¹³C₄¹²C₃HF₁₃O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

368.03

5 μg/ml SOLVENT(S):

Methanol

.

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/22/2015

EXPIRY DATE: (mm/dd/yyyy)

05/22/2020

RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99%¹³C

(1,2,3,4-13C₄)

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:

. Dai

(mm/dd/yyyy)

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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:

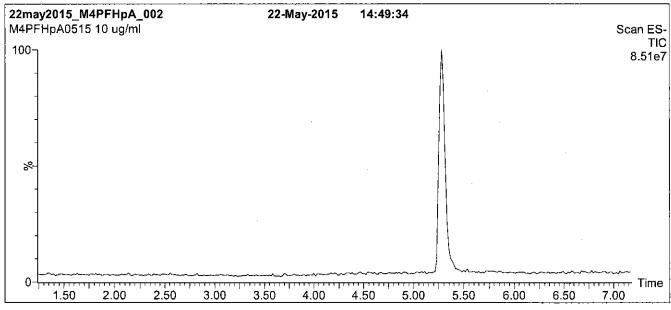
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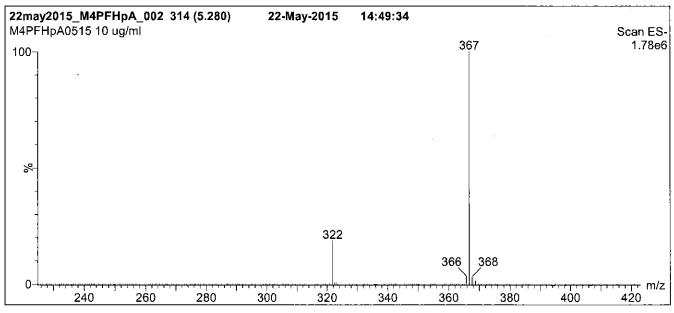




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Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





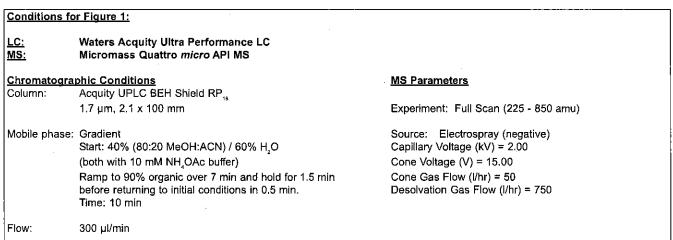
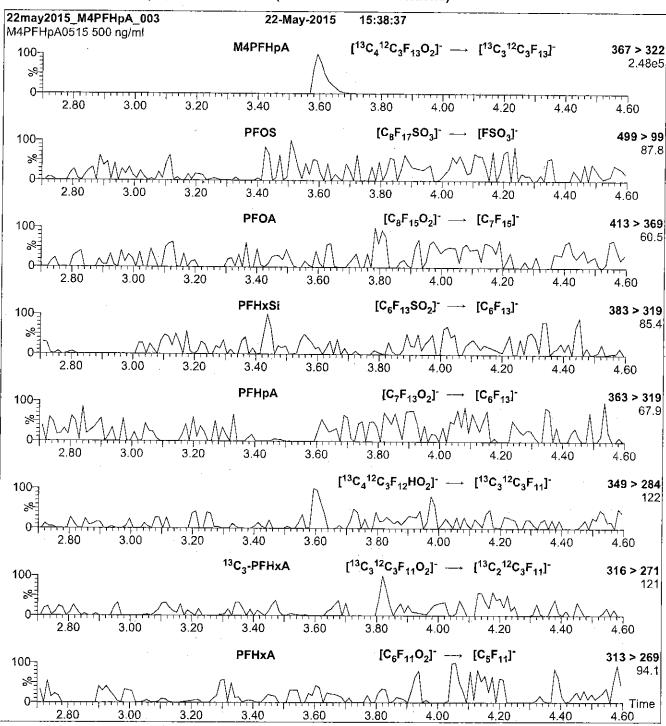
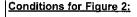


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml M4PFHpA)

MS Parameters

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

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH, OAc buffer)

Flow:

300 µl/min

LCM4PFHPA_00005



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



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0515

COMPOUND:

Perfluoro-n-[1,2,3,4-13C₄]heptanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹²C₄¹²C₃HF₁₃O₂

368.03

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT: SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

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

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.

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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QUALITY MANAGEMENT:

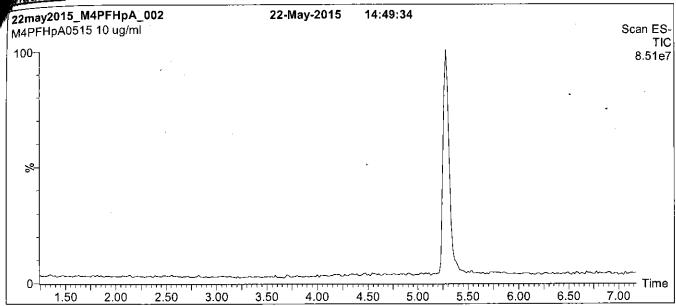
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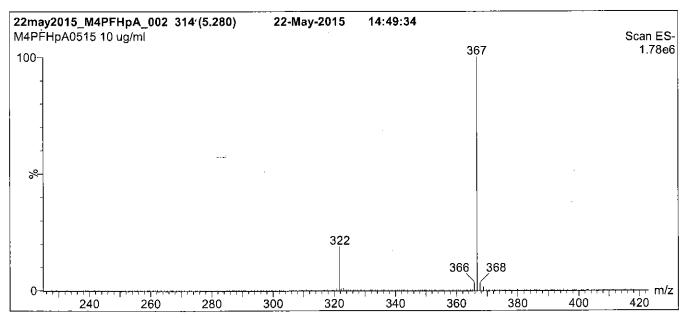




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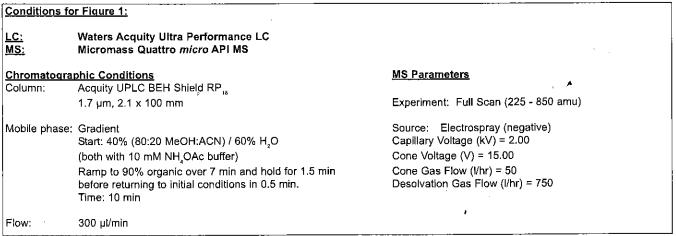
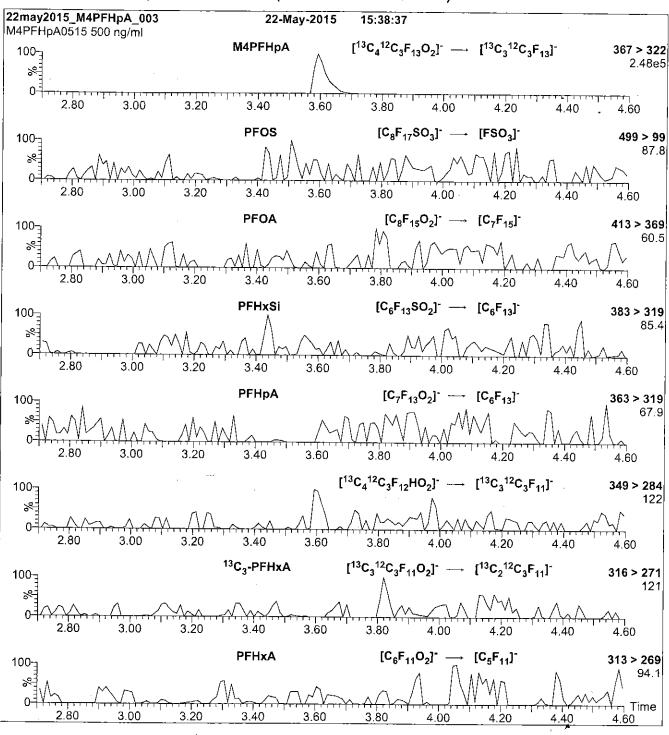
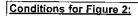


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM5PFPEA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

COMPOUND:

Perfluoro-n-[13C_x]pentanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C,HF,O,

MOLECULAR WEIGHT:

269.01

 $(^{13}C_{5})$

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

05/22/2015

EXPIRY DATE: (mm/dd/yyyy)

05/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains < 0.1% of perfluoro-n-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: _

(mm/dd/ssss)

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, $u_i(y)$, 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:

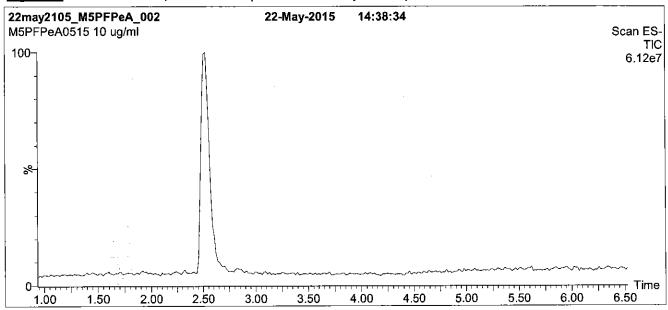
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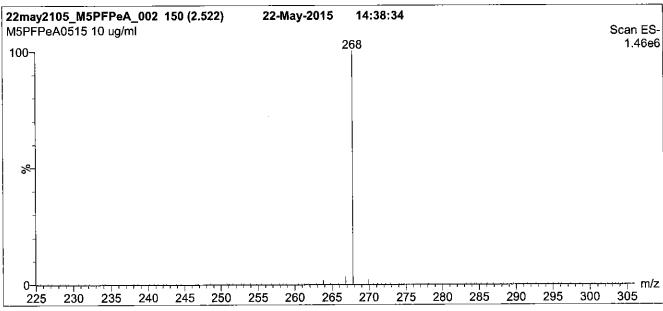




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Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





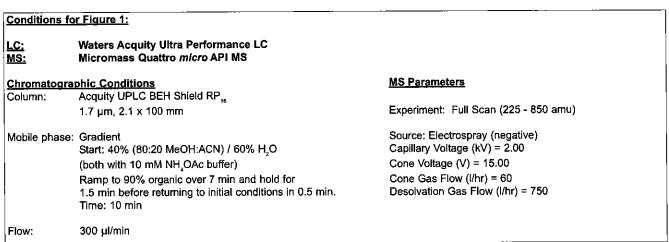
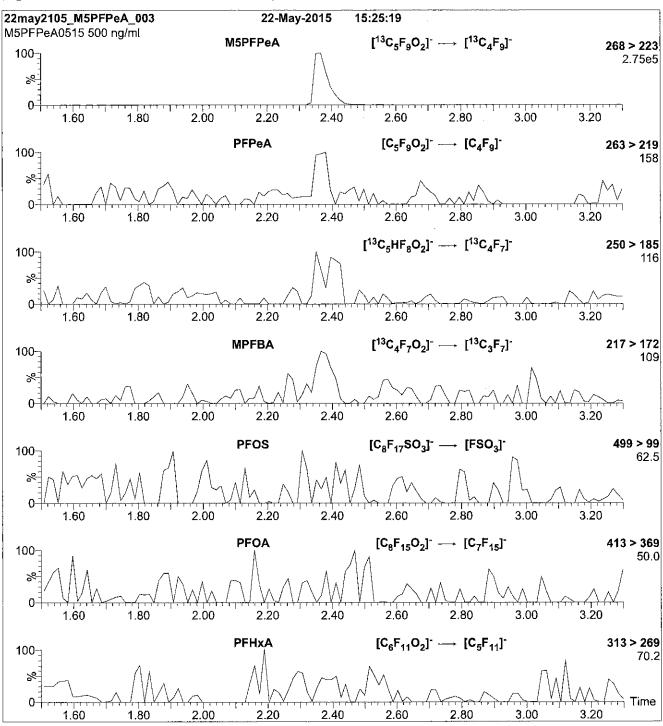
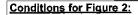


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

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

LCM5PFPEA_00005



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

COMPOUND:

Perfluoro-n-[13C]pentanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C_eHF_aO_a

MOLECULAR WEIGHT:

269.01

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% 13C $(^{13}C_{e})$

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:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

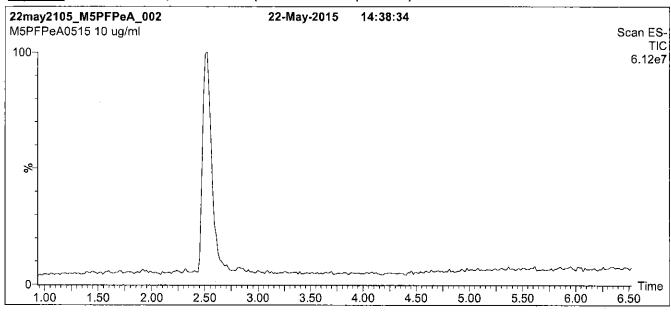
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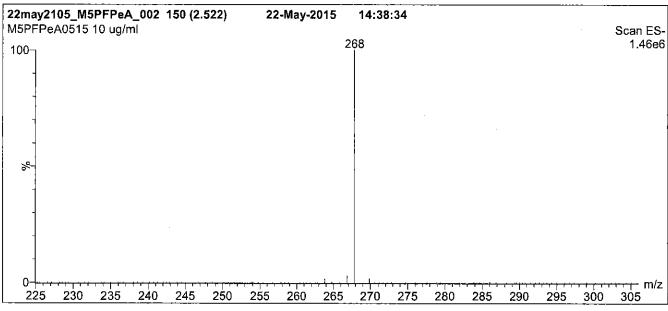




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Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





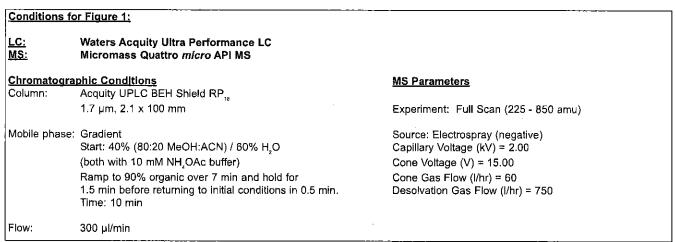
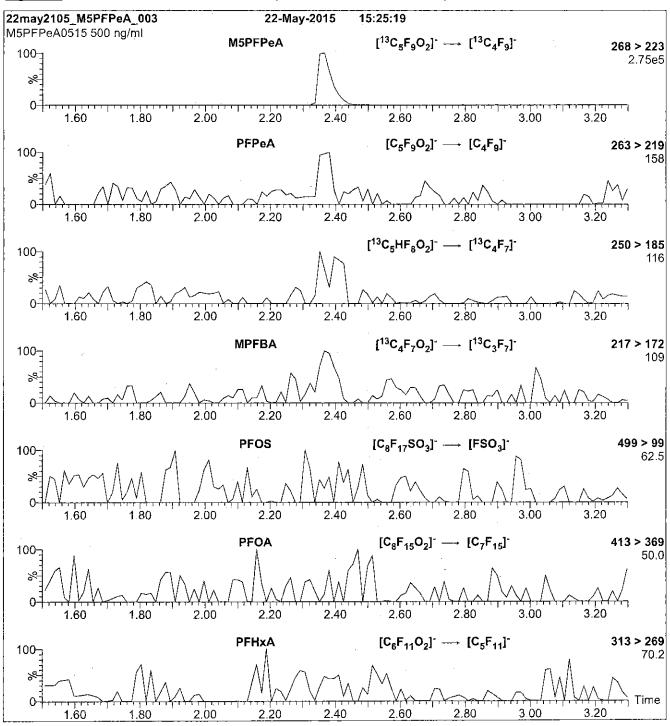
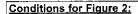


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μI (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM5PFPEA_00006



609706

ID: LCM5PFPEA_00006 Exp: 05/22/20 Prpd: CBW 13C5-Perfluoropentanoic R: 4/7/16



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M5PFPeA

LOT NUMBER:

M5PFPeA0515

COMPOUND:

Perfluoro-n-[13C_s]pentanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₅HF₆O₉

MOLECULAR WEIGHT:

269,01

CONCENTRATION:

CHEMICAL PURITY:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

LAST TESTED: (mm/dd/yyyy)

>98%

05/22/2015

EXPIRY DATE: (mm/dd/yyyy)

05/22/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% 13C

 $(^{13}C_{5})$

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:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

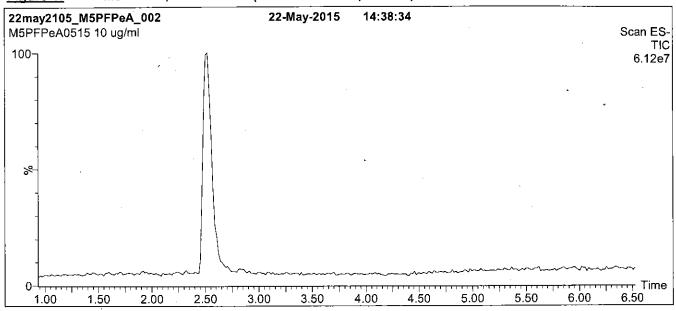
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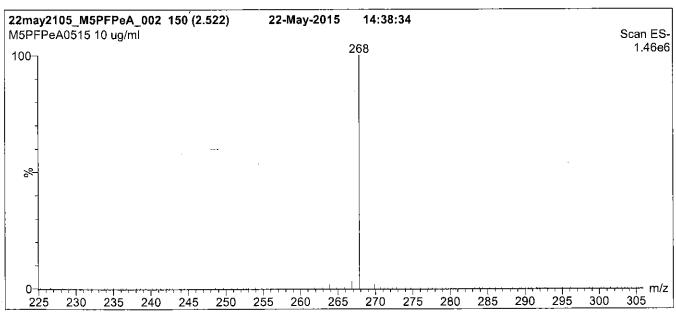




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Figure 1: M5PFPeA; LC/MS Data (TIC and Mass Spectrum)





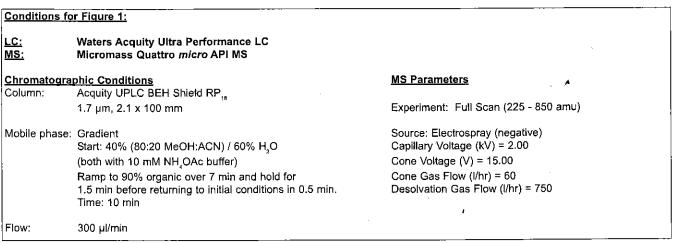
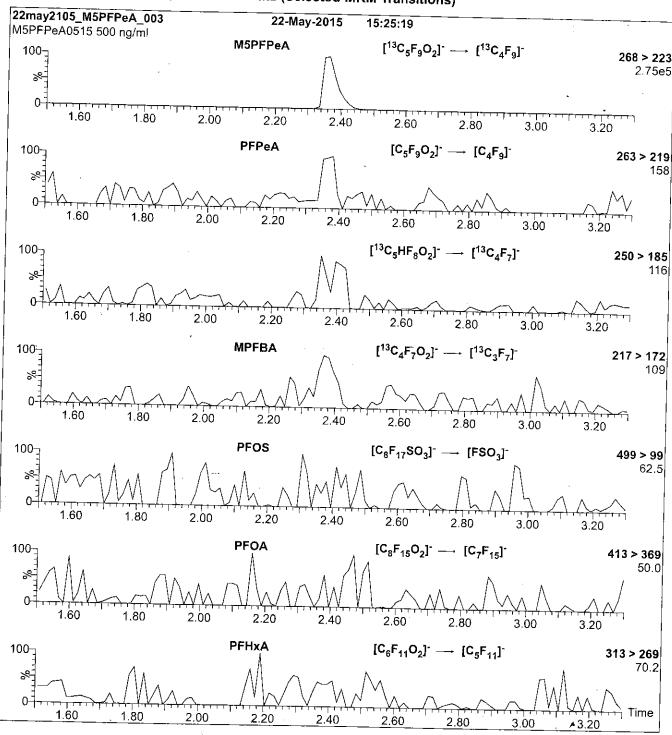
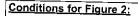


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml M5PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_oO

Flow: 300 µl/min

MS Parameters

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

(both with 10 mM NH₂OAc buffer)

LCM8FOSA_00006



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

LOT NUMBER:

M8FOSA1214I

COMPOUND:

Perfluoro-1-[13C] octanesulfonamide

STRUCTURE:

CAS_#:

Not available

MOLECULAR FORMULA:

¹³C₈H₂F₁₇NO₂S

CONCENTRATION:

50 ± 2.5 μg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/15/2014

EXPIRY DATE: (mm/dd/yyyy)

12/15/2016

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(S):

507.09 Isopropanol

ISOTOPIC PURITY:

≥99% ¹³C

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

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: 04/01/201

(mm/dd/yyyy

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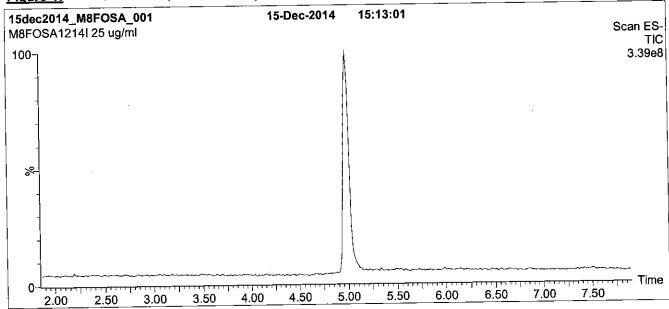
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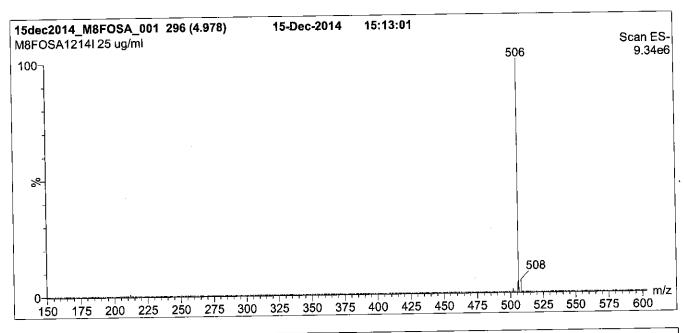


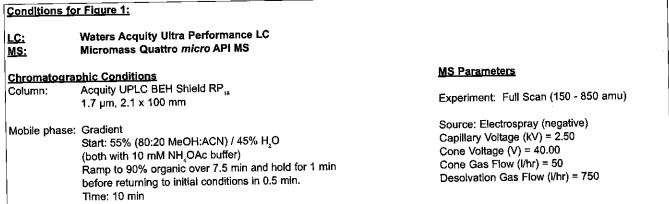


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Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)



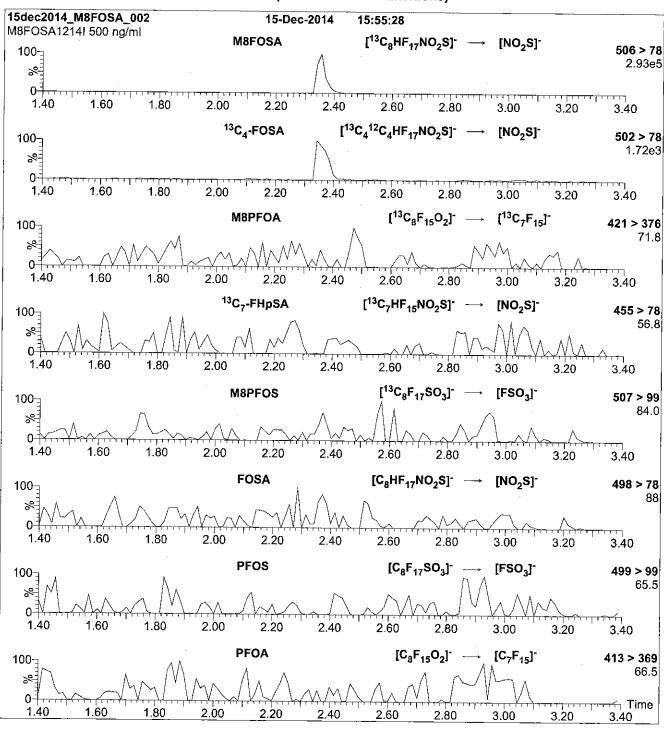


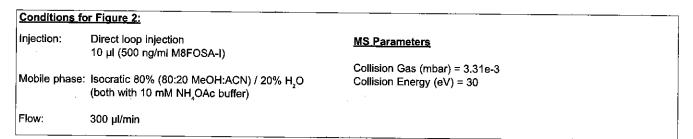


Flow:

300 µl/min

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





LCM8FOSA_00007



572887

ID: LCM8FOSA_00007 Exp. 12/15/16 Prpd: CBW 13C8-Perfluorooctanesulf R: 1/25/16

S:



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

LOT NUMBER:

M8FOSA1214I

COMPOUND:

Perfluoro-1-[13C]]octanesulfonamide

CAS#:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₈H₉F₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/15/2014

EXPIRY DATE: (mm/dd/yyyy)

12/15/2016

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

507.09

SOLVENT(S):

Isopropanol

ISOTOPIC PURITY:

≥99% ¹³C

 $(^{13}C_{8})$

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>

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

 $x_4, x_2,...x_n$ 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:

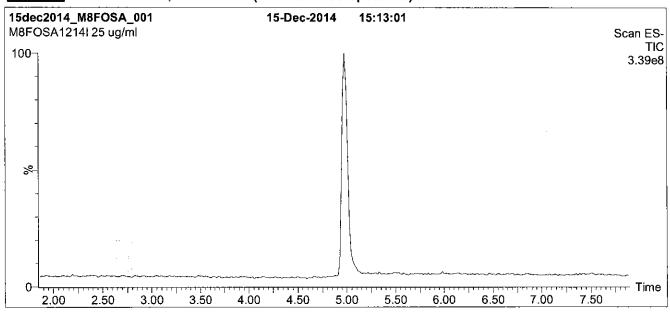
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

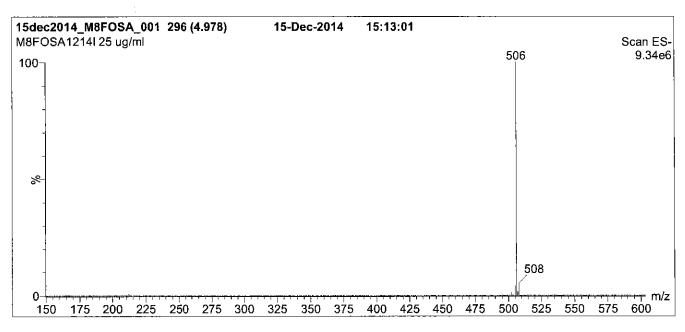




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Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





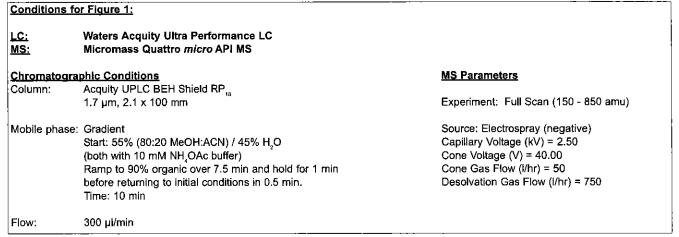
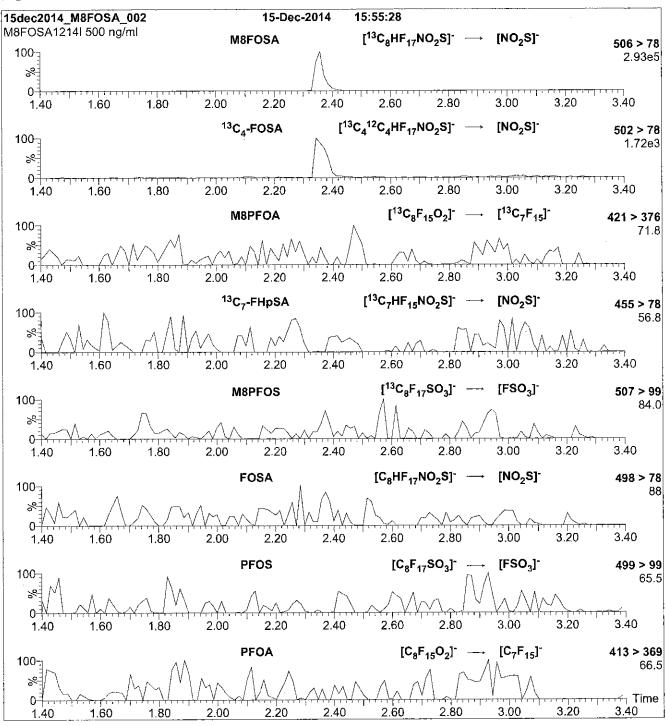
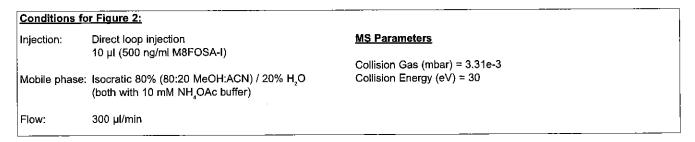


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





LCM8FOSA_00008



ID: LCM8FOSA_00008 Exp: 12/22/17 Prpd: CBW 13C8-Perfluorooctanesulfo



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M8FOSA-I

LOT NUMBER:

M8FOSA1215I

COMPOUND:

Perfluoro-1-[13C_a]octanesulfonamide

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₆H₃F₁₇NO₃S

CONCENTRATION:

50 ± 2.5 µg/ml

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2017

RECOMMENDED STORAGE:

Refrigerate ampoule

MOLECULAR WEIGHT:

507.09

SOLVENT(S):

Isopropanol

ISOTOPIC PURITY:

≥99% ¹³C

 $(^{13}C_{_{\rm B}})$

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:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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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.

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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:

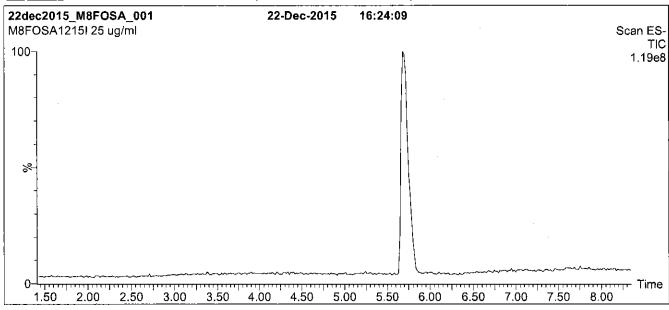
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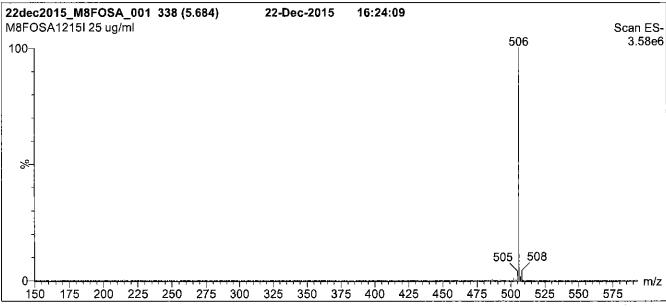




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Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





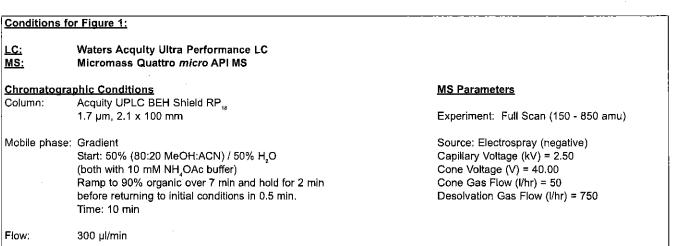
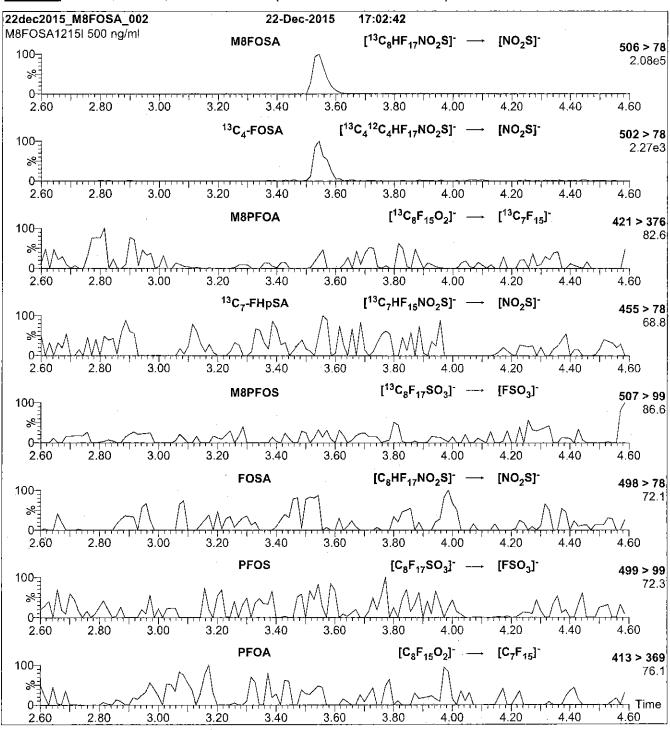
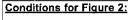


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₂OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCM8FOSA_00009

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



WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M8FOSA-I

COMPOUND:

Perfluoro-1-[13C] octanesulfonamide

LOT NUMBER:

M8FOSA1215I

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₈H₂F₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2017

RECOMMENDED STORAGE:

12/22/2017

Refrigerate ampoule

MOLECULAR WEIGHT:

SOLVENT(S):

Isopropanol

507.09

ISOTOPIC PURITY:

≥99% ¹³C

 $(^{13}C_{_{\rm B}})$

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

U 1/14/2010

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:

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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:

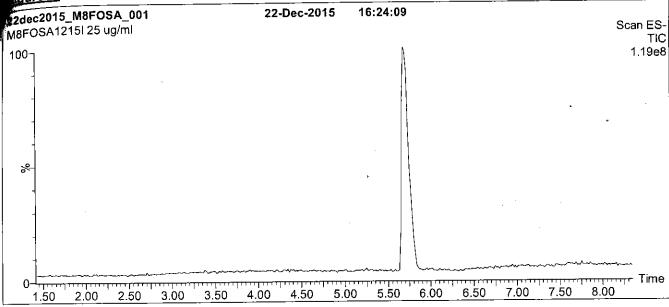
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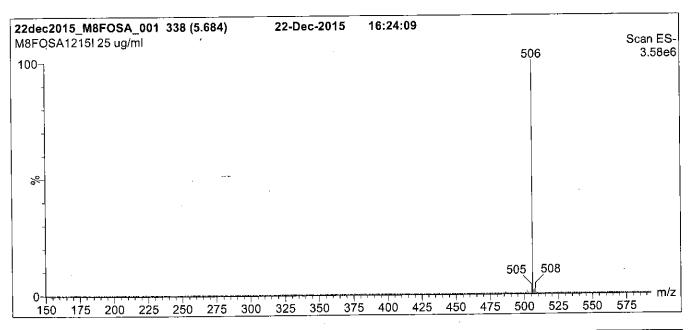




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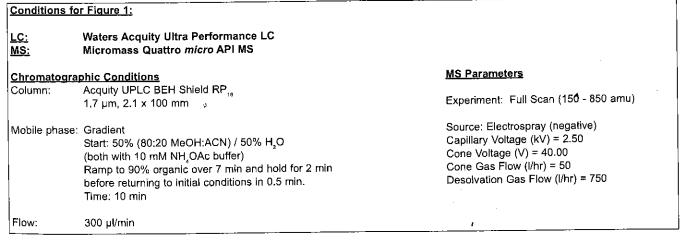
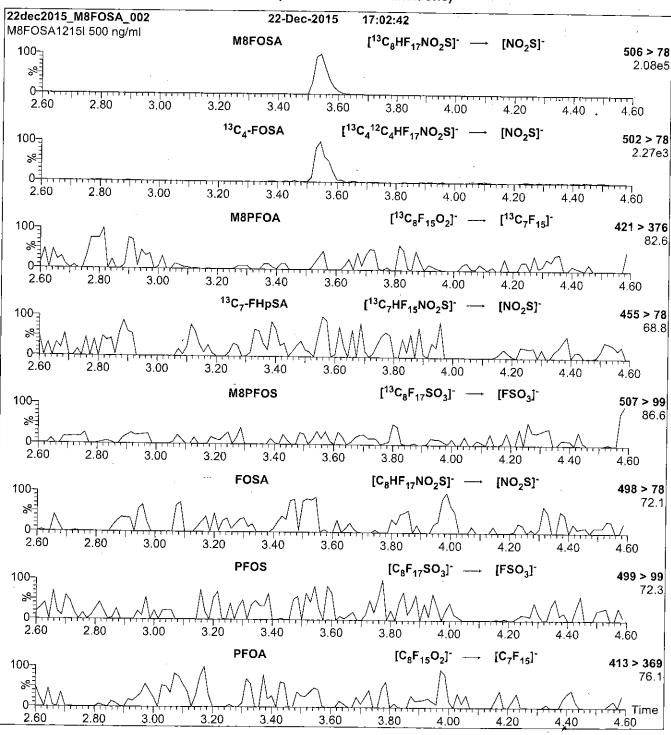
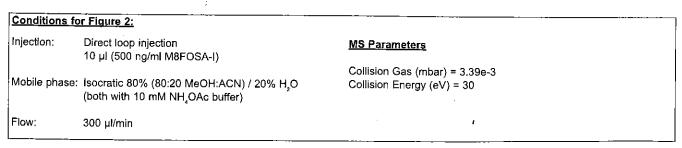


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





LCMPFBA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA1014

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄HF,O₂

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

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

SOLVENT(S):

Methanol

....

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C (1,2,3,4-¹³C₂)

LAST TESTED: (mm/dd/yyyy)

10/31/2014

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

• Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

P.C. Chittim

vate: _

(mm/dd/yyy

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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

$$x_t, x_0, ... x_n$$
 on which it depends is:

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

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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:

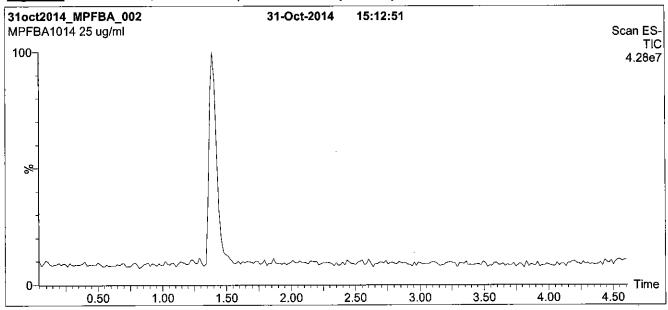
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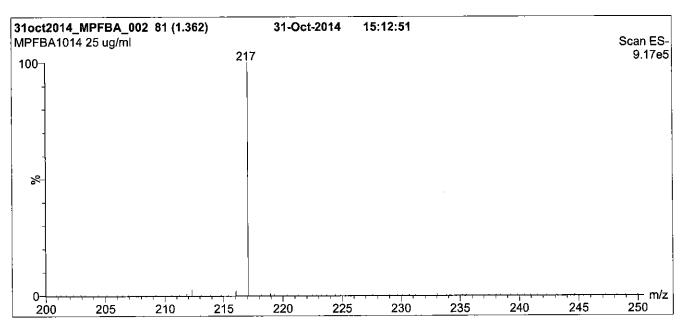




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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)





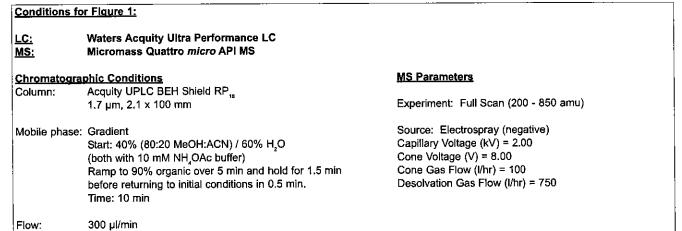
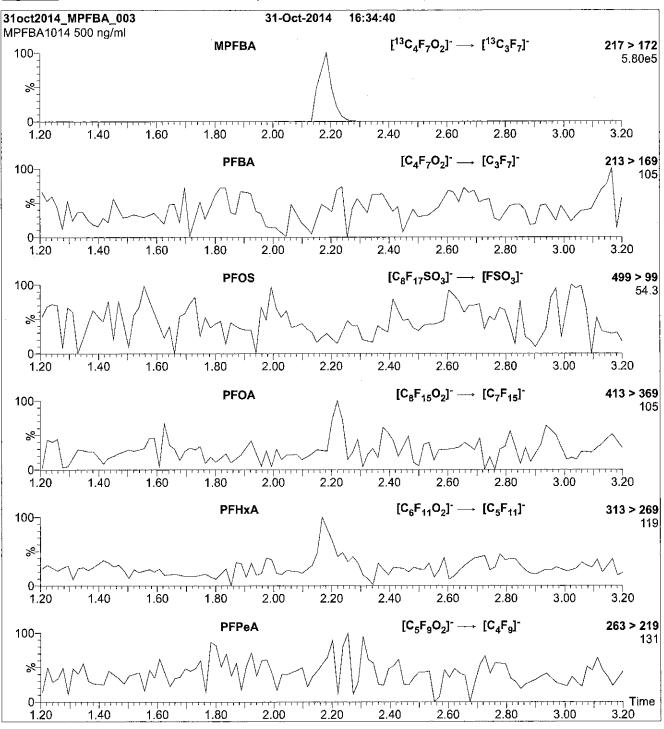
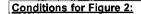


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3

Collision Energy (eV) = 10

LCMPFBA_00005



Exp: 10/31/19 Prpd: CBW 13C4-Perfluorobutanoic ad R: 3/3/16 CBW



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA1014

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄HF₇O₂

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

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

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

10/31/2014

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

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE;

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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:

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

The combined relative standard uncertainty, $u_{n}(y)$, 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:

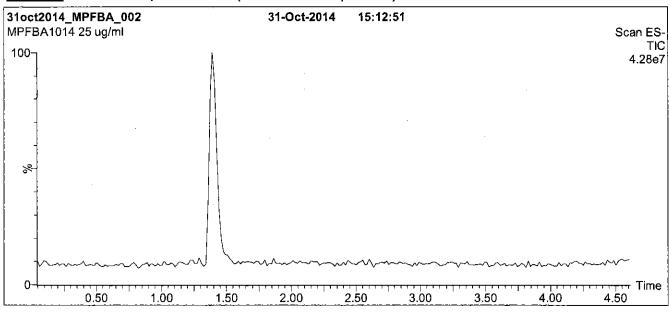
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

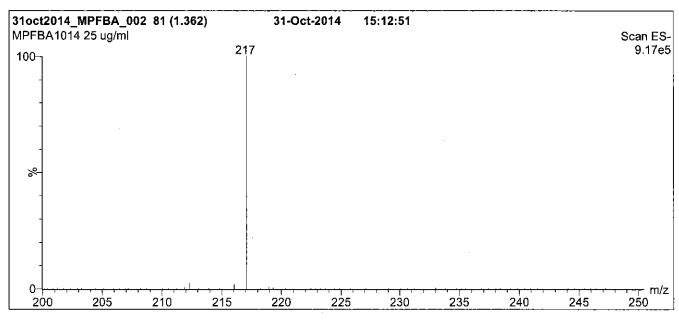




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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)





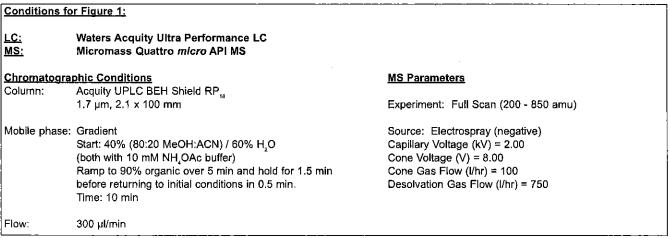
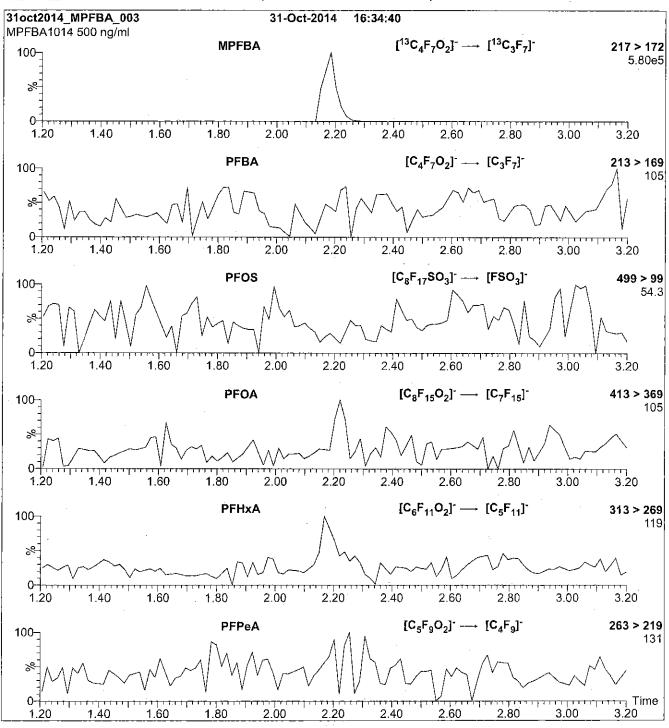
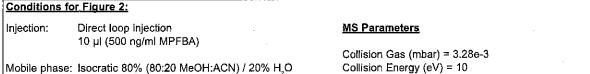


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300 µl/min Flow:

LCMPFBA_00006







CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFBA

LOT NUMBER:

MPFBA1014

COMPOUND:

Perfluoro-n-[1,2,3,4-13C₄]butanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄HF₂O,

MOLECULAR WEIGHT:

218.01

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%13C

LAST TESTED: (mm/dd/yyyy)

10/31/2014

(1,2,3,4-13C₁)

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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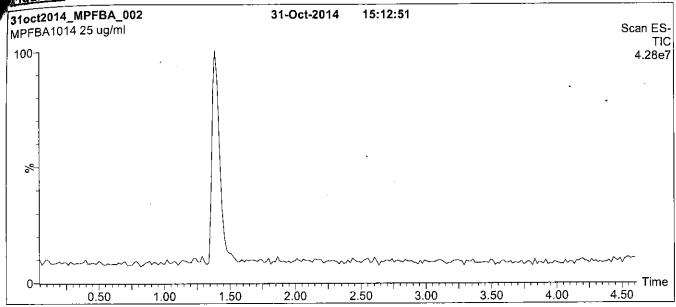
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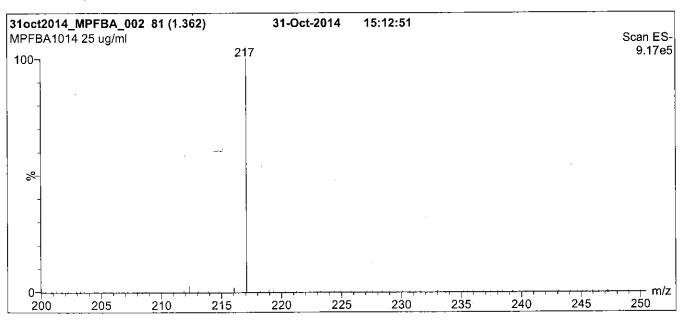




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MPFBA; LC/MS Data (TIC and Mass Spectrum)





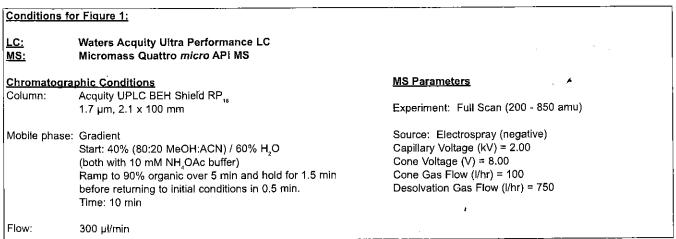
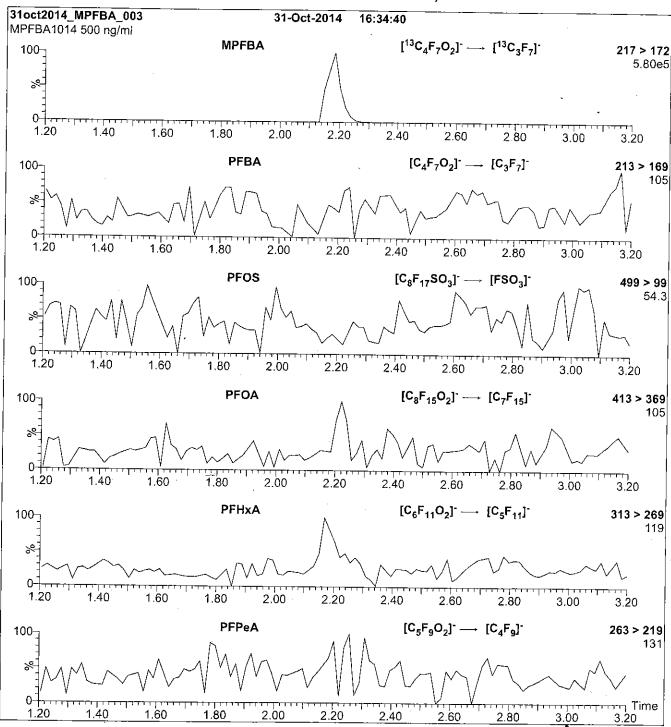
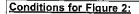


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow;

300 µl/min

MS Parameters

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

LCMPFDA_00004





CERTIFICATE OF ANALYSIS DOCUMENTATION

12LCMS0262

LCMPFDA -00001

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0411

COMPOUND:

STRUCTURE:

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

CAS#

Not available

MOLECULAR FORMULA:

 $^{13}C_{2}^{12}C_{8}HF_{19}O_{2}$

MOLECULAR WEIGHT:

516.07

CONCENTRATION:

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C (1,2-¹³C₃)

LAST TESTED: (mm/dd/yyyy)

04/07/2011

04/07/2014

EXPIRY DATE: (mm/dd/yyyy)
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 ¹³C₄-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

04/19/2011

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

Form#:27, Issued 2004-11-10 Revision#:1, Revised 2010-07-26 MPFDA0411 (1 of 4)

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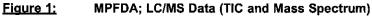
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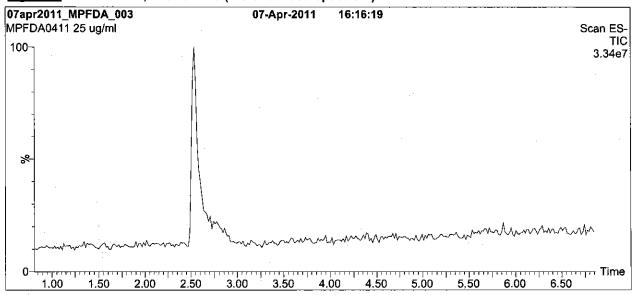
LIMITED WARRANTY:

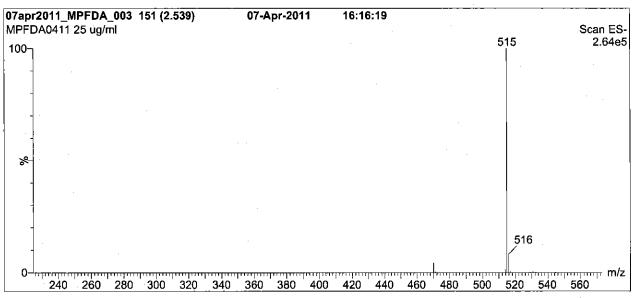
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Form#:27, Issued 2004-11-10 Revision#:1, Revised 2010-07-26 MPFDA0411 (2 of 4)







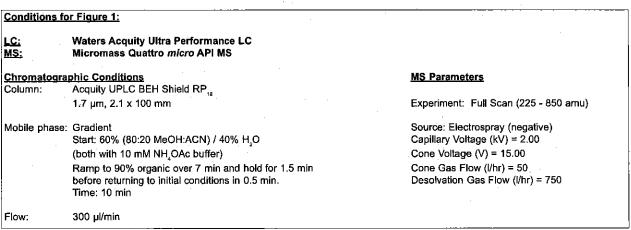
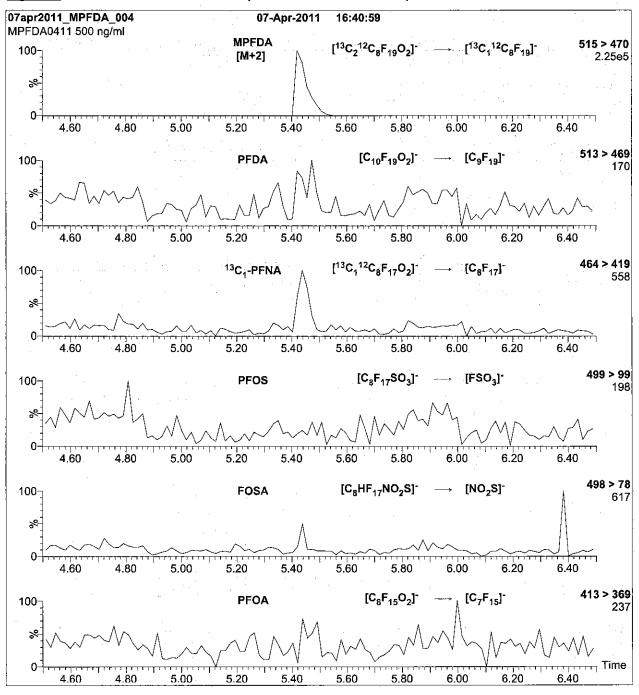
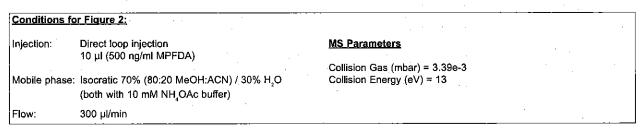


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





Form#:27, Issued 2004-11-10 Revision#:1, Revised 2010-07-26 MPFDA0411 (4 of 4) rev0

LCMPFDA_00005



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0414

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C212CHF19O2

MOLECULAR WEIGHT:

516.07

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

Water (<1%) >99% 13C

LAST TESTED: (mm/dd/yyyy)

04/13/2014

ISOTOPIC PURITY:

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

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.

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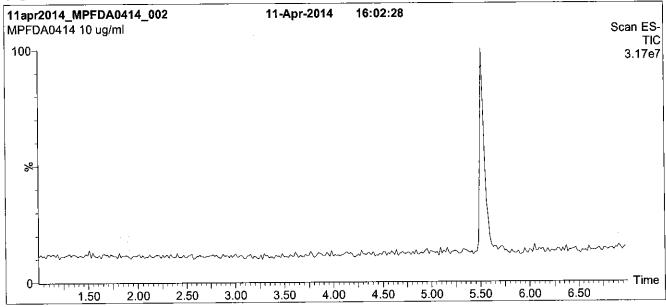
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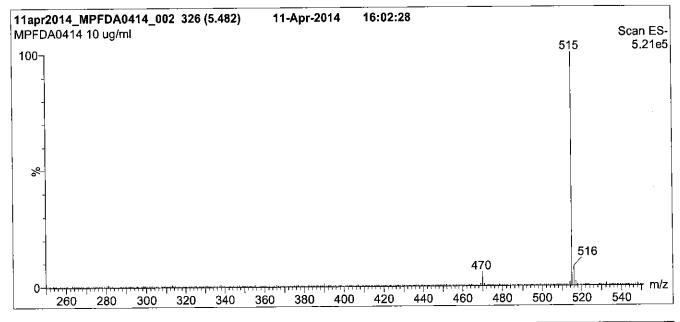




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





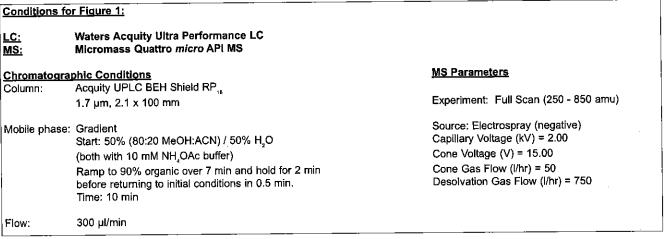
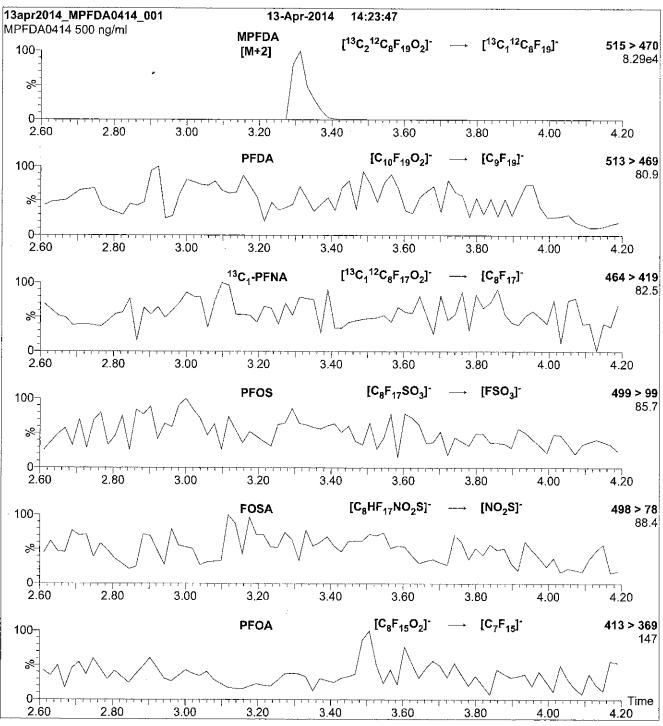
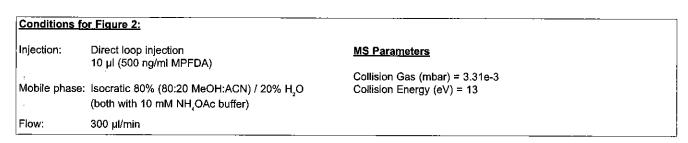


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDA_00006





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0815

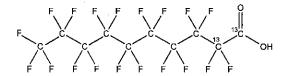
COMPOUND:

Perfluoro-n-[1,2-13C2]decanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₈HF₁₉O₂

MOLECULAR WEIGHT:

516.07

CONCENTRATION:

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

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) >99% 13C

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

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

08/19/2015

EXPIRY DATE: (mm/dd/yyyy)

08/19/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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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:

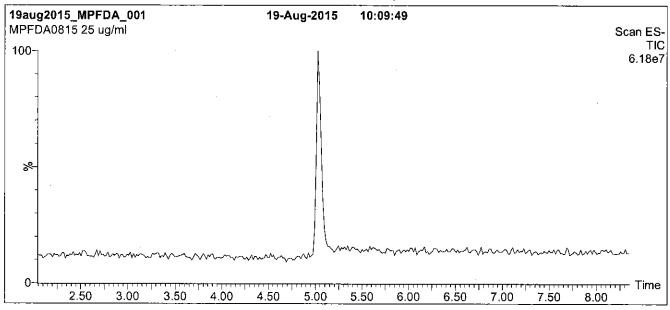
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

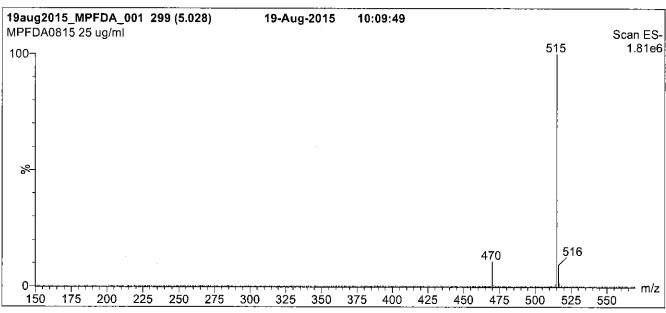




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





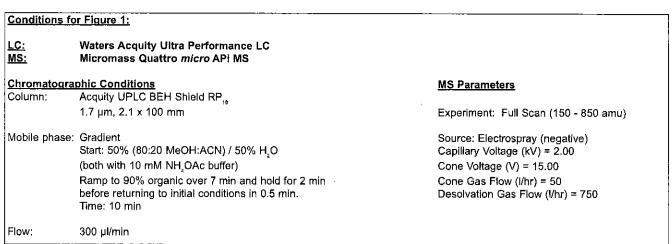
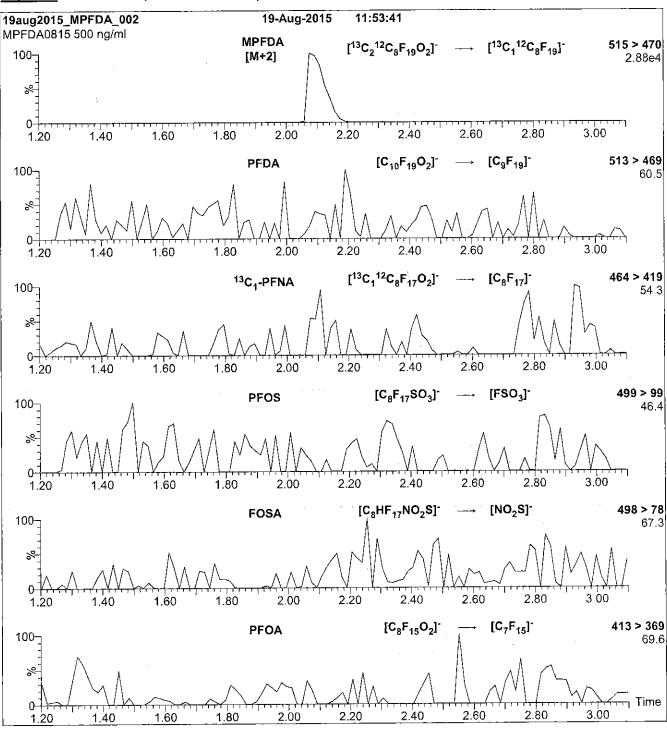
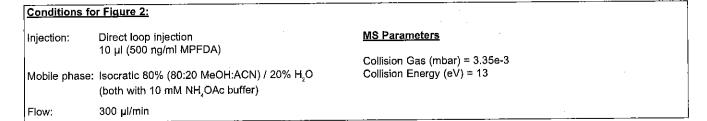


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDA_00007



13C2-Perfluornodecanoic a



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDA

LOT NUMBER:

MPFDA0815

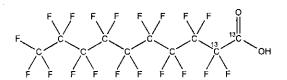
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₄HF₁₀O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

516.07

SOLVENT(S):

Methanol

≥99% ¹³C

(1,2-13C₂)

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.

Contains < 0.1% of ¹³C₄-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 08/21/2015

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 solutility 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:

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

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

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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:

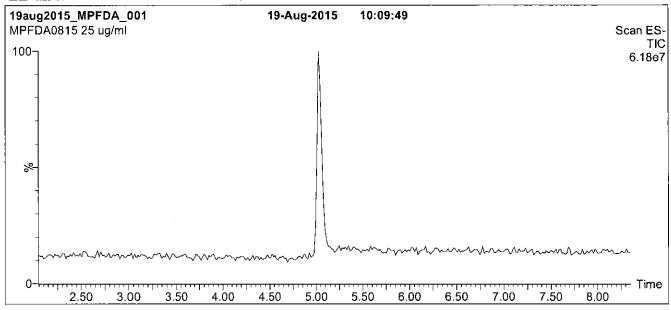
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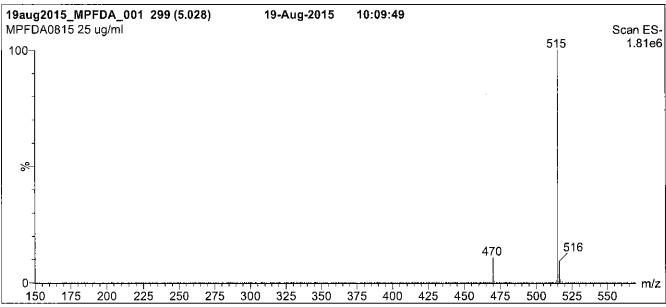




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





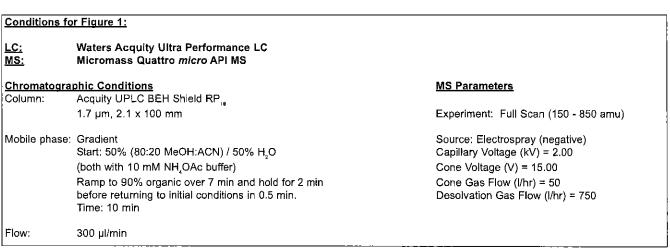
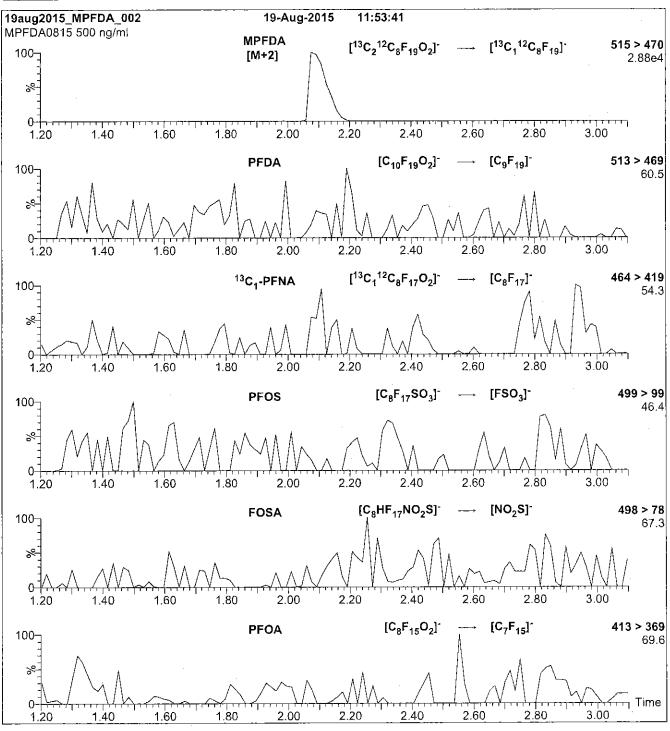
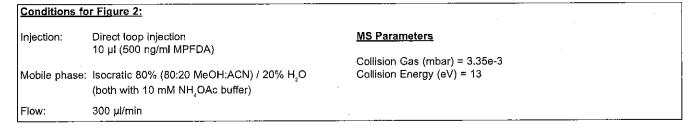


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDoA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

LOT NUMBER:

MPFDoA0714

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₁₀HF₂₃O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

616.08

SOLVENT(S):

Methanol

(1,2-13C₂)

Water (<1%) ≥99% 13C

ISOTOPIC PURITY:

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/17/2014

EXPIRY DATE: (mm/dd/yyyy)

07/17/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 07/21/2014

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_i(y)$, 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

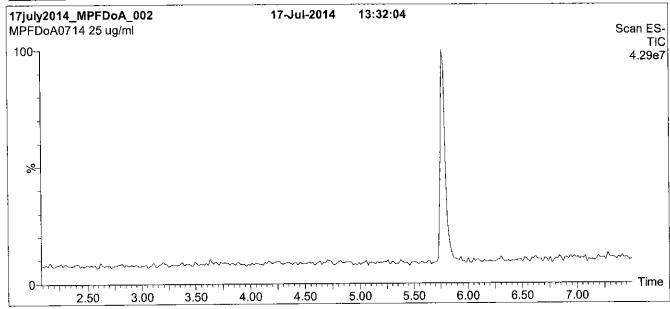
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

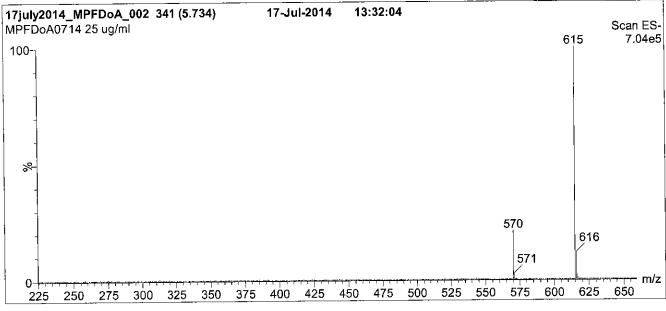




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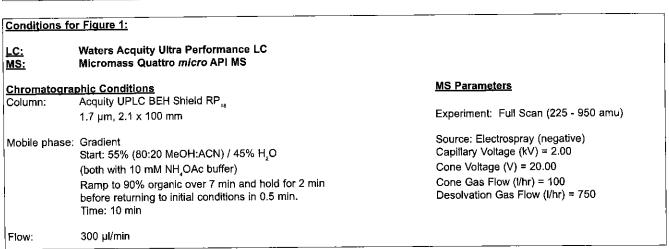
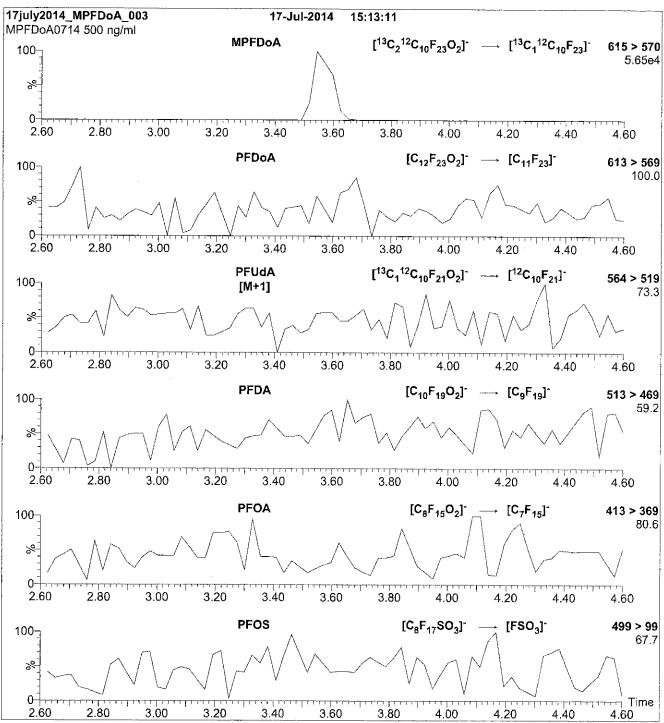
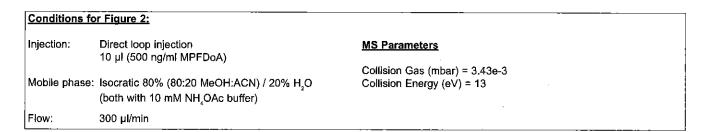


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFDoA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

LOT NUMBER:

MPFDoA0714

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

CONCENTRATION:

¹³C₂¹²C₁₀HF₂₃O₂

MOLECULAR WEIGHT:

616.08

 $50 \pm 2.5 \,\mu g/ml$ SOLVENT(S): Methanol Water (<1%)

ISOTOPIC PURITY:

≥99% ¹³C $(1,2^{-13}C_{o})$

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

07/17/2014

>98%

EXPIRY DATE: (mm/dd/yyyy)

07/17/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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_z(y), of a value y and the uncertainty of the independent parameters

 $x_{*}, x_{*}, ...x_{*}$ 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.

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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:

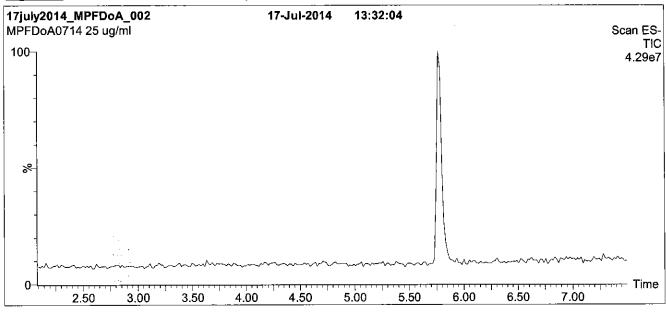
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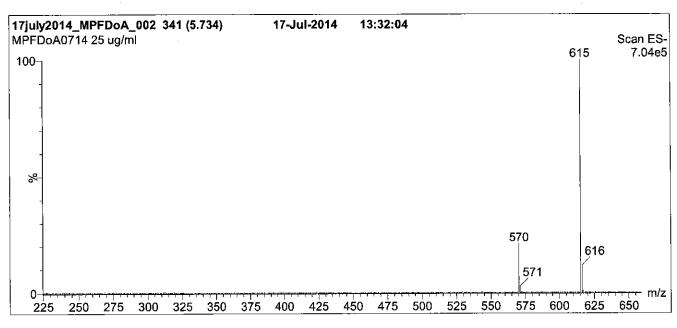




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





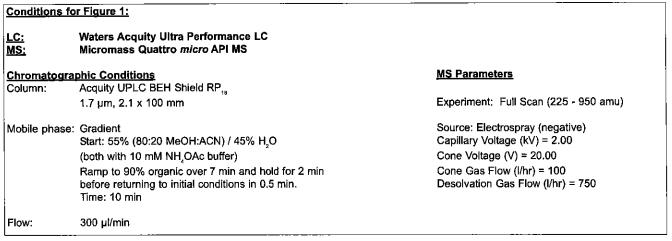
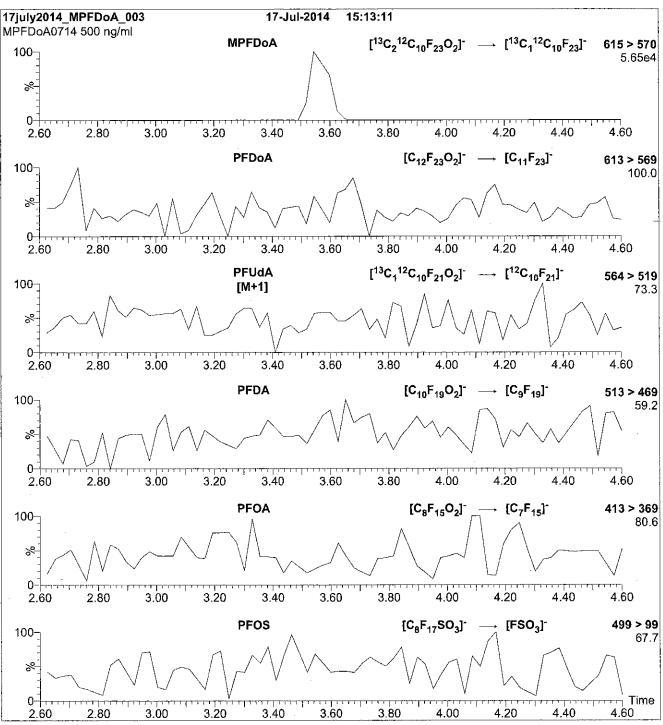
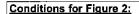


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μI (500 ng/ml MPFDoA)

MS Parameters

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

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

(both with 10 mM NH₄OAc buffer)

Flow:

300 µ1/min

LCMPFDoA 00005

13C2-Perfluornododecanoic



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

LOT NUMBER:

MPFDoA0714

COMPOUND:

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

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₂¹²C₁₀HF₂O₃

CONCENTRATION:

CHEMICAL PURITY:

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

MOLECULAR WEIGHT:

616.08

SOLVENT(S):

Methanol

Water (<1%)

ISOTOPIC PURITY:

≥99% ¹³C $(1,2^{-13}C_2)$

07/17/2014

>98%

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

07/17/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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EXPIRY DATE / PERIOD OF VALIDITY:

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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:

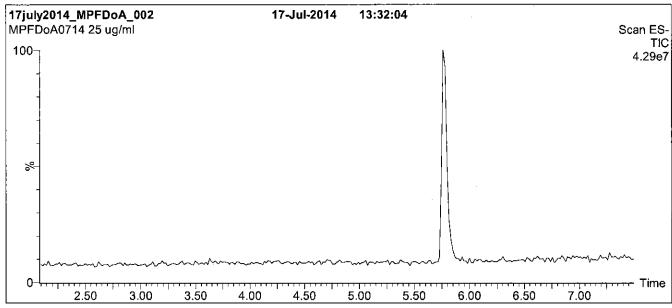
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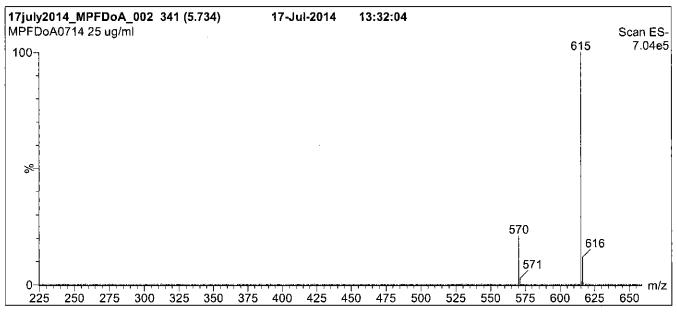




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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)





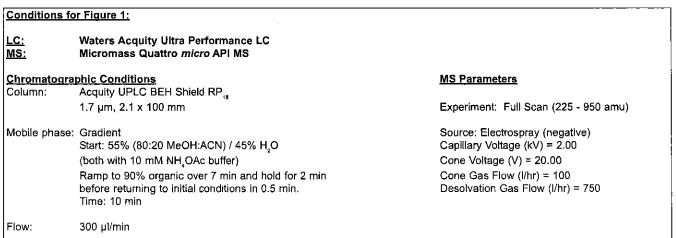
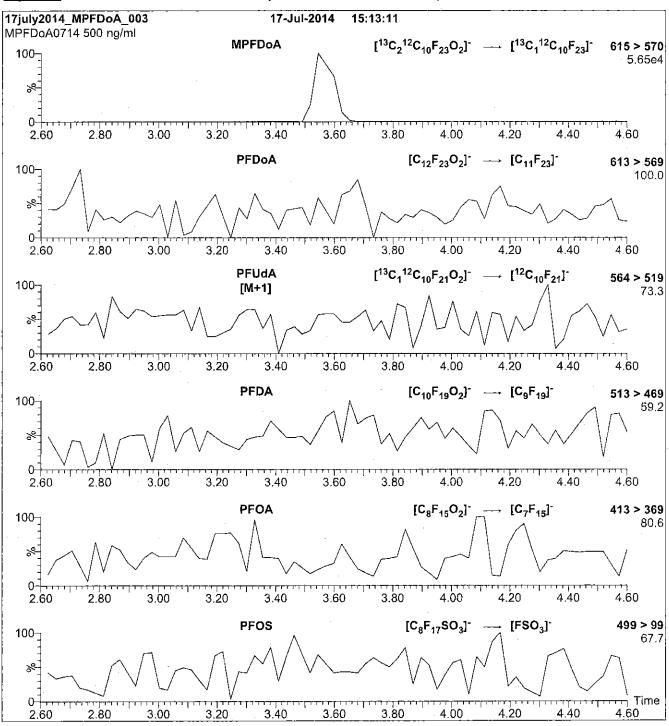
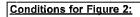


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFDoA_00006



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

R: 4/7/16





CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFDoA

LOT NUMBER:

MPFDoA0714

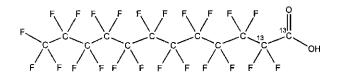
COMPOUND:

Perfluoro-n-[1,2-13C2]dodecanoic acid

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₁₀HF₂₃O₂

CONCENTRATION:

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

616.08

SOLVENT(S):

Methanol

≥99% ¹³C

(1,2-13C₂)

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/17/2014

EXPIRY DATE: (mm/dd/yyyy)

07/17/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

04/01/2015

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

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:

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

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:

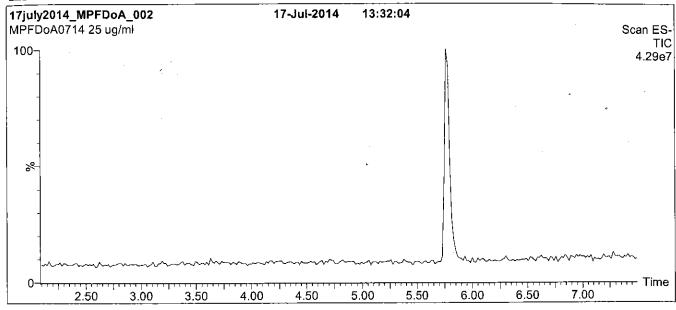
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

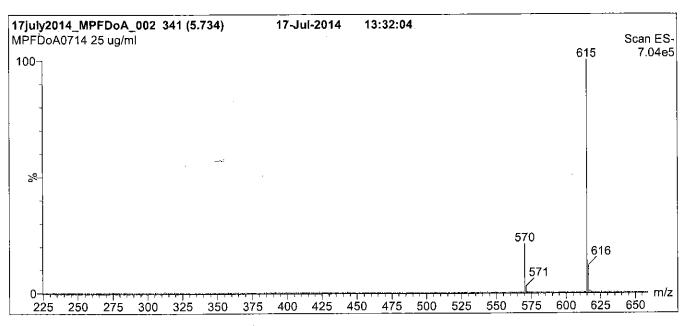




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





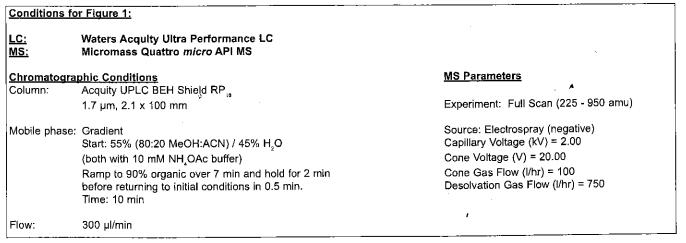
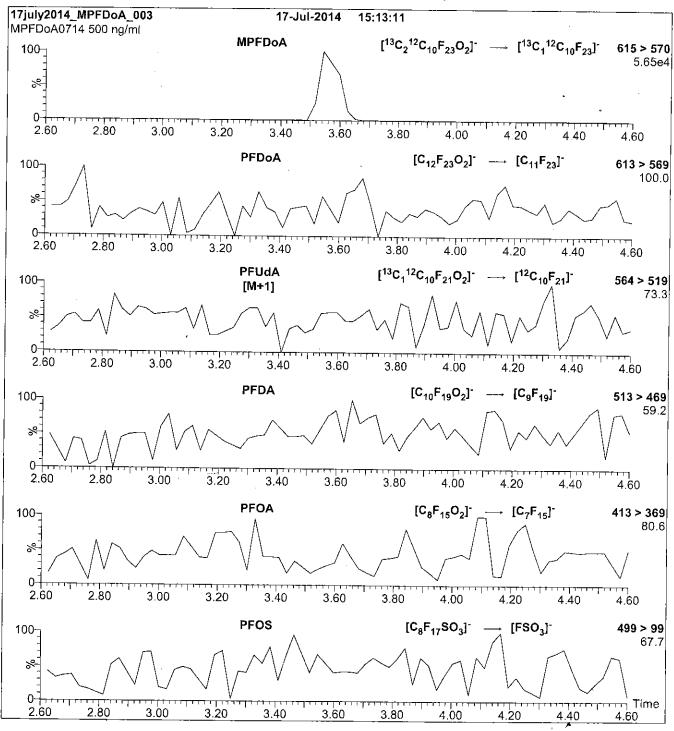
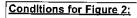


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFHxA_00006



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA0414

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C212C4HF4O2

MOLECULAR WEIGHT:

316.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99%13C (1,2-13C₂)

LAST TESTED: (mm/dd/yyyy)

04/13/2014

EXPIRY DATE: (mm/dd/yyyy)

04/13/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>04/15/2014</u>

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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_z(y)$, 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

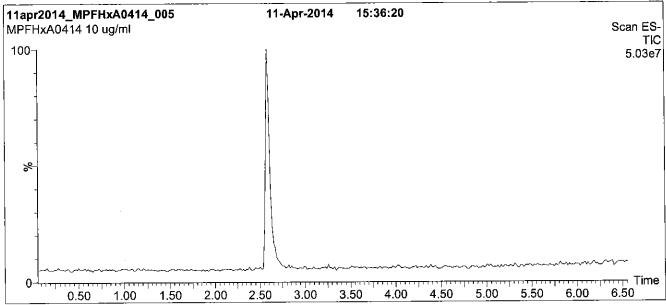
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

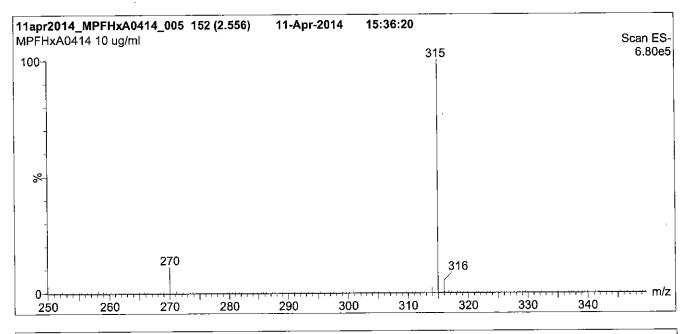


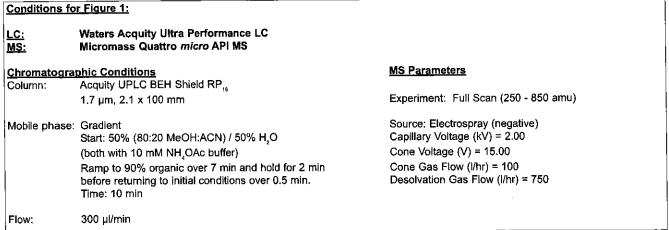


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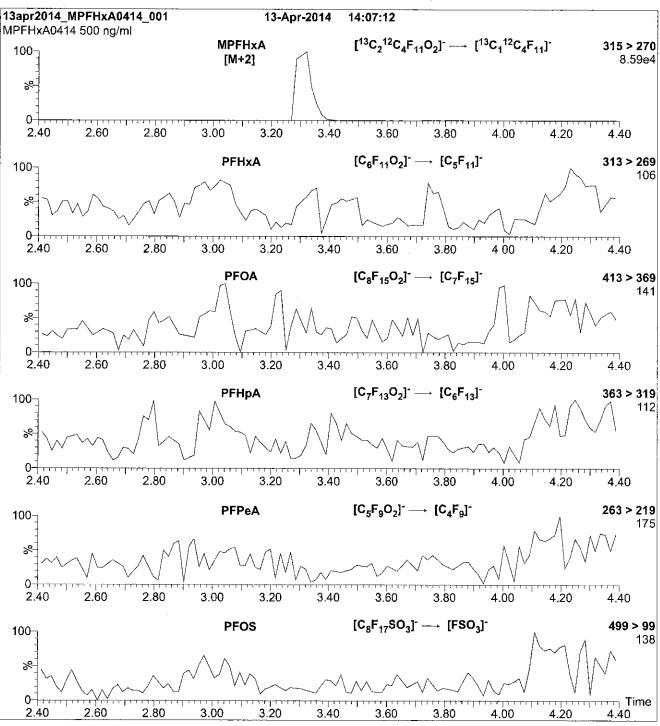


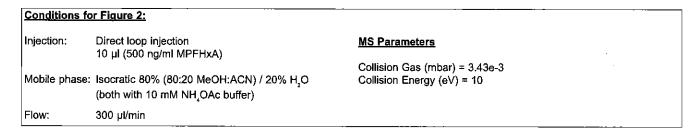






<u>Figure 2:</u> MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxA_00007



ID: LCMPFHxA 00007 Exp:04/09/20 Prpd;CBW Opn:02/25/16 13C2-Perfluorohexanoic ac



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA0415

COMPOUND:

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

CAS #:

Not available

STRUCTURE:

MOLECULAR FORMULA:

¹³C₂¹²C₄HF₁₁O₂

MOLECULAR WEIGHT:

316.04

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

≥99%13C

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

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

LAST TESTED: (mm/dd/yyyy)

04/09/2015

EXPIRY DATE: (mm/dd/yyyy)

04/09/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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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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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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:

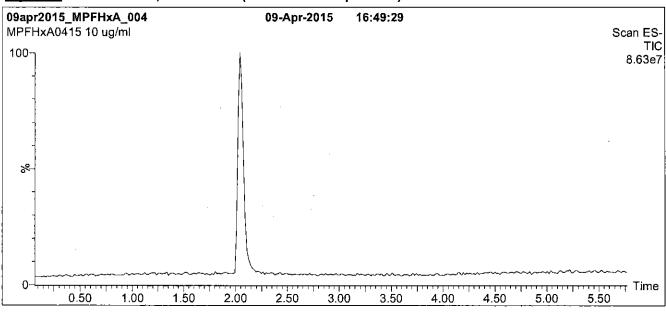
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

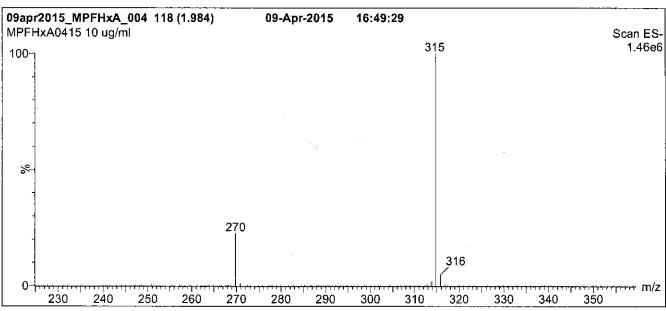




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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)





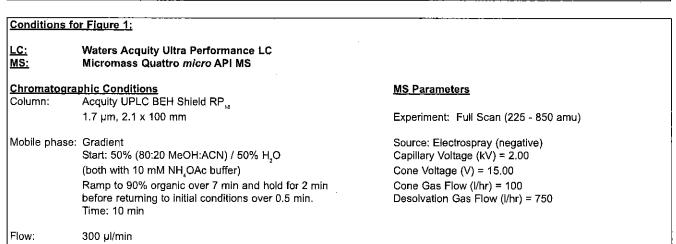
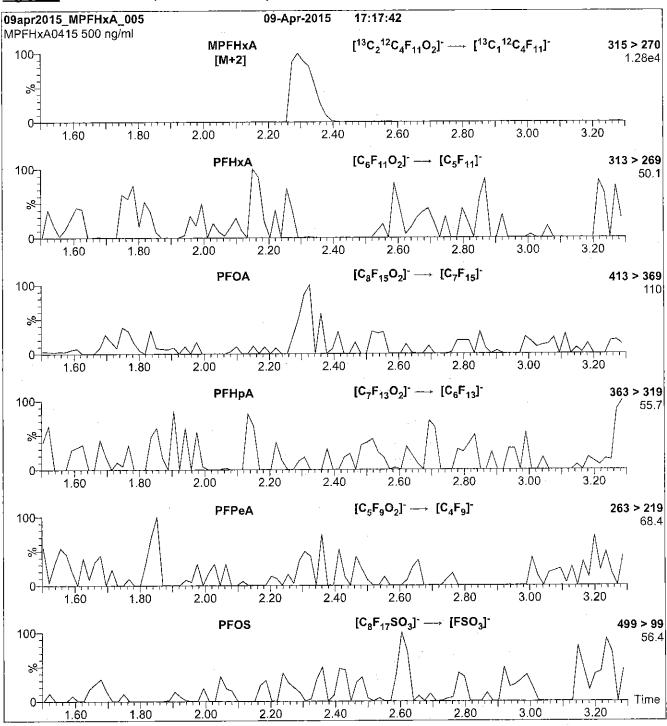
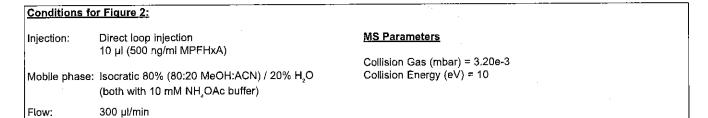


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxA_00008



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxA

LOT NUMBER:

MPFHxA0415

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

F F F F F F

MOLECULAR FORMULA:

13C, 12C, HF, O,

MOLECULAR WEIGHT:

316.04

CONCENTRATION:

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

SOLVENT(S):

Methanol

IOOTODIO E

Water (<1%)

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

04/09/2015

oorong rolari

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

EXPIRY DATE: (mm/dd/yyyy)

04/09/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains < 0.1% of perfluoro-n-hexanoic acid and ~ 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date

04/14/2015

(mm/dd/yyyy)

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

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

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

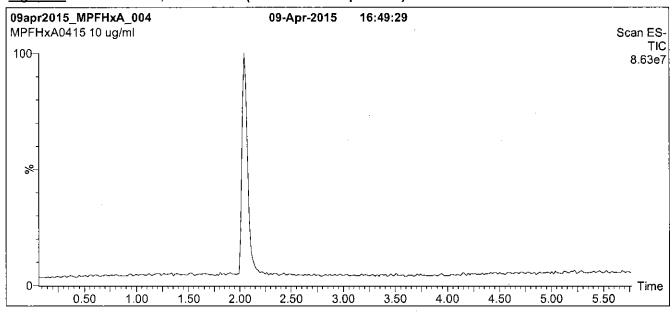
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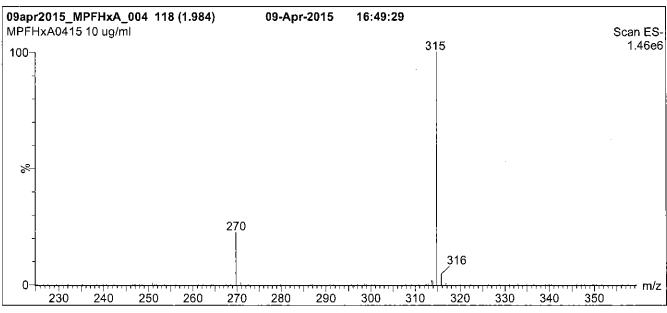


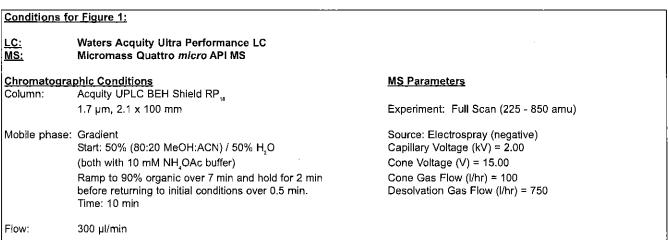


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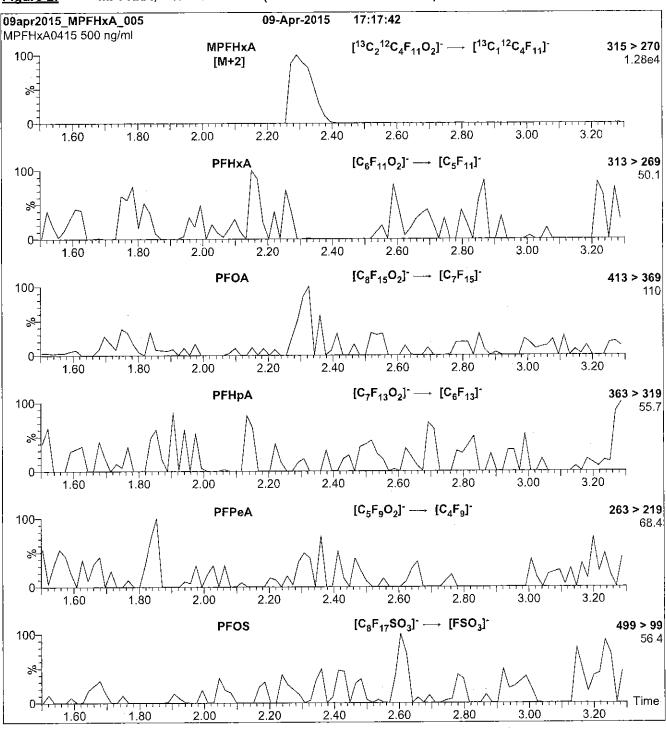
Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)

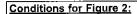






MPFHxA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





Injection:

Direct loop injection

10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFHxS_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS0713

COMPOUND:

Sodium perfluoro-1-hexane[18O2]sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₆F₁₃S¹⁸O₂¹⁶ONa

CONCENTRATION:

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

MOLECULAR WEIGHT:

426.10

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>94% (18O₃)

LAST TESTED: (mm/dd/yyyy)

07/25/2013

EXPIRY DATE: (mm/dd/yyyy)

07/25/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

The response factor for MPFHxS ($C_eF_{13}S^{16}O_2^{-16}O^-$) has been observed to be up to 10% lower than for PFHxS (C₈F₁₃S¹⁶O₃) when both compounds are injected together. This difference may vary between instruments.

Due to the isotopic purity of the starting material (160, >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:

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_s(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:

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

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

QUALITY MANAGEMENT:

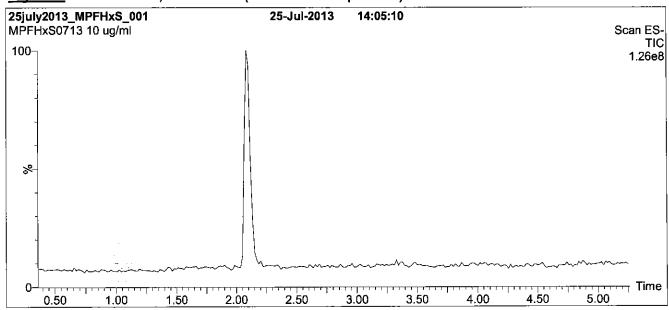
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

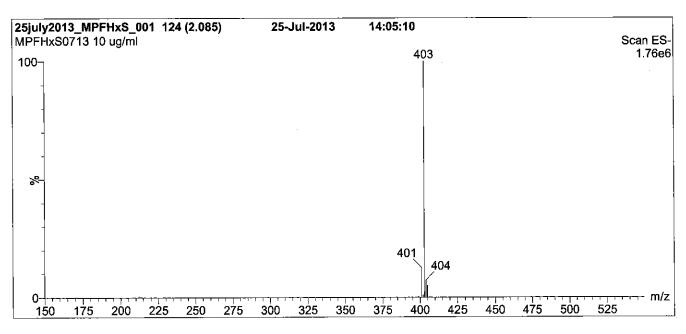




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





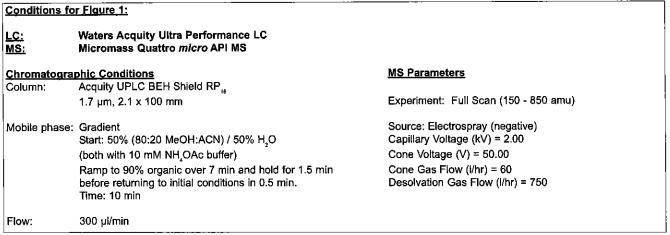
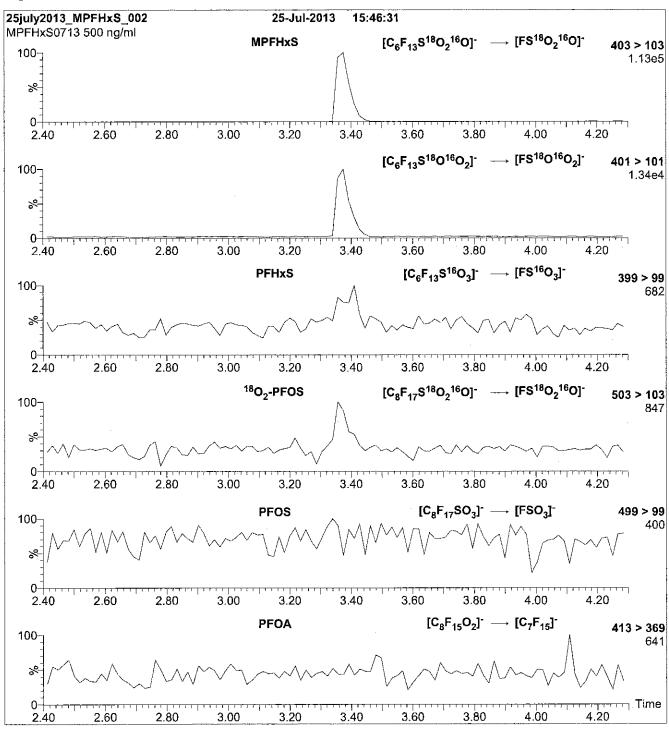
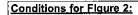


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFHxS_00005

Exp: 08/23/20 Prpd: CBW 18O2-Perfluoronexanesulfo



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS1015

COMPOUND:

Sodium perfluoro-1-hexane[18O₂]sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₈F₁₃S¹⁸O₂¹⁶ONa

MOLECULAR WEIGHT:

426.10

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>94% (16O₂)

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

 $47.3 \pm 2.4 \mu g/ml$ (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 (C₅F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₈F₁₃S¹⁸O₃-) when both compounds are injected together. This difference may vary between

Due to the isotopic purity of the starting material (16O₂ >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 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 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:

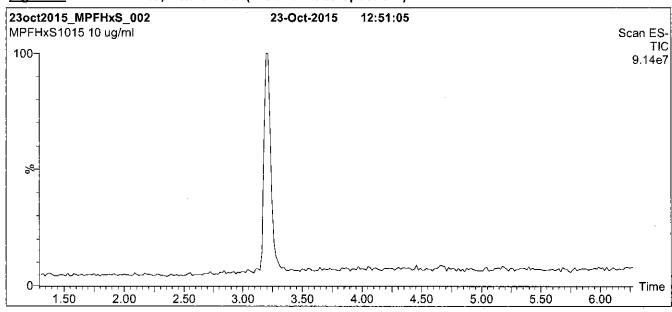
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

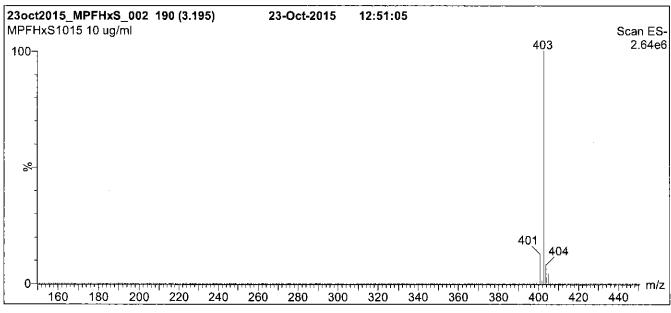




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





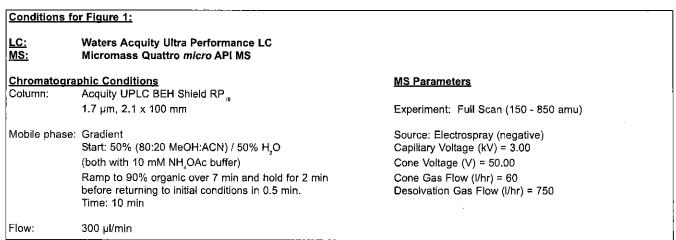
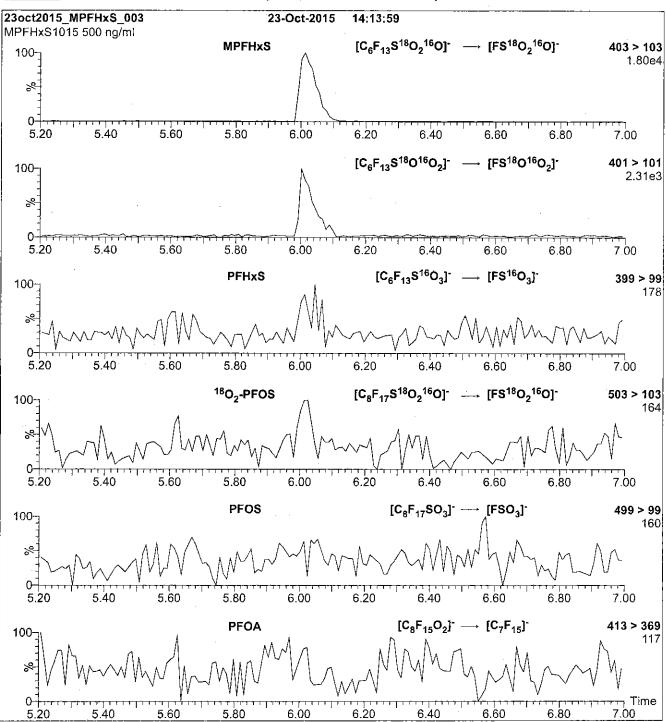
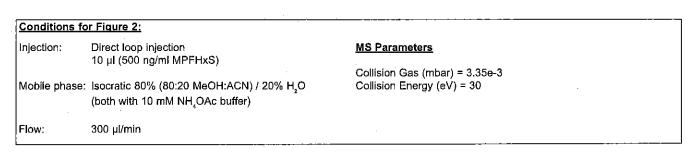


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFHxS_00006



ID: LCMPFHxS_00006 18O2-Perfluorohexanesulfo R: 4/7/16 CBW



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFHxS

LOT NUMBER:

MPFHxS1015

COMPOUND:

Sodium perfluoro-1-hexane[180,]sulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₆F₁₃S¹⁸O₂¹⁶ONa

MOLECULAR WEIGHT:

426.10

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>94% (18O₂)

LAST TESTED: (mm/dd/yyyy)

10/23/2015 10/23/2020

EXPIRY DATE: (mm/dd/yyyy) 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 (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C_sF₃S¹⁸O₃) when both compounds are injected together. This difference may vary between instruments.

Due to the isotopic purity of the starting material (160, >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

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.

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:

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

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 ±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:

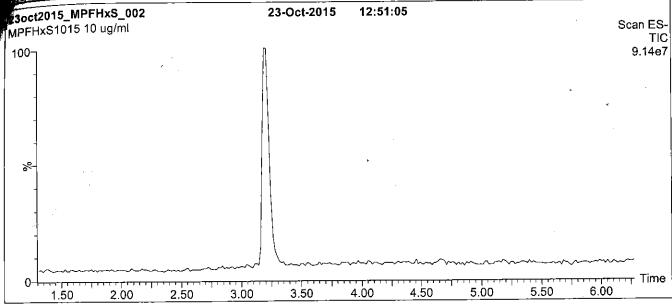
This product was produced using a Quality Management System registered to the latest versions of ISQ 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

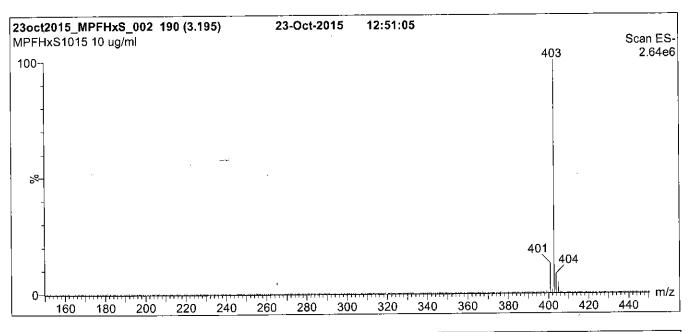




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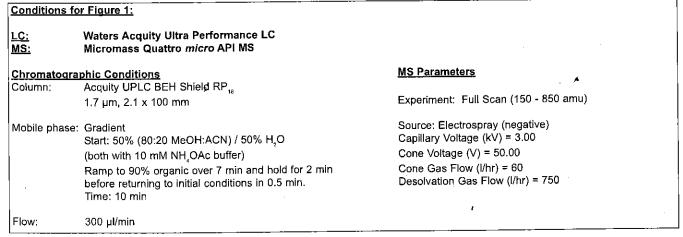
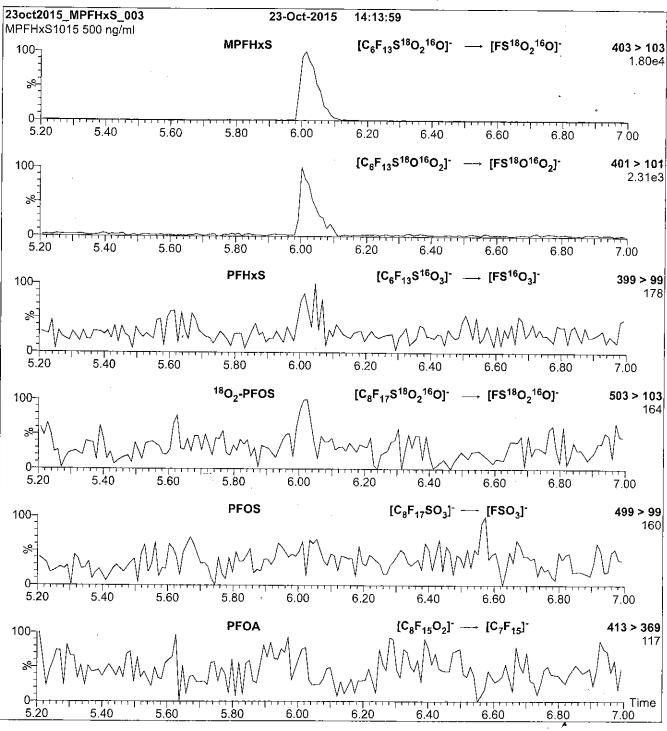
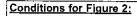


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μI (500 ng/ml MPFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFNA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0414

COMPOUND:

Perfluoro-n-[1,2,3,4,5-13C]nonanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₂

MOLECULAR WEIGHT:

469.04

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

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

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99%13C

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:

Date: 04/13/2014

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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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.

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

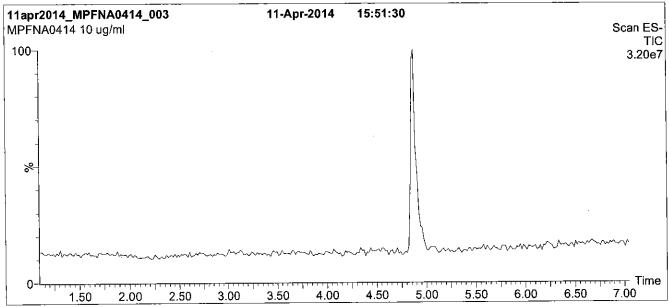
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

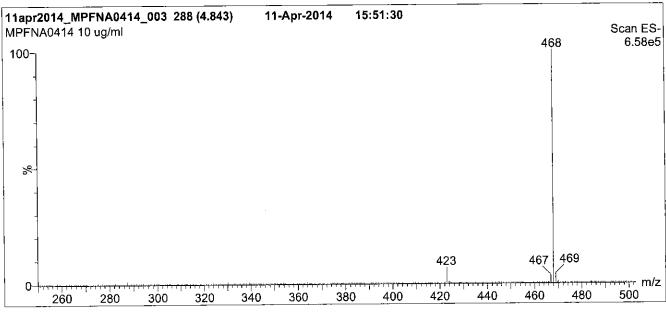




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com







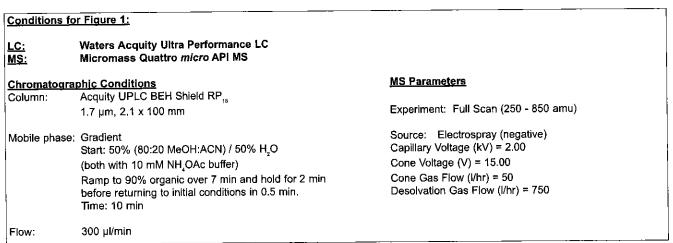
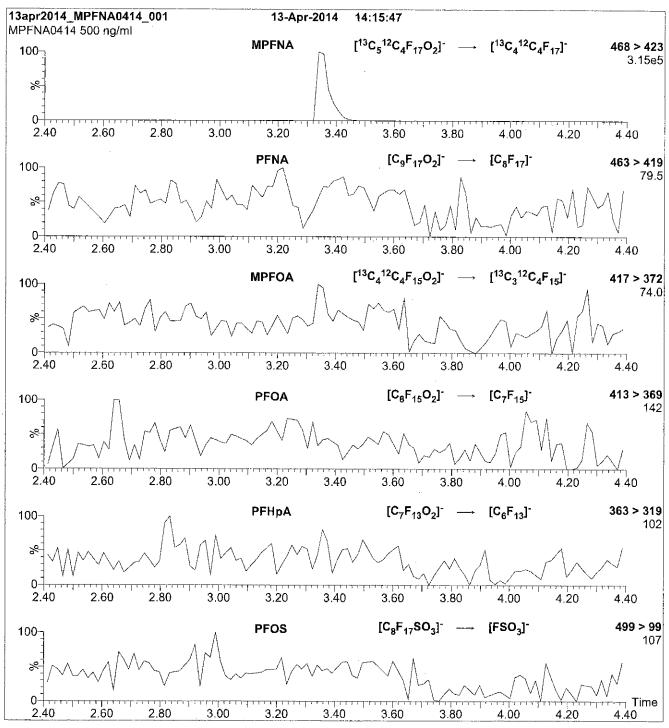
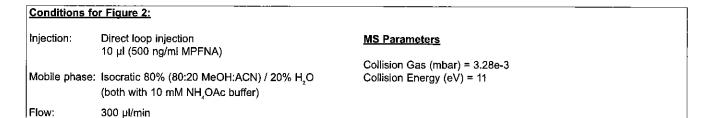


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFNA_00004



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



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0414

COMPOUND:

Perfluoro-n-[1,2,3,4,5-13Cs]nonanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₇

CONCENTRATION:

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

MOLECULAR WEIGHT:

469.04

SOLVENT(S):

ISOTOPIC PURITY:

Methanol

>99%13C

Water (<1%)

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

CHEMICAL PURITY:

>98%

04/13/2014

LAST TESTED: (mm/dd/yyyy)

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

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:

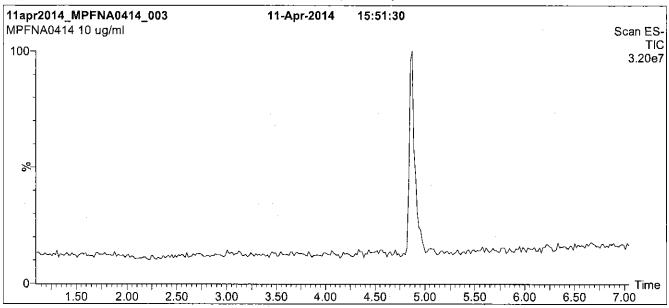
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

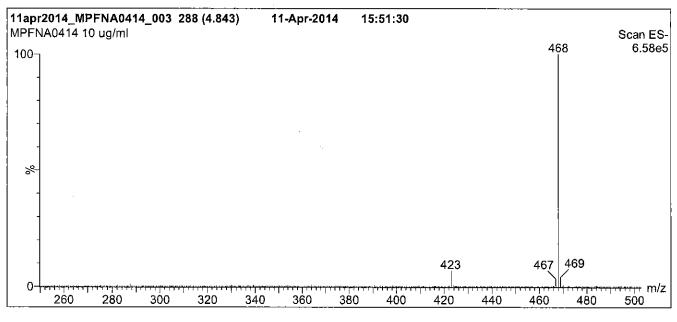


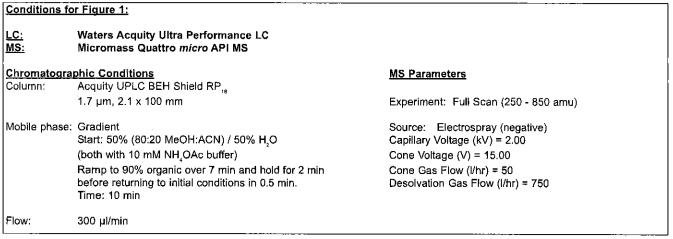


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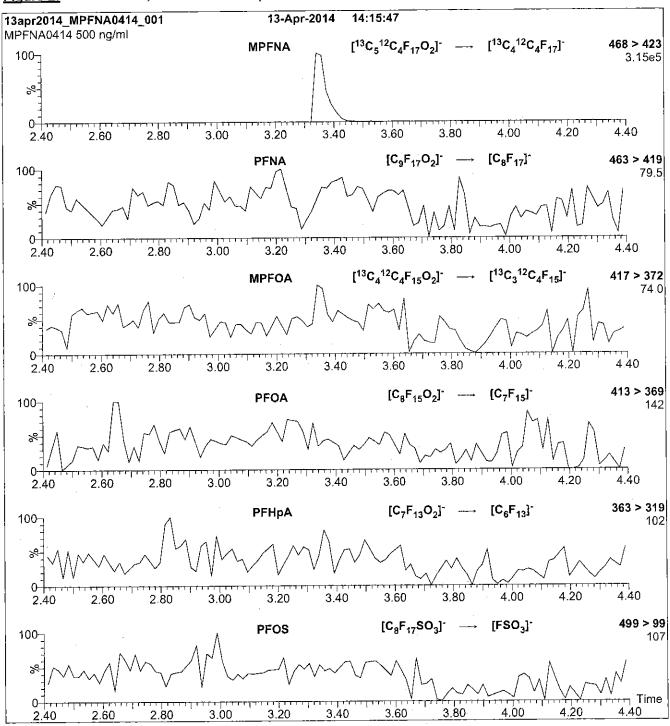
Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)







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





Injection:

Flow:

Direct loop injection

10 μl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

300 µl/min

MS Parameters

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

LCMPFNA_00005



ID: LCMPFNA 00005 Exp: 04/13/19 Prpd: CBW 13C5-Perfluornonanoic aci



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFNA

LOT NUMBER:

MPFNA0414

COMPOUND:

Perfluoro-n-[1,2,3,4,5-13C_s]nonanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₅¹²C₄HF₁₇O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

469.04

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

04/13/2014

EXPIRY DATE: (mm/dd/yyyy)

04/13/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

ISOTOPIC PURITY:

>99%13C

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

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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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

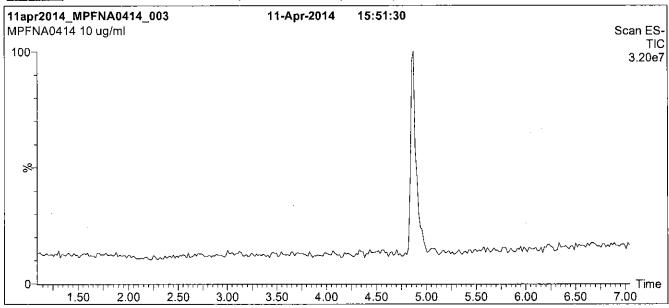
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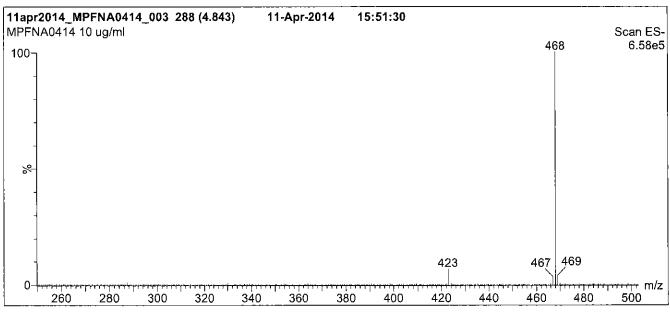




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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





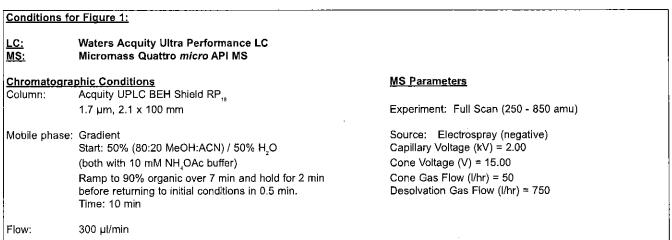
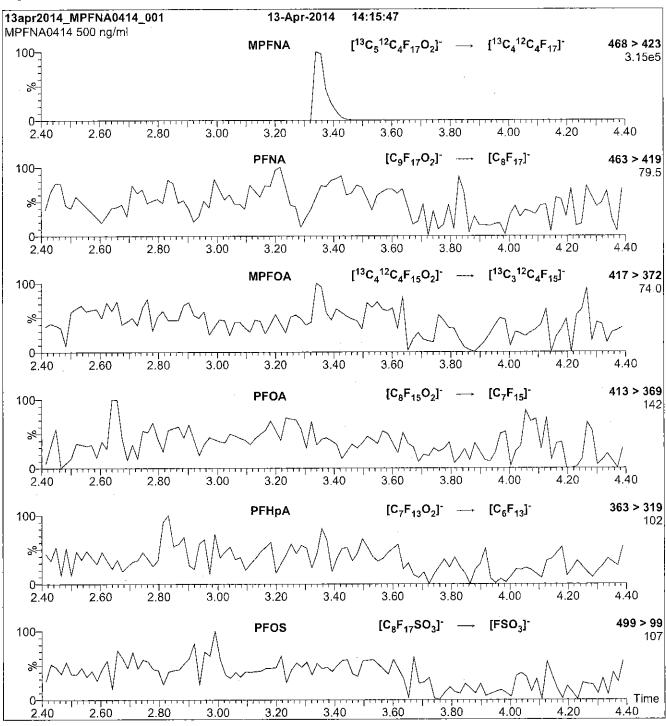
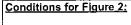


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCMPFOA 00007



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOA

LOT NUMBER:

MPFOA0415

COMPOUND:

Perfluoro-n-[1,2,3,4-12C₄]octanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄HF₁₅O₂

MOLECULAR WEIGHT:

418.04

CONCENTRATION: 50 ± 2.5 µg/ml SOLVENT(S):

Methanol Water (<1%)

ISOTOPIC PURITY:

>99% 13C (1,2,3,4-13C₄)

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

04/10/2015

>98%

EXPIRY DATE: (mm/sd/yyyy)

04/10/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 04/1<u>0/2015</u>

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

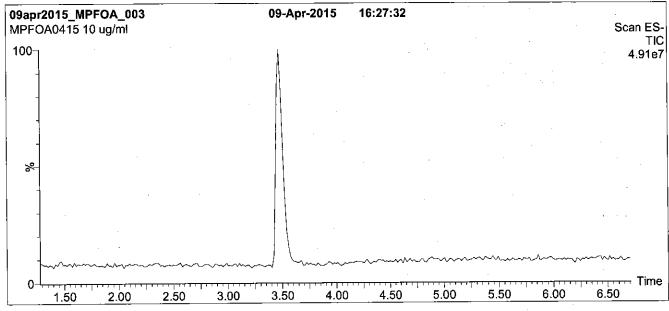
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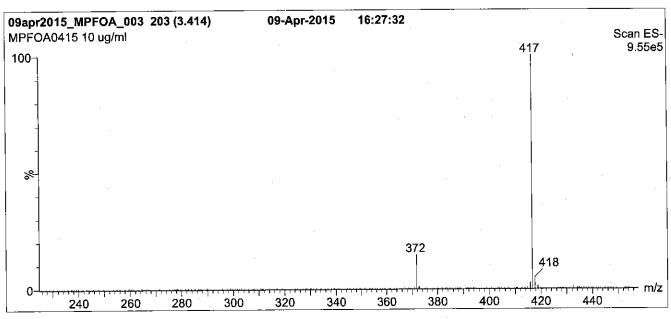




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Figure 1: MPFOA; LC/MS Data (TIC and Mass Spectrum)





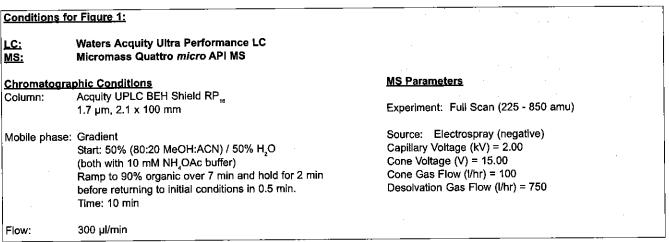
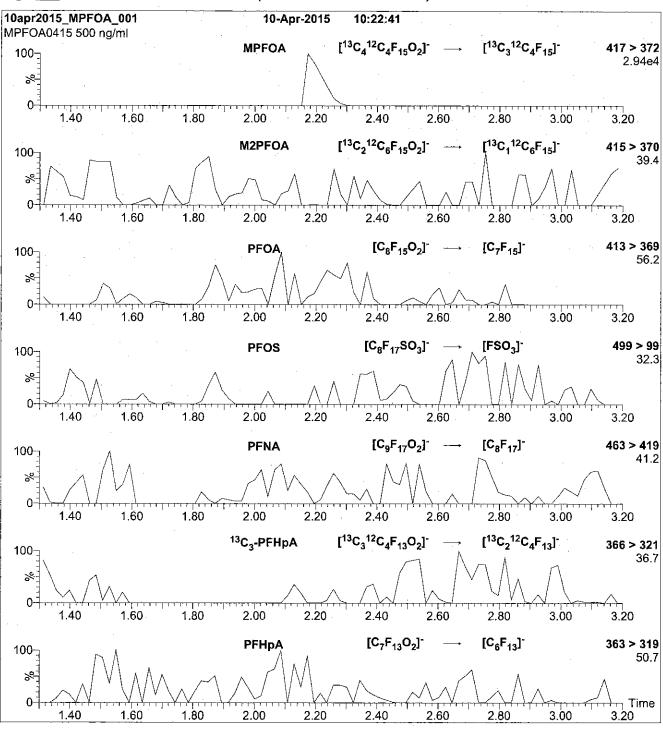
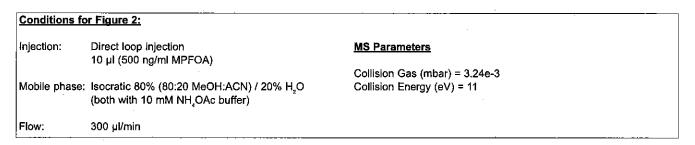


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOA_00008



ID: LCMPFOA_00008 Exp. 04/10/20 Prod; CBW 13C4-Perfluorocctanoic ac R: 1/25/16





CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFOA

LOT NUMBER:

MPFOA0415

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄HF₁₅O₂

MOLECULAR WEIGHT:

418.04

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

Water (<1%) ≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

04/10/2015

ISOTOPIC PURITY:

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

EXPIRY DATE: (mm/dd/yyyy)

04/10/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>04/10/2015</u>

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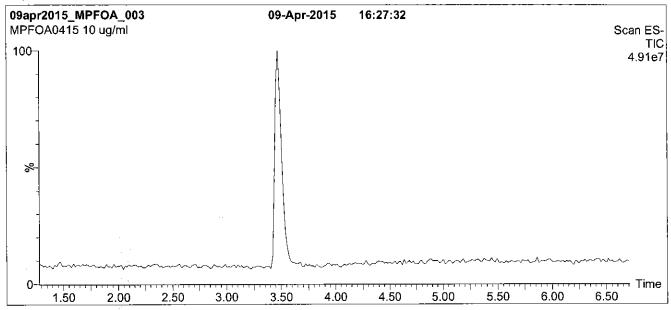
QUALITY MANAGEMENT:

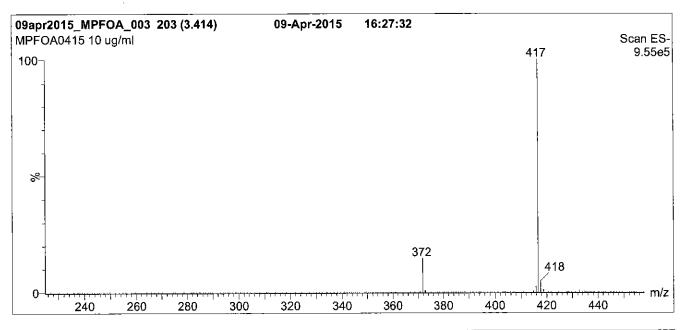
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Figure 1: MPFOA; LC/MS Data (TIC and Mass Spectrum)





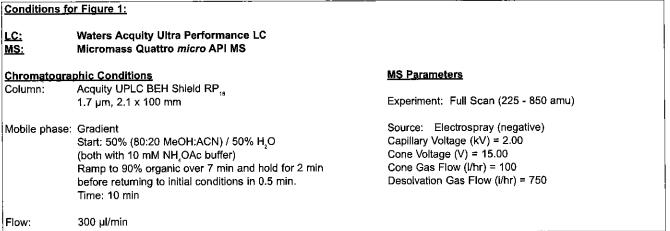
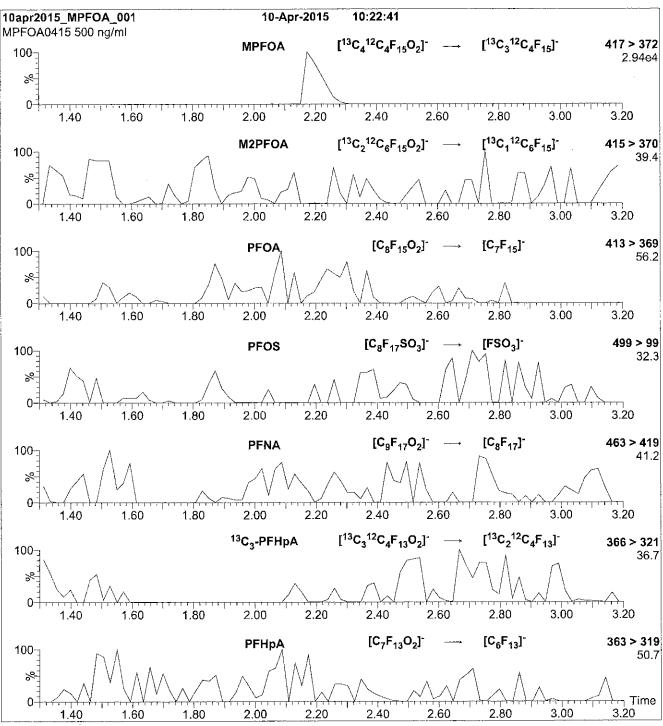
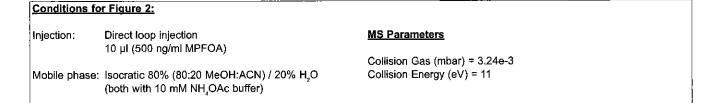


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





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

300 µl/min

Flow:

LCMPFOA_00009



ID: LCMPFOA_00009 Exp: 01/22/21 Prpd; CBW 13C4-Perfluorooctanoic ac R: 3/3/16 CBW



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:

¹³C₄¹²C₄HF₁₅O₂

CONCENTRATION:

MOLECULAR WEIGHT:

418.04

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

SOLVENT(S):

Methanol Water (<1%)

ISOTOPIC PURITY:

≥99% 13C

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

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:

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UNCERTAINTY:

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

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

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

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

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

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

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.

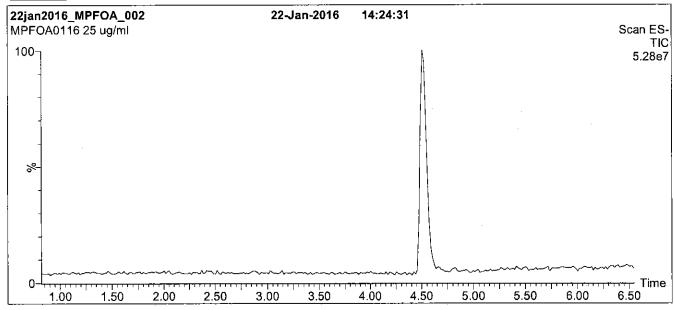
QUALITY MANAGEMENT:

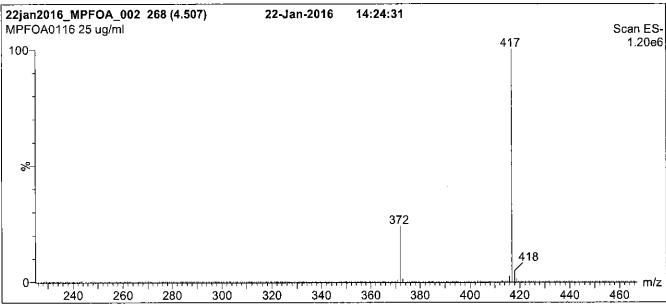
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





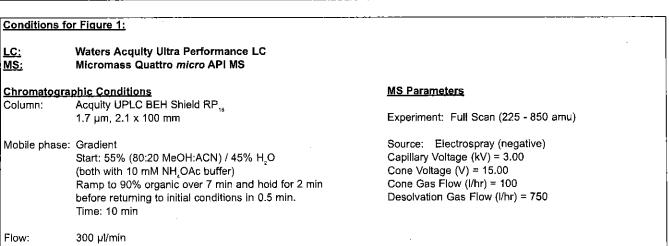
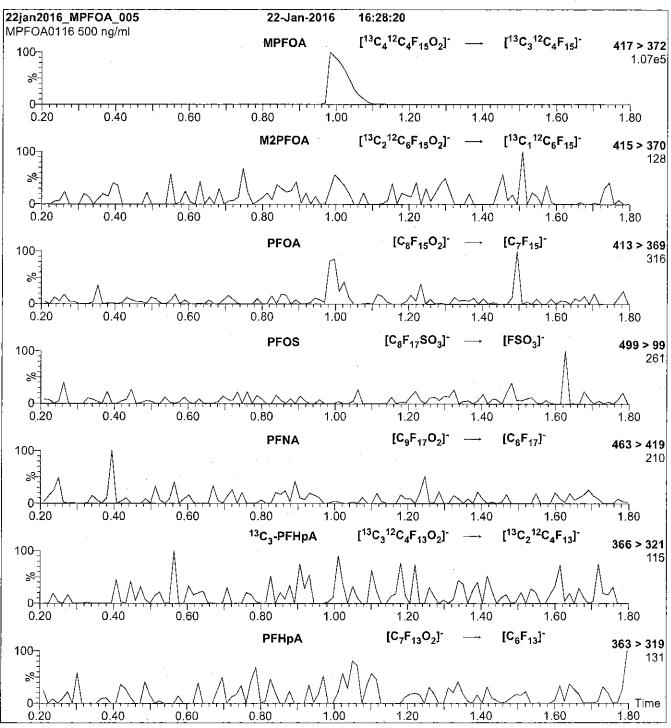
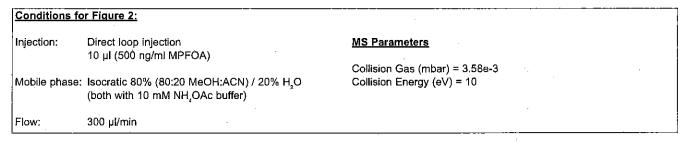


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOA 00010



ID: LCMPFOA 00010

Exp: 01/22/21 Prpd: CBW 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:

¹³C₄¹²C₄HF₁₅O₉

MOLECULAR WEIGHT:

418.04

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) ≥99% ¹³C

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/ad/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Störe 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)

<u>ADDITIONAL INFORMATION:</u>

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:

Date: 02/01/2016

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.

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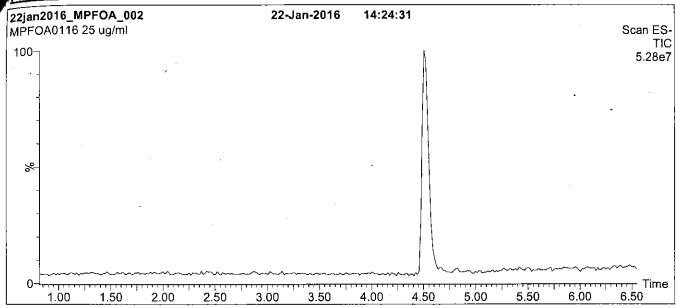
QUALITY MANAGEMENT:

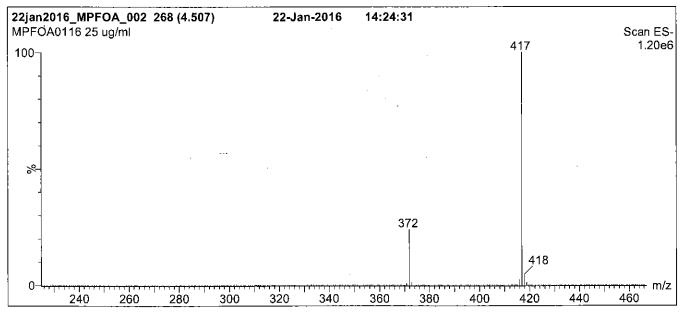
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Figure 1: MPFOA; LC/MS Data (TIC and Mass Spectrum)





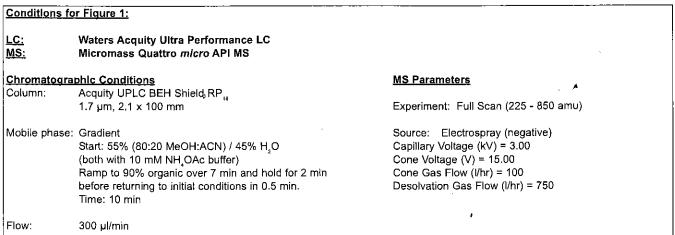
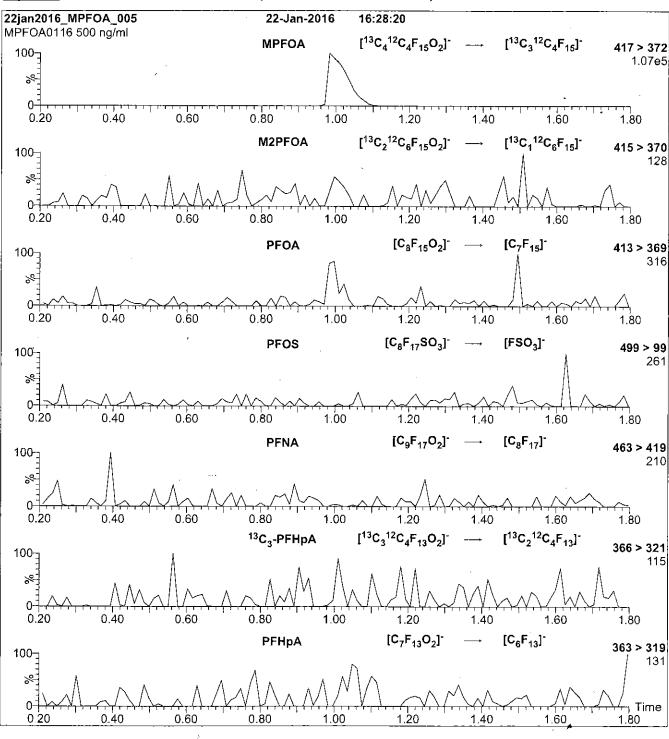
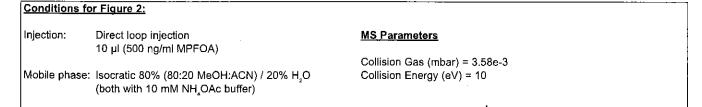


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





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

300 µl/min

Flow:

LCMPFOS_00009

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS0515

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄F₁₇SO₃Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

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

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

≥99% ¹³C (1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

05/15/2015

EXPIRY DATE: (mm/dd/yyyy)

05/15/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

Contains ~ 0.8% Sodium perfluoro-1-[1,2,3-13C,]heptanesulfonate.

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:

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SYNTHESIS / CHARACTERIZATION:

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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.

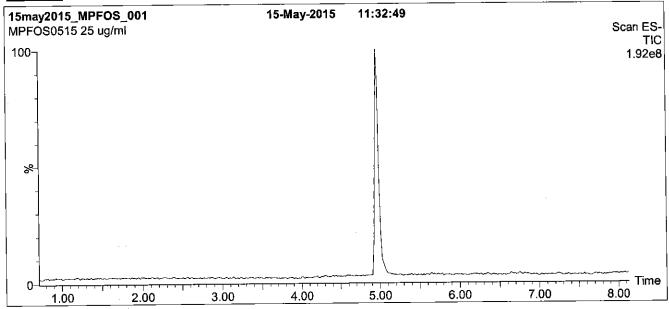
QUALITY MANAGEMENT:

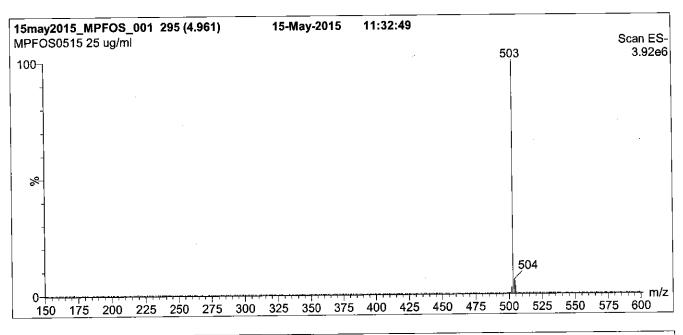
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)





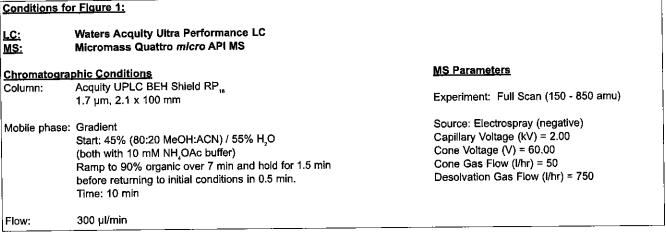
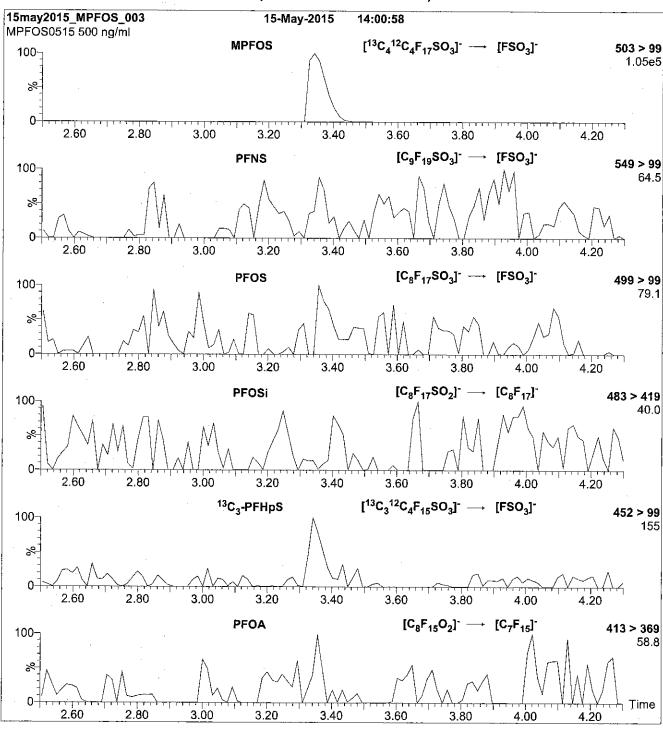
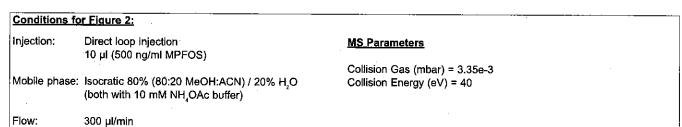


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOS_00010



ID: LCMPEOS 00010 Exp: 05/15/20 Prpd: CBW 13C4-Perfluorooctanesullo R: 1/25/16



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS0515

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄F₁₇SO₃Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

50.0 ± 2.5 µg/ml (Na salt)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C

LAST TESTED: (mm/dd/yyyy)

05/15/2015

(1,2,3,4-13C₄)

EXPIRY DATE: (mm/dd/yyyy)

05/15/2020

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:

Chittim

Date:

05/28/2015

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:

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SYNTHESIS / CHARACTERIZATION:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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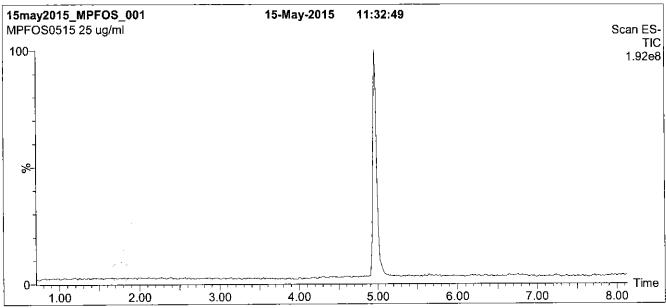
QUALITY MANAGEMENT:

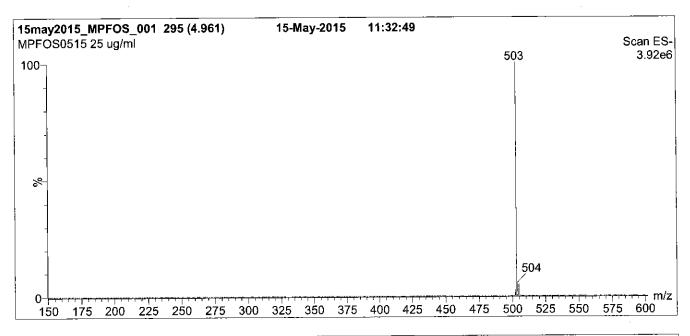
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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)





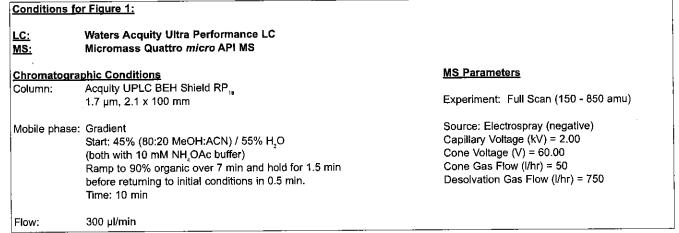
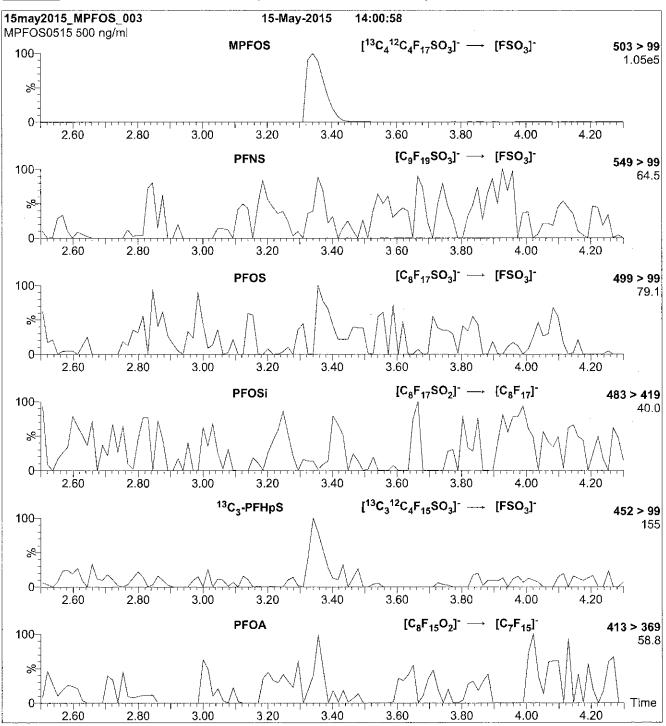
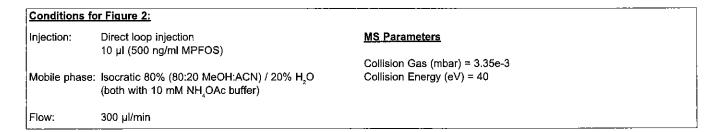


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFOS_00012



ID: LCMPFOS_00012 Exp: 01/22/21 Prpd: CBW 13C4-Perfluorooctanesulfo Rea 3/29/10

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



CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

MPFOS

LOT NUMBER:

MPFOS0116

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₄¹²C₄F₁₇SO₃Na

MOLECULAR WEIGHT:

526.08

CONCENTRATION:

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

ISOTOPIC PURITY:

>99% 13C $(1,2,3,4^{-13}C_{\lambda})$

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

 $47.8 \pm 2.4 \,\mu\text{g/ml}$ (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 Bv:

Chittim

Date: 02/01/2016

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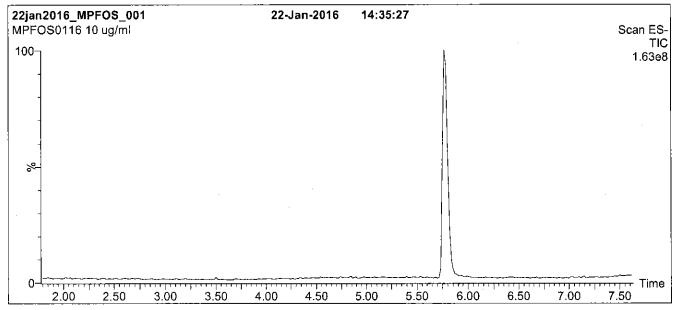
QUALITY MANAGEMENT:

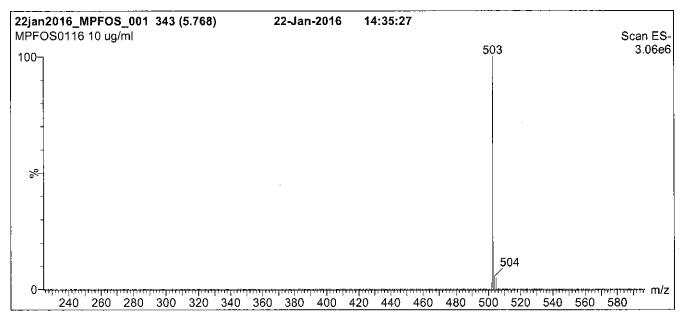
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





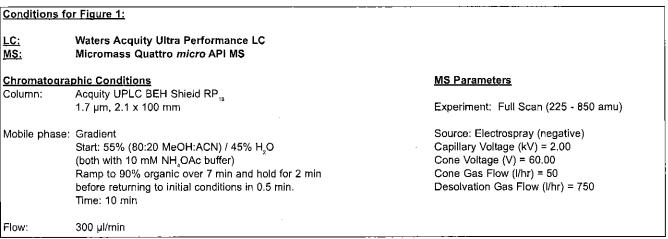
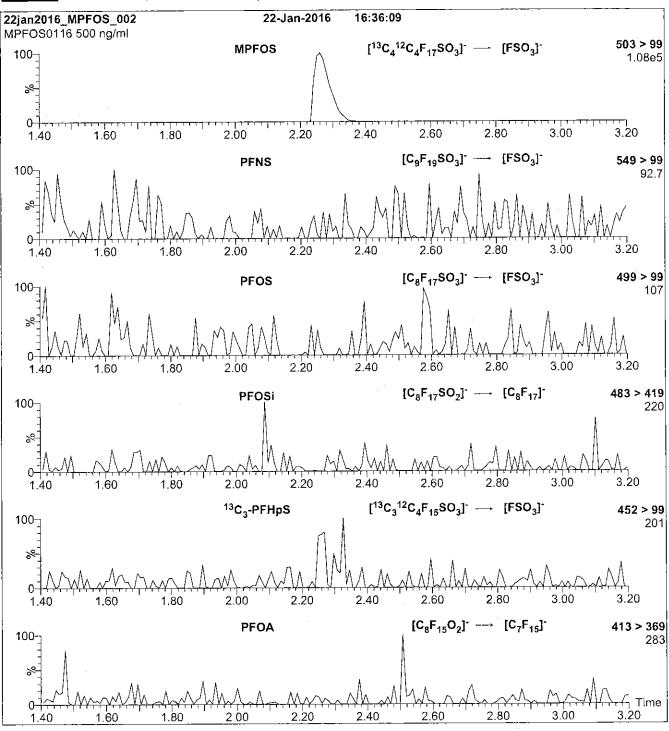
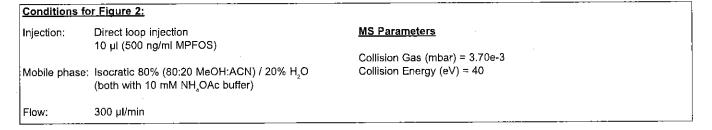


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





LCMPFUdA_00004



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1014

COMPOUND:

Perfluoro-n-[1,2-13C₂]undecanoic acid

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₉HF₂₁O₂

MOLECULAR WEIGHT:

566.08

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) >99% ¹³C

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/31/2014

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

• Presence of 1-13C₁-PFUdA (~1%; see Figure 2), 2-13C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the 13C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 11

11/03/2014

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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{x}(y)$, 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

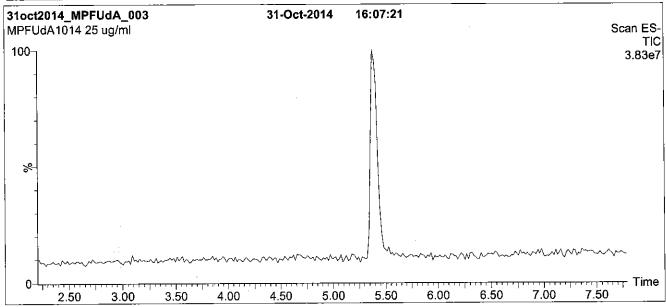
QUALITY MANAGEMENT:

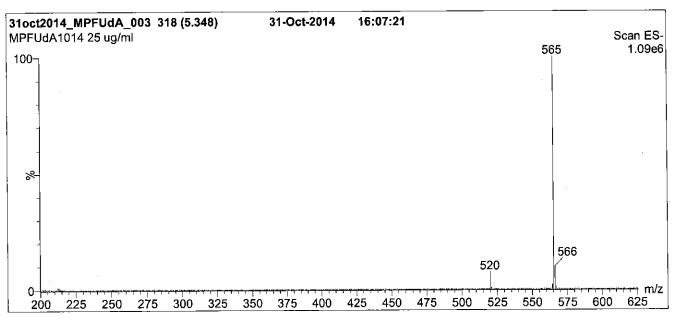
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





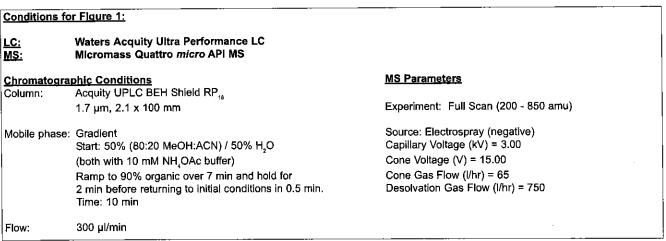
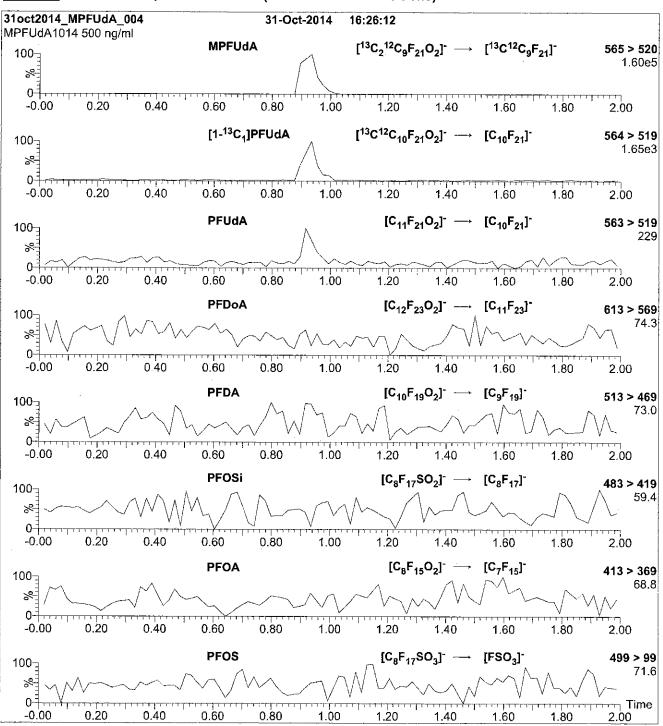
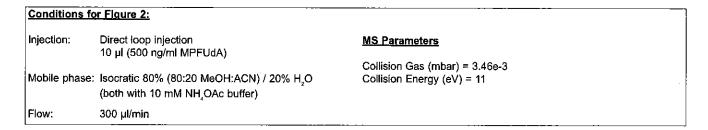


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFUdA_00005



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1014

COMPOUND:

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

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

13C, 12C, HF, O,

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

566.08

SOLVENT(S):

Methanol

>99% 13C

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

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/31/2014

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

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

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:

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

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

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.

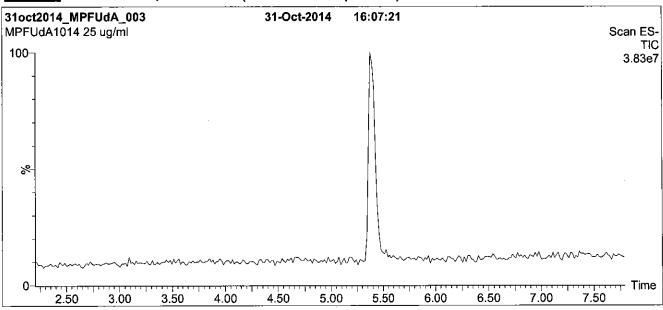
QUALITY MANAGEMENT:

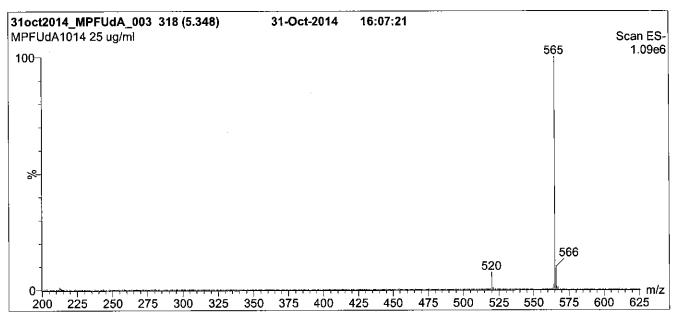
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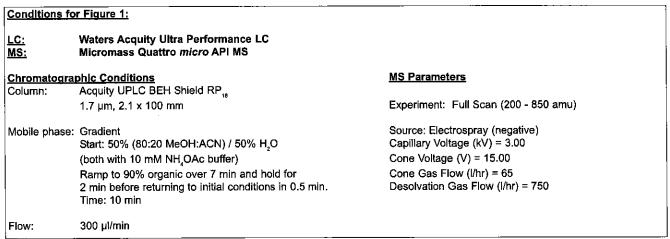
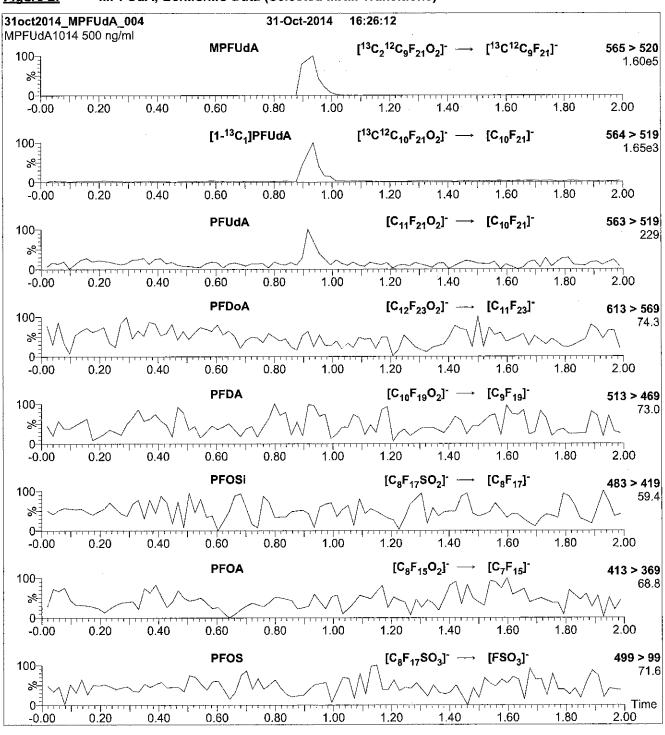
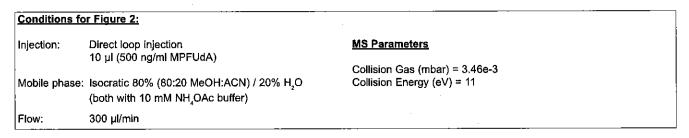


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFUdA_00006

ID: LCMPFUdA_00006 Exp: 10/31/19 Prpd: CBW

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1014

COMPOUND:

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

CAS#:

Not available

STRUCTURE:

F C C C C C C C 13 13 C OH

MOLECULAR FORMULA:

¹³C₂¹²C₉HF₂₁O₂

CONCENTRATION:

50 ± 2.5 µg/ml

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

566.08

SOLVENT(S):

Methanol

(1,2-13C_a)

Water (<1%) >99% ¹³C

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/31/2014

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

• Presence of 1-13C₁-PFUdA (~1%; see Figure 2), 2-13C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the 13C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

(mm/dd/yyyy)

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

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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:

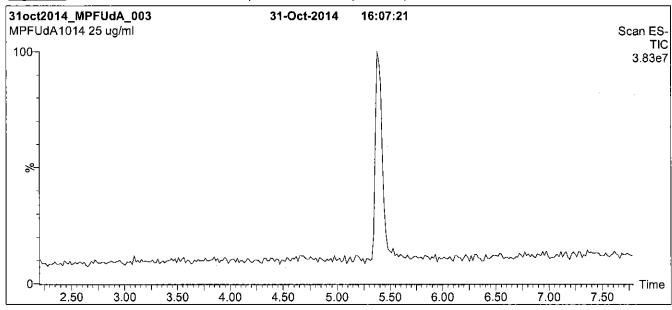
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA, A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

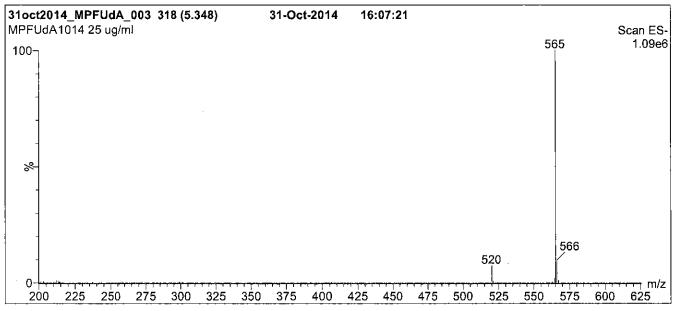




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





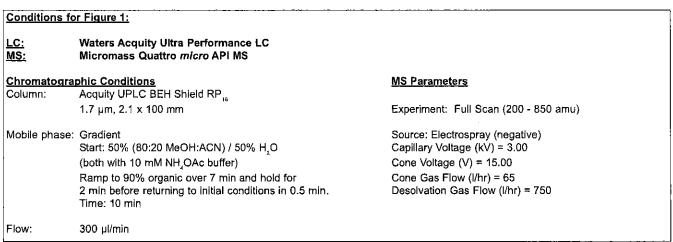
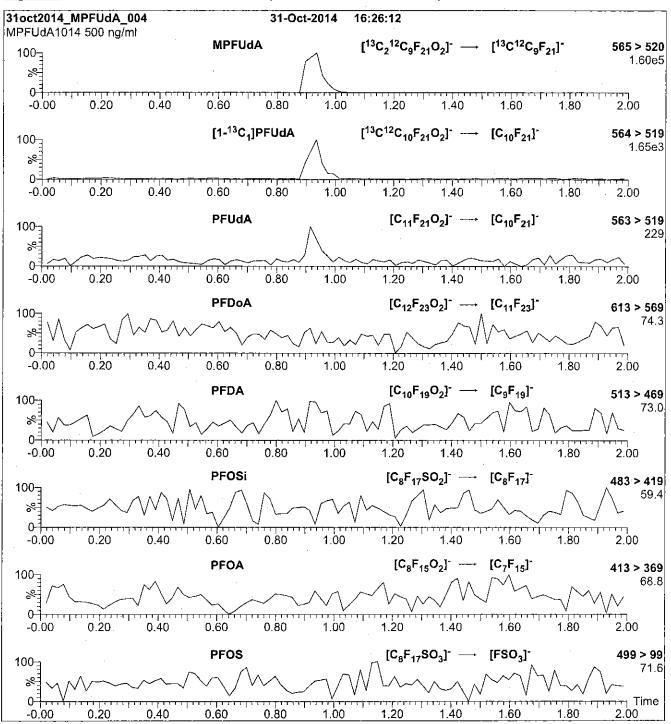
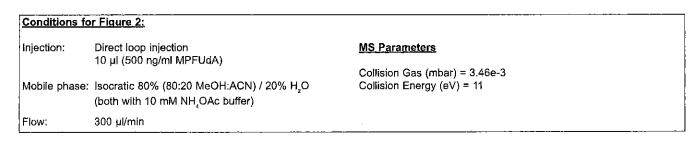


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





LCMPFUdA_00007



ID: LCMPFUdA_00007
Exp: 10/31/19 Prpd: CBW
13C2-Perfluornoundecanoic

R: 4/7/16 CBW



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

MPFUdA

LOT NUMBER:

MPFUdA1014

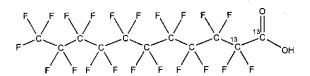
COMPOUND:

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

STRUCTURE:

CAS #:

Not available



MOLECULAR FORMULA:

¹³C₂¹²C₆HF₂₁O₂

CONCENTRATION:

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

ISOTOPIC PURITY:

566.08

SOLVENT(S):

Methanol

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

Water (<1%) ≥99% ¹³C

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/31/2014

EXPIRY DATE: (mm/dd/yyyy)

10/31/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

• Presence of 1-13C₁-PFUdA (~1%; see Figure 2), 2-13C₁-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the 13C-precursor.

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Certified By:

B G. Chittim

Date:

(mm/dd/yyyy)

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

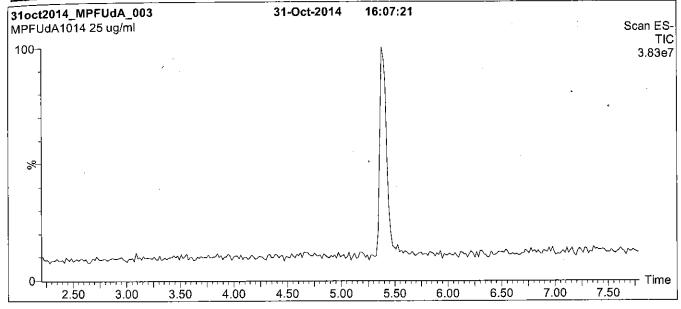
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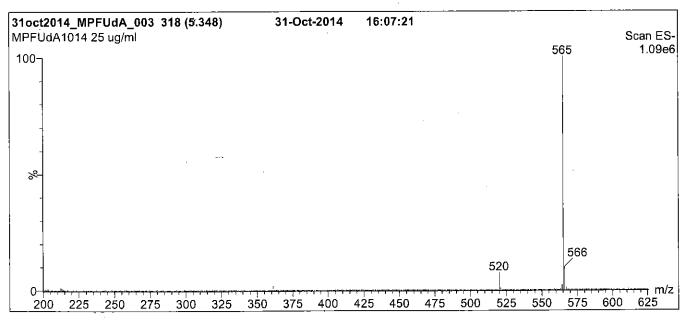




For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

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





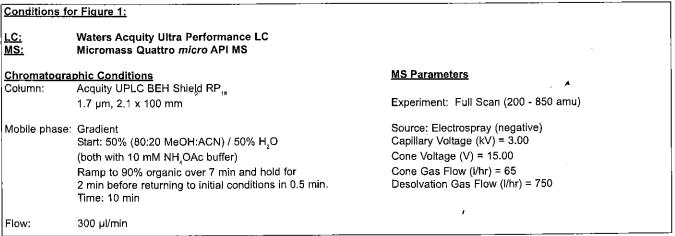
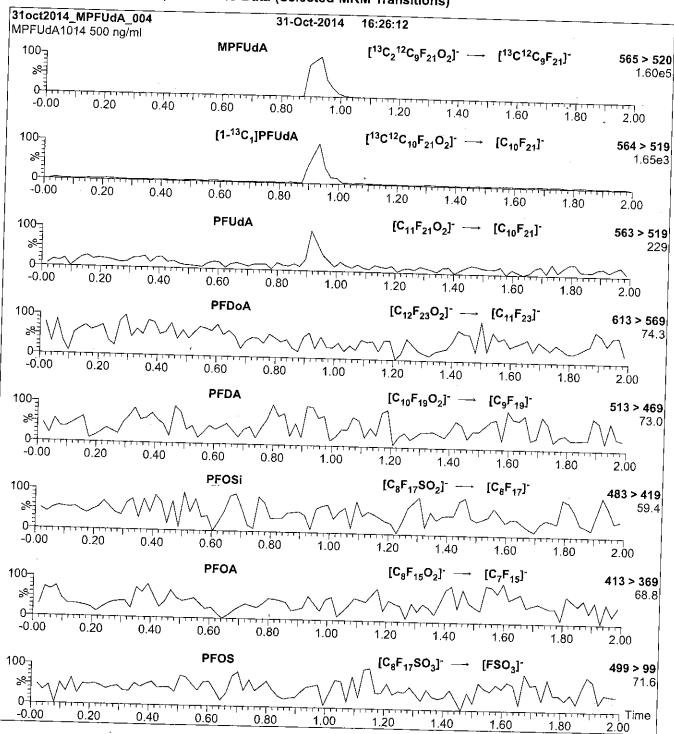
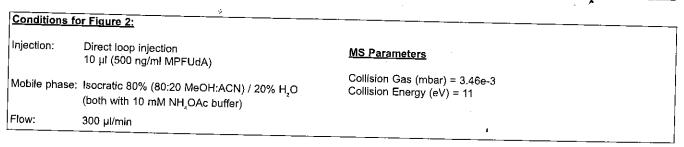


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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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:

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:

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UNCERTAINTY:

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

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

$$x_{ij} x_{ij} ... x_{ij}$$
 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.

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 www.well-labs.com or contact us directly at info@well-labs.com**

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

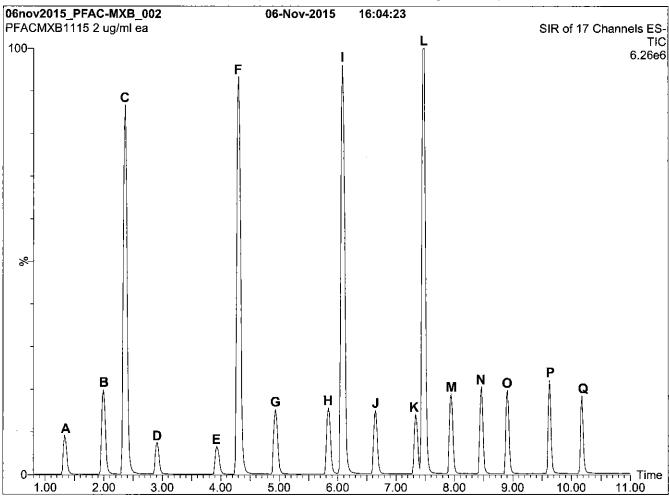
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000		Α
Perfluoro-n-pentanoic acid	PFPeA	2000		В
Perfluoro-n-hexanoic acid	PFHxA	2000		D
Perfluoro-n-heptanoic acid	PFHpA	2000		E
Perfluoro-n-octanoic acid	PFOA	2000		G
Perfluoro-n-nonanoic acid	PFNA	2000		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:

D.C. Christian

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% H₂O / 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

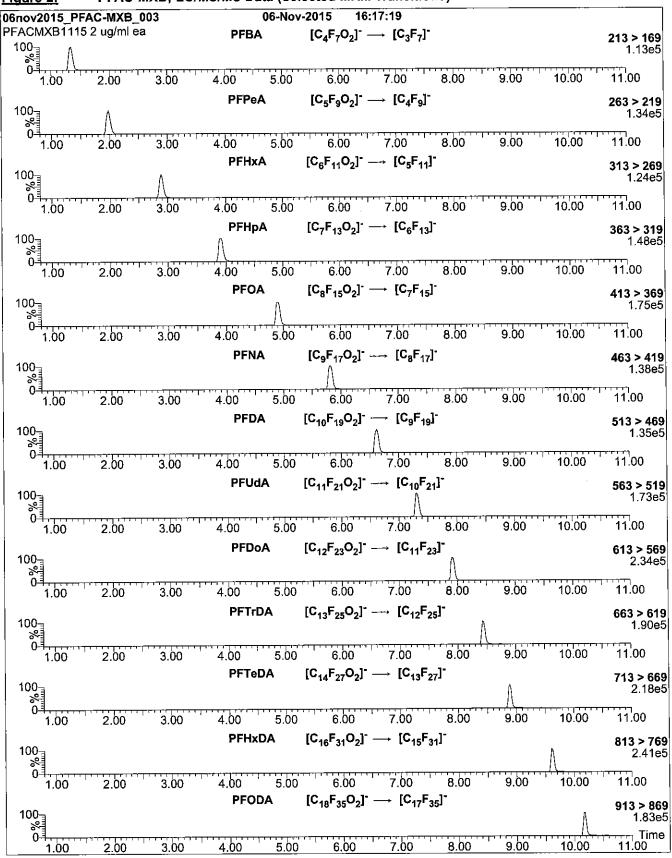
MS Parameters

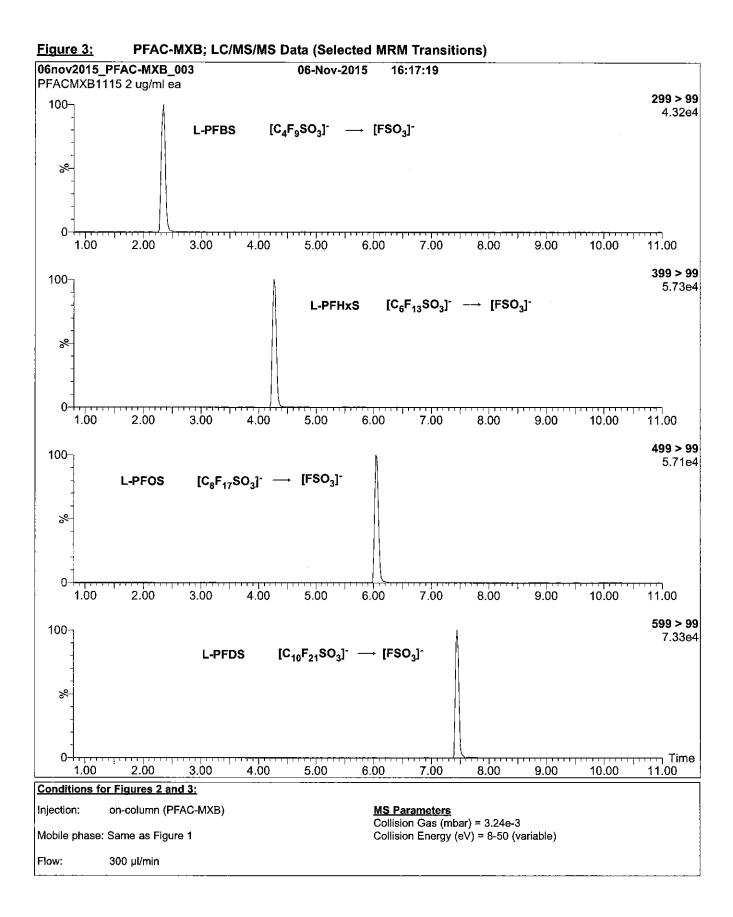
Experiment: SIR of 17 Channels

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_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFBA

LOT NUMBER:

PFBA0313

COMPOUND:

Perfluoro-n-butanoic acid

STRUCTURE:

CAS #:

375-22-4

MOLECULAR FORMULA:

C₄HF₂O₃

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)

03/05/2013

EXPIRY DATE: (mm/dd/yyyy)

03/05/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

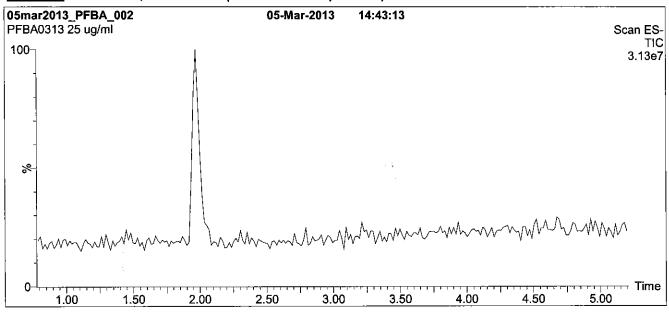
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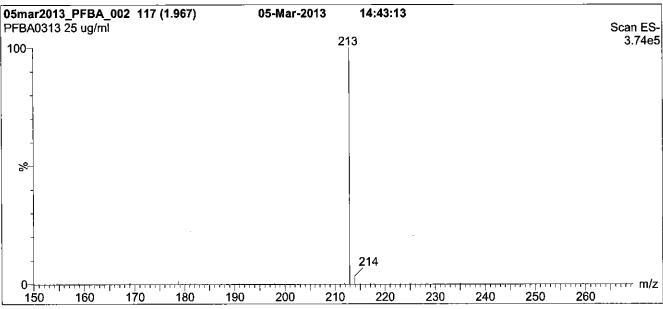




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Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)





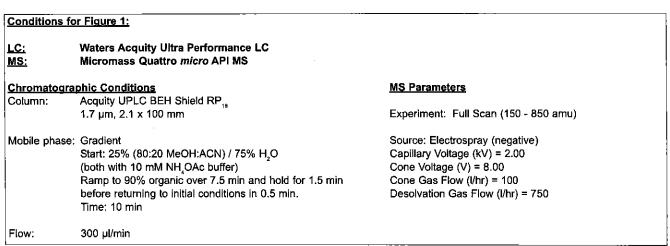
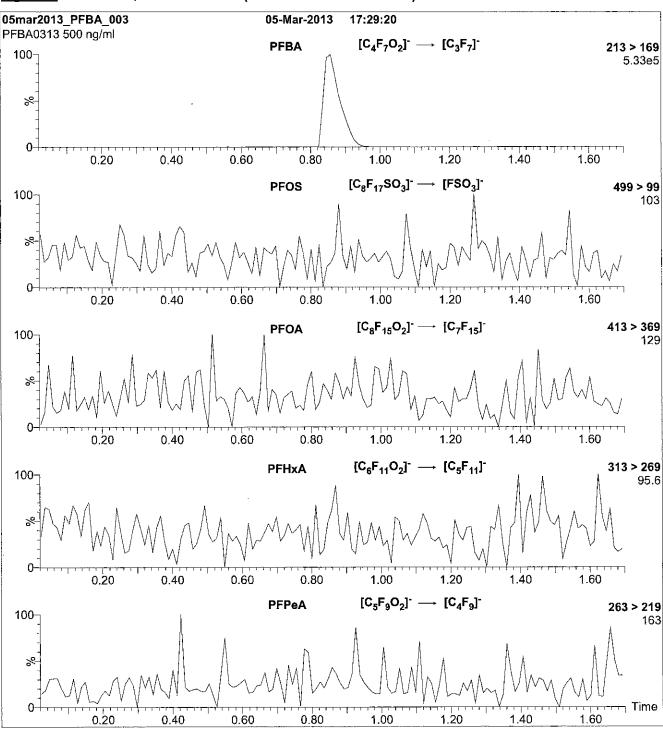
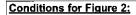


Figure 2: PFBA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH, OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.70e-3 Collision Energy (eV) = 10

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:

C₄HF₂O₂

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:

P.C. Chittim

Date: _0

/mm/dd/sasu)

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

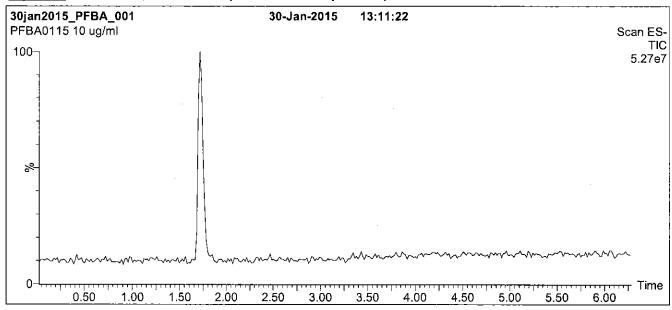
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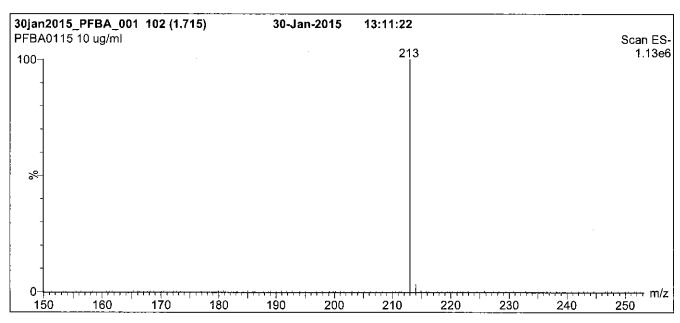


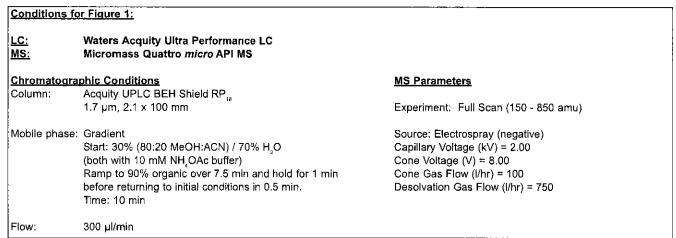


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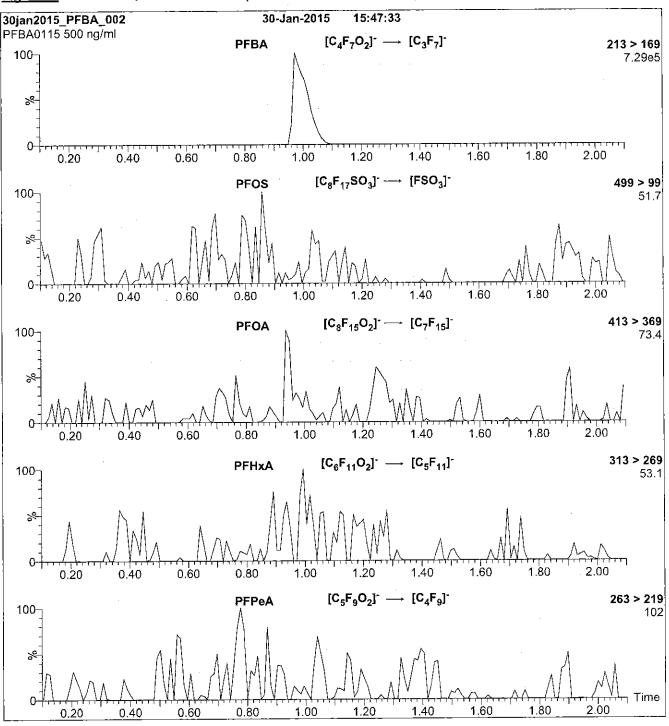
Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)

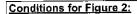






PFBA; LC/MS/MS Data (Selected MRM Transitions) Figure 2:





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

LCPFBS_00003



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 F F F

MOLECULAR FORMULA:

C₄F₄SO₃K

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

44.2 ± 2.2 µg/ml (PFBS anion)

CHEMICAL PURITY:

CONCENTRATION:

>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:

(mm/dd/www)

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QUALITY MANAGEMENT:

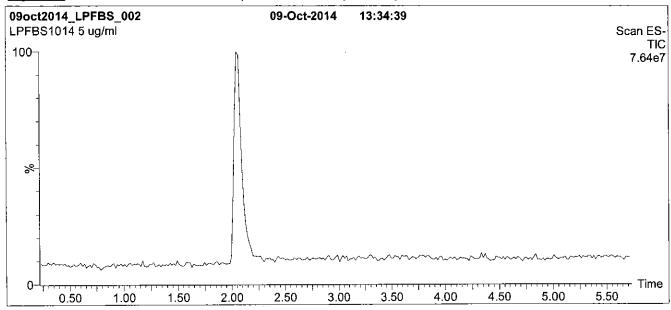
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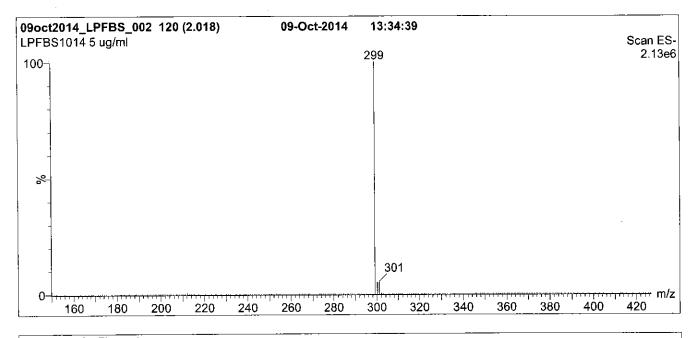




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Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)





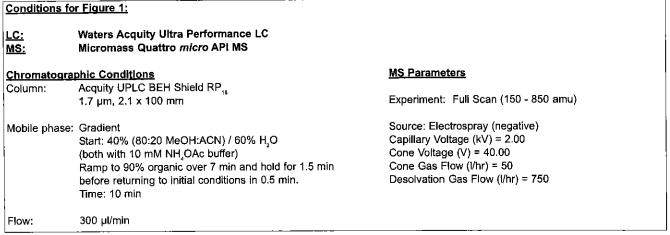
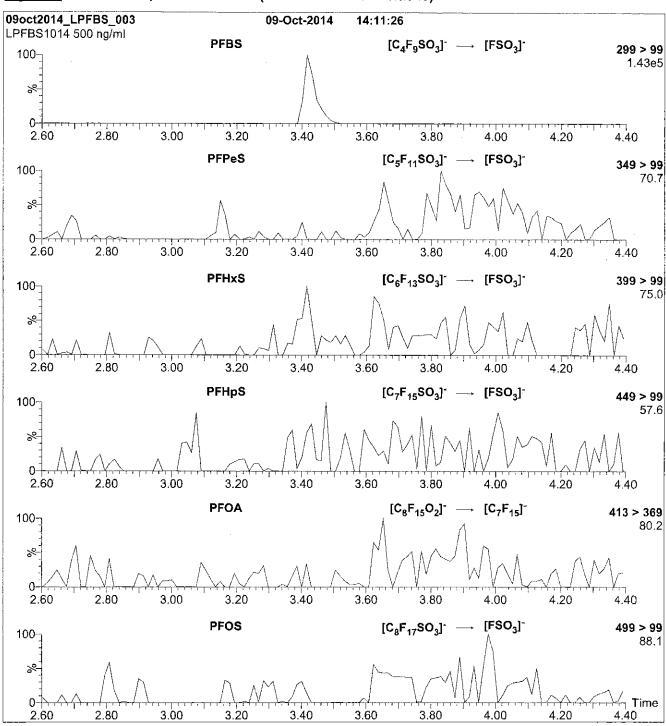
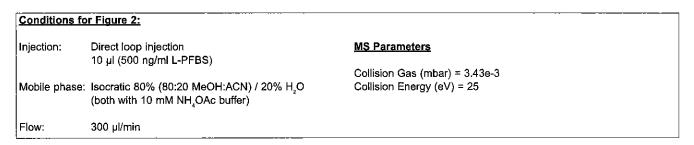


Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)





LCPFDA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0613

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2

F F F F F F F F F

MOLECULAR FORMULA:

C₁₀HF₁₉O₂

MOLECULAR WEIGHT:

514.08

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/19/2013

EXPIRY DATE: (mm/dd/yyyy)

06/19/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.4% PFNA and ~ 0.1% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, u(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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

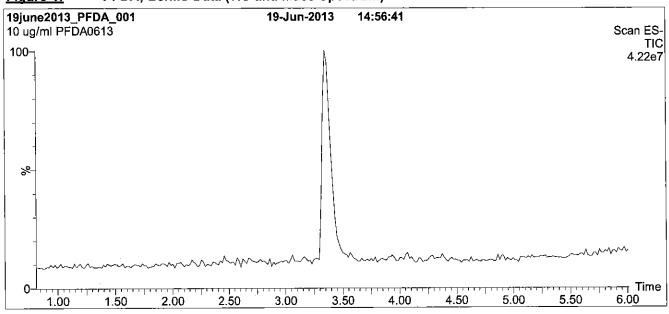
QUALITY MANAGEMENT:

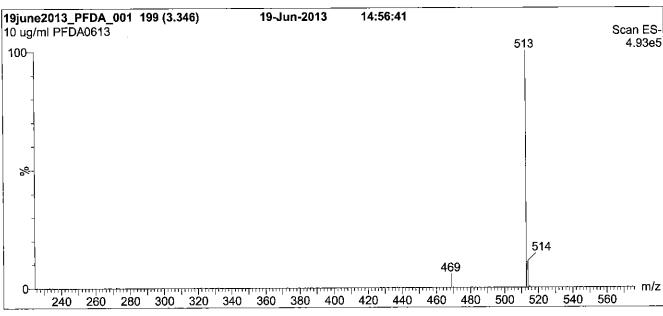
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





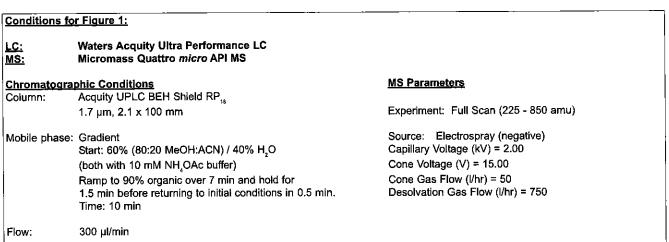
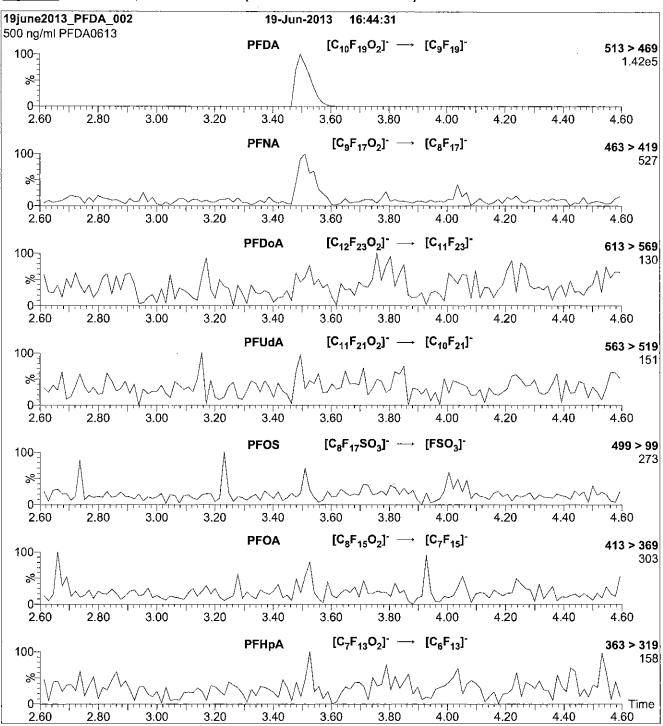
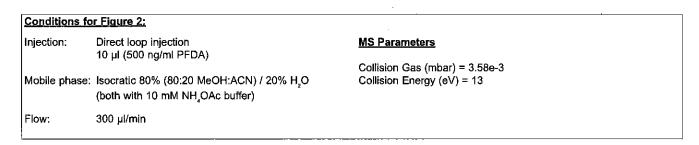


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





LCPFDA 00004



PRODUCT CODE:

PFDA

LOT NUMBER:

PFDA0615

COMPOUND:

Perfluoro-n-decanoic acid

STRUCTURE:

CAS #:

335-76-2

MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT: SOLVENT(S): 514.08

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/02/2015

EXPIRY DATE: (mm/dd/yyyy)

07/02/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u>07/24/2015 </u>

(mm/dd/yyyy)

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:

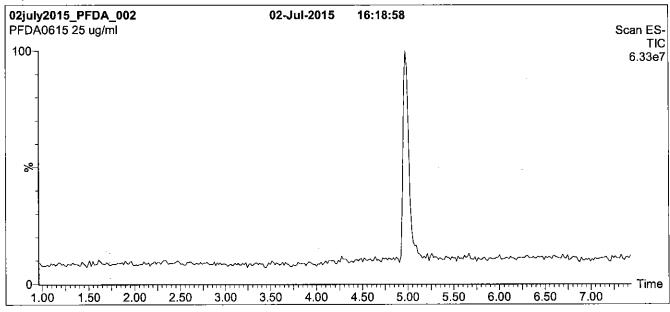
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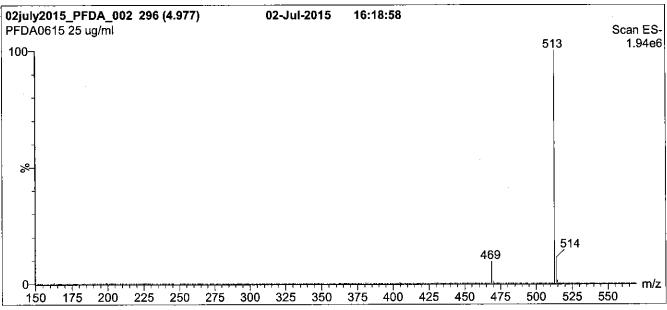




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





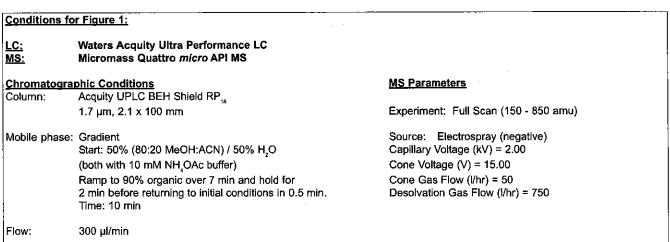
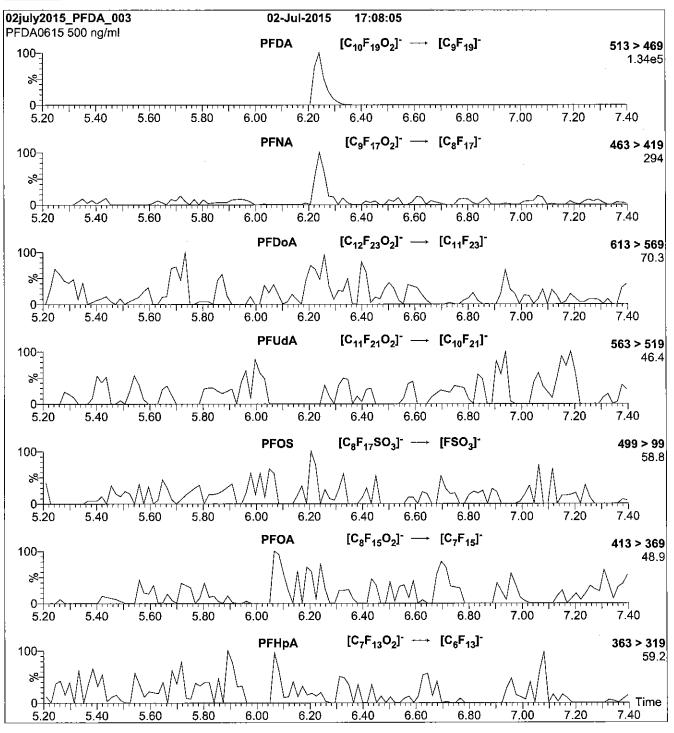
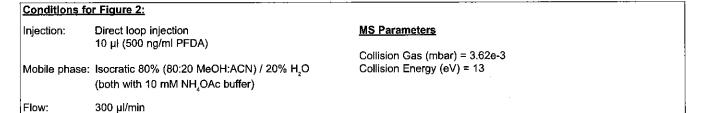


Figure 2: PFDA; LC/MS/MS Data (Selected MRM Transitions)





LCPFDoA_00003



PRODUCT CODE:

PFDoA

LOT NUMBER:

PFDoA0113

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1

MOLECULAR FORMULA:

C, HF, O,

MOLECULAR WEIGHT:

614.10

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/03/2013

EXPIRY DATE: (mm/dd/yyyy)

01/03/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

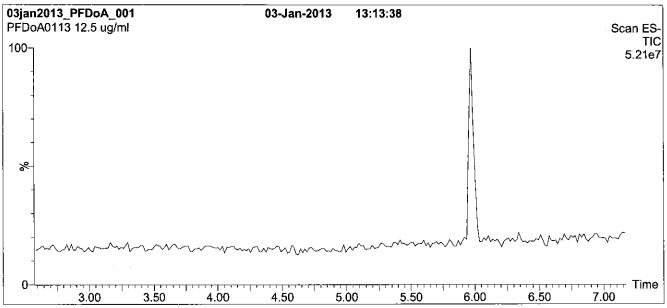
B.C. Chittim

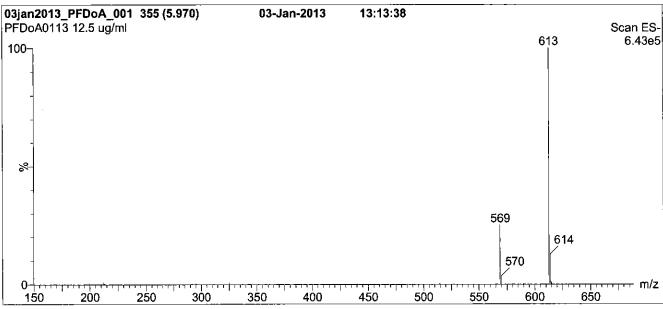
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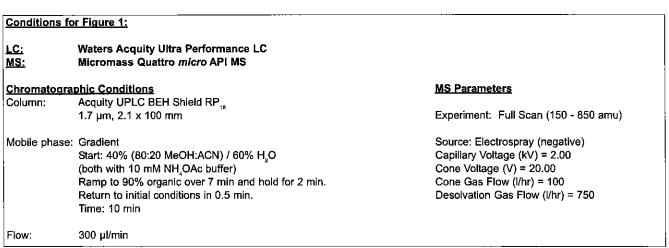
<u>)2/01/2013 </u>

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







LCPFDoA_00004



PRODUCT CODE:

PFDoA

LOT NUMBER:

PFDoA0115

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1

MOLECULAR FORMULA:

C₁₂HF₂₃O₂

MOLECULAR WEIGHT:

614.10

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. Schrifting

Date:

(mm/dd/sss/)

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SYNTHESIS / CHARACTERIZATION:

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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.

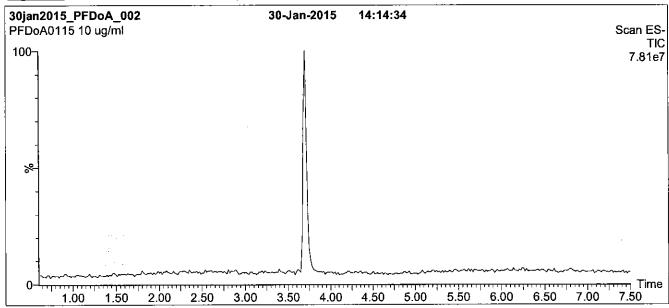
QUALITY MANAGEMENT:

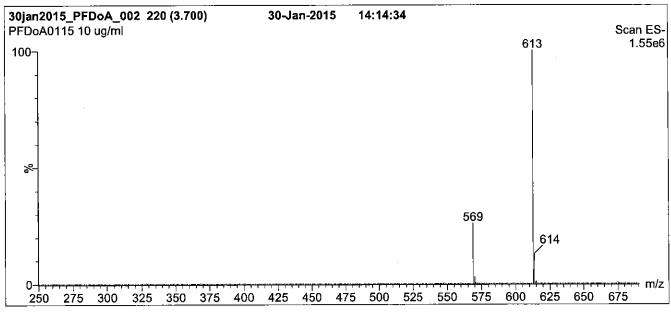
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Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)





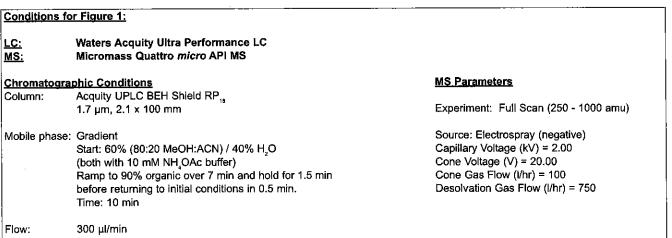
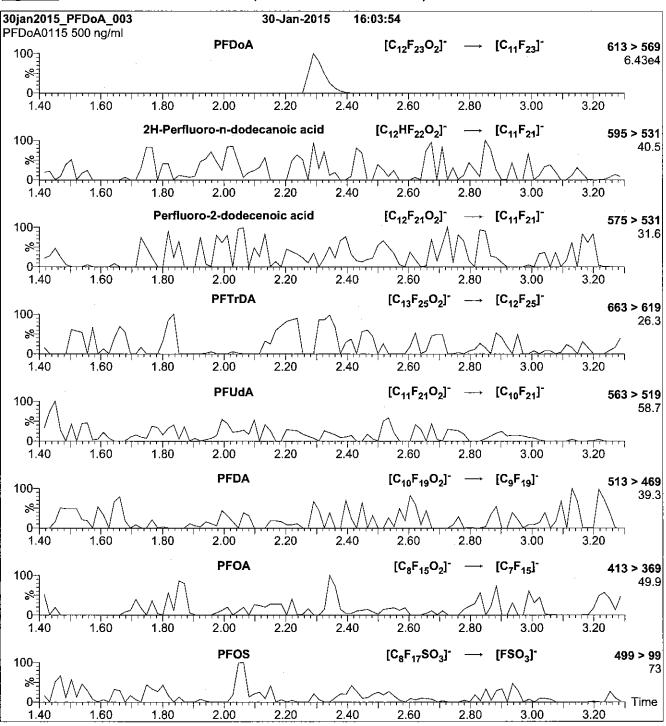
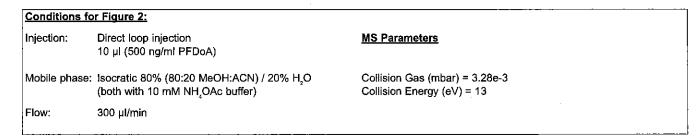


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





LCPFDoS_00003



PRODUCT CODE:

L-PFDoS

LOT NUMBER:

LPFDoS1011

COMPOUND:

Sodium perfluoro-1-dodecanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₁₂F₂₅SO₃Na

MOLECULAR WEIGHT:

722.14

CONCENTRATION:

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

 $48.4 \pm 2.4 \mu g/ml$ (PFDoS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/06/2011

EXPIRY DATE: (mm/dd/yyyy)

10/06/2016

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 ~ 0.3% of sodium perfluoro-1-tetradecanesulfonate and ~ 0.8% of perfluoro-n-dodecanoic acid (PFDoA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: _

(ppm/dd/yaay)

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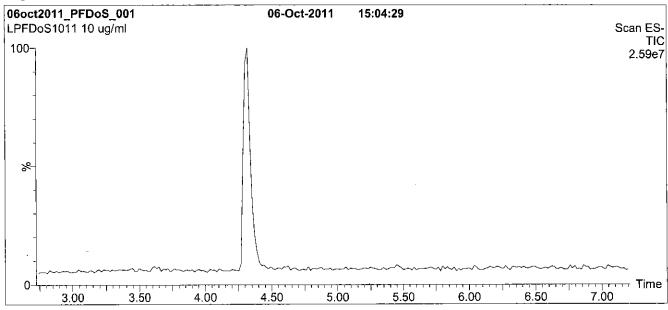
QUALITY MANAGEMENT:

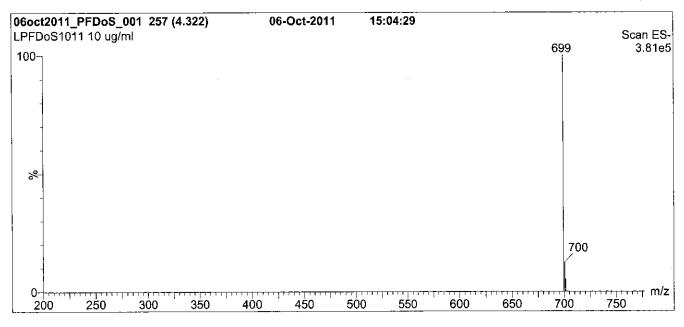
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Figure 1: L-PFDoS; LC/MS Data (TIC and Mass Spectrum)





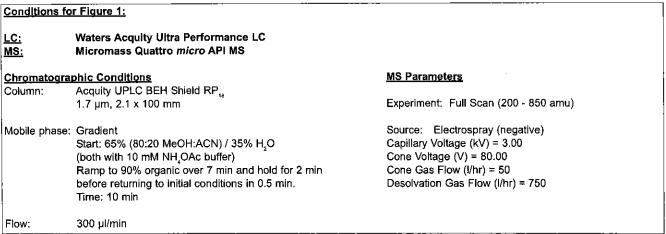
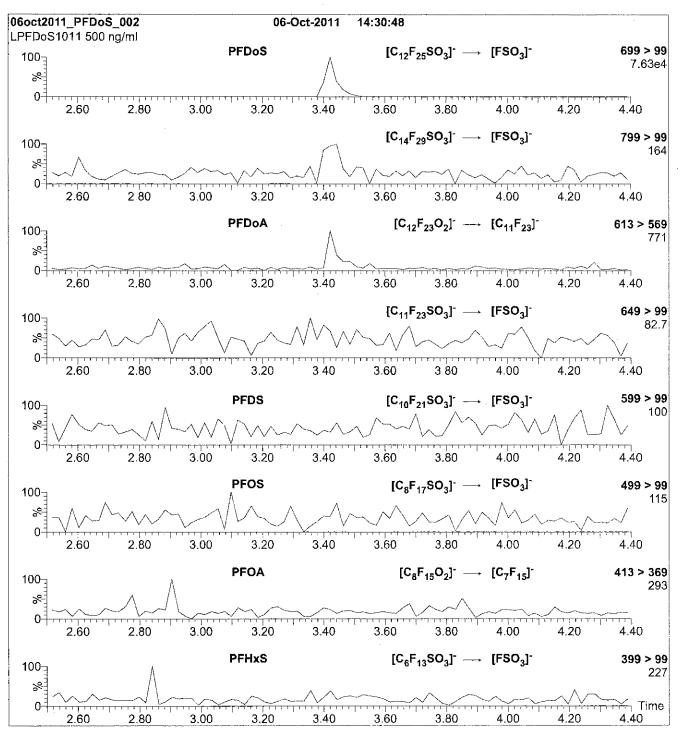
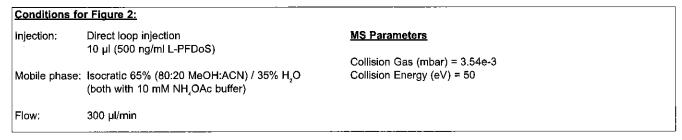


Figure 2: L-PFDoS; LC/MS/MS Data (Selected MRM Transitions)





LCPFDS_00003



PRODUCT CODE:

L-PFDS

LOT NUMBER:

LPFDS0913

COMPOUND:

Sodium perfluoro-1-decanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₁₀F₂₁SO₃Na

MOLECULAR WEIGHT: SOLVENT(S):

622.13 Methanol

CONCENTRATION:

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

 $48.2 \pm 2.4 \mu g/ml$ (PFDS anion)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/13/2013

EXPIRY DATE: (mm/dd/yyyy)

09/13/2018

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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UNCERTAINTY:

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

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

 $x_4, x_2,...x_n$ 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

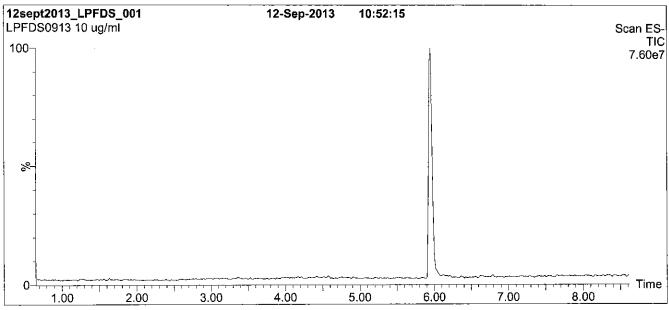
QUALITY MANAGEMENT:

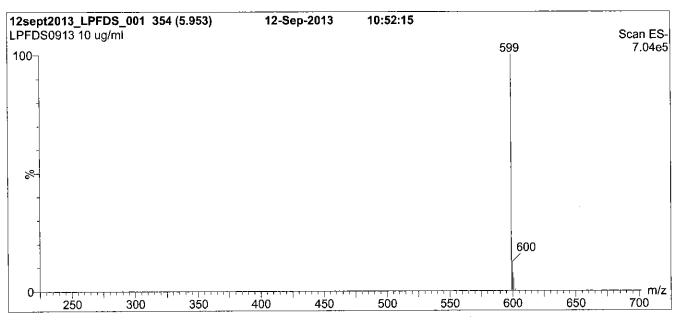
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





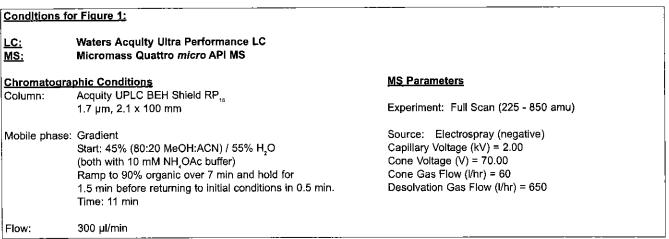
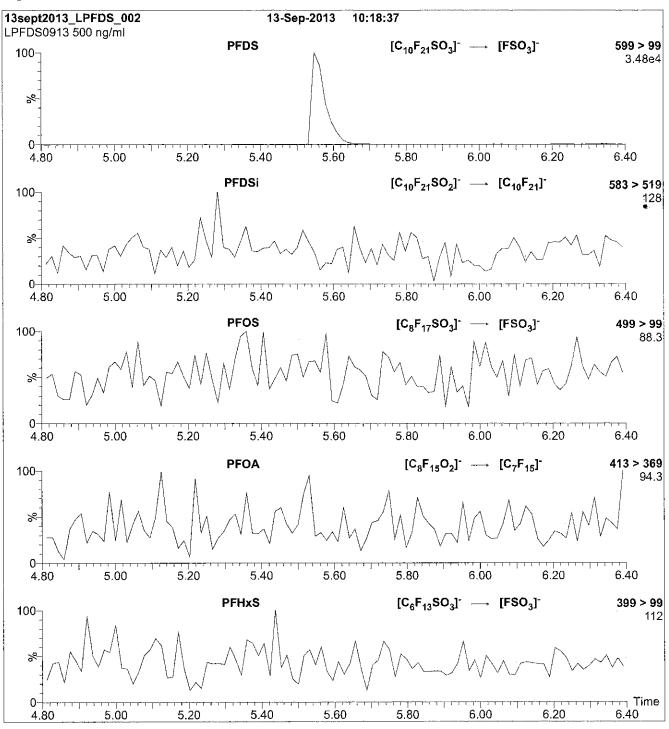
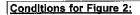


Figure 2: L-PFDS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μI (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H2O

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.78e-3 Collision Energy (eV) = 50

LCPFHpA_00004



PRODUCT CODE:

PFHpA

LOT NUMBER:

PFHpA0514

COMPOUND:

Perfluoro-n-heptanoic acid

STRUCTURE:

CAS #:

375-85-9

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

 $50 \pm 2.5 \mu g/ml$

MOLECULAR WEIGHT:

SOLVENT(S):

364.06

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/09/2014

EXPIRY DATE: (mm/dd/yyyy)

05/09/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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

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

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LIMITED WARRANTY:

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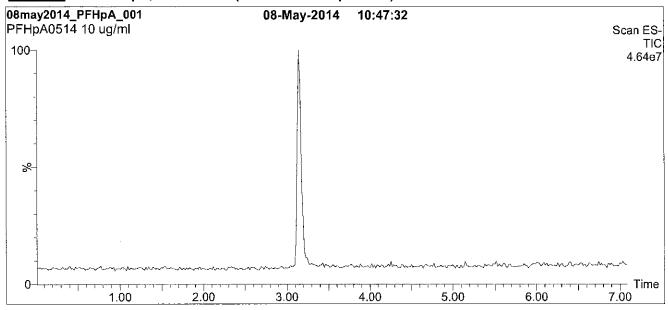
QUALITY MANAGEMENT:

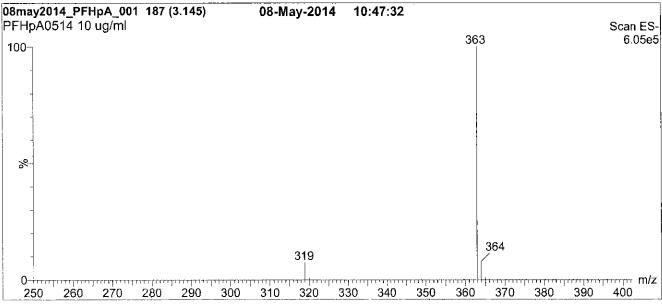
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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





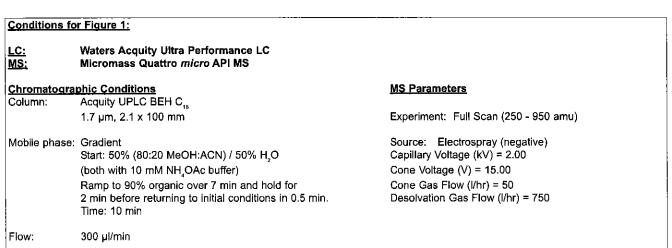
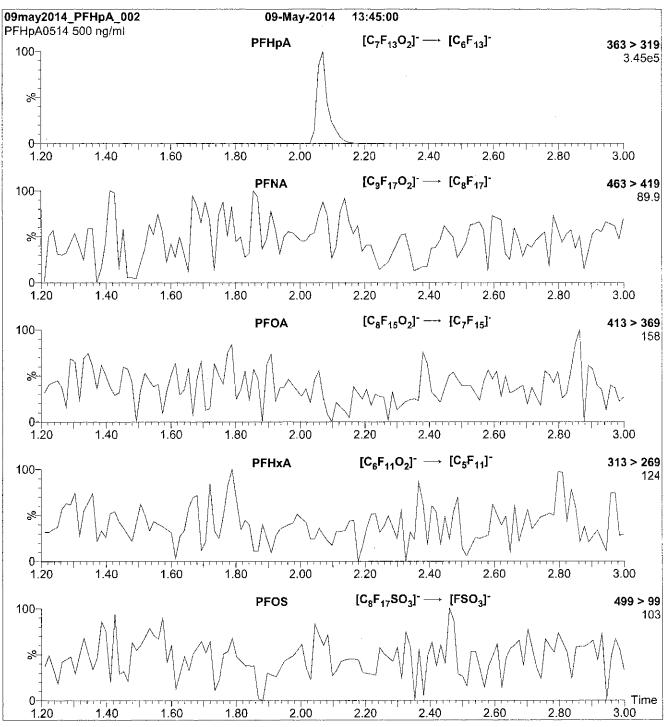
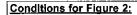


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₂OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFHpS_00005



PRODUCT CODE:

L-PFHpS

LOT NUMBER:

LPFHpS0114

COMPOUND:

Sodium perfluoro-1-heptanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₇F₁₅SO₃Na

MOLECULAR WEIGHT:

472.10

CONCENTRATION:

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

SOLVENT(S):

Methanol

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

 $47.6 \pm 2.4 \mu g/m!$ (PFHpS 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 ~ 0.1% of L-PFHxS (C₈F₁₃SO₃Na) and ~ 0.2% of L-PFOS (C₈F₁₇SO₃Na).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u> 13/2/12015</u>

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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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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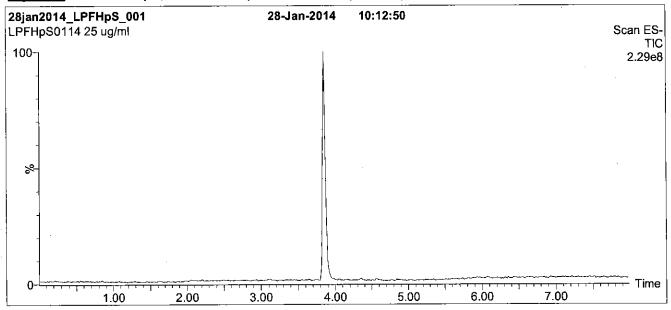
QUALITY MANAGEMENT:

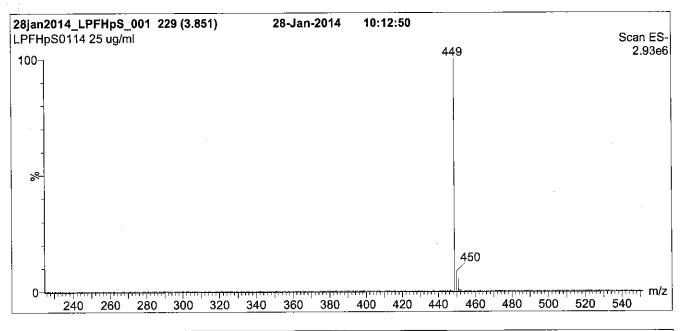
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





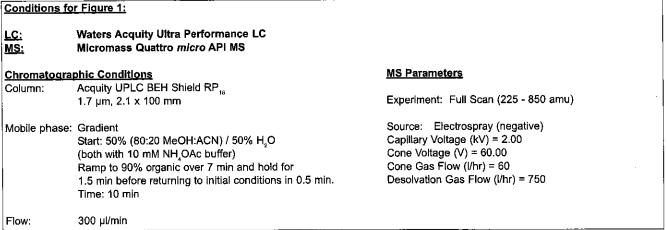
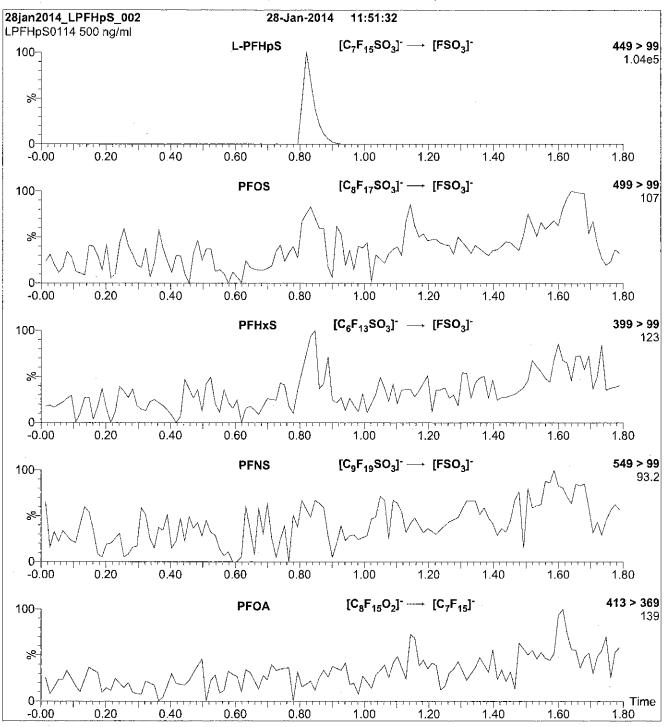
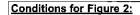


Figure 2: L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml L-PFHpS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.66e-3 Collision Energy (eV) = 35

LCPFHxA_00003



PRODUCT CODE:

PFHxA

LOT NUMBER:

PFHxA0514

COMPOUND:

Perfluoro-n-hexanoic acid

CAS #:

307-24-4

STRUCTURE:

MOLECULAR FORMULA:

C₆HF₄O₂

CONCENTRATION:

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

MOLECULAR WEIGHT:

314.05

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/09/2014

EXPIRY DATE: (mm/dd/yyyy)

05/09/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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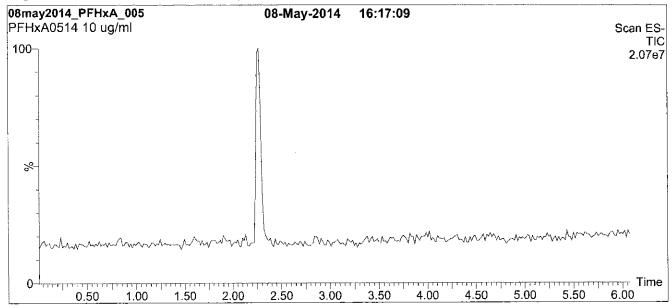
QUALITY MANAGEMENT:

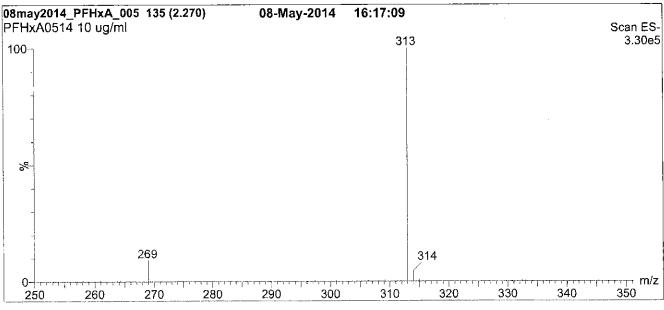
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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





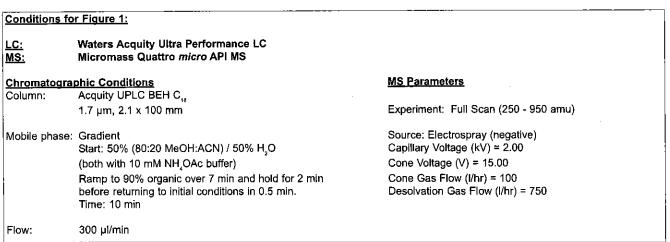
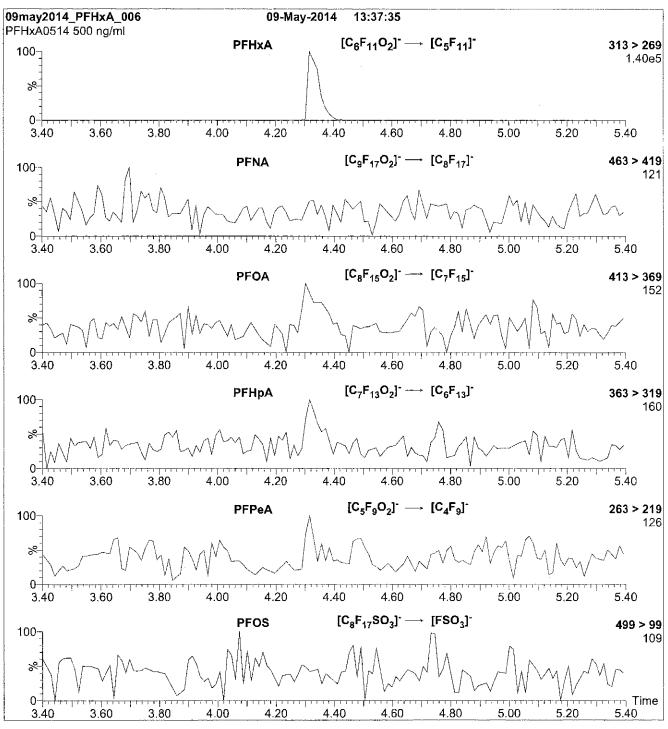
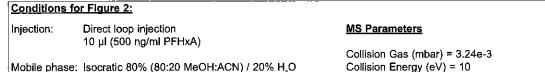


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

LCPFHxS-br_00001





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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QUALITY MANAGEMENT:

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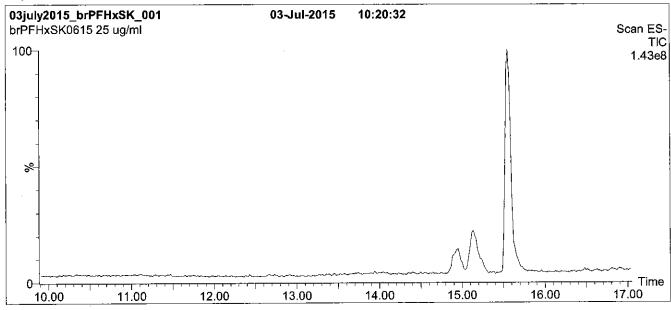
Table A: br-PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)*

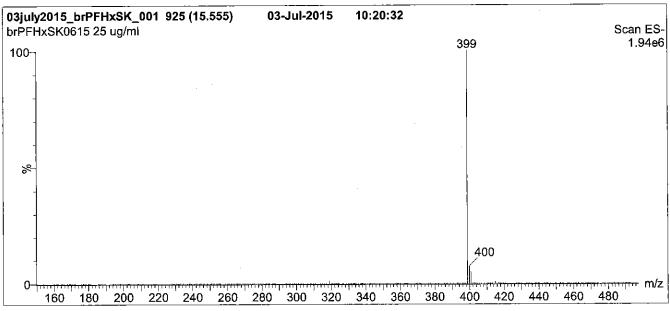
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ⁻ K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	CF ₃ CF ₃ CCF ₂ CF ₂ SO ₃ -K ⁺ CF ₃	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)





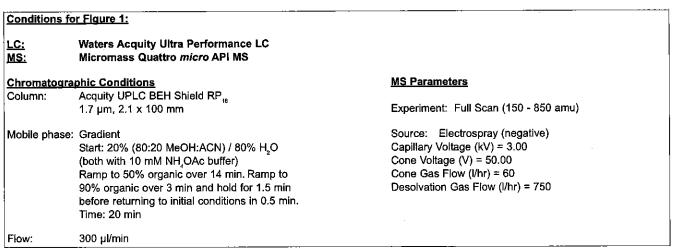
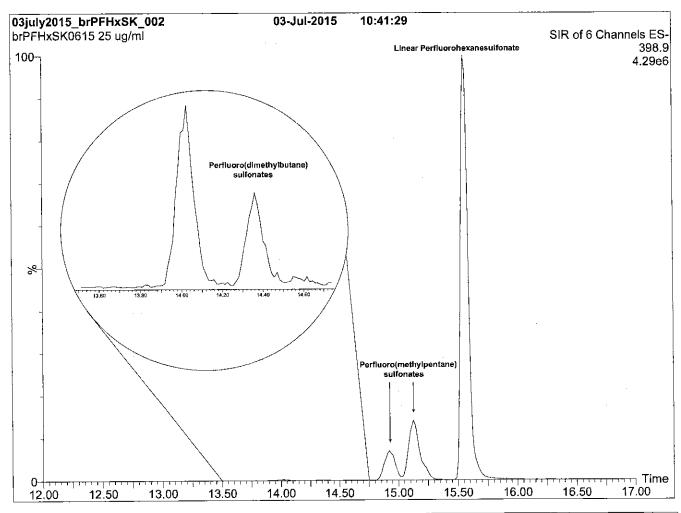


Figure 2: br-PFHxSK; LC/MS Data



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% H₂O

(both with 10 mM NH₄OAc 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:

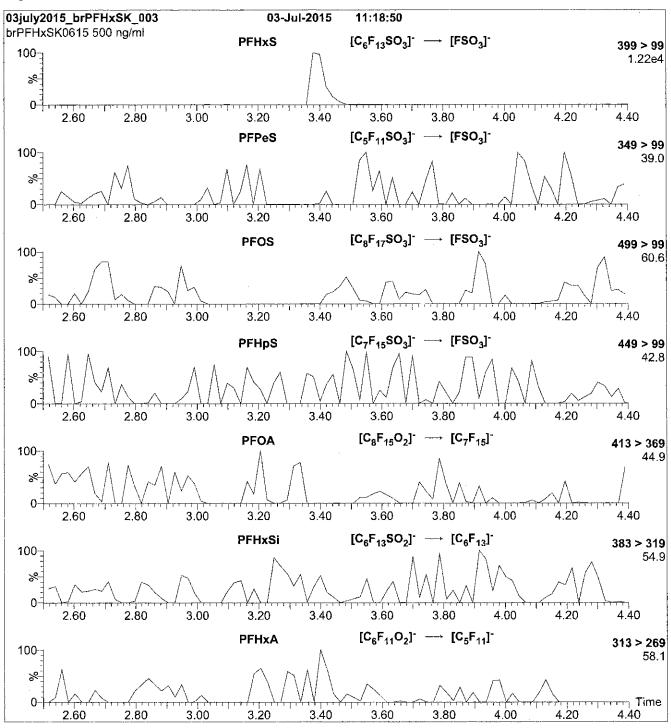
300 µl/min

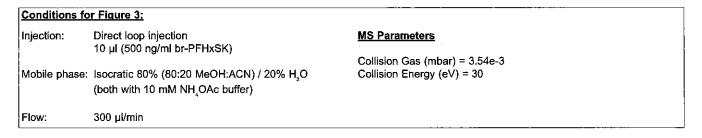
MS Parameters

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)





LCPFNA_00004



PRODUCT CODE:

PFNA

LOT NUMBER:

PFNA0514

COMPOUND:

Perfluoro-n-nonanoic acid

STRUCTURE:

CAS #:

375-95-1

F F F F F F F F

MOLECULAR FORMULA:

C₉HF₁₇O₂

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)

05/09/2014

EXPIRY DATE: (mm/dd/yyyy)

05/09/2019

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

 Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

05/22/2014

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, u(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.

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

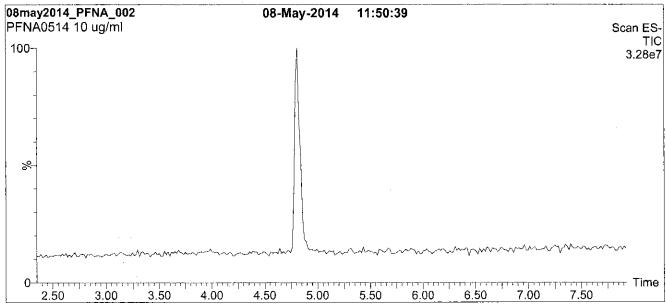
QUALITY MANAGEMENT:

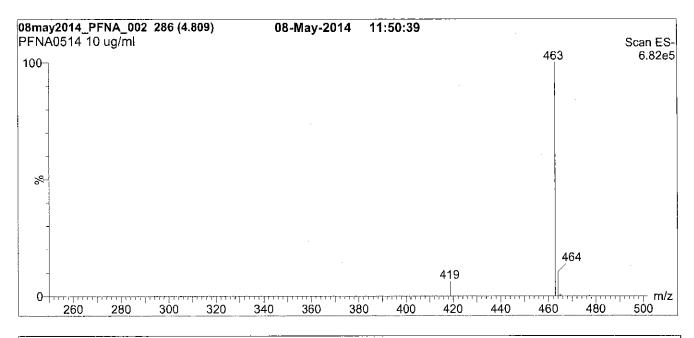
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).











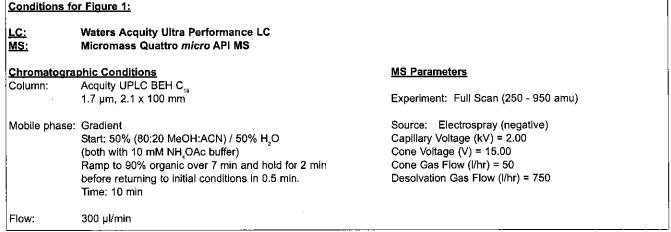
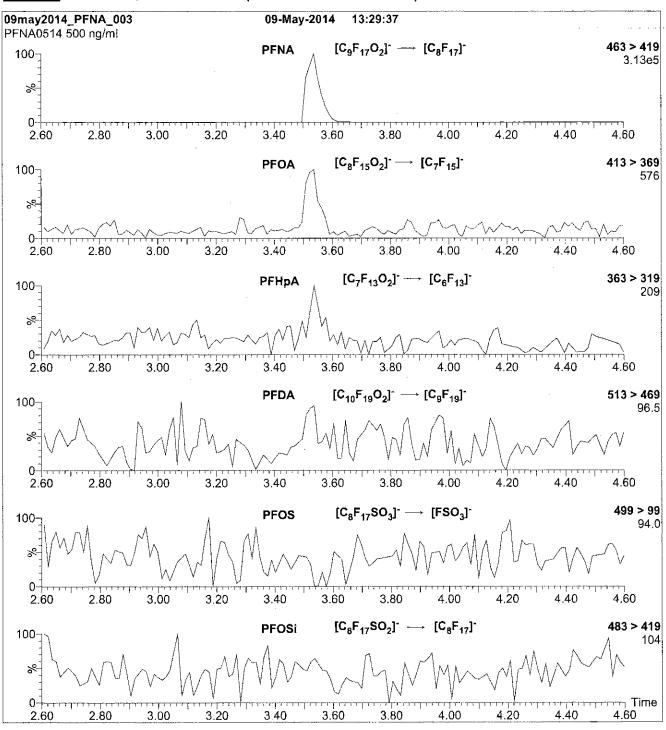
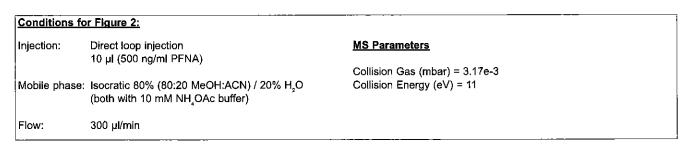


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





LCPFNS_00002



PRODUCT CODE:

L-PFNS

LOT NUMBER:

LPFNS0712

COMPOUND:

Sodium perfluoro-1-nonanesulfonate

STRUCTURE:

CAS #:

98789-57-2

MOLECULAR FORMULA:

C_aF₁₉SO₃Na

MOLECULAR WEIGHT:

572.12

CONCENTRATION:

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

 $48.0 \pm 2.4 \mu g/ml$ (PFNS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/04/2012

EXPIRY DATE: (mm/dd/yyyy)

07/04/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/15/2013

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{x}(y)$, 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

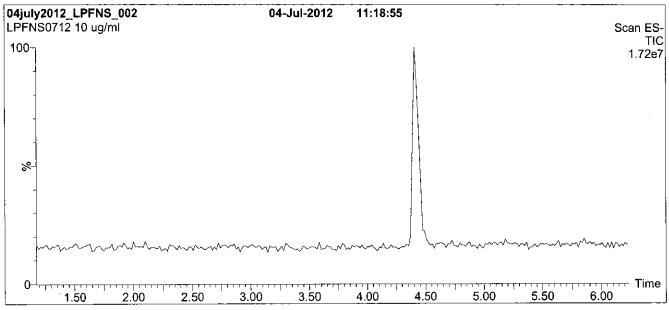
QUALITY MANAGEMENT:

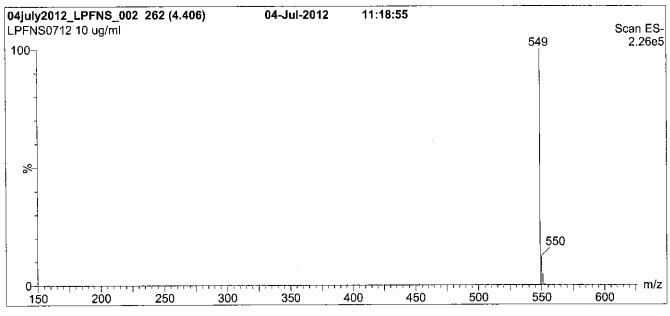
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





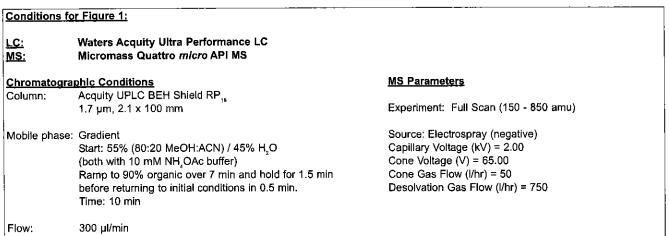
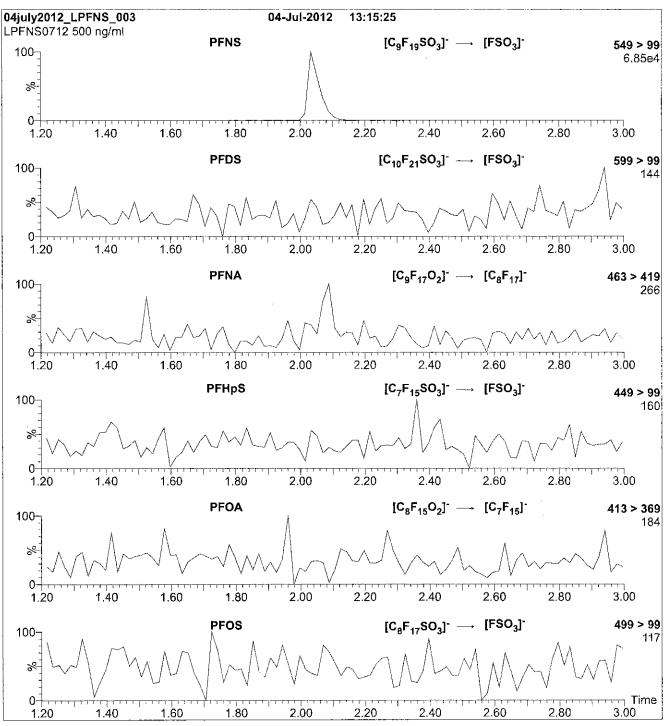
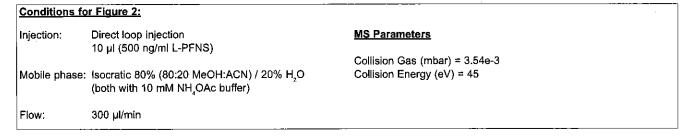


Figure 2: L-PFNS; LC/MS/MS Data (Selected MRM Transitions)





LCPFOA_00004



PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA1013

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

C,HF,O,

MOLECULAR WEIGHT:

414.07

CONCENTRATION:

MOLECULAR FORMULA:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/11/2013

EXPIRY DATE: (mm/dd/yyyy)

10/11/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 10/18/2

(mm/dd/yyyy

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

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

 $x_{11} x_{22} ... x_{n}$ 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

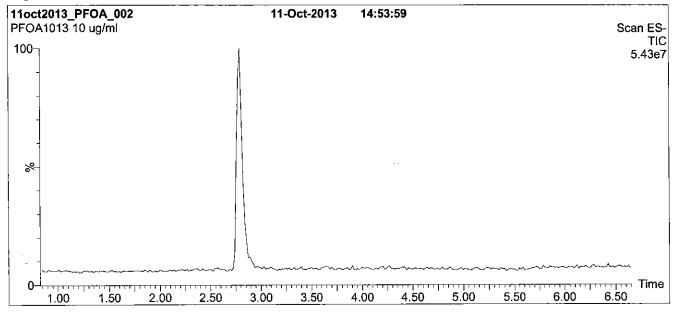
QUALITY MANAGEMENT:

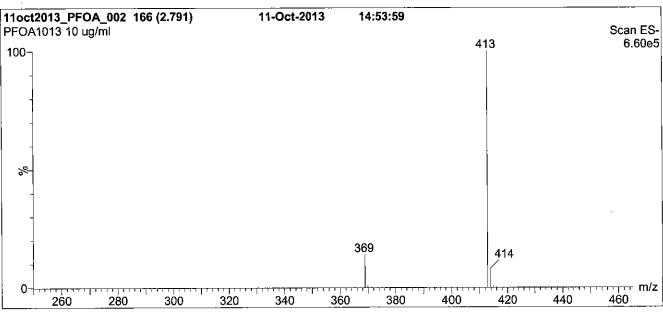
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





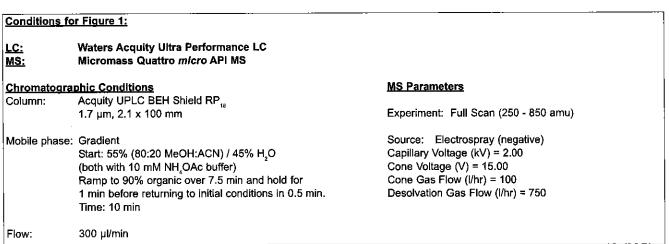
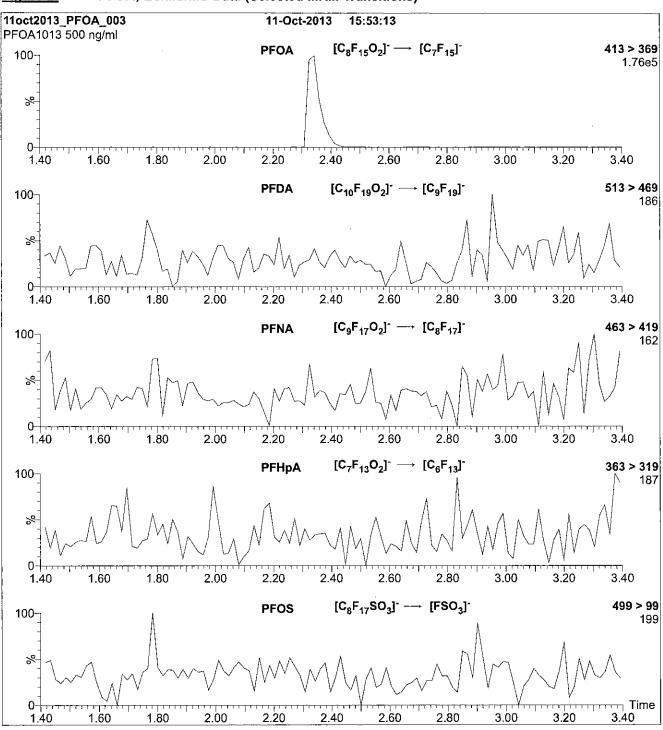
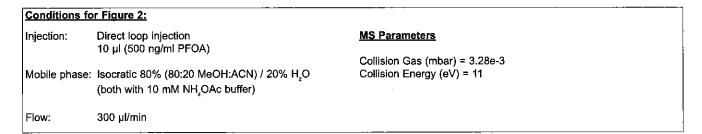


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





LCPFOA_00005



PRODUCT CODE:

PFOA

LOT NUMBER:

PFOA1115

COMPOUND:

Perfluoro-n-octanoic acid

STRUCTURE:

CAS #:

335-67-1

F F F F F F F

MOLECULAR FORMULA:

C,HF,O,

CONCENTRATION:

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

MOLECULAR WEIGHT:

414.07

g/ml <u>SOLVENT(S):</u>

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

vvv) 11/06/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

/mm/dd/sees)

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(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:

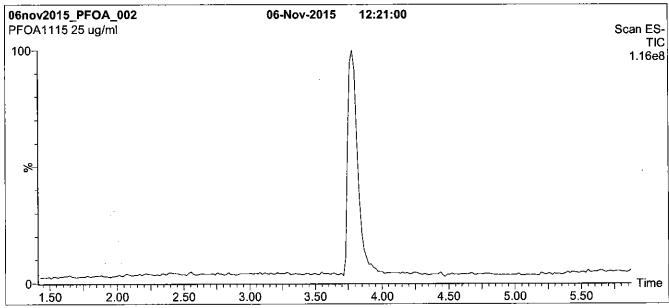
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

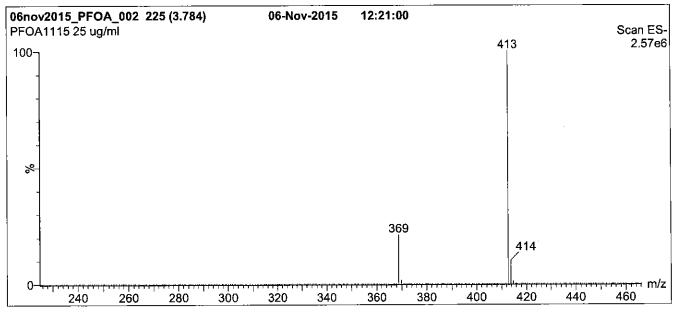




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





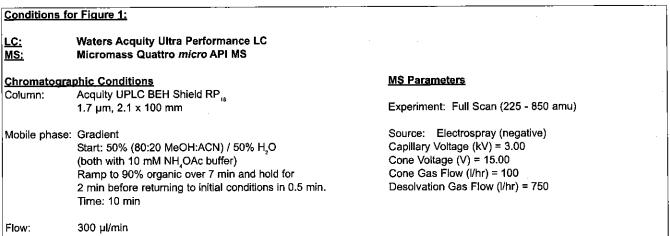
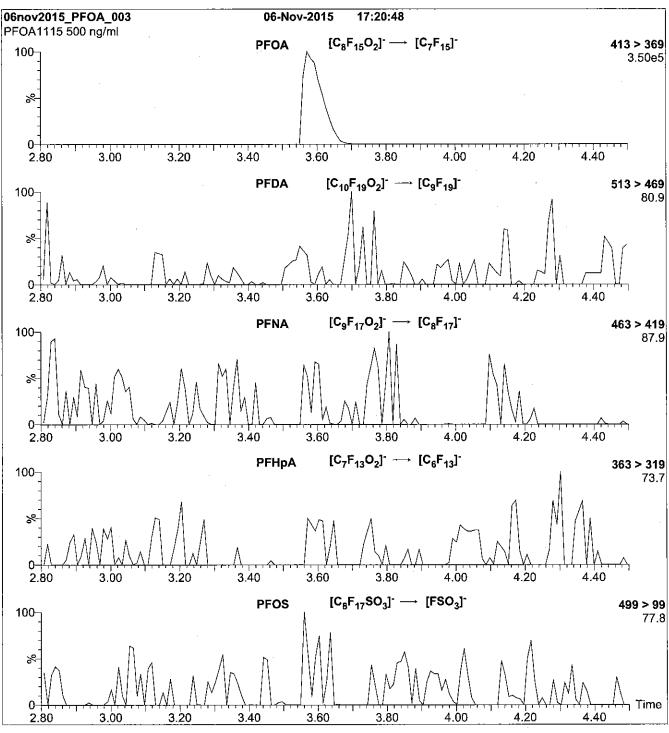
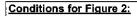


Figure 2: PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3 Collision Energy (eV) = 10

LCPFODA_00004



PRODUCT CODE:

PFODA

LOT NUMBER:

PFODA0807

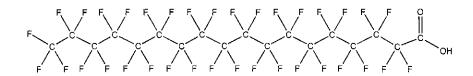
COMPOUND:

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



MOLECULAR FORMULA:

C18HF35O2

50 ± 2.5 μg/ml

MOLECULAR WEIGHT:

914.15

SOLVENT(S):

Methanol

Water (4%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

04/25/2014

EXPIRY DATE: (mm/dd/yyyy)

04/25/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

: <u>04/28/2014</u>

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_x(y)$, 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

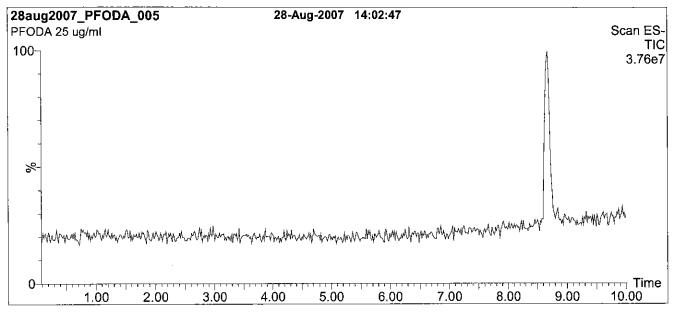
QUALITY MANAGEMENT:

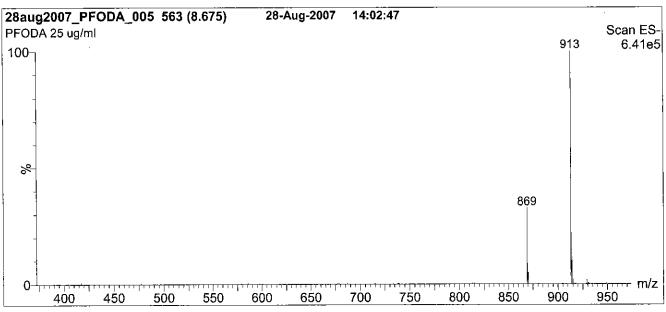
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





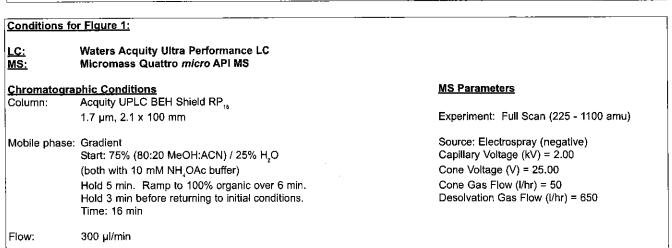
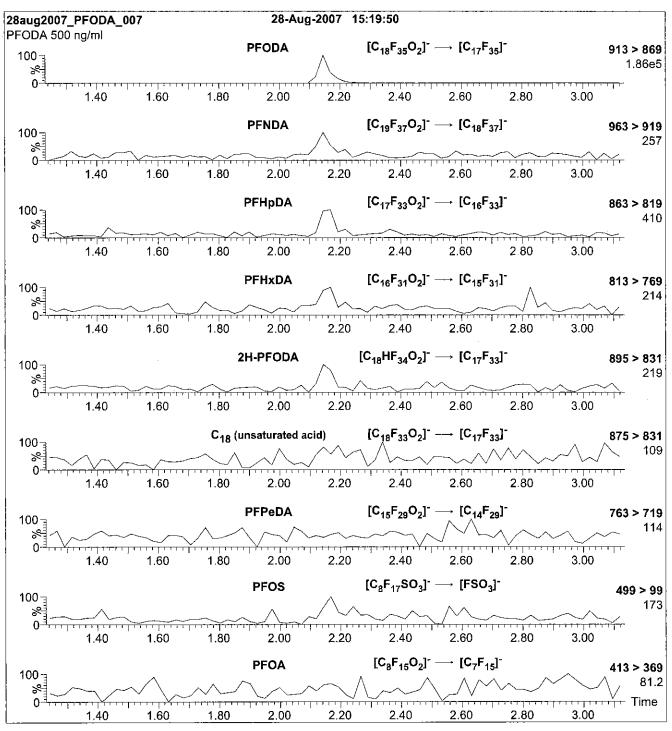
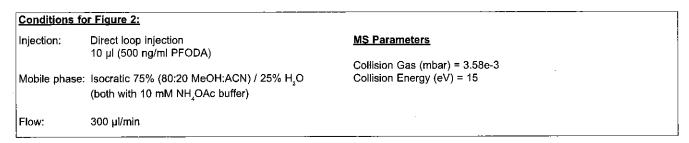


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





LCPFOS-br_00001



<u>br-PFOSK</u>

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).

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(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:

Form#:13, Issued 2004-11-10 Revision#:3, Revised 2015-03-24

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).





Table A: br-PFOSK; Isomeric Components and Percent Composition (by 19F-NMR)*

Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1 1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ K*	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CF ₃ K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K* CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K* CF ₃	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₃ SO ₃ K ⁺ CF ₃	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CFCF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K [†] CF ₃	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	CF ₃ CFCF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ -CCF ₂ CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ CF ₃ CF ₂ -C-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF-CF-CF ₂ CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	CF ₃ -CF-CF ₂ -CF-CF ₂ CF ₂ SO ₃ K ⁺ CF ₃ CF ₃	0.07

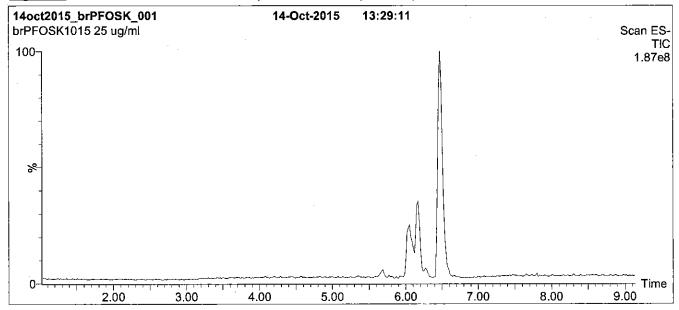
Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
 Systematic Name: Potassium perfluorooctane-2-sulfonate.

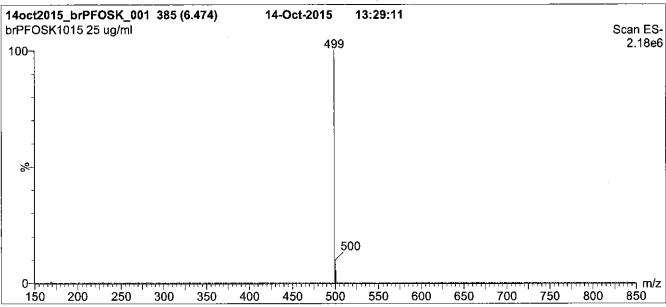
Certified By:

Date:

<u>10/15/2015</u>

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)





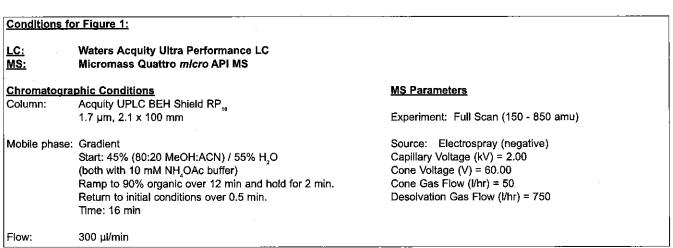
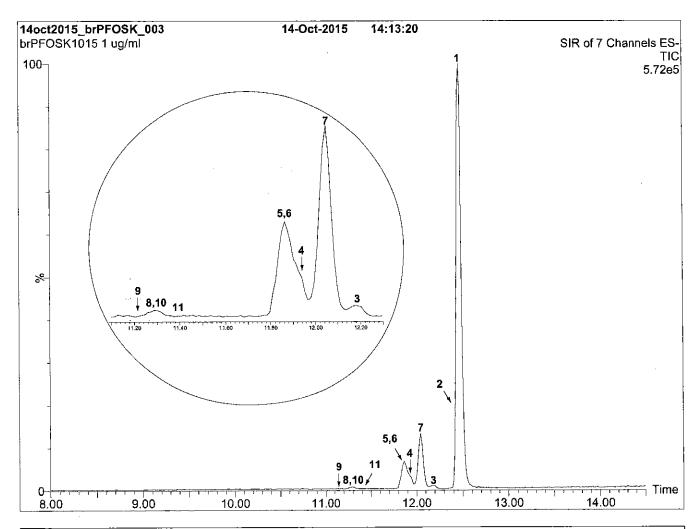


Figure 2: br-PFOSK; LC/MS Data (SIR)



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% H₂O (both with 10 mM NH₂OAc buffer)

Ramp to 90% organic over 15 min and hold for 3 min. Return to initial conditions over 1 min.

Time: 20 min

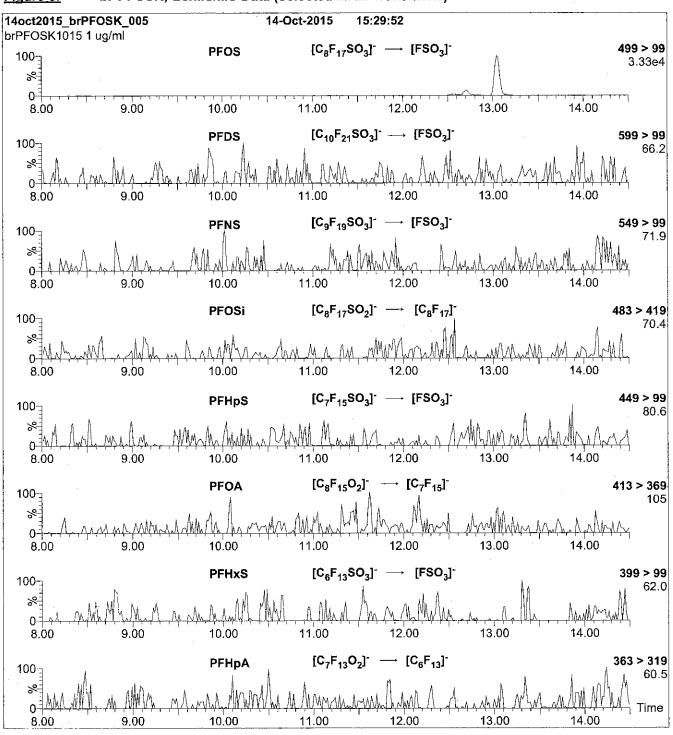
Flow:

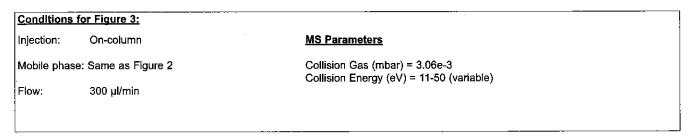
300 µl/min

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_00004



PRODUCT CODE:

L-PFOS

LOT NUMBER:

LPFOS0614

COMPOUND:

Sodium perfluoro-1-octanesulfonate

STRUCTURE:

CAS #:

4021-47-0

MOLECULAR FORMULA:

C_xF₁₇SO₃Na

MOLECULAR WEIGHT:

522.11

CONCENTRATION:

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

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

06/20/2014

>98%

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.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 10/27/2014

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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 x_i , x_o ,... x_a on which it depends is:

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

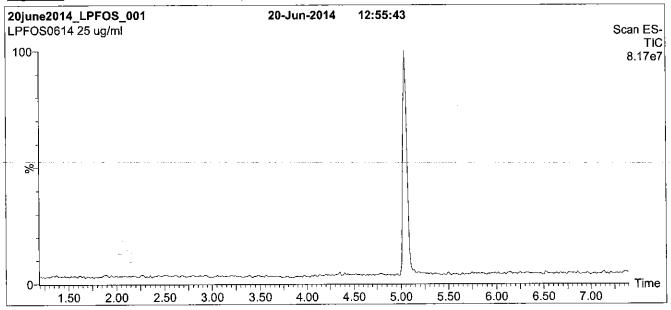
QUALITY MANAGEMENT:

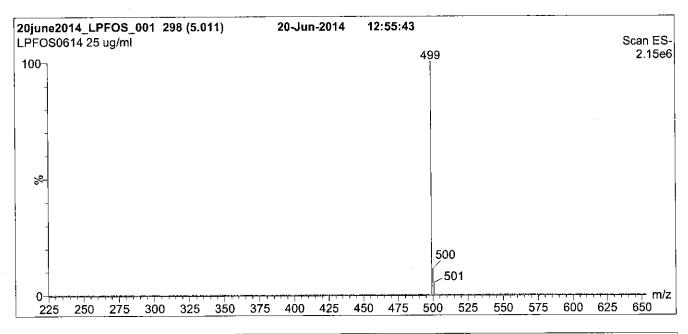
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





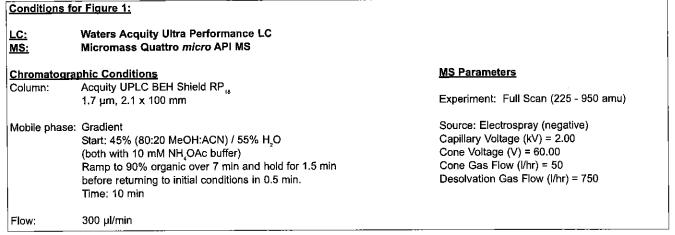
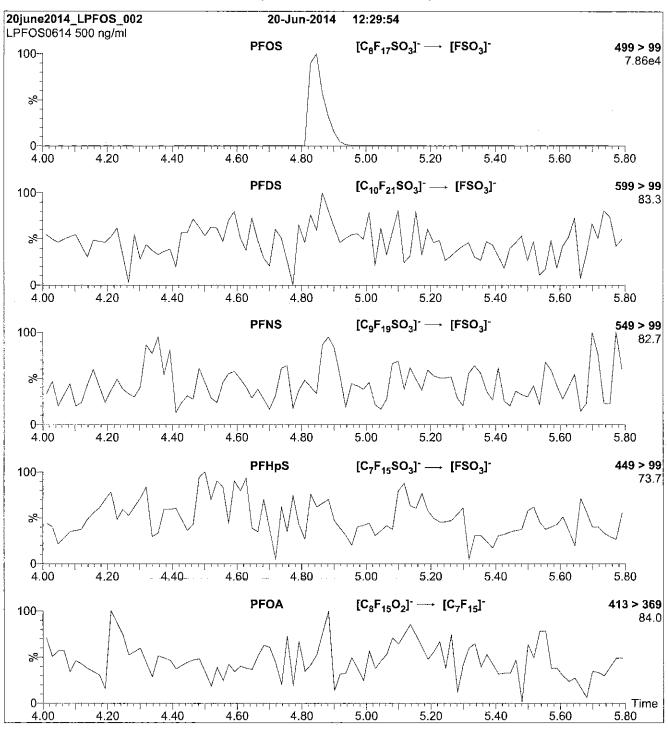
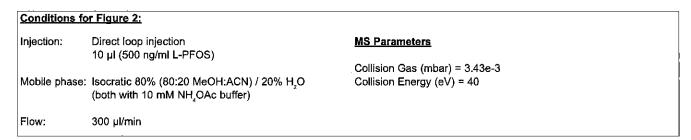


Figure 2: L-PFOS; LC/MS/MS Data (Selected MRM Transitions)





LCPFOSA_00005



PRODUCT CODE:

FOSA-I

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

FOSA0714I

499.14

Isopropanol

COMPOUND:

Perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

754-91-6

MOLECULAR FORMULA:

 $C_BH_2F_{17}NO_2S$

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/31/2014

EXPIRY DATE: (mm/dd/yyyy)

Stability studies ongoing

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 08/05/2014

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. They are designed to be used as reference standards for the identification and/or quantification of specific chemical compound(s).

HAZARDS:

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SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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

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TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

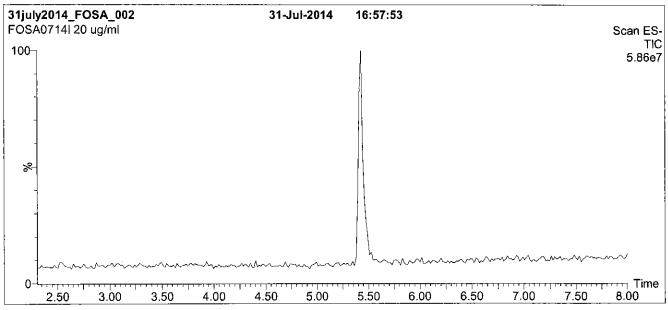
QUALITY MANAGEMENT:

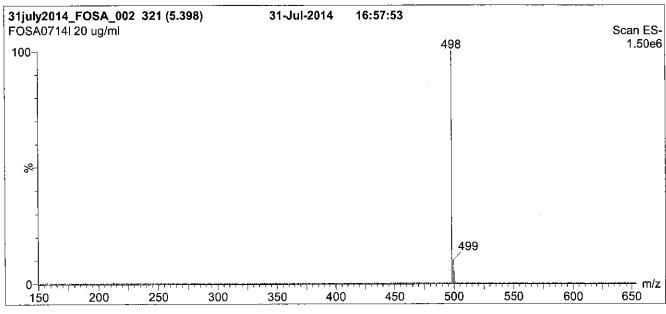
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





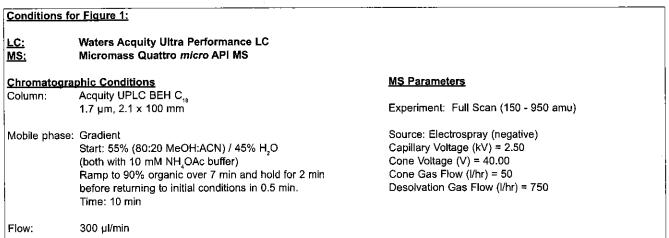
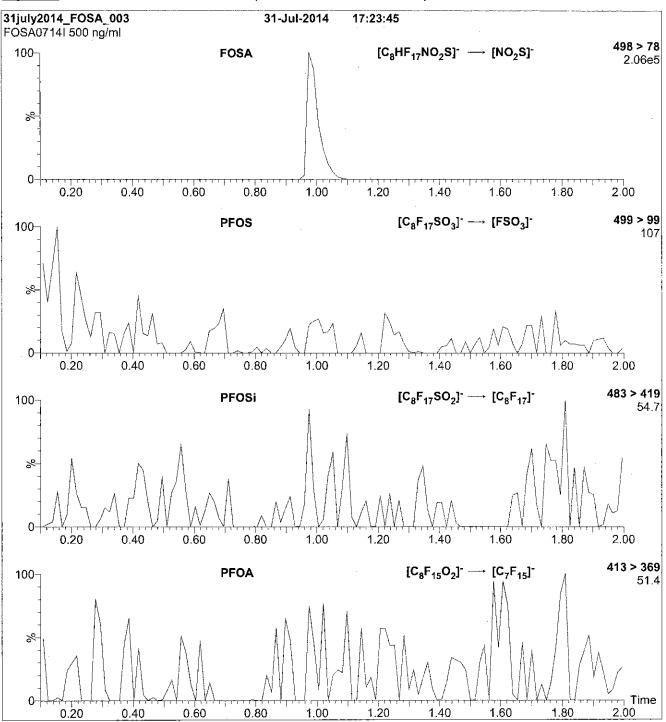


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml FOSA-I)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFOSA_00006



PRODUCT CODE:

FOSA-I

LOT NUMBER:

MOLECULAR WEIGHT:

SOLVENT(S):

FOSA0815I

COMPOUND:

Perfluoro-1-octanesulfonamide

CAS #:

754-91-6

499.14

Isopropanol

STRUCTURE:

F F F F F F F

MOLECULAR FORMULA:

C₁H₂F₁₇NO₂S

CONCENTRATION:

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

09/02/2015

EXPIRY DATE: (mm/dd/yyyy)

09/02/2017

RECOMMENDED STORAGE:

Refrigerate ampoule

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

(mm/dd/yyyy)

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

<u>INTENDED USE:</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:

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.

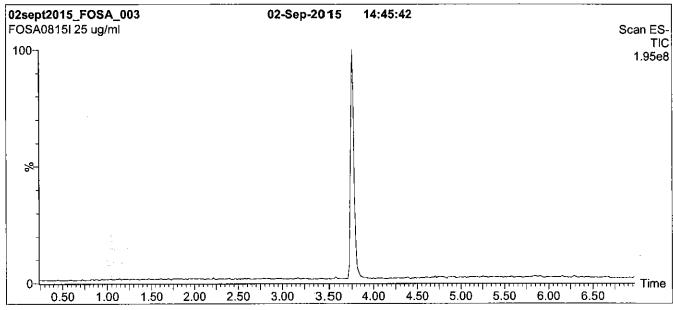
QUALITY MANAGEMENT:

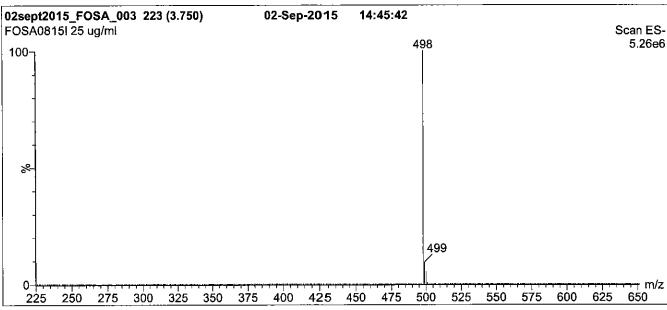
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





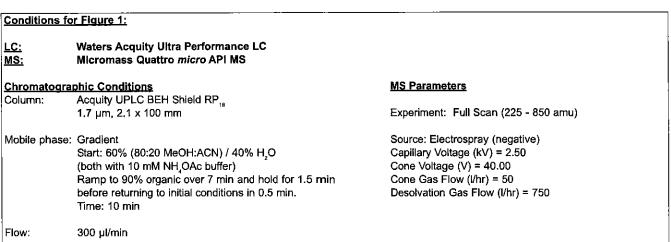
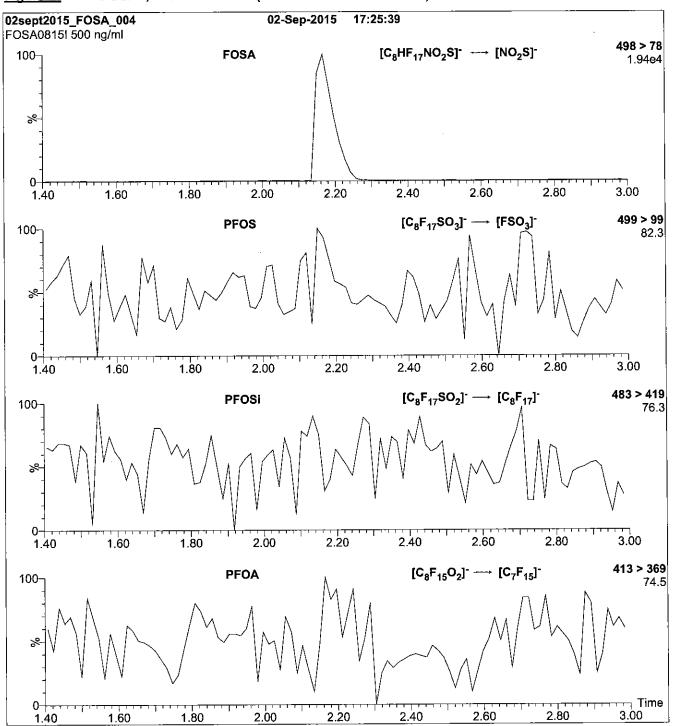
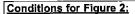


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% $\rm H_{\rm 2}O$

(both with 10 mM NH OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFPeA_00003



PRODUCT CODE:

PFPeA

LOT NUMBER:

PFPeA0113

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

CAS #:

2706-90-3

MOLECULAR FORMULA:

C_tHF₀O₂

MOLECULAR WEIGHT:

264.05

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/03/2013

EXPIRY DATE: (mm/dd/yyyy)

01/03/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C₅H₂F₈O₂ (hydrido - derivative) as measured by ¹⁹F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date: (

(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

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

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 $x_1, x_2,...x_n$ 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 our products.

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

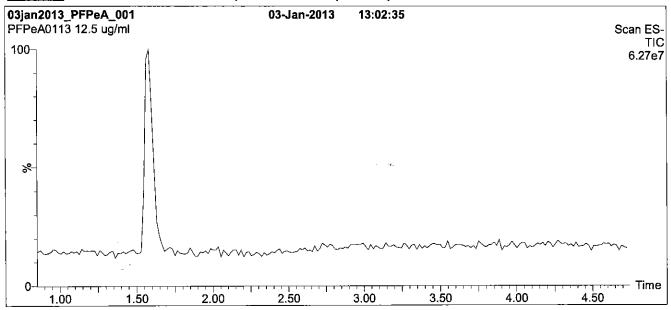
QUALITY MANAGEMENT:

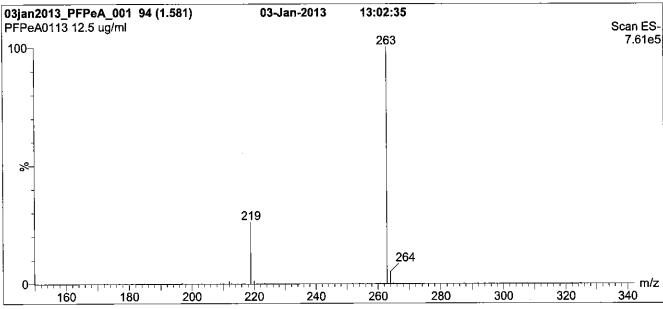
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).





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





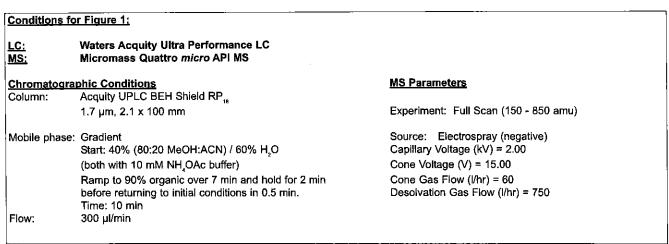
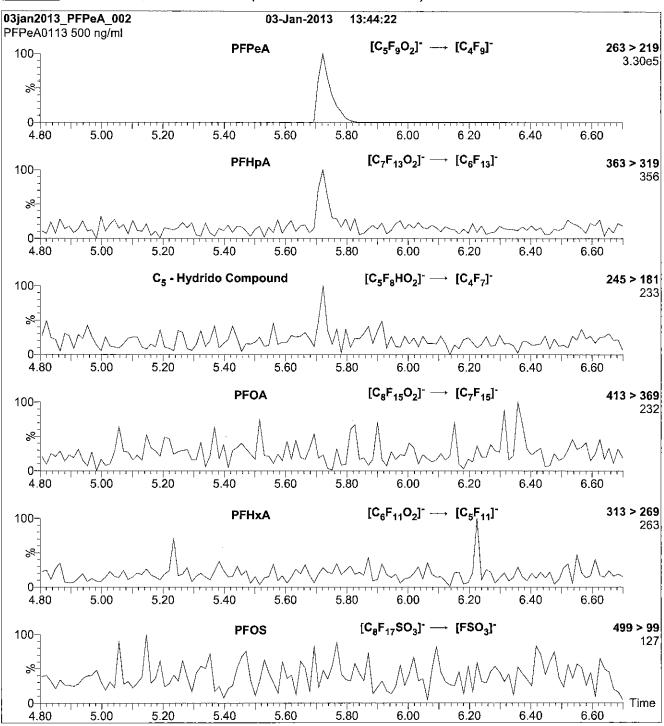
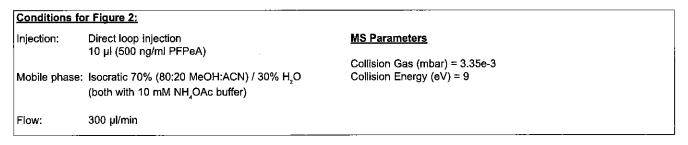


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





LCPFPeA_00004



PRODUCT CODE:

PFPeA

LOT NUMBER:

PFPeA0115

COMPOUND:

Perfluoro-n-pentanoic acid

STRUCTURE:

CAS #:

2706-90-3

MOLECULAR FORMULA:

C,HF,O,

,

 $50 \pm 2.5 \mu g/ml$

MOLECULAR WEIGHT:

264.05

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

CONCENTRATION:

>98%

LAST TESTED: (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mrn/dd/yyyy)

01/30/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

• Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ¹⁹F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By

B G Chittim

Date:

<u>U3/20/2U I</u>

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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SYNTHESIS / CHARACTERIZATION:

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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:

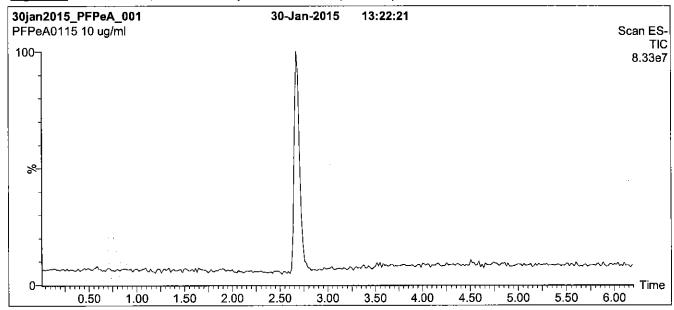
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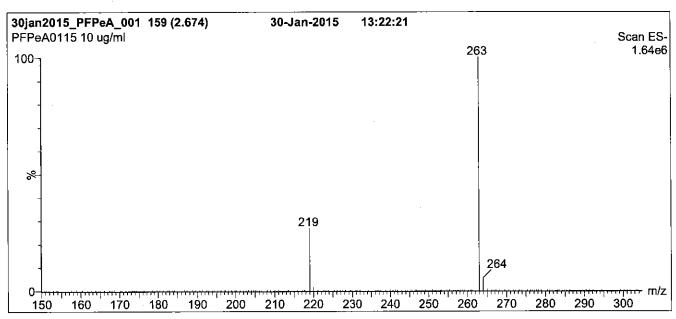




^{**}For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com**

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





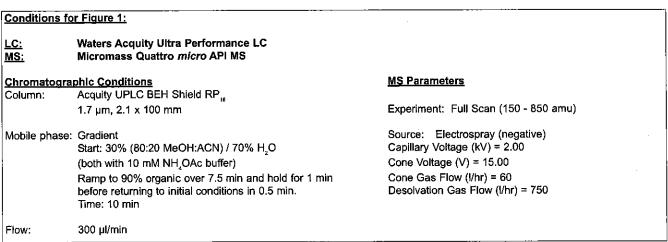
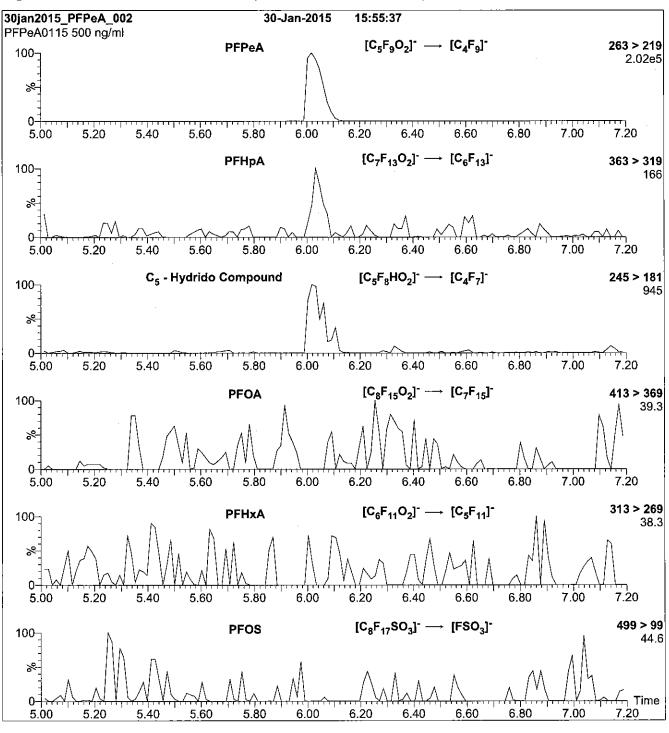


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H₂O

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

MS Parameters

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

LCPFPeS_00002



PRODUCT CODE:

L-PFPe\$

LOT NUMBER:

LPFPeS0712

COMPOUND:

Sodium perfluoro-1-pentanesulfonate

STRUCTURE:

CAS #:

Not available

MOLECULAR FORMULA:

C₅F₄SO₃Na

MOLECULAR WEIGHT:

372.09

CONCENTRATION:

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

46.9 ± 2.3 μg/ml (PFPeS anion)

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

07/04/2012

EXPIRY DATE: (mm/dd/yyyy)

07/04/2017

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 01/15/2013

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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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.

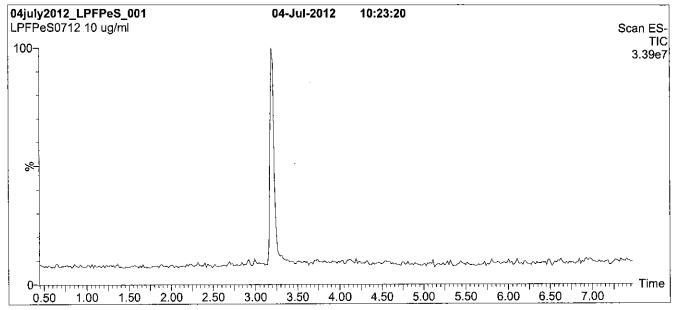
QUALITY MANAGEMENT:

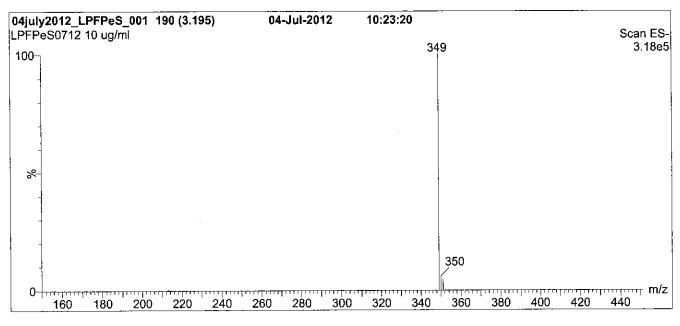
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Figure 1: L-PFPeS; LC/MS Data (TIC and Mass Spectrum)





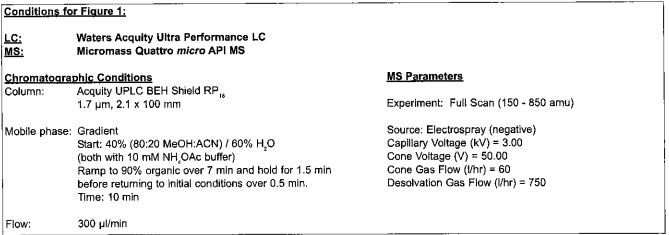
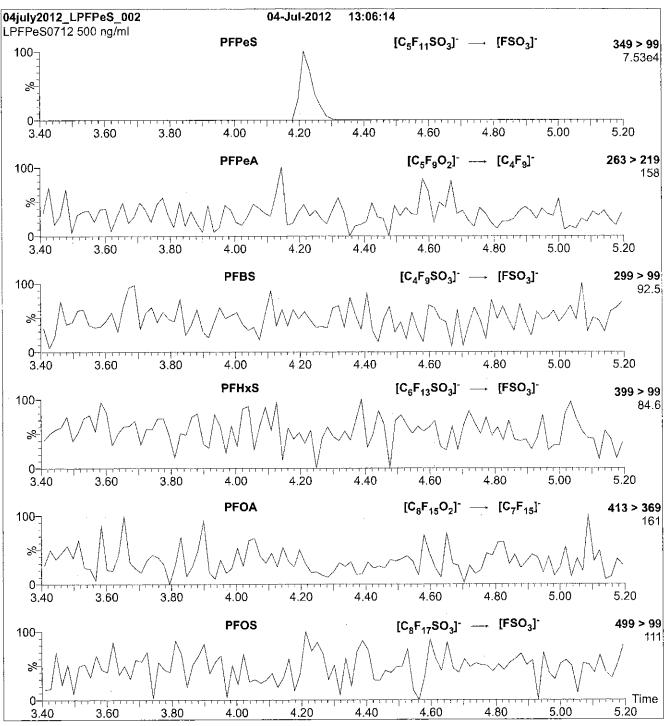
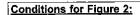


Figure 2: L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml L-PFPeS)

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) = 3.66e-3 Collision Energy (eV) = 30

Reagent

LCPFTeDA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFTeDA

LOT NUMBER:

PFTeDA0613

COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7

MOLECULAR FORMULA:

C,4HF,27O,

MOLECULAR WEIGHT:

714.11

CONCENTRATION:

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/19/2013

EXPIRY DATE: (mm/dd/yyyy)

06/19/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 07/17/2013

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

INTENDED USE:

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HOMOGENEITY:

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UNCERTAINTY:

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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:

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

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

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

TRACEABILITY:

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

EXPIRY DATE / PERIOD OF VALIDITY:

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

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

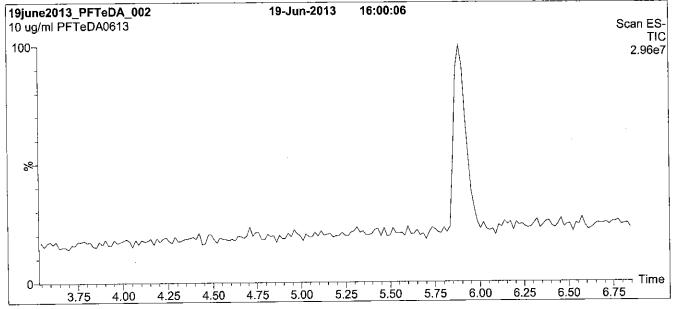
This product was produced using a Quality Management System registered to ISO 9001:2008 by SAI Global, ISO/IEC 17025:2005 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34:2009 by ACLASS (certificate number AR-1523).

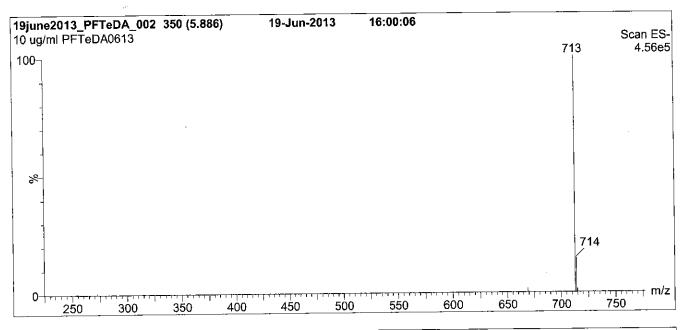




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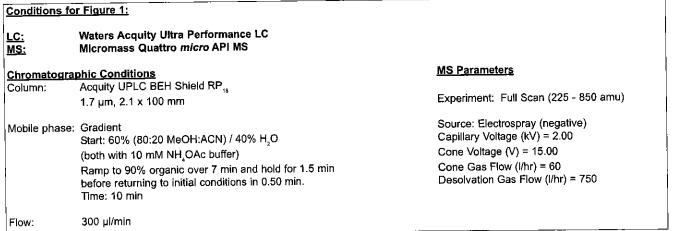
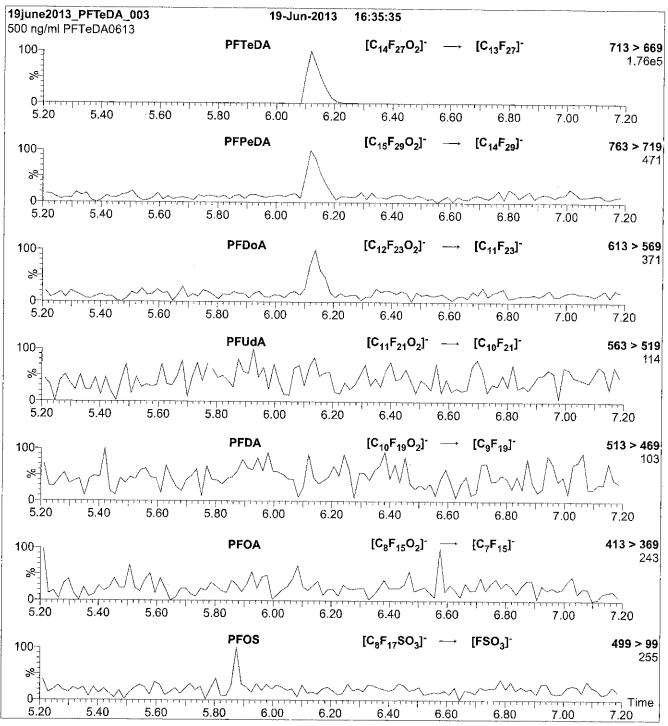
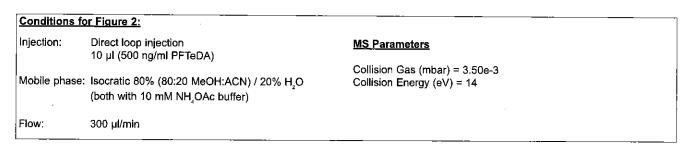


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFTrDA_00003



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,

MOLECULAR WEIGHT:

664.11

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

12/10/2013

EXPIRY DATE: (mm/dd/yyyy)

12/10/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.1% of PFUdA (C₁₁HF₂₁O₂), ~ 0.4% of PFDoA (C₁₂HF₂₃O₂), and ~ 0.1% of PFTeDA $(C_{14}HF_{27}O_2).$

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/11/2013

INTENDED USE:

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

HAZARDS:

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

SYNTHESIS / CHARACTERIZATION:

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

HOMOGENEITY:

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

UNCERTAINTY:

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

The combined relative standard uncertainty, $u_{z}(y)$, 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 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 for the period of time specified by the expiry date in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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

QUALITY MANAGEMENT:

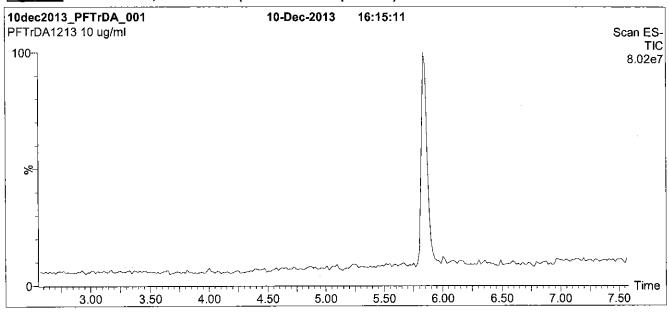
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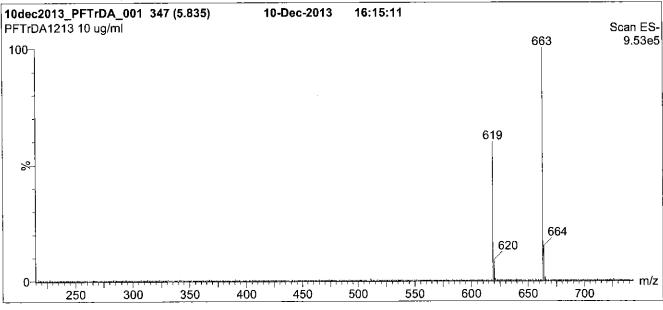




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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





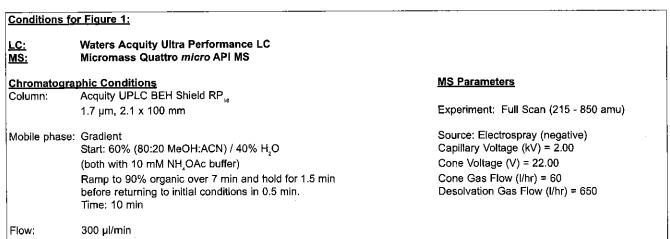
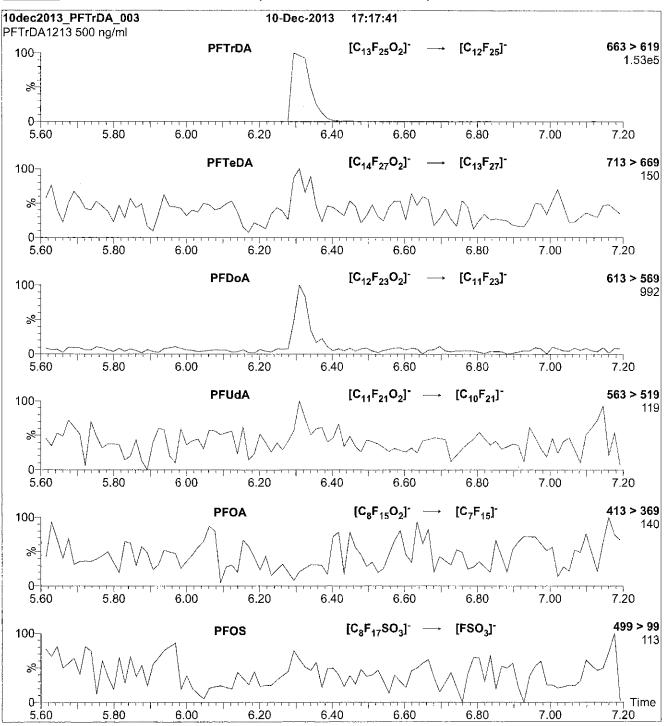
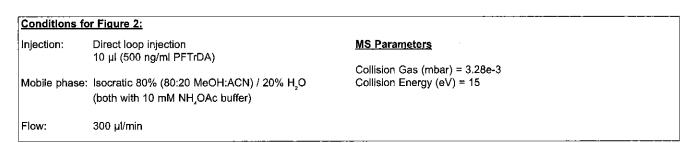


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Reagent

LCPFUdA_00003



CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

PFUdA

LOT NUMBER:

PFUdA0613

COMPOUND:

Perfluoro-n-undecanoic acid

STRUCTURE:

CAS #:

2058-94-8

MOLECULAR FORMULA:

C,HF,O,

MOLECULAR WEIGHT:

564.09

CONCENTRATION:

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

06/19/2013

EXPIRY DATE: (mm/dd/yyyy)

06/19/2018

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

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

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

ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>07/03/2013</u>

INTENDED USE:

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

HAZARDS:

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

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

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

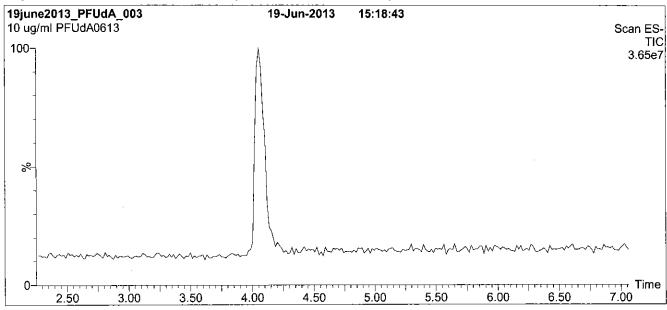
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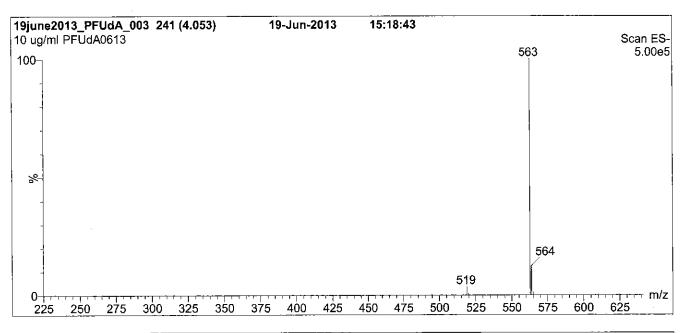




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Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)





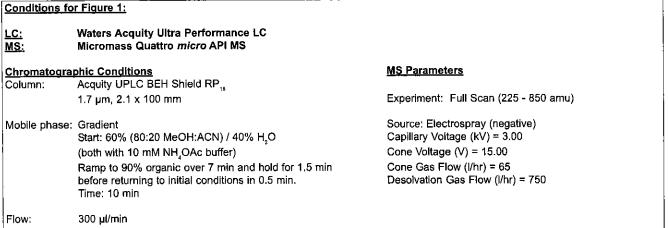
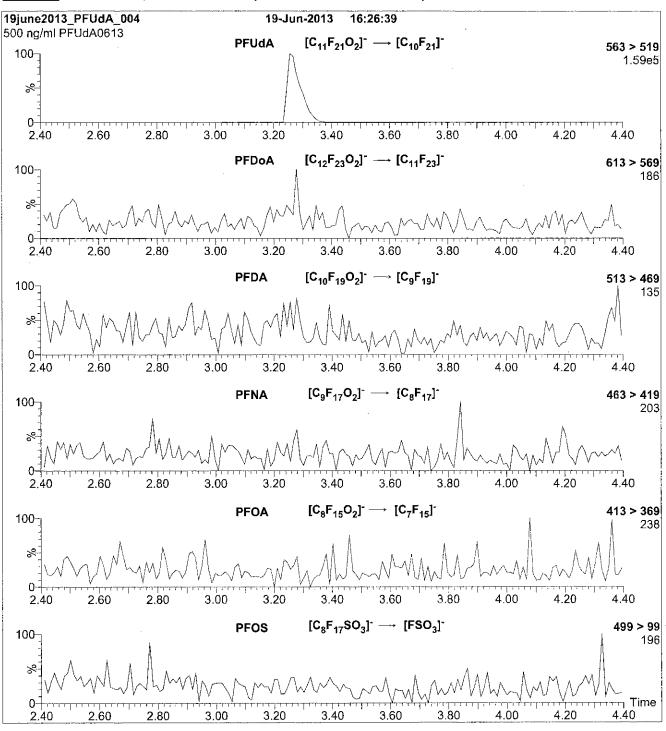
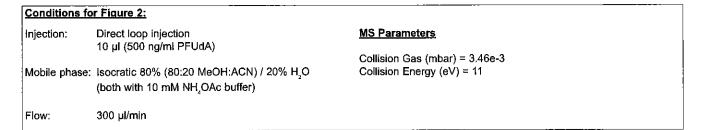


Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)





Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-1870) 4	_	-	1	
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SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13CHpA #	PFHxS #	PFOA #	PFNA #
OF-RW44-0516	320-18704-1	99	99	98	78
OF-FB42B-0516	320-18704-8	130	129	130	131
OF-RW42C-516	320-18704-9	96	107	97	87
OF-RW42CD-0516	320-18704-10	96	98	102	95
OF-FB42C-0516	320-18704-11	123	115	129	127

Column to be used to flag recovery values

FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-187	04	_	• [Ĺ
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SDG No.: ____

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	13CHpA #	PFHxS #	PFOA #	PFOS #	PFNA #
OF-FB44-0516	320-18704-2	137	126	136	85	137
OF-RW42B2-0516	320-18704-3	89	86	92	101	84
OF-FB42B2-0516	320-18704-4	130	122	135	93	132
OF-RW42A-0516	320-18704-5	102	141	107	138	111
OF-FB42A-0516	320-18704-6	125	132	131	141	129
OF-RW42B-0516	320-18704-7	77	90	80	130	70
	MB	131	130	133	126	129
	320-109334/1-A					
	LCS	129	131	123	115	129
	320-109334/2-A					
	LCSD	120	120	118	109	120
	320-109334/3-A					

	QC LIMITS
13CHpA = 13C4-PFHpA	25-150
PFHxS = 1802 PFHxS	25-150
PFOA = 13C4 PFOA	25-150
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-18	3704-1
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SDG No.:

Matrix: Water Level: Low

GC Column (1): <u>Acquity</u> ID: <u>2.1 (mm)</u>

Client Sample ID	Lab Sample ID	PFOS	#
OF-RW44-0516 DL	320-18704-1 DL	145	
OF-FB42B-0516 RA	320-18704-8 RA	120	
OF-RW42C-516 RA	320-18704-9 RA	124	
OF-RW42CD-0516 RA	320-18704-10 RA	124	
OF-FB42C-0516 RA	320-18704-11 RA	114	

 $\frac{QC LIMITS}{25-150}$

PFOS = 13C4 PFOS

 $\ensuremath{\text{\#}}$ Column to be used to flag recovery values

FORM II WS-LC-0025

FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacr	amento	Job No.: 3	320-18704-1
SDG No.	:			
Matrix:	Water	Level: Low	Lab File I	ID: 25MAY2016B4A_016.d
Lab ID:	LCS 320-109334/2-A		Client ID:	:

	SPIKE ADDED	LCS CONCENTRATION	LCS %	QC LIMITS	#
COMPOUND	(ug/L)	(ug/L)	REC	REC	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0340	85	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0325	81	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0313	78	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0261	74	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0229	63	60-140	
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0310	83	60-140	М
1802 PFHxS	0.0946	0.124	131	25-150	
13C4 PFOS	0.0956	0.109	115	25-150	
13C5 PFNA	0.100	0.129	129	25-150	
13C4 PFOA	0.100	0.123	123	25-150	
13C4-PFHpA	0.100	0.129	129	25-150	

 $[\]mbox{\#}$ Column to be used to flag recovery and RPD values FORM III WS-LC-0025

FORM III LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name	e: TestAmerica Sac	ramento	Job No.: 320-	18704-1
SDG No.	:			
Matrix:	Water	Level: Low	Lab File ID: 2	25MAY2016B4A_017.d
Lab ID:	LCSD 320-109334/3	-A	Client ID:	

	SPIKE ADDED	LCSD CONCENTRATION	LCSD %	010	QC L1	IMITS	#
COMPOUND	(ug/L)	(ug/L)	REC	RPD	RPD	REC	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0330	83	3	30	60-140	
Perfluorooctanoic acid (PFOA)	0.0400	0.0309	77	5	30	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0338	85	8	30	60-140	
Perfluorobutanesulfonic acid (PFBS)	0.0354	0.0270	76	3	30	50-150	
Perfluorohexanesulfonic acid (PFHxS)	0.0364	0.0313	86	31	30	60-140	M Q
Perfluorooctanesulfonic acid (PFOS)	0.0371	0.0330	89	6	30	60-140	М
1802 PFHxS	0.0946	0.114	120			25-150	
13C4 PFOS	0.0956	0.104	109			25-150	
13C5 PFNA	0.100	0.120	120			25-150	
13C4 PFOA	0.100	0.118	118			25-150	
13C4-PFHpA	0.100	0.120	120			25-150	

 $[\]mbox{\#}$ Column to be used to flag recovery and RPD values FORM III WS-LC-0025

FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
SDG No.:	
Lab File ID: 25MAY2016B4A_015.d	Lab Sample ID: MB 320-109334/1-A
Matrix: Water	Date Extracted: 05/09/2016 16:04
Instrument ID: A4	Date Analyzed: 05/25/2016 20:26
Level: (Low/Med) Low	

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB		
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALY	ZED
OF-FB42B-0516 RA	320-18704-8 RA	24MAY2016A6 A 028.d	05/25/2016	01:37
OF-RW42C-516 RA	320-18704-9 RA	24MAY2016A6 A 029.d	05/25/2016	01:58
OF-RW42CD-0516 RA	320-18704-10 RA	24MAY2016A6 A 030.d	,	02:20
OF-FB42C-0516 RA	320-18704-11 RA	24MAY2016A6 A 031.d		02:41
	LCS 320-109334/2-A	25MAY2016B4 A 016.d	,	20:47
	LCSD 320-109334/3-A	25MAY2016B4 A 017.d		21:08
OF-RW44-0516	320-18704-1	25MAY2016B4 A 018.d	05/25/2016	21:29
OF-FB44-0516	320-18704-2	25MAY2016B4 A 019.d	05/25/2016	21:51
OF-RW42B2-0516	320-18704-3	25MAY2016B4 A 020.d	05/25/2016	22:12
OF-FB42B2-0516	320-18704-4	25MAY2016B4 A 021.d	05/25/2016	22:33
OF-RW42A-0516	320-18704-5	25MAY2016B4 A 022.d	05/25/2016	22:54
OF-FB42A-0516	320-18704-6	25MAY2016B4 A 023.d	05/25/2016	23:15
OF-RW42B-0516	320-18704-7	25MAY2016B4 A 024.d	05/25/2016	23:37
OF-FB42B-0516	320-18704-8	25MAY2016B4 A 028.d	05/26/2016	01:01
OF-RW42C-516	320-18704-9	25MAY2016B4 A 029.d	05/26/2016	01:22
OF-RW42CD-0516	320-18704-10	25MAY2016B4 A 030.d	05/26/2016	01:44
OF-FB42C-0516	320-18704-11	25MAY2016B4 A 031.d	05/26/2016	02:05
OF-RW44-0516 DL	320-18704-1 DL	25MAY2016B4 A 060.d	05/26/2016	12:24

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW44-0516 Lab Sample ID: 320-18704-1

Matrix: Water Lab File ID: 25MAY2016B4A_018.d

Analysis Method: WS-LC-0025 Date Collected: 05/04/2016 09:12

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 531.5(mL) Date Analyzed: 05/25/2016 21:29

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.014		0.0024	0.0019	0.00075
335-67-1	Perfluorooctanoic acid (PFOA)	0.36	М	0.0024	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.0038		0.0024	0.0019	0.00062
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.013		0.0024	0.0019	0.00086
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.32	Q	0.0024	0.0019	0.00082

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	99		25-150
STL00995	13C5 PFNA	78		25-150
STL00990	13C4 PFOA	98		25-150
STL01892	13C4-PFHpA	99		25-150

Report Date: 26-May-2016 13:59:20 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_018.d

Lims ID: 320-18704-A-1-A Client ID: 0F-RW44-0516

Sample Type: Client

Inject. Date: 25-May-2016 21:29:57 ALS Bottle#: 4 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-1-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:13:56 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 26-May-2016 13:59:18

	i ii ot Eovoi itovio	orron bar				2 410.		e may zere relen			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
-	51 Perfluorobu	ıtanesulfo	onic acid	I							
				-0.014	1.000	148210	6.75				
	D 8 13C4-PFH	рΑ									
	366.6 > 321.6	9.380	9.387	-0.007		4225038	49.4		98.9	4964	
	9 Perfluorohe										
	362.8 > 318.7	9.380	9.388	-0.008	1.000	321434	7.53			43.3	
	58 Perfluorohe										
		9.412	9.421	-0.009	1.000	8493141	169.3				
	D 11 18O2 PFH										
		9.412	9.422	-0.010		1388543	46.8		98.9	1824	
	D 12 13C4 PFC		10 500	0.001		425 4002	40.0		07.7	F/00	
	416.5 > 371.6			-0.001		4354083	48.8		97.7	5600	
	13 Perfluorooc 412.8 > 368.8	tanoic ac 10.502		0.002	1 000	7629343	193.7			1950	M M
	412.8 > 168.7				1.000	2565530	173.7	2.97(0.00-0.00)		3901	M
	D 16 13C4 PFC		10.001	0.002	1.000	200000		2.77(0.00 0.00)		0,01	
		11.461	11.465	-0.004		175674	26.0		54.5	193	
	15 Perfluorood	tane sulf	onic acid	d							EM
		11.461			1.000	35816333	697.1			5359	EM
	498.3 > 98.2	11.461	11.466	-0.005	1.000	17048242		2.10(0.00-0.00)		6848	M
	D 17 13C5 PFN	Α									
	467.5 > 422.6	11.480	11.484	-0.004		3070687	39.1		78.3	5074	
	18 Perfluorono										
	462.5 > 418.6	11.480	11.486	-0.006	1.000	151644	2.00			40.5	

Report Date: 26-May-2016 13:59:20

OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

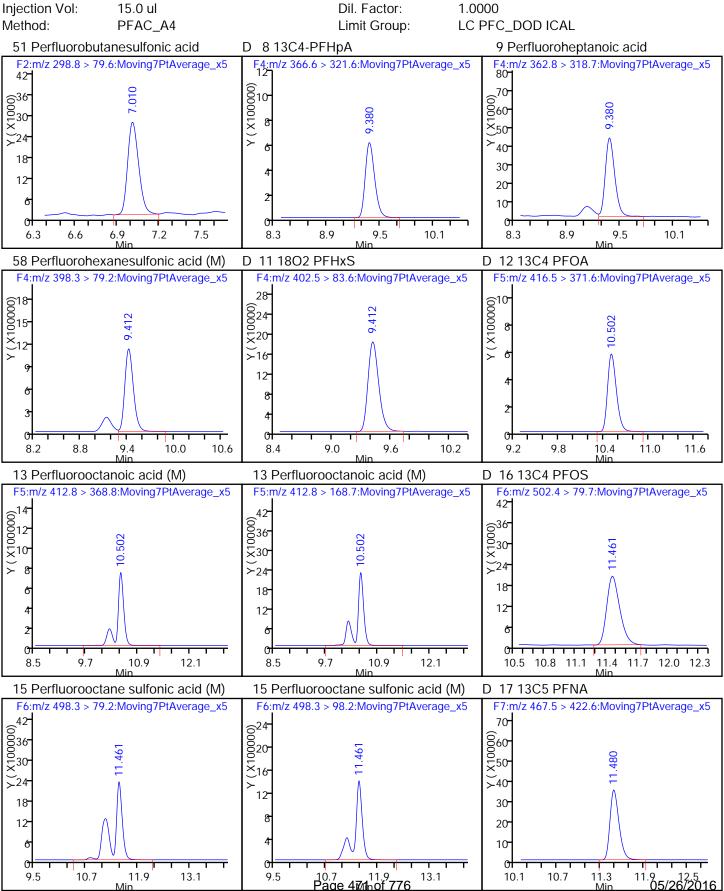
Chrom Revision: 2.2 20-Apr-2016 13:59:46

Lims ID: 320-18704-A-1-A Lab Sample ID:

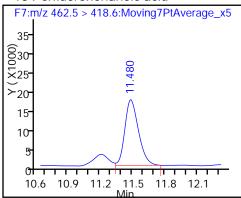
Client ID: OF-RW44-0516

Operator ID: JRB ALS Bottle#: 4 Worklist Smp#: 18

320-18704-1



18 Perfluorononanoic acid



Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report Report Date: 26-May-2016 13:59:20

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_018.d

Injection Date: 25-May-2016 21:29:57 Instrument ID: A4

Lims ID: 320-18704-A-1-A Lab Sample ID: 320-18704-1

Client ID: OF-RW44-0516

ALS Bottle#: Operator ID: **JRB** 4 Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

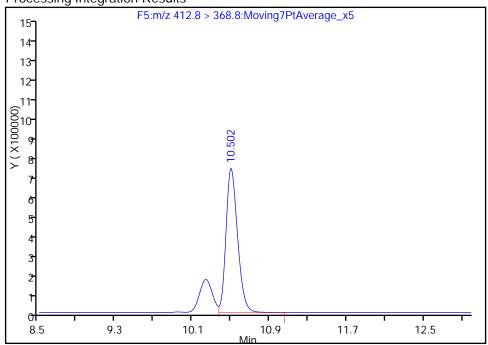
Column: Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

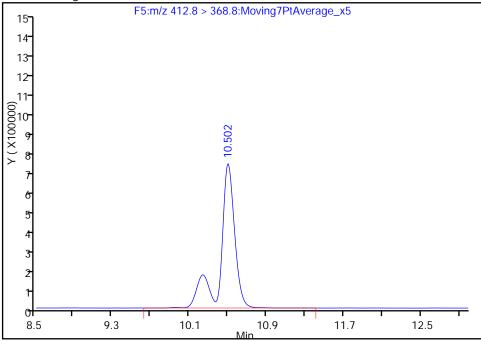
RT: 10.50 Area: 6049839 Amount: 148.6781 Amount Units: ng/ml

Processing Integration Results



RT: 10.50 Area: 7629343 193.6668 Amount: Amount Units: ng/ml





Reviewer: westendorfc, 26-May-2016 08:27:00

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 13:59:20 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_018.d Data File:

Injection Date: 25-May-2016 21:29:57 Instrument ID: A4

Lims ID: 320-18704-A-1-A Lab Sample ID: 320-18704-1

OF-RW44-0516 Client ID:

ALS Bottle#: Operator ID: **JRB** Worklist Smp#: 18

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC A4 LC PFC_DOD ICAL Limit Group:

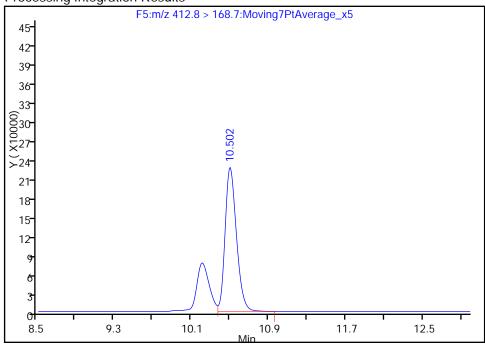
Column: Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

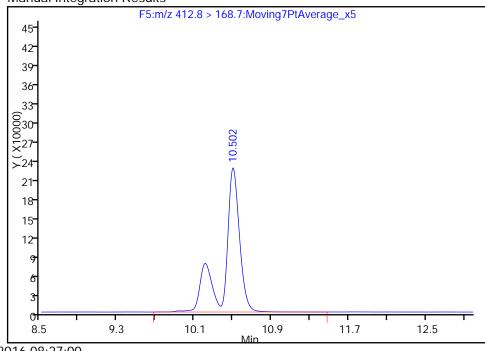
RT: 10.50 Area: 1859313 Amount: 148.6781 Amount Units: ng/ml

Processing Integration Results



RT: 10.50 2565530 Area: Amount: 193.6668 Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 26-May-2016 08:27:00

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW44-0516 DL Lab Sample ID: 320-18704-1 DL

Matrix: Water Lab File ID: 25MAY2016B4A_060.d

Analysis Method: WS-LC-0025 Date Collected: 05/04/2016 09:12

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 531.5(mL) Date Analyzed: 05/26/2016 12:24

Con. Extract Vol.: 1.00(mL) Dilution Factor: 20

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.80	D M Q	0.075	0.056	0.024

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS	
STL00991	13C4 PFOS	145		25-150	

Report Date: 26-May-2016 15:02:58 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_060.d

Lims ID: 320-18704-A-1-A Client ID: 0F-RW44-0516

Sample Type: Client

Inject. Date: 26-May-2016 12:24:51 ALS Bottle#: 27 Worklist Smp#: 60

Injection Vol: 15.0 ul Dil. Factor: 20.0000

Sample Info: 320-18704-a-1-a 20X

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 15:02:36 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 26-May-2016 15:02:36

_								· · · · · · · · · · · · · · · · · · ·			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	51 Perfluorobu	tanesulfo	onic acid	ı							
		7.019	7.024		1.000	8027	0.0481				
ı	D 8 13C4-PFH	οA									
	366.6 > 321.6	9.365	9.387	-0.022		313075	3.66		7.3	1333	
	9 Perfluorohe										
	362.8 > 318.7	9.357	9.388	-0.031	1.000	22732	-0.0332			20.6	
	58 Perfluorohe										M
	398.3 > 79.2		9.421	-0.025	1.000	752284	8.88				M
	D 11 18O2 PFH		0.400	0.007		447004	0.05			400	
		9.396	9.422	-0.026		117234	3.95		8.4	433	
	D 12 13C4 PFO		10 502	0.001		22471/	2 / 4		7.0	1200	
	416.5 > 371.6			-0.021		324716	3.64		7.3	1209	
	13 Perfluorooc 412.8 > 368.8	tanoic ac 10.482		0.022	1.000	539840	9.12			487	M M
		10.482			1.000	187738	7.12	2.88(0.00-0.00)		492	M
	D 16 13C4 PFO		. 0.00	0.022		.000		2.00(0.00 0.00)		.,_	
	502.4 > 79.7		11.465	-0.016		23394	3.47		7.3	92.1	
	15 Perfluorooc	tane sulf	onic acid	d							M
	498.3 > 79.2	11.449			1.000	2803519	21.1			4036	M
	498.3 > 98.2	11.449	11.466	-0.017	1.000	1343064		2.09(0.00-0.00)		1938	M
ı	D 17 13C5 PFN	Α									
	467.5 > 422.6	11.469	11.484	-0.015		260614	3.32		6.6	1138	
	18 Perfluorono										
	462.5 > 418.6	11.469	11.486	-0.017	1.000	11481	0.0877			17.7	

Report Date: 26-May-2016 15:02:58 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 15:02:58 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_060.d

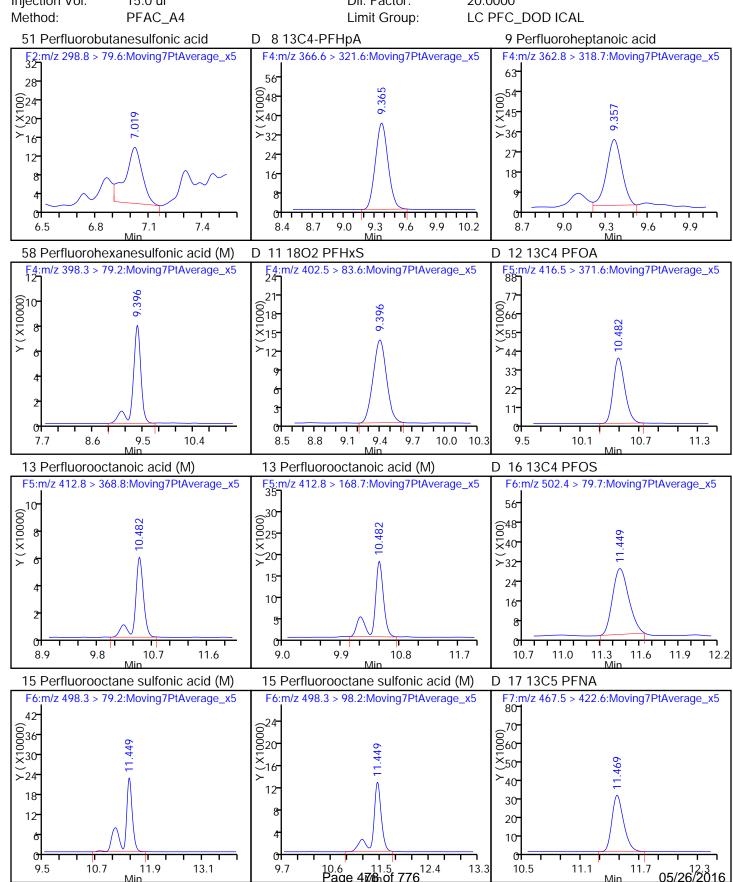
Injection Date: 26-May-2016 12:24:51 Instrument ID: A

Lims ID: 320-18704-A-1-A Lab Sample ID: 320-18704-1

Client ID: OF-RW44-0516

Operator ID: JRB ALS Bottle#: 27 Worklist Smp#: 60

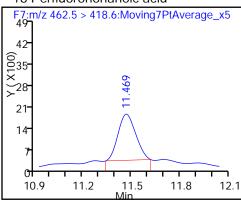
Injection Vol: 15.0 ul Dil. Factor: 20.0000



Report Date: 26-May-2016 15:02:58 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_060.d

18 Perfluorononanoic acid



Report Date: 26-May-2016 15:02:58 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_060.d

Injection Date: 26-May-2016 12:24:51 Instrument ID: A4

Lims ID: 320-18704-A-1-A Lab Sample ID: 320-18704-1

Client ID: OF-RW44-0516

Operator ID: JRB ALS Bottle#: 27 Worklist Smp#: 60

Injection Vol: 15.0 ul Dil. Factor: 20.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

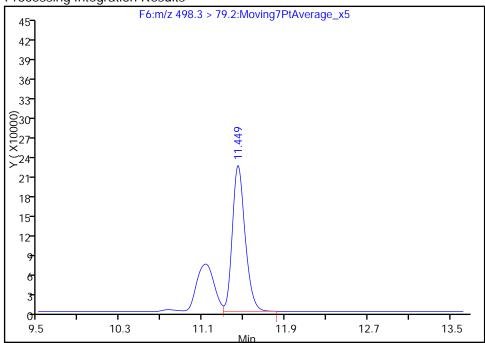
Column: Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

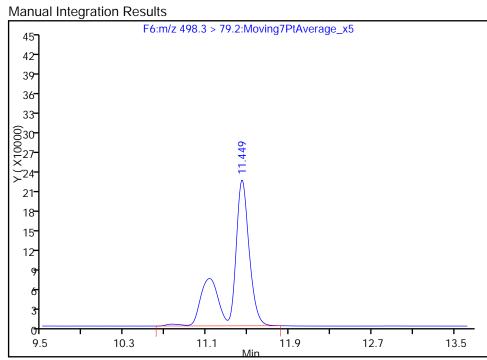
Signal: 1

RT: 11.45
Area: 1922238
Amount: 14.695240
Amount Units: ng/ml

Processing Integration Results



RT: 11.45
Area: 2803519
Amount: 21.129540
Amount Units: ng/ml



Reviewer: barnettj, 26-May-2016 15:02:36

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 15:02:58 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_060.d

Injection Date: 26-May-2016 12:24:51 Instrument ID: A4

Lims ID: 320-18704-A-1-A Lab Sample ID: 320-18704-1

Client ID: OF-RW44-0516

Operator ID: JRB ALS Bottle#: 27 Worklist Smp#: 60

Injection Vol: 15.0 ul Dil. Factor: 20.0000

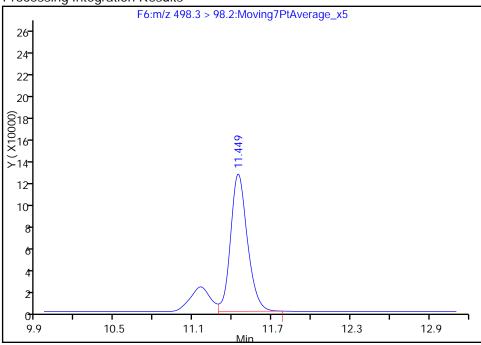
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

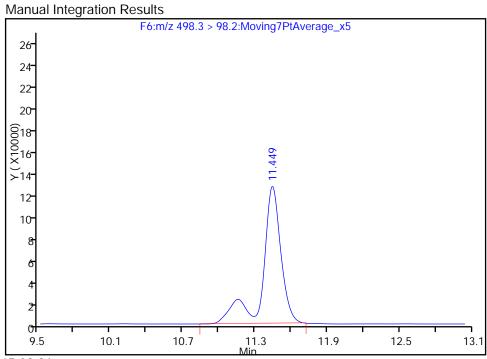
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.45 Area: 1130126 Amount: 14.695240 Amount Units: ng/ml **Processing Integration Results**



RT: 11.45
Area: 1343064
Amount: 21.129540
Amount Units: ng/ml



Reviewer: barnettj, 26-May-2016 15:02:36

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB44-0516 Lab Sample ID: 320-18704-2

Matrix: Water Lab File ID: 25MAY2016B4A_019.d

Analysis Method: WS-LC-0025 Date Collected: 05/04/2016 09:00

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 517.8(mL) Date Analyzed: 05/25/2016 21:51

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00077
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	Ū	0.0024	0.0019	0.00072
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00063
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00089
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019	UMQ	0.0024	0.0019	0.00084
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0037	JМ	0.0039	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	126		25-150
STL00991	13C4 PFOS	85		25-150
STL00995	13C5 PFNA	137		25-150
STL00990	13C4 PFOA	136		25-150
STL01892	13C4-PFHpA	137		25-150

Report Date: 26-May-2016 11:05:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_019.d

Lims ID: 320-18704-A-2-A Client ID: 0F-FB44-0516

Sample Type: Client

Inject. Date: 25-May-2016 21:51:08 ALS Bottle#: 5 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-2-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:30:38

= 0	011011110	31011010111	,		24.0.		10 may 20 10 00 100 1			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFH	lpA									
366.6 > 321.6	9.380	9.387	-0.007		5866976	68.6		137	10393	
58 Perfluoroh	exanesulf	onic acid	d							M
398.3 > 79.2	9.419	9.421	-0.002	1.000	26690	0.4164				M
D 11 1802 PFI	HxS									
402.5 > 83.6	9.419	9.422	-0.003		1774355	59.8		126	3859	
D 12 13C4 PF0	DΑ									
416.5 > 371.6	10.500	10.503	-0.003		6079730	68.2		136	8071	
13 Perfluoroo	ctanoic ac	cid								
412.8 > 368.8		10.504		1.000	19559	0.2846			33.5	
412.8 > 168.7	10.500	10.504	-0.004	0.999	5422		3.61(0.00-0.00)		20.1	
D 16 13C4 PF	OS									
502.4 > 79.7	11.459	11.465	-0.006		273152	40.5		84.7	1172	
15 Perfluoroo	ctane sulf	onic acid	t							M
498.3 > 79.2	11.468			1.000	100429	1.92			207	M
498.3 > 98.2	11.459	11.466	-0.007	0.999	42159		2.38(0.00-0.00)		48.8	
D 17 13C5 PF	NΑ									
467.5 > 422.6	11.488	11.484	0.004		5372009	68.5		137	6777	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:05:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_019.d Data File:

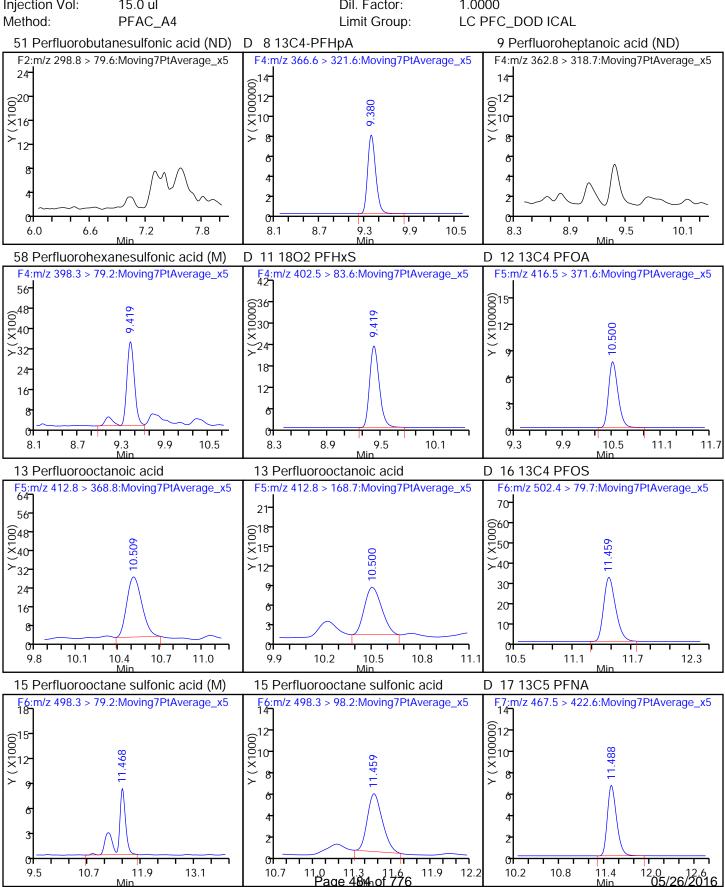
Injection Date: 25-May-2016 21:51:08 Instrument ID:

Lims ID: 320-18704-A-2-A Lab Sample ID: 320-18704-2

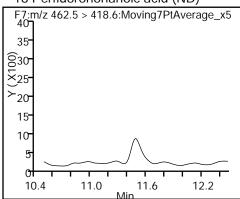
OF-FB44-0516 Client ID:

Operator ID: **JRB** ALS Bottle#: 5 Worklist Smp#: 19

Dil. Factor: 1.0000 Injection Vol: 15.0 ul



18 Perfluorononanoic acid (ND)



Report Date: 26-May-2016 11:05:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_019.d

Injection Date: 25-May-2016 21:51:08 Instrument ID: A4

Lims ID: 320-18704-A-2-A Lab Sample ID: 320-18704-2

Client ID: OF-FB44-0516

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

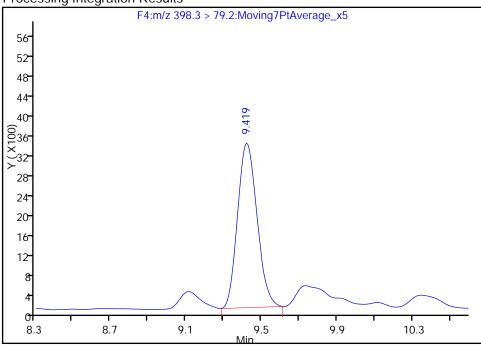
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F4:MRM

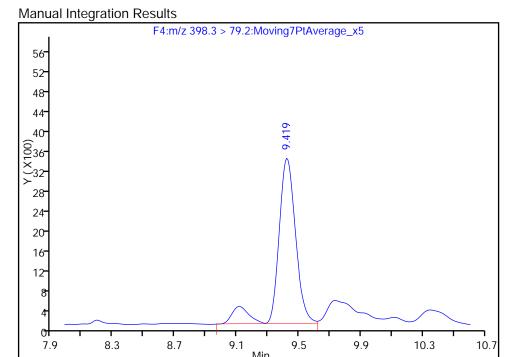
58 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.42 Area: 23596 Amount: 0.368116 Amount Units: ng/ml **Processing Integration Results**



RT: 9.42
Area: 26690
Amount: 0.416384
Amount Units: ng/ml



Reviewer: barnettj, 26-May-2016 10:46:54

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:05:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_019.d

Injection Date: 25-May-2016 21:51:08 Instrument ID: A4

Lims ID: 320-18704-A-2-A Lab Sample ID: 320-18704-2

Client ID: OF-FB44-0516

Operator ID: JRB ALS Bottle#: 5 Worklist Smp#: 19

Injection Vol: 15.0 ul Dil. Factor: 1.0000

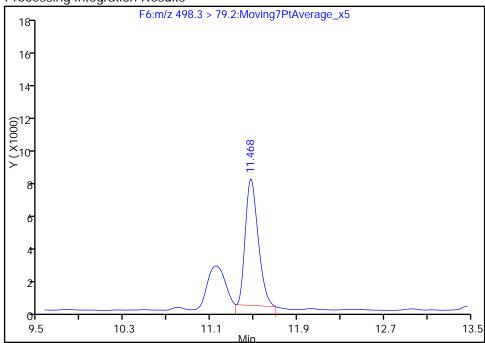
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

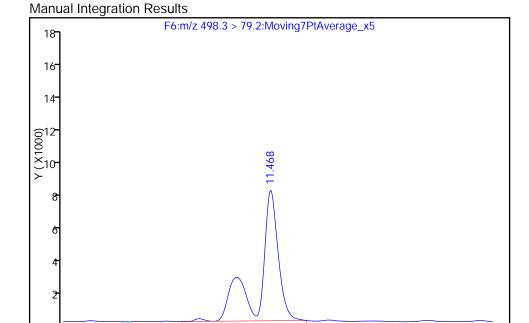
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.47 Area: 63147 Amount: 1.049096 Amount Units: ng/ml **Processing Integration Results**



RT: 11.47
Area: 100429
Amount: 1.916793
Amount Units: ng/ml



11.9

12.7

Reviewer: westendorfc, 26-May-2016 08:30:38

Audit Action: Manually Integrated

Audit Reason: Isomers

11.1

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10.3

9.5

13.5

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW42B2-0516 Lab Sample ID: 320-18704-3

Matrix: Water Lab File ID: 25MAY2016B4A_020.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:44

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 510.9(mL) Date Analyzed: 05/25/2016 22:12

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.013		0.0024	0.0020	0.00078
335-67-1	Perfluorooctanoic acid (PFOA)	0.18	М	0.0024	0.0020	0.00073
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0024	0.0020	0.00064
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.058		0.0024	0.0020	0.00090
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.43	Q	0.0024	0.0020	0.00085
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.018	М	0.0039	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	86		25-150
STL00991	13C4 PFOS	101		25-150
STL00995	13C5 PFNA	84		25-150
STL00990	13C4 PFOA	92		25-150
STL01892	13C4-PFHpA	89		25-150

Report Date: 26-May-2016 11:05:29 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_020.d

Lims ID: 320-18704-A-3-A Client ID: 0F-RW42B2-0516

Sample Type: Client

Inject. Date: 25-May-2016 22:12:19 ALS Bottle#: 6 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-3-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:31:24

First Level Reviewer: westendoric					Date:		6-May-2016 08:31:2	<u> </u>			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	51 Perfluorobu	tanesulfo	onic acid								
	298.8 > 79.6	7.014	7.024	-0.010	1.000	556641	29.7				
	0 8 13C4-PFH _k	οA									
	366.6 > 321.6	9.380	9.387	-0.007		3797170	44.4		88.8	5774	
	9 Perfluoroher	otanoic a	cid								
	362.8 > 318.7	9.380	9.388	-0.008	1.000	249392	6.44			64.8	
	58 Perfluorohe										
	398.3 > 79.2	9.419	9.421	-0.002	1.000	9535637	218.6				
) 11 18O2 PFH										
	402.5 > 83.6	9.419	9.422	-0.003		1207494	40.7		86.0	2071	
) 12 13C4 PFO										
•		10.500		-0.003		4098901	46.0		92.0	7806	
	13 Perfluorooc				4 000	0.400004	20.7			0.4.47	M
	412.8 > 368.8	10.500			1.000 1.000	3438831	92.7	2.82(0.00-0.00)		2447	M
	412.8 > 168.7		10.504	-0.004	1.000	1219334		2.82(0.00-0.00)		2224	M
	D 16 13C4 PFO 502.4 > 79.7	S 11.459	11 /65	0.006		326148	48.3		101	808	
•	15 Perfluorooc					320140	40.5		101	000	M
	498.3 > 79.2	11.109			1.000	802984	9.07			1148	M
) 17 13C5 PFN		11.400	0.007	1.000	002704	7.07			1140	141
		11.479	11 484	-0.005		3280641	41.8		83.6	6685	
	18 Perfluorono			0.000		0200011	11.0		00.0	0000	
		11.488		0.002	1.000	10718	0.1309			6.6	
				· · · -							

Report Date: 26-May-2016 11:05:29 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:05:29 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_020.d

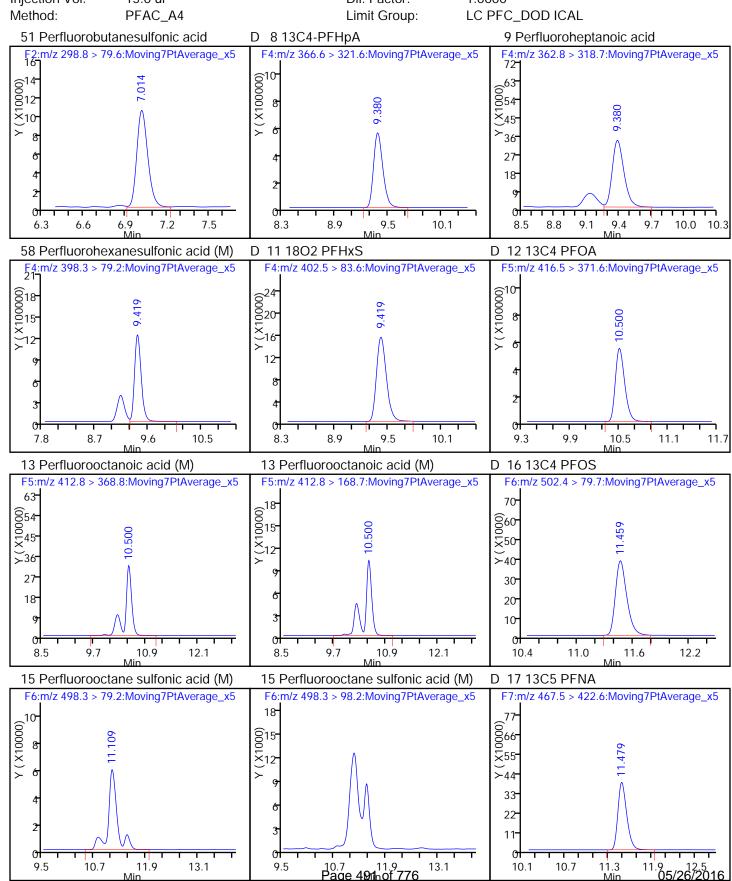
Injection Date: 25-May-2016 22:12:19 Instrument ID: A4

Lims ID: 320-18704-A-3-A Lab Sample ID: 320-18704-3

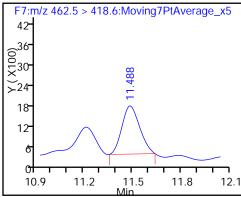
Client ID: OF-RW42B2-0516

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000



18 Perfluorononanoic acid



Report Date: 26-May-2016 11:05:30 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_020.d

Injection Date: 25-May-2016 22:12:19 Instrument ID: A4

Lims ID: 320-18704-A-3-A Lab Sample ID: 320-18704-3

Client ID: OF-RW42B2-0516

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

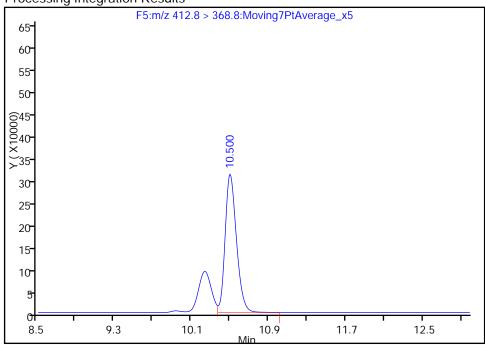
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

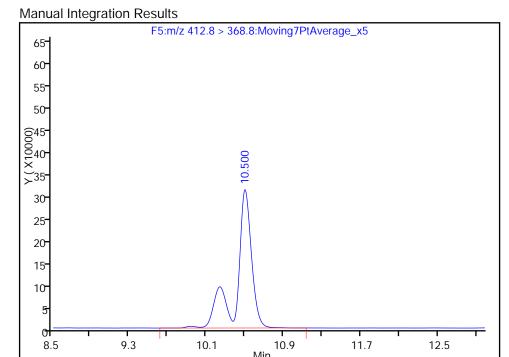
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 10.50 Area: 2548487 Amount: 66.529574 Amount Units: ng/ml **Processing Integration Results**



RT: 10.50 Area: 3438831 Amount: 92.690353 Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:31:24

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:05:30 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_020.d

Injection Date: 25-May-2016 22:12:19 Instrument ID: A4

Lims ID: 320-18704-A-3-A Lab Sample ID: 320-18704-3

Client ID: OF-RW42B2-0516

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

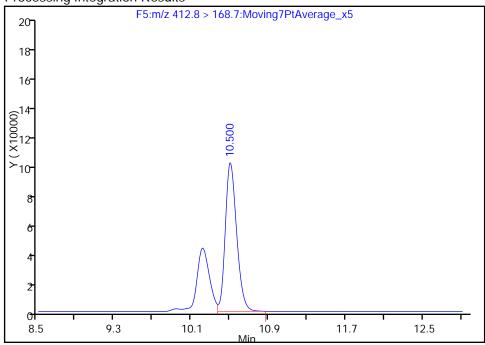
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

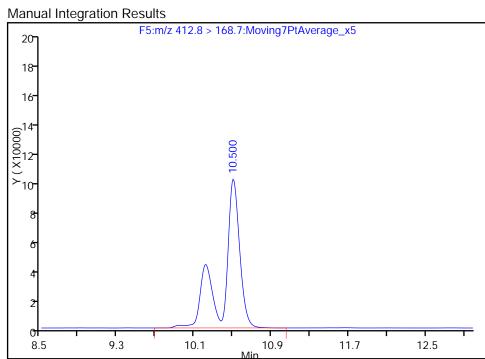
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 10.50 Area: 820673 Amount: 66.529574 Amount Units: ng/ml **Processing Integration Results**



RT: 10.50
Area: 1219334
Amount: 92.690353
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:31:24

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:05:30 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_020.d

Injection Date: 25-May-2016 22:12:19 Instrument ID: A4

Lims ID: 320-18704-A-3-A Lab Sample ID: 320-18704-3

Client ID: OF-RW42B2-0516

Operator ID: JRB ALS Bottle#: 6 Worklist Smp#: 20

Injection Vol: 15.0 ul Dil. Factor: 1.0000

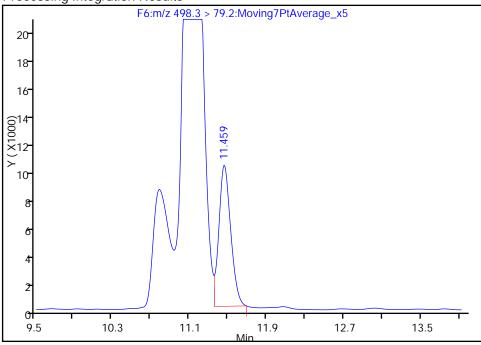
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

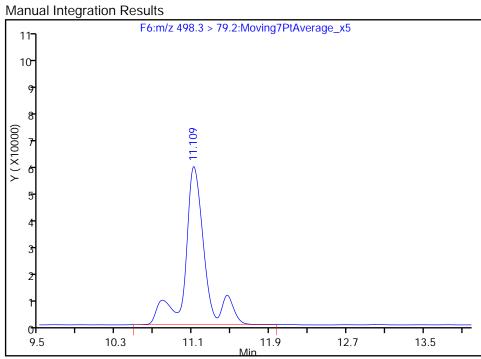
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.46 Area: 86162 Amount: 1.198858 Amount Units: ng/ml **Processing Integration Results**



RT: 11.11
Area: 802984
Amount: 9.071172
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:31:24

Audit Action: Manually Integrated

Audit Reason: Isomers

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Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

Report Date: 26-May-2016 11:05:30

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB42B2-0516 Lab Sample ID: 320-18704-4

Matrix: Water Lab File ID: 25MAY2016B4A_021.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:35

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 513.3(mL) Date Analyzed: 05/25/2016 22:33

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00078
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.0019	0.00073
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00064
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00089
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.00097	JМQ	0.0024	0.0019	0.00085
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0029	Ū	0.0039	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	122		25-150
STL00991	13C4 PFOS	93		25-150
STL00995	13C5 PFNA	132		25-150
STL00990	13C4 PFOA	135		25-150
STL01892	13C4-PFHpA	130		25-150

Report Date: 26-May-2016 11:05:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_021.d

Lims ID: 320-18704-A-4-A Client ID: 0F-FB42B2-0516

Sample Type: Client

Inject. Date: 25-May-2016 22:33:30 ALS Bottle#: 7 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-4-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:31:46

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 8 13C4-PFH	D 8 13C4-PFHpA											
366.6 > 321.6	9.380	9.387	-0.007		5574642	65.2		130	10087			
9 Perfluorohe	otanoic a	cid										
362.8 > 318.7	9.396	9.388	0.008	1.000	2643	-0.3627			12.1			
58 Perfluorohe	xanesulf	onic acio	t							M		
398.3 > 79.2	9.419	9.421	-0.002	1.000	30890	0.4981				M		
D 11 1802 PFH												
402.5 > 83.6	9.419	9.422	-0.003		1716584	57.8		122	4139			
D 12 13C4 PFO												
416.5 > 371.6	10.499	10.503	-0.004		6019271	67.5		135	9541			
13 Perfluorooc												
	10.499	10.504	-0.005	1.000	5842	0.0362			8.5			
D 16 13C4 PFO		44.47			001010			00.0	4470			
502.4 > 79.7	11.458	11.465	-0.007		301060	44.6		93.3	1172			
D 17 13C5 PFN		44.404	0.000		E4000/E			400	0000			
467.5 > 422.6	11.487	11.484	0.003		5180365	66.0		132	8332			

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:05:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento

\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_021.d Data File:

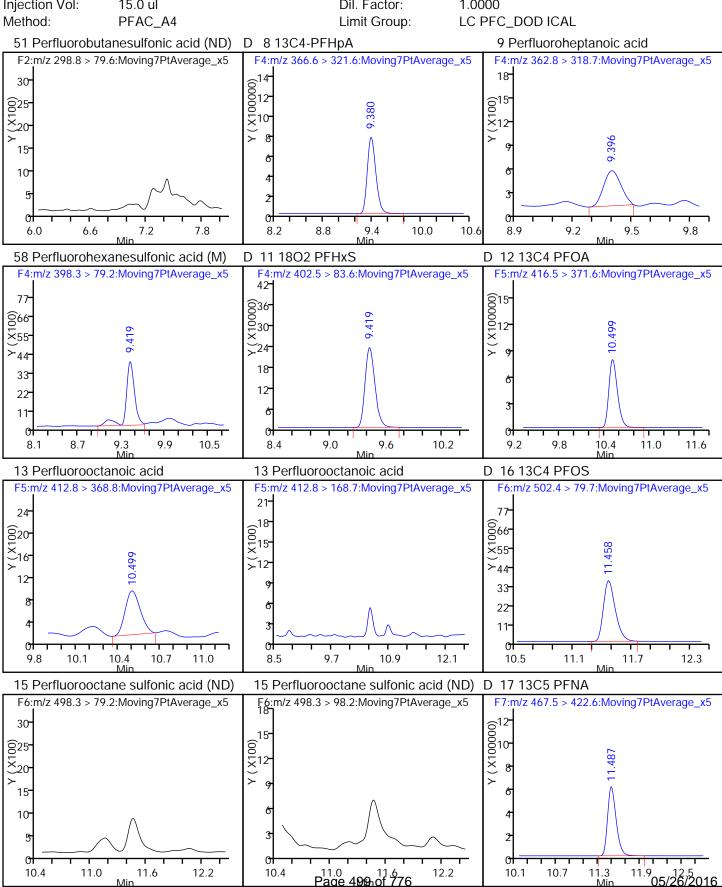
Injection Date: 25-May-2016 22:33:30 Instrument ID:

Lims ID: 320-18704-A-4-A Lab Sample ID: 320-18704-4

Client ID: OF-FB42B2-0516

Operator ID: **JRB** ALS Bottle#: 7 Worklist Smp#: 21

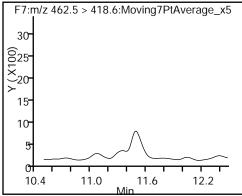
Dil. Factor: 1.0000 Injection Vol: 15.0 ul



Report Date: 26-May-2016 11:05:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_021.d

18 Perfluorononanoic acid (ND)



Report Date: 26-May-2016 11:05:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_021.d

Injection Date: 25-May-2016 22:33:30 Instrument ID: A4

Lims ID: 320-18704-A-4-A Lab Sample ID: 320-18704-4

Client ID: OF-FB42B2-0516

Operator ID: JRB ALS Bottle#: 7 Worklist Smp#: 21

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

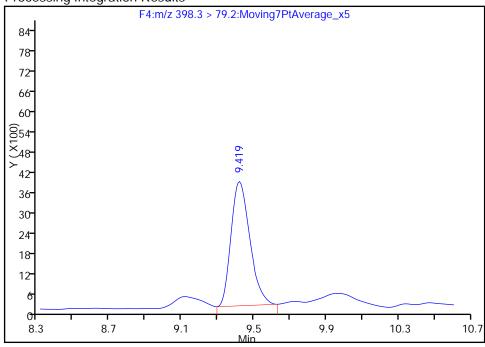
Column: Detector F4:MRM

58 Perfluorohexanesulfonic acid, CAS: 355-46-4

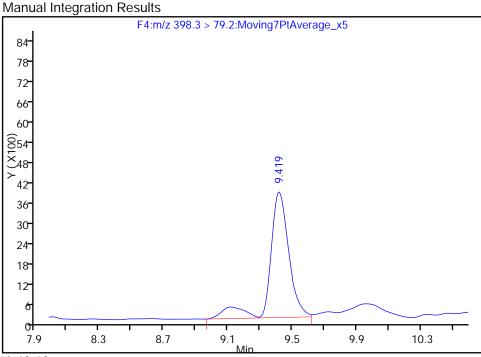
Signal: 1

RT: 9.42
Area: 26576
Amount: 0.428559
Amount Units: ng/ml

Processing Integration Results



RT: 9.42
Area: 30890
Amount: 0.498126
Amount Units: ng/ml



Reviewer: barnettj, 26-May-2016 10:48:18

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW42A-0516 Lab Sample ID: 320-18704-5

Matrix: Water Lab File ID: 25MAY2016B4A_022.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:23

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 530.2(mL) Date Analyzed: 05/25/2016 22:54

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00076
335-67-1	Perfluorooctanoic acid (PFOA)	0.0031	М	0.0024	0.0019	0.00071
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00062
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00087
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0067	M Q	0.0024	0.0019	0.00082
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0028	U	0.0038	0.0028	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	141		25-150
STL00991	13C4 PFOS	138		25-150
STL00995	13C5 PFNA	111		25-150
STL00990	13C4 PFOA	107		25-150
STL01892	13C4-PFHpA	102		25-150

Report Date: 26-May-2016 11:06:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_022.d

Lims ID: 320-18704-A-5-A Client ID: 0F-RW42A-0516

Sample Type: Client

Inject. Date: 25-May-2016 22:54:40 ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-5-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:32:28

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	51 Perfluorobu	tanesulfo	onic acid								
2	298.8 > 79.6	7.028	7.024	0.004	1.000	10448	0.1679				
Г	8 13C4-PFH _F	ρA									
3	366.6 > 321.6	9.380	9.387	-0.007		4361910	51.0		102	7131	
	9 Perfluoroher	otanoic a	cid								
3	362.8 > 318.7	9.380	9.388	-0.008	1.000	4318	-0.3089			2.4	
	58 Perfluorohe										M
3	398.3 > 79.2	9.419	9.421	-0.002	1.000	254919	3.56				M
) 11 18O2 PFH										
2	402.5 > 83.6	9.412	9.422	-0.010		1982326	66.8		141	4486	
) 12 13C4 PFO										
2	416.5 > 371.6	10.499	10.503	-0.004		4777617	53.6		107	7269	
	13 Perfluorooc										M
	112.8 > 368.8		10.504		1.000	73737	1.64	2 41 (2 22 2 22)		35.7	M
		10.499	10.504	-0.005	0.999	30629		2.41(0.00-0.00)		112	M
) 16 13C4 PFO		11 4/5	0.007		444110	/ F 0		120	1105	
		11.458	11.405	-0.007		444119	65.8		138	1195	
) 17 13C5 PFN		11 /0/	0.007		4244047	EE 7		111	7010	
	167.5 > 422.6	11.478	11.484	-0.006		4366967	55.7		111	7818	

QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:06:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_022.d Data File:

Injection Date: 25-May-2016 22:54:40 Instrument ID:

Lims ID: 320-18704-A-5-A

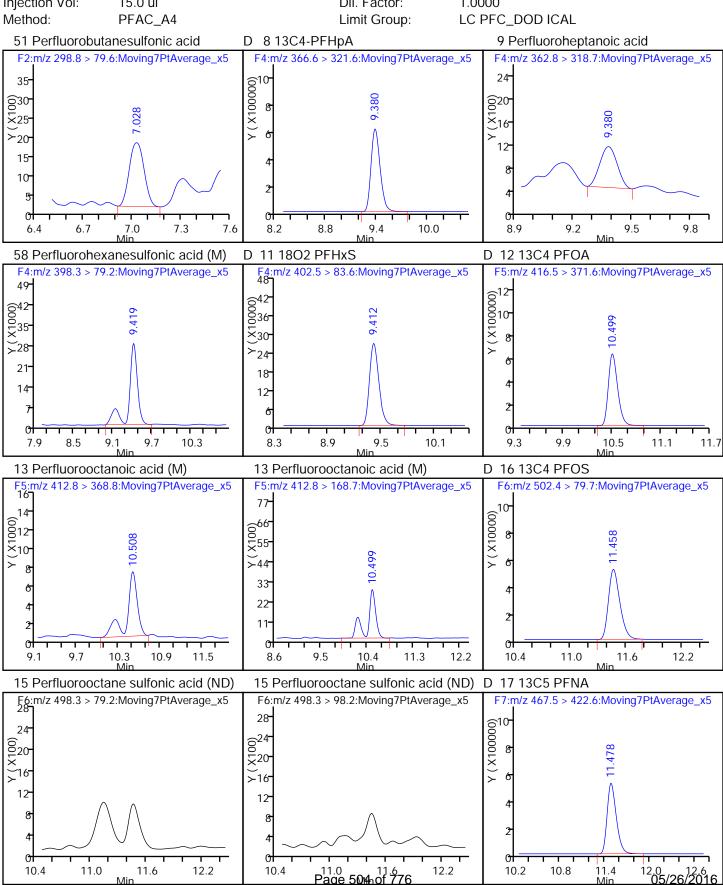
OF-RW42A-0516 Client ID:

Operator ID: **JRB** ALS Bottle#: 8 Worklist Smp#: 22

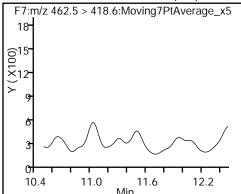
Lab Sample ID:

320-18704-5

Injection Vol: Dil. Factor: 1.0000 15.0 ul



18 Perfluorononanoic acid (ND)



Report Date: 26-May-2016 11:06:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_022.d

Injection Date: 25-May-2016 22:54:40 Instrument ID: A4

Lims ID: 320-18704-A-5-A Lab Sample ID: 320-18704-5

Client ID: OF-RW42A-0516

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

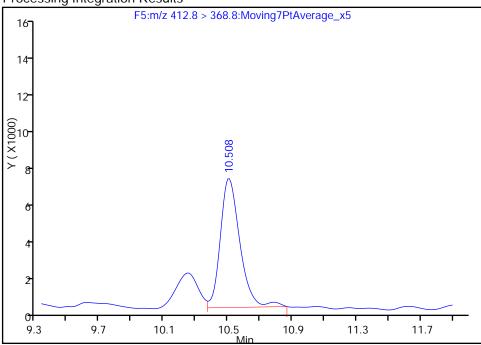
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

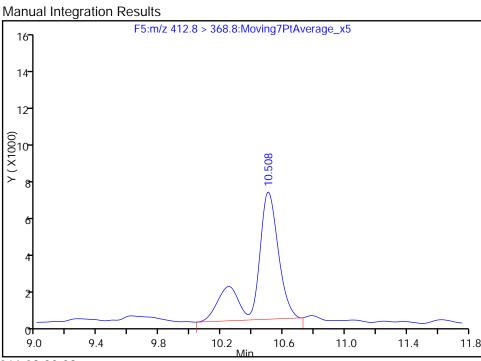
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 10.51 Area: 59723 Amount: 1.337612 Amount Units: ng/ml **Processing Integration Results**



RT: 10.51 Area: 73737 Amount: 1.635358 Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:32:28

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:06:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_022.d Data File:

Injection Date: 25-May-2016 22:54:40 Instrument ID: A4

Lims ID: 320-18704-A-5-A Lab Sample ID: 320-18704-5

OF-RW42A-0516 Client ID:

Operator ID: **JRB** ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC A4 LC PFC_DOD ICAL Limit Group:

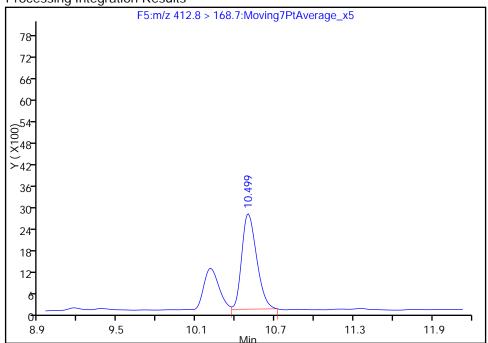
Column: Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

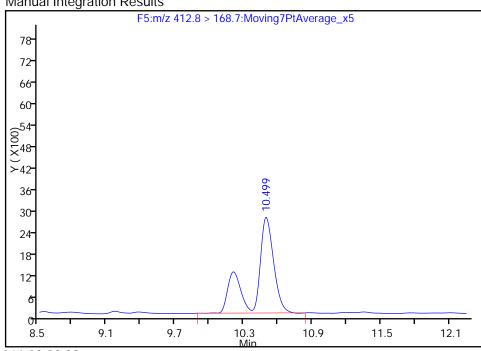
RT: 10.50 Area: 21085 Amount: 1.337612 Amount Units: ng/ml

Processing Integration Results



RT: 10.50 30629 Area: Amount: 1.635358 Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 26-May-2016 08:32:28

Audit Action: Manually Integrated

Audit Reason: Isomers Page 507 of 776

Report Date: 26-May-2016 11:06:00 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_022.d

Injection Date: 25-May-2016 22:54:40 Instrument ID: A4

Lims ID: 320-18704-A-5-A Lab Sample ID: 320-18704-5

Client ID: OF-RW42A-0516

Operator ID: JRB ALS Bottle#: 8 Worklist Smp#: 22

Injection Vol: 15.0 ul Dil. Factor: 1.0000

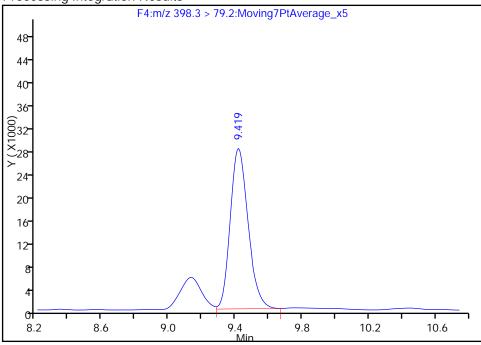
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F4:MRM

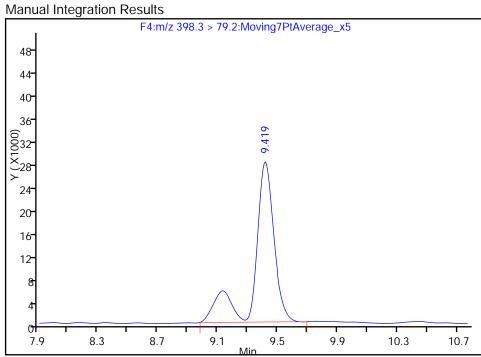
58 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.42 Area: 208312 Amount: 2.908879 Amount Units: ng/ml **Processing Integration Results**



RT: 9.42
Area: 254919
Amount: 3.559702
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:32:28

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB42A-0516 Lab Sample ID: 320-18704-6

Matrix: Water Lab File ID: 25MAY2016B4A_023.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:20

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 518.5(mL) Date Analyzed: 05/25/2016 23:15

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0019	U	0.0024	0.0019	0.00077
335-67-1	Perfluorooctanoic acid (PFOA)	0.0019	U	0.0024	0.0019	0.00072
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0024	0.0019	0.00063
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0019	U	0.0024	0.0019	0.00089
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0019	UQ	0.0024	0.0019	0.00084
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0014	J	0.0039	0.0029	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	132		25-150
STL00991	13C4 PFOS	141		25-150
STL00995	13C5 PFNA	129		25-150
STL00990	13C4 PFOA	131		25-150
STL01892	13C4-PFHpA	125		25-150

Report Date: 26-May-2016 11:06:13 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_023.d

Lims ID: 320-18704-A-6-A Client ID: 0F-FB42A-0516

Sample Type: Client

Inject. Date: 25-May-2016 23:15:52 ALS Bottle#: 9 Worklist Smp#: 23

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-6-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:33:15

That Earth Reviewell Westerlache					24.0.		oaj 2010 001001			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFHpA										
366.6 > 321.6	9.380	9.387	-0.007		5356917	62.7		125	6889	
58 Perfluorohe	xanesulf	onic acio	d							
398.3 > 79.2	9.412	9.421	-0.009	1.000	10353	0.1552				
D 11 1802 PFH:										
402.5 > 83.6	9.412	9.422	-0.010		1846633	62.2		132	4196	
D 12 13C4 PFO										
416.5 > 371.6			-0.004		5858797	65.7		131	8312	
13 Perfluorooct			0.040	1 000		0.0540			44.0	
412.8 > 368.8		10.504	-0.013	1.000	6679	0.0549			11.8	
D 16 13C4 PFO		11 4/5	0.007		455440	/7.5		1 4 1	1710	
502.4 > 79.7					455412	67.5		141	1719	
15 Perfluorooct				1 000	0422	0.7331			22.4	
498.3 > 79.2		11.400	-0.008	1.000	9633	0.7331			23.4	
D 17 13C5 PFN										
467.5 > 422.6	11.478	11.484	-0.006		5069210	64.6		129	8194	
18 Perfluorono										
462.5 > 418.6	11.478	11.486	-0.008	1.000	4916	0.0376			10.5	

Report Date: 26-May-2016 11:06:13 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_023.d Data File:

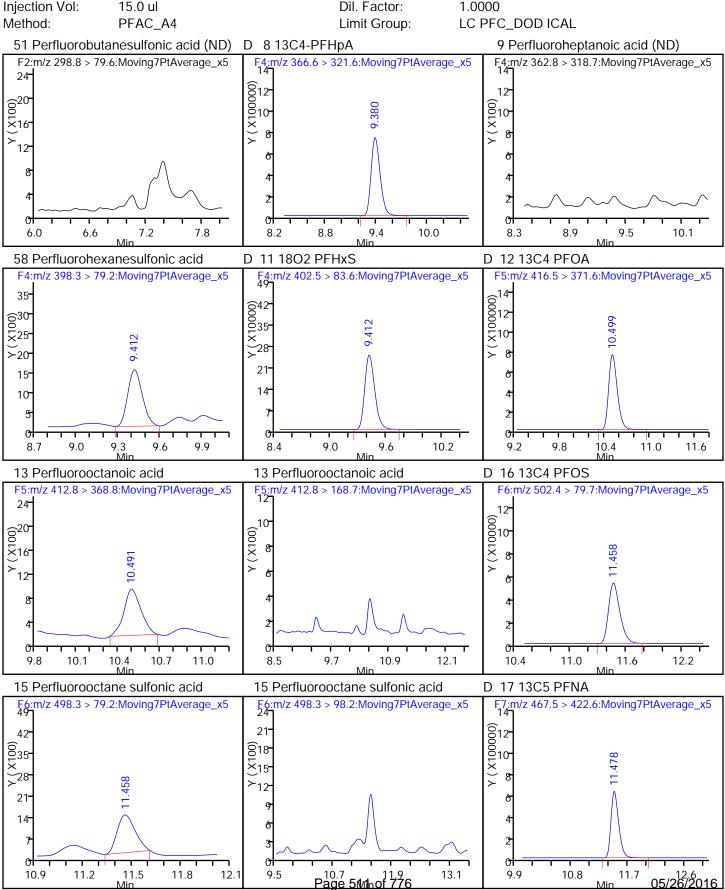
Injection Date: 25-May-2016 23:15:52 Instrument ID:

Lims ID: 320-18704-A-6-A Lab Sample ID: 320-18704-6

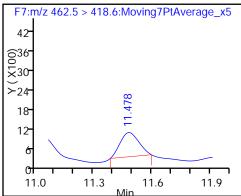
Client ID: OF-FB42A-0516

Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 23

Dil. Factor: Injection Vol: 15.0 ul 1.0000



18 Perfluorononanoic acid



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW42B-0516 Lab Sample ID: 320-18704-7

Matrix: Water Lab File ID: 25MAY2016B4A_024.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:07

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 539.8(mL) Date Analyzed: 05/25/2016 23:37

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.013		0.0023	0.0019	0.00074
335-67-1	Perfluorooctanoic acid (PFOA)	0.19	М	0.0023	0.0019	0.00069
375-95-1	Perfluorononanoic acid (PFNA)	0.0014	J	0.0023	0.0019	0.00061
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.057		0.0023	0.0019	0.00085
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.38	Q	0.0023	0.0019	0.00081
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.013	М	0.0037	0.0028	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	90		25-150
STL00991	13C4 PFOS	130		25-150
STL00995	13C5 PFNA	70		25-150
STL00990	13C4 PFOA	80		25-150
STL01892	13C4-PFHpA	77		25-150

Report Date: 26-May-2016 11:06:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_024.d

Lims ID: 320-18704-A-7-A Client ID: 0F-RW42B-0516

Sample Type: Client

Inject. Date: 25-May-2016 23:37:01 ALS Bottle#: 10 Worklist Smp#: 24

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-7-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:36:58

	. Het Zerei Herretter Heetendene				24.0.		20 1114 20 10 00 100				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	51 Perfluorobutanesulfonic acid										
:		7.019			1.000	604837	30.9				
D 8 13C4-PFHpA											
	366.6 > 321.6		9.387	-0.007		3279769	38.4		76.7	4989	
	9 Perfluoroher										
	362.8 > 318.7			-0.008	1.000	235685	7.09			58.9	
	58 Perfluorohe										
	398.3 > 79.2				1.000	9447539	207.2				
) 11 1802 PFH		, <u>-</u> .	0.002		, , , , , , ,	207.2				
		9.412	9 422	-0.010		1261977	42.5		89.9	2046	
) 12 13C4 PFO		71122	0.0.0		0.,,,			07.7		
	116.5 > 371.6		10 503	-0 004		3544321	39.8		79.5	9087	
	13 Perfluorooc			0.001		0011021	07.0		77.0	,00,	М
	112.8 > 368.8	10.499		-0.005	1.000	3313820	103.3			1824	M
	112.8 > 168.7				1.000	1245888	100.0	2.66(0.00-0.00)		2788	M
) 16 13C4 PFO							(
		11.458	11.465	-0.007		418445	62.0		130	1283	
	15 Perfluorooc										М
4				-0.358	1.000	763871	6.90			1255	M
) 17 13C5 PFN			0.000		, 6667.	0.70			00	
	167.5 > 422.6		11 484	-0.006		2754235	35.1		70.2	5710	
	18 Perfluorono			5.000		2707200	55.1		70.2	3710	
		11.478		-0 008	1.000	51275	0.7546			34.3	
•	102.3 / 410.0	11.470	11.400	-0.000	1.000	31273	0.7540			J4.J	

Report Date: 26-May-2016 11:06:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:06:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_024.d

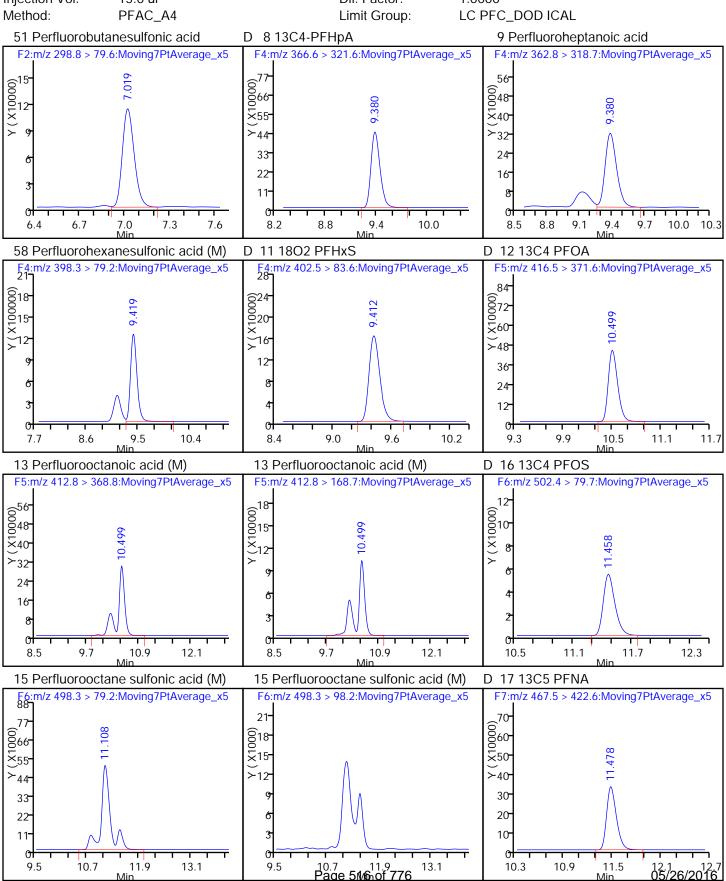
Injection Date: 25-May-2016 23:37:01 Instrument ID: A

Lims ID: 320-18704-A-7-A Lab Sample ID: 320-18704-7

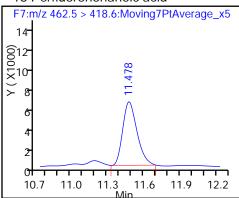
Client ID: OF-RW42B-0516

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 24

Injection Vol: 15.0 ul Dil. Factor: 1.0000



18 Perfluorononanoic acid



Report Date: 26-May-2016 11:06:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_024.d

Injection Date: 25-May-2016 23:37:01 Instrument ID: A4

Lims ID: 320-18704-A-7-A Lab Sample ID: 320-18704-7

Client ID: OF-RW42B-0516

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 24

Injection Vol: 15.0 ul Dil. Factor: 1.0000

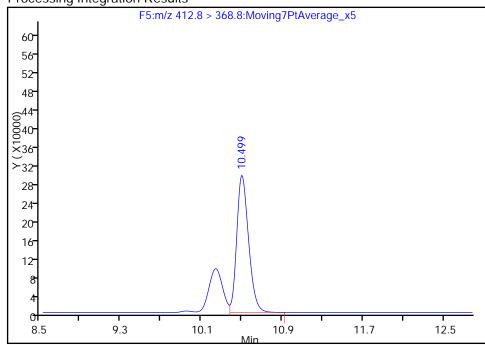
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

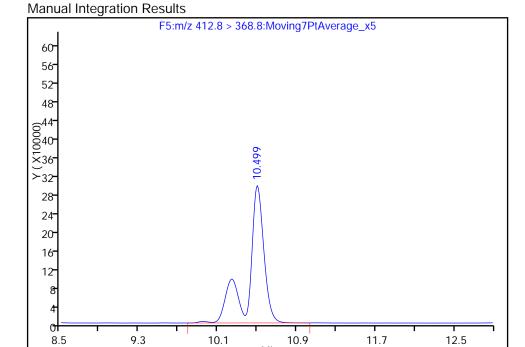
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 10.50 Area: 2398216 Amount: 72.402739 Amount Units: ng/ml **Processing Integration Results**



RT: 10.50
Area: 3313820
Amount: 103.3050
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:36:58

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:06:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_024.d Data File:

Injection Date: 25-May-2016 23:37:01 Instrument ID: A4

Lims ID: 320-18704-A-7-A Lab Sample ID: 320-18704-7

OF-RW42B-0516 Client ID:

Operator ID: **JRB** ALS Bottle#: 10 Worklist Smp#: 24

Injection Vol: 15.0 ul Dil. Factor: 1.0000

LC PFC_DOD ICAL Method: PFAC A4 Limit Group:

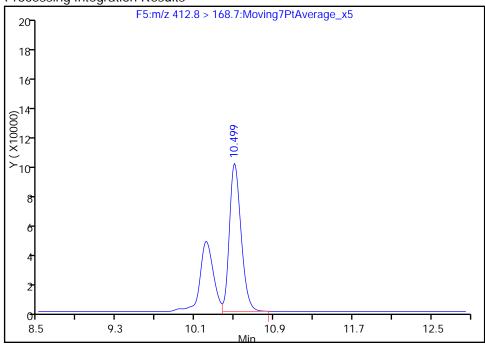
Column: Detector F5:MRM

13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

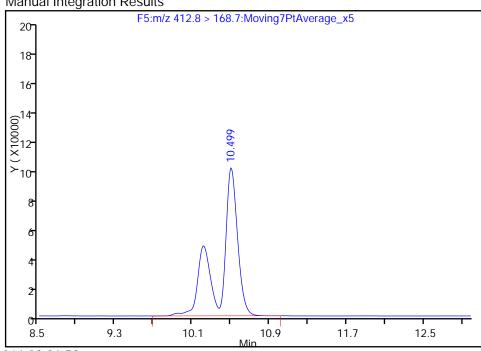
RT: 10.50 Area: 802848 Amount: 72.402739 Amount Units: ng/ml

Processing Integration Results



RT: 10.50 Area: 1245888 Amount: 103.3050 Amount Units: ng/ml

Manual Integration Results



Reviewer: westendorfc, 26-May-2016 08:36:58

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 519 of 776 05/26/2016 Report Date: 26-May-2016 11:06:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_024.d

Injection Date: 25-May-2016 23:37:01 Instrument ID: A4

Lims ID: 320-18704-A-7-A Lab Sample ID: 320-18704-7

Client ID: OF-RW42B-0516

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 24

Injection Vol: 15.0 ul Dil. Factor: 1.0000

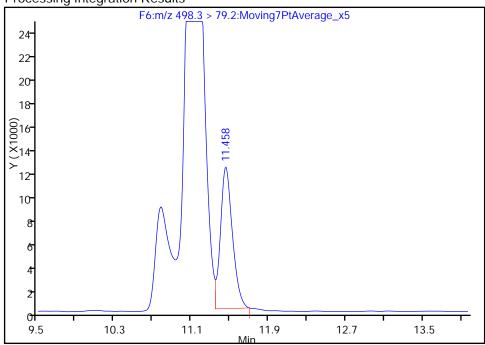
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

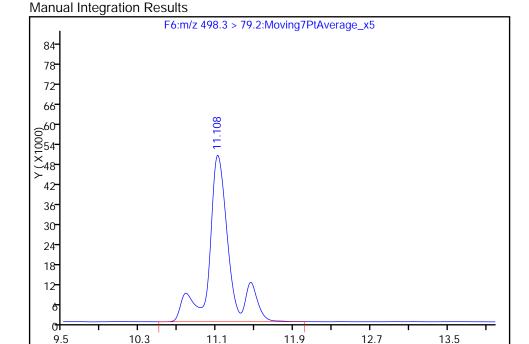
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.46 Area: 101180 Amount: 1.097294 Amount Units: ng/ml **Processing Integration Results**



RT: 11.11
Area: 763871
Amount: 6.896788
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:36:58

Audit Action: Manually Integrated

Audit Reason: Isomers

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Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

Report Date: 26-May-2016 11:06:24

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB42B-0516 RA Lab Sample ID: 320-18704-8 RA

Matrix: Water Lab File ID: 24MAY2016A6A_028.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:05

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 509(mL) Date Analyzed: 05/25/2016 01:37

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111182 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0029	U	0.0039	0.0029	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	120		25-150

Report Date: 26-May-2016 11:31:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_028.d

Lims ID: 320-18704-A-8-A Client ID: 0F-FB42B-0516

Sample Type: Client

Inject. Date: 25-May-2016 01:37:43 ALS Bottle#: 11 Worklist Smp#: 28

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-A-8-A

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:30:45 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 11:18:07

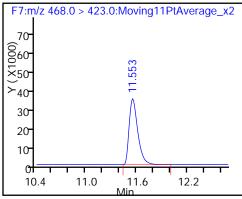
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFHpA											
;	367.0 > 322.0	9.470	9.459	0.011		176202	48.8		97.7	15389	
) 11 18O2 PFH:	xS									
4	403.0 > 84.0	9.499	9.494	0.005		274619	49.7		105	23184	
	41 Perfluorohe	xanesulf	onic acid	l							
,	399.0 > 80.0	9.518	9.495	0.023	1.000	27	0.1353				
	12 13C4 PFO										
4	417.0 > 372.0	10.577	10.577	0.0		185951	51.3		103	12148	
	16 13C4 PFO										
į	503.0 > 80.0	11.527	11.524	0.003		570991	57.4		120	42100	
) 17 13C5 PFN										
4	168.0 > 423.0	11.553	11.551	0.002		248966	72.4		145	17464	

Report Date: 26-May-2016 11:31:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_028.d **Injection Date:** 25-May-2016 01:37:43 Instrument ID: Α6 Lims ID: 320-18704-A-8-A Lab Sample ID: 320-18704-8 Client ID: OF-FB42B-0516 Operator ID: **JRB** ALS Bottle#: 11 Worklist Smp#: 28 Injection Vol: Dil. Factor: 15.0 ul 1.0000 Method: PFAC A6 LC PFC_DOD ICAL Limit Group: 40 Perfluorobutanesulfonic acid (ND) D 8 13C4-PFHpA 9 Perfluoroheptanoic acid (ND) F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 56 Y (XInfinity) 6 8 66- 55<u>-</u> ×40 ≻₃₂ 33 22 16 11 9.4 6.6 7.2 7.8 8.8 9.1 9.7 8.4 9.0 9.6 10.2 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid (ND) F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage x2F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 35 15- Y (X10000) 30 0012 × × 25- 20 15 .518 10 9.3 9.9 8.7 9.2 9.5 10.1 10.7 10.5 8.9 9.8 10.1 9.5 11.3 D 12 13C4 PFOA 13 Perfluorooctanoic acid (ND) 15 Perfluorooctane sulfonic acid (ND) F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 (000 40 ×)32 Y (XInfinity) Y (XInfinity) 24 16 9.5 9.3 9.9 10.5 11.7 10.5 12.3 10.1 10.7 11.3 11.1 11.1 11.7 15 Perfluorooctane sulfonic acid (ND) D 16 13C4 PFOS 18 Perfluorononanoic acid (ND) F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 F7:m/z 463.0 > 419.0:Moving11PtAverage_x2 21 621- 6218-Y (XInfinity 0 10.5 11.1 11.7 12.3 10.3 12.7 10.5 11.1 11.7

Report Date: 26-May-2016 11:31:02 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_028.d

D 17 13C5 PFNA



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB42B-0516 Lab Sample ID: 320-18704-8

Matrix: Water Lab File ID: 25MAY2016B4A_028.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:05

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 509(mL) Date Analyzed: 05/26/2016 01:01

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00079
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00073
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00064
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	Ū	0.0025	0.0020	0.00090
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U Q	0.0025	0.0020	0.00085

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	129		25-150
STL00995	13C5 PFNA	131		25-150
STL00990	13C4 PFOA	130		25-150
STL01892	13C4-PFHpA	130		25-150

Report Date: 26-May-2016 11:06:59 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_028.d

Lims ID: 320-18704-A-8-A Client ID: 0F-FB42B-0516

Sample Type: Client

Inject. Date: 26-May-2016 01:01:43 ALS Bottle#: 11 Worklist Smp#: 28

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-8-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:06:38 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 26-May-2016 10:54:56

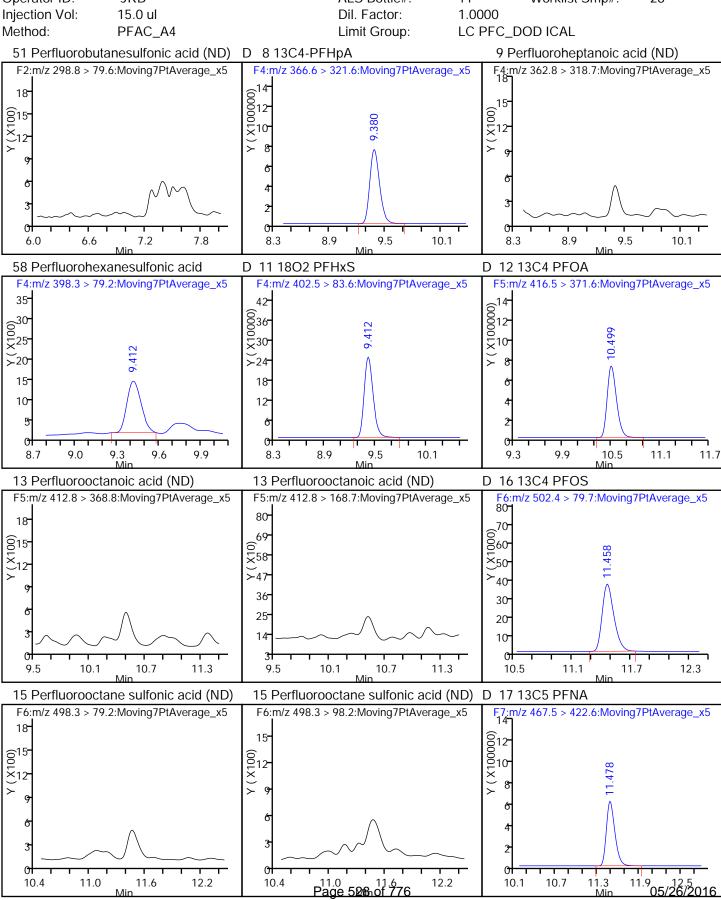
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFH _k	ρA									
366.6 > 321.6	9.380	9.387	-0.007		5577138	65.2		130	7580	
58 Perfluorohe	xanesulf	onic acid	d							
398.3 > 79.2	9.412	9.421	-0.009	1.000	9073	0.1383				
D 11 1802 PFH	xS									
402.5 > 83.6	9.412	9.422	-0.010		1816048	61.2		129	5913	
D 12 13C4 PFO	Α									
416.5 > 371.6	10.499	10.503	-0.004		5806488	65.1		130	8145	
D 16 13C4 PFO	S									
502.4 > 79.7	11.458	11.465	-0.007		311209	46.1		96.5	940	
D 17 13C5 PFN	Α									
467.5 > 422.6	11.478	11.484	-0.006		5142841	65.6		131	8676	

Report Date: 26-May-2016 11:06:59 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_028.d **Injection Date:** 26-May-2016 01:01:43 Instrument ID: A4 Lims ID: 320-18704-A-8-A Lab Sample ID: 320-18704-8 Client ID: OF-FB42B-0516

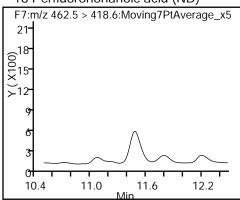
Operator ID: **JRB** ALS Bottle#: 11 Worklist Smp#: 28

Dil. Factor: 15.0 ul 1.0000

PFAC A4 Method: Limit Group:



18 Perfluorononanoic acid (ND)



FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1
SDG No.:

Client Sample ID: OF-RW42C-516 RA Lab Sample ID: 320-18704-9 RA

Matrix: Water Lab File ID: 24MAY2016A6A_029.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 10:02

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 540.6(mL) Date Analyzed: 05/25/2016 01:58

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111182 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.020	М	0.0037	0.0028	0.0012

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	124		25-150

Report Date: 26-May-2016 11:31:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_029.d

Lims ID: 320-18704-A-9-A Client ID: 0F-RW42C-516

Sample Type: Client

Inject. Date: 25-May-2016 01:58:59 ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-A-9-A

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:30:45 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 11:20:09

= 0					24.0.		10 may 2010 1 m2010			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobu	tanesulfo	onic acid								
298.9 > 80.0	7.081	7.074	0.007	1.000	85241	9.22				
D 8 13C4-PFH _k	ρA									
367.0 > 322.0	9.458	9.459	-0.001		152210	42.2		84.4	14290	
9 Perfluoroher	otanoic a	cid								
363.0 > 319.0	9.458	9.462	-0.004	1.000	8620	2.94			70.6	
D 11 18O2 PFH	xS									
403.0 > 84.0	9.493	9.494	-0.001		300624	54.4		115	26496	
41 Perfluorohe										M
399.0 > 80.0	9.493	9.495	-0.002	1.000	738797	118.0				M
13 Perfluorooc										M
413.0 > 369.0	10.577			1.000	165371	49.2	2.25(2.22.2.22)		3876	M
413.0 > 169.0	10.577	10.573	0.004	1.000	73487		2.25(0.00-0.00)		3657	M
D 12 13C4 PFO		10 577	0.000		157005	42 F		07.0	10724	
417.0 > 372.0					157805	43.5		87.0	10734	
15 Perfluorooc 499.0 > 80.0	tane sulf 11.176			1.000	125042	10.9			5026	M M
499.0 > 80.0 499.0 > 99.0	11.176			1.000	35477	10.9	3.52(0.00-0.00)		1470	M
D 16 13C4 PFO		11.021	0.000	1.001	00177		0.02(0.00 0.00)		1170	
503.0 > 80.0	11.518	11.524	-0.006		590947	59.4		124	44508	
D 17 13C5 PFN			3.000		3,3,1,	0711			. 1000	
	11.545	11.551	-0.006		173524	50.4		101	12773	

Report Date: 26-May-2016 11:31:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:31:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_029.d **Injection Date:** 25-May-2016 01:58:59 Instrument ID: Α6 Lims ID: 320-18704-A-9-A Lab Sample ID: 320-18704-9 OF-RW42C-516 Client ID: Operator ID: **JRB** ALS Bottle#: 12 Worklist Smp#: 29 Dil. Factor: Injection Vol: 15.0 ul 1.0000 LC PFC_DOD ICAL Method: PFAC_A6 Limit Group: 40 Perfluorobutanesulfonic acid D 8 13C4-PFHpA 9 Perfluoroheptanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 63 56- (30 001 × 1000 × 054**-**0645-1245-6⁴⁸ ×40 ∠20 <u>></u>36 -32 15 27 24 10 18 16 9.4 6.7 7.0 7.3 7.6 9.1 9.7 10.0 10.3 8.8 9.1 9.7 10.0 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) 13 Perfluorooctanoic acid (M) F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage x2F5:m/z 413.0 > 369.0:Moving11PtAverage x2Y (X10000) 20 48 0017 000 14 041 00 ×34 ∑27[.] 20 13 9.7 8.9 9.9 9.1 10.3 9.8 10.7 10.8 11.7 8.5 8.0 9.0 13 Perfluorooctanoic acid (M) D 12 13C4 PFOA 15 Perfluorooctane sulfonic acid (M) F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 20 49 6 8 42 (017-000 × 14-× 11-(0001X) × (x1000) ×35-≻₂₈-21 14 -1+ 9.9 10.8 11.7 10.1 10.7 11.3 10.4 9.0 9.5 9.5 11.3 12.2 15 Perfluorooctane sulfonic acid (M) D 16 13C4 PFOS 18 Perfluorononanoic acid (ND) F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 F7:m/z 463.0 > 419.0:Moving11PtAverage_x2 (21⁻ (21⁻ (218⁻ 30 83 **971** <u>6</u>25 \S_{20} ∑₁₅-≥59 12 15 35 10 23 11

0

10.2

10.8 11.4 12.0 Page 586hof 776

12.5

11.6

9.8

10.7

0

10.5

11.1

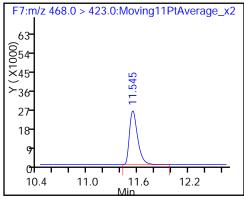
11.7

12.6

Report Date: 26-May-2016 11:31:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_029.d

D 17 13C5 PFNA



Report Date: 26-May-2016 11:31:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_029.d

Injection Date: 25-May-2016 01:58:59 Instrument ID: A6

Lims ID: 320-18704-A-9-A Lab Sample ID: 320-18704-9

Client ID: OF-RW42C-516

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

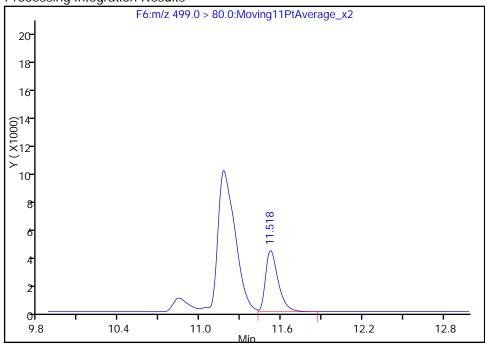
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

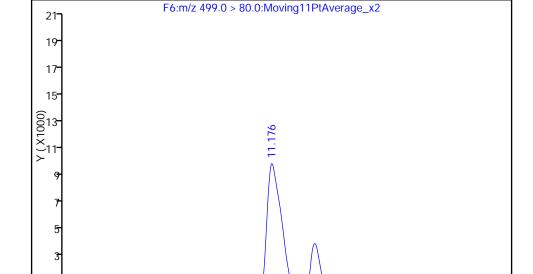
Signal: 1

RT: 11.52 Area: 28267 Amount: 2.454832 Amount Units: ng/ml **Processing Integration Results**

Manual Integration Results



RT: 11.18
Area: 125042
Amount: 10.859202
Amount Units: ng/ml



11.3

11.9

12.5

Reviewer: barnettj, 25-May-2016 11:20:09

Audit Action: Manually Integrated

Audit Reason: Isomers

10.7

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10.1

9.5

Report Date: 26-May-2016 11:31:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_029.d

Injection Date: 25-May-2016 01:58:59 Instrument ID: A6

Lims ID: 320-18704-A-9-A Lab Sample ID: 320-18704-9

Client ID: OF-RW42C-516

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

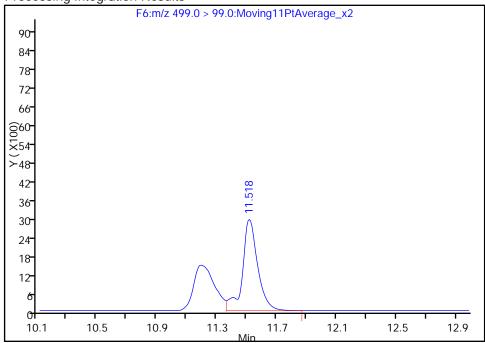
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

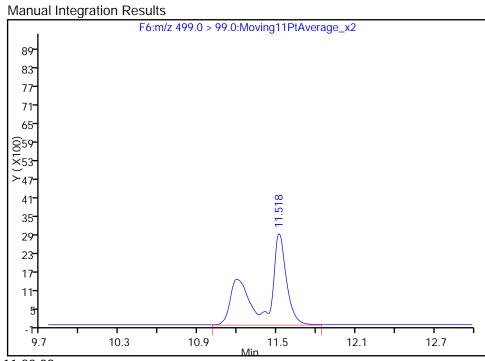
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.52 Area: 20745 Amount: 2.454832 Amount Units: ng/ml **Processing Integration Results**



RT: 11.52 Area: 35477 Amount: 10.859202 Amount Units: ng/ml



Reviewer: barnettj, 25-May-2016 11:20:09

Audit Action: Manually Integrated

Audit Reason: Isomers Page 536 of 776

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW42C-516 Lab Sample ID: 320-18704-9

Matrix: Water Lab File ID: 25MAY2016B4A_029.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 10:02

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 540.6(mL) Date Analyzed: 05/26/2016 01:22

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0050		0.0023	0.0018	0.00074
335-67-1	Perfluorooctanoic acid (PFOA)	0.093	М	0.0023	0.0018	0.00069
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.0018	0.00060
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.016		0.0023	0.0018	0.00085
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.26	M Q	0.0023	0.0018	0.00080

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	107		25-150
STL00995	13C5 PFNA	87		25-150
STL00990	13C4 PFOA	97		25-150
STL01892	13C4-PFHpA	96		25-150

Report Date: 26-May-2016 11:07:11 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_029.d

Lims ID: 320-18704-A-9-A Client ID: 0F-RW42C-516

Sample Type: Client

Inject. Date: 26-May-2016 01:22:54 ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-9-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:06:38 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 09:26:02

First Level Reviewer, westernoone				Date.		.0-181ay-2010 09.20.0)			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
51 Perfluorobu	tanesulfo	onic acid	I							
298.8 > 79.6	7.014		-0.010	1.000	207456	8.81				
D 8 13C4-PFH	οA									
366.6 > 321.6	9.380	9.387	-0.007		4090577	47.9		95.7	6471	
9 Perfluoroher	otanoic a	cid								
362.8 > 318.7	9.380	9.388	-0.008	1.000	122836	2.72			38.6	
58 Perfluorohe	xanesulf	onic acid	d							M
398.3 > 79.2	9.412	9.421	-0.009	1.000	7486271	138.4				M
D 11 18O2 PFH	xS									
402.5 > 83.6	9.412	9.422	-0.010		1497774	50.5		107	2434	
D 12 13C4 PFO	Α									
416.5 > 371.6	10.500	10.503	-0.003		4328131	48.6		97.1	8588	
13 Perfluorooc										M
412.8 > 368.8	10.500			1.000	1965651	50.1			942	M
412.8 > 168.7		10.504	-0.004	1.000	654595		3.00(0.00-0.00)		1141	M
D 16 13C4 PFO		44.47	0.007		040400			07.0		
	11.459				313493	46.5		97.2	683	
15 Perfluorooc				1 000	170050/	00.0			1010	M
498.3 > 79.2		11.466	-0.348	1.000	1799506	20.3			1949	M
D 17 13C5 PFN			0.005		0.407000	40.7		07.4	0004	
	11.479		-0.005		3427329	43.7		87.4	9821	
18 Perfluorono			0.007	1 000	2/272	0.0007			15.0	
462.5 > 418.6	11.479	11.486	-0.007	1.000	26273	0.3096			15.9	

Report Date: 26-May-2016 11:07:11 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:07:11 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_029.d Data File:

Injection Date: 26-May-2016 01:22:54 Instrument ID:

Lims ID: 320-18704-A-9-A

OF-RW42C-516 Client ID:

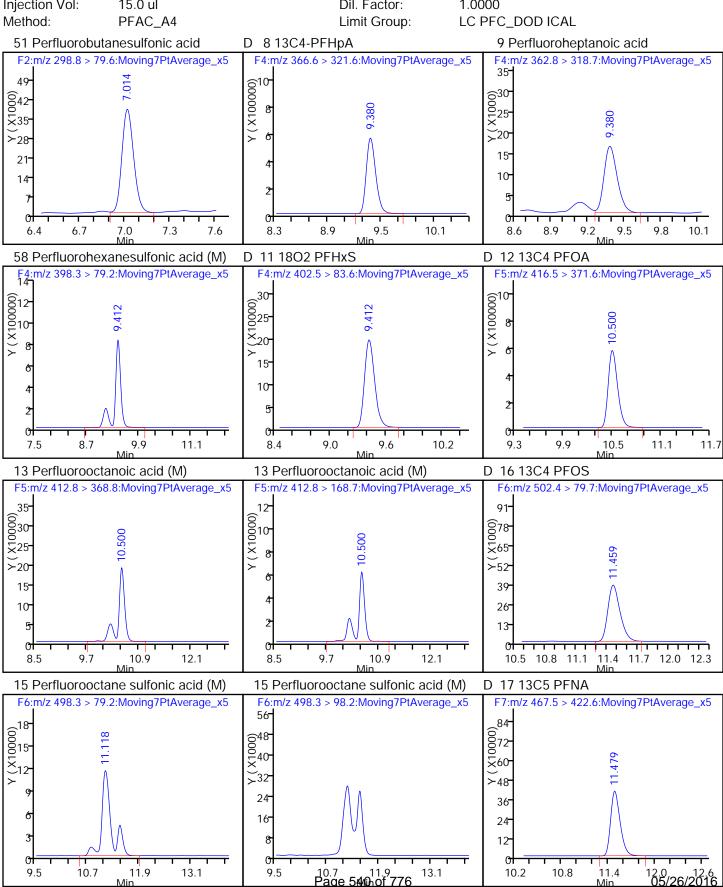
Operator ID: **JRB** ALS Bottle#: 12 Worklist Smp#:

Lab Sample ID:

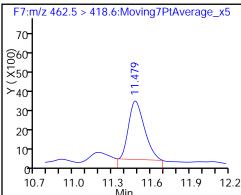
320-18704-9

29

Injection Vol: Dil. Factor: 15.0 ul 1.0000



18 Perfluorononanoic acid



Report Date: 26-May-2016 11:07:11 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_029.d

Injection Date: 26-May-2016 01:22:54 Instrument ID: A4

Lims ID: 320-18704-A-9-A Lab Sample ID: 320-18704-9

Client ID: OF-RW42C-516

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

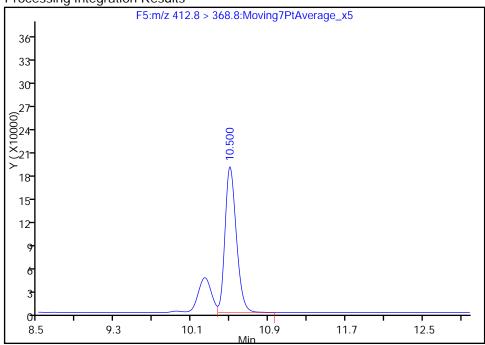
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

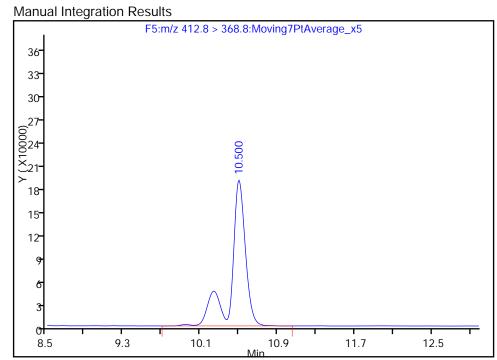
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 10.50 Area: 1530921 Amount: 37.848802 Amount Units: ng/ml **Processing Integration Results**



RT: 10.50
Area: 1965651
Amount: 50.143511
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 09:26:02

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:07:11 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_029.d

Injection Date: 26-May-2016 01:22:54 Instrument ID: A4

Lims ID: 320-18704-A-9-A Lab Sample ID: 320-18704-9

Client ID: OF-RW42C-516

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

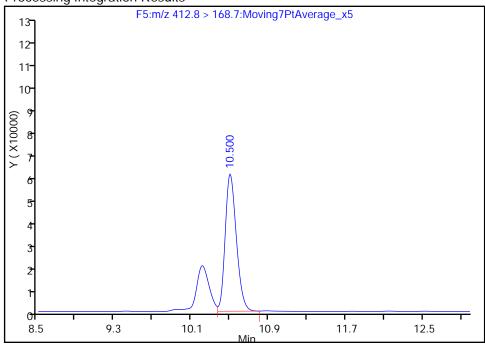
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

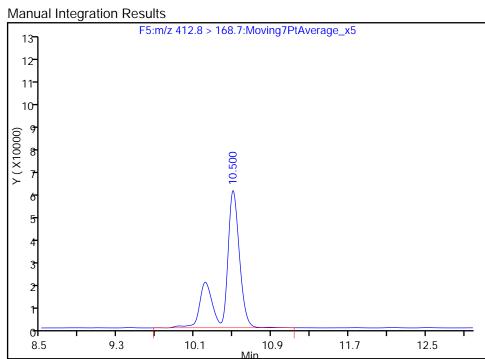
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 2

RT: 10.50 Area: 469366 Amount: 37.848802 Amount Units: ng/ml **Processing Integration Results**



RT: 10.50
Area: 654595
Amount: 50.143511
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 09:26:02

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 543 of 776 05/26/2016

Report Date: 26-May-2016 11:07:11 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_029.d

Injection Date: 26-May-2016 01:22:54 Instrument ID: A4

Lims ID: 320-18704-A-9-A Lab Sample ID: 320-18704-9

Client ID: OF-RW42C-516

Operator ID: JRB ALS Bottle#: 12 Worklist Smp#: 29

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

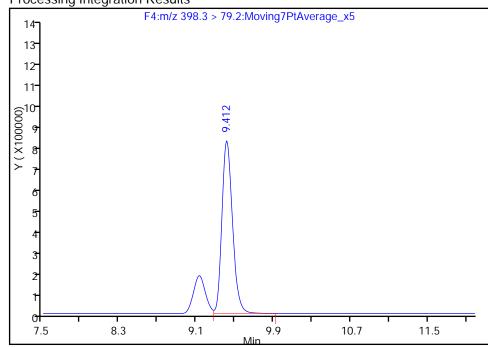
Column: Detector F4:MRM

58 Perfluorohexanesulfonic acid, CAS: 355-46-4

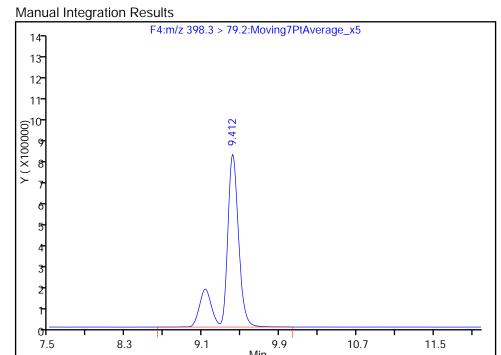
Signal: 1

RT: 9.41
Area: 5972618
Amount: 110.3837
Amount Units: ng/ml

Processing Integration Results



RT: 9.41
Area: 7486271
Amount: 138.3585
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 09:28:24

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW42CD-0516 RA Lab Sample ID: 320-18704-10 RA

Matrix: Water Lab File ID: 24MAY2016A6A_030.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 10:04

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 535.1(mL) Date Analyzed: 05/25/2016 02:20

Con. Extract Vol.: 1.00 (mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111182 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL	
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.023	М	0.0037	0.0028	0.0012	

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS		
STL00991	13C4 PFOS	124		25-150		

Report Date: 26-May-2016 11:31:14 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_030.d

Lims ID: 320-18704-A-10-A Client ID: 0F-RW42CD-0516

Sample Type: Client

Inject. Date: 25-May-2016 02:20:17 ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-A-10-A

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:30:45 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 13:52:15

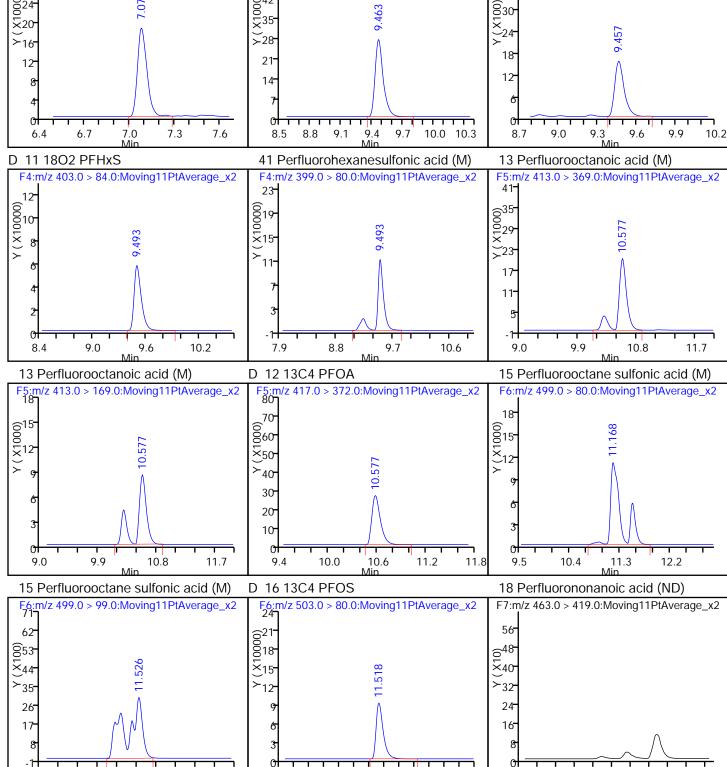
T II St Ec voi Ttevi	nst Level Neviewer. Barnettj			20 May 2010 10:02.						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
40 Perfluorobutanesulfonic acid										
298.9 > 80.0	7.078	7.074	0.004	1.000	80682	8.46				
D 8 13C4-PFF	•									
367.0 > 322.0	9.463	9.459	0.004		150385	41.7		83.4	13435	
9 Perfluorohe	•									
363.0 > 319.0		9.462	-0.005	1.000	7838	2.74			41.4	
D 11 1802 PFI		0.404	0.004		04.04.00	F / 4		440	07000	
403.0 > 84.0		9.494			310122	56.1		119	27200	
41 Perfluoroh				1 000	700050	100.1				M
399.0 > 80.0		9.495	-0.002	1.000	788959	122.1				M
13 Perfluoroo 413.0 > 369.0	ctanoic ac 10.577		0.004	1.000	183132	44.1			718	M M
413.0 > 169.0	10.577			1.000	84040	77.1	2.18(0.00-0.00)		4084	M
D 12 13C4 PFOA										
417.0 > 372.0		10.577	0.0		195027	53.8		108	13195	
15 Perfluoroo	ctane sulf	onic acid	ł							М
499.0 > 80.0	11.168	11.524	-0.356	1.000	141377	12.3			5343	M
499.0 > 99.0	11.526	11.524	0.002	1.032	50952		2.77(0.00-0.00)		1447	M
D 16 13C4 PFOS										
503.0 > 80.0	11.518	11.524	-0.006		588939	59.2		124	44251	
D 17 13C5 PFNA										
468.0 > 423.0	11.544	11.551	-0.007		223213	64.9		130	16384	

Report Date: 26-May-2016 11:31:14 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:31:14 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_030.d **Injection Date:** 25-May-2016 02:20:17 Instrument ID: Α6 Lims ID: 320-18704-A-10-A Lab Sample ID: 320-18704-10 OF-RW42CD-0516 Client ID: Operator ID: **JRB** ALS Bottle#: 13 Worklist Smp#: 30 Dil. Factor: Injection Vol: 15.0 ul 1.0000 LC PFC_DOD ICAL Method: PFAC_A6 Limit Group: 40 Perfluorobutanesulfonic acid D 8 13C4-PFHpA 9 Perfluoroheptanoic acid F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 28 36 ©42 8 ×35 ©24 830 ×20 $\stackrel{\smile}{\succeq}_{24}$ ∑28- ≻16⁻ 18 21 12 14 6.7 7.0 7.3 9.4 9.3 9.9 7.6 9.1 9.7 10.0 10.3 9.0 9.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid (M) 13 Perfluorooctanoic acid (M) F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage x241-23 Y (X10000) 00019 ×15 635 029 × **~**23 17 11



12.6

10.5

11.1

11.7

10.0

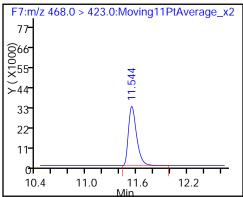
10.9

11.8

12.7

10.2

D 17 13C5 PFNA



Report Date: 26-May-2016 11:31:14 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_030.d

Injection Date: 25-May-2016 02:20:17 Instrument ID: A6

Lims ID: 320-18704-A-10-A Lab Sample ID: 320-18704-10

Client ID: OF-RW42CD-0516

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000

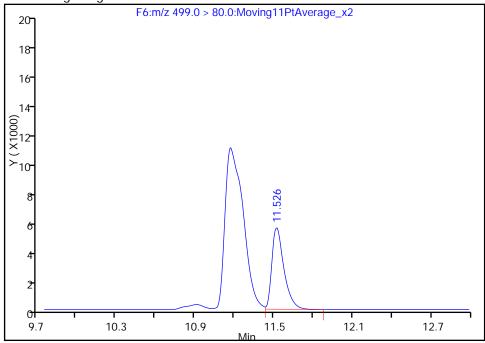
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

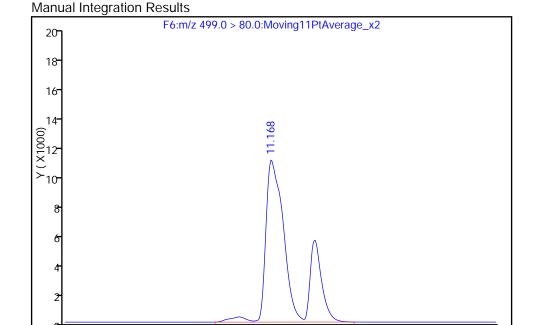
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.53 Area: 34511 Amount: 3.007307 Amount Units: ng/ml **Processing Integration Results**



RT: 11.17
Area: 141377
Amount: 12.319667
Amount Units: ng/ml



11.3

11.9

12.5

Reviewer: barnettj, 25-May-2016 13:52:15

Audit Action: Manually Integrated

Audit Reason: Isomers

10.7

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10.1

9.5

Report Date: 26-May-2016 11:31:14 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_030.d

Injection Date: 25-May-2016 02:20:17 Instrument ID: A6

Lims ID: 320-18704-A-10-A Lab Sample ID: 320-18704-10

Client ID: OF-RW42CD-0516

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000

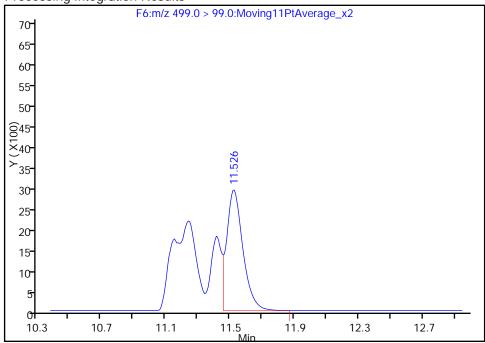
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

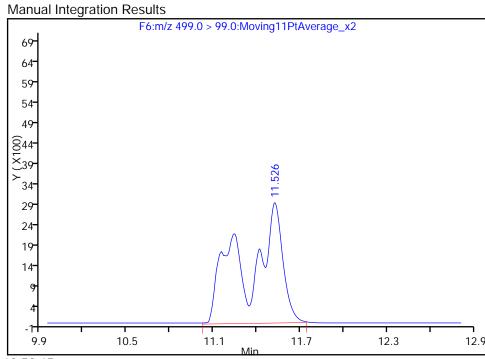
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.53 Area: 20106 Amount: 3.007307 Amount Units: ng/ml **Processing Integration Results**



RT: 11.53
Area: 50952
Amount: 12.319667
Amount Units: ng/ml



Reviewer: barnettj, 25-May-2016 13:52:15

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-RW42CD-0516 Lab Sample ID: 320-18704-10

Matrix: Water Lab File ID: 25MAY2016B4A_030.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 10:04

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 535.1(mL) Date Analyzed: 05/26/2016 01:44

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0045		0.0023	0.0019	0.00075
335-67-1	Perfluorooctanoic acid (PFOA)	0.087	М	0.0023	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.0019	U	0.0023	0.0019	0.00061
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.017		0.0023	0.0019	0.00086
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.28	M Q	0.0023	0.0019	0.00081

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	98		25-150
STL00995	13C5 PFNA	95		25-150
STL00990	13C4 PFOA	102		25-150
STL01892	13C4-PFHpA	96		25-150

Report Date: 26-May-2016 11:07:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_030.d

Lims ID: 320-18704-A-10-A Client ID: 0F-RW42CD-0516

Sample Type: Client

Inject. Date: 26-May-2016 01:44:05 ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-10-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:06:38 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 09:26:11

First Level Reviewer: westendoric			Date: 26-May-2016 09:26			11					
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	51 Perfluorobu	ıtanesulfı	onic acid	l							
	298.8 > 79.6	7.014		-0.010	1.000	197381	9.16				
	D 8 13C4-PFH _I		7.02	0.0.0		.,,,,,,,	76				
	366.6 > 321.6		9 387	-0.007		4103726	48.0		96.0	5807	
	9 Perfluorohe			0.007		1100720	10.0		70.0	0007	
	362.8 > 318.7			-0 008	1.000	111304	2.42			33.9	
	58 Perfluorohe				1.000	111001	2.12			00.7	М
	398.3 > 79.2		9.421		1.000	7378527	149.0				M
	D 11 1802 PFH		, <u>.</u>	0.002	1.000	7070027	117.0				•••
		9.412	9 422	-0.010		1370952	46.2		97.7	2652	
	D 12 13C4 PFO		7.122	0.010		1070702	10.2		,,,,	2002	
	416.5 > 371.6		10 503	-0.001		4560841	51.2		102	6429	
	13 Perfluorooc			0.001		1000011	01.2		102	0127	M
	412.8 > 368.8		10.504	-0.002	1.000	1917226	46.4			976	M
	412.8 > 168.7				1.000	462552	40.4	4.14(0.00-0.00)		64.2	101
	D 16 13C4 PFO										
		11.461	11.465	-0.004		265448	39.3		82.3	485	
	15 Perfluorooc										М
	498.3 > 79.2		11.466		1.000	1777431	23.5			2321	M
	498.3 > 98.2		11.466		1.030	611722		2.91(0.00-0.00)		419	М
	D 17 13C5 PFN	А						,			
		11.480	11.484	-0.004		3725528	47.5		95.0	5819	
	18 Perfluorono										
	462.5 > 418.6			-0.006	1.000	28789	0.3121			18.0	

Report Date: 26-May-2016 11:07:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:07:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_030.d

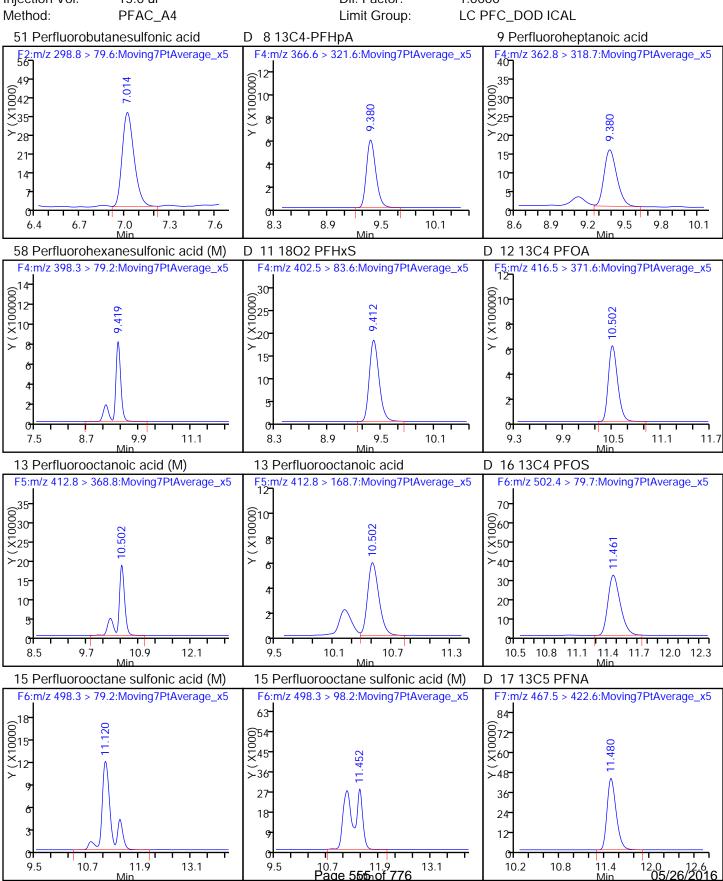
Injection Date: 26-May-2016 01:44:05 Instrument ID: A

Lims ID: 320-18704-A-10-A Lab Sample ID: 320-18704-10

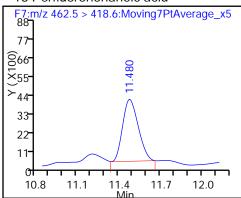
Client ID: OF-RW42CD-0516

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000



18 Perfluorononanoic acid



Report Date: 26-May-2016 11:07:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_030.d

Injection Date: 26-May-2016 01:44:05 Instrument ID: A4

Lims ID: 320-18704-A-10-A Lab Sample ID: 320-18704-10

Client ID: OF-RW42CD-0516

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000

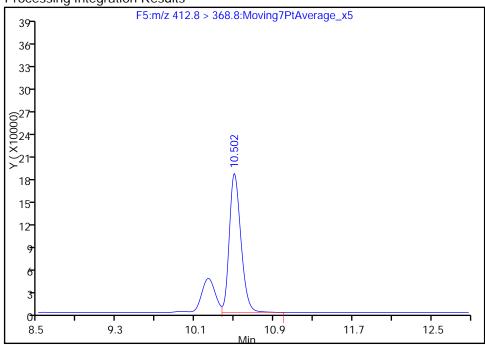
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F5:MRM

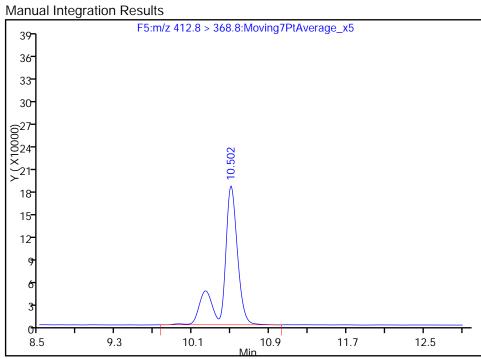
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 10.50 Area: 1489661 Amount: 34.949604 Amount Units: ng/ml **Processing Integration Results**



RT: 10.50 Area: 1917226 Amount: 46.407438 Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 09:29:19

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:07:18 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_030.d

Injection Date: 26-May-2016 01:44:05 Instrument ID: A4

Lims ID: 320-18704-A-10-A Lab Sample ID: 320-18704-10

Client ID: OF-RW42CD-0516

Operator ID: JRB ALS Bottle#: 13 Worklist Smp#: 30

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

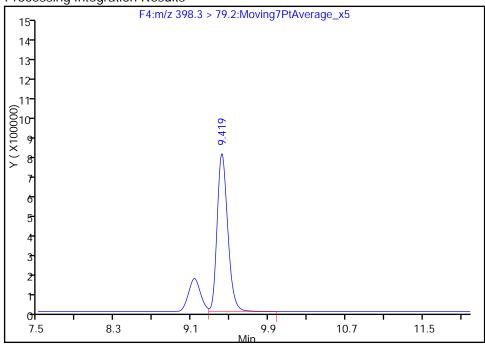
Column: Detector F4:MRM

58 Perfluorohexanesulfonic acid, CAS: 355-46-4

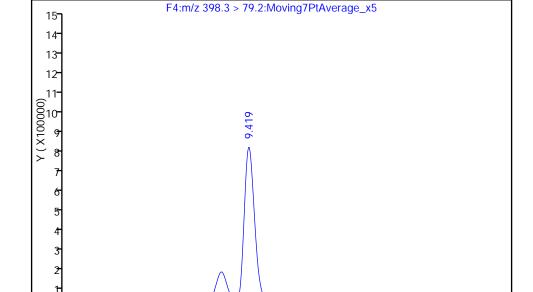
Signal: 1

RT: 9.42 Area: 5956267 Amount: 120.2648 Amount Units: ng/ml **Processing Integration Results**

Manual Integration Results



RT: 9.42 Area: 7378527 Amount: 148.9820 Amount Units: ng/ml



9.9

10.7

Reviewer: westendorfc, 26-May-2016 09:29:19

Audit Action: Manually Integrated

Audit Reason: Isomers

9.1

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8.3

7.5

11.5

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB42C-0516 RA Lab Sample ID: 320-18704-11 RA

Matrix: Water Lab File ID: 24MAY2016A6A_031.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:55

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 458.9(mL) Date Analyzed: 05/25/2016 02:41

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111182 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0033	U M	0.0044	0.0033	0.0014

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00991	13C4 PFOS	114		25-150

Report Date: 26-May-2016 11:31:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_031.d

Lims ID: 320-18704-A-11-A Client ID: 0F-FB42C-0516

Sample Type: Client

Inject. Date: 25-May-2016 02:41:32 ALS Bottle#: 14 Worklist Smp#: 31

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-A-11-A

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:30:45 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnetti Date: 25-May-2016 13:53:29

i iisi Levei Keviewei. Dairiettj				Date.		25-101ay-2010 13.55.2	۷ 7			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 8 13C4-PFH	рА									
367.0 > 322.0	9.463	9.459	0.004		184596	51.2		102	15472	
D 11 1802 PF	HxS									
403.0 > 84.0	9.493	9.494	-0.001		305897	55.3		117	26701	
41 Perfluoroh	exanesulf	onic acid	b							
399.0 > 80.0	9.499	9.495	0.004	1.000	4723	0.8710				
D 12 13C4 PF0	AC									
417.0 > 372.0	10.568	10.577	-0.009		245796	67.8		136	16388	
15 Perfluoroo	ctane sulf	onic acid	b							M
499.0 > 80.0		11.524		1.000	3095	0.2940			162	M
499.0 > 99.0		11.524	-0.014	0.999	102		30.34(0.00-0.00)		6.5	M
D 16 13C4 PF0										
503.0 > 80.0		11.524	0.002		540300	54.3		114	39908	
D 17 13C5 PFN										
468.0 > 423.0	11.544	11.551	-0.007		236336	68.7		137	17043	

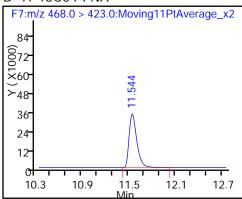
QC Flag Legend

Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:31:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_031.d **Injection Date:** 25-May-2016 02:41:32 Instrument ID: Α6 Lims ID: 320-18704-A-11-A Lab Sample ID: 320-18704-11 Client ID: OF-FB42C-0516 Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 31 Dil. Factor: Injection Vol: 15.0 ul 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 40 Perfluorobutanesulfonic acid (ND) D 8 13C4-PFHpA 9 Perfluoroheptanoic acid (ND) F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 Y (XInfinity) (0001×) (012 X) X) 8 24 16 7.2 9.6 6.0 6.6 7.8 8.4 9.0 10.2 8.4 9.0 9.6 10.2 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid (ND) F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage x2F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 24 10 (X10000) X ©²⁰ ×16 Y (X100) 12 9.0 9.0 9.6 10.2 9.6 10.2 10.1 10.7 11.3 9.5 8.4 D 12 13C4 PFOA 13 Perfluorooctanoic acid (ND) 15 Perfluorooctane sulfonic acid (M) F6:m/z 499.0 > 80.0:Moving11PtAverage_x2 F5:m/z 413.0 > 169.0:Moving11PtAverage_x2 F5:m/z 417.0 > 372.0:Moving11PtAverage_x2 91 14 Y (XInfinity) [©]78- ×65-<u>@</u>12 <u>≻</u>10 ∑52- 39 26 13 9.5 10.0 11.2 10.7 11.3 10.1 10.7 11.3 10.6 11.8 10.1 11.9 12.5 9.4 15 Perfluorooctane sulfonic acid (M) D 16 13C4 PFOS 18 Perfluorononanoic acid (ND) F6:m/z 503.0 > 80.0:Moving11PtAverage_x2 F7:m/z 463.0 > 419.0:Moving11PtAverage_x2 F6:m/z 499.0 > 99.0:Moving11PtAverage_x2 84 (000015-X) 72 60 ≥30 **≻**48 ≻₂₄· 36 18 24 12 12 $^{\circ}$ 0 0 10.5 11.1 11.7 12.3 10.3 10.9 11.5 12.1 Page 560hof 776 12.7 10.5 11.1 11.7

D 17 13C5 PFNA



Report Date: 26-May-2016 11:31:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_031.d

Injection Date: 25-May-2016 02:41:32 Instrument ID:

Lims ID: 320-18704-A-11-A Lab Sample ID: 320-18704-11

Client ID: OF-FB42C-0516

ALS Bottle#: Operator ID: **JRB** 14 Worklist Smp#: 31

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

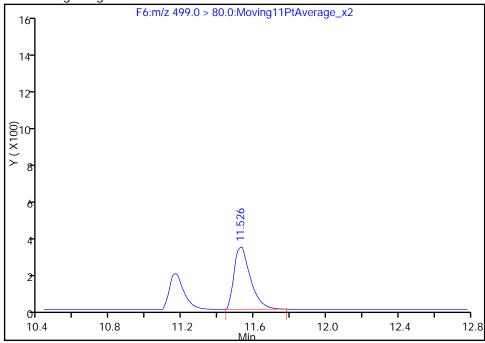
Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

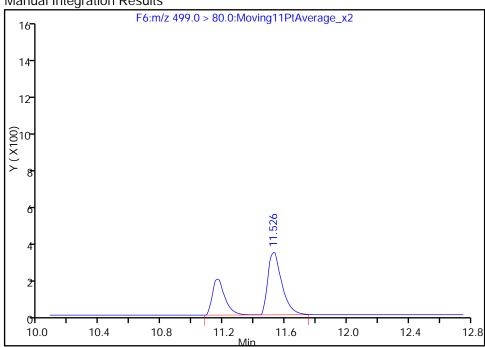
RT: 11.53 Area: 2026 Amount: 0.192440 Amount Units: ng/ml

Processing Integration Results



RT: 11.53 Area: 3095 0.293979 Amount: Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 25-May-2016 13:53:29

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:31:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_031.d

Injection Date: 25-May-2016 02:41:32 Instrument ID: A6

Lims ID: 320-18704-A-11-A Lab Sample ID: 320-18704-11

Client ID: OF-FB42C-0516

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 31

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

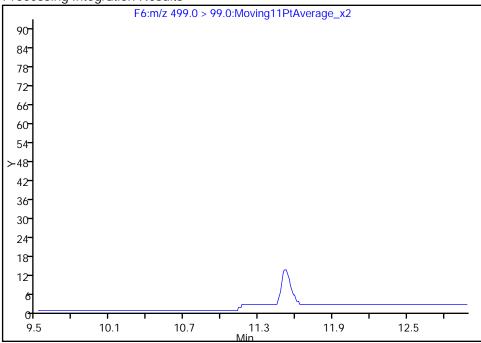
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

Not Detected

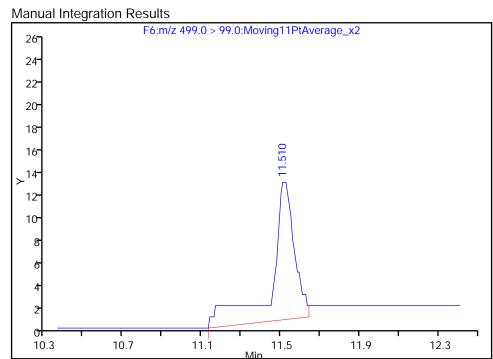
Expected RT: 11.52

Processing Integration Results



RT: 11.51 Area: 102 Amount: 0.293979

Amount Units: ng/ml



Reviewer: barnettj, 25-May-2016 13:53:29

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Client Sample ID: OF-FB42C-0516 Lab Sample ID: 320-18704-11

Matrix: Water Lab File ID: 25MAY2016B4A_031.d

Analysis Method: WS-LC-0025 Date Collected: 05/05/2016 09:55

Extraction Method: 3535 Date Extracted: 05/09/2016 16:04

Sample wt/vol: 458.9(mL) Date Analyzed: 05/26/2016 02:05

Con. Extract Vol.: 1.00(mL) Dilution Factor: 1

Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0022	U	0.0027	0.0022	0.00087
335-67-1	Perfluorooctanoic acid (PFOA)	0.0022	U	0.0027	0.0022	0.00081
375-95-1	Perfluorononanoic acid (PFNA)	0.0022	U	0.0027	0.0022	0.00071
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0022	U	0.0027	0.0022	0.0010
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0011	JМQ	0.0027	0.0022	0.00095

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	115		25-150
STL00995	13C5 PFNA	127		25-150
STL00990	13C4 PFOA	129		25-150
STL01892	13C4-PFHpA	123		25-150

Report Date: 26-May-2016 11:07:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_031.d

Lims ID: 320-18704-A-11-A Client ID: 0F-FB42C-0516

Sample Type: Client

Inject. Date: 26-May-2016 02:05:17 ALS Bottle#: 14 Worklist Smp#: 31

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: 320-18704-a-11-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:06:38 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 09:29:28

				•							
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D	8 13C4-PFH	ρA									
3	66.6 > 321.6	9.380	9.387	-0.007		5254445	61.5		123	7458	
	9 Perfluoroher										
	62.8 > 318.7				1.000	3074	-0.3512			9.3	
	58 Perfluorohe				1 000	20027	0.4052				M
			9.421	-0.009	1.000	28937	0.4953				M
	11 18O2 PFH 02.5 > 83.6	xS 9.412	9 422	-0.010		1617203	54.5		115	4305	
	12 13C4 PFO		7.122	0.010		1017200	01.0		110	1000	
	16.5 > 371.6		10.503	-0.004		5744245	64.4		129	8575	
	13 Perfluorooc	tanoic ac	cid								
4	12.8 > 368.8	10.499	10.504	-0.005	1.000	10717	0.1352			19.1	
	16 13C4 PFO	S									
5	02.4 > 79.7	11.458	11.465	-0.007		228875	33.9		70.9	768	
	15 Perfluorooc				1 000	0507/	4.04				M
	98.3 > 79.2 98.3 > 98.2	11.467			1.000 0.999	25276 12392	1.04	2.04(0.00-0.00)		69.3 25.1	M M
	17 13C5 PFN		11.400	-0.000	0.777	12372		2.04(0.00-0.00)		23.1	IVI
	67.5 > 422.6		11.484	-0.006		4969816	63.4		127	9384	
	18 Perfluorono										
	62.5 > 418.6			0.001	1.000	6101	0.0481			11.4	

Report Date: 26-May-2016 11:07:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 26-May-2016 11:07:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_031.d

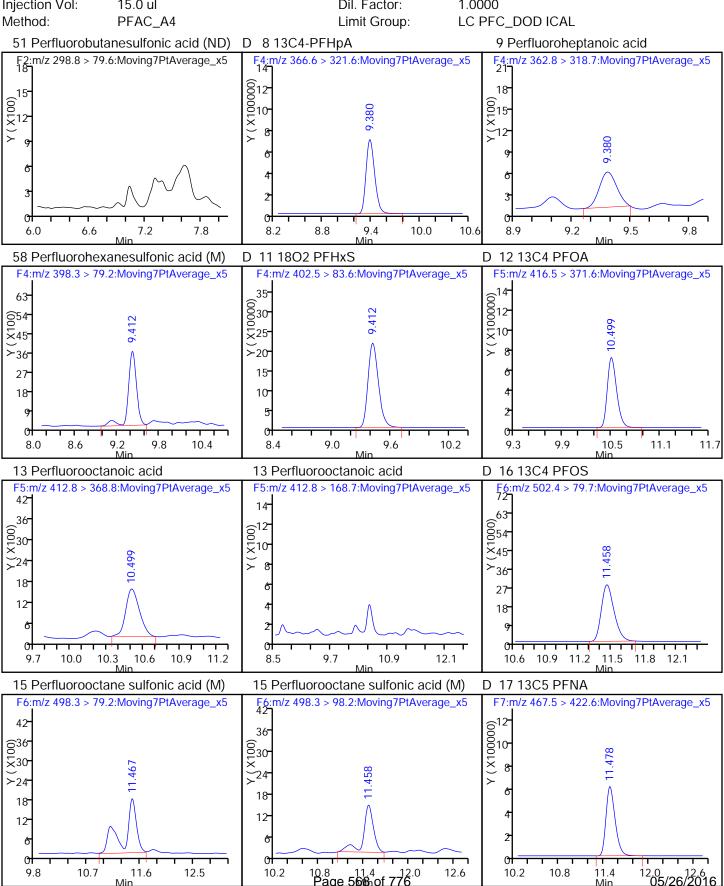
Injection Date: 26-May-2016 02:05:17 Instrument ID:

Lims ID: 320-18704-A-11-A Lab Sample ID: 320-18704-11

Client ID: OF-FB42C-0516

Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 31

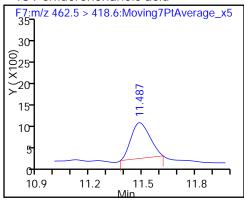
Dil. Factor: Injection Vol: 15.0 ul 1.0000



Report Date: 26-May-2016 11:07:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_031.d

18 Perfluorononanoic acid



Report Date: 26-May-2016 11:07:24 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_031.d

Injection Date: 26-May-2016 02:05:17 Instrument ID: A4

Lims ID: 320-18704-A-11-A Lab Sample ID: 320-18704-11

Client ID: OF-FB42C-0516

Operator ID: JRB ALS Bottle#: 14 Worklist Smp#: 31

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

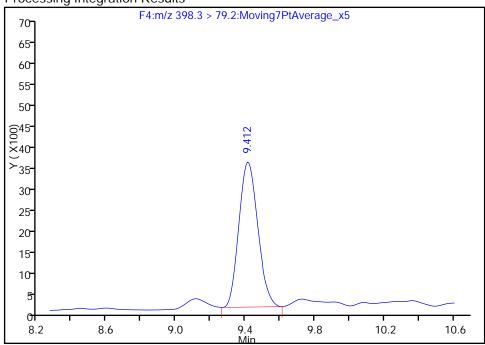
Column: Detector F4:MRM

58 Perfluorohexanesulfonic acid, CAS: 355-46-4

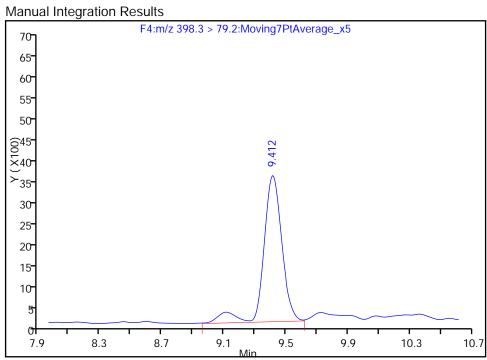
Signal: 1

RT: 9.41
Area: 26126
Amount: 0.447193
Amount Units: ng/ml

Processing Integration Results



RT: 9.41
Area: 28937
Amount: 0.495308
Amount Units: ng/ml



Reviewer: barnettj, 26-May-2016 10:56:24

Audit Action: Manually Integrated

Audit Reason: Isomers

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LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A4

GC Column: Acquity

Calibration Start Date: 05/25/2016 16:55

Calibration End Date: 05/25/2016 19:01

Calibration ID: 21647

Calibration Files:

LAB SAMPLE ID:	LAB FILE ID:
STD 320-111390/5	25MAY2016B4A 005.d
STD 320-111390/6	25MAY2016B4A 006.d
STD 320-111390/7	25MAY2016B4A 007.d
STD 320-111390/8	25MAY2016B4A 008.d
STD 320-111390/9	25MAY2016B4A 009.d
STD 320-111390/10	25MAY2016B4A 010.d
STD 320-111390/11	25MAY2016B4A 011.d
	STD 320-111390/5 STD 320-111390/6 STD 320-111390/7 STD 320-111390/8 STD 320-111390/9 STD 320-111390/10

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	5.803	5.797	5.797	5.797	5.800	5.797	5.800	5.548 - 6.048	5.799
Perfluoropentanoic acid (PFPeA)	6.913	6.909	6.913	6.909	6.909	6.909	6.909	6.660 - 7.160	6.910
Perfluorobutanesulfonic acid (PFBS)	+++++	7.028	7.024	7.024	7.024	7.024	7.024	6.774 - 7.274	7.025
Perfluorohexanoic acid (PFHxA)	+++++	8.155	8.160	8.155	8.155	8.155	8.155	7.907 - 8.407	8.156
Perfluoroheptanoic acid (PFHpA)	+++++	9.380	9.388	9.388	9.388	9.388	9.388	9.138 - 9.638	9.387
Perfluorohexanesulfonic acid (PFHxS)	9.419	9.419	9.419	9.419	9.419	9.427	9.419	9.171 - 9.671	9.420
Perfluorooctanoic acid (PFOA)	10.509	10.499	10.502	10.502	10.509	10.509	10.502	10.254 - 10.754	10.505
Perfluoroheptanesulfonic Acid (PFHpS)	+++++	10.508	10.502	10.511	10.509	10.509	10.511	10.258 - 10.758	10.508
Perfluorooctanesulfonic acid (PFOS)	+++++	11.467	11.461	11.470	11.468	11.467	11.461	11.216 - 11.716	11.466
Perfluorononanoic acid (PFNA)	11.487	11.487	11.480	11.480	11.488	11.487	11.489	11.236 - 11.736	11.485
Perfluorodecanoic acid (PFDA)	12.324	12.324	12.327	12.327	12.325	12.324	12.328	12.075 - 12.575	12.326
Perfluorooctane Sulfonamide (FOSA)	12.896	12.896	12.888	12.888	12.897	12.896	12.888	12.643 - 13.143	12.893
Perfluorodecanesulfonic acid (PFDS)	12.999	12.999	12.991	12.991	13.000	12.999	12.991	12.746 - 13.246	12.996
Perfluoroundecanoic acid (PFUnA)	13.041	13.041	13.044	13.044	13.042	13.041	13.045	12.792 - 13.292	13.043
Perfluorododecanoic acid (PFDoA)	13.650	13.650	13.644	13.644	13.639	13.650	13.644	13.396 - 13.896	13.646
Perfluorotridecanoic Acid (PFTriA)	14.171	14.161	14.154	14.164	14.161	14.161	14.165	13.912 - 14.412	14.162
Perfluorotetradecanoic acid (PFTeA)	14.607	14.598	14.592	14.602	14.599	14.598	14.602	14.350 - 14.850	14.600
Perfluoro-n-hexadecanoic acid (PFHxDA)	15.257	15.257	15.252	15.252	15.258	15.257	15.252	15.005 - 15.505	15.255
Perfluoro-n-octandecanoic acid (PFODA)	15.595	15.595	15.591	15.591	15.595	15.595	15.591	15.343 - 15.843	15.593
13C4 PFBA	5.800	5.797	5.797	5.800	5.797	5.800	5.800	5.548 - 6.048	5.799
13C5-PFPeA	6.913	6.904	6.909	6.904	6.904	6.909	6.904	6.657 - 7.157	6.907
13C2 PFHxA	+++++	8.155	8.160	8.155	8.155	8.155	8.155	7.906 - 8.406	8.156
13C4-PFHpA	9.388	9.388	9.388	9.388	9.388	9.388	9.380	9.137 - 9.637	9.387
1802 PFHxS	9.427	9.419	9.419	9.419	9.419	9.419	+++++	9.172 - 9.672	9.420
13C4 PFOA	10.509	10.499	10.502	10.502	10.500	10.509	+++++	10.253 - 10.753	10.504
13C4 PFOS	11.467	11.467	11.461	11.461	11.468	11.467	+++++	11.215 - 11.715	11.465
13C5 PFNA	11.487	11.487	11.480	11.480	11.488	11.487	11.480	11.234 - 11.734	11.484
13C2 PFDA	12.324	12.324	12.327	12.327	12.325	12.324	12.328	12.075 - 12.575	12.326
13C8 FOSA	12.896	12.896	12.888	12.888	12.897	12.896	12.888	12.643 - 13.143	12.893
13C2 PFUnA	13.051	13.041	13.044	13.044	13.042	13.041	13.045	12.794 - 13.294	13.044
13C2 PFDoA	13.650	13.650	13.644	13.644	13.639	13.650	13.644	13.396 - 13.896	13.646
13C2-PFTeDA	14.607	14.598	14.602	14.602	14.599	14.598	14.602	14.351 - 14.851	14.601
13C2-PFHxDA	15.257	15.257	15.252	15.252	15.258	15.257	15.252	15.005 - 15.505	15.255

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 Analy Batch No.: 111390

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/25/2016 16:55 Calibration End Date: 05/25/2016 19:01 Calibration ID: 21647

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	STD 320-111390/5	25MAY2016B4A 005.d	
Level 2	STD 320-111390/6	25MAY2016B4A 006.d	
Level 3	STD 320-111390/7	25MAY2016B4A 007.d	
Level 4	STD 320-111390/8	25MAY2016B4A 008.d	
Level 5	STD 320-111390/9	25MAY2016B4A 009.d	
Level 6	STD 320-111390/10	25MAY2016B4A 010.d	
Level 7	STD 320-111390/11	25MAY2016B4A 011.d	

ANALYTE		CF	יַ		CURVE COEFFICIENT				MIN CF	%RSD			# MIN R^2
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4	TYPE	В	M1	M2			%RS	OR COD	OR COD
13C4 PFBA	90426 90489	93702 69083	88967 67191	91832	Ave		84527.2857			13.4	50.	0	
13C5-PFPeA	84075 80131	88112 67366	79827 57639	79829	Ave		76711.2743			13.7	50.	0	
13C2 PFHxA	+++++ 88726	93214 75852	88217 63360	88780	Ave		83024.8300			13.6	50.	0	
13C4-PFHpA	97016 88518	97521 72637	93069 62582	87045	Ave		85483.7314			15.4	50.	0	
1802 PFHxS	32114 28446	33843 21871	32545 +++++	29259	Ave		29679.5173			14.6	50.	0	
13C4 PFOA	95358 86472	101177 69215	94622 +++++	88014	Ave		89142.7267			12.5	50.	0	
13C4 PFOS	7547.6 5997.7	8261.6 4238.7	7254.1	7192.7	Ave		6748.72734			21.2	50.	0	
13C5 PFNA	83768 81444	90726 67996	85184 58045	81914	Ave		78439.4543			14.5	50.	0	
13C2 PFDA	113865 98334	116442 88286	113382 70925	98189	Ave		99917.5000			16.5	50.	0	
13C8 FOSA	106708 97856	108315 81051	106014 70011	105710	Ave		96523.5914			15.6	50.	0	
13C2 PFUnA	110798 106166	120213 84367	108832 72975	106384	Ave		101390.671			16.3	50.	0	
13C2 PFDoA	114960 108533	119900 92813	108605 81295	111530	Ave		105376.626			12.8	50.	0	
13C2-PFTeDA	77742 85231	80236 68244	76604 63739	79461	Ave		75893.7886			9.8	50.	0	
13C2-PFHxDA	29325 32507	32299 26911	29981 23318	29654	Ave		29142.1229			11.0	50.	0	

Note: The ml coefficient is the same as Ave CF for an Ave curve type.

CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 Analy Batch No.: 111390

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/25/2016 16:55 Calibration End Date: 05/25/2016 19:01 Calibration ID: 21647

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RR	%RSD	#	MAX	R^2	# 1	MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RSD	OR COD		OR COD
Perfluorobutanoic acid (PFBA)	51562 48110	54589 47389	59528	53593	62013	AveID		0.6418			9.4		35.0			
Perfluoropentanoic acid (PFPeA)	45950 33549	45680 27499	41742	38810	40556	AveID		0.5079			4.7		35.0			
Perfluorobutanesulfonic acid (PFBS)	+++++ 16828	30042 13573	22359	20369		L2ID		0.7293						0.9950		0.9900
Perfluorohexanoic acid (PFHxA)	+++++ 33959	48716 28459				L1ID		0.4487						0.9990		0.9900
Perfluoroheptanoic acid (PFHpA)	+++++ 36889	66614 30989				L2ID		0.4789						0.9950		0.9900
Perfluorohexanesulfonic acid (PFHxS)	56469 37411	62875 32107	53633			AveID		1.7087			6.3		35.0			
Perfluorooctanoic acid (PFOA)	45998 31110	50890 26141	45904	37002	41392	L1ID	0.0322	0.4522						1.0000		0.9900
Perfluoroheptanesulfonic Acid (PFHpS)	+++++ 34336	56642 27018	54720	45924	46998	L2ID	-0.926	7.7628						0.9900		0.9900
Perfluorooctanesulfonic acid (PFOS)	+++++ 57319	76877 45376	83720	70811	77490	L1ID	-9.247	13.993						0.9960		0.9900
Perfluorononanoic acid (PFNA)	95262 82019	129381 70717	108058	93343	99857	L2ID	0.0022	1.2307						0.9920		0.9900
Perfluorodecanoic acid (PFDA)	94072 93997	117054 78340	119534	106142	111497	AveID		1.0385			9.8		35.0			
Perfluorooctane Sulfonamide (FOSA)	104638 92535	113427 78543	117605	105216	106590	AveID		1.0693			5.9		35.0			
Perfluorodecanesulfonic acid (PFDS)	32002 17577	33342 13614	34233	27101	25265	AveID		4.2089			6.9		50.0			
Perfluoroundecanoic acid (PFUnA)	145968 103214	132732 84787						1.1791			6.6		35.0			
Perfluorododecanoic acid (PFDoA)	95024 88677	96089 74116		95821	110823	AveID		0.9121			9.6		35.0			
Perfluorotridecanoic Acid (PFTriA)	77272 69226	90621 59609	88571	75800		AveID		1.0254			8.3		50.0			
Perfluorotetradecanoic acid (PFTeA)	67818 31192	48934 28663	38993	35082	38993	AveID		0.5424			28.9		50.0			
Perfluoro-n-hexadecanoic acid (PFHxDA)	188072 70899	147266 62857	85884	71378	89377	L2ID	1.9284	2.5720						0.9960		0.9900
Perfluoro-n-octandecanoic acid (PFODA)	66886 54974	71437 53503	66638	59423	78676	AveID		2.2110			6.6		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.: 320-18704-1 Analy Batch No.: 111390

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/25/2016 16:55 Calibration End Date: 05/25/2016 19:01 Calibration ID: 21647

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111390/5	25MAY2016B4A 005.d
Level 2	STD 320-111390/6	25MAY2016B4A 006.d
Level 3	STD 320-111390/7	25MAY2016B4A 007.d
Level 4	STD 320-111390/8	25MAY2016B4A 008.d
Level 5	STD 320-111390/9	25MAY2016B4A 009.d
Level 6	STD 320-111390/10	25MAY2016B4A 010.d
Level 7	STD 320-111390/11	25MAY2016B4A 011.d

ANALYTE	CURVE			RESPONSE			CONCENTRATION (NG/ML)					
	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	
13C4 PFBA	Ave	4521321 3454161	4685114 3359557	4448328	4591623	4524446	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C5-PFPeA	Ave	4203739 3368310	4405611 2881925	3991347	3991474	4006540	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2 PFHxA	Ave	+++++ 3792575	4660722 3168006	4410855	4438990	4436301	+++++ 50.0	50.0 50.0	50.0	50.0	50.0	
13C4-PFHpA	Ave	4850779 3631838	4876027 3129112	4653428	4352241	4425881	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
1802 PFHxS	Ave	1518975 1034483	1600780 ++++	1539364	1383940	1345505	47.3 47.3	47.3 +++++	47.3	47.3	47.3	
13C4 PFOA	Ave	4767875 3460734	5058838 ++++	4731111	4400676	4323584	50.0 50.0	50.0 ++++	50.0	50.0	50.0	
13C4 PFOS	Ave	360775 202612	394903 +++++	346744	343813	286688	47.8 47.8	47.8 ++++	47.8	47.8	47.8	
13C5 PFNA	Ave	4188406 3399779	4536292 2902258	4259193	4095685	4072196	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2 PFDA	Ave	5693238 4414285	5822117 3546229	5669119	4909456	4916681	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C8 FOSA	Ave	5335389 4052543	5415770 3500532	5300712	5285513	4892798	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2 PFUnA	Ave	5539892 4218333	6010665 3648730	5441575	5319223	5308317	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2 PFDoA	Ave	5748006 4640667	5994993 4064771	5430267	5576489	5426626	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2-PFTeDA	Ave	3887106 3412182	4011816 3186926	3830217	3973031	4261548	50.0 50.0	50.0 50.0	50.0	50.0	50.0	
13C2-PFHxDA	Ave	1466248 1345541	1614964 1165903	1499037	1482695	1625355	50.0 50.0	50.0 50.0	50.0	50.0	50.0	

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 Analy Batch No.: 111390

SDG No.:

Instrument ID: A4 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/25/2016 16:55 Calibration End Date: 05/25/2016 19:01 Calibration ID: 21647

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111390/5	25MAY2016B4A 005.d
Level 2	STD 320-111390/6	25MAY2016B4A 006.d
Level 3	STD 320-111390/7	25MAY2016B4A 007.d
Level 4	STD 320-111390/8	25MAY2016B4A 008.d
Level 5	STD 320-111390/9	25MAY2016B4A 009.d
Level 6	STD 320-111390/10	25MAY2016B4A 010.d
Level 7	STD 320-111390/11	25MAY2016B4A 011.d

ANALYTE	IS CURVE			RESPONSE			CONCENTRATION (NG/ML)					
	REF TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	
Perfluorobutanoic acid (PFBA)	AveID	25781 9621902	54589 18955715	297640	1071850	3100647	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluoropentanoic acid (PFPeA)	AveID	22975 6709860	45680 10999657	208712	776204	2027795	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluorobutanesulfonic acid (PFBS)	L2ID	+++++ 2975252	26557 4799473	98828	360125	989482	+++++ 177	0.884 354	4.42	17.7	44.2	
Perfluorohexanoic acid (PFHxA)	L1ID	+++++ 6791811	48716 11383764	221266	721387	2079954	+++++ 200	1.00 400	5.00	20.0	50.0	
Perfluoroheptanoic acid (PFHpA)	L2ID	+++++ 7377792	66614 12395409	229994	762273	2246637	+++++ 200	1.00 400	5.00	20.0	50.0	
Perfluorohexanesulfonic acid (PFHxS)	AveID	26710 7078226	59480 12149225	253682	836825	2346082	0.473 189	0.946 378	4.73	18.9	47.3	
Perfluorooctanoic acid (PFOA)	L1ID	22999 6221982	50890 10456476	229522	740049	2069583	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID	++++ 6537635	53923 10288308	260465	874389	2237092	+++++ 190	0.952 381	4.76	19.0	47.6	
Perfluorooctanesulfonic acid (PFOS)	L1ID	++++ 10959354	73494 17351697	400180	1353901	3704007	+++++ 191	0.956 382	4.78	19.1	47.8	
Perfluorononanoic acid (PFNA)	L2ID	47631 16403896	129381 28286865	540290	1866863	4992828	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluorodecanoic acid (PFDA)	AveID	47036 18799359	117054 31336025	597671	2122830	5574851	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluorooctane Sulfonamide (FOSA)	AveID	52319 18507083	113427 31417050	588024	2104314	5329485	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluorodecanesulfonic acid (PFDS)	AveID	15425 3388769	32142 5249459	165005	522503	1217760	0.482 193	0.964 386	4.82	19.3	48.2	
Perfluoroundecanoic acid (PFUnA)	AveID	72984 20642853	132732 33914731	644718	2308031	6249999	0.500 200	1.00 400	5.00	20.0	50.0	
Perfluorododecanoic acid (PFDoA)	AveID	47512 17735307	96089 29646208	548185	1916429	5541148	0.500 200	1.00 400	5.00	20.0	50.0	

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Analy Batch No.: 111390 Job No.: 320-18704-1

SDG No.:

GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N Instrument ID: A4

Calibration Start Date: 05/25/2016 16:55 Calibration End Date: 05/25/2016 19:01 Calibration ID: 21647

ANALYTE	IS	CURVE			RESPONSE				CONCEN	TRATION (1	NG/ML)	
	REF	TYPE -	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorotridecanoic Acid (PFTriA)		AveID	38636 13845210	90621 23843779	442855	1515996	4237745	0.500	1.00	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		AveID	33909 6238413	48934 11465072	194966	701642	1949635	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	94036 14179794	147266 25142674	429422	1427552	4468853	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	33443 10994803	71437 21401177	333192	1188460	3933807	0.500 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution

L1ID = Linear 1/conc IsoDil

L2ID = Linear 1/conc^2 IsoDil

Report Date: 26-May-2016 11:02:09 Chrom Revision: 2.2 20-Apr-2016 13:59:46

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_005.d

Lims ID: Std L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 25-May-2016 16:55:09 ALS Bottle#: 10 Worklist Smp#: 5

Injection Vol: 15.0 ul 1.0000 Dil. Factor:

Sample Info: STD L1

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm, T=35C

Operator ID: **JRB** Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\\Sacramento\ChromData\\A4\\20160525-31065.b\\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:02:07 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: **Initial Calibration**

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

25-May-2016 18:27:24 First Level Reviewer: barnetti Date:

First Level Revie	wer: bar	nettj			Date:		25-May-2016 18:27:2	<u> </u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.803	5.798	0.005	1.000	25781	0.4442		88.8	118	
D 113C4 PFBA										
216.7 > 171.5	5.800	5.798	0.002		4521321	53.5		107	18338	
D 3 13C5-PFPe	eΑ									
267.6 > 222.7	6.913	6.907	0.006		4203739	54.8		110	8232	
4 Perfluoroper	ntanoic a	cid								
262.9 > 218.7	6.913	6.910	0.003	1.000	22975	0.5380		108	10.9	
5 Perfluorobut	ane Sulf	onate								
		7.024	0.0	1.000	12833	NC			25.4	
298.8 > 98.6	7.024	7.024	0.0	1.000	6418		2.00(0.00-0.00)		13.3	
51 Perfluorobu										
298.8 > 79.6	7.024	7.024	0.0	1.000	12833	0.3740		84.6		
D 613C2 PFHx										
314.6 > 269.7	8.160	8.156	0.004		4611872	55.5		111	8247	
7 Perfluorohex										
312.9 > 268.7	8.165	8.157	0.008	1.000	26685	0.4632		92.6	135	
D 8 13C4-PFHp	ρA									
366.6 > 321.6	9.388	9.387	0.001		4850779	56.7		113	7959	
9 Perfluorohep	otanoic a	cid								
362.8 > 318.7	9.396	9.388	0.008	1.000	24242	0.1095		21.9	110	
10 Perfluorohe	xane Sul	lfonate								
398.3 > 79.2	9.419	9.421	-0.002	1.000	26710	NC			46.3	
58 Perfluorohe	xanesulf	onic acid	d							
398.3 > 79.2	9.419	9.421	-0.002	1.000	26710	0.4868		103		
D 11 1802 PFH	xS									
402.5 > 83.6	9.427	9.422	0.005		1518975	51.2		108	4592	
					Page 577 of	776			05/26	6/2016

Report Date: 26- Data File:												
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 12 13C4 PFO 416.5 > 371.6	A 10.509	10.503	0.006		4767875	53.5		107	4857			
13 Perfluorooc 412.8 > 368.8 412.8 > 168.7		10.504		1.000 0.999	22999 7461	0.4622	3.08(0.00-0.00)	92.4 92.4	50.6 25.8			
39 Perfluorohe		fonic Ac	id	1.000	24080	0.5303	,	111				
14 Perfluorohe		ulfonate		1.000	24080	NC			168			
D 16 13C4 PFO 502.4 > 79.7	S	11.465		1.000	360775	53.5		112	1493			
15 Perfluorooc 498.3 > 79.2	tane sulf		d	1.000	32668	0.9702		203	158			
498.3 > 98.2 D 17 13C5 PFN	11.467	11.466		1.000	16176	0,7,02	2.02(0.00-0.00)	203	34.3			
	11.487		0.003		4188406	53.4		107	8199			
462.5 > 418.6 D 19 13C2 PFD	11.487		0.001	1.000	47631	0.4602		92.0	117			
514.4 > 469.5	12.324		-0.001		5693238	57.0		114	10082			
	12.324		-0.001	1.000	47036	0.3978		79.6	120			
D 23 13C8 FOS 505.4 > 77.6	12.896	12.893			5335389	55.3		111	4000			
	12.896	12.893		1.000	52319	0.4585		91.7	145			
25 Perfluorode 598.4 > 79.6	cane Su 12.999		0.003	1.000	15425	NC			57.5			
49 Perfluorode 598.4 > 79.6	12.999	12.996		1.000	15425	0.4856		101				
27 Perfluoroun 562.4 > 518.5			-0.001	1.000	72984	0.5587		112	82.7			
D 26 13C2 PFU 564.3 > 519.5		13.044	0.007		5539892	54.6		109	6729			
D 28 13C2 PFD 614.4 > 569.4		13.646	0.004		5748006	54.5		109	4148			
29 Perfluorodo 612.4 > 568.6			0.004	1.000	47512	0.4531		90.6	33.7			
30 Perfluorotrio 662.4 > 618.5			0.009	1.000	38636	0.4847		96.9	27.5			
32 Perfluorotet 712.6 > 668.5			0.007	1.000	33909	0.8041		161	33.0			
D 33 13C2-PFT6 714.5 > 669.5	eDA				3887106	51.2		102	3337			
D 35 13C2-PFH 814.8 > 769.6	xDA				1466248	50.3		101	3594			
557 707.0	. 5.207	. 5.200	5.552			00.0			55,1			

Page 578 of $776^{0.4970}$

99.4

²⁶05/26/2016

34 Perfluorohexadecanoic acid

Signal RT RT RT REL Response ng/ml Ratio(Limits) %Rec S/N Flags

36 Perfluorooctandecanoic acid

OC Flag Legend Processing Flags

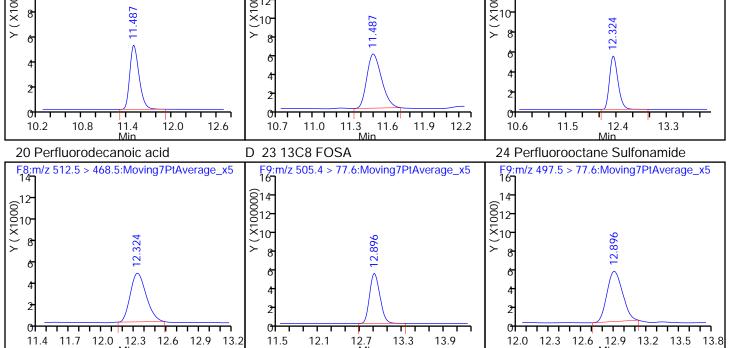
Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L1_00018 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:02:09 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_005.d **Injection Date:** 25-May-2016 16:55:09 Instrument ID: A4 Lims ID: Std L1 Client ID: Operator ID: **JRB** ALS Bottle#: 10 Worklist Smp#: 5 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) 5.803 6072 560 **6**54 ×45 **≻**48 >36 36 27 18 24 12 5.5 5.8 4.3 5.2 7.0 7.0 6.1 6.1 5.8 6.4 7.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 35 Y (X100000) 84 7.024 6³⁰ ×25 60⁷² _ ≻20 **≻**48 36 15 24 10 12 6.9 7.8 7.2 7.5 6.7 7.0 7.3 7.6 7.5 8.4 8.7 6.6 8.1 9.0 6.3 6.4 7 Perfluorohexanoic acid D 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 (X100000) X (X1000000) X (X1000000) 56- Y (X1000) <u>@</u>48 ×40 **≻**32 24 16 01 7.8 8.1 8.7 8.3 8.9 9.5 8.9 9.2 9.5 9.8 10.1 7.5 8.4 10.1 8.6 D 12 13C4 PFOA 58 Perfluorohexanesulfonic acid 11 1802 PFHxS F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 (X100000) (X100000) (X100000) 35 70 030 ×25 600 ×50 <u></u>20⁻ -40 15- 30 10 20 10 0 0 0 9.0 9.3 9.6 9.9 10.2 8.4 9.0 Page 5& of 776 10.2 9.4 10.0 10.6 8.7 05/26/2016



15.7

16.0

15.4

10

14.5

14.8

15.1

15.4

15.7

16.0

15.1

Report Date: 26-May-2016 11:02:22 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_006.d

Lims ID: Std L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 25-May-2016 17:15:50 ALS Bottle#: 11 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L2

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:02:21 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 18:13:00

First Level Revie	wer: bar	nettj			Date:	2	25-May-2016 18:13:	00		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.797	5.798	-0.001	1.000	54589	0.9078		90.8	227	
D 113C4 PFBA	Δ.									
216.7 > 171.5	5.797	5.798	-0.001		4685114	55.4		111	14887	
D 3 13C5-PFPe	eΑ									
267.6 > 222.7	6.904	6.907	-0.003		4405611	57.4		115	10143	
4 Perfluoroper	ntanoic a	cid								
262.9 > 218.7	6.909	6.910	-0.001	1.000	45680	1.02		102	19.5	
5 Perfluorobut										
298.8 > 79.6	7.028	7.024	0.004	1.000	26557	NC			53.3	
298.8 > 98.6	7.028	7.024	0.004	1.000	15186		1.75(0.00-0.00)		31.9	
51 Perfluorobu				1 000	0.4557	0.0004		400		
298.8 > 79.6	7.028	7.024	0.004	1.000	26557	0.9021		102		
D 6 13C2 PFHx		0.157	0.001		4//0722	F/ 1		110	0000	
314.6 > 269.7		8.156	-0.001		4660722	56.1		112	9898	
7 Perfluorohex 312.9 > 268.7		8.157	0.002	1.000	48716	0.9832		98.3	270	
		6.137	-0.002	1.000	40/10	0.9032		90.3	270	
D 8 13C4-PFHp 366.6 > 321.6		9.387	0.001		4876027	57.0		114	6073	
9 Perfluoroher			0.001		4070027	37.0		114	0073	
362.8 > 318.7			-0.008	1.000	66614	1.01		101	307	
10 Perfluorohe			0.000	1.000	00011	1.01		101	007	
398.3 > 79.2	9.419		-0.002	1.000	59480	NC			114	
58 Perfluorohe										
398.3 > 79.2		9.421		1.000	59480	1.03		109		
D 11 1802 PFH	xS									
402.5 > 83.6	9.419	9.422	-0.003		1600780	53.9		114	3799	
					Page 583 of	776			05/26	6/2016

Page 583 of 776

Report Date: 26-May-2016 11:02:22 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 26- Data File:				to\Chrom			20-Apr-2016 13:59: 0\25MAY2016B4A_(
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFC 416.5 > 371.6	A 10.499	10.503	-0.004		5058838	56.7		113	5920	
13 Perfluorood 412.8 > 368.8 412.8 > 168.7	10.499			1.000 1.001	50890 19193	1.04	2.65(0.00-0.00)	104 104	84.7 61.2	
39 Perfluorohe 448.3 > 79.2	eptanesul 10.508			1.000	53923	0.9601		101		
14 Perfluorohe 448.3 > 79.2	eptane Su 10.508		0.0	1.000	53923	NC			359	
D 16 13C4 PFC 502.4 > 79.7	S 11.467	11.465	0.002		394903	58.5		122	1542	
15 Perfluorood 498.3 > 79.2 498.3 > 98.2	11.467 11.467	onic acid 11.466 11.466	0.001	1.000 1.000	73494 46925	1.30	1.57(0.00-0.00)	136 136	215 89.2	
	11.487		0.003		4536292	57.8		116	5606	
	11.487		0.001	1.000	129381	1.16		116	367	
	12.324		-0.001		5822117	58.3		117	8557	
20 Perfluorode 512.5 > 468.5			-0.001	1.000	117054	0.9679		96.8	254	
D 23 13C8 FOS 505.4 > 77.6	5A 12.896	12.893	0.003		5415770	56.1		112	4768	
24 Perfluorood 497.5 > 77.6	tane Sulf 12.896			1.000	113427	0.9793		97.9	292	
25 Perfluorode 598.4 > 79.6			0.003	1.000	32142	NC			119	
49 Perfluorode 598.4 > 79.6	ecane Sul 12.999			1.000	32142	0.9244		95.9		
27 Perfluorour 562.4 > 518.5			-0.001	1.000	132732	0.9364		93.6	203	
D 26 13C2 PFU 564.3 > 519.5		13.044	-0.003		6010665	59.3		119	7574	
D 28 13C2 PFD 614.4 > 569.4		13.646	0.004		5994993	56.9		114	3402	
29 Perfluorodo 612.4 > 568.6			0.004	1.000	96089	0.8786		87.9	51.4	
30 Perfluorotri		acid		1.000	90621	1.10		110	55.8	
32 Perfluorote 712.6 > 668.5	tradecan	oic acid		1.000	48934	1.12		112	50.3	
D 33 13C2-PFT 714.5 > 669.5	eDA				4011816	52.9		106	3196	
D 35 13C2-PFH	IxDA									
814.8 > 769.6 34 Perfluorohe	xadecan	oic acid		4.000	1614964	55.4		111	2889	
812.6 > 768.6	15.257	15.255	0.002	1.000	Page 584 of 7	776 ^{1.02}		102	40 ₀ 5/26	3/2016

Report Date: 26-May-2016 11:02:22 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_006.d Data File:

EXP **DLT REL** Amount RT RT ng/ml Ratio(Limits) %Rec S/N Flags Signal RT RT Response

36 Perfluorooctandecanoic acid

912.7 > 868.6 15.595 15.593 0.002 1.00 100 103 1.000 71437

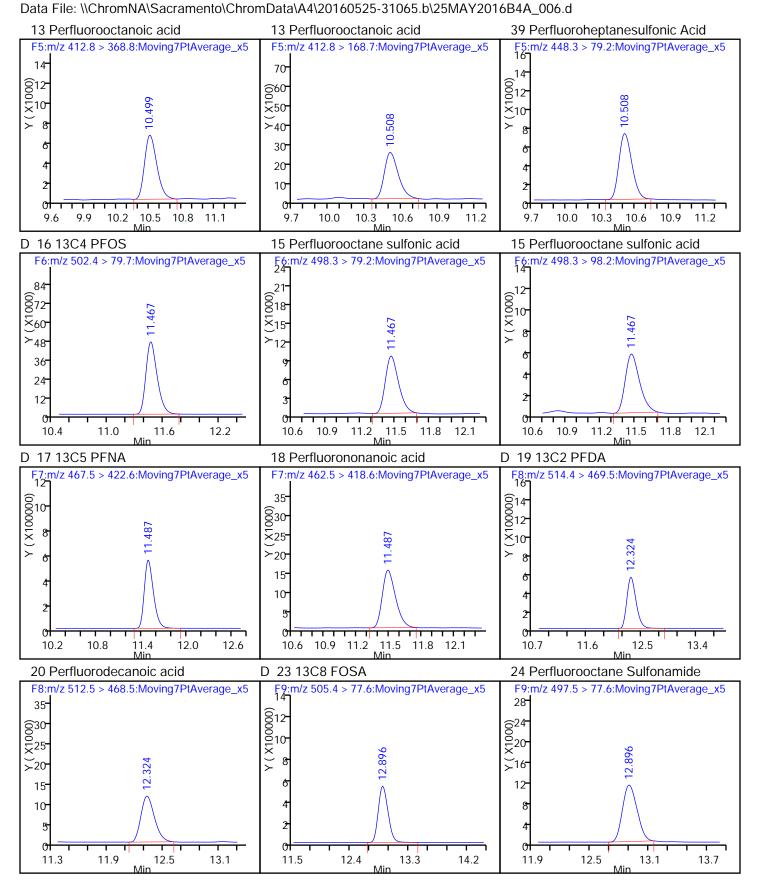
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L2_00018 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:02:22 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_006.d **Injection Date:** 25-May-2016 17:15:50 Instrument ID: A4 Lims ID: Std L2 Client ID: Operator ID: **JRB** ALS Bottle#: 11 Worklist Smp#: Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) 684 872 (0012 ×10° × 8 ≻₄₈-36 24 12 5.4 6.0 7.0 5.7 6.3 4.8 5.4 6.0 6.6 5.8 6.4 7.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 Y (X100000) (X1000) (X1000) 8 84 606.9 ×60 ≻₄₈-36 24 12 6.8 7.1 7.4 6.7 7.0 7.3 7.6 7.6 8.2 8.8 6.5 7.0 6.2 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 21 (X100000) X (X1000000) X (X1000000) 15 (018 000 15 × 12 (00012 X) > 9 8.155 7.8 8.1 8.7 8.9 9.5 8.8 9.1 9.4 9.7 10.0 7.5 8.4 8.3 10.1 8.5 12 13C4 PFOA 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 635 630 (000012-X) <u>0</u>12 ∑₁₀ ×25 ≻20 15 10 0 0 0 10.0 8.9 9.2 9.5 9.8 10.1 8.4 9.0 Page 5&6 of 776 10.2 9.4 10.6 8.6 05/26/2016



15.6

15.9

16.2

15

10

15.0

15.3

21

14

14.5

14.8

15.1

15.4

15.7

16.0

Report Date: 26-May-2016 11:02:34 Chrom Revision: 2.2 20-Apr-2016 13:59:46

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_007.d

Lims ID: Std L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 25-May-2016 17:36:58 ALS Bottle#: 12 Worklist Smp#: 7

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L3

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm, T=35C

Operator ID: **JRB** Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\\Sacramento\ChromData\\A4\\20160525-31065.b\\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:02:32 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: **Initial Calibration**

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

25-May-2016 18:12:20 First Level Reviewer: barnetti Date:

FIRST Level Revie	vei Reviewer: barnettj			Date: 25-May-2016 18				:12:20		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.797	5.798	-0.001	1.000	297640	5.21		104	1398	
D 113C4 PFBA										
216.7 > 171.5	5.797	5.798	-0.001		4448328	52.6		105	16101	
D 3 13C5-PFPe	eΑ									
267.6 > 222.7	6.909	6.907	0.002		3991347	52.0		104	6618	
4 Perfluoroper	ntanoic a	cid								
262.9 > 218.7	6.913	6.910	0.003	1.000	208712	5.15		103	94.5	
5 Perfluorobut		onate								
	7.024	7.024	0.0	1.000	98828	NC			240	
298.8 > 98.6	7.024	7.024	0.0	1.000	65179		1.52(0.00-0.00)		142	
51 Perfluorobu										
298.8 > 79.6		7.024	0.0	1.000	98828	3.99		90.3		
D 6 13C2 PFHx										
314.6 > 269.7	8.160	8.156	0.004		4410855	53.1		106	9884	
7 Perfluorohex										
		8.157	0.003	1.000	221266	5.41		108	858	
D 8 13C4-PFHp										
		9.387	0.001		4653428	54.4		109	7627	
9 Perfluorohep										
362.8 > 318.7	9.388		0.0	1.000	229994	4.75		95.0	663	
10 Perfluorohe										
398.3 > 79.2	9.419	9.421	-0.002	1.000	253682	NC			474	
58 Perfluorohe										
	9.419	9.421	-0.002	1.000	253682	4.56		96.4		
D 11 1802 PFH										
402.5 > 83.6	9.419	9.422	-0.003		1539364	51.9		110	4335	
					Page 589 of	776			05/26	6/2016

Report Date: 26-May-2016 11:02:34 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 26- Data File:	,			to\Chrom			20-Apr-2016 13:59: \\25MAY2016B4A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	10.502		-0.001		4731111	53.1		106	8520	
412.8 > 168.7	10.502 10.511	10.504 10.504	0.007	1.000 1.001	229522 76842	5.29	2.99(0.00-0.00)	106 106	435 335	
	10.502	10.508		1.000	260465	4.74		99.7		
	10.502		-0.006	1.000	260465	NC			1116	
D 16 13C4 PFC 502.4 > 79.7	11.461				346744	51.4		107	1150	
15 Perfluorood 498.3 > 79.2 498.3 > 98.2	11.461 11.470	11.466	-0.005	1.000 1.001	400180 222000	4.60	1.80(0.00-0.00)	96.3 96.3	1500 444	
	11.480		-0.004		4259193	54.3		109	7438	
18 Perfluorono 462.5 > 418.6	11.480		-0.006	1.000	540290	5.15		103	1060	
	12.327		0.002		5669119	56.7		113	5615	
	12.327		0.002	1.000	597671	5.08		102	1438	
D 23 13C8 FOS 505.4 > 77.6	12.888				5300712	54.9		110	4612	
24 Perfluorood 497.5 > 77.6	12.888	12.893		1.000	588024	5.19		104	1148	
25 Perfluorode 598.4 > 79.6	12.991	12.996		1.000	165005	NC			776	
	12.991	12.996		1.000	165005	5.40		112		
27 Perfluorour 562.4 > 518.5			0.002	1.000	644718	5.02		100	788	
D 26 13C2 PFU 564.3 > 519.5		13.044	0.0		5441575	53.7		107	5474	
D 28 13C2 PFD 614.4 > 569.4		13.646	-0.002		5430267	51.5		103	3396	
29 Perfluorodo 612.4 > 568.6			-0.002	1.000	548185	5.53		111	336	
30 Perfluorotrio 662.4 > 618.5			-0.008	1.000	442855	5.64		113	232	
32 Perfluorote 712.6 > 668.5			-0.008	1.000	194966	4.69		93.8	149	
D 33 13C2-PFT 714.5 > 669.5		14.601	0.001		3830217	50.5		101	2935	
D 35 13C2-PFH 814.8 > 769.6		15.255	-0.003		1499037	51.4		103	3014	
34 Perfluorohe 812.6 > 768.6			-0.003	1.000	Page 590 of 77	6 4.82		96.4	¹⁰⁴ /26	S/2016
					aye Jau Ul 11	O .			03/20	<i>,,</i> 2010

Report Date: 26-May-2016 11:02:34 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_007.d Data File:

EXP **DLT REL** Amount Signal RT RT ng/ml Ratio(Limits) %Rec S/N Flags RT RT Response

36 Perfluorooctandecanoic acid

912.7 > 868.6 15.591 15.593 -0.002 1.000 5.03 101 456 333192

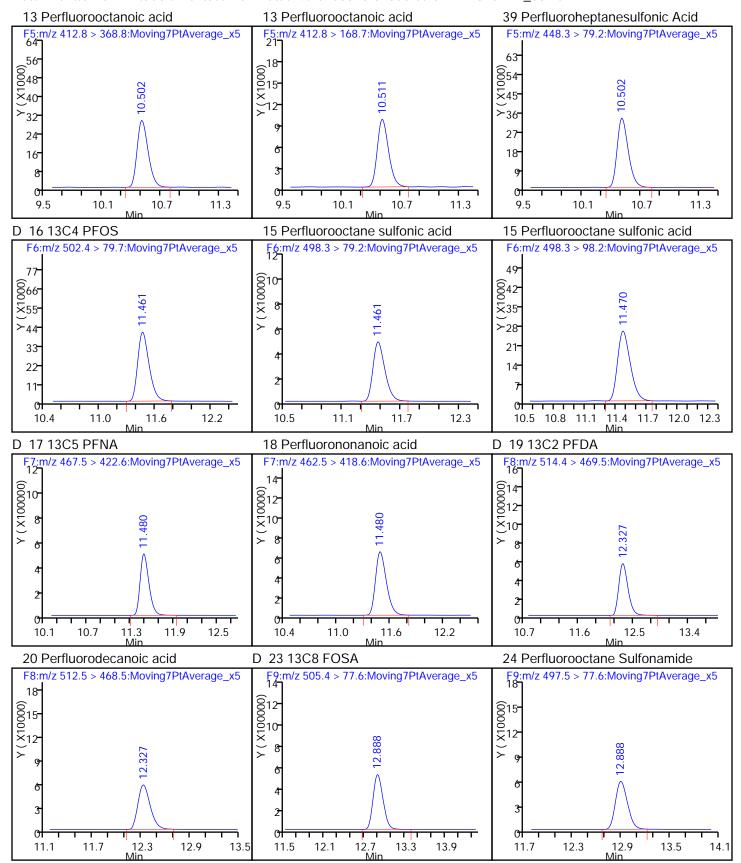
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00016 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:02:34 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_007.d **Injection Date:** 25-May-2016 17:36:58 Instrument ID: A4 Lims ID: Std L3 Client ID: Operator ID: **JRB** ALS Bottle#: 12 Worklist Smp#: 7 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 3 13C5-PFPeA F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 Y (X100000) 63 677-866-0 0 5 4 ×45 ≻₃₆-27 33 18 22 5.2 5.8 5.3 5.9 5.5 6.1 4.7 6.5 5.9 6.5 7.1 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 28 49 Y (X100000) 642 ×35 ©24- ×20-∑16- -28 21 6.9 7.2 6.8 7.1 7.8 7.6 8.2 8.8 6.5 7.4 6.3 6.6 7.5 7.0 6.2 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 (X100000) X (X1000000) X (X1000000) 56- 56- 6 6 8 <u>6</u>48 ×40 ×40 **≻**32 **≻**32 24 24 16 7.7 8.0 8.3 8.2 8.8 9.4 10.0 10.6 8.8 9.1 9.4 9.7 10.0 10.3 8.6 8.5 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS D 12 13C4 PFOA F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 (X100000) (X100000) (X100000) 35 (0030-56 6 6 8 -25 ⁻20 ≻₃₂ 15 24 10 16 0 0 08.8 9.1 9.4 9.7 10.0 10.3 8.4 9.0 Page 592h of 776 10.2 9.3 9.9 10.5 8.5



15.8

16.1

14.7

15.0

15.3

15.6

15.9

14.9

15.2

Report Date: 26-May-2016 11:02:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_008.d

Lims ID: Std L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 25-May-2016 17:58:10 ALS Bottle#: 13 Worklist Smp#: 8

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L4

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:02:44 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 19:09:55

First Level Revie	rst Level Reviewer: barnettj				Date: 25-May-2016 19:09:			55		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.797	5.798	-0.001	1.000	1071850	18.2		90.9	3903	
D 113C4 PFBA	١									
216.7 > 171.5	5.800	5.798	0.002		4591623	54.3		109	17146	
D 3 13C5-PFP6	eΑ									
267.6 > 222.7	6.904	6.907	-0.003		3991474	52.0		104	7812	
4 Perfluoroper	ntanoic a	cid								
262.9 > 218.7	6.909	6.910	-0.001	1.000	776204	19.1		95.7	360	
5 Perfluorobut										
298.8 > 79.6	7.024	7.024	0.0	1.000	360125	NC			703	
298.8 > 98.6	7.024	7.024		1.000	244125		1.48(0.00-0.00)		548	
51 Perfluorobu				1 000	0/0405	41.		0.4.5		
298.8 > 79.6		7.024	0.0	1.000	360125	16.7		94.5		
D 6 13C2 PFHx		0.457	0.001		4.420000	F2 F		107	7004	
314.6 > 269.7	8.155	8.156	-0.001		4438990	53.5		107	7931	
7 Perfluorohex			0.000	1 000	701207	17.0		00.7	1 401	
		8.157	-0.002	1.000	721387	17.9		89.6	1491	
D 8 13C4-PFH _p 366.6 > 321.6	9.388	9.387	0.001		4352241	50.9		102	7598	
			0.001		4332241	30.9		102	7390	
9 Perfluorohep 362.8 > 318.7		9.388	0.0	1.000	762273	17.9		89.4	2345	
			0.0	1.000	702273	17.7		07.4	2343	
10 Perfluorohe 398.3 > 79.2	9.419		-0.002	1.000	836825	NC			1573	
58 Perfluorohe				1.000	030023	NC			1373	
398.3 > 79.2		9.421		1.000	836825	16.7		88.5		
D 11 1802 PFH	xS									
402.5 > 83.6	9.419	9.422	-0.003		1383940	46.6		98.6	2880	
					Page 595 of	776			05/26	6/2016

Report Date: 26-May-2016 11:02:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 26- Data File:				to\Chrom			20-Apr-2016 13:59: \25MAY2016B4A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFC 416.5 > 371.6	A 10.502	10.503	-0.001		4400676	49.4		98.7	8204	
412.8 > 168.7	10.502 10.502	10.504 10.504	-0.002	1.000 1.000	740049 254003	18.5	2.91(0.00-0.00)	92.6 92.6	1413 1124	
	10.511	10.508		1.000	874389	15.8		82.9		
	10.511		0.003	1.000	874389	NC			1812	
D 16 13C4 PFC 502.4 > 79.7	11.461				343813	50.9		107	1367	
15 Perfluorood 498.3 > 79.2 498.3 > 98.2	11.470 11.461	11.466	0.004	1.000 0.999	1353901 818357	14.1	1.65(0.00-0.00)	73.8 73.8	2350 1126	
	11.480		-0.004		4095685	52.2		104	5733	
18 Perfluorono 462.5 > 418.6	11.480		-0.006	1.000	1866863	18.5		92.6	3372	
D 19 13C2 PFD 514.4 > 469.5	A 12.327	12.325	0.002		4909456	49.1		98.3	6069	
20 Perfluorode 512.5 > 468.5	ecanoic a 12.327		0.002	1.000	2122830	20.8		104	2631	
D 23 13C8 FOS 505.4 > 77.6	5A 12.888	12.893	-0.005		5285513	54.8		110	5392	
24 Perfluorood 497.5 > 77.6				1.000	2104314	18.6		93.1	2345	
25 Perfluorode 598.4 > 79.6			-0.005	1.000	522503	NC			1398	
49 Perfluorode 598.4 > 79.6	ecane Sul 12.991			1.000	522503	17.3		89.5		
27 Perfluorour 562.4 > 518.5			0.002	1.000	2308031	18.4		92.0	2547	
D 26 13C2 PFU 564.3 > 519.5		13.044	0.0		5319223	52.5		105	6022	
D 28 13C2 PFD 614.4 > 569.4		13.646	-0.002		5576489	52.9		106	2954	
29 Perfluorodo 612.4 > 568.6	decanoio	acid		1.000	1916429	18.8		94.2	936	
30 Perfluorotrio 662.4 > 618.5	decanoic	acid				18.6		93.0	875	
32 Perfluorote	tradecand	oic acid		1.000	1515996					
712.6 > 668.5 D 33 13C2-PFT	eDA			1.000	701642	16.3		81.4	530	
714.5 > 669.5 D 35 13C2-PFH		14.601	0.001		3973031	52.3		105	2966	
814.8 > 769.6 34 Perfluorohe			-0.003		1482695	50.9		102	2650	
812.6 > 768.6			-0.003	1.000	Page 596 of 77	6 18.0		89.8	327/26	6/2016

Report Date: 26-May-2016 11:02:45 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_008.d Data File:

EXP **DLT REL** Amount RT RT ng/ml Ratio(Limits) %Rec S/N Flags Signal RT RT Response

36 Perfluorooctandecanoic acid

912.7 > 868.6 15.591 15.593 -0.002 1.000 18.1 90.6 1188460 1236

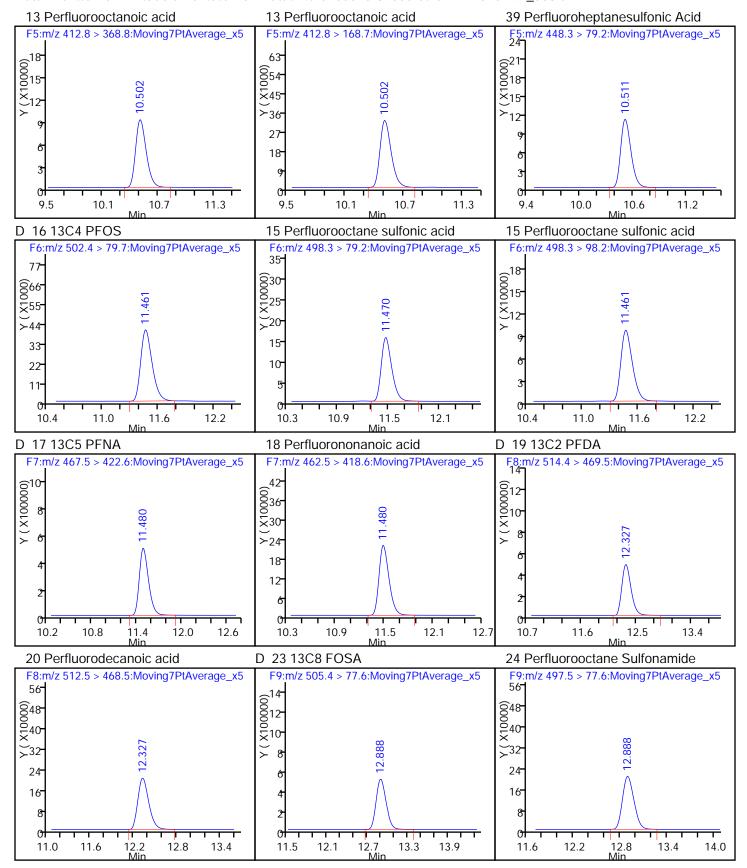
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00018 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:02:45 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_008.d **Injection Date:** 25-May-2016 17:58:10 Instrument ID: A4 Lims ID: Std L4 Client ID: Operator ID: **JRB** ALS Bottle#: 13 Worklist Smp#: 8 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) ©21-©18-678 678 ∑₁₅ ∑65 39 26 13 5.2 5.8 5.2 5.8 5.9 7.1 5.5 6.1 4.6 6.4 6.5 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 18 77-Y (X100000) 00015 X12 <u>666</u> ∑55- **≻**44 33 22 11-6.9 7.2 6.4 7.0 7.6 7.8 7.2 7.8 8.4 8.7 5.8 6.6 7.5 7.5 8.1 9.0 6.3 8 13C4-PFHpA 7 Perfluorohexanoic acid 9 Perfluoroheptanoic acid F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 (00015-X)12-Y (X100000) (00015-00015-012-7.7 8.0 8.3 8.2 8.8 9.4 10.0 10.6 8.9 9.5 10.1 8.6 8.3 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS 12 13C4 PFOA F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 18 (X100000) 630 625 00015 X12 ∑₂₀ 10 0 0 10.0 8.7 9.3 9.9 10.5 8.4 9.0 Page 59% of 776 10.2 9.4 10.6 8.1 05/26/2016



15.6 15.9 16.2 16.5

18

12

14.7 15.0 15.3

14

14.2

14.8

15.4

16.0

Report Date: 26-May-2016 11:02:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_009.d

Lims ID: Std L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 25-May-2016 18:19:21 ALS Bottle#: 14 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L5

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm, T=35C

Operator ID: **JRB** Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\\Sacramento\ChromData\\A4\\20160525-31065.b\\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:02:52 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: **Initial Calibration**

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

25-May-2016 20:09:50 First Level Reviewer: barnetti Date:

First Level Revie	viewer: barneiij			Date: 25-May-2016				20:09:50		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.800	5.798	0.002	1.000	3100647	53.4		107	9264	
D 113C4 PFBA										
216.7 > 171.5	5.797	5.798	-0.001		4524446	53.5		107	13463	
D 3 13C5-PFPe	eΑ									
267.6 > 222.7	6.904	6.907	-0.003		4006540	52.2		104	6534	
4 Perfluoropen	ntanoic a	cid								
262.9 > 218.7	6.909	6.910	-0.001	1.000	2027795	49.8		99.7	813	
5 Perfluorobuta		onate								
		7.024	0.0	1.000	989482	NC			1707	
298.8 > 98.6	7.024	7.024	0.0	1.000	595561		1.66(0.00-0.00)		1061	
51 Perfluorobut										
298.8 > 79.6		7.024	0.0	1.000	989482	47.5		108		
D 613C2 PFHx										
314.6 > 269.7	8.155	8.156	-0.001		4436301	53.4		107	10982	
7 Perfluorohex										
		8.157	-0.002	1.000	2079954	52.1		104	2188	
D 8 13C4-PFHp										
		9.387	0.001		4425881	51.8		104	6353	
9 Perfluorohep										
362.8 > 318.7	9.388	9.388	0.0	1.000	2246637	52.6		105	4886	
10 Perfluorohe										
398.3 > 79.2	9.419	9.421	-0.002	1.000	2346082	NC			3698	
58 Perfluorohe										
	9.419	9.421	-0.002	1.000	2346082	48.3		102		
D 11 1802 PFH:										
402.5 > 83.6	9.419	9.422	-0.003		1345505	45.3		95.8	2598	
					Page 601 of	776			05/26	6/2016

Report Date: 26-May-2016 11:02:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\Chrom			\25MAY2016B4A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFC	DΑ									
416.5 > 371.6	10.500		-0.003		4323584	48.5		97.0	5641	
13 Perfluorood 412.8 > 368.8	10.509		0.005	1.000	2069583	52.9		106	2106	
412.8 > 168.7		10.504		1.000	659359	52.9	3.14(0.00-0.00)	106	1960	
39 Perfluorohe	•									
448.3 > 79.2		10.508	0.001	1.000	2237092	48.2		101		
14 Perfluorohe 448.3 > 79.2	10.509		0.001	1.000	2237092	NC			4297	
D 16 13C4 PFC)S									
	11.468				286688	42.5		88.9	983	
15 Perfluorood				1 000	2704007	44.0		02.7	2220	
498.3 > 79.2 498.3 > 98.2		11.466 11.466		1.000 1.000	3704007 2172713	44.8	1.70(0.00-0.00)	93.7 93.7	3220 3206	
D 17 13C5 PFN		11.400	0.002	1.000	21/2/13		1.70(0.00-0.00)	73.7	3200	
	11.488	11.484	0.004		4072196	51.9		104	6079	
18 Perfluorono	onanoic a	cid								
462.5 > 418.6		11.486	0.002	1.000	4992828	49.8		99.6	4565	
D 19 13C2 PFD 514.4 > 469.5	DA 12.325	12.325	0.0		4916681	49.2		98.4	5079	
20 Perfluorode			0.0		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	. ,		70		
512.5 > 468.5		12.325	0.0	1.000	5574851	54.6		109	4682	
D 23 13C8 FOS 505.4 > 77.6		12.893	0.004		4892798	50.7		101	3472	
24 Perfluorood					4092790	50.7		101	3472	
497.5 > 77.6		12.893		1.000	5329485	50.9		102	3524	
25 Perfluorode			0.004	4 000	40477/0	NO			000/	
598.4 > 79.6		12.996		1.000	1217760	NC			3026	
49 Perfluorode 598.4 > 79.6	13.000			1.000	1217760	48.2		100		
27 Perfluorour	ndecanoio	c acid								
562.4 > 518.5		13.042	0.0	1.000	6249999	49.9		99.9	4164	
D 26 13C2 PFU 564.3 > 519.5		13.044	-0.002		5308317	52.4		105	5567	
D 28 13C2 PFC	ОоА									
614.4 > 569.4			-0.007		5426626	51.5		103	3060	
29 Perfluorodo 612.4 > 568.6	naecanoio 13.639		-0.007	1.000	5541148	56.0		112	2330	
30 Perfluorotri										
662.4 > 618.5	14.161	14.162	-0.001	1.000	4237745	48.5		97.0	1792	
32 Perfluorote			0.004	1 000	4040405	40.0		04.0	4007	
712.6 > 668.5 D 33 13C2-PFT	14.599	14.600	-0.001	1.000	1949635	42.2		84.3	1207	
714.5 > 669.5		14.601	-0.002		4261548	56.2		112	3742	
D 35 13C2-PFF										
814.8 > 769.6			0.003		1625355	55.8		112	3319	
34 Perfluorohe 812.6 > 768.6			0.003	1.000	Page 602 of 776	. 52.7		105	828 05/26	2/2040
				-	Page 602 01 //6)			05/26	0/2016

Report Date: 26-May-2016 11:02:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_009.d Data File:

EXP **DLT REL** Amount Signal RT RT ng/ml Ratio(Limits) %Rec S/N Flags RT RT Response

36 Perfluorooctandecanoic acid

912.7 > 868.6 15.595 15.593 0.002 109 1.000 3933807 54.7 2837

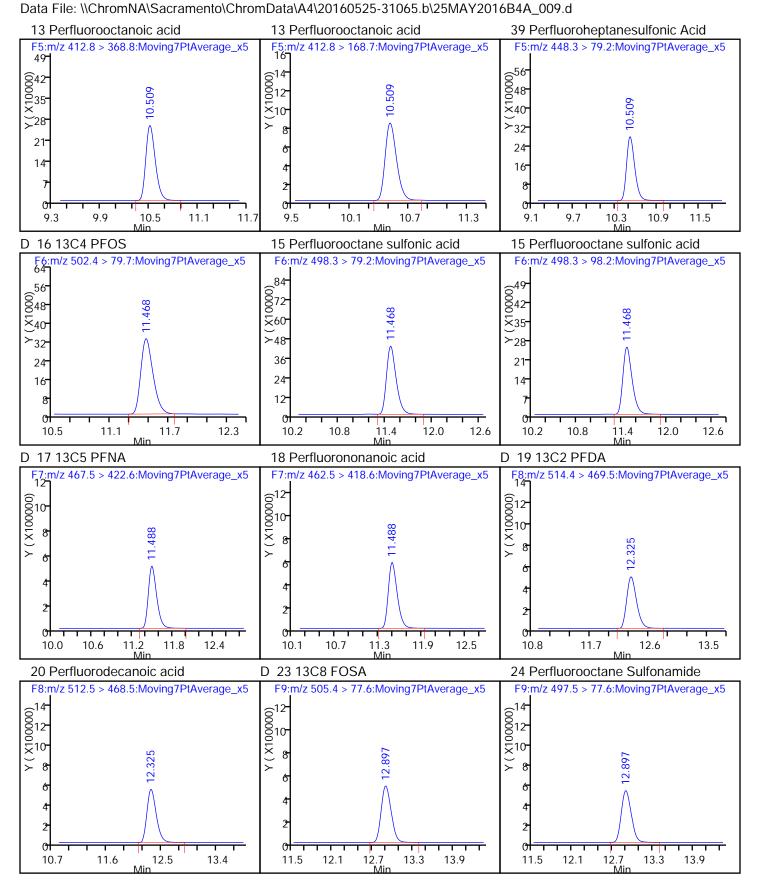
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Report Date: 26-May-2016 11:02:54 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_009.d **Injection Date:** 25-May-2016 18:19:21 Instrument ID: A4 Lims ID: Std L5 Client ID: Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 9 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 56- 84 6⁷⁷ 0048 ×40 0072 X60 ×55 -32 ×48 24 36 33 24 22 12 5.2 5.8 5.3 5.9 6.5 7.1 6.4 7.0 4.7 6.5 5.9 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 24 91 0030 036 ©20-×16-(0078-0078-005-**≻**52 12 18 39 26 13 7.9 6.4 7.0 6.8 7.1 7.4 7.7 7.3 8.5 9.1 5.8 7.6 6.2 6.5 6.7 8 13C4-PFHpA 7 Perfluorohexanoic acid 9 Perfluoroheptanoic acid F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 56- 49-00042-×35-Y (X100000) 0048 1000 ×40 <u></u>32⁻ ≻28 24 21 16 14 7.8 8.4 9.0 8.7 9.3 9.9 8.8 9.4 10.0 8.1 10.5 8.2 10.6 58 Perfluorohexanesulfonic acid 11 1802 PFHxS 12 13C4 PFOA F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 56 (X100000) (048 (00001X) 630 625 ∑₂₀ <u></u>32− 15 24 10 16 0 0 0 7.8 8.7 9.6 10.5 8.4 Page 604h of 776 10.2 9.3 9.9 10.5



15.8

16.4

15.2

0

14.6

14.6

14.0

15.2

15.8

16.4

Report Date: 26-May-2016 11:03:08 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_010.d

Lims ID: Std L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 25-May-2016 18:40:31 ALS Bottle#: 15 Worklist Smp#: 10

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L6

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:06 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 19:32:47

First Level Revie	t Level Reviewer: barnettj				Date: 25-May-2016 19:32:47			47		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.797	5.798	-0.001	1.000	9621902	217.0		109	17052	
D 113C4 PFBA	4									
216.7 > 171.5	5.800	5.798	0.002		3454161	40.9		81.7	9277	
D 3 13C5-PFPe										
267.6 > 222.7	6.909	6.907	0.002		3368310	43.9		87.8	7420	
4 Perfluoroper					.===					
	6.909		-0.001	1.000	6709860	196.1		98.1	2582	
5 Perfluorobut			0.0	1 000	2075252	NC			70/7	
298.8 > 79.6 298.8 > 98.6	7.024 7.024	7.024 7.024	0.0	1.000 1.000	2975252 1882375	NC	1.58(0.00-0.00)		7267 4185	
51 Perfluorobu				1.000	1002373		1.30(0.00-0.00)		4103	
298.8 > 79.6	7.024	7.024		1.000	2975252	186.4		105		
D 613C2 PFHx										
314.6 > 269.7	8.155	8.156	-0.001		3792575	45.7		91.4	9905	
7 Perfluorohex	canoic ac	cid								
312.9 > 268.7	8.155	8.157	-0.002	1.000	6791811	199.4		99.7	2196	
D 8 13C4-PFHp	ρA									
366.6 > 321.6	9.388	9.387	0.001		3631838	42.5		85.0	5756	
9 Perfluorohep										
362.8 > 318.7	9.388	9.388	0.0	1.000	7377792	211.7		106	7400	
10 Perfluorohe:										
398.3 > 79.2	9.427		0.006	1.000	7078226	NC			5491	
58 Perfluorohe										
398.3 > 79.2	9.427	9.421	0.006	1.000	7078226	189.4		100		
D 11 1802 PFH:		0.400	0.000		1001100	0.4.0		70.7	0.4.00	
402.5 > 83.6	9.419	9.422	-0.003		1034483	34.9		73.7	2680	
					Page 607 of	776			05/26	6/2016

Report Date: 26-May-2016 11:03:08 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\Chrom)\25MAY2016B4A_(
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFC	PΑ									
416.5 > 371.6	10.509	10.503	0.006		3460734	38.8		77.6	6681	
13 Perfluorood	tanoic ad	cid								
412.8 > 368.8	10.509			1.000	6221982	198.7		99.4	5486	
412.8 > 168.7	10.509	10.504	0.005	1.000	2017481		3.08(0.00-0.00)	99.4	3896	
39 Perfluorohe	•									
448.3 > 79.2		10.508	0.001	1.000	6537635	198.8		104		
14 Perfluorohe	-									
	10.509	10.508	0.001	1.000	6537635	NC			5179	
D 16 13C4 PFC										
	11.467				202612	30.0		62.8	901	
15 Perfluorood										
498.3 > 79.2		11.466		1.000	10959354	185.4		97.0	2831	
498.3 > 98.2		11.466	0.001	1.000	6591696		1.66(0.00-0.00)	97.0	3500	
D 17 13C5 PFN										
	11.487		0.003		3399779	43.3		86.7	4637	
18 Perfluorono										
462.5 > 418.6	11.487	11.486	0.001	1.000	16403896	196.0		98.0	7842	
D 19 13C2 PFD	Α									
514.4 > 469.5	12.324	12.325	-0.001		4414285	44.2		88.4	7325	
20 Perfluorode	ecanoic a	cid								
512.5 > 468.5	12.324	12.325	-0.001	1.000	18799359	205.0		103	6134	
D 23 13C8 FOS	SA									
505.4 > 77.6	12.896	12.893	0.003		4052543	42.0		84.0	3474	
24 Perfluorood	tane Sul	fonamide	Э							
497.5 > 77.6	12.896	12.893	0.003	1.000	18507083	213.5		107	5047	
25 Perfluorode	ecane Su	lfonate								
598.4 > 79.6	12.999	12.996	0.003	1.000	3388769	NC			2969	
49 Perfluorode	ecane Su	Ifonic ac	id							
598.4 > 79.6	12.999	12.996	0.003	1.000	3388769	189.9		98.5		
27 Perfluorour	ndecanoi	c acid								
562.4 > 518.5	13.041	13.042	-0.001	1.000	20642853	207.5		104	4465	
D 26 13C2 PFU	InA									
564.3 > 519.5		13.044	-0.003		4218333	41.6		83.2	4177	
D 28 13C2 PFD	οΑ									
614.4 > 569.4		13.646	0.004		4640667	44.0		88.1	3049	
29 Perfluorodo	odecanoi	c acid								
	13.650		0.004	1.000	17735307	209.5		105	3265	
30 Perfluorotri										
	14.161		-0.001	1.000	13845210	197.9		98.9	2730	
32 Perfluorote			0.00.		.00.02.0	.,,,,		70.7		
	14.598		-0.002	1.000	6238413	168.5		84.3	2114	
		14.000	0.002	1.000	0230+13	100.0		04.0	2117	
D 33 13C2-PFT		14 601	0.003		2/12102	45 O		90 O	2045	
714.5 > 669.5		14.001	-0.003		3412182	45.0		89.9	2965	
D 35 13C2-PFH		15 055	0.000		1245544	47.0		00.0	2205	
	15.257		0.002		1345541	46.2		92.3	2295	
34 Perfluorohe			0.000	4 000	4.4.7070.	0044		400	1001	
812.6 > 768.6	15.25/	15.255	0.002	1.000	Page 608 of 7	776 ^{204.1}		102	190 <u>1</u> /26	6/2016

Report Date: 26-May-2016 11:03:08 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_010.d Data File:

EXP **DLT REL Amount** RT RT ng/ml Ratio(Limits) %Rec S/N Flags Signal RT RT Response

36 Perfluorooctandecanoic acid

912.7 > 868.6 15.595 15.593 0.002 92.4 1.000 10994803 184.8 3575

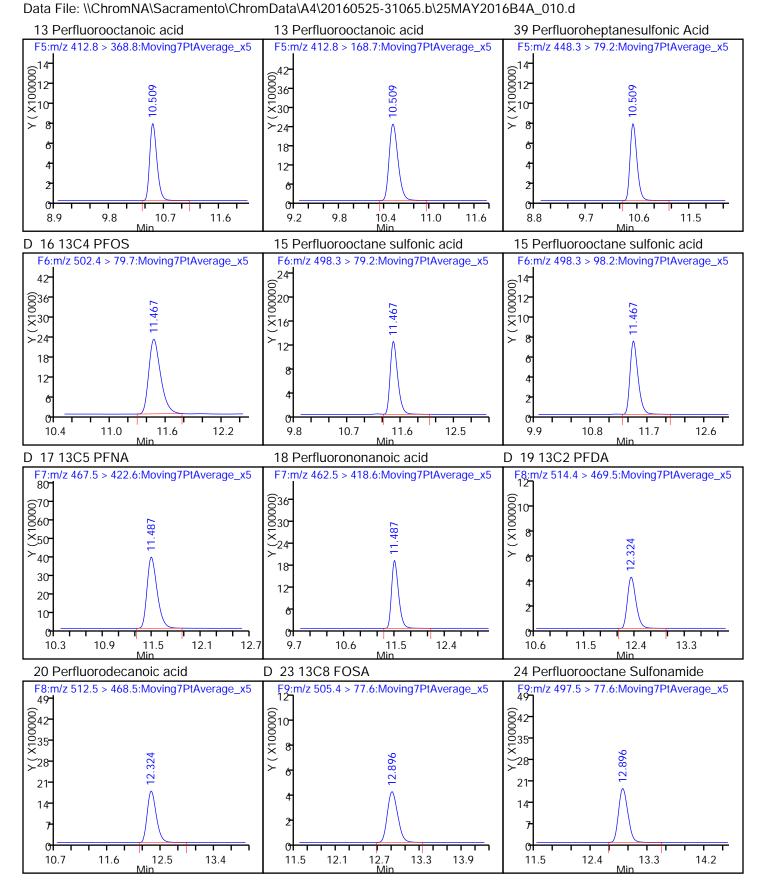
QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00015 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:03:08 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_010.d **Injection Date:** 25-May-2016 18:40:31 Instrument ID: A4 Lims ID: Std L6 Client ID: Operator ID: **JRB** ALS Bottle#: 15 Worklist Smp#: 10 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 18 (X100000) X 63 0054**-**00545-00545-060-×50--36 _ ≻40 27 30 18 20 10 5.1 5.7 6.3 6.9 6.0 7.0 4.8 5.4 6.6 5.8 6.4 7.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D $F2:m/z \ 262.9 > 218.7:Moving7PtAverage \ x5$ F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 (0000012) X & 56- 77 00048- 10000 40- 0066 ×55 <u></u>32 --44 24 33 16- 22 11-6.4 7.0 7.6 6.3 7.2 8.1 7.4 8.0 8.6 9.2 5.8 5.4 6.8 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 77- (018 000015 X)12 0014 0012 X10 ∑55- **≻**44 33 22 11 01 7.3 7.9 8.5 9.1 8.8 9.4 8.7 9.6 10.5 8.2 10.0 7.8 6.7 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS 12 13C4 PFOA F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 24 (0000012⁻ 670 660 0 0 20 ∑₁₀ ∑₁₆-×50 >₄₀ 12 30 20 10 0 00 7.9 8.8 9.7 10.6 8.4 9.0 Page 6Mh of 776 10.2 9.3 9.9 10.5



15.7

16.3

15-

10

14.5

15.1

18

12

14.0

14.6

15.2

15.8

16.4

Report Date: 26-May-2016 11:03:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Lims ID: Std L7

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 25-May-2016 19:01:43 ALS Bottle#: 16 Worklist Smp#: 11

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L7

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:19 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 19:38:14

First Level Revie	irst Level Reviewer: barnettj				Date: 25-May-2016 19:38:14			14		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.800	5.798	0.002	1.000	18955715	439.6		110	31257	
D 113C4 PFBA	٨									
216.7 > 171.5	5.800	5.798	0.002		3359557	39.7		79.5	9276	
D 3 13C5-PFP6	eΑ									
267.6 > 222.7	6.904	6.907	-0.003		2881925	37.6		75.1	4979	
4 Perfluoroper										
262.9 > 218.7	6.909	6.910	-0.001	1.000	10999657	375.7		93.9	3476	
5 Perfluorobut										
298.8 > 79.6	7.024	7.024	0.0	1.000	4799473	NC	1 50/0 00 0 00)		10933	
298.8 > 98.6	7.024	7.024		1.000	3025074		1.59(0.00-0.00)		6160	
51 Perfluorobu 298.8 > 79.6		onic acid 7.024		1.000	4799473	354.6		100		
D 6 13C2 PFHx		7.024	0.0	1.000	4777473	334.0		100		
314.6 > 269.7	8.155	8.156	-0.001		3168006	38.2		76.3	4926	
7 Perfluorohex			0.001		0.00000	00.2		70.0	1,20	
		8.157	-0.002	1.000	11383764	400.2		100	2155	
D 8 13C4-PFH _R										
	9.380	9.387	-0.007		3129112	36.6		73.2	4202	
9 Perfluoroher	otanoic a	cid								
362.8 > 318.7		9.388	0.0	1.000	12395409	413.1		103	6683	
10 Perfluorohe	xane Sul	lfonate								
398.3 > 79.2	9.419	9.421	-0.002	1.000	12149225	NC			7701	
58 Perfluorohe	xanesulf	onic acid	d							
398.3 > 79.2	9.419	9.421	-0.002	1.000	12149225	383.3		101		
D 11 18O2 PFH										
402.5 > 83.6	9.427	9.422	0.005		877315	29.6		62.5	2317	
					Page 613 of	776			05/26	6/2016

Report Date: 26-May-2016 11:03:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 26- Data File:			Chrom Revision: 2.2 20-Apr-2016 13:59:46 nto\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d							
	1,01,110	EXP	DLT	REL	15414111120100	Amount	12011111120102111	711.0		
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 12 13C4 PFO	Α									
416.5 > 371.6	10.502	10.503	-0.001		2892631	32.4		64.9	3522	
13 Perfluorooc			0.000	1 000	1045/47/	200 /		00.0	E 4 E 4	
412.8 > 368.8 412.8 > 168.7	10.502 10.502			1.000 1.000	10456476 3385329	399.6	3.09(0.00-0.00)	99.9 99.9	5451 3599	
39 Perfluorohe					0000027		0.07(0.00 0.00)	, , , ,	0077	
448.3 > 79.2	10.511			1.000	10288308	422.7		111		
14 Perfluorohe	•									
	10.511	10.508	0.003	1.000	10288308	NC			4016	
D 16 13C4 PFO 502.4 > 79.7	S 11.461	11 //65	-0 004		149927	22.2		46.5	435	
15 Perfluorooc					14//2/	22.2		40.5	433	
498.3 > 79.2	11.461			1.000	17351697	396.0		104	2400	
498.3 > 98.2	11.461	11.466	-0.005	1.000	10408783		1.67(0.00-0.00)	104	2974	
D 17 13C5 PFN		11 101	0.004		2002250	27.0		740	4774	
	11.480		-0.004		2902258	37.0		74.0	4664	
18 Perfluorono 462.5 > 418.6	nanoic a 11.489		0.003	1.000	28286865	396.0		99.0	8740	
D 19 13C2 PFD			0.000			0,0.0		,,,,	0	
	12.328	12.325	0.003		3546229	35.5		71.0	3861	
20 Perfluorode										
	12.328	12.325	0.003	1.000	31336025	425.4		106	5310	
D 23 13C8 FOS 505.4 > 77.6	A 12.888	12 002	0.005		3500532	36.3		72.5	3380	
24 Perfluorooc					3300332	30.3		72.5	3300	
497.5 > 77.6	12.888			1.000	31417050	419.7		105	3789	
25 Perfluorode	cane Sul	lfonate								
598.4 > 79.6	12.991	12.996	-0.005	1.000	5249459	NC			3431	
49 Perfluorode										
598.4 > 79.6	12.991		-0.005	1.000	5249459	397.6		103		
27 Perfluoroun 562.4 > 518.5			0 003	1.000	33914731	394.1		98.5	5142	
D 26 13C2 PFU		13.042	0.003	1.000	33714731	374.1		70.5	3172	
564.3 > 519.5		13.044	0.001		3648730	36.0		72.0	3746	
D 28 13C2 PFD	οA									
614.4 > 569.4	13.644	13.646	-0.002		4064771	38.6		77.1	3105	
29 Perfluorodo			0.000	1 000	20/4/202	200.0		100.0	2027	
612.4 > 568.6			-0.002	1.000	29646208	399.8		100.0	3037	
30 Perfluorotrio 662.4 > 618.5	aecanoic 14.165		0.003	1.000	23843779	364.8		91.2	3003	
32 Perfluorotet			0.000	1.000	20010777	001.0		,	0000	
712.6 > 668.5			0.002	1.000	11465072	331.6		82.9	2655	
D 33 13C2-PFT	eDA									
	14.602	14.601	0.001		3186926	42.0		84.0	3029	
D 35 13C2-PFH		15 255	0.000		11/5000	40.0		00.0	2242	
	15.252		-0.003		1165903	40.0		80.0	2242	
34 Perfluorohe 812.6 > 768.6			-0.003	1.000	25142674 Page 614 of 7	418.5		105	²³ 75/26	2/0040
				-	Page 614 of	0110			05/26)/2016

Report Date: 26-May-2016 11:03:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

104 4306 21401177 415.1

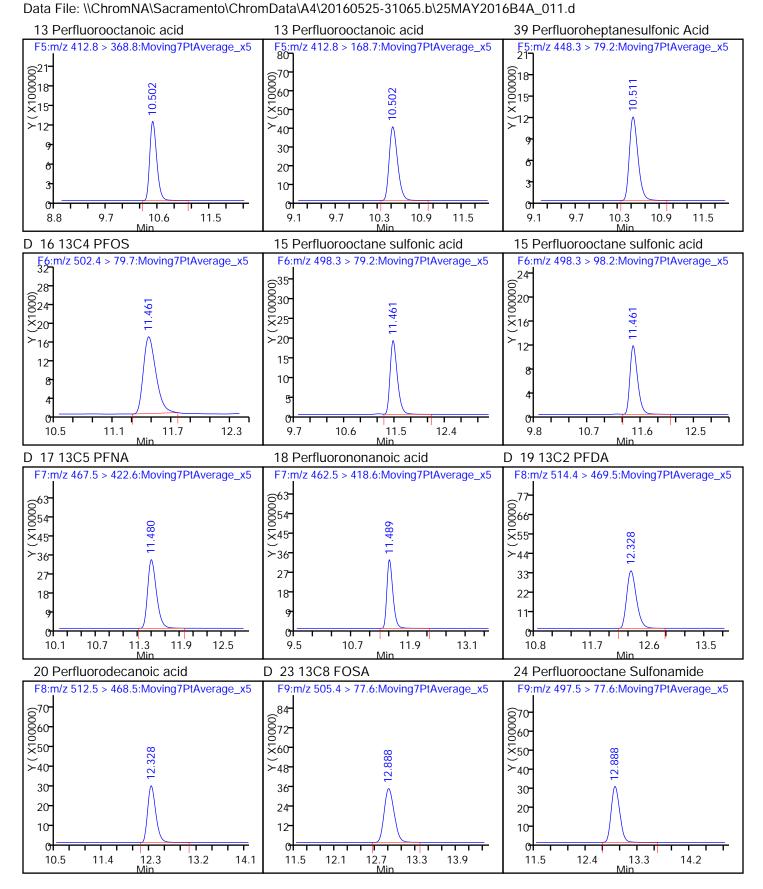
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00015 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:03:21 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d **Injection Date:** 25-May-2016 19:01:43 Instrument ID: A4 Lims ID: Std L7 Client ID: Operator ID: **JRB** ALS Bottle#: 16 Worklist Smp#: 11 Injection Vol: 15.0 ul Dil. Factor: 1.0000 Method: PFAC A4 Limit Group: LC PFC_DOD ICAL 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 56- 56 0030 25-× 20 0048 0048 ×40 0048 ×40 -32 15 24 24 10 16 16 4.8 7.5 5.3 5.9 6.9 5.7 6.6 4.7 6.5 6.3 6.6 7.2 7.5 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid $F2:m/z \ 262.9 > 218.7:Moving7PtAverage \ x5$ F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 (000018 (000015) 15-12-84 63 0054 6072- 560- $\stackrel{\smile}{\times}_{45}$ **≻**48 ≻₃₆-36 27 24 18 12 6.7 7.0 7.9 7.7 8.9 7.3 7.9 8.8 8.3 6.1 6.1 7.1 5.5 5.2 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 70 (24⁻ 00020 0024 00020 × 16 0060 X 50 9.380 ∑₁₆ 16 ∑40⁻ 12 30 20 7.6 8.5 8.8 9.4 10.0 8.7 9.6 10.5 9.4 8.2 7.8 6.7 D 12 13C4 PFOA 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 (00001 00020 (18-(000015-63 0054 ∑₁₆ ×45 **≻**36• 12 27 18 0 0 8.5 9.4 10.3 11.2 8.3 8.9 Page 61/6 of 776 10.1 9.3 9.9 10.5 7.6



16.0

16.6

18

14.2

14.8

20

10

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15.2

15.8

16.4

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A6

GC Column: Acquity

Calibration Start Date: 05/24/2016 17:07

Calibration End Date: 05/24/2016 19:14

Analy Batch No.: 111182

The part of the purple of the purple

Calibration Files:

LAB SAMPLE ID:	LAB FILE ID:
STD 320-111182/4	24MAY2016A6A 004.d
STD 320-111182/5	24MAY2016A6A 005.d
STD 320-111182/6	24MAY2016A6A 006.d
STD 320-111182/7	24MAY2016A6A 007.d
STD 320-111182/8	24MAY2016A6A 008.d
STD 320-111182/9	24MAY2016A6A 009.d
STD 320-111182/10	24MAY2016A6A 010.d
	STD 320-111182/4 STD 320-111182/5 STD 320-111182/6 STD 320-111182/7 STD 320-111182/8 STD 320-111182/9

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)		5.794	5.791	5.788	5.785	5.791	5.794	0.000 - 0.000	5.791
Perfluoropentanoic acid (PFPeA)	+++++	6.951	6.946	6.946	6.951	6.951	6.951	6.699 - 7.199	6.949
Perfluorobutanesulfonic acid (PFBS)	7.078	7.067	7.081	7.078	7.071	7.071	7.071	6.824 - 7.324	7.074
Perfluorohexanoic acid (PFHxA)	8.214	8.230	8.230	8.225	8.230	+++++	+++++	7.975 - 8.475	8.226
Perfluoroheptanoic acid (PFHpA)	9.464	9.464	9.470	9.463	9.464	9.458	+++++	9.212 - 9.712	9.464
Perfluorohexanesulfonic acid (PFHxS)	9.499	9.487	9.499	9.498	9.499	9.493	9.487	9.245 - 9.745	9.495
Perfluorooctanoic acid (PFOA)	+++++	10.577	10.577	10.577	10.586	10.568	+++++	10.323 - 10.823	10.577
Perfluoroheptanesulfonic Acid (PFHpS)		10.596	10.586	10.586	10.586	10.577	10.577	0.000 - 0.000	10.585
Perfluorooctanesulfonic acid (PFOS)	++++	11.527	11.527	11.526	11.527	11.518	11.518	11.274 - 11.774	11.524
Perfluorononanoic acid (PFNA)	++++	11.545	11.553	11.553	11.553	11.545	+++++	11.297 - 11.797	11.550
Perfluorodecanoic acid (PFDA)	12.373	12.363	12.383	12.373	12.383	+++++	+++++	12.126 - 12.626	12.375
Perfluorooctane Sulfonamide (FOSA)	++++	12.994	12.994	12.994	12.994	12.994	12.994	12.744 - 13.244	12.994
Perfluorodecanesulfonic acid (PFDS)	13.024	13.031	13.032	13.032	13.031	13.031	13.041	12.782 - 13.282	13.032
Perfluoroundecanoic acid (PFUnA)	++++	13.084	13.085	13.076	13.075	13.084	13.094	12.832 - 13.332	13.083
Perfluorododecanoic acid (PFDoA)		13.664	13.666	13.657	13.664	13.673	13.676	0.000 - 0.000	13.667
Perfluorotridecanoic Acid (PFTriA)	14.159	14.166	14.167	14.167	14.166	14.173	14.167	13.916 - 14.416	14.166
Perfluorotetradecanoic acid (PFTeA)	14.589	14.595	14.589	14.589	14.588	14.594	14.583	14.340 - 14.840	14.590
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++	15.178	15.180	15.184	15.178	15.178	15.175	14.929 - 15.429	15.179
Perfluoro-n-octandecanoic acid (PFODA)	15.456	15.445	15.446	15.456	15.450	15.449	15.446	15.200 - 15.700	15.450
13C4 PFBA	5.794	5.797	5.794	5.797	5.788	5.800	5.803	5.546 - 6.046	5.796
13C5-PFPeA	6.951	6.946	6.946	6.941	6.946	6.946	6.946	6.696 - 7.196	6.946
13C2 PFHxA	8.225	8.225	8.219	8.225	8.219	8.219	+++++	7.973 - 8.473	8.222
13C4-PFHpA	9.464	9.464	9.464	9.463	9.464	9.452	+++++	9.209 - 9.709	9.462
1802 PFHxS	9.499	9.487	9.499	9.498	9.493	9.493	9.487	9.244 - 9.744	9.494
13C4 PFOA	10.577	10.577	10.577	10.577	10.577	10.577	+++++	10.327 - 10.827	10.577
13C4 PFOS	11.527	11.527	11.527	11.526	11.527	11.518	11.518	11.274 - 11.774	11.524
13C5 PFNA	11.544	11.553	11.553	11.553	11.553	+++++	+++++	11.301 - 11.801	11.551
13C2 PFDA	12.373	12.383	12.383	12.373	12.383	+++++	+++++	12.130 - 12.630	12.379
13C8 FOSA	12.994	12.994	12.994	12.994	12.994	12.984	12.994	12.743 - 13.243	12.993
13C2 PFUnA	13.076	13.075	13.085	13.076	13.075	13.075	13.094	12.829 - 13.329	13.079
13C2 PFDoA	13.666	13.664	13.666	13.657	13.664	13.673	13.676	13.417 - 13.917	13.667
13C2-PFTeDA	14.589	14.588	14.589	14.589	14.588	14.594	14.583	14.339 - 14.839	14.589
13C2-PFHxDA	15.185	15.178	15.180	15.184	15.178	15.178	15.175	14.930 - 15.430	15.180

LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmeri	ca Sacramento	Job No.: 320-18704-1	Analy Batch No.: 111182
SDG No.:		-	

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111182/4	24MAY2016A6A 004.d
Level 2	STD 320-111182/5	24MAY2016A6A 005.d
Level 3	STD 320-111182/6	24MAY2016A6A 006.d
Level 4	STD 320-111182/7	24MAY2016A6A 007.d
Level 5	STD 320-111182/8	24MAY2016A6A 008.d
Level 6	STD 320-111182/9	24MAY2016A6A 009.d
Level 7	STD 320-111182/10	24MAY2016A6A_010.d

ANALYTE		CF	יק		CURVE		COEFFICIENT	#	MIN CF	%RSD			# MIN R^2
	LVL 1 LVL 5	LVL 2 LVL 6	LVL 3 LVL 7	LVL 4	TYPE	В	M1	M2			%RS	D OR COD	OR COD
13C4 PFBA	1539.3 1092.6	1282.9 1025.1	1461.5 855.26	1273.0	Ave		1218.52857			19.9	50.	0	
13C5-PFPeA	2122.3 2244.1	2509.8 2086.5	3622.5 1518.5	2491.1	Ave		2370.68286			27.1	50.	0	
13C2 PFHxA	4154.8 2791.2	3723.8 2487.3	4149.6	3314.2	Ave		3436.82333			20.3	50.	0	
13C4-PFHpA	4217.9 2990.2	3607.8 2581.3	4160.0	4085.5	Ave		3607.11000			19.0	50.	0	
1802 PFHxS	5797.1 5868.4	6067.4 5096.4	5746.9 4499.4	5613.6	Ave		5527.02809			9.9	50.	0	
13C4 PFOA	3688.0 2978.5	4514.1 1829.9	4419.4	4333.6	Ave		3627.25667			29.1	50.	0	
13C4 PFOS	9932.7 10567	10399 9087.2	10721 7923.2	11019	Ave		9949.80873			11.0	50.	0	
13C5 PFNA	4818.3 3208.4	4411.4	4700.7 +++++	3914.2	Ave		3439.82857			41.6	50.	0	
13C2 PFDA	4382.7 3498.0	4994.7	4671.7	3826.8	Ave		4274.79200			14.3	50.	0	
13C8 FOSA	30762 30033	33002 23765	34207 24147	30036	Ave		29421.8800			13.7	50.	0	
13C2 PFUnA	7087.1 4263.6	7893.5 2890.3	7571.9 2486.7	6375.5	Ave		5509.80571			41.1	50.	0	
13C2 PFDoA	9806.7 7385.1	8750.1 4862.0	8765.8 4220.9	6374.0	Ave		7166.37143			29.4	50.	0	
13C2-PFTeDA	12313 9937.2	13445 7182.7	12738 6536.0	11273	Ave		10489.3629			26.0	50.	0	
13C2-PFHxDA	22924 21828	24234 18283	23487 16752	22698	Ave		21457.9371			13.2	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.: 320-18704-1 Analy Batch No.: 111182

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIE	NT	# MIN RF	F %RSD	#	MAX	R^2		MIN R^2
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	TYPE	В	M1	M2				%RSD	OR COD		OR COD
Perfluorobutanoic acid (PFBA)	+++++ 1412.8	273.00 1202.3	1247.2	1367.4	1342.5	L2ID	-1.087	1.2569						0.9870	*	0.9900
Perfluoropentanoic acid (PFPeA)	+++++ 2419.4	2407.0 1843.0	2919.8	2533.6			-0.656	1.1888						0.9990		0.9900
Perfluorobutanesulfonic acid (PFBS)	8629.0 7138.5	6955.9 6726.1	8643.4	7023.3	9258.1	L1ID	-0.109	1.4668						0.9980		0.9900
Perfluorohexanoic acid (PFHxA)	150.00	1066.0	2657.4	2912.8	2636.1	L1ID	-0.570	0.9301						0.9960		0.9900
Perfluoroheptanoic acid (PFHpA)	1158.0 2776.3	2939.0	3962.4	3586.5	3800.2	L1ID	-0.409	1.1008						0.9920		0.9900
Perfluorohexanesulfonic acid (PFHxS)	4105.7 5075.3	3808.7 4396.6	6820.9	5380.0	5892.9			0.9864						0.9990		0.9900
Perfluorooctanoic acid (PFOA)	+++++ 1780.6	5270.0		3641.7	3382.3			1.0654			14.7		35.0			
Perfluoroheptanesulfonic Acid (PFHpS)	+++++ 4182.1	5583.0 3683.7	5085.5	4909.2	5815.0	AveID		0.4887			8.9		50.0			
Perfluorooctanesulfonic acid (PFOS)	+++++ 8719.8	10286 8089.9	9399.8	8683.7	10079	AveID		0.9314			9.1		35.0			
Perfluorononanoic acid (PFNA)	+++++ 2224.1	3622.0	3086.8	3218.2	3285.6	AveID		0.9155			25.1		35.0			
Perfluorodecanoic acid (PFDA)	1716.0	3576.0	5404.8	4642.8	4317.4	L2ID	-0.436	1.2274						0.9980		0.9900
Perfluorooctane Sulfonamide (FOSA)	+++++ 28113	29052 26898	38346	35142	36154	AveID		1.1120			10.7		35.0			
Perfluorodecanesulfonic acid (PFDS)	5207.5 4482.1	6414.9 3786.8	5724.1	4803.5	5359.9	L1ID	0.0605	0.4834						0.9990		0.9900
Perfluoroundecanoic acid (PFUnA)	+++++ 3727.6	14731 2935.6	11733	6852.0	5858.0	L2ID	0.6384	1.2532						0.9870	*	0.9900
Perfluorododecanoic acid (PFDoA)	+++++ 5425.7	6792.0 3901.9	11498	6988.9	6574.6	AveID		1.0192			18.9		35.0			
Perfluorotridecanoic Acid (PFTriA)	7350.0 7026.7	13425 5408.6	17237	11561		AveID		1.4789			26.6		50.0			
Perfluorotetradecanoic acid (PFTeA)	19694 7991.4	18230 6700.0	13399	10810	11063	L1ID	0.2611	1.5985						0.9990		0.9900
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 18388	61062 16102	31522	20672	22232	L2ID	3.5645	3.3119						0.9830	*	0.9900
Perfluoro-n-octandecanoic acid (PFODA)	26276 24854	32129 24757	28029	26162	28600	AveID		4.0719			26.9		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.: 320-18704-1 Analy Batch No.: 111182

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/24/2016 17:07 Calibration End Date: 05/24/2016 19:14 Calibration ID: 21628

Calibration Files:

LEVEL:		LAB	SAMPLE ID:	LAB FILE ID:
Level	1	STD	320-111182/4	24MAY2016A6A 004.d
Level	2	STD	320-111182/5	24MAY2016A6A 005.d
Level	3	STD	320-111182/6	24MAY2016A6A 006.d
Level	4	STD	320-111182/7	24MAY2016A6A 007.d
Level	5	STD	320-111182/8	24MAY2016A6A 008.d
Level	6	STD	320-111182/9	24MAY2016A6A 009.d
Level	7	STD	320-111182/10	24MAY2016A6A 010.d

ANALYTE	CURVE			RESPONSE			CONCENTRATION (NG/ML)						
	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5		
13C4 PFBA	Ave	76963 51257	64145 42763	73077	63652	54628	50.0 50.0	50.0 50.0	50.0	50.0	50.0		
13C5-PFPeA	Ave	106114 104324	125492 75925	181125	124553	112206	50.0 50.0	50.0 50.0	50.0	50.0	50.0		
13C2 PFHxA	Ave	207741 124365	186191 ++++	207481	165711	139558	50.0 50.0	50.0 ++++	50.0	50.0	50.0		
13C4-PFHpA	Ave	210893 129064	180390	208002	204276	149508	50.0 50.0	50.0 ++++	50.0	50.0	50.0		
1802 PFHxS	Ave	274201 241061	286987 212821	271830	265525	277574	47.3 47.3	47.3 47.3	47.3	47.3	47.3		
13C4 PFOA	Ave	184400 91496	225703 ++++	220970	216681	148927	50.0 50.0	50.0 ++++	50.0	50.0	50.0		
13C4 PFOS	Ave	474781 434368	497077 378731	512441	526709	505099	47.8 47.8	47.8 47.8	47.8	47.8	47.8		
13C5 PFNA	Ave	240916	220571 ++++	235035	195708	160421	50.0	50.0 ++++	50.0	50.0	50.0		
13C2 PFDA	Ave	219137	249735 ++++	233584	191340	174902	50.0	50.0 ++++	50.0	50.0	50.0		
13C8 FOSA	Ave	1538080 1188273	1650124 1207359	1710359	1501807	1501656	50.0 50.0	50.0 50.0	50.0	50.0	50.0		
13C2 PFUnA	Ave	354353 144515	394675 124337	378596	318776	213180	50.0 50.0	50.0 50.0	50.0	50.0	50.0		
13C2 PFDoA	Ave	490337 243100	437505 211043	438290	318700	369255	50.0 50.0	50.0 50.0	50.0	50.0	50.0		
13C2-PFTeDA	Ave	615662 359134	672264 326798	636894	563664	496861	50.0 50.0	50.0 50.0	50.0	50.0	50.0		
13C2-PFHxDA	Ave	1146199 914173	1211693 837620	1174335	1134880	1091378	50.0 50.0	50.0 50.0	50.0	50.0	50.0		

Curve Type Legend:

Ave = Average

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 Analy Batch No.: 111182

SDG No.:

Instrument ID: A6 GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Start Date: 05/24/2016 17:07 Calibration End Date: 05/24/2016 19:14 Calibration ID: 21628

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD 320-111182/4	24MAY2016A6A 004.d
Level 2	STD 320-111182/5	24MAY2016A6A 005.d
Level 3	STD 320-111182/6	24MAY2016A6A 006.d
Level 4	STD 320-111182/7	24MAY2016A6A 007.d
Level 5	STD 320-111182/8	24MAY2016A6A 008.d
Level 6	STD 320-111182/9	24MAY2016A6A 009.d
Level 7	STD 320-111182/10	24MAY2016A6A 010.d

ANALYTE	IS CURVE			RESPONSE			CONCENTRATION (NG/ML)					
	REF TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	
Perfluorobutanoic acid (PFBA)	L2ID	+++++ 282560	273 480936	6236	27348	67124	++++ 200	1.00 400	5.00	20.0	50.0	
Perfluoropentanoic acid (PFPeA)	L1ID	+++++ 483871	2407 737184	14599	50671	127936	+++++ 200	1.00 400	5.00	20.0	50.0	
Perfluorobutanesulfonic acid (PFBS)	L1ID	3814 1262078	6149 2378342	38204	124172	409210	0.442 177	0.884 354	4.42	17.7	44.2	
Perfluorohexanoic acid (PFHxA)	L1ID	75 ++++	1066 ++++	13287	58255	131803	0.500 ++++	1.00	5.00	20.0	50.0	
Perfluoroheptanoic acid (PFHpA)	L1ID	579 555259	2939 ++++	19812	71730	190009	0.500 200	1.00	5.00	20.0	50.0	
Perfluorohexanesulfonic acid (PFHxS)	L1ID	1942 960243	3603 1663673	32263	101790	278735	0.473 189	0.946 378	4.73	18.9	47.3	
Perfluorooctanoic acid (PFOA)	AveID	+++++ 356123	5270 ++++	22121	72833	169115	+++++ 200	1.00	5.00	20.0	50.0	
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	+++++ 796277	5315 1402764	24207	93471	276794	+++++ 190	0.952 381	4.76	19.0	47.6	
Perfluorooctanesulfonic acid (PFOS)	AveID	+++++ 1667222	9833 3093589	44931	166032	481794	+++++ 191	0.956 382	4.78	19.1	47.8	
Perfluorononanoic acid (PFNA)	AveID	+++++ 444822	3622 ++++	15434	64364	164281	+++++ 200	1.00	5.00	20.0	50.0	
Perfluorodecanoic acid (PFDA)	L2ID	858 ++++	3576 ++++	27024	92855	215872	0.500	1.00	5.00	20.0	50.0	
Perfluorooctane Sulfonamide (FOSA)	AveID	+++++ 5622658	29052 10759050	191731	702846	1807702	+++++ 200	1.00 400	5.00	20.0	50.0	
Perfluorodecanesulfonic acid (PFDS)	L1ID	2510 864142	6184 1460173	27590	92611	258349	0.482 193	0.964 386	4.82	19.3	48.2	
Perfluoroundecanoic acid (PFUnA)	L2ID	+++++ 745515	14731 1174235	58666	137039	292902	+++++ 200	1.00 400	5.00	20.0	50.0	
Perfluorododecanoic acid (PFDoA)	AveID	+++++ 1085132	6792 1560769	57489	139778	328730	+++++ 200	1.00 400	5.00	20.0	50.0	

FORM VI

RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Analy Batch No.: 111182 Job No.: 320-18704-1 SDG No.:

GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N Instrument ID: A6

Calibration Start Date: 05/24/2016 17:07 Calibration End Date: 05/24/2016 19:14 Calibration ID: 21628

ANALYTE	IS	CURVE	RESPONSE						CONCE	NTRATION (1	NG/ML)	
	REF	TYPE	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3	LVL 4	LVL 5
Perfluorotridecanoic Acid (PFTriA)		AveID	3675 1405333	13425 2163423	86184	231228	576659	0.500 200	1.00	5.00	20.0	50.0
Perfluorotetradecanoic acid (PFTeA)		L1ID	9847 1598285	18230 2679987	66997	216201	553149	0.500 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)		L2ID	+++++ 3677680	61062 6440831	157611	413438	1111597	+++++ 200	1.00 400	5.00	20.0	50.0
Perfluoro-n-octandecanoic acid (PFODA)		AveID	13138 4970845	32129 9902853	140146	523232	1430022	0.500 200	1.00 400	5.00	20.0	50.0

Curve Type Legend:

AveID = Average isotope dilution

L1ID = Linear 1/conc IsoDil

L2ID = Linear 1/conc^2 IsoDil

Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Lims ID: Std L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 24-May-2016 17:07:08 ALS Bottle#: 9 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L1

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 25-May-2016 14:05:29 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK049

First Level Reviewer: barnettj Date: 24-May-2016 17:44:31

I II St Level Kevie	ewei. bai	Hettj			Date.		4-101ay-2010 17.44.C)		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 113C4 PFB	۸									
217.0 > 172.0	5.794	5.796	-0.002		76963	63.2		126	9869	
D 3 13C5-PFP										
267.9 > 223.0	6.951	6.946	0.005		106114	44.8		89.5	3239	
4 Perfluorope										М
•	6.951		0.002	1.000	107	0.5938		119	15.5	M
40 Perfluorobu	utanesulfo	onic acid	I							
298.9 > 80.0	7.078	7.074	0.004	1.000	3814	0.5229		118		
5 Perfluorobu	tane Sulf	onate								
298.9 > 80.0	7.078	7.074	0.004	1.000	3814	NC			22.6	
298.9 > 99.0	7.067	7.074	-0.007	0.999	971		3.93(0.00-0.00)		108	
D 613C2 PFH	хA									
315.0 > 270.0	8.225	8.223	0.002		207741	60.4		121	18543	
7 Perfluorohe	xanoic ad	cid								M
313.0 > 269.0	8.214	8.225	-0.011	1.000	75	0.6325		126	9.5	M
D 8 13C4-PFH	pΑ									
367.0 > 322.0	9.464	9.459	0.005		210893	58.5		117	18350	
9 Perfluorohe	ptanoic a	cid								M
363.0 > 319.0	9.464	9.462	0.002	1.000	579	0.4961		99.2	53.0	M
D 11 18O2 PFH	lxS									
403.0 > 84.0	9.499	9.494	0.005		274201	49.6		105	23131	
10 Perfluorohe	exane Su	lfonate								
399.0 > 80.0	9.499	9.495	0.004	1.000	1942	NC			194	
41 Perfluorohe	exanesulf	onic acid	d							
399.0 > 80.0	9.499	9.495	0.004	1.000	1942	0.4702		99.4		

Data File:	\\Cnrc	JIIINA\58	acramen	to/Chron	iData\A6\20160	1524-31021.1	0\24\VIAY2016A6A_0	JU4.U		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
12 Dorflygrood	topolo oc	,id								М
13 Perfluorooct 413.0 > 369.0			0.014	1 000	1243	0.3164		63.3	15.9	M
		10.573	-0.014	1.000	1243	0.3104		03.3	13.9	IVI
D 12 13C4 PFO		10 E77	0.0		104400	EO 0		100	10110	
	10.577				184400	50.8		102	12110	
15 Perfluorooct				4 000	1001	0.4470		045	70.5	M
	11.527			1.000	1084	0.1172	2 20(0 00 0 00)	24.5	79.5	M
	11.535	11.524	0.011	1.001	328		3.30(0.00-0.00)	24.5	26.0	M
D 16 13C4 PFO		44 504			47.4704			00.0	05000	
	11.527		0.003		474781	47.7		99.8	35220	
18 Perfluorono										M
463.0 > 419.0	11.528	11.547	-0.019	1.000	154	0.0349		7.0	6.8	M
D 17 13C5 PFN										
468.0 > 423.0	11.544	11.551	-0.007		240916	57.2		114	17211	
20 Perfluorode	canoic a	cid								M
513.0 > 469.0	12.373	12.376	-0.003	1.000	858	0.5146		103	55.0	M
D 19 13C2 PFD/	A									
515.0 > 470.0	12.373	12.380	-0.007		219137	51.3		103	13306	
D 23 13C8 FOS	A									
	12.994	12.993	0.001		1538080	52.3		105	66984	
24 Perfluorooct	tane Sulf	fonamide	7							
	12.994			1.000	10841	0.3169		63.4	729	
39 Perfluorode										
	13.024			1.000	2510	0.3976		82.5		
25 Perfluorode			0.000	1.000	2310	0.3770		02.0		
	13.024		0 008	1.000	2510	NC			181	
		13.032	-0.000	1.000	2310	NC			101	
D 26 13C2 PFU		12.070	0.002		254252	/ / 2		100	24//1	
	13.076		-0.003		354353	64.3		129	24661	
27 Perfluoround			0.007	1 000	5004	0.0400		40.4	10.4	
563.0 > 519.0		13.082	-0.006	1.000	5084	0.0630		12.6	18.4	
D 28 13C2 PFD										
615.0 > 570.0	13.666	13.667	-0.001		490337	68.4		137	33358	
30 Perfluorotrio	lecanoic	acid								
663.0 > 619.0	14.159	14.166	-0.007	1.000	3675	0.2534		50.7	0.9	
D 33 13C2-PFT	eDA									
715.0 > 670.0	14.589	14.589	0.0		615662	58.7		117	28040	
32 Perfluoroteti	radecan	oic acid								
713.0 > 669.0	14.589	14.590	-0.001	1.000	9847	0.4648		93.0	6.2	
34 Perfluorohe	xadecan	oic acid								
813.0 > 769.0			0.001	1.000	35656	0.0216		4.3	83.5	
D 35 13C2-PFH				-	-					
	15.185	15 120	0.005		1146199	53.4		107	10750	
					1110177	00.4		107	10,00	
36 Perfluorooct 913.0 > 869.0				1.000	13138	0.3290		65.8	20.5	
/13.0 / 007.0	13.430	10.400	0.000	1.000	13130	0.3270		00.0	20.5	

Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46

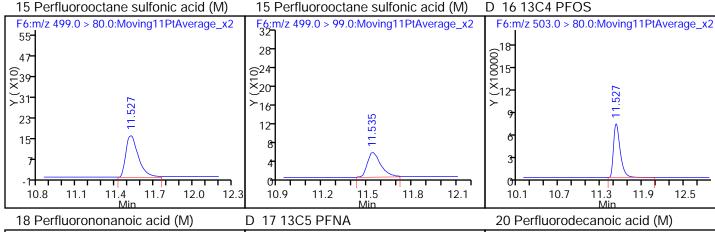
OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

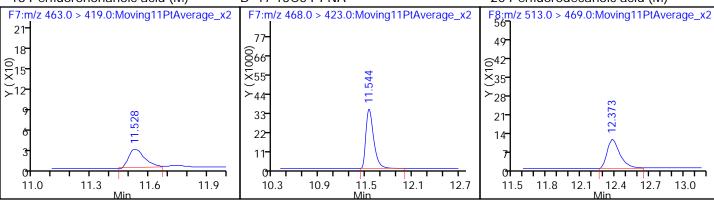
M - Manually Integrated

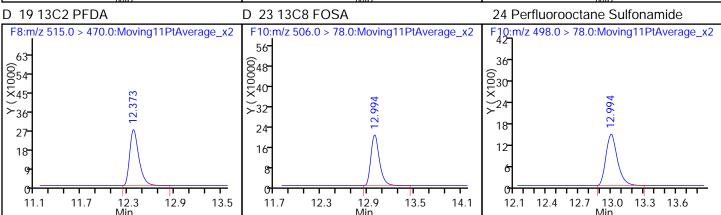
Reagents:

LCPFC-L1_00019 Amount Added: 1.00 Units: mL

Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_004.d **Injection Date:** 24-May-2016 17:07:08 Instrument ID: Α6 Lims ID: Std L1 Client ID: Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: Injection Vol: 15.0 ul Dil. Factor: 1.0000 Method: PFAC A6 LC PFC_DOD ICAL Limit Group: 2 Perfluorobutyric acid (ND) D 113C4 PFBA D 313C5-PFPeA F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 Y (XInfinity) 630 8 25 ×25 © 824 $\stackrel{\smile}{\times}_{20}$ <u>></u>20 15- 12 10 5.5 5.8 6.2 4.7 5.3 5.9 6.5 6.1 6.5 6.8 7.1 7.4 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid (M) 40 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 219.0:Moving11PtAverage x2F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 24 70 28 660 ×50 20 <u>6</u> ×16 624- ×20->₁₂ ∑16- <u>></u>40 30 20 10 6.9 7.2 7.0 8.9 7.3 7.7 8.3 6.7 8 13C4-PFHpA 7 Perfluorohexanoic acid (M) D 9 Perfluoroheptanoic acid (M) F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 84 28 56- 648-°€24 72 ∑20 60 ×40 ≻48 ≻₃₂-8.214 36 12 24 24 16 12 8.2 8.5 9.1 9.7 10.3 8.9 9.2 9.5 9.8 7.9 8.5 10.1 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid (M) F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 V (X10000) 91 12 ē⁷⁸ (X100 (X100 8 -65 ≻52 39 26 13 0 0 0 10.8 0<u>5/26/201</u> 8.8 9.4 10.0 10.6 8.5 9.1 Page 62% of 776 10.3 9.9 10.2 10.5 8.2







15.7

16.0

16

14.4

14.7

15.0

15.3

15.6

15.9

14.8

15.1

Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F2:MRM

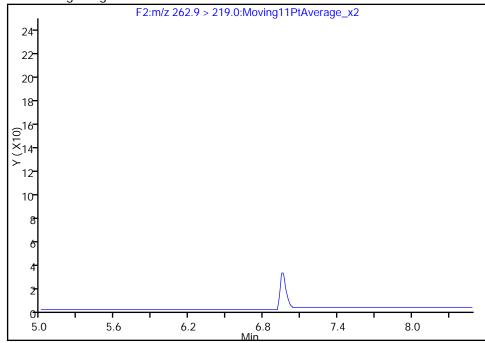
4 Perfluoropentanoic acid, CAS: 2706-90-3

Signal: 1

Not Detected

Expected RT: 6.95

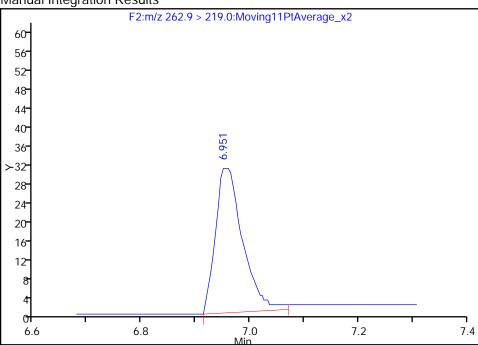
Processing Integration Results



RT: 6.95 Area: 107 Amount: 0.593846

Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

Page 631 of 776

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: Α6

Lims ID: Std L1

Client ID:

Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 4

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

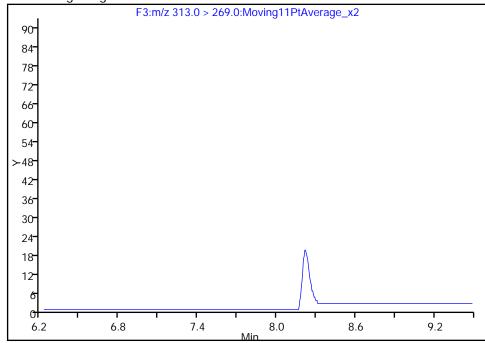
7 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

Not Detected

Expected RT: 8.22

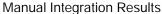
Processing Integration Results

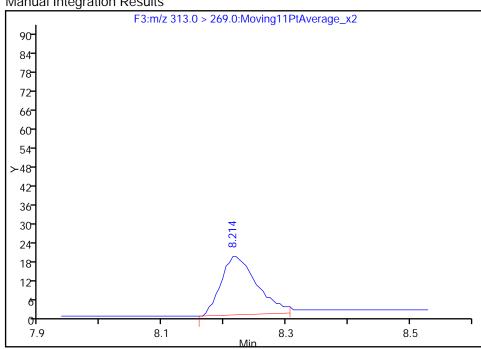


RT: 8.21 Area: 75

0.632470 Amount:

Amount Units: ng/ml





Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F4:MRM

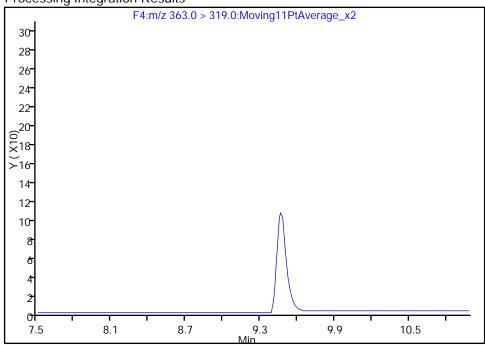
9 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

Not Detected

Expected RT: 9.46

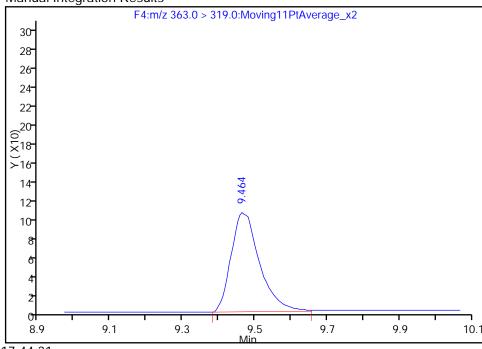
Processing Integration Results



RT: 9.46 Area: 579 Amount: 0.496110

Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: Α6

Lims ID: Std L1

Client ID:

Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 4

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F5:MRM

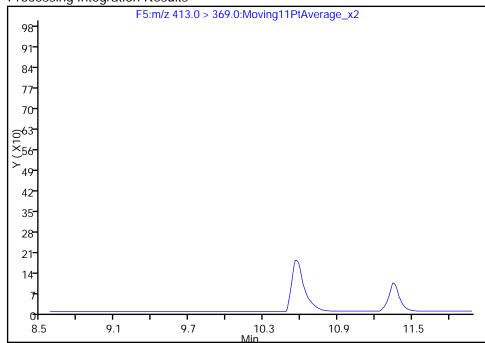
13 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

Not Detected

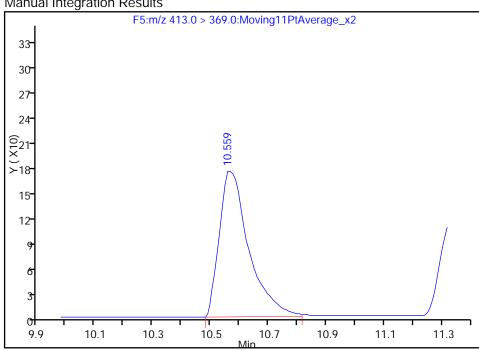
Expected RT: 10.57

Processing Integration Results



RT: 10.56 Area: 1243 Amount: 0.316363 Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: Α6

Lims ID: Std L1

Client ID:

Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 4

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

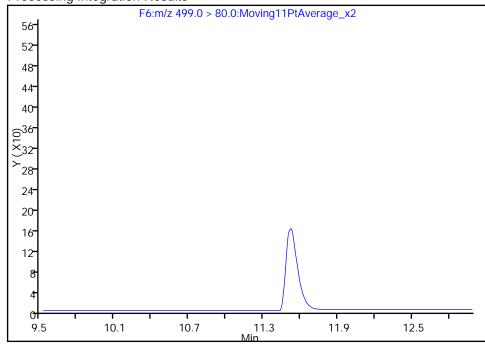
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

Not Detected

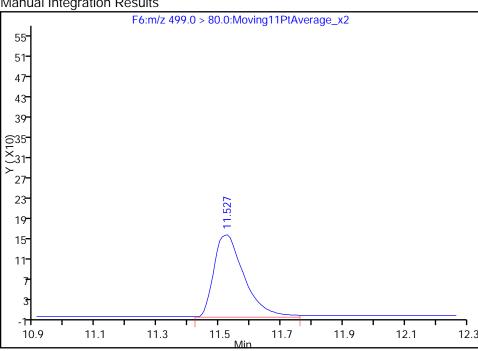
Expected RT: 11.52

Processing Integration Results



RT: 11.53 1084 Area: Amount: 0.117173 Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

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Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46
Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: A6

Lims ID: Std L1

Client ID:

Operator ID: JRB ALS Bottle#: 9 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

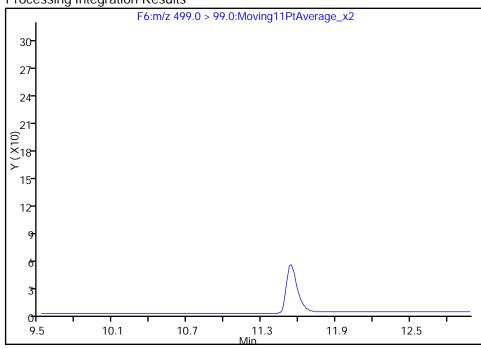
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

Not Detected

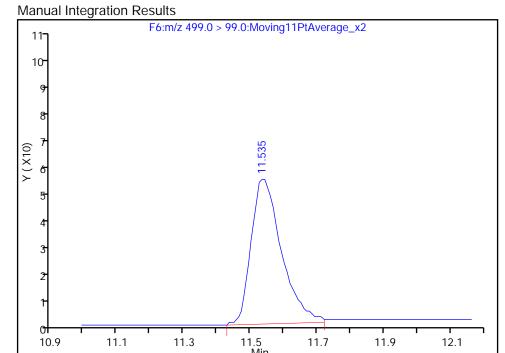
Expected RT: 11.52

Processing Integration Results



RT: 11.54 Area: 328 Amount: 0.117173

Amount Units: ng/ml



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak Page 636 of 776

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: Α6

Lims ID: Std L1

Client ID:

Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 4

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F7:MRM

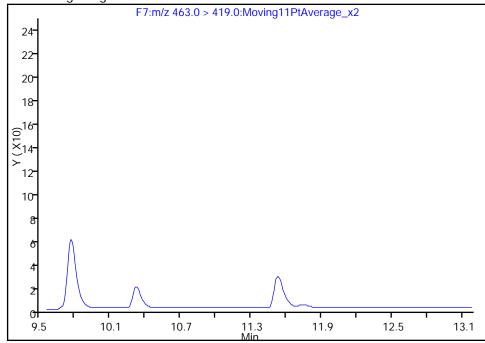
18 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

Not Detected

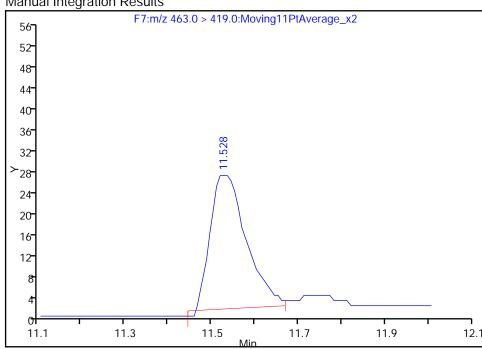
Expected RT: 11.55

Processing Integration Results



RT: 11.53 Area: 154 Amount: 0.034911 Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

Report Date: 25-May-2016 14:05:31 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_004.d

Injection Date: 24-May-2016 17:07:08 Instrument ID: Α6

Lims ID: Std L1

Client ID:

Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 4

Injection Vol: 15.0 ul Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F8:MRM

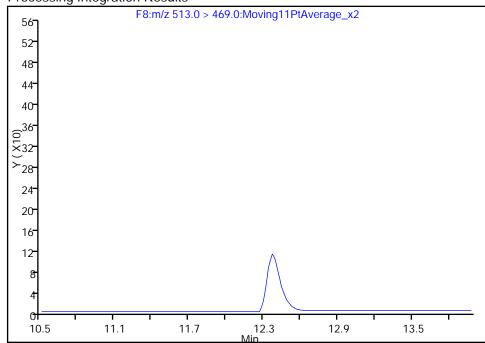
20 Perfluorodecanoic acid, CAS: 335-76-2

Signal: 1

Not Detected

Expected RT: 12.38

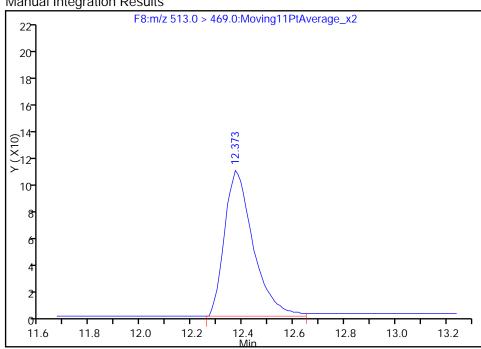
Processing Integration Results



RT: 12.37 Area: 858 Amount: 0.514582

Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 17:44:31

Audit Action: Manually Integrated

Audit Reason: Missed Peak

Report Date: 25-May-2016 14:05:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_005.d

Lims ID: Std L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 24-May-2016 17:28:24 ALS Bottle#: 10 Worklist Smp#: 5

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L2

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 25-May-2016 14:05:46 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK049

First Level Reviewer: barnettj Date: 24-May-2016 18:11:25

First Level Revie	wer: bar	nettj			Date:		24-May-2016 18:11:2	25		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	yric acid									М
212.9 > 169.0	5.794	5.791	0.003	1.000	273	1.03		103	40.0	M
D 113C4 PFBA										
217.0 > 172.0	5.797	5.796	0.001		64145	52.6		105	6791	
D 3 13C5-PFPe					105.100	500		407	10011	
267.9 > 223.0		6.946	0.0		125492	52.9		106	12341	
4 Perfluoroper			0.000	1 000	2407	1.27		12/	205	
262.9 > 219.0		6.949		1.000	2407	1.36		136	295	
40 Perfluorobut 298.9 > 80.0	tanesulto 7.067			1.000	6149	0.7653		86.6		
5 Perfluorobut			-0.007	1.000	0147	0.7033		00.0		
298.9 > 80.0	7.067	7.074	-0.007	1.000	6149	NC			37.5	
298.9 > 99.0	7.085	7.074	0.011	1.002	2846	110	2.16(0.00-0.00)		126	
D 613C2 PFHx	A									
315.0 > 270.0	8.225	8.223	0.002		186191	54.2		108	16557	
7 Perfluorohex	anoic ac	cid								M
313.0 > 269.0	8.230	8.225	0.005	1.000	1066	0.9208		92.1	122	M
D 8 13C4-PFHp										
367.0 > 322.0	9.464	9.459	0.005		180390	50.0		100	15866	
9 Perfluorohep										
363.0 > 319.0		9.462	0.002	1.000	2939	1.11		111	298	
D 11 18O2 PFH:		0.404			00/007	E4.0		440	0.1.1.1	
403.0 > 84.0	,,		-0.007		286987	51.9		110	24441	
10 Perfluorohe:			0.000	1 000	2402	NIC			254	
399.0 > 80.0			-0.008	1.000	3603	NC			354	
41 Perfluorohe: 399.0 > 80.0	xanesult 9.487		a -0.008	1.000	3603	0.7326		77.4		
377.0 > 00.0	7.40/	7.470	-0.006	1.000				11.4	05/0	2/0040
					Dago 630 of 7	/ / K			ひん/20	3/2016

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05/26/2016

Report Date: 25- Data File:				to\Chrom	Chrom Revision: 2.2 20-Apr-2016 13:59:46 hromData\A6\20160524-31021.b\24MAY2016A6A_005.d						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
13 Perfluorooc											
413.0 > 369.0 413.0 > 169.0	10.577 10.577		0.004 0.004	1.000 1.000	5270 2496	1.10	2.11(0.00-0.00)	110 110	361 184		
D 12 13C4 PFO		10.573	0.004	1.000	2470		2.11(0.00-0.00)	110	104		
417.0 > 372.0		10.577	0.0		225703	62.2		124	14944		
14 Perfluorohe	•		0.011	1 000	E21E	NC			251		
449.0 > 80.0 38 Perfluorohe		10.585		1.000	5315	NC			351		
449.0 > 80.0	•	10.585		1.000	5315	1.05		110			
15 Perfluorooc										М	
499.0 > 80.0 499.0 > 99.0		11.524 11.524		1.000 1.000	9833 1034	1.02	9.51(0.00-0.00)	106 106	782 80.0	М	
D 16 13C4 PFO		11.524	0.003	1.000	1034		7.31(0.00-0.00)	100	00.0	IVI	
503.0 > 80.0		11.524	0.003		497077	50.0		105	10487		
18 Perfluorono				4 000	0.400	0.0040		00.7		М	
	11.545	11.547	-0.002	1.000	3622	0.8968		89.7	41.3	M	
D 17 13C5 PFN 468.0 > 423.0	A 11.553	11.551	0.002		220571	52.4		105	15968		
20 Perfluorode											
513.0 > 469.0	12.363	12.376	-0.013	1.000	3576	0.9384		93.8	234		
D 19 13C2 PFD		10 200	0.000		240725	FO 4		117	140/7		
515.0 > 470.0 D 23 13C8 FOS	12.383	12.380	0.003		249735	58.4		117	14967		
506.0 > 78.0		12.993	0.001		1650124	56.1		112	72506		
24 Perfluorooc											
498.0 > 78.0		12.994		1.000	29052	0.7916		79.2	1997		
39 Perfluorode 599.0 > 80.0	cane Sul 13.031			1 000	6184	1.11		115			
25 Perfluorode			-0.001	1.000	0104	1.11		113			
599.0 > 80.0		13.032	-0.001	1.000	6184	NC			465		
D 26 13C2 PFU											
565.0 > 520.0			-0.004		394675	71.6		143	27858		
27 Perfluoroun 563.0 > 519.0			0.002	1.000	14731	0.9798		98.0	205		
D 28 13C2 PFD		13.002	0.002	1.000	14731	0.7770		70.0	200		
615.0 > 570.0		13.667	-0.003		437505	61.0		122	29159		
29 Perfluorodo	decanoio	c acid									
613.0 > 569.0			-0.003	1.000	6792	0.7616		76.2	6.4		
30 Perfluorotrio 663.0 > 619.0			0.0	1.000	13425	1.04		104	3.1		
D 33 13C2-PFT		14.100	0.0	1.000	10425	1.04		104	5.1		
715.0 > 670.0		14.589	-0.001		672264	64.1		128	17239		
32 Perfluorotet											
713.0 > 669.0			0.005	1.000	18230	1.14		114	5.9		
34 Perfluorohe 813.0 > 769.0			-0 001	1.000	61062	1.03		103	157		
D 35 13C2-PFH		10.177	0.001	1.000	01002	1.03		103	137		
815.0 > 770.0		15.180	-0.002		Page 640 of	776 ^{56.5}		113	94 <u>42</u> 05/20	6/2016	
						-			55,2		

Report Date: 25-May-2016 14:05:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46

\\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_005.d Data File: EXP DLT **REL** Amount Signal RT RT ng/ml Ratio(Limits) %Rec S/N Flags RT RT Response

36 Perfluorooctandecanoic acid

913.0 > 869.0 15.445 15.450 -0.005 1.000 0.9018 90.2 59.7 32129

OC Flag Legend Processing Flags

NC - Not Calibrated

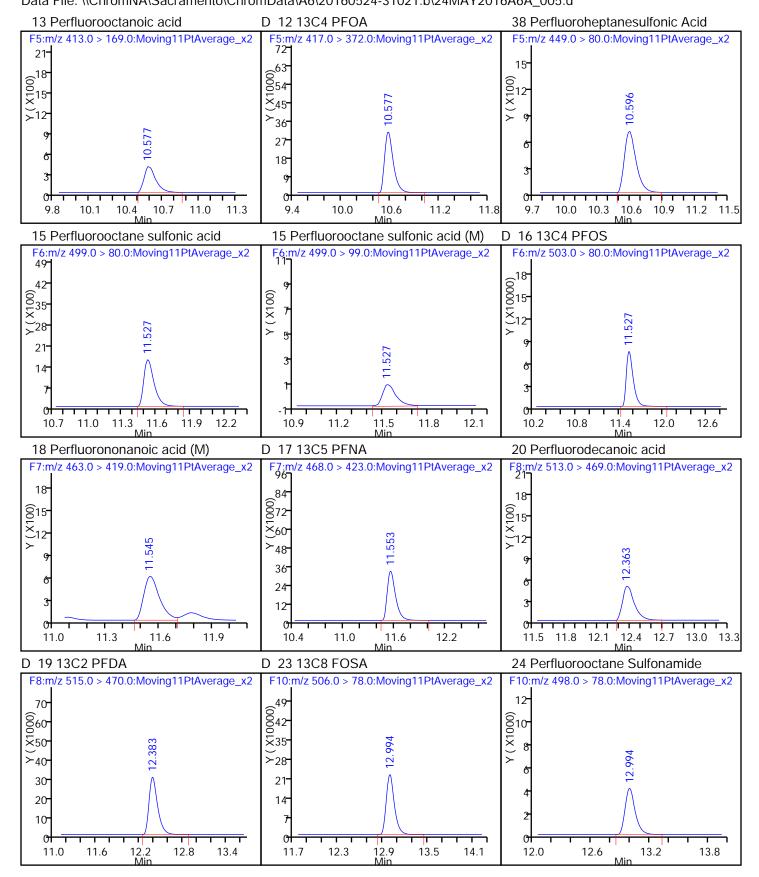
Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00020 Amount Added: 1.00 Units: mL

Report Date: 25-May-2016 14:05:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_005.d **Injection Date:** 24-May-2016 17:28:24 Instrument ID: Α6 Lims ID: Std L2 Client ID: Operator ID: **JRB** ALS Bottle#: 10 Worklist Smp#: 5 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid (M) 1 13C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 (36⁻ (30-(30-36 ²30− 18 18 12 12 6.9 5.7 6.0 5.1 5.4 5.7 6.0 6.3 6.3 7.2 7.5 6.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 49 35 18 <u>| @</u>15 <u>6</u>30 ∑25 ∑28- ~20- 21 15 10 6.9 6.7 7.0 7.3 7.2 7.5 7.9 8.2 8.5 7.6 8.8 9.1 6.6 8 13C4-PFHpA 7 Perfluorohexanoic acid (M) D 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 10 49 6 8 42 14 <u>@</u>12 Y (X100) ×35-<u>≻</u>10 ≻₂₈-21 14 8.0 9.1 9.4 9.7 9.1 9.4 9.7 10.0 7.7 8.3 8.8 10.0 10.3 8.8 8.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 24 18 ⁷⁸ ©²⁰ ×16 0015 X ×65 -52 12 39 26 0 09.1 Page 642hof 776 8.7 9.3 9.9 10.5 8.5 10.3 9.7 10.0 10.3 10.6 8.1



15.7

16.0

18

14.4

14.7

15.0

15.3

15.6

15.9

14.8

15.1

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_005.d

Injection Date: 24-May-2016 17:28:24 Instrument ID: Α6

Lims ID: Std L2

Client ID:

Operator ID: **JRB** ALS Bottle#: 10 Worklist Smp#: 5

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F1:MRM

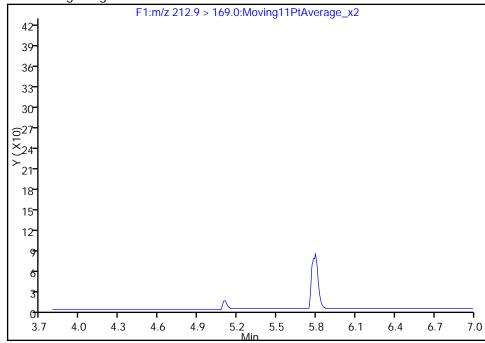
2 Perfluorobutyric acid, CAS: 375-22-4

Signal: 1

Not Detected

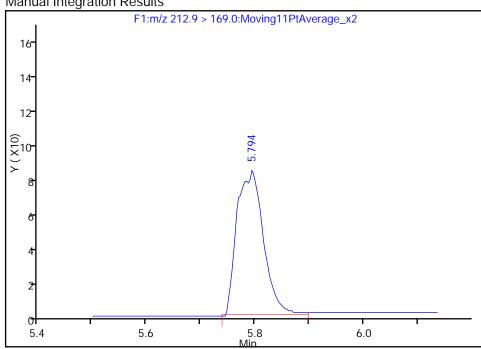
Expected RT: 5.79

Processing Integration Results



RT: 5.79 Area: 273 Amount: 1.034033 Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 18:11:25

Audit Action: Manually Integrated

Audit Reason: Missed Peak

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_005.d

Injection Date: 24-May-2016 17:28:24 Instrument ID: A6

Lims ID: Std L2

Client ID:

Operator ID: **JRB** ALS Bottle#: 10 Worklist Smp#: 5

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F3:MRM

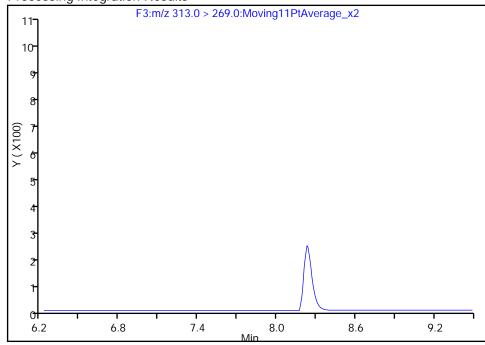
7 Perfluorohexanoic acid, CAS: 307-24-4

Signal: 1

Not Detected

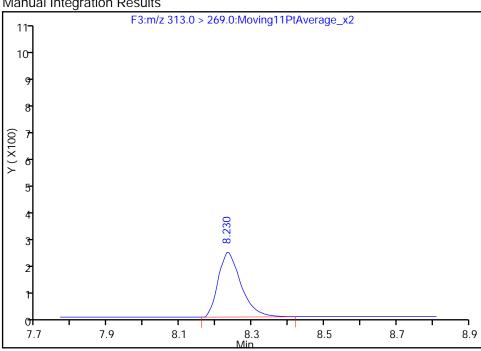
Expected RT: 8.22

Processing Integration Results



RT: 8.23 Area: 1066 0.920826 Amount: Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 18:11:25

Audit Action: Manually Integrated

Audit Reason: Missed Peak

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TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_005.d

Injection Date: 24-May-2016 17:28:24 Instrument ID: A6

Lims ID: Std L2

Client ID:

Operator ID: **JRB** ALS Bottle#: 10 Worklist Smp#: 5

15.0 ul Injection Vol: Dil. Factor: 1.0000

PFAC_A6 Method: Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F6:MRM

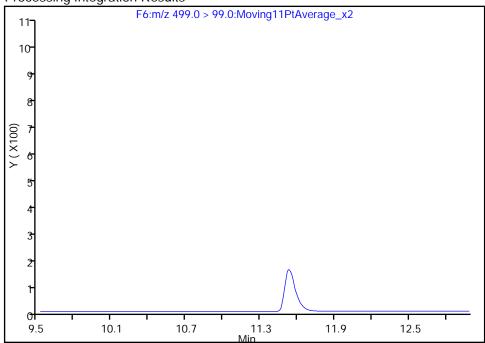
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

Not Detected

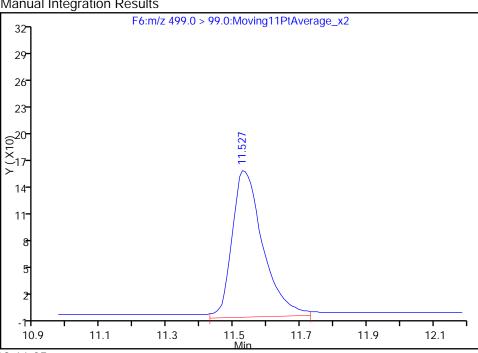
Expected RT: 11.52

Processing Integration Results



RT: 11.53 Area: 1034 1.015203 Amount: Amount Units: ng/ml

Manual Integration Results



Reviewer: barnettj, 24-May-2016 18:11:25

Audit Action: Manually Integrated

Audit Reason: Missed Peak

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Report Date: 25-May-2016 14:05:48 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_005.d

Injection Date: 24-May-2016 17:28:24 Instrument ID: A6

Lims ID: Std L2

Client ID:

Operator ID: JRB ALS Bottle#: 10 Worklist Smp#: 5

Injection Vol: 15.0 ul Dil. Factor: 1.0000

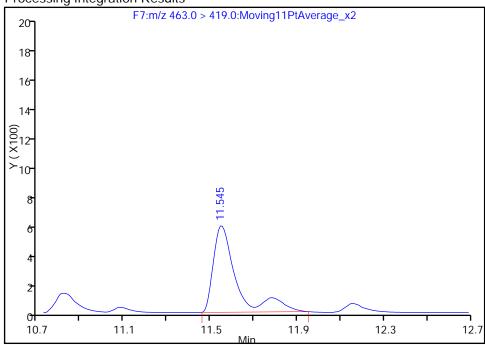
Method: PFAC_A6 Limit Group: LC PFC_DOD ICAL

Column: Acquity BEH C18 (2.10 mm) Detector F7:MRM

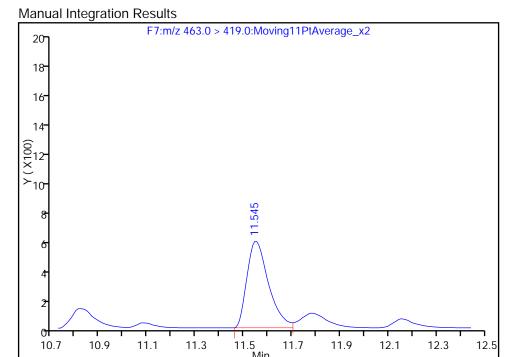
18 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

RT: 11.54 Area: 4287 Amount: 0.974035 Amount Units: ng/ml **Processing Integration Results**



RT: 11.54
Area: 3622
Amount: 0.896833
Amount Units: ng/ml



Reviewer: westendorfc, 25-May-2016 08:46:40

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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Report Date: 25-May-2016 14:06:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_006.d

Lims ID: Std L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 24-May-2016 17:49:40 ALS Bottle#: 11 Worklist Smp#: 6

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L3

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 25-May-2016 14:06:04 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK049

First Level Reviewer: westendorfc Date: 25-May-2016 08:43:22

First Level Revie	ewer: wes	stendorf	С		Date:	2	25-May-2016 08:43:	22		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobu	tvric acid									
212.9 > 169.0	5.791	5.791	0.0	1.000	6236	4.26		85.2	755	
D 113C4 PFB/	Д									
217.0 > 172.0	5.794	5.796	-0.002		73077	60.0		120	3910	
D 3 13C5-PFP										
267.9 > 223.0		6.946	0.0		181125	76.4		153	18131	
4 Perfluorope				1 000	4.4500	0.04		70.0	4 / 0 4	
262.9 > 219.0			-0.003	1.000	14599	3.94		78.8	1601	
40 Perfluorobu				1 000	20204	4 / 1		104		
298.9 > 80.0	7.081	7.074	0.007	1.000	38204	4.61		104		
5 Perfluorobu 298.9 > 80.0	tane Sulf 7.081	onate 7.074	0.007	1.000	38204	NC			172	
298.9 > 80.0 298.9 > 99.0	7.081	7.074	0.007	1.000	38204 15881	NC	2.41(0.00-0.00)		237	
D 6 13C2 PFH		7.071	0.007	1.000	10001		2.11(0.00 0.00)		207	
315.0 > 270.0	8.219	8.223	-0.004		207481	60.4		121	19302	
7 Perfluorohe										
313.0 > 269.0	8.230		0.005	1.000	13287	4.06		81.1	1168	
D 8 13C4-PFH	pA									
367.0 > 322.0	•	9.459	0.005		208002	57.7		115	18393	
9 Perfluorohe	ptanoic a	ıcid								
363.0 > 319.0	9.470	9.462	0.008	1.000	19812	4.70		94.0	1804	
D 11 1802 PFH	lxS									
403.0 > 84.0	9.499	9.494	0.005		271830	49.2		104	14997	
10 Perfluorohe	exane Su	lfonate								
399.0 > 80.0	9.499	9.495	0.004	1.000	32263	NC			908	
41 Perfluorohe										
399.0 > 80.0	9.499	9.495	0.004	1.000	32263	5.82		123		
					Page 649 of	776			05/26	3/2016

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05/26/2016

Report Date: 25-May-2016 14:06:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 25- Data File:				to\Chrom			20-Apr-2016 13:59: \\24MAY2016A6A_0			
Signal	RT	EXP RT	DLT RT	REL RT		Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooc 413.0 > 369.0 413.0 > 169.0	tanoic ac 10.577 10.577	10.573		1.000 1.000	22121 5775	4.70	3.83(0.00-0.00)	94.0 94.0	1454 394	
D 12 13C4 PFO 417.0 > 372.0	A 10.577	10.577	0.0		220970	60.9		122	14279	
14 Perfluorohe 449.0 > 80.0	ptane Su 10.586		0.001	1.000	24207	NC			1633	
38 Perfluorohe 449.0 > 80.0	ptanesul 10.586			1.000	24207	4.62		97.1		
15 Perfluorooc 499.0 > 80.0 499.0 > 99.0	tane sulfo 11.527 11.535	11.524	0.003	1.000 1.001	44931 18380	4.50	2.44(0.00-0.00)	94.1 94.1	3377 1344	
D 16 13C4 PFO 503.0 > 80.0	S 11.527	11.524	0.003		512441	51.5		108	37583	
18 Perfluorono 463.0 > 419.0	nanoic a 11.553		0.006	1.000	15434	3.59		71.7	372	
D 17 13C5 PFN 468.0 > 423.0	A 11.553	11.551	0.002		235035	55.8		112	17037	
20 Perfluorode 513.0 > 469.0			0.007	1.000	27024	5.07		101	1662	
D 19 13C2 PFD 515.0 > 470.0	A 12.383	12.380	0.003		233584	54.6		109	14151	
D 23 13C8 FOS 506.0 > 78.0	A 12.994	12.993	0.001		1710359	58.1		116	112588	
24 Perfluorooc 498.0 > 78.0	tane Sulf 12.994			1.000	191731	5.04		101	12690	
39 Perfluorode 599.0 > 80.0				1.000	27590	5.20		108		
25 Perfluorode 599.0 > 80.0	cane Sul 13.032		0.0	1.000	27590	NC			1974	
D 26 13C2 PFU 565.0 > 520.0		13.079	0.006		378596	68.7		137	26771	
27 Perfluoroun 563.0 > 519.0			0.003	1.000	58666	5.67		113	828	
D 28 13C2 PFD 615.0 > 570.0		13.667	-0.001		438290	61.2		122	29531	
29 Perfluorodo 613.0 > 569.0	decanoio	acid		1.000	57489	6.44		129	44.8	
30 Perfluorotrio 663.0 > 619.0	decanoic	acid		1.000	86184	6.65		133	22.5	
D 33 13C2-PFT	eDA			1.000	636894	60.7		121	16393	
32 Perfluorotet		oic acid		1 000						
713.0 > 669.0 34 Perfluorohe	xadecan	oic acid		1.000	66997	4.62		92.4	39.3	
813.0 > 769.0 D 35 13C2-PFH	xDA			1.000	157611	4.35		87.1	368	
815.0 > 770.0	15.180	15.180	0.0		Page 650 of 77	6 54.7		109	11532 05726	5/2016

Report Date: 25-May-2016 14:06:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_006.d Data File:

EXP **DLT REL** Amount Signal RT RT ng/ml Ratio(Limits) %Rec S/N Flags RT RT Response

36 Perfluorooctandecanoic acid

913.0 > 869.0 15.446 15.450 -0.004 1.000 3.93 78.5 140146 157

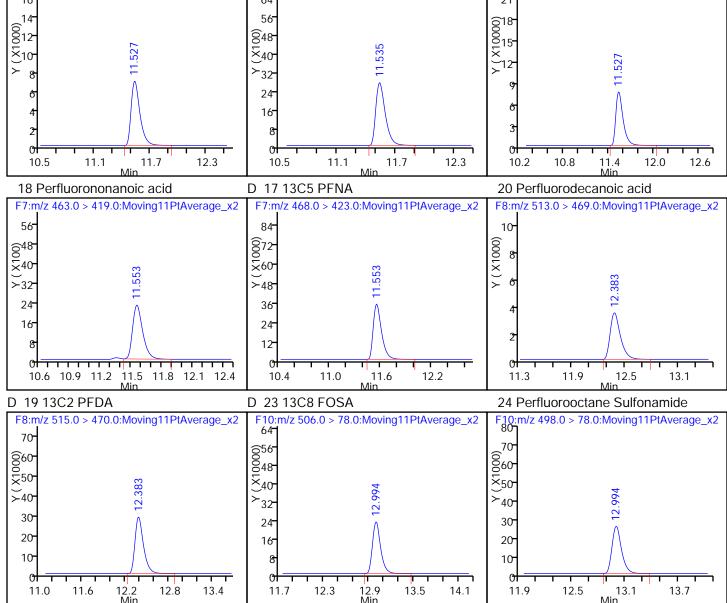
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L3_00017 Amount Added: 1.00 Units: mL

Report Date: 25-May-2016 14:06:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_006.d 24-May-2016 17:49:40 **Injection Date:** Instrument ID: Α6 Lims ID: Std L3 Client ID: Operator ID: **JRB** ALS Bottle#: 11 Worklist Smp#: 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC A6 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 18 63 0015 ×12 054 0645 ×45 8₂₀ <u>~</u>36 12 27 18 5.5 5.8 5.9 5.7 6.0 5.2 6.1 6.5 7.1 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 12 56 70 660 (X1000) X (X1000) <u>8</u>48 ×40 ×50 ≻₃₂ >₄₀ 24 30 20 16 10 7.0 7.3 7.9 6.7 6.7 7.0 7.3 7.6 8.2 8.5 8.8 7.6 9.1 6.4 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 56- 70 10 (0) ×40 ×32 <u>660</u> Y (X1000) ∑50 ≻40- 24 30 16 20 10 7.8 8.1 8.4 8.7 9.1 9.4 9.7 9.0 9.3 9.6 9.9 7.5 8.8 10.0 10.3 8.7 10.2 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 V (X10000) 70 12 (0010° (0010° 8 60° ×50° <u></u>40⁻ 30 20 10 0 0 $^{\circ}$ 9.1 9.7 10.3 8.5 9.1 Page 65@of 776 10.3 9.6 10.2 10.8 8.5



15.4 15.7 16.0 16.3

26-

14.5 14.8 15.1

18

14.4

14.7

15.0

15.3

15.6

15.9

Report Date: 26-May-2016 11:29:35 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_007.d

Lims ID: Std L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 24-May-2016 18:10:55 ALS Bottle#: 12 Worklist Smp#: 7

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L4

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:29:34 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 26-May-2016 11:29:34

FIRST Level Revie	ewer: bar	neuj			Date:		26-May-2016 11:29:3	34		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	tyric acid									
212.9 > 169.0	•		-0.003	1.000	27348	18.0		89.8	2608	
D 113C4 PFB/										
217.0 > 172.0	5.797	5.796	0.001		63652	52.2		104	6598	
D 3 13C5-PFP6			0.005		10.4550	F0 F		405	40000	
	6.941		-0.005		124553	52.5		105	12323	
4 Perfluoropei		6.949	0.003	1 000	50671	17.7		00.2	5409	
262.9 > 219.0				1.000	30071	17.7		88.3	5409	
40 Perfluorobu 298.9 > 80.0	nanesun 7.078		0.004	1.000	124172	15.2		85.7		
5 Perfluorobut			0.004	1.000	124172	13.2		03.7		
298.9 > 80.0	7.078	7.074	0.004	1.000	124172	NC			241	
298.9 > 99.0	7.078	7.074	0.004	1.000	60653		2.05(0.00-0.00)		1934	
D 613C2 PFH	κA									
315.0 > 270.0	8.225	8.223	0.002		165711	48.2		96.4	15639	
7 Perfluorohex	xanoic ad	cid								
313.0 > 269.0	8.225	8.225	0.0	1.000	58255	19.5		97.6	5581	
D 8 13C4-PFH _I										
367.0 > 322.0	9.463	9.459	0.004		204276	56.6		113	17847	
9 Perfluorohej										
363.0 > 319.0		9.462	0.001	1.000	71730	16.3		81.6	6612	
D 11 18O2 PFH		0.404	0.004		2/5525	40.0		100	22557	
403.0 > 84.0	9.498		0.004		265525	48.0		102	22556	
10 Perfluorohe 399.0 > 80.0	exane Su 9.498		0.003	1.000	101790	NC			722	
41 Perfluorohe				1.000	101790	INC			122	
399.0 > 80.0	9.498	9.495	u 0.003	1.000	101790	18.5		97.9		
577.07 00.0	7. 170	7.175	0.000	1.000	Page 655 of			,,,,	05/06	8/2016

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05/26/2016

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooct	tanoic ac	id								
413.0 > 369.0	10.577	10.573		1.000	72833	15.8		78.9	3330	
	10.577	10.573	0.004	1.000	16576		4.39(0.00-0.00)	78.9	1104	
D 12 13C4 PFO. 417.0 > 372.0	A 10.577	10 577	0.0		216681	59.7		119	14135	
14 Perfluorohe			0.0		210001	37.7		117	14133	
449.0 > 80.0	10.586	10.585		1.000	93471	NC			6112	
38 Perfluorohe 449.0 > 80.0	ptanesul 10.586			1.000	93471	17.4		91.2		
15 Perfluorooct				1.000	93471	17.4		91.2		
	11.526			1.000	166032	16.2		84.6	24238	
499.0 > 99.0	11.526	11.524	0.002	1.000	98842		1.68(0.00-0.00)	84.6	4901	
D 16 13C4 PFO										
	11.526		0.002		526709	52.9		111	39433	
18 Perfluorono			0.007	1 000	/ 42/ 4	10.0		00.0	E 4 4	
463.0 > 419.0		11.547	0.006	1.000	64364	18.0		89.8	544	
D 17 13C5 PFNA 468.0 > 423.0		11.551	0.002		195708	56.9		114	13958	
20 Perfluorode			0.002		.,0,00	00.7			10700	
513.0 > 469.0			-0.003	1.000	92855	20.1		101	5653	
D 19 13C2 PFD	А									
515.0 > 470.0	12.373	12.380	-0.007		191340	44.8		89.5	11626	
D 23 13C8 FOS										
	12.994				1501807	51.0		102	98845	
24 Perfluorooct 498.0 > 78.0	tane Sulf 12.994			1.000	702846	21.0		105	46281	
39 Perfluorode				1.000	702040	21.0		105	40201	
	13.032			1.000	92611	17.3		89.5		
25 Perfluorode										
599.0 > 80.0	13.032	13.032	0.0	1.000	92611	NC			6411	
D 26 13C2 PFU	nA									
565.0 > 520.0	13.076	13.079	-0.003		318776	57.9		116	22709	
27 Perfluoroun										
563.0 > 519.0		13.082	-0.006	1.000	137039	16.6		83.2	1612	
D 28 13C2 PFD6 615.0 > 570.0		12 447	0.010		318700	44.5		88.9	10700	
29 Perfluorodo			-0.010		310700	44.3		00.9	10700	
613.0 > 569.0			-0.010	1.000	139778	21.5		108	101	
30 Perfluorotrio										
663.0 > 619.0			0.001	1.000	231228	24.5		123	401	
D 33 13C2-PFT	eDA									
715.0 > 670.0	14.589	14.589	0.0		563664	53.7		107	34432	
32 Perfluoroteti										
713.0 > 669.0			-0.001	1.000	216201	21.1		105	75.8	
34 Perfluorohe:			0.005	1 000	412420	10 5		02.5	042	
813.0 > 769.0		15.1/9	0.005	1.000	413438	18.5		92.5	943	
D 35 13C2-PFH: 815.0 > 770.0		15 120	0 004		_113/1880	52.0		106	6127	
013.0 / 110.0	13.104	13.100	0.004		Page 656 of 77	6 32.7		100	6127 05/26	6/2016

Report Date: 26-May-2016 11:29:35 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_007.d Data File:

EXP **DLT REL** Amount Signal RT RT ng/ml Ratio(Limits) %Rec S/N Flags RT RT Response

36 Perfluorooctandecanoic acid

913.0 > 869.0 15.456 15.450 0.006 1.000 20.2 101 702 523232

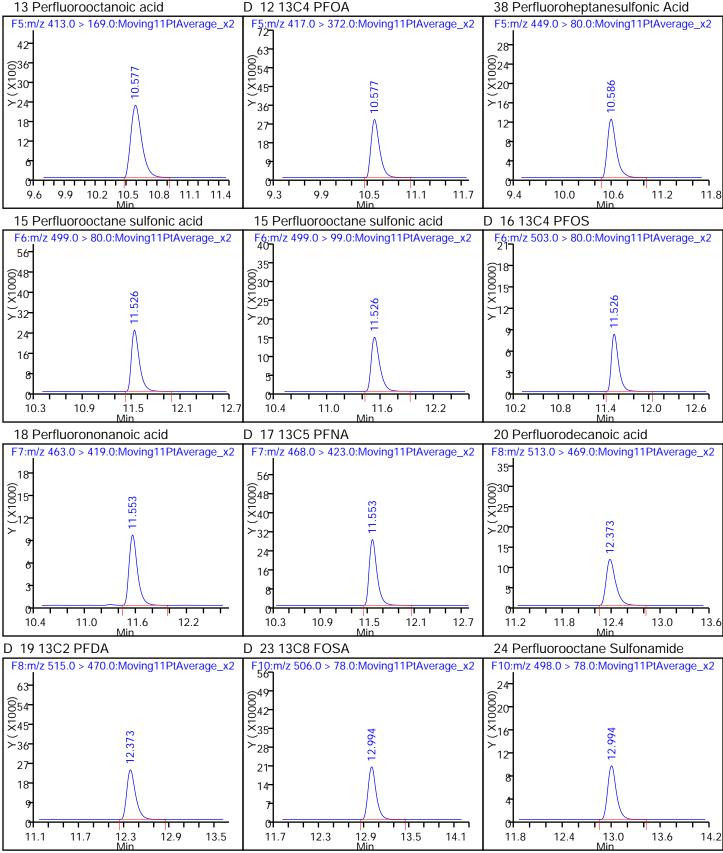
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020 Amount Added: 1.00 Units: mL

Report Date: 26-May-2016 11:29:35 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_007.d **Injection Date:** 24-May-2016 18:10:55 Instrument ID: Α6 Lims ID: Std L4 Client ID: Operator ID: **JRB** ALS Bottle#: 12 Worklist Smp#: 7 15.0 ul Dil. Factor: Injection Vol: 1.0000 LC PFC_DOD ICAL Method: PFAC A6 Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 018 0015 X 12 ×30-866 $\stackrel{\smile}{\times}_{55}$ 18 33 12 22 5.8 5.3 5.9 5.5 6.1 5.0 5.6 6.2 6.7 7.0 7.3 6.4 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3;m/z 315.0 > 270.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 21- 0018-30 6 25 642 ∑₁₅- \succeq_{20} ×35 ≻₂₈ 15 21 10 14 6.9 7.2 7.5 6.7 7.8 9.0 6.6 7.0 7.3 7.6 7.2 8.4 6.3 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 24 18 ©56**-**0048**-**<u>@</u>20 © 215 ×16 ×40 ≻₃₂-12 24 16 8.0 8.3 9.1 9.4 9.7 8.9 9.2 9.5 9.8 7.7 8.6 8.9 8.8 10.0 10.3 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 V (X10000) 35 ©25 830 ×25 ′20 ≻20 15 15 10 10 0 0 8.9 9.2 9.5 9.8 Page 65/86 of 776 8.0 8.9 9.8 10.7 8.6 10.1 9.5 10.1 10.7



15.4 15.7 16.0 16.3

10

14.5 14.8 15.1

27

18

14.2

14.8

15.4

16.0

Report Date: 25-May-2016 14:06:36 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_008.d

Lims ID: Std L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 24-May-2016 18:32:11 ALS Bottle#: 13 Worklist Smp#: 8

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L5

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 25-May-2016 14:06:35 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK049

First Level Reviewer: westendorfc Date: 25-May-2016 08:45:03

First Level Reviewer: westendorfc						25-May-2016 08:45:	08:45:03			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobu	tvric acid									
212.9 > 169.0	5.785		-0.006	1.000	67124	49.7		99.5	4565	
D 113C4 PFB/	A									
217.0 > 172.0	5.788	5.796	-0.008		54628	44.8		89.7	3776	
D 3 13C5-PFP										
267.9 > 223.0	6.946	6.946	0.0		112206	47.3		94.7	10072	
4 Perfluorope										
262.9 > 219.0		6.949		1.000	127936	48.5		97.0	8414	
40 Perfluorobu				1 000	400040	47 (400		
298.9 > 80.0	7.071		-0.003	1.000	409210	47.6		108		
5 Perfluorobu			0.000	1 000	400210	NO			070	
298.9 > 80.0 298.9 > 99.0	7.071 7.067	7.074 7.074	-0.003 -0.007	1.000 0.999	409210 152656	NC	2.68(0.00-0.00)		878 755	
D 6 13C2 PFH:		7.074	0.007	0.777	102000		2.00(0.00 0.00)		755	
315.0 > 270.0	8.219	8.223	-0.004		139558	40.6		81.2	11653	
7 Perfluorohe										
	8.230		0.005	1.000	131803	51.4		103	7179	
D 8 13C4-PFH	Aq									
367.0 > 322.0	•	9.459	0.005		149508	41.4		82.9	12507	
9 Perfluorohe	ptanoic a	cid								
363.0 > 319.0	9.464	9.462	0.002	1.000	190009	58.1		116	16374	
D 11 1802 PFH	łxS									
403.0 > 84.0	9.493	9.494	-0.001		277574	50.2		106	23772	
10 Perfluorohe	exane Su	lfonate								
399.0 > 80.0	9.499	9.495	0.004	1.000	278735	NC			3079	
41 Perfluorohe										
399.0 > 80.0	9.499	9.495	0.004	1.000	278735	48.3		102		
					Page 661 of	776			05/26	3/2016

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05/26/2016

Report Date: 25-May-2016 14:06:36 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 25- Data File:				o\Chrom			20-Apr-2016 13:59: \24MAY2016A6A_0			
		EXP	DLT	REL		Amount				
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooc										
413.0 > 369.0 413.0 > 169.0	10.586 10.577			1.000 0.999	169115 68555	53.3	2.47(0.00-0.00)	107 107	3057 4415	
D 12 13C4 PFO		10.070	0.001	0.777	00000		2.17(0.00 0.00)	107	1110	
	10.577	10.577	0.0		148927	41.1		82.1	9614	
14 Perfluorohe	•		0.001	1 000	27/704	NC			17201	
	10.586			1.000	276794	NC			17301	
38 Perfluorohe 449.0 > 80.0	10.586			1.000	276794	53.6		113		
15 Perfluorooc	tane sulf	onic acid	l							
499.0 > 80.0	11.527			1.000	481794	49.0		102	1235	
499.0 > 99.0	11.527	11.524	0.003	1.000	273375		1.76(0.00-0.00)	102	3091	
D 16 13C4 PFO										
503.0 > 80.0	11.527		0.003		505099	50.8		106	36296	
18 Perfluorono			0.007	1 000	1/4001	FF 0		440	10/1	
	11.553	11.547	0.006	1.000	164281	55.9		112	1361	
D 17 13C5 PFN.		11 551	0.000		140421	20.1		74.0	11701	
	11.553		0.002		160421	38.1		76.2	11734	
20 Perfluorode 513.0 > 469.0			0.007	1.000	215872	50.6		101	12999	
		12.370	0.007	1.000	213072	30.0		101	12999	
D 19 13C2 PFD. 515.0 > 470.0	A 12.383	12 380	0 003		174902	40.9		81.8	10549	
D 23 13C8 FOS		12.300	0.003		174702	40.7		01.0	10547	
506.0 > 78.0	12.994	12.993	0.001		1501656	51.0		102	99229	
24 Perfluorooc										
498.0 > 78.0	12.994			1.000	1807702	54.1		108	39459	
39 Perfluorode	cane Sul	fonic aci	d							
599.0 > 80.0	13.031	13.032	-0.001	1.000	258349	50.5		105		
25 Perfluorode	cane Sul	fonate								
599.0 > 80.0	13.031	13.032	-0.001	1.000	258349	NC			18253	
D 26 13C2 PFU	nA									
565.0 > 520.0	13.075	13.079	-0.004		213180	38.7		77.4	14861	
27 Perfluoroun										
563.0 > 519.0		13.082	-0.007	1.000	292902	54.3		109	6756	
D 28 13C2 PFD		10 //7	0.002		2/0255	515		100	24070	
615.0 > 570.0			-0.003		369255	51.5		103	24960	
29 Perfluorodo 613.0 > 569.0			0.003	1.000	328730	43.7		87.4	344	
			-0.003	1.000	320/30	43.7		07.4	344	
30 Perfluorotric 663.0 > 619.0			0.0	1.000	576659	52.8		106	575	
D 33 13C2-PFT		14.100	0.0	1.000	370037	32.0		100	373	
715.0 > 670.0		14 589	-0.001		496861	47.4		94.7	44656	
32 Perfluorotet			0.001		170001	17.1		, 1,	11000	
713.0 > 669.0			-0.002	1.000	553149	46.7		93.4	303	
34 Perfluorohe			0.002		333			70		
813.0 > 769.0			-0.001	1.000	1111597	44.4		88.7	922	
D 35 13C2-PFH										
815.0 > 770.0		15.180	-0.002		1091378 Page 662 of 77	50.9		102	9820 05/26	3/2016
					i age ouz oi //	U			03/20	<i>,,</i> 2010

Report Date: 25-May-2016 14:06:36 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_008.d Data File:

EXP **DLT REL** Amount RT RT ng/ml Ratio(Limits) %Rec S/N Flags Signal RT RT Response

36 Perfluorooctandecanoic acid

913.0 > 869.0 15.450 15.450 0.0 47.6 95.1 1.000 1430022 2245

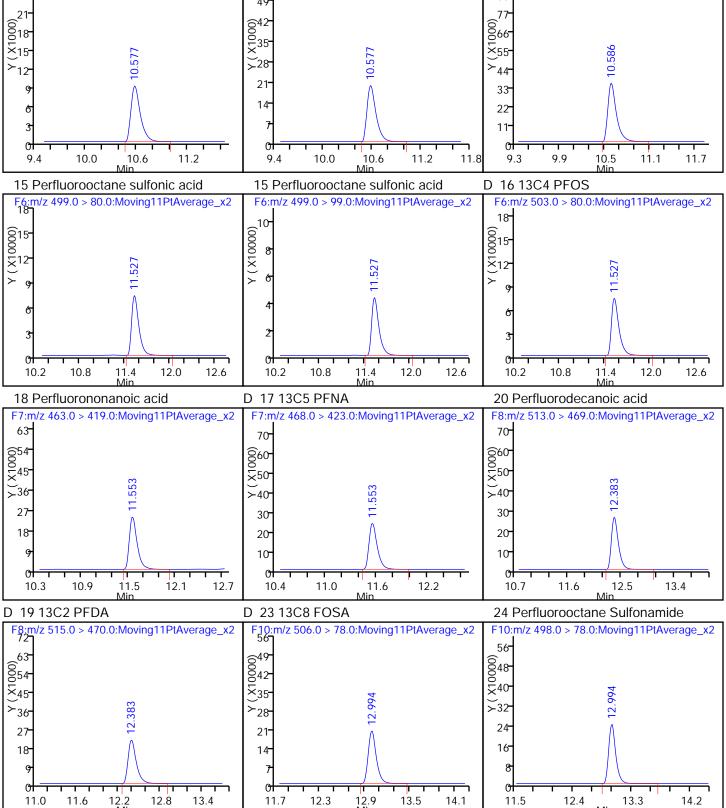
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00018 Amount Added: 1.00 Units: mL

Report Date: 25-May-2016 14:06:36 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_008.d **Injection Date:** 24-May-2016 18:32:11 Instrument ID: Α6 Lims ID: Std L5 Client ID: Operator ID: **JRB** ALS Bottle#: 13 Worklist Smp#: 8 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 28 (018 000 15 × 12 ²⁴ ×20 **≻**16 12 5.3 5.9 5.5 5.8 7.3 5.6 6.2 6.5 5.2 6.1 6.4 6.7 7.0 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid D F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 Y (X10000) 36 630<u>-</u> ©36 ×30 18 18 12 12 7.1 7.9 6.8 7.4 7.7 6.7 7.3 7.9 8.2 8.5 6.5 7.6 8.8 9.1 6.1 8 13C4-PFHpA 7 Perfluorohexanoic acid D 9 Perfluoroheptanoic acid F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 63 35- 630-6 824 654 00 145 X ×20 ×25-<u>></u>36 ≻₁₆-≻₂₀-27 15 18 10 01 7.8 9.0 9.7 10.3 9.1 9.4 9.7 7.2 8.4 8.5 9.1 8.8 10.0 10.3 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F5;m/z 413.0 > 369.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 (X10000) V (X10000) @ 42 **≥**35 28 21 0 0 8.7 9.3 9.9 10.5 8.3 8.9 Page 66%hof 776 10.1 10.7 9.4 10.0 10.6 8.1



15.6

16.2

15.0

36

24-

14.4

24 16

14.4

14.7

15.0

15.3

15.6

15.9

Report Date: 25-May-2016 14:06:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_009.d

Lims ID: Std L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 24-May-2016 18:53:25 ALS Bottle#: 14 Worklist Smp#: 9

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L6

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 25-May-2016 14:06:52 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK049

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	yric acid									
212.9 > 169.0	5.791	5.791	0.0	1.000	282560	220.2		110	3471	
D 113C4 PFBA										
217.0 > 172.0	5.800	5.796	0.004		51257	42.1		84.1	2979	
D 3 13C5-PFP6										
	6.946		0.0		104324	44.0		88.0	4847	
4 Perfluoroper			0.000	1 000	400074	105 /		07.0	1 1705	
			0.002	1.000	483871	195.6		97.8	14795	
40 Perfluorobu				1 000	12/2070	1/00		05.5		
298.9 > 80.0		7.074	-0.003	1.000	1262078	168.9		95.5		
5 Perfluorobut 298.9 > 80.0	ane Sulf 7.071	onate 7.074	0.002	1.000	1242070	NC			688	
298.9 > 99.0	7.071	7.074	-0.003 -0.007	0.999	1262078 558381	NC	2.26(0.00-0.00)		1540	
D 6 13C2 PFH		7.074	0.007	0.777	330301		2.20(0.00 0.00)		1340	
315.0 > 270.0		8.223	-0.004		124365	36.2		72.4	11213	
7 Perfluorohe										
313.0 > 269.0	8.219		-0.006	1.000	491786	213.2		107	5927	
D 8 13C4-PFH	οΑ									
367.0 > 322.0		9.459	-0.007		129064	35.8		71.6	11580	
9 Perfluorohe	otanoic a	cid								
363.0 > 319.0	9.458	9.462	-0.004	1.000	555259	195.8		97.9	24489	
D 11 1802 PFH	xS									
403.0 > 84.0	9.493	9.494	-0.001		241061	43.6		92.2	4120	
10 Perfluorohe	xane Su	lfonate								
399.0 > 80.0	9.493	9.495	-0.002	1.000	960243	NC			5433	
41 Perfluorohe										
399.0 > 80.0	9.493	9.495	-0.002	1.000	960243	191.1		101		

Data File:	\\Chr	omNA\Sa	acramen	to\Chrom	Data\A6\20160	0160524-31021.b\24MAY2016A6A_009.d				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooc	tanoic ac	sid								
413.0 > 369.0		10.573	-0.005	1.000	356123	182.7		91.3	1830	
		10.573		1.000	166130	102.7	2.14(0.00-0.00)	91.3	10669	
		10.070	0.005	1.000	100100		2.14(0.00 0.00)	71.5	10007	
D 12 13C4 PFO. 417.0 > 372.0		10.577	0.0		91496	25.2		50.4	5612	
			0.0		71470	25.2		30.4	3012	
14 Perfluorohe	•		0.000	1 000	70/077	NC			1/001	
		10.585		1.000	796277	NC			16021	
38 Perfluorohe	•									
		10.585		1.000	796277	179.3		94.2		
15 Perfluorooc										
499.0 > 80.0		11.524		1.000	1667222	197.0		103	667	
499.0 > 99.0	11.518	11.524	-0.006	1.000	970644		1.72(0.00-0.00)	103	7118	
D 16 13C4 PFO	S									
503.0 > 80.0	11.518	11.524	-0.006		434368	43.7		91.3	31460	
18 Perfluorono	nanoic a	cid								
463.0 > 419.0	11.545	11.547	-0.002	1.000	444822	273.8		137	3180	
D 17 13C5 PFN	Α									
		11.551	-0.006		88714	21.1		42.1	6021	
20 Perfluorode	canoic a	cid								
513.0 > 469.0			-0.003	1.000	582943	274.3		137	34940	
		12.070	0.000	1.000	002710	271.0		107	01710	
D 19 13C2 PFD		12.380	0.007		04401	20.3		40.4	5276	
		12.300	-0.007		86691	20.3		40.6	3270	
D 23 13C8 FOS		40.000	0.000		4400070	40.4		00.0	70005	
506.0 > 78.0		12.993			1188273	40.4		8.08	78225	
24 Perfluorooc										
498.0 > 78.0	12.994	12.994	0.0	1.000	5622658	212.8		106	5773	
39 Perfluorode	cane Su	lfonic ac	id							
599.0 > 80.0	13.031	13.032	-0.001	1.000	864142	196.6		102		
25 Perfluorode	cane Su	lfonate								
599.0 > 80.0	13.031	13.032	-0.001	1.000	864142	NC			58581	
D 26 13C2 PFU	nΑ									
		13.079	-0.004		144515	26.2		52.5	9864	
27 Perfluoroun			0.001		111010	20.2		02.0	,001	
563.0 > 519.0			0.002	1.000	745515	205.3		103	2485	
		13.002	0.002	1.000	743313	200.0		103	2400	
D 28 13C2 PFD		10 //7	0.007		242100	22.0		/7.0	/ / / 7	
		13.667	0.006		243100	33.9		67.8	6467	
29 Perfluorodo										
613.0 > 569.0	13.673	13.667	0.006	1.000	1085132	219.0		109	1940	
30 Perfluorotrio	decanoic	acid								
663.0 > 619.0	14.173	14.166	0.007	1.000	1405333	195.4		97.7	2774	
D 33 13C2-PFT	eDA									
715.0 > 670.0	14.594	14.589	0.005		359134	34.2		68.5	10438	
32 Perfluorotet	radecan	oic acid								
		14.590	0 004	1.000	1598285	205.5		103	1559	
			3.00 1		.0,0200	200.0		100	.507	
34 Perfluorohe. 813.0 > 769.0			0.001	1.000	2677600	227.2		114	2940	
		15.179	-U.UU I	1.000	3677680	227.3		114	2940	
D 35 13C2-PFH		45.455	0.005		04.44==	40.1		05.5	F005	
815.0 > 770.0	15.178	15.180	-0.002		Page 668 of 7	776 ^{42.6}		85.2	5088/26	3/2016

Report Date: 25-May-2016 14:06:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_009.d Data File:

EXP **DLT REL Amount** RT RT ng/ml Ratio(Limits) %Rec S/N Flags Signal RT RT Response

36 Perfluorooctandecanoic acid

913.0 > 869.0 15.449 15.450 -0.001 1.000 4970845 251.1 126 5172

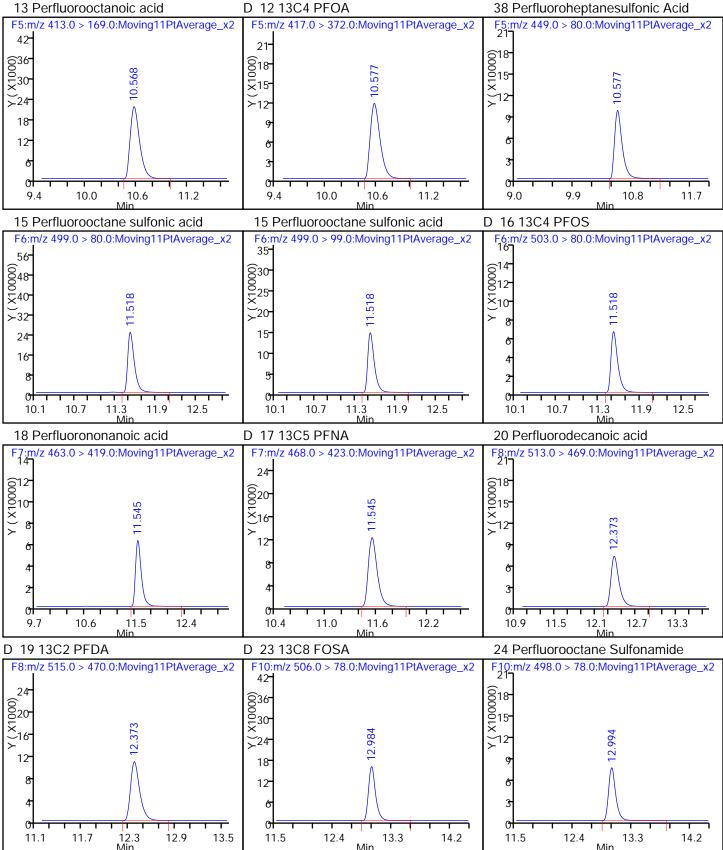
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L6_00017 Amount Added: 1.00 Units: mL

Report Date: 25-May-2016 14:06:52 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_009.d **Injection Date:** 24-May-2016 18:53:25 Instrument ID: Α6 Lims ID: Std L6 Client ID: Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 9 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 18 630 00 25 × <u>666</u> 5.8000 0 15 ∑55⁻ ∑20⁻ >44 33 15 10 5.5 5.8 7.3 5.2 5.5 5.8 6.1 5.2 6.1 6.4 6.7 7.0 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 219.0:Moving11PtAverage x2F2:m/z 298.9 > 80.0:Moving11PtAverage x2F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 35 36- × (×10000) × (×100000) 8 ©30-025-630<u>-</u> ∑₂₄ ∑20 18 15 12 10 7.9 8.0 6.9 7.2 7.5 6.7 7.3 7.7 8.3 8.9 6.3 6.6 7.8 8.6 6.1 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 49 (00015-00015-012-(12 × 100001 ×) × 8 642 00 35 21 0 7.6 8.2 8.8 9.1 9.4 9.7 8.9 9.5 7.0 8.8 10.0 10.3 8.3 10.1 10.7 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 77-28- 666 ×55 666 866 ×20-**∑**55 ×44 ≻16- 44 33 12 33 22 22 00 08.6 8.9 9.2 9.5 9.8 8.3 8.9 Page 67/0h of 776 10.1 10.7 9.3 9.9 10.5 10.1 11.1 05/26/2016



15.4

16.0

16.6

15.9

14.2

14.8

15.3

12

14.1

14.7

Report Date: 25-May-2016 14:07:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Lims ID: Std L7

Client ID:

Sample Type: IC Calib Level: 7

Inject. Date: 24-May-2016 19:14:42 ALS Bottle#: 15 Worklist Smp#: 10

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: STD L7

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 25-May-2016 14:07:05 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK049

First Level Reviewer: westendorfc Date: 25-May-2016 09:09:15

First Level Reviewer: westendorfc			Date: 25-May-2016 09:09			15				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobu	tvric acid									
212.9 > 169.0	5.794	5.791	0.003	1.000	480936	448.3		112	30992	
D 113C4 PFB/	A									
	5.803	5.796	0.007		42763	35.1		70.2	3993	
D 3 13C5-PFP										
		6.946	0.0		75925	32.0		64.1	6422	
4 Perfluorope			0.000	1 000	707404	400.0		100	7/0	
262.9 > 219.0		6.949		1.000	737184	408.9		102	763	
40 Perfluorobu 298.9 > 80.0	utanesulfo 7.071		d -0.003	1.000	2378342	360.5		102		
5 Perfluorobu			-0.003	1.000	2370342	300.3		102		
298.9 > 80.0	7.071	7.074	-0.003	1.000	2378342	NC			1609	
298.9 > 99.0	7.071		-0.003	1.000	1068357	140	2.23(0.00-0.00)		1247	
D 613C2 PFH:	хA						, ,			
315.0 > 270.0	8.230	8.223	0.007		100843	29.3		58.7	8755	
7 Perfluorohe	xanoic ad	cid								
313.0 > 269.0	8.225	8.225	0.0	1.000	879336	469.3		117	2846	
D 8 13C4-PFH	•									
367.0 > 322.0	9.446	9.459	-0.013		98014	27.2		54.3	8884	
9 Perfluorohe	•									
363.0 > 319.0		9.462	-0.010	1.000	934808	433.6		108	10544	
D 11 18O2 PFH		0.404	0.007		040004	00.5		04.4	47705	
403.0 > 84.0		9.494	-0.007		212821	38.5		81.4	17795	
10 Perfluorohe 399.0 > 80.0			-0.008	1.000	1663673	NC			21467	
				1.000	1003073	NC			∠140/	
41 Perfluorohe 399.0 > 80.0	9.487		u -0.008	1.000	1663673	375.0		99.1		
0,7.0 > 00.0	7.407	7.475	0.000	1.000	Page 673 of			//.1	05/20	3/2016
					Faue 07.3 01	((()			U0/20	ハイひょり

Page 673 of 776

05/26/2016

Report Date: 25-May-2016 14:07:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\Chrom			0\24MAY2016A6A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooc	tanoic ac	cid								
413.0 > 369.0	10.568	10.573		1.000	630418	498.2		125	2201	
	10.568	10.573	-0.005	1.000	262989		2.40(0.00-0.00)	125	15603	
D 12 13C4 PFO		10 577	0.0		/1022	17.0		24.1	2720	
	10.577		0.0		61823	17.0		34.1	3730	
14 Perfluorohe 449.0 > 80.0	•	10.585	-0.008	1.000	1402764	NC			5422	
38 Perfluorohe				1.000	1102701	110			0122	
449.0 > 80.0	10.577			1.000	1402764	362.3		95.1		
15 Perfluorooc	tane sulf	onic acid	t							
499.0 > 80.0		11.524		1.000	3093589	419.2		110	848	
499.0 > 99.0		11.524	-0.006	1.000	1782798		1.74(0.00-0.00)	110	7596	
D 16 13C4 PFO		44 504	0.007		270724	20.4		70 (07000	
503.0 > 80.0		11.524	-0.006		378731	38.1		79.6	27398	
18 Perfluorono 463.0 > 419.0	nanoic a 11.553		0.006	1.000	629734	549.6		137	14015	
D 17 13C5 PFN		11.547	0.000	1.000	029734	349.0		137	14015	
	11.553	11 551	0.002		62575	14.9		29.7	4265	
20 Perfluorode			0.002		02070	,		27.7	1200	
513.0 > 469.0			0.007	1.000	764487	625.9		156	14620	
D 19 13C2 PFD	A									
515.0 > 470.0	12.393	12.380	0.013		49786	11.6		23.3	2872	
D 23 13C8 FOS	A									
506.0 > 78.0	12.994	12.993	0.001		1207359	41.0		82.1	53102	
24 Perfluorooc										
498.0 > 78.0		12.994		1.000	10759050	400.7		100	3964	
39 Perfluorode				1 000	14/0172	201.1		00.0		
599.0 > 80.0		13.032	0.009	1.000	1460173	381.1		98.8		
25 Perfluorode 599.0 > 80.0	13.041		0 000	1 000	1460173	NC			32714	
D 26 13C2 PFU		13.032	0.007	1.000	1400173	NC			32714	
565.0 > 520.0		13.079	0.015		124337	22.6		45.1	8600	
27 Perfluoroun										
563.0 > 519.0			0.012	1.000	1174235	376.3		94.1	1771	
D 28 13C2 PFD	oΑ									
615.0 > 570.0	13.676	13.667	0.009		211043	29.4		58.9	13719	
29 Perfluorodo	decanoi	c acid								
613.0 > 569.0	13.676	13.667	0.009	1.000	1560769	362.8		90.7	3244	
30 Perfluorotrio	decanoic	acid								
663.0 > 619.0		14.166	0.001	1.000	2163423	346.6		86.6	2620	
D 33 13C2-PFT										
715.0 > 670.0			-0.006		326798	31.2		62.3	14251	
32 Perfluorotet			0.007	1 000	2/70007	207.0		00.2	170/	
713.0 > 669.0			-0.007	1.000	2679987	397.0		99.3	1786	
34 Perfluorohe 813.0 > 769.0			0.004	1.000	6/1/0021	459.7		115	3339	
		15.179	-0.004	1.000	6440831	407.7		115	JJJ7	
D 35 13C2-PFH 815.0 > 770.0		15 180	-0 005		<u>_837620</u>	39.0		78.1	11251.	. /o.c. : -
3.3.0 / 170.0	. 5. 1 / 5	10.100	0.000		Page 674 of 77	b 57.5		, 0. 1	11251 ₂₆	5/2016

Report Date: 25-May-2016 14:07:06 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d Data File:

_											
			EXP	DLT			Amount				
ı	Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags

36 Perfluorooctandecanoic acid

144 4788 9902853 576.2

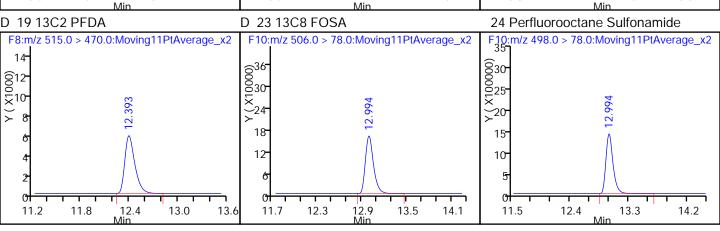
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L7_00017 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 25-May-2016 14:07:06 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\20160524-31021.b\\24MAY2016A6A_010.d **Injection Date:** 24-May-2016 19:14:42 Instrument ID: Α6 Lims ID: Std L7 Client ID: Operator ID: **JRB** ALS Bottle#: 15 Worklist Smp#: 10 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 (00012 X) > 9 5.3 5.9 4.8 5.4 6.0 6.6 5.6 6.2 6.4 6.7 7.0 7.3 7.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 (0042 (0042 (00015-X)12-6.951 6 20 20 ×35 ≻28 21 14 8.0 6.9 7.2 7.5 6.9 7.5 7.7 8.3 8.9 6.6 5.7 6.3 8.1 8.6 6.3 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 30 ©35- (000015 X) 12 6 25 ×25 15 15 10 10 7.7 8.3 8.9 9.1 9.4 9.7 9.0 9.6 10.2 8.8 10.0 10.3 7.1 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 (000012 X) 0042 00035 × <u>8</u>48 ×40 <u></u> ≥28-21 24 14 0 0 0 8.8 9.4 10.0 10.6 7.5 8.4 Page 67/6 of 776 10.2 9.2 9.8 10.4 11.0 05/ 8.2



15.9

16.5

16

14.1

14.7

15.2 15.5 15.8 16.1

12

14.3 14.6 14.9

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: <u>ICV 320-111390/13</u> Calibration Date: <u>05/25/2016</u> 19:44

Instrument ID: A4 Calib Start Date: 05/25/2016 16:55

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/25/2016 19:01

Lab File ID: 25MAY2016B4A_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6418	0.6042		47.1	50.0	-5.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.5079	0.4357		42.9	50.0	-14.2	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID	0.7655	0.6286		38.0	44.3	-14.2	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4002		44.4	50.0	-11.2	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.4343		44.9	50.0	-10.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.705	1.616		44.7	47.3	-5.2	25.0
Perfluorooctanoic acid (PFOA)	L1ID	0.4698	0.4140		45.7	50.0	-8.6	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID	7.344	7.099		43.6	47.6	-8.3	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID	11.43	11.46		39.8	47.8	-16.7	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.183		48.1	50.0	-3.9	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.039	1.015		48.8	50.0	-2.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.069	0.9064		42.4	50.0	-15.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	4.187	4.035		46.3	48.3	-3.6	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.179	1.055		44.7	50.0	-10.5	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9121	0.8447		46.3	50.0	-7.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.025	1.020		49.7	50.0	-0.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5424	0.4528		41.7	50.0	-16.5	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		2.841		54.5	50.0	9.0	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.211	2.063		46.7	50.0	-6.7	25.0

Report Date: 26-May-2016 11:03:49 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_013.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 25-May-2016 19:44:02 ALS Bottle#: 9 Worklist Smp#: 13

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: ICV

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 20:10:40

First Level Reviewer: barnettj					Date: 25-May-2016 20:10:40					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobu	tvric acid									
212.7 > 168.6	5.800	5.798	0.002	1.000	2958964	47.1			7956	
D 113C4 PFB	Д									
216.7 > 171.5	5.797	5.798	-0.001		4897041	57.9		116	17343	
D 3 13C5-PFP										
267.6 > 222.7		6.907	0.002		4007616	52.2		104	7316	
4 Perfluorope			0.001	1 000	174/1/0	40.0			FF0	
262.9 > 218.7		6.910	-0.001	1.000	1746168	42.9			558	
5 Perfluorobut 298.8 > 79.6	tane Sulf 7.024	onate 7.024	0.0	1.000	795232	NC			2061	
298.8 > 98.6	7.024	7.024		1.000	539269	NC	1.47(0.00-0.00)		1224	
51 Perfluorobu				1.000	007207		, (0.00 0.00)			
298.8 > 79.6	7.024	7.024		1.000	795232	38.0				
D 613C2 PFH:	хA									
314.6 > 269.7	8.155	8.156	-0.001		4868461	58.6		117	8025	
7 Perfluorohe	xanoic ad	cid								
312.9 > 268.7	8.155	8.157	-0.002	1.000	1948205	44.4			2121	
22 PFPeS (Pe		•								
348.7 > 79.5	8.231	8.231	0.0	0.874	1626958	NC			6115	
D 8 13C4-PFH										
366.6 > 321.6		9.387	0.001		4696622	54.9		110	6023	
9 Perfluorohe	•		0.0	1 000	2020007	44.0			4057	
362.8 > 318.7		9.388	0.0	1.000	2039886	44.9			4057	
10 Perfluorohe 398.3 > 79.2	exane Su 9.419		-0.002	1.000	2183057	NC			3581	
58 Perfluorohe				1.000	2103037	INC			330 I	
398.3 > 79.2			u -0.002	1.000	2183057	44.7				
2,3,0,,,,2	,,,,,	/ · · · <u>-</u> ·	0.002		Page 680 of				05/24	6/2016
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05/26/2016

Report Date: 26-May-2016 11:03:49 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\ChromI			\25MAY2016B4A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFH	lxS									
402.5 > 83.6		9.422	-0.003		1352349	45.6		96.3	4547	
D 12 13C4 PFO	Α									
416.5 > 371.6	10.500	10.503	-0.003		4522634	50.7		101	6631	
13 Perfluorooc	tanoic ac	cid								
	10.500			1.000	1872553	45.7			2392	
412.8 > 168.7	10.500			1.000	614282		3.05(0.00-0.00)		1683	
39 Perfluorohe	•			1 000		40.7				
	10.509		0.001	1.000	2002003	43.6				
14 Perfluorohe	•		0.001	1 000	2002002	NC			4517	
	10.509	10.508	0.001	1.000	2002003	NC			4517	
D 16 13C4 PFO 502.4 > 79.7	11.459	11 145	0.004		283194	42.0		87.8	1259	
					203194	42.0		07.0	1239	
15 Perfluorooc 498.3 > 79.2	tane suii 11.459			1.000	3241703	39.8			2688	
498.3 > 98.2	11.459			1.000	2020911	37.0	1.60(0.00-0.00)		2424	
D 17 13C5 PFN			0.007							
467.5 > 422.6		11.484	-0.005		4181087	53.3		107	8671	
18 Perfluorono										
462.5 > 418.6			0.002	1.000	4947520	48.1			5432	
D 19 13C2 PFD										
	12.325	12.325	0.0		5407179	54.1		108	6738	
20 Perfluorode	canoic a	cid								
	12.325		0.0	1.000	5486255	48.8			4722	
D 23 13C8 FOS	5A									
505.4 > 77.6	12.897	12.893	0.004		5081241	52.6		105	4736	
24 Perfluorooc	tane Sulf	fonamide	Э							
497.5 > 77.6	12.897	12.893	0.004	1.000	4605524	42.4			3112	
25 Perfluorode	cane Sul	lfonate								
598.4 > 79.6	12.988	12.996	-0.008	1.000	1153396	NC			3804	
49 Perfluorode	cane Sul	lfonic ac	id							
598.4 > 79.6	12.988	12.996	-0.008	1.000	1153396	46.3				
27 Perfluoroun	decanoio	c acid								
562.4 > 518.5	13.042	13.042	0.0	1.000	5563123	44.7			4406	
D 26 13C2 PFU	nA									
564.3 > 519.5	13.042	13.044	-0.002		5271958	52.0		104	4367	
D 28 13C2 PFD	οΑ									
614.4 > 569.4	13.639	13.646	-0.007		5767571	54.7		109	3882	
29 Perfluorodo	decanoio	c acid								
612.4 > 568.6	13.639	13.646	-0.007	1.000	4872011	46.3			1800	
30 Perfluorotrio	decanoic	acid								
662.4 > 618.5	14.161	14.162	-0.001	1.000	3975330	49.7			1664	
32 Perfluorotet	tradecand	oic acid								
712.6 > 668.5	14.599	14.600	-0.001	1.000	1765191	41.7			1124	
D 33 13C2-PFT										
714.5 > 669.5	14.599	14.601	-0.002		3898106	51.4		103	3149	
D 35 13C2-PFH										
814.8 > 769.6	15.250	15.255	-0.005		Page 681 of 776	3 46.1		92.2	²⁷ 05/26	6/2016

Report Date: 26-May-2016 11:03:49 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_013.d Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohe 812.6 > 768.6	xadecan 15.250		-0.005	1.000	3816658	54.5			669	
36 Perfluorooc 912.7 > 868.6	tandecar 15.589			1.000	2771533	46.7			2240	

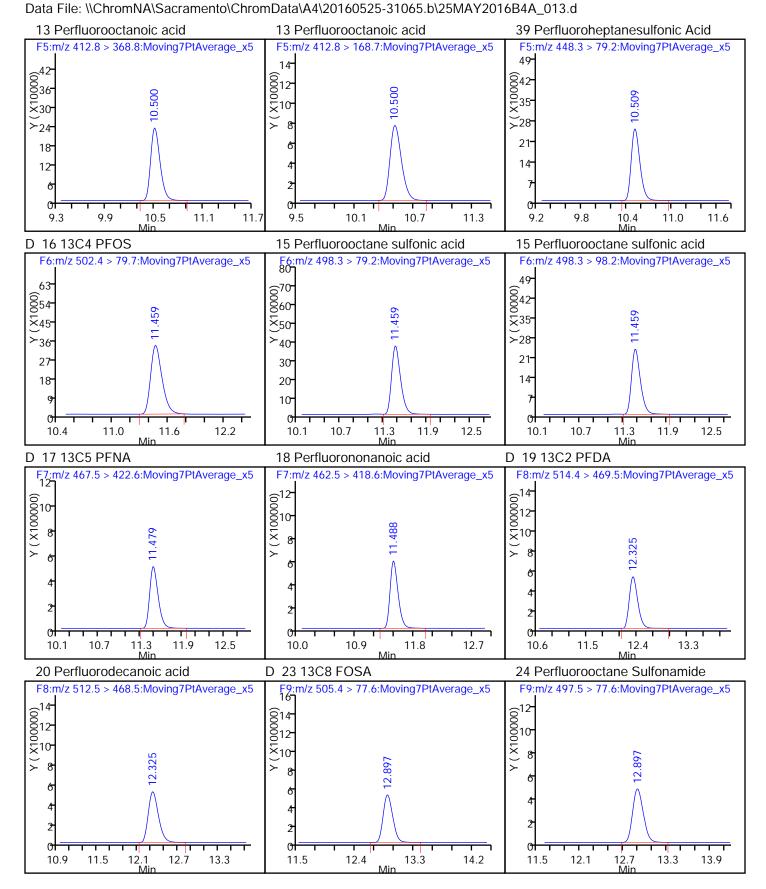
QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFCIC_00016 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:03:49 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_013.d **Injection Date:** 25-May-2016 19:44:02 Instrument ID: A4 Lims ID: **ICV** Client ID: Operator ID: **JRB** ALS Bottle#: 9 Worklist Smp#: 13 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) 6072 560 0048<u>-</u> **≻**48 36 24 24 16 12 5.2 5.8 6.9 5.5 6.1 4.8 5.4 6.0 6.6 6.3 7.2 7.5 6.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 18-Y (X100000) ©35 ©30 0015 ×12 ×25 **≻**20 15 10 8.0 6.2 6.8 7.4 7.6 7.6 8.2 6.4 6.7 7.0 7.3 7.0 8.8 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 (X100000) X (X1000000) X (X1000000) (49-(00042-×35-642 0036 ×30-≻28 21 18 12 14 7.9 8.2 8.2 8.8 9.4 8.8 9.4 7.6 8.5 8.8 10.0 8.2 10.0 58 Perfluorohexanesulfonic acid 11 1802 PFHxS 12 13C4 PFOA F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 49 (X100000) 630 625 0042 ×35 ∑20 -28 15 21 10 14 0 0 8.9 9.5 10.1 8.3 8.9 Page 686 of 776 10.1 9.3 9.9 10.5 8.3



15.8

16.4

15.2

14.2

14.8

15.4

16.0

14.6

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: <u>CCV 320-111390/26</u> Calibration Date: <u>05/26/2016</u> 00:19

Instrument ID: A4 Calib Start Date: 05/25/2016 16:55

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/25/2016 19:01

Lab File ID: 25MAY2016B4A_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6418	0.6989		54.5	50.0	8.9	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.5079	0.4529		44.6	50.0	-10.8	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID	0.7655	0.6861		41.4	44.2	-6.3	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4451		49.4	50.0	-1.2	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.5147		53.3	50.0	6.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.705	1.597		44.2	47.3	-6.4	25.0
Perfluorooctanoic acid (PFOA)	L1ID	0.4698	0.4306		47.5	50.0	-4.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID	7.344	9.614		59.1	47.6	24.1	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID	11.43	15.15		52.4	47.8	9.7	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.271		51.6	50.0	3.3	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.039	1.158		55.7	50.0	11.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.069	1.119		52.3	50.0	4.7	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	4.187	4.908		56.2	48.2	17.2	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.179	1.236		52.4	50.0	4.8	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9121	1.000		54.8	50.0	9.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.025	1.070		52.2	50.0	4.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5424	0.4935		45.5	50.0	-9.0	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.032		58.2	50.0	16.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.211	2.447		55.3	50.0	10.7	25.0

Report Date: 26-May-2016 11:06:38 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_026.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 26-May-2016 00:19:21 ALS Bottle#: 14 Worklist Smp#: 26

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:06:38 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:38:23

First Level Revie	ewer: wes	stendorfo	2		Date:	2	26-May-2016 08:38:	23		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	vric acid									
212.7 > 168.6	5.803	5.798	0.005	1.000	3767714	54.5		109	10299	
D 113C4 PFBA	Ą									
216.7 > 171.5	5.800	5.798	0.002		5390646	63.8		128	15898	
D 3 13C5-PFP6	D 3 13C5-PFPeA									
267.6 > 222.7	6.909	6.907	0.002		4189268	54.6		109	6932	
4 Perfluoroper										
262.9 > 218.7	6.909	6.910	-0.001	1.000	1897302	44.6		89.2	648	
5 Perfluorobut										
298.8 > 79.6	7.024	7.024	0.0	1.000	963487	NC	1 57(0 00 0 00)		1696	
298.8 > 98.6	7.024	7.024		1.000	614559		1.57(0.00-0.00)		1024	
51 Perfluorobu 298.8 > 79.6	7.024	onic acid 7.024		1.000	963487	41.4		93.7		
D 6 13C2 PFHx		7.024	0.0	1.000	703407	41.4		73.7		
314.6 > 269.7		8.156	-0.001		5084933	61.2		122	12622	
7 Perfluorohex			0.00.		000.700	0				
		8.157	-0.002	1.000	2263317	49.4		98.8	2707	
22 PFPeS (Per	rflouro-1-	pentane	sulfonat							
348.7 > 79.5	8.236	•	0.005	0.874	1959073	NC			6071	
D 8 13C4-PFHp	ρA									
366.6 > 321.6	9.388	9.387	0.001		4562028	53.4		107	8666	
9 Perfluorohep	otanoic a	cid								
362.8 > 318.7	9.388	9.388	0.0	1.000	2348028	53.3		107	4307	
10 Perfluorohe										
398.3 > 79.2	9.419		-0.002	1.000	2399459	NC			3269	
58 Perfluorohe										
398.3 > 79.2	9.419	9.421	-0.002	1.000	2399459	44.2		93.4		
					Page 687 of	776			05/26	6/2016

Page 687 of 776

Report Date: 26-May-2016 11:06:38										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFH 402.5 > 83.6	lxS 9.419	9.422	-0.003		1502735	50.6		107	4241	
D 12 13C4 PFO 416.5 > 371.6	A 10.499	10.503	-0.004		4781419	53.6		107	9469	
	tanoic ad 10.499 10.509	10.504		1.000 1.001	2058937 667276	47.5	3.09(0.00-0.00)	95.1	2379 2205	
39 Perfluorohe 448.3 > 79.2	eptanesul 10.509			1.000	2477239	59.1		124		
14 Perfluorohe 448.3 > 79.2	ptane Su 10.509		0.001	1.000	2477239	NC			4850	
D 16 13C4 PFO 502.4 > 79.7	S 11.458	11.465	-0.007		258745	38.3		80.2	1022	
15 Perfluorooc 498.3 > 79.2 498.3 > 98.2	tane sulf 11.467 11.467	11.466	0.001	1.000 1.000	3920597 2347024	52.4	1.67(0.00-0.00)	110	3993 2355	
D 17 13C5 PFN 467.5 > 422.6	A 11.487	11.484	0.003		4226305	53.9		108	6985	
18 Perfluorono 462.5 > 418.6	nanoic a 11.487		0.001	1.000	5372672	51.6		103	5407	
D 19 13C2 PFD 514.4 > 469.5	A 12.324	12.325	-0.001		5212699	52.2		104	8293	
20 Perfluorode 512.5 > 468.5	ecanoic a 12.324		-0.001	1.000	6033677	55.7		111	4753	
D 23 13C8 FOS 505.4 > 77.6	A 12.896	12.893	0.003		4874151	50.5		101	3405	
24 Perfluorooc 497.5 > 77.6	tane Sulf 12.896			1.000	5454594	52.3		105	3301	
25 Perfluorode 598.4 > 79.6	cane Sul 12.999		0.003	1.000	1280451	NC			3271	
49 Perfluorode 598.4 > 79.6	cane Sul 12.999			1.000	1280451	56.2		117		
27 Perfluoroun 562.4 > 518.5			-0.001	1.000	6669328	52.4		105	5583	
D 26 13C2 PFU 564.3 > 519.5		13.044	-0.003		5396564	53.2		106	6445	
D 28 13C2 PFD 614.4 > 569.4		13.646	0.004		5544926	52.6		105	3814	
29 Perfluorodo 612.4 > 568.6			0.004	1.000	5546128	54.8		110	2038	
30 Perfluorotrio 662.4 > 618.5	decanoic	acid		1.000	4213222	52.2		104	1620	
32 Perfluorotet 712.6 > 668.5	tradecand	oic acid		1.000	1942546	45.5		91.0	1037	
D 33 13C2-PFT 714.5 > 669.5	eDA			1.000	3936524	51.9		104	3192	
D 35 13C2-PFH	lxDA									
814.8 > 769.6	15.25/	15.255	0.002		Page 688 of 776	3 48.∠ 3		96.3	³⁴¹⁹ /26	5/2016

Report Date: 26-May-2016 11:06:38 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_026.d

did 1.101										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohe 812.6 > 768.6	exadecan 15.257		0.002	1.000	4255767	58.2		116	632	
36 Perfluorood 912.7 > 868.6	tandecar 15.594			1.000	3434053	55.3		111	2738	

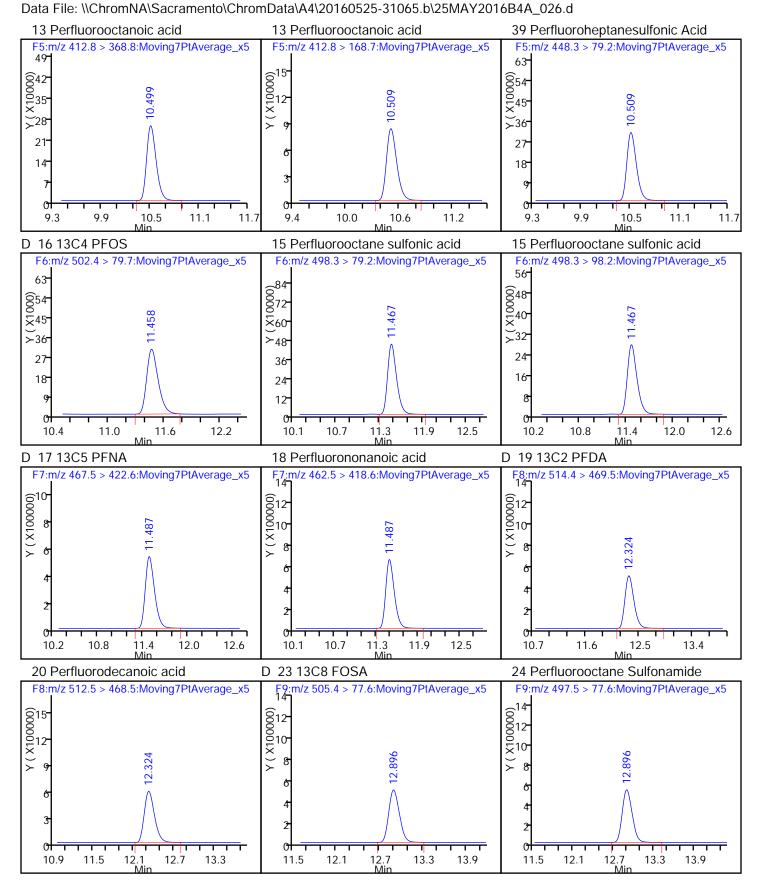
QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:06:39 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_026.d **Injection Date:** 26-May-2016 00:19:21 Instrument ID: A4 Lims ID: CCV L5 Client ID: Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 26 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 $F2:m/z 267.6 > 222.7:Moving7PtAverage_x5$ Y (X100000) ©70 960 684° 672° ×50 48 30 36 20 24 10 5.3 5.9 5.3 5.9 6.9 6.5 4.7 6.5 6.3 7.2 7.5 6.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 42 (0000010° ×) × 24 X10000 30-×16-∑24[±] 18 12 7.1 7.7 6.5 6.8 7.1 7.4 7.7 7.6 8.2 8.8 5.9 6.2 6.5 7.0 8 13C4-PFHpA 7 Perfluorohexanoic acid 9 Perfluoroheptanoic acid _____F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 56 Y (X100000) 649 642 0048 0048 ×40 9.388 ×35 -32 ≻₂₈-24 16 7.9 8.2 8.5 8.7 9.3 9.9 10.5 8.9 9.5 10.1 7.6 8.8 8.1 8.3 12 13C4 PFOA 58 Perfluorohexanesulfonic acid 11 1802 PFHxS F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 35 (X100000) (049 0042 830 8 × × ×35- <u></u>20⁻ ≻28 15 21 10 0 0 8.7 9.3 9.9 10.5 8.4 9.0 Page 690h of 776 10.2 9.2 9.8 10.4 8.1



15.7

16.3

14.2

14.8

15.4

16.0

14.5

15.1

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: <u>CCV 320-111390/39</u> Calibration Date: <u>05/26/2016</u> 04:54

Instrument ID: A4 Calib Start Date: 05/25/2016 16:55

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/25/2016 19:01

Lab File ID: 25MAY2016B4A_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6418	0.6046		18.8	20.0	-5.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.5079	0.3257		12.8	20.0	-35.9*	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID	0.7655	0.5827		14.0	17.7	-21.1	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.3311		14.6	20.0	-27.1*	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.4613		18.9	20.0	-5.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.705	1.677		18.6	18.9	-1.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID	7.344	13.58		33.4	19.0	75.5*	25.0
Perfluorooctanoic acid (PFOA)	L1ID	0.4698	0.3494		15.4	20.0	-23.1	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID	11.43	20.57		28.8	19.1	50.4*	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.148		18.7	20.0	-6.7	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.039	1.031		19.9	20.0	-0.7	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.069	1.035		19.4	20.0	-3.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	4.187	6.238		28.6	19.3	49.0*	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.179	1.049		17.8	20.0	-11.0	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9121	0.8527		18.7	20.0	-6.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.025	1.147		22.4	20.0	11.9	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5424	0.4834		17.8	20.0	-10.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.065		23.1	20.0	15.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.211	2.456		22.2	20.0	11.1	25.0

Report Date: 26-May-2016 11:08:39 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_039.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 26-May-2016 04:54:41 ALS Bottle#: 13 Worklist Smp#: 39

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:08:39 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:58:41

FIRST	Level Revie	wer: wes	stendorio			Date:		26-141ay-2016 08:58:4	4 1		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2	Perfluorobut	vric acid									
	.7 > 168.6	5.794	5.798	-0.004	1.000	1408244	18.8		94.2	4838	
D 1	I 13C4 PFBA	١									
216	.7 > 171.5	5.794	5.798	-0.004		5822722	68.9		138	28760	
	3 13C5-PFPe										
267	.6 > 222.7	6.899	6.907	-0.008		4170945	54.4		109	9056	
	Perfluoroper										
	9 > 218.7			-0.006	1.000	543321	12.8		64.1	245	
	Perfluorobut			0.010	1 000	2025/4	NO			(0.4	
	1.8 > 79.6 1.8 > 98.6	7.014 7.019	7.024 7.024	-0.010	1.000 1.001	292564 205302	NC	1.43(0.00-0.00)		684 483	
	Perfluorobu				1.001	203302		1.43(0.00-0.00)		403	
	.8 > 79.6		7.024		1.000	292564	14.0		78.9		
	6 13C2 PFHx		7.02	0.010	1.000	2,2001	1 1.0		, 0. ,		
		8.149	8.156	-0.007		5385666	64.9		130	14004	
7	Perfluorohex	canoic ac	id								
312	.9 > 268.7	8.149	8.157	-0.008	1.000	713252	14.6		72.9	2148	
22	PFPeS (Per	flouro-1-	pentane	sulfonat							
348	.7 > 79.5	8.225	8.231	-0.006	0.874	684713	NC			4875	
D 8	3 13C4-PFHp	Α									
366	.6 > 321.6	9.380	9.387	-0.007		4536811	53.1		106	9198	
	Perfluorohep										
	.8 > 318.7			-0.008	1.000	837131	18.9		94.3	2318	
	Perfluorohe										
		9.412		-0.009	1.000	900884	NC			1808	
	Perfluorohe:				1 000	000004	10 /		00.1		
398	.3 > 79.2	9.412	9.421	-0.009	1.000	900884	18.6		98.1		
						Page 604 of 1	776			05/26	3/2016

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05/26/2016

Report Date: 26-May-2016 11: Data File: \\ChromNA		to\Chrom	Chrom Revision: 2.2 20-Apr-2016 13:59:46 mData\A4\20160525-31065.b\25MAY2016B4A_039.d						
Signal RT R1		REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 11 18O2 PFHxS 402.5 > 83.6 9.412 9.42	2 -0.010		1343314	45.3		95.7	3631		
D 12 13C4 PFOA 416.5 > 371.6 10.499 10.50	03 -0.004		5015776	56.3		113	8753		
13 Perfluorooctanoic acid 412.8 > 368.8		1.000 1.000	701051 214873	15.4	3.26(0.00-0.00)	76.9	1371 750		
39 Perfluoroheptanesulfonic 448.3 > 79.2 10.499 10.50		1.000	938436	33.4		176			
14 Perfluoroheptane Sulfona 448.3 > 79.2 10.499 10.50		1.000	938436	NC			2899		
D 16 13C4 PFOS 502.4 > 79.7 11.458 11.46	55 -0.007		173539	25.7		53.8	760		
15 Perfluorooctane sulfonic a 498.3 > 79.2 11.458 11.46 498.3 > 98.2 11.458 11.46	66 -0.008	1.000 1.000	1427567 871347	28.8	1.64(0.00-0.00)	150	2846 1685		
D 17 13C5 PFNA 467.5 > 422.6 11.478 11.48	34 -0.006		4346675	55.4		111	7471		
18 Perfluorononanoic acid 462.5 > 418.6 11.478 11.48	36 -0.008	1.000	1996482	18.7		93.3	2740		
D 19 13C2 PFDA 514.4 > 469.5 12.324 12.33	25 -0.001		5516495	55.2		110	8090		
20 Perfluorodecanoic acid 512.5 > 468.5 12.324 12.33	25 -0.001	1.000	2274852	19.9		99.3	2785		
D 23 13C8 FOSA 505.4 > 77.6 12.884 12.89	93 -0.009		4206655	43.6		87.2	2914		
24 Perfluorooctane Sulfonam 497.5 > 77.6 12.884 12.89		1.000	1742000	19.4		96.8	2325		
25 Perfluorodecane Sulfonat 598.4 > 79.6 12.987 12.99		1.000	436667	NC			1705		
49 Perfluorodecane Sulfonic 598.4 > 79.6 12.987 12.99		1.000	436667	28.6		148			
27 Perfluoroundecanoic acid 562.4 > 518.5 13.041 13.04	12 -0.001	1.000	2405688	17.8		89.0	2877		
D 26 13C2 PFUnA 564.3 > 519.5 13.041 13.04	14 -0.003		5732557	56.5		113	5245		
D 28 13C2 PFDoA 614.4 > 569.4 13.638 13.64	16 -0.008		5905805	56.0		112	4549		
29 Perfluorododecanoic acid 612.4 > 568.6 13.638 13.64	16 -0.008	1.000	2014334	18.7		93.5	915		
30 Perfluorotridecanoic acid 662.4 > 618.5 14.161 14.16	52 -0.001	1.000	1661359	22.4		112	688		
32 Perfluorotetradecanoic ac 712.6 > 668.5 14.588 14.60		1.000	700032	17.8		89.1	418		
D 33 13C2-PFTeDA 714.5 > 669.5 14.598 14.60	01 -0.003		3620074	47.7		95.4	3817		
D 35 13C2-PFHxDA 814.8 > 769.6 15.250 15.25	55 -0.005		Page 695 of 776	s ^{40.0}		80.1	^{27,95} /26	6/2016	

Report Date: 26-May-2016 11:08:39 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_039.d Data File:

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohe 812.6 > 768.6	xadecan 15.250		-0.005	1.000	1430209	23.1		115	217	
36 Perfluorooc 912.7 > 868.6	tandecar 15.588			1.000	1146394	22.2		111	1407	

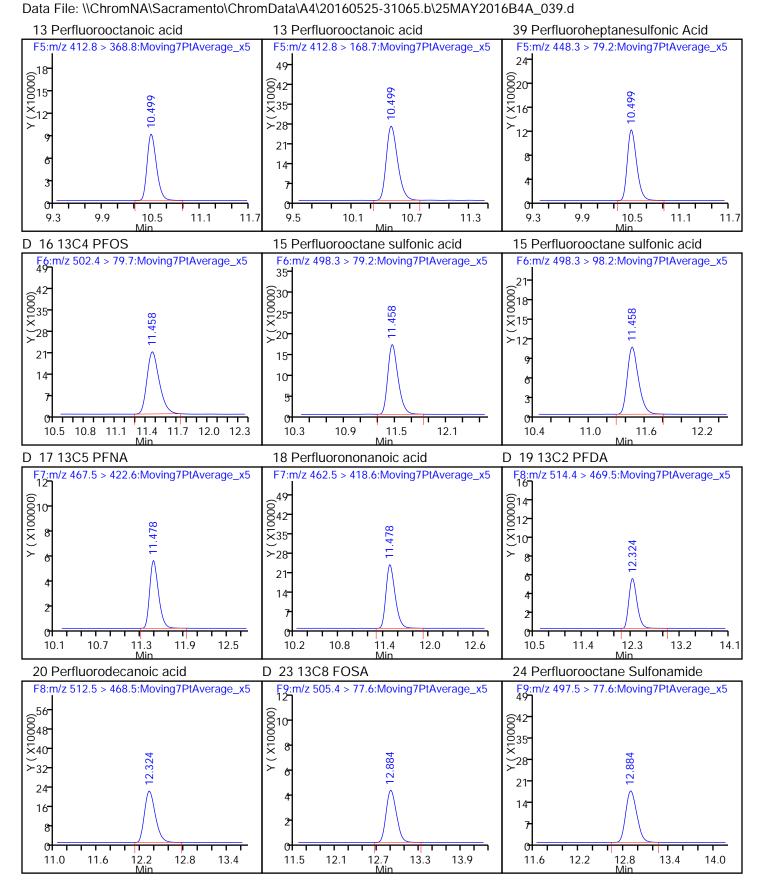
QC Flag Legend Processing Flags

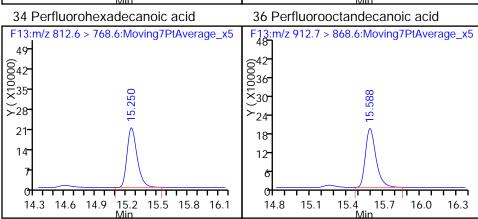
NC - Not Calibrated

Reagents:

LCPFC-L4_00018 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:08:40 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_039.d **Injection Date:** 26-May-2016 04:54:41 Instrument ID: A4 Lims ID: CCV L4 Client ID: Operator ID: **JRB** ALS Bottle#: 13 Worklist Smp#: 39 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 (0000010° ×) × 684 672 628 624 \succeq_{20} ×60 ≻₄₈-36 24 5.2 5.8 5.9 5.5 6.1 4.1 5.0 6.8 5.9 6.5 7.1 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 (000012-X) > 8 70 (00012 X10 660 ×50 <u>></u>40 30 20 10 7.1 7.2 6.5 7.7 6.9 7.8 6.9 7.5 8.1 8.7 9.3 6.6 7.5 6.3 8 13C4-PFHpA 7 Perfluorohexanoic acid 9 Perfluoroheptanoic acid F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 18 Y (X100000) (00015-00015-012-00015- ×12-7.9 8.2 8.5 8.2 8.8 9.4 10.0 9.0 9.6 10.2 7.6 8.8 10.6 8.4 7.3 12 13C4 PFOA 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 28- (0000012 X) 621- 6218-∑₁₅-×20-≻16- 12 0 0 0 8.8 9.4 10.0 10.6 8.4 Page 697n of 776 10.2 9.2 9.8 10.4 8.2





FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: CCV 320-111390/52 Calibration Date: 05/26/2016 09:30

Instrument ID: A4 Calib Start Date: 05/25/2016 16:55

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/25/2016 19:01

Lab File ID: 25MAY2016B4A_052.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6418	0.6808		53.0	50.0	6.1	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.5079	0.4545		44.7	50.0	-10.5	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID	0.7655	0.7270		43.9	44.2	-0.7	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4357		48.4	50.0	-3.3	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.4962		51.4	50.0	2.8	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.705	1.689		46.7	47.3	-1.0	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID	7.344	9.98		61.3	47.6	28.8*	25.0
Perfluorooctanoic acid (PFOA)	L1ID	0.4698	0.4492		49.6	50.0	-0.8	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID	11.43	15.04		52.0	47.8	8.9	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.268		51.5	50.0	3.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.039	1.133		54.6	50.0	9.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.069	1.144		53.5	50.0	7.0	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	4.187	4.836		55.4	48.2	15.5	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.179	1.204		51.0	50.0	2.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9121	1.011		55.4	50.0	10.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.025	1.051		51.3	50.0	2.5	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5424	0.4976		45.9	50.0	-8.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.026		58.1	50.0	16.1	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.211	2.271		51.4	50.0	2.7	25.0

Report Date: 26-May-2016 14:50:33 Chrom Revision: 2.2 20-Apr-2016 13:59:46

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_052.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 26-May-2016 09:30:00 ALS Bottle#: 14 Worklist Smp#: 52

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm, T=35C

Operator ID: **JRB** Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\\Sacramento\ChromData\\A4\\20160525-31065.b\\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 14:50:32 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: **Initial Calibration**

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 10:42:49

First Level Reviewer, westerdoric					Date.		0-101ay-2010 10.42.	47		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	yric acid									
212.7 > 168.6	5.791	5.798	-0.007	1.000	3672218	53.0		106	9046	
D 113C4 PFBA										
216.7 > 171.5	5.791	5.798	-0.007		5394207	63.8		128	13483	
D 3 13C5-PFPe										
267.6 > 222.7	6.895	6.907	-0.012		3884337	50.6		101	6219	
4 Perfluoroper			0.015	1 000	17/5/2/	44.7		00.5	705	
262.9 > 218.7			-0.015	1.000	1765434	44.7		89.5	725	
5 Perfluorobut 298.8 > 79.6		onate 7.024	-0.010	1.000	924335	NC			1866	
298.8 > 98.6		7.024		1.000	587226	NC	1.57(0.00-0.00)		1153	
51 Perfluorobu							(, , , , , , , , , , , , , , , , , , ,			
298.8 > 79.6		7.024		1.000	924335	43.9		99.3		
D 613C2 PFHx	κA									
314.6 > 269.7	8.144	8.156	-0.012		5133825	61.8		124	10226	
7 Perfluorohex										
312.9 > 268.7	8.144	8.157	-0.013	1.000	2236561	48.4		96.7	2225	
22 PFPeS (Per		•								
348.7 > 79.5		8.231	-0.011	0.874	1853798	NC			5500	
D 8 13C4-PFHp		0.007	0.015		4222742	FO /		101	7440	
366.6 > 321.6			-0.015		4322713	50.6		101	7112	
9 Perfluorohep 362.8 > 318.7			-0.016	1.000	2145114	51.4		102	4606	
			-0.016	1.000	2145116	31.4		103	4000	
10 Perfluorohe. 398.3 > 79.2	9.404		-0.017	1.000	2297484	NC			2734	
58 Perfluorohe										
398.3 > 79.2		9.421		1.000	2297484	46.7		98.8		
					Page 701 of	776			05/20	6/2016

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Data File:	\\Chrc	mNA\Sa	acramen	to\Chrom	Data\A4\2016052	5-31065.b	\25MAY2016B4A_0	52.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
_	<u> </u>									
D 11 18O2 PFH 402.5 > 83.6		9.422	-0.018		1360545	45.8		96.9	3287	
D 12 13C4 PFO										
	10.491		-0.012		4621796	51.8		104	7450	
13 Perfluorooc			0.010	1 000	207/104	40.7		00.0	2200	
412.8 > 368.8 412.8 > 168.7	10.491			1.000 1.000	2076194 610230	49.6	3.40(0.00-0.00)	99.2	3200 2261	
39 Perfluorohe				1.000	010230		3.40(0.00-0.00)		2201	
	10.491			1.000	2360550	61.3		129		
14 Perfluorohe										
	10.491		-0.017	1.000	2360550	NC			6238	
D 16 13C4 PFO	S									
502.4 > 79.7	11.449	11.465	-0.016		237635	35.2		73.7	1147	
15 Perfluorooc										
	11.449			1.000	3574629	52.0	4 74 (0 00 0 00)	109	2989	
	11.449	11.466	-0.017	1.000	2088861		1.71(0.00-0.00)		2393	
D 17 13C5 PFN. 467.5 > 422.6		11 /0/	0.015		4171021	53.2		106	6910	
18 Perfluorono			-0.013		4171021	55.2		100	0910	
462.5 > 418.6			-0.017	1 000	5289681	51.5		103	4776	
D 19 13C2 PFD		111100	0.017	1.000	0207001	01.0		100	1770	
	12.311	12.325	-0.014		5142622	51.5		103	7691	
20 Perfluorode	canoic a	cid								
512.5 > 468.5	12.311	12.325	-0.014	1.000	5827242	54.6		109	4878	
D 23 13C8 FOS	A									
505.4 > 77.6	12.884	12.893	-0.009		4739929	49.1		98.2	4345	
24 Perfluorooc										
497.5 > 77.6	12.884		-0.009	1.000	5423843	53.5		107	4551	
25 Perfluorode			0.000	1 000	1150700	NO			0770	
	12.987			1.000	1158799	NC			2778	
49 Perfluorode 598.4 > 79.6	cane Sul 12.987			1.000	1158799	55.4		115		
			-0.009	1.000	1130799	55.4		113		
27 Perfluoroun 562.4 > 518.5	uecanoic 13.030		-0.012	1.000	6427336	51.0		102	4887	
D 26 13C2 PFU		10.012	0.0.2	1.000	0127000	01.0		102	1007	
564.3 > 519.5		13.044	-0.014		5339142	52.7		105	5389	
D 28 13C2 PFD	оА									
614.4 > 569.4		13.646	-0.008		5501955	52.2		104	3339	
29 Perfluorodo	decanoio	acid								
612.4 > 568.6	13.638	13.646	-0.008	1.000	5564931	55.4		111	2066	
30 Perfluorotrio	decanoic	acid								
662.4 > 618.5	14.150	14.162	-0.012	1.000	4153984	51.3		103	1530	
32 Perfluorotet										
712.6 > 668.5		14.600	-0.012	1.000	1966524	45.9		91.7	1060	
D 33 13C2-PFT		14/01	0.040		2054070	FO 4		101	2705	
	14.588	14.601	-0.013		3951979	52.1		104	3785	
D 35 13C2-PFH 814.8 > 769.6		15 255	_N N12		1/152012	40 O		99.8	2070	
017.0 / 107.0	10.44	10.200	-0.013		Page 702 of 776	77.7		77.0	³⁰⁷⁹ /26	3/2016

Report Date: 26-May-2016 14:50:33 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_052.d

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohe 812.6 > 768.6			-0.005	1.000	4398736	58.1		116	628	
36 Perfluorood 912.7 > 868.6	tandecar 15.581			1.000	3301852	51.4		103	2420	

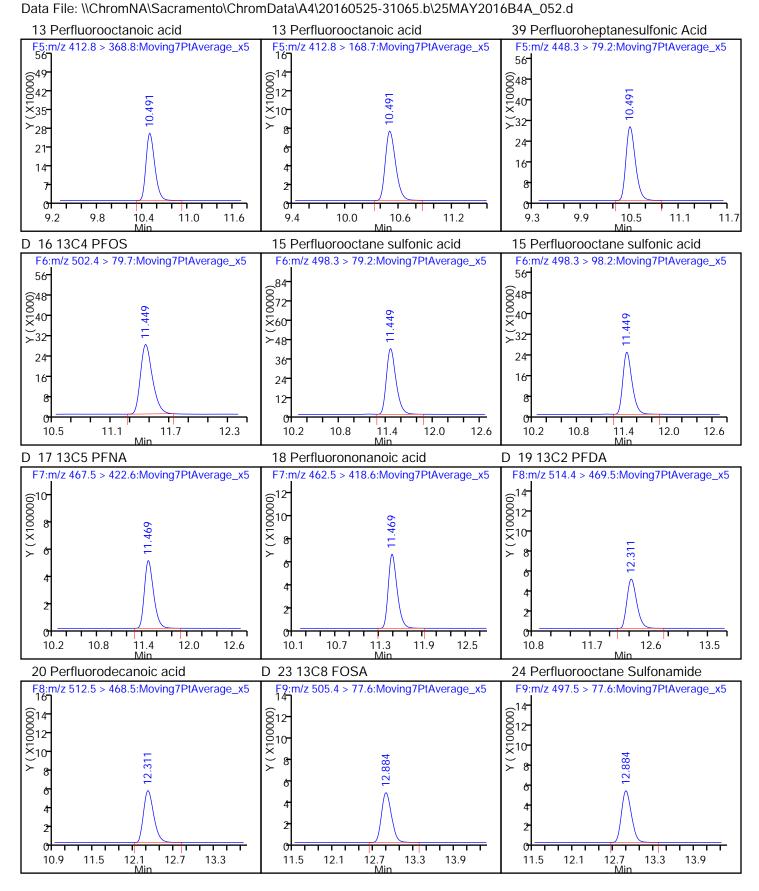
QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 14:50:33 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_052.d **Injection Date:** 26-May-2016 09:30:00 Instrument ID: A4 Lims ID: CCV L5 Client ID: Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 52 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) 84 060 0072 X60 ∑50 -48 ≻40 36 30 20 24 10 12 6.0 5.4 6.0 6.6 4.8 5.4 6.6 6.7 7.0 7.3 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 21 (0000010° ×) × ©35 ©30 0018-15-X ×25 **≻**20 15 10 6.9 7.1 7.2 7.8 6.8 7.4 7.7 7.6 8.2 6.3 6.6 7.5 6.2 6.5 7.0 8.8 7 Perfluorohexanoic acid D 8 13C4-PFHpA 9 Perfluoroheptanoic acid _____F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 Y (X100000) 49 649 642 0042 ×35 9.372 ×35 ≻₂₈->28 21 14 7.9 8.2 8.5 8.2 8.8 9.4 10.0 8.7 9.3 9.9 7.6 8.8 10.6 8.1 10.5 12 13C4 PFOA 58 Perfluorohexanesulfonic acid D 11 1802 PFHxS F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 49 30-0025-(X100000) 0042 ×35 ×₂₀ -28 15 21 10 14 0 0 0 8.9 9.5 10.1 8.4 Page 704h of 776 10.2 9.3 9.9 10.5 8.3



15.0

14.7

15.3

15.6

15.9

14.7

14.1

15.3

15.9

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: <u>CCV 320-111390/64</u> Calibration Date: <u>05/26/2016 13:49</u>

Instrument ID: A4 Calib Start Date: 05/25/2016 16:55

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/25/2016 19:01

Lab File ID: 25MAY2016B4A_064.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.6418	0.6718		52.3	50.0	4.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.5079	0.4928		48.5	50.0	-3.0	25.0
Perfluorobutanesulfonic acid (PFBS)	L2ID	0.7655	0.7326		44.2	44.2	0.0	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.4616		51.3	50.0	2.5	25.0
Perfluoroheptanoic acid (PFHpA)	L2ID		0.5380		55.7	50.0	11.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.705	1.591		44.0	47.3	-6.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	L2ID	7.344	8.682		53.4	47.6	12.1	25.0
Perfluorooctanoic acid (PFOA)	L1ID	0.4698	0.4627		51.1	50.0	2.2	25.0
Perfluorooctanesulfonic acid (PFOS)	L1ID	11.43	13.34		46.2	47.8	-3.3	25.0
Perfluorononanoic acid (PFNA)	L2ID		1.221		49.6	50.0	-0.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	1.039	1.148		55.3	50.0	10.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.069	1.178		55.1	50.0	10.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	4.187	4.102		47.0	48.2	-2.0	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	1.179	1.190		50.5	50.0	0.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9121	0.9790		53.7	50.0	7.3	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.025	1.053		51.3	50.0	2.7	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	0.5424	0.4888		45.1	50.0	-9.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		2.693		51.6	50.0	3.2	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	2.211	2.266		51.2	50.0	2.5	25.0

Report Date: 26-May-2016 14:56:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_064.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 26-May-2016 13:49:32 ALS Bottle#: 14 Worklist Smp#: 64

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Sublist: chrom-PFAC_A4*sub12

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 14:56:20 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 26-May-2016 14:50:11

First Level Reviewer: parnettj					Date:		26-May-2016 14:50:	11		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	tvric acid									
212.7 > 168.6	5.791	5.798	-0.007	1.000	3909541	52.3		105	10035	
D 113C4 PFB/	Δ									
216.7 > 171.5	5.794	5.798	-0.004		5819143	68.8		138	18650	
D 3 13C5-PFP	eA									
267.6 > 222.7	6.895	6.907	-0.012		4228763	55.1		110	8144	
4 Perfluorope										
262.9 > 218.7			-0.011	1.000	2083837	48.5		97.0	907	
5 Perfluorobut										
298.8 > 79.6 298.8 > 98.6	7.014 7.010	7.024 7.024	-0.010	1.000 0.999	1021530 677240	NC	1 51(0 00 0 00)		2076 1356	
				0.999	077240		1.51(0.00-0.00)		1330	
51 Perfluorobu 298.8 > 79.6			ı -0.010	1.000	1021530	44.2		100		
D 6 13C2 PFH		7.024	0.010	1.000	102 1330	77.2		100		
	8.144	8.156	-0.012		5142554	61.9		124	11094	
7 Perfluorohe										
	8.144		-0.013	1.000	2373850	51.3		103	2342	
22 PFPeS (Pe	rflouro-1-	pentane	esulfonat							
348.7 > 79.5	8.220	8.231	-0.011	0.874	1999761	NC			9023	
D 8 13C4-PFH	рA									
366.6 > 321.6	9.372	9.387	-0.015		4424729	51.8		104	6396	
9 Perfluorohe	•									
362.8 > 318.7	9.372	9.388	-0.016	1.000	2380302	55.7		111	4855	
10 Perfluorohe										
	9.404			1.000	2373405	NC			2875	
58 Perfluorohe				1 600	0070405	44.0		00.4		
398.3 > 79.2	9.404	9.421	-0.01/	1.000	2373405	44.0		93.1		
					Page 708 of	776			05/26	3/2016

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05/26/2016

Report Date: 26-May-2016 14:56:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:	,			to\Chrom[20-Apr-2016 13:59: \25MAY2016B4A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 11 18O2 PFH 402.5 > 83.6	xS 9.404	9.422	-0.018		1492109	50.3		106	3060	
	10.491		-0.012		4761254	53.4		107	7285	
13 Perfluorooc 412.8 > 368.8 412.8 > 168.7	tanoic ac 10.491 10.491	10.504		1.000 1.000	2203209 699540	51.1	3.15(0.00-0.00)	102	3047 1803	
39 Perfluorohe 448.3 > 79.2	10.491	10.508		1.000	2485571	53.4		112		
14 Perfluorohe 448.3 > 79.2 D 16 13C4 PFO	10.491		-0.017	1.000	2485571	NC			5482	
	11.449				287502	42.6		89.1	1295	
498.3 > 79.2 498.3 > 98.2 D 17 13C5 PFN	11.449 11.449	11.466	-0.017	1.000 1.000	3834781 2258814	46.2	1.70(0.00-0.00)	96.7	4693 2821	
467.5 > 422.6 18 Perfluorono	11.469		-0.015		4388244	55.9		112	6278	
	11.478		-0.008	1.000	5356499	49.6		99.2	5267	
	12.311		-0.014		5394950	54.0		108	6978	
	12.311		-0.014	1.000	6191531	55.3		111	5809	
	12.884				4957169	51.4		103	3869	
497.5 > 77.6	12.884	12.893		1.000	5838662	55.1		110	3345	
25 Perfluorode 598.4 > 79.6	12.987	12.996	-0.009	1.000	1189326	NC			3145	
49 Perfluorode 598.4 > 79.6	12.987	12.996		1.000	1189326	47.0		97.5		
27 Perfluoroun 562.4 > 518.5	13.030		-0.012	1.000	6692247	50.5		101	5103	
D 26 13C2 PFU 564.3 > 519.5	13.030	13.044	-0.014		5622371	55.5		111	5156	
D 28 13C2 PFD 614.4 > 569.4	13.638		-0.008		5829629	55.3		111	3700	
29 Perfluorodo 612.4 > 568.6			-0.008	1.000	5706941	53.7		107	2568	
30 Perfluorotrio 662.4 > 618.5			-0.012	1.000	4389239	51.3		103	1370	
32 Perfluorotet 712.6 > 668.5			-0.012	1.000	2038037	45.1		90.1	1016	
D 33 13C2-PFT 714.5 > 669.5		14.601	-0.013		4169691	54.9		110	4008	
D 35 13C2-PFH 814.8 > 769.6		15.255	-0.005		Page 709 of 77	s ^{56.5}		113	²⁹¹² /26	6/2016

Report Date: 26-May-2016 14:56:21 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_064.d

Bata i iio:	1101110	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	aoi airioi i	.010111011	ibata ii t fizo 100	020 0100010	120111111201010111_0	, o 1. a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
34 Perfluorohe 812.6 > 768.6	xadecan 15.250		-0.005	1.000	4437409	51.6		103	623	
36 Perfluorood 912.7 > 868.6		noic acid 15.593		1.000	3733517	51.2		102	2866	

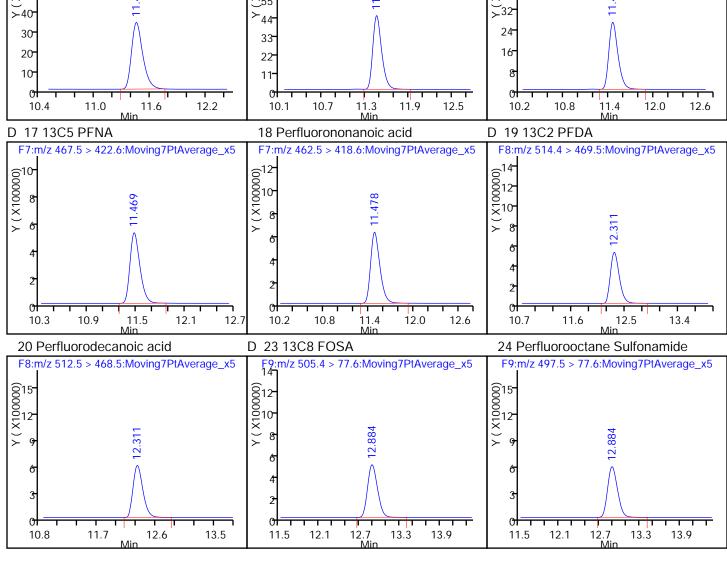
QC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L5_00017 Amount Added: 1.00 Units: mL

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 14:56:21 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_064.d 26-May-2016 13:49:32 **Injection Date:** Instrument ID: A4 Lims ID: CCV L5 Client ID: Operator ID: **JRB** ALS Bottle#: 14 Worklist Smp#: 64 Injection Vol: 15.0 ul Dil. Factor: 1.0000 PFAC A4 Limit Group: LC PFC_DOD ICAL Method: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 (0000010° ×) × (77- (0678-0678-√65-×55 **≻**52 39 33 26 22 13 11 5.3 5.9 5.3 5.9 6.5 4.7 6.5 6.6 6.9 7.2 7.5 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid D $F2:m/z \ 262.9 > 218.7:Moving7PtAverage \ x5$ F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 (0000010° ×) × 21- 00018-×15-(0036-30-30-≻24 18 12 6.9 7.5 7.2 8.2 6.3 8.1 6.6 7.8 7.6 8.8 6.0 7.0 9.4 7 Perfluorohexanoic acid D 8 13C4-PFHpA 9 Perfluoroheptanoic acid F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 63 (X100000) X (X1000000) X (X1000000) 49 0042 ×35 0054**-**0001× <u>></u>36 -28 27 21 18 7.8 8.1 8.4 8.9 9.5 8.8 9.4 10.0 7.5 8.7 8.3 10.1 8.2 10.6 58 Perfluorohexanesulfonic acid 11 1802 PFHxS 12 13C4 PFOA F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 35 (X100000) 656 648 0030 ×25 ×40 ²⁰ \succ_{32} 15 24 10 16 0 0 0 9.0 Page 71/11h of 776 9.0 9.6 10.2 8.4 10.2 9.2 9.8 10.4 8.4



15.7

16.3

14.1

14.7

15.3

15.9

14.5

15.1

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: ICV 320-111182/12 Calibration Date: 05/24/2016 19:57

Instrument ID: A6 Calib Start Date: 05/24/2016 17:07

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/24/2016 19:14

Lab File ID: 24MAY2016A6A_012.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	L2ID		1.077		43.7	50.0	-12.6	25.0
Perfluoropentanoic acid (PFPeA)	L1ID		1.145		48.7	50.0	-2.6	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		1.208		36.5	44.3	-17.5	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.8613		46.9	50.0	-6.2	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		0.8762		40.2	50.0	-19.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	L1ID		0.9313		44.7	47.3	-5.3	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.065	1.229		57.7	50.0	15.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9314	0.8427		43.2	47.8	-9.5	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9155	0.7533		41.1	50.0	-17.7	25.0
Perfluorodecanoic acid (PFDA)	L2ID		1.194		49.0	50.0	-2.0	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.112	1.135		51.0	50.0	2.1	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.4548		45.3	48.3	-6.2	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.365		53.9	50.0	7.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.019	1.000		49.1	50.0	-1.9	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.479	1.474		49.8	50.0	-0.3	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		1.569		48.9	50.0	-2.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.065		45.2	50.0	-9.6	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	4.072	4.355		53.5	50.0	7.0	25.0

Report Date: 26-May-2016 11:29:41 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_012.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 24-May-2016 19:57:14 ALS Bottle#: 16 Worklist Smp#: 12

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: ICV

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A4*sub6

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:29:40 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 25-May-2016 08:51:08

FIRST Level Revie	stendom	تـــــــــــــــــــــــــــــــــــــ		Date:		25-May-2016 08:51:0	JØ			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	tyric acid									
212.9 > 169.0	5.803	5.791	0.012	1.000	59854	43.7			3285	
D 113C4 PFB/										
217.0 > 172.0	5.794	5.796	-0.002		55582	45.6		91.2	698	
D 3 13C5-PFP6 267.9 > 223.0	eA 6.951	6.946	0.005		117592	49.6		99.2	11512	
4 Perfluoropei			0.003		117372	47.0		77.2	11312	
262.9 > 219.0		6.949	-0.003	1.000	134658	48.7			3066	
40 Perfluorobu	ıtanesulfo	onic acid	I							
298.9 > 80.0	7.075	7.074	0.001	1.000	297389	36.5				
5 Perfluorobut										
298.9 > 80.0	7.075	7.074	0.001	1.000	297389	NC	2 22/0 00 0 00)		441	
298.9 > 99.0 D 6 13C2 PFHx	7.071	7.074	-0.003	1.000	133236		2.23(0.00-0.00)		677	
315.0 > 270.0	8.219	8 223	-0 004		153017	44.5		89.0	13828	
7 Perfluorohe			0.00.					07.0	.0020	
	8.219		-0.006	1.000	131791	46.9			12290	
D 8 13C4-PFH _I	рΑ									
367.0 > 322.0	9.463	9.459	0.004		165174	45.8		91.6	15000	
9 Perfluorohe										
363.0 > 319.0		9.462	0.001	1.000	144719	40.2			12540	
D 11 18O2 PFH 403.0 > 84.0		9.494	-0.001		263089	47.6		101	22435	
10 Perfluorohe			-0.001		203069	47.0		101	22433	
399.0 > 80.0	9.499		0.004	1.000	244766	NC			2202	
41 Perfluorohe										
399.0 > 80.0	9.499	9.495	0.004	1.000	244766	44.7				
					Page 715 of	776			05/20	3/2016

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05/26/2016

Report Date: 26-May-2016 11:29:41 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_012.d

Data File:	\\Chr	mNA\Sa	acrament	to\Chrom	Data\A6\20160524	I-31021.b	\24MAY2016A6A_0	12.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooct	tanoic ac	id								
		10.573	0.013	1.000	145134	57.7			9551	
		10.573		0.999	60102	37.7	2.41(0.00-0.00)		3982	
		10.575	0.004	0.777	00102		2.41(0.00-0.00)		3702	
D 12 13C4 PFO		10 577	0.0		1100/5	20.5		/ - 1	7/00	
		10.577	0.0		118065	32.5		65.1	7628	
14 Perfluorohe										
449.0 > 80.0	10.586	10.585	0.001	1.000	204733	NC			13262	
15 Perfluorooct	tane sulf	onic acid	l							
499.0 > 80.0	11.535	11.524	0.011	1.000	431423	43.2			1744	
499.0 > 99.0	11.535	11.524	0.011	1.000	249934		1.73(0.00-0.00)		18628	
D 16 13C4 PFO	S									
503.0 > 80.0		11.524	0.002		512462	51.5		108	24974	
18 Perfluorono										
		11.547	0.006	1.000	141846	41.1			1405	
		11.547	0.000	1.000	141040	41.1			1405	
D 17 13C5 PFN		44 554	0.000		100000	E 4 7		400	10/04	
468.0 > 423.0	11.553	11.551	0.002		188289	54.7		109	13634	
20 Perfluorode	canoic a	cid								
513.0 > 469.0	12.373	12.376	-0.003	1.000	219049	49.0			13443	
D 19 13C2 PFD	Α									
515.0 > 470.0	12.373	12.380	-0.007		183401	42.9		85.8	10880	
D 23 13C8 FOS										
506.0 > 78.0		12.993	0.001		1440030	48.9		97.9	93913	
					1440030	40.7		71.7	73713	
24 Perfluorooct				4 000	4/04440	F4 0			74/00	
		12.994		1.000	1634148	51.0			71603	
39 Perfluorode	cane Sul	lfonic aci	d							
599.0 > 80.0	13.032	13.032	0.0	1.000	235274	45.3				
25 Perfluorode	cane Sul	lfonate								
599.0 > 80.0	13.032	13.032	0.0	1.000	235274	NC			15947	
D 26 13C2 PFUi										
		13.079	0.002		241426	43.8		87.6	16778	
			-0.003		241420	43.0		67.0	10776	
27 Perfluoroun										
563.0 > 519.0	13.076	13.082	-0.006	1.000	329534	53.9			3565	
D 28 13C2 PFD	Ac									
615.0 > 570.0	13.666	13.667	-0.001		329493	46.0		92.0	21950	
29 Perfluorodo	decanoio	acid								
		13.667	-0.001	1.000	329486	49.1			114	
30 Perfluorotrio										
663.0 > 619.0			0.007	1.000	405010	49.8			410	
		14.100	-0.007	1.000	485819	49.0			648	
D 33 13C2-PFT										
715.0 > 670.0	14.589	14.589	0.0		531672	50.7		101	48125	
32 Perfluoroteti	radecan	oic acid								
713.0 > 669.0	14.589	14.590	-0.001	1.000	516964	48.9			379	
34 Perfluorohe	xadecan	oic acid								
		15.179	0.0	1.000	1009949	45.2			966	
		10.177	5.5	1.000	100//1/	10.2			,00	
D 35 13C2-PFH:		15 100	0.001		1047000	40.0		07.7	40/7	
		15.180			1047882	48.8		97.7	4867	
36 Perfluorooct										
913.0 > 869.0	15.456	15.450	0.006	1.000	Page 716 of 776	53.5			²¹ 55/26	5/2016
					5 : ::::					-

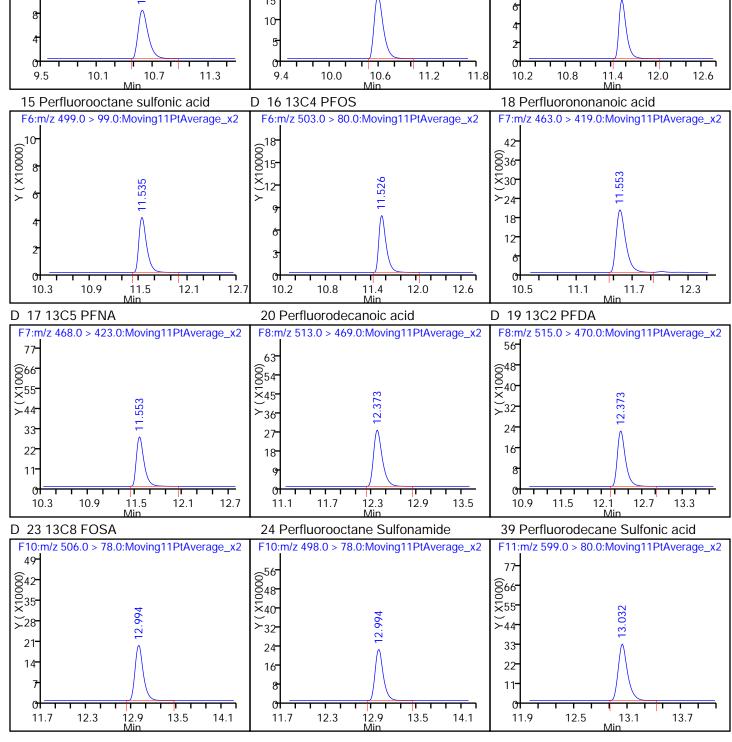
Report Date: 26-May-2016 11:29:41 Chrom Revision: 2.2 20-Apr-2016 13:59:46

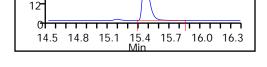
OC Flag Legend
Processing Flags
NC - Not Calibrated

Reagents:

LCPFCIC_00017 Amount Added: 1.00 Units: mL

Report Date: 26-May-2016 11:29:41 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_012.d **Injection Date:** 24-May-2016 19:57:14 Instrument ID: Α6 Lims ID: **ICV** Client ID: Operator ID: **JRB** ALS Bottle#: 16 Worklist Smp#: 12 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 (00015 X)12 X (0018 X) 12 6 25 25 \(\Sigma_{20}\) 15 10 5.3 5.9 5.9 5.6 6.2 6.5 5.3 5.6 6.2 6.5 6.8 7.1 7.4 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 70 00135 × × × 28 6⁴² 2₃₅ 860 ×50∙ ≻₄₀ 21 21 30 20 10 6.9 7.2 6.9 7.2 7.5 7.8 7.8 9.0 6.6 7.5 7.2 8.4 6.3 6.3 6.6 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 63 42 42 (054- 0001 × ×30-©36 ×30 _ ≻36- ≻₂₄-⁻24 27 18 18 18 12 12 7.9 8.2 8.8 9.0 9.6 10.0 7.6 8.5 8.4 10.2 8.2 8.8 9 4 10.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F5;m/z 413.0 > 369.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 91 84 <u>8</u>78 @ 42 <u>872</u> ∑65 ×60-**≥**35 -52− ≻48- ≻28 39 36 21 26 24 13 12 0 $^{\circ}$ 08.9 9.2 9.5 9.8 Page 7/16h of 776 9.1 9.7 10.3 8.6 10.1 9.1 9.7 10.3 10.9 8.5





36⁻ 24⁻

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: <u>CCV 320-111182/26</u> Calibration Date: <u>05/25/2016</u> 00:55

Instrument ID: A6 Calib Start Date: 05/24/2016 17:07

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/24/2016 19:14

Lab File ID: 24MAY2016A6A_026.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	L2ID		1.104		44.8	50.0	-10.5	25.0
Perfluoropentanoic acid (PFPeA)	L1ID		1.085		46.2	50.0	-7.6	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		1.402		42.3	44.2	-4.2	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.9271		50.5	50.0	0.9	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		1.189		54.4	50.0	8.7	25.0
Perfluorohexanesulfonic acid (PFHxS)	L1ID		1.060		51.0	47.3	7.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.065	1.173		55.0	50.0	10.1	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4887	0.5558		54.1	47.6	13.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9314	0.9598		49.3	47.8	3.0	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9155	1.131		61.8	50.0	23.6	25.0
Perfluorodecanoic acid (PFDA)	L2ID		1.253		51.4	50.0	2.8	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.112	1.295		58.2	50.0	16.5	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.5016		49.9	48.2	3.5	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		1.377		54.4	50.0	8.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.019	1.064		52.2	50.0	4.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.479	1.519		51.3	50.0	2.7	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		1.442		44.9	50.0	-10.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		3.106		45.8	50.0	-8.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	4.072	4.304		52.9	50.0	5.7	25.0

Report Date: 26-May-2016 11:30:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_026.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 25-May-2016 00:55:11 ALS Bottle#: 13 Worklist Smp#: 26

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5 CCV L5

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub5

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:30:45 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: barnettj Date: 25-May-2016 10:45:01

First Level Revie	ewer: bar	nettj			Date:	2	25-May-2016 10:45:0)1		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	tyric acid									
212.9 > 169.0	5.794	5.791	0.003	1.000	61898	44.8		89.5	2956	
D 113C4 PFB	Δ									
217.0 > 172.0	5.797	5.796	0.001		56087	46.0		92.1	6709	
D 3 13C5-PFP6	eA									
267.9 > 223.0	6.955	6.946	0.009		106059	44.7		89.5	5099	
4 Perfluoropei										
262.9 > 219.0	6.951	6.949	0.002	1.000	115068	46.2		92.4	11169	
40 Perfluorobu										
298.9 > 80.0	7.074	7.074	0.0	1.000	346116	42.3		95.8		
5 Perfluorobut										
298.9 > 80.0	7.074	7.074	0.0	1.000	346116	NC	2 (0(0 00 0 00)		430	
298.9 > 99.0	7.074	7.074	0.0	1.000	133306		2.60(0.00-0.00)		1219	
D 6 13C2 PFH) 315.0 > 270.0		8.223	0.002		140004	40.8		81.5	12436	
	8.225		0.002		140094	40.0		01.3	12430	_
7 Perfluorohex 313.0 > 269.0	8.230		0.005	1.000	129887	50.5		101	11629	E
D 8 13C4-PFH _I		0.223	0.003	1.000	127007	30.3		101	11027	L
367.0 > 322.0	9.463	9.459	0.004		138918	38.5		77.0	11952	
9 Perfluorohe			0.001		100710	00.0		77.0	11702	
		9.462	0.007	1.000	165107	54.4		109	13556	
D 11 1802 PFH										
403.0 > 84.0	9.493	9.494	-0.001		264166	47.8		101	22806	
10 Perfluorohe										
399.0 > 80.0			-0.002	1.000	279963	NC			3139	
41 Perfluorohe	exanesulf	onic aci	d							
399.0 > 80.0	9.493		-0.002	1.000	279963	51.0		108		
					Page 722 of	776			05/26	5/2016

Page 722 of 776

05/26/2016

Data File:	\\Chrc	mNA\Sa	acrament	to\ChromI	Data\A6\2016052	1-31021.b	\24MAY2016A6A_0	26.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooct	tanoic ac	id								
	10.577		0.004	1.000	167907	55.0		110	2205	
413.0 > 169.0	10.577	10.573	0.004	1.000	89160		1.88(0.00-0.00)		5919	
D 12 13C4 PFO										
	10.577		0.0		143191	39.5		79.0	9410	
14 Perfluorohe 449.0 > 80.0	ptane Su 10.586		0.001	1.000	261378	NC			17143	
38 Perfluorohe 449.0 > 80.0	ptanesul 10.586			1.000	261378	54.1		114		
15 Perfluorooct	tane sulf	onic acid	I							
	11.526			1.000	453297	49.3	(103	1750	
	11.526	11.524	0.002	1.000	252865		1.79(0.00-0.00)		19014	
D 16 13C4 PFO: 503.0 > 80.0		11 52/	0.002		472207	47 E		99.3	25202	
18 Perfluorono	11.526		0.002		472287	47.5		99.3	35282	
	11.553		0.006	1.000	163026	61.8		124	1102	
D 17 13C5 PFN	A									
	11.553		0.002		144083	41.9		83.8	10101	
20 Perfluorode 513.0 > 469.0	canoic a 12.383		0 007	1.000	205950	51.4		103	12432	E
D 19 13C2 PFD		12.570	0.007	1.000	200700	31.4		100	12402	_
	12.383	12.380	0.003		164324	38.4		76.9	9706	
D 23 13C8 FOS										
	12.994				1400664	47.6		95.2	91852	
24 Perfluorooct 498.0 > 78.0	tane Sulf 12.994			1.000	1814228	58.2		116	59622	
39 Perfluorode				1.000	1014220	30.2		110	37022	
	13.032			1.000	238874	49.9		104		
25 Perfluorode	cane Sul	fonate								
	13.032	13.032	0.0	1.000	238874	NC			16549	
D 26 13C2 PFUi 565.0 > 520.0		12.070	0.002		252054	45.9		91.8	17812	
27 Perfluoroun			-0.003		252954	40.9		91.0	1/012	
563.0 > 519.0			-0.006	1.000	348408	54.4		109	1740	
D 28 13C2 PFD		10 //7	0.001		220012	45.0		01.0	21021	
615.0 > 570.0 29 Perfluorodo			-0.001		328812	45.9		91.8	21931	
613.0 > 569.0			-0.001	1.000	349907	52.2		104	316	
30 Perfluorotrio	decanoic	acid								
663.0 > 619.0	14.167	14.166	0.001	1.000	499310	51.3		103	683	
D 33 13C2-PFT										
715.0 > 670.0			0.007		503357	48.0		96.0	9043	
32 Perfluoroteti 713.0 > 669.0	radecano 14.589		-0.001	1.000	474132	44.9		89.9	398	
34 Perfluorohe:	xadecan	oic acid								
813.0 > 769.0		15.179	0.005	1.000	1021226	45.8		91.6	2160	
D 35 13C2-PFH: 815.0 > 770.0		15 100	0.001		060444	4E 2		90.4	11207	
010.0 > 110.0	10.179	15.180	-0.001		Page 723 of 776	43.2		70.4	1120726	6/2016

Report Date: 26-May-2016 11:30:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_026.d Data File:

Signal RT	EXP DLT RT RT	RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
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36 Perfluorooctandecanoic acid

106 2881 1415262 52.9

OC Flag Legend Processing Flags

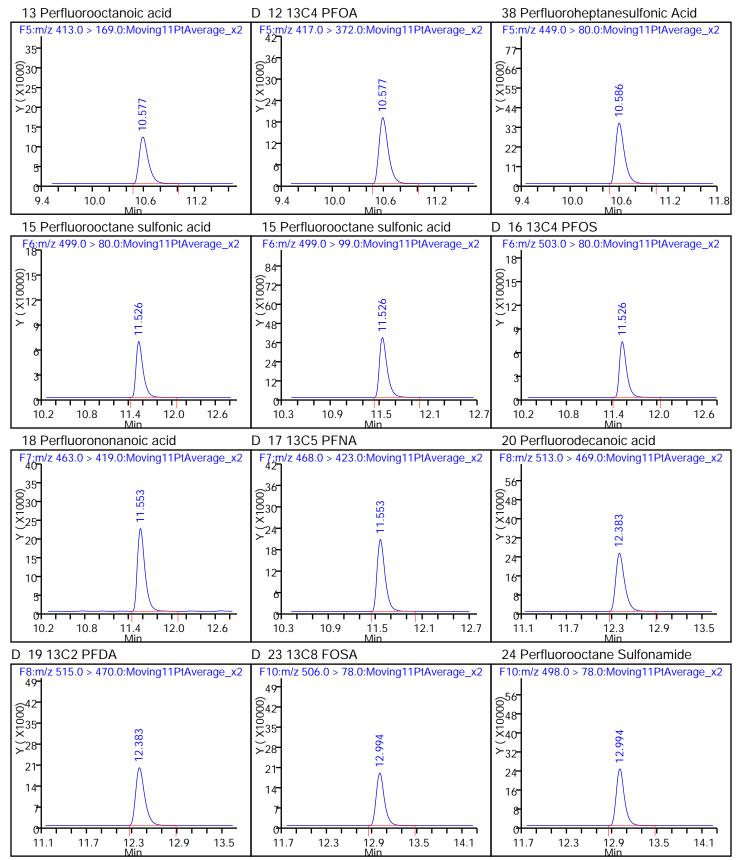
NC - Not Calibrated

E - Exceeded Maximum Amount

Reagents:

LCPFC-L5_00018 Amount Added: 1.00 Units: mL

Report Date: 26-May-2016 11:30:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A6\\20160524-31021.b\\24MAY2016A6A_026.d **Injection Date:** 25-May-2016 00:55:11 Instrument ID: Α6 Lims ID: CCV L5 Client ID: Operator ID: **JRB** ALS Bottle#: 13 Worklist Smp#: 26 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F_{40}^{2} m/z 267.9 > 223.0:Moving11PtAverage_x2 830 830 6 2 8 18 <u>8</u>20 ∑₁₆ ∑₁₅-×25 20 15 10 5.5 5.8 5.5 5.8 6.9 6.1 5.2 6.1 6.3 6.6 7.2 7.5 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid D F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage x2F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 42 35 84 (36-20030-672-©30 ×25 ×60 ⁻20 ≻₄₈-18 15 36 12 10 24 12 6.9 7.2 6.9 7.2 7.5 7.8 7.7 8.0 8.3 8.6 6.6 7.8 6.6 7.5 8.9 6.3 6.3 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 42 36 000 35 × >28 <u>6</u>30 ×30-8.230 ⁻24 18 18 12 12 8.0 8.3 8.6 8.9 9.1 9.4 9.7 8.3 8.9 9.5 7.7 8.8 10.0 10.3 10.1 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 V (X10000) 10 (X10000) 49 642- ×35- ≻28 21 14 0 0 0 9.0 9.6 10.2 8.4 9.0 Page 725 of 776 10.2 9.4 10.0 10.6 8.4



15.8

16.4

36-24-12-

14.0

14.6

14.7

14.4

15.0

15.3

15.6

15.9

FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Lab Sample ID: CCV 320-111182/39 Calibration Date: 05/25/2016 05:31

Instrument ID: A6 Calib Start Date: 05/24/2016 17:07

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 05/24/2016 19:14

Lab File ID: 24MAY2016A6A_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	L2ID		1.189		19.8	20.0	-1.1	25.0
Perfluoropentanoic acid (PFPeA)	L1ID		1.050		18.2	20.0	-8.9	25.0
Perfluorobutanesulfonic acid (PFBS)	L1ID		1.267		15.3	17.7	-13.2	25.0
Perfluorohexanoic acid (PFHxA)	L1ID		0.8371		18.6	20.0	-6.9	25.0
Perfluoroheptanoic acid (PFHpA)	L1ID		0.8494		15.8	20.0	-21.0	25.0
Perfluorohexanesulfonic acid (PFHxS)	L1ID		1.026		19.8	18.9	4.7	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	0.4887	0.5702		22.2	19.0	16.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.065	0.9475		17.8	20.0	-11.1	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9314	0.7707		15.8	19.1	-17.3	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9155	0.8275		18.1	20.0	-9.6	25.0
Perfluorodecanoic acid (PFDA)	L2ID		1.139		18.9	20.0	-5.4	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	1.112	1.114		20.0	20.0	0.1	25.0
Perfluorodecanesulfonic acid (PFDS)	L1ID		0.4316		17.1	19.3	-11.4	25.0
Perfluoroundecanoic acid (PFUnA)	L2ID		0.8750		13.5	20.0	-32.7*	25.0
Perfluorododecanoic acid (PFDoA)	AveID	1.019	0.8769		17.2	20.0	-14.0	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	1.479	1.607		21.7	20.0	8.7	25.0
Perfluorotetradecanoic acid (PFTeA)	L1ID		1.513		18.8	20.0	-6.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L2ID		2.880		16.3	20.0	-18.4	25.0
Perfluoro-n-octandecanoic acid (PFODA)	AveID	4.072	3.639		17.9	20.0	-10.6	25.0

Report Date: 26-May-2016 11:33:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_039.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 25-May-2016 05:31:42 ALS Bottle#: 12 Worklist Smp#: 39

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4 CCV L4

Misc. Info.: Acquity BEH 1.7um, 3X150mm T=50*C

Operator ID: JRB Instrument ID: A6

Sublist: chrom-PFAC_A6*sub9

Method: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\PFAC_A6.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:33:04 Calib Date: 24-May-2016 19:14:42

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_010.d

Column 1: Acquity BEH C18 (2.10 mm) Det: F1:MRM

Process Host: XAWRK003

FIUCESS FIUSI.	AAVVI	11003								
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobut	yric acid									
212.9 > 169.0	5.785	5.791	-0.006	1.000	24516	19.8		98.9	2655	
D 113C4 PFBA										
217.0 > 172.0	5.788	5.796	-0.008		51543	42.3		84.6	4115	
D 3 13C5-PFP6		. 04/	0.005		100050	F2.0		104	10104	
267.9 > 223.0	6.941	6.946	-0.005		123252	52.0		104	12104	
4 Perfluoroper 262.9 > 219.0		cia 6.949	0.002	1.000	51754	18.2		91.1	2784	
40 Perfluorobu				1.000	0.701	10.2		, , , , ,	2,01	
298.9 > 80.0	7.064			1.000	132186	15.3		86.8		
5 Perfluorobut	ane Sulf	onate								
298.9 > 80.0	7.064	7.074	-0.010	1.000	132186	NC			2147	
298.9 > 99.0	7.064	7.074	-0.010	1.000	44772		2.95(0.00-0.00)		1922	
D 6 13C2 PFHx					105.107	5.4.0		100	4 (0 5 4	
315.0 > 270.0		8.223	-0.003		185496	54.0		108	16254	
7 Perfluorohex 313.0 > 269.0	kanoic ac 8.214		-0.011	1.000	62112	18.6		93.1	5780	
D 8 13C4-PFH _k		0.223	-0.011	1.000	02112	10.0		75.1	3700	
367.0 > 322.0		9.459	-0.007		197990	54.9		110	17555	
9 Perfluoroher										
363.0 > 319.0			-0.010	1.000	67272	15.8		79.0	6059	
D 11 1802 PFH	xS									
403.0 > 84.0	9.487	9.494	-0.007		279183	50.5		107	24612	
10 Perfluorohe										
399.0 > 80.0	9.487		-0.008	1.000	114530	NC			2815	
41 Perfluorohe 399.0 > 80.0				1.000	114530	19.8		105		
377.0 > 80.0	7.40/	9.495	-0.008	1.000	114530	19.8		105		

Report Date: 26-May-2016 11:33:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:	•			to\Chrom[20-Apr-2016 13:59: \24MAY2016A6A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	tanoic ac 10.568 10.568	10.573		1.000 1.000	72773 33128	17.8	2.20(0.00-0.00)	88.9	3171 2235	
D 12 13C4 PFO 417.0 > 372.0		10.577	-0.009		192011	52.9		106	12508	
14 Perfluorohe 449.0 > 80.0	ptane Su 10.568		-0.017	1.000	118851	NC			7870	
38 Perfluorohe 449.0 > 80.0	ptanesul 10.568			1.000	118851	22.2		117		
15 Perfluorooc 499.0 > 80.0	11.510	11.524	-0.014	1.000	161312	15.8	1 72/0 00 0 00)	82.7	2027	
499.0 > 99.0 D 16 13C4 PFO	11.510 S	11.524	-0.014	1.000	93311		1.73(0.00-0.00)		7071	
503.0 > 80.0 18 Perfluorono	11.510		-0.014		523298	52.6		110	39424	
463.0 > 419.0	11.536		-0.011	1.000	66657	18.1		90.4	547	
D 17 13C5 PFN 468.0 > 423.0	11.536		-0.015		201389	58.5		117	14618	
20 Perfluorode 513.0 > 469.0	canoic a 12.362		-0.014	1.000	92943	18.9		94.6	5551	
D 19 13C2 PFD 515.0 > 470.0		12.380	-0.018		204048	47.7		95.5	12472	
D 23 13C8 FOS 506.0 > 78.0	A 12.984	12.993	-0.009		1457981	49.6		99.1	23737	
24 Perfluorooc 498.0 > 78.0	tane Sulf 12.984			1.000	649442	20.0		100	42140	
39 Perfluorode 599.0 > 80.0				1 000	91093	17.1		88.6		
25 Perfluorode	cane Sul	lfonate						00.0	(200	
D 26 13C2 PFU				1.000	91093	NC			6298	
565.0 > 520.0 27 Perfluoroun			-0.003		294932	53.5		107	20535	
563.0 > 519.0 D 28 13C2 PFD		13.082	-0.006	1.000	103225	13.5		67.3	1092	
615.0 > 570.0	13.657		-0.010		355704	49.6		99.3	12039	
29 Perfluorodo 613.0 > 569.0			-0.010	1.000	124768	17.2		86.0	103	
30 Perfluorotrio 663.0 > 619.0			-0.007	1.000	228673	21.7		109	114	
D 33 13C2-PFT 715.0 > 670.0		14.589	-0.013		534879	51.0		102	19409	
32 Perfluorotet 713.0 > 669.0			-0.014	1.000	215249	18.8		93.8	120	
34 Perfluorohe 813.0 > 769.0			-0.005	1.000	409730	16.3		81.6	240	
D 35 13C2-PFH 815.0 > 770.0	lxDA							104		100:5
2.2.0 / 770.0	,		5.571		Page 730 of 77	b 52.3			²³ 85/26	0/2016

Report Date: 26-May-2016 11:33:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_039.d

Signal RT	EXP DLT RT RT	RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
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36 Perfluorooctandecanoic acid

17.9 89.4 744 517823

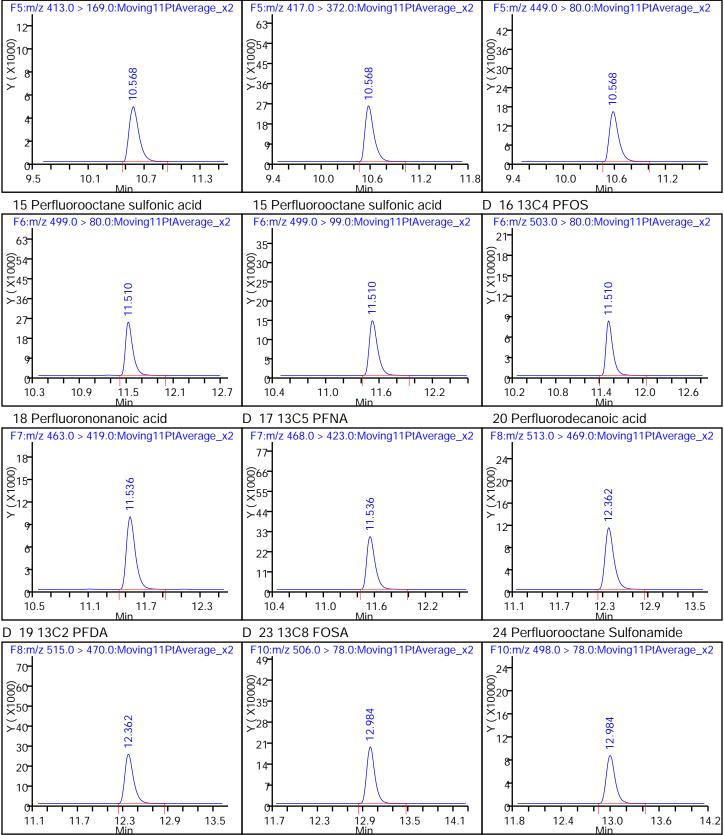
OC Flag Legend Processing Flags

NC - Not Calibrated

Reagents:

LCPFC-L4_00020 Amount Added: 1.00 Units: mL

Report Date: 26-May-2016 11:33:05 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A6\20160524-31021.b\24MAY2016A6A_039.d **Injection Date:** 25-May-2016 05:31:42 Instrument ID: Α6 Lims ID: CCV L4 Client ID: Operator ID: **JRB** ALS Bottle#: 12 Worklist Smp#: 39 15.0 ul Dil. Factor: Injection Vol: 1.0000 PFAC A6 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 217.0 > 172.0:Moving11PtAverage_x2 F1:m/z 212.9 > 169.0:Moving11PtAverage_x2 F2:m/z 267.9 > 223.0:Moving11PtAverage_x2 18 84 630 25-X 0015- X12 972 ×60 ∑20⁻ ≻₄₈-15 36 10 24 12 5.8 5.2 5.5 5.5 6.1 5.8 6.1 6.5 6.8 7.1 7.4 7.7 6 13C2 PFHxA 4 Perfluoropentanoic acid 40 Perfluorobutanesulfonic acid D F2:m/z 298.9 > 80.0:Moving11PtAverage_x2 F3:m/z 315.0 > 270.0:Moving11PtAverage_x2 F2:m/z 262.9 > 219.0:Moving11PtAverage_x2 42 56 21 0018 ×15 ×30-0648- 1640- 1648- -32 18 12 16 7.2 7.5 7.8 6.9 7.6 8.4 9.0 6.6 6.7 7.0 7.3 7.2 6.3 6.4 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 313.0 > 269.0:Moving11PtAverage_x2 F4:m/z 367.0 > 322.0:Moving11PtAverage_x2 F4:m/z 363.0 > 319.0:Moving11PtAverage_x2 24 91 (00015 X) 12 <u>8</u>78 <u>@</u>20 ×65 ×16 **≻**52 12 39 26 13 7.9 8.2 8.8 9.1 9.4 9.7 10.0 10.3 8.9 9.2 9.5 9.8 7.6 8.5 8.8 10.1 8.6 D 11 1802 PFHxS 41 Perfluorohexanesulfonic acid 13 Perfluorooctanoic acid F4:m/z 399.0 > 80.0:Moving11PtAverage_x2 F4:m/z 403.0 > 84.0:Moving11PtAverage_x2 F5:m/z 413.0 > 369.0:Moving11PtAverage_x2 21 35 84 830 618 00 15 × 872-≥60 ×25 ≻₄₈ ≻20 36 15 24 10 12 0 0 0 8.9 9.2 9.5 9.8 Page 78% of 776 8.9 9.5 10.1 10. 8.6 10.1 9.5 10.1 10.7 05/26/201 8.3



15.4 15.7 16.0 16.3

10

14.5 14.8 15.1

16-

14.2

14.8

15.4

16.0

FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 SDG No.: Lab Sample ID: MB 320-109334/1-A Client Sample ID: Matrix: Water Lab File ID: 25MAY2016B4A_015.d Analysis Method: WS-LC-0025 Date Collected: Date Extracted: 05/09/2016 16:04 Extraction Method: 3535 Sample wt/vol: 500.00(mL) Date Analyzed: 05/25/2016 20:26 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1 Injection Volume: 15(uL) GC Column: Acquity ID: 2.1 (mm) % Moisture: GPC Cleanup:(Y/N) N Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.00149	J	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	130		25-150
STL00991	13C4 PFOS	126		25-150
STL00995	13C5 PFNA	129		25-150
STL00990	13C4 PFOA	133		25-150
STL01892	13C4-PFHpA	131		25-150

Report Date: 26-May-2016 11:04:20 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_015.d

Lims ID: MB 320-109334/1-A

Client ID:

Sample Type: MB

Inject. Date: 25-May-2016 20:26:24 ALS Bottle#: 1 Worklist Smp#: 15

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: mb 320-109334/1-a BOX 73

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:17:16

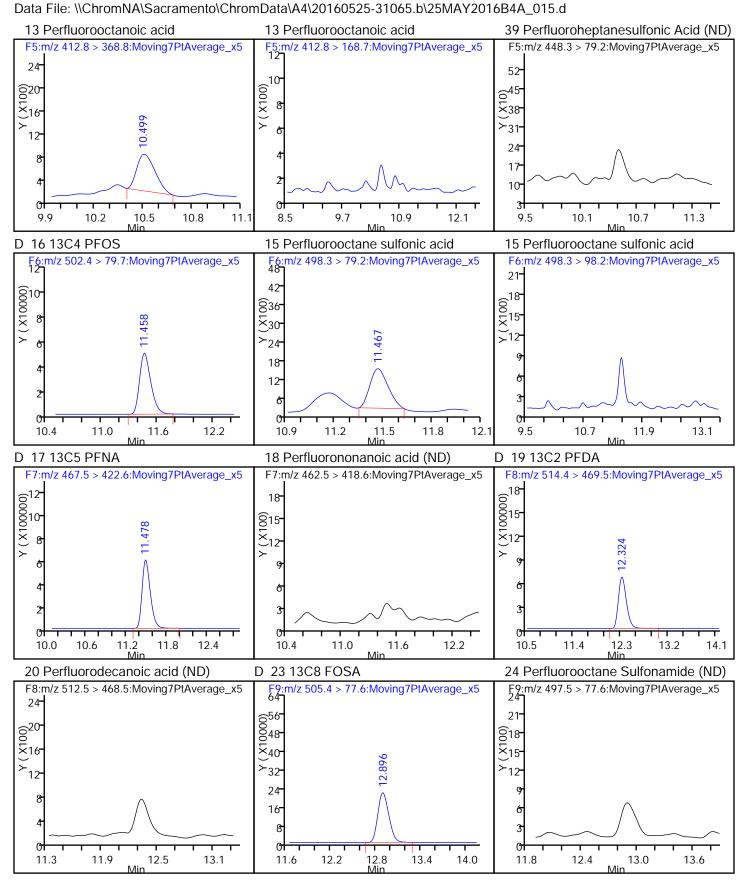
FIRST Level Revi	ewer: wes	stendono	<i>.</i>		Date:		6-May-2016 08:17:	10		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobu	ıtvric acid									
212.7 > 168.6	5.772		-0.026	1.000	12291	0.1559			34.4	
D 113C4 PFB	Α									
216.7 > 171.5	5.797	5.798	-0.001		6140465	72.6		145	18816	
D 3 13C5-PFP										
267.6 > 222.7	6.904	6.907	-0.003		5035625	65.6		131	9935	
4 Perfluorope										
	6.909	6.910	-0.001	1.000	6231	0.1218			2.1	
D 613C2 PFH		0.15/	0.001		(242012	7/ /		150	11710	
	8.155		-0.001		6343913	76.4		153	11712	
7 Perfluorohe 312.9 > 268.7	exanoic ac 8.149		-0 008	1.000	19352	0.1583			62.7	
D 8 13C4-PFH		0.137	-0.000	1.000	17332	0.1303			02.7	
366.6 > 321.6	•	9.387	-0.007		5599891	65.5		131	6371	
10 Perfluoroh										
	9.419		-0.002	1.000	13678	NC			24.9	
58 Perfluoroh	exanesulf	onic acid	d							
398.3 > 79.2	9.419	9.421	-0.002	1.000	13678	0.2080				
D 11 1802 PF	HxS									
402.5 > 83.6	9.419	9.422	-0.003		1820154	61.3		130	4540	
D 12 13C4 PF0										
416.5 > 371.6			-0.004		5948413	66.7		133	13578	
13 Perfluoroo			0.005	1 000	1000	0.0107			0.0	
	10.499	10.504	-0.005	1.000	4880	0.0196			9.3	
D 16 13C4 PF0		11 4/5	0.007		407 400	/ 0.2		10/	1050	
502.4 > 79.7	11.458	11.465	-0.007		406422	60.2		126	1059	

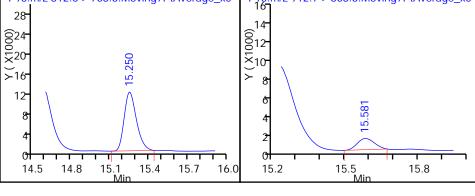
Data File:	NCIII	JIIINA\5	acramen	LONCHION	1Dala\H4\20100	∵20-31U05.D	1251VIA Y 20 16B4A_0	713.U		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooc	tane sulf	onic acid								
498.3 > 79.2	11.467	11.466	0.001	1.000	9835	0.7435			19.0	
D 17 13C5 PFN										
467.5 > 422.6		11.484	-0.006		5044024	64.3		129	8227	
D 19 13C2 PFD		40.005	0.004		(0/0400	, 0 7		400	7400	
514.4 > 469.5		12.325	-0.001		6962102	69.7		139	7103	
D 23 13C8 FOS 505.4 > 77.6		12.893	0.003		2202247	22.8		45.6	3878	
27 Perfluoroun			0.003		2202247	22.0		45.0	3070	
		13.042	-0.001	1.000	17024	0.1048			29.0	
D 26 13C2 PFU	nA									
564.3 > 519.5	13.041	13.044	-0.003		6889228	67.9		136	6846	
D 28 13C2 PFD	οΑ									
614.4 > 569.4	13.638	13.646	-0.008		5949164	56.5		113	4026	
29 Perfluorodo										
612.4 > 568.6			0.004	1.000	2931	0.0270			1.7	
30 Perfluorotrio 662.4 > 618.5			0.002	1.000	4133	0.0472			2.2	
32 Perfluorotet			-0.002	1.000	4133	0.0472			2.2	
		14.600	-0.002	1.000	12811	0.2769			6.1	
D 33 13C2-PFT										
714.5 > 669.5		14.601	-0.003		4265437	56.2		112	4339	
D 35 13C2-PFH	xDA									
814.8 > 769.6	15.250	15.255	-0.005		1306539	44.8		89.7	3719	
34 Perfluorohe										
812.6 > 768.6			-0.005	1.000	78003	0.4109			15.3	
36 Perfluorooc			0.010	1 000	F00/	0.1022			10.4	
912.7 > 868.6	15.581	15.593	-0.012	1.000	5906	0.1022			10.4	

OC Flag Legend Processing Flags

NC - Not Calibrated

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:04:20 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_015.d **Injection Date:** 25-May-2016 20:26:24 Instrument ID: A4 Lims ID: MB 320-109334/1-A Client ID: Operator ID: **JRB** ALS Bottle#: Worklist Smp#: 15 15.0 ul Dil. Factor: 1.0000 Injection Vol: PFAC A4 LC PFC_DOD ICAL Method: Limit Group: 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) (0000012° X (X) 836 ∑30 ≻₂₄ 18 12 5.6 5.9 5.3 5.9 5.8 7.0 6.2 4.7 6.5 6.4 7.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid (ND) D F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 (0015⁻ 0000012⁻ × 9 42 24 8.155 ×30 820 ×₁₆-**≻**24 12 18 12 6.9 7.2 7.2 7.8 7.6 8.2 8.8 6.6 7.5 6.0 6.6 7.0 6.3 8 13C4-PFHpA 7 Perfluorohexanoic acid 9 Perfluoroheptanoic acid (ND) F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 56 (X100000) X (X1000000) X (X1000000) 8 (248-(240-(200-<u>></u>32 24 16 01 7.8 8.1 8.7 8.2 8.8 9.4 8.9 9.5 8.4 10.0 8.3 10.1 12 13C4 PFOA 58 Perfluorohexanesulfonic acid 11 1802 PFHxS F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 42 56 0014 00012 X10 X30-(001× 1001× 1001× 18 24 12 16 0 0 0 9.0 9.3 9.6 9.9 10.2 8.4 9.0 Page 78% of 776 10.2 9.1 9.7 10.3 Mir 10.9 8.7





FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 SDG No.: Lab Sample ID: LCS 320-109334/2-A Client Sample ID: Matrix: Water Lab File ID: 25MAY2016B4A_016.d Analysis Method: WS-LC-0025 Date Collected: Date Extracted: 05/09/2016 16:04 Extraction Method: 3535 Sample wt/vol: 500.00(mL) Date Analyzed: 05/25/2016 20:47 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1 Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm) % Moisture: GPC Cleanup:(Y/N) N Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0340		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0325		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0313		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0261		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0229		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0310	М	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	131		25-150
STL00991	13C4 PFOS	115		25-150
STL00995	13C5 PFNA	129		25-150
STL00990	13C4 PFOA	123		25-150
STL01892	13C4-PFHpA	129		25-150

Report Date: 26-May-2016 11:04:33 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_016.d

Lims ID: LCS 320-109334/2-A

Client ID:

Sample Type: LCS

Inject. Date: 25-May-2016 20:47:35 ALS Bottle#: 2 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-109334/2-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:18:36

First Level Revie	First Level Reviewer: westendorfc Date: 26-May-2016 08:18:36									
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobuty	vric acid									
212.7 > 168.6	5.797	5.798	-0.001	1.000	1188649	16.0		80.1	2964	
D 113C4 PFBA										
216.7 > 171.5	5.797	5.798	-0.001		5778035	68.4		137	16448	
D 3 13C5-PFPe	·Α									
267.6 > 222.7	6.904	6.907	-0.003		4949523	64.5		129	8735	
4 Perfluoropen	itanoic a	cid								
262.9 > 218.7	6.904	6.910	-0.006	1.000	730434	14.5		72.6	238	
5 Perfluorobuta	ane Sulfo	onate								
298.8 > 79.6		7.024	-0.005	1.000	375282	NC			613	
298.8 > 98.6	7.019	7.024	-0.005	1.000	242878		1.55(0.00-0.00)		473	
51 Perfluorobut										
298.8 > 79.6	7.019	7.024	-0.005	1.000	375282	13.1		73.9		
D 613C2 PFHx										
314.6 > 269.7	8.155	8.156	-0.001		6062115	73.0		146	10597	
7 Perfluorohex										
312.9 > 268.7	8.155	8.157	-0.002	1.000	806231	14.6		73.2	1342	
D 8 13C4-PFHp										
366.6 > 321.6	9.380	9.387	-0.007		5493226	64.3		129	5979	
9 Perfluorohep										
362.8 > 318.7	9.380	9.388	-0.008	1.000	915377	17.0		84.9	2239	
10 Perfluorohex					_					M
398.3 > 79.2	9.421		0.0	1.000	0	NC			113	M
58 Perfluorohex										
398.3 > 79.2	9.419	9.421	-0.002	1.000	758908	11.4		62.8		
D 11 1802 PFH										
402.5 > 83.6	9.419	9.422	-0.003		1838708	62.0		131	4338	
D 12 13C4 PFO		10 500	0.004		F 470F00	/1 -		400	0075	
416.5 > 371.6	10.499	10.503	-0.004		Page 9542 of 770	5 61.5		123	9075/26	6/2016

Data File:	\\Chr	omNA\Sa	acramen	to\Chrom	Data\A4\2016052	5-31065.b	\\25MAY2016B4A_0)16.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooc	tanoic ac	-id			•					
412.8 > 368.8	10.499 10.499	10.504		1.000 1.000	809970 242140	16.3	3.35(0.00-0.00)	81.4	1088 750	
39 Perfluorohe 448.3 > 79.2	ptanesul 10.499			1.000	999418	16.8	,	88.1		
14 Perfluorohe		ulfonate		1.000	999418	NC			3060	
D 16 13C4 PFO 502.4 > 79.7	S	11.465		1.000	369485	54.7		115	1878	
15 Perfluorooc					309403	34.7		113	10/0	M
	11.458		-0.008	1.000 1.000	1602778 854153	15.5	1.88(0.00-0.00)	83.4	4509 1259	M M
D 17 13C5 PFN										
	11.478		-0.006		5045903	64.3		129	9867	
	11.487		0.001	1.000	1942416	15.6		78.2	1988	
	12.324		-0.001		7195166	72.0		144	6054	
20 Perfluorode 512.5 > 468.5	canoic a 12.324		-0.001	1.000	2517968	16.8		84.2	2785	
D 23 13C8 FOS		10.000			00/0001	0.4.0			-7. 10	
505.4 > 77.6		12.893			3363021	34.8		69.7	5742	
24 Perfluorooc 497.5 > 77.6	12.896	12.893		1.000	1197215	16.6		83.2	1749	
	12.987	12.996		1.000	514697	NC			1874	
49 Perfluorode 598.4 > 79.6	cane Su 12.987			1.000	514697	15.8		82.1		
27 Perfluoroun 562.4 > 518.5	decanoio 13.041		-0.001	1.000	2497039	16.0		79.8	2179	
D 26 13C2 PFU 564.3 > 519.5		13.044	-0.003		6632605	65.4		131	7099	
D 28 13C2 PFD										
614.4 > 569.4 29 Perfluorodo			-0.008		7499411	71.2		142	5268	
612.4 > 568.6	13.638	13.646	-0.008	1.000	2148962	15.7		78.5	825	
30 Perfluorotric 662.4 > 618.5	14.150	14.162	-0.012	1.000	1594557	19.5		97.5	691	
32 Perfluorotet 712.6 > 668.5	radecan 14.598		-0.002	1.000	665851	15.4		76.9	335	
D 33 13C2-PFT6 714.5 > 669.5		14.601	-0.003		3988271	52.6		105	4266	
D 35 13C2-PFH 814.8 > 769.6		15.255	-0.005		1463607	50.2		100	3373	
34 Perfluorohe		oic acid		1 000	1385816	17.7		88.3		
812.6 > 768.6 36 Perfluorooc				1.000	1303010	17.7		00.3	242	
	15.588			1.000	Page 743 of 776	3 15.9		79.6	1361/20	6/2016

Report Date: 26-May-2016 11:04:33

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Chrom Revision: 2.2 20-Apr-2016 13:59:46 Report Date: 26-May-2016 11:04:33 TestAmerica Sacramento Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_016.d **Injection Date:** 25-May-2016 20:47:35 Instrument ID: A4 Lims ID: LCS 320-109334/2-A Client ID: Operator ID: **JRB** ALS Bottle#: 2 Worklist Smp#: 16 Injection Vol: 15.0 ul Dil. Factor: 1.0000 Method: PFAC A4 Limit Group: LC PFC_DOD ICAL 2 Perfluorobutyric acid D 113C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) (0000010° ×) × ©21-©18-∑₁₅ 5.2 5.8 5.3 5.9 5.8 7.0 5.5 6.1 4.7 6.5 6.4 7.6 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 Y (X10000) (0012 000010 X) × (000015 X) > 9 6.9 8.7 7.0 7.3 7.2 7.5 8.1 9.3 6.4 6.7 7.6 6.3 6.6 7.5 6.9 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 18 (0000012 (0000012 (0000012 (0000012) (0000012) (0000012) (0000012) (0000012) (0000012) (0000012) 24 0020 ×16 0015 ×12 12 01 7.9 8.2 8.5 8.3 8.9 9.5 9.0 9.6 10.2 7.6 8.8 10.1 8.4 D 12 13C4 PFOA 58 Perfluorohexanesulfonic acid (M) D 11 1802 PFHxS F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 (0000012-10-42 (000015 ×) 12 X30-18 12 0 0

8.9

8.3

9.5

10.1

8.4

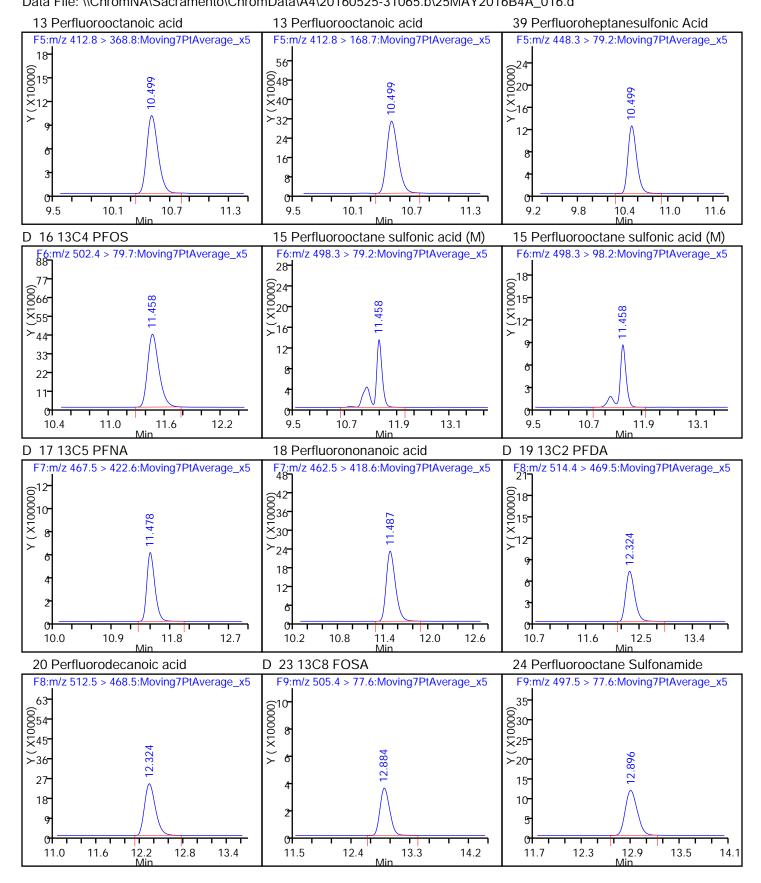
9.0 Page 74/5 of 776 10.2

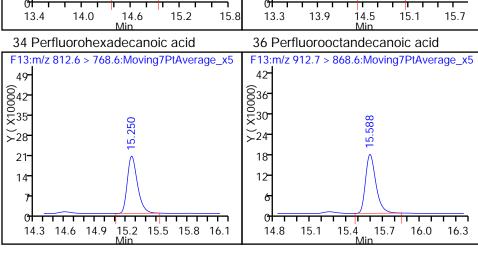
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9.7

10.3

10.9





Report Date: 26-May-2016 11:04:33 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_016.d

Injection Date: 25-May-2016 20:47:35 Instrument ID: A4

Lims ID: LCS 320-109334/2-A

Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

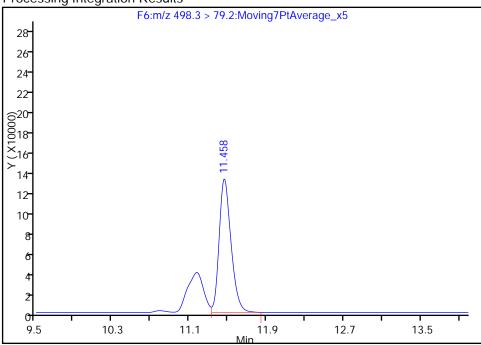
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

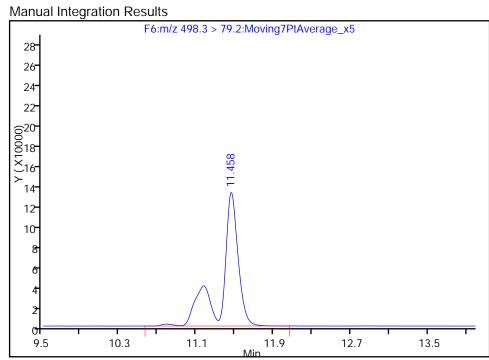
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.46 Area: 1124144 Amount: 13.806764 Amount Units: ng/ml **Processing Integration Results**



RT: 11.46
Area: 1602778
Amount: 15.479118
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:18:36

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:04:33 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_016.d

Injection Date: 25-May-2016 20:47:35 Instrument ID: A4

Lims ID: LCS 320-109334/2-A

Client ID:

Operator ID: JRB ALS Bottle#: 2 Worklist Smp#: 16

Injection Vol: 15.0 ul Dil. Factor: 1.0000

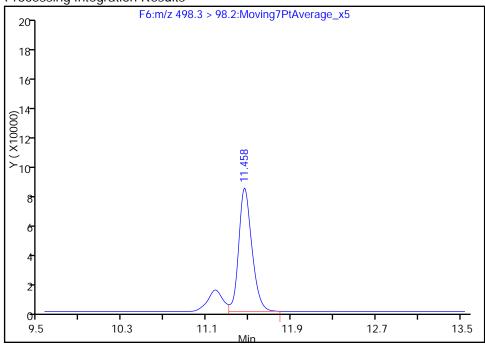
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Column: Detector F6:MRM

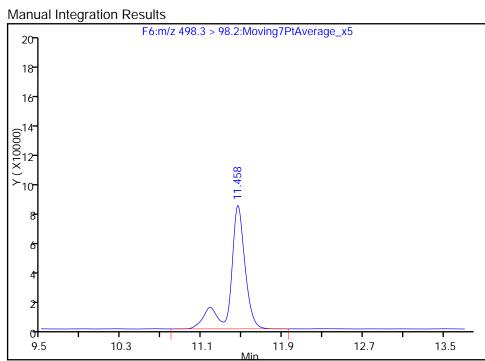
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.46 Area: 708810 Amount: 13.806764 Amount Units: ng/ml **Processing Integration Results**



RT: 11.46
Area: 854153
Amount: 15.479118
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:18:36

Audit Action: Manually Integrated

Audit Reason: Isomers

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FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1 SDG No.: Lab Sample ID: LCSD 320-109334/3-A Client Sample ID: _____ Matrix: Water Lab File ID: 25MAY2016B4A_017.d Analysis Method: WS-LC-0025 Date Collected: Date Extracted: 05/09/2016 16:04 Extraction Method: 3535 Sample wt/vol: 500.00(mL) Date Analyzed: 05/25/2016 21:08 Con. Extract Vol.: 1.00(mL) Dilution Factor: 1 Injection Volume: 15(uL) GC Column: Acquity ID: 2.1(mm) % Moisture: GPC Cleanup:(Y/N) N Analysis Batch No.: 111390 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0330		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0309		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0338		0.0025	0.0020	0.00065
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0270		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0313	M Q	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0330	М	0.0040	0.0030	0.0013

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	120		25-150
STL00991	13C4 PFOS	109		25-150
STL00995	13C5 PFNA	120		25-150
STL00990	13C4 PFOA	118		25-150
STL01892	13C4-PFHpA	120		25-150

Report Date: 26-May-2016 11:04:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_017.d

Lims ID: LCSD 320-109334/3-A

Client ID:

Sample Type: LCSD

Inject. Date: 25-May-2016 21:08:46 ALS Bottle#: 3 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

Sample Info: lcsd 320-109334/3-a

Misc. Info.: Acquity BEH C18,1.7u, 3X150mm,T=35C

Operator ID: JRB Instrument ID: A4

Method: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\PFAC_A4.m

Limit Group: LC PFC_DOD ICAL

Last Update: 26-May-2016 11:03:48 Calib Date: 25-May-2016 19:01:43

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_011.d

Column 1: Det: F1:MRM

Process Host: XAWRK003

First Level Reviewer: westendorfc Date: 26-May-2016 08:21:56

First Level Revie	First Level Reviewer: westendorfc Date: 26-May-2016 08:21:56									
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
2 Perfluorobuty 212.7 > 168.6	yric acid 5.797	5.798	-0.001	1.000	1160895	16.5		82.7	3232	
D 113C4 PFBA 216.7 > 171.5	5.797	5.798	-0.001		5467484	64.7		129	14764	
D 3 13C5-PFPe 267.6 > 222.7		6.907	-0.003		4894290	63.8		128	10081	
4 Perfluoroper 262.9 > 218.7	ntanoic a	cid	-0.006	1.000	691107	13.9		69.5	261	
5 Perfluorobut 298.8 > 79.6	ane Sulfo		-0.005	1.000	355957	NC			663	
298.8 > 98.6 51 Perfluorobu	7.019	7.024	-0.005	1.000	231128		1.54(0.00-0.00)		434	
298.8 > 79.6 D 613C2 PFHx	7.019	7.024		1.000	355957	13.5		76.4		
314.6 > 269.7 7 Perfluorohex	8.155		-0.001		5800757	69.9		140	11480	
312.9 > 268.7 D 8 13C4-PFHp	8.155	8.157	-0.002	1.000	807749	15.3		76.7	1649	
•	9.380	9.387	-0.007		5138617	60.1		120	6122	
362.8 > 318.7 10 Perfluorohe:	9.380	9.388	-0.008	1.000	833267	16.5		82.6	2198	M
398.3 > 79.2 58 Perfluorohe:	9.421	9.421	0.0	1.000	0	NC			105	M M
398.3 > 79.2 D 11 1802 PFH:	9.419			1.000	952563	15.6		85.9		M
402.5 > 83.6 D 12 13C4 PFO	9.412	9.422	-0.010		1687468	56.9		120	3766	
	10.500	10.503	-0.003		Pag201914 of 77	5 59.1		118	81 05 1/26	6/2016

Report Date: 26-May-2016 11:04:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46

Data File:				to\ChromI			\25MAY2016B4A_0			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorooc	tanoic ac	id		-						
412.8 > 368.8	10.500		-0.004	1.000	740172	15.5		77.3	1032	
412.8 > 168.7	10.500			1.000	249140		2.97(0.00-0.00)		1048	
39 Perfluorohe	ptanesul	fonic Aci	id							
448.3 > 79.2	10.500	10.508	-0.008	1.000	1009388	17.8		93.6		
14 Perfluorohe	ptane Su	ılfonate								
448.3 > 79.2	10.500	10.508	-0.008	1.000	1009388	NC			3290	
D 16 13C4 PFO	S									
502.4 > 79.7	11.459	11.465	-0.006		351173	52.0		109	1005	
15 Perfluorooc										M
498.3 > 79.2	11.459			1.000	1628177	16.5	1 07/0 00 0 00)	88.9	2704	M
498.3 > 98.2	11.459	11.466	-0.007	1.000	825303		1.97(0.00-0.00)		1826	M
D 17 13C5 PFN		11 404	0.005		471047/	(0.1		120	, 000	
	11.479		-0.005		4712476	60.1		120	6990	
18 Perfluorono 462.5 > 418.6	nanoic a 11.488		0.002	1.000	1961053	16.9		84.5	2245	
		11.400	0.002	1.000	1901003	10.9		04.3	2243	
D 19 13C2 PFD 514.4 > 469.5	A 12.325	12 225	0.0		6451642	64.6		129	6346	
			0.0		0431042	04.0		127	0340	
20 Perfluorode 512.5 > 468.5	canoic a 12.325		0.0	1.000	2440367	18.2		91.1	2801	
		12.323	0.0	1.000	2440307	10.2		71.1	2001	
D 23 13C8 FOS 505.4 > 77.6	A 12.885	12 203	-0 008		2738840	28.4		56.7	2986	
24 Perfluorooc					2730040	20.4		30.7	2700	
497.5 > 77.6	12.885			1.000	1025999	17.5		87.6	1980	
25 Perfluorode			0.000	1.000	1020777	17.0		07.0	.,00	
598.4 > 79.6	12.988		-0.008	1.000	539534	NC			1498	
49 Perfluorode										
598.4 > 79.6		12.996		1.000	539534	17.4		90.5		
27 Perfluoroun										
562.4 > 518.5			0.0	1.000	2440793	16.4		82.1	2887	
D 26 13C2 PFU	nA									
564.3 > 519.5		13.044	-0.002		6306987	62.2		124	4535	
D 28 13C2 PFD	οA									
614.4 > 569.4		13.646	-0.007		6879325	65.3		131	3668	
29 Perfluorodo	decanoio	acid								
612.4 > 568.6			-0.007	1.000	2047610	16.3		81.6	782	
30 Perfluorotrio	decanoic	acid								
662.4 > 618.5	14.151	14.162	-0.011	1.000	1792499	20.1		101	735	
32 Perfluorotet	radecan	oic acid								
712.6 > 668.5	14.599	14.600	-0.001	1.000	797193	16.9		84.6	345	
D 33 13C2-PFT	eDA									
	14.599	14.601	-0.002		4343104	57.2		114	3064	
D 35 13C2-PFH	xDA									
814.8 > 769.6	15.251	15.255	-0.004		1595830	54.8		110	3290	
34 Perfluorohe	xadecan	oic acid								
812.6 > 768.6			-0.004	1.000	1514673	17.7		88.5	281	
36 Perfluorooc	tandecar	noic acid								
912.7 > 868.6				1.000	941946 Page 752 of 776	13.3		66.7	1081/20	6/201 <u>6</u>
					1 aye 132 01 116	,			03/20	J/ ZU 10

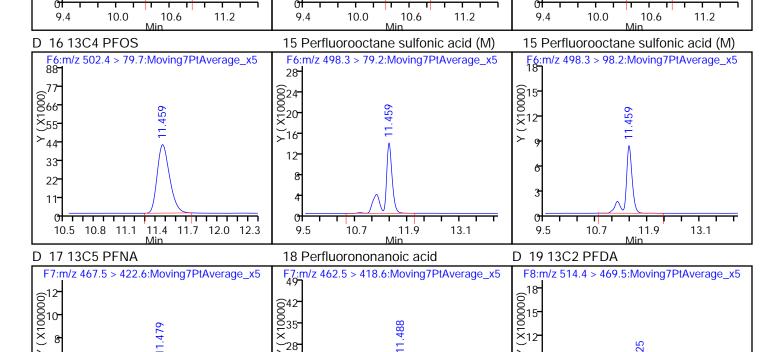
Report Date: 26-May-2016 11:04:46

OC Flag Legend
Processing Flags
NC - Not Calibrated
Review Flags

M - Manually Integrated

Chrom Revision: 2.2 20-Apr-2016 13:59:46

Report Date: 26-May-2016 11:04:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 TestAmerica Sacramento Data File: \\ChromNA\\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_017.d **Injection Date:** 25-May-2016 21:08:46 Instrument ID: A4 Lims ID: LCSD 320-109334/3-A Client ID: Operator ID: **JRB** ALS Bottle#: 3 Worklist Smp#: 17 Injection Vol: 15.0 ul Dil. Factor: 1.0000 Method: PFAC A4 Limit Group: LC PFC_DOD ICAL 2 Perfluorobutyric acid 1 13C4 PFBA D 313C5-PFPeA F1:m/z 212.7 > 168.6:Moving7PtAverage_x5 F1:m/z 216.7 > 171.5:Moving7PtAverage_x5 F2:m/z 267.6 > 222.7:Moving7PtAverage_x5 Y (X100000) Y (X100000) (00020 × × 16 12 5.3 5.9 6.2 6.3 6.9 7.5 5.6 4.8 5.4 6.0 6.6 5.7 8.1 6 13C2 PFHxA 4 Perfluoropentanoic acid 51 Perfluorobutanesulfonic acid F2:m/z 262.9 > 218.7:Moving7PtAverage_x5 F2:m/z 298.8 > 79.6:Moving7PtAverage_x5 F3:m/z 314.6 > 269.7:Moving7PtAverage_x5 Y (X10000) (000012-X) > 8 (000012 ×) > 9 7.1 6.9 6.5 7.7 7.2 7.5 8.4 9.3 6.3 6.6 7.5 6.6 7 Perfluorohexanoic acid 8 13C4-PFHpA 9 Perfluoroheptanoic acid F3:m/z 312.9 > 268.7:Moving7PtAverage_x5 F4:m/z 366.6 > 321.6:Moving7PtAverage_x5 F4:m/z 362.8 > 318.7:Moving7PtAverage_x5 21 (X100000) X (X1000000) (18-(00015-X)12-0018 0015 ×12 7.7 8.0 8.3 8.9 9.5 8.9 9.5 10.1 8.6 8.3 10.1 8.3 58 Perfluorohexanesulfonic acid (M) 12 13C4 PFOA D 11 1802 PFHxS F5:m/z 416.5 > 371.6:Moving7PtAverage_x5 F4:m/z 402.5 > 83.6:Moving7PtAverage_x5 F4:m/z 398.3 > 79.2:Moving7PtAverage_x5 18 (0000012 X) 00015 X12 (36-(36-(36-×24-18 12 0 0 0 7.5 8.7 9.9 11.1 8.3 8.9 Page 75% of 776 10.1 9.2 9.8 10.4



28-21-14-

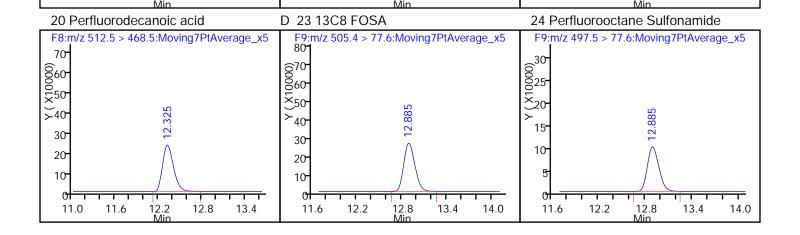
10.3

10.9

10.0

11.8

12.7



11.5

12.1

10.6

12.7

11.5

12.4

10.9

13.3

15.6 15.9 16.2 16.5

18

12

14.7 15.0 15.3

15.2 15.5 15.8 16.1

21

14.3 14.6 14.9

Report Date: 26-May-2016 11:04:46 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_017.d

Injection Date: 25-May-2016 21:08:46 Instrument ID: A4

Lims ID: LCSD 320-109334/3-A

Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

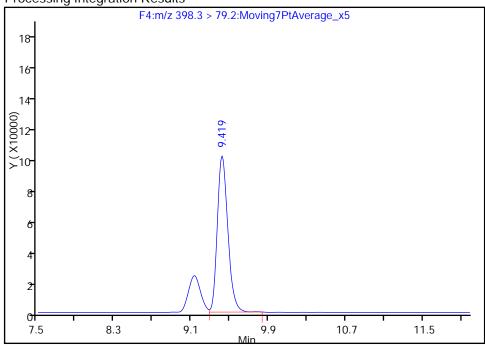
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F4:MRM

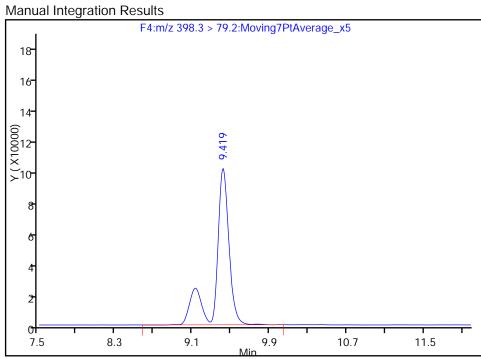
58 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

RT: 9.42 Area: 743327 Amount: 12.193569 Amount Units: ng/ml **Processing Integration Results**



RT: 9.42 Area: 952563 Amount: 15.625886 Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:21:56

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:04:47 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_017.d

Injection Date: 25-May-2016 21:08:46 Instrument ID: A4

Lims ID: LCSD 320-109334/3-A

Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

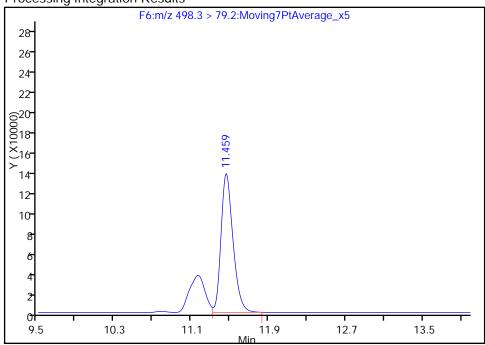
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

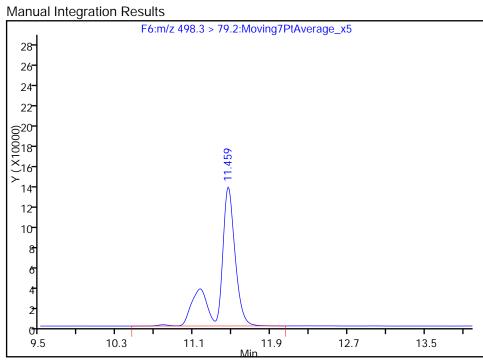
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

RT: 11.46 Area: 1192139 Amount: 15.405385 Amount Units: ng/ml **Processing Integration Results**



RT: 11.46
Area: 1628177
Amount: 16.498889
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:21:56

Audit Action: Manually Integrated

Audit Reason: Isomers

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Report Date: 26-May-2016 11:04:47 Chrom Revision: 2.2 20-Apr-2016 13:59:46 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\A4\20160525-31065.b\25MAY2016B4A_017.d

Injection Date: 25-May-2016 21:08:46 Instrument ID: A4

Lims ID: LCSD 320-109334/3-A

Client ID:

Operator ID: JRB ALS Bottle#: 3 Worklist Smp#: 17

Injection Vol: 15.0 ul Dil. Factor: 1.0000

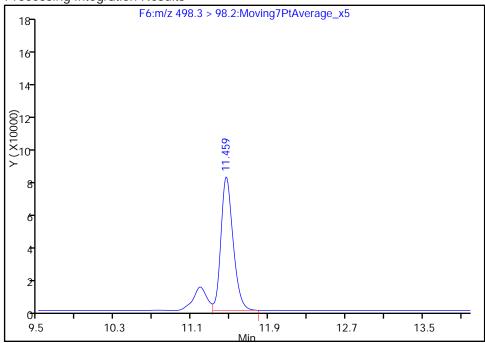
Method: PFAC_A4 Limit Group: LC PFC_DOD ICAL

Column: Detector F6:MRM

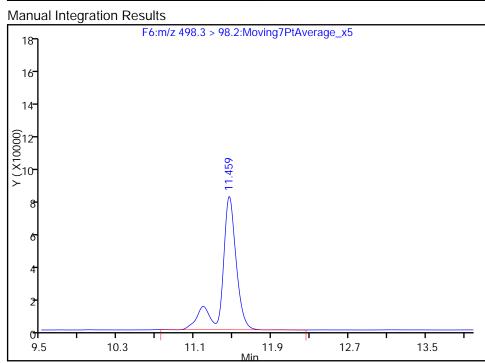
15 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

RT: 11.46 Area: 689226 Amount: 15.405385 Amount Units: ng/ml **Processing Integration Results**



RT: 11.46
Area: 825303
Amount: 16.498889
Amount Units: ng/ml



Reviewer: westendorfc, 26-May-2016 08:21:56

Audit Action: Manually Integrated

Audit Reason: Isomers

Page 759 of 776 05/26/2016

Lab Name: TestAmerica Sacramento

SDG No.:

Instrument ID: A6

Start Date: 05/24/2016 17:07

Analysis Batch Number: 111182 End Date: 05/25/2016 10:08

TAB SAMPLE ID CLIENT SAMPLE ID DATE ANALYZED DILUTION TAB FILE ID COLUMN ID FACTOR 24MAY2016A6A 00 STD 320-111182/4 IC 05/24/2016 17:07 Acquity 2.1 (mm) 1 STD 320-111182/5 IC 05/24/2016 17:28 24MAY2016A6A 00 Acquity 2.1 (mm) 1 STD 320-111182/6 IC 05/24/2016 17:49 24MAY2016A6A 00 Acquity 2.1 (mm) STD 320-111182/7 TC 24MAY2016A6A 00 05/24/2016 18:10 1 Acquity 2.1 (mm) STD 320-111182/8 IC 05/24/2016 18:32 24MAY2016A6A 00 Acquity 2.1 (mm) Acquity 2.1 (mm) STD 320-111182/9 TC 05/24/2016 18:53 24MAY2016A6A 00 1 STD 320-111182/10 IC 05/24/2016 19:14 1 24MAY2016A6A 01 Acquity 2.1 (mm) 0.<u>d</u> 05/24/2016 19:35 7.7.7.7.7 Acquity 2.1 (mm) 1 ICV 320-111182/12 05/24/2016 19:57 24MAY2016A6A 01 Acquity 2.1 (mm) 1 ZZZZZ 05/24/2016 21:01 1 Acquity 2.1(mm) ZZZZZ 05/24/2016 21:22 Acquity 2.1 (mm) 05/24/2016 21:43 Acquity 2.1 (mm) 77777 1 ZZZZZ 05/24/2016 22:04 Acquity 2.1 (mm) 7.7.7.7.7 05/24/2016 22:26 1 Acquity 2.1(mm) ZZZZZ 05/24/2016 22:47 1 Acquity 2.1(mm) 05/24/2016 23:08 77777 Acquity 2.1(mm) 1 05/24/2016 23:30 77777 1 Acquity 2.1 (mm) 05/24/2016 23:51 77777 1 Acquity 2.1 (mm) ZZZZZ 05/25/2016 00:12 Acquity 2.1(mm) 1 ZZZZZ 05/25/2016 00:33 1 Acquity 2.1(mm) CCV 320-111182/26 05/25/2016 00:55 24MAY2016A6A 02 Acquity 2.1 (mm) 1 ZZZZZ 05/25/2016 01:16 Acquity 2.1 (mm) 05/25/2016 01:37 24MAY2016A6A 02 320-18704-8 RA Acquity 2.1 (mm) 1 05/25/2016 01:58 320-18704-9 RA 1 24MAY2016A6A 02 Acquity 2.1 (mm) 320-18704-10 RA 05/25/2016 02:20 24MAY2016A6A 03 Acquity 2.1 (mm) 1 24MAY2016A6A 03 320-18704-11 RA 05/25/2016 02:41 1 Acquity 2.1 (mm) 1.d ZZZZZ 05/25/2016 03:02 1 Acquity 2.1 (mm) 05/25/2016 03:24 7.7.7.7.7 1 Acquity 2.1 (mm) ZZZZZ 05/25/2016 03:45 1 Acquity 2.1 (mm) ZZZZZ 05/25/2016 04:06 1 Acquity 2.1(mm) ZZZZZ 05/25/2016 04:27 Acquity 2.1 (mm) 1 ZZZZZ 05/25/2016 04:49 1 Acquity 2.1 (mm) ZZZZZ 05/25/2016 05:10 Acquity 2.1 (mm) 1 CCV 320-111182/39 05/25/2016 05:31 24MAY2016A6A 03 Acquity 2.1(mm) 1 ZZZZZ 05/25/2016 05:52 Acquity 2.1(mm) 1 ZZZZZ 05/25/2016 06:14 Acquity 2.1 (mm) 1 05/25/2016 06:35 Acquity 2.1 (mm) 77777 1 ZZZZZ 05/25/2016 06:56 Acquity 2.1 (mm) 77777 05/25/2016 07:18 Acquity 2.1(mm) 1

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
SDG No.:	
Instrument ID: A6	Start Date: 05/24/2016 17:07
Analysis Batch Number: 111182	End Date: 05/25/2016 10:08

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
ZZZZZ		05/25/2016 07:39	1		Acquity 2.1(mm)
ZZZZZ		05/25/2016 08:00	1		Acquity 2.1 (mm)
ZZZZZ		05/25/2016 08:21	1		Acquity 2.1 (mm)
ZZZZZ		05/25/2016 08:43	1		Acquity 2.1 (mm)
ZZZZZ		05/25/2016 09:04	1		Acquity 2.1 (mm)
ZZZZZ		05/25/2016 09:25	1		Acquity 2.1 (mm)
CCV 320-111182/52		05/25/2016 10:08	1		Acquity 2.1(mm)

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Instrument ID: A4 Start Date: 05/25/2016 16:55

Analysis Batch Number: 111390 End Date: 05/26/2016 13:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
STD 320-111390/5 IC		05/25/2016 16:55	1	25MAY2016B4A_00 5.d	Acquity 2.1 (mm)
STD 320-111390/6 IC		05/25/2016 17:15	1	25MAY2016B4A_00 6.d	Acquity 2.1 (mm)
STD 320-111390/7 IC		05/25/2016 17:36	1	25MAY2016B4A_00 7.d	Acquity 2.1 (mm)
STD 320-111390/8 IC		05/25/2016 17:58	1	25MAY2016B4A_00 8.d	Acquity 2.1 (mm)
STD 320-111390/9 IC		05/25/2016 18:19	1	25MAY2016B4A_00 9.d	Acquity 2.1 (mm)
STD 320-111390/10 IC		05/25/2016 18:40	1	25MAY2016B4A_01 0.d	Acquity 2.1 (mm)
STD 320-111390/11 IC		05/25/2016 19:01	1	25MAY2016B4A_01 1.d	Acquity 2.1 (mm)
ZZZZZ		05/25/2016 19:22	1		Acquity 2.1 (mm)
ICV 320-111390/13		05/25/2016 19:44	1	25MAY2016B4A_01 3.d	
ZZZZZ		05/25/2016 20:05	1		Acquity 2.1 (mm)
MB 320-109334/1-A		05/25/2016 20:26	1	25MAY2016B4A_01 5.d	Acquity 2.1 (mm)
LCS 320-109334/2-A		05/25/2016 20:47	1	25MAY2016B4A_01 6.d	Acquity 2.1 (mm)
LCSD 320-109334/3-A		05/25/2016 21:08	1	25MAY2016B4A_01 7.d	Acquity 2.1 (mm)
320-18704-1		05/25/2016 21:29	1	25MAY2016B4A_01 8.d	Acquity 2.1 (mm)
320-18704-2		05/25/2016 21:51	1	25MAY2016B4A_01 9.d	Acquity 2.1 (mm)
320-18704-3		05/25/2016 22:12	1	25MAY2016B4A_02 0.d	Acquity 2.1 (mm)
320-18704-4		05/25/2016 22:33	1	25MAY2016B4A_02 1.d	Acquity 2.1 (mm)
320-18704-5		05/25/2016 22:54	1	25MAY2016B4A_02 2.d	Acquity 2.1 (mm)
320-18704-6		05/25/2016 23:15	1	25MAY2016B4A_02 3.d	Acquity 2.1 (mm)
320-18704-7		05/25/2016 23:37	1	25MAY2016B4A_02 4.d	Acquity 2.1 (mm)
ZZZZZ		05/25/2016 23:58	1		Acquity 2.1 (mm)
CCV 320-111390/26		05/26/2016 00:19	1	25MAY2016B4A_02 6.d	
ZZZZZ		05/26/2016 00:40	1		Acquity 2.1 (mm)
320-18704-8		05/26/2016 01:01	1	25MAY2016B4A_02 8.d	
320-18704-9		05/26/2016 01:22	1	25MAY2016B4A_02 9.d	
320-18704-10		05/26/2016 01:44	1	25MAY2016B4A_03 0.d	Acquity 2.1 (mm)
320-18704-11		05/26/2016 02:05	1	25MAY2016B4A_03 1.d	Acquity 2.1 (mm)
ZZZZZ		05/26/2016 02:26	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 02:47	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 03:08	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 03:29	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 03:51	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 04:12	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 04:33	1		Acquity 2.1 (mm)
CCV 320-111390/39		05/26/2016 04:54	1	25MAY2016B4A_03 9.d	Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-18704-1
SDG No.:	
Instrument ID: A4	Start Date: 05/25/2016 16:55
Analysis Batch Number: 111390	End Date: 05/26/2016 13:49

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ZZZZZ		05/26/2016 05:15	1		Acquity 2.1(mm)
ZZZZZ		05/26/2016 05:37	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 05:58	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 06:19	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 06:40	20		Acquity 2.1(mm)
ZZZZZ		05/26/2016 07:01	20		Acquity 2.1(mm)
ZZZZZ		05/26/2016 07:22	1		Acquity 2.1(mm)
ZZZZZ		05/26/2016 07:44	1		Acquity 2.1(mm)
ZZZZZ		05/26/2016 08:05	1		Acquity 2.1(mm)
ZZZZZ		05/26/2016 08:26	1		Acquity 2.1(mm)
ZZZZZ		05/26/2016 08:47	1		Acquity 2.1(mm)
ZZZZZ		05/26/2016 09:08	1		Acquity 2.1(mm)
CCV 320-111390/52		05/26/2016 09:30	1	25MAY2016B4A_05 2.d	Acquity 2.1 (mm)
ZZZZZ		05/26/2016 09:51	1		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 10:12	20		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 10:33	100		Acquity 2.1(mm)
ZZZZZ		05/26/2016 10:58	20		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 11:21	20		Acquity 2.1(mm)
ZZZZZ		05/26/2016 11:42	20		Acquity 2.1(mm)
ZZZZZ		05/26/2016 12:03	20		Acquity 2.1 (mm)
320-18704-1 DL		05/26/2016 12:24	20	25MAY2016B4A_06 0.d	Acquity 2.1 (mm)
ZZZZZ		05/26/2016 12:46	20		Acquity 2.1 (mm)
ZZZZZ		05/26/2016 13:07	20		Acquity 2.1 (mm)
CCV 320-111390/64		05/26/2016 13:49	1	25MAY2016B4A_06 4.d	Acquity 2.1(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Batch Number: 109334 Batch Start Date: 05/09/16 16:04 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 05/10/16 18:26

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00039	LCPFCSP 00046
MB 320-109334/1		3535, WS-LC-0025				500.00 mL	1.00 mL	50 uL	
LCS 320-109334/2		3535, WS-LC-0025				500.00 mL	1.00 mL	50 uL	20 uL
LCSD 320-109334/3		3535, WS-LC-0025				500.00 mL	1.00 mL	50 uL	20 uL
320-18704-A-1	OF-RW44-0516	3535, WS-LC-0025	Т	579.20 g	47.69 g	531.5 mL	1.00 mL	50 uL	
320-18704-A-2	OF-FB44-0516	3535, WS-LC-0025	T	562.21 g	44.44 g	517.8 mL	1.00 mL	50 uL	
320-18704-A-3	OF-RW42B2-0516	3535, WS-LC-0025	Т	555.49 g	44.56 g	510.9 mL	1.00 mL	50 uL	
320-18704-A-4	OF-FB42B2-0516	3535, WS-LC-0025	Т	557.56 g	44.31 g	513.3 mL	1.00 mL	50 uL	
320-18704-A-5	OF-RW42A-0516	3535, WS-LC-0025	T	574.38 g	44.21 g	530.2 mL	1.00 mL	50 uL	
320-18704-A-6	OF-FB42A-0516	3535, WS-LC-0025	Т	563.11 g	44.57 g	518.5 mL	1.00 mL	50 uL	
320-18704-A-7	OF-RW42B-0516	3535, WS-LC-0025	Т	583.90 g	44.08 g	539.8 mL	1.00 mL	50 uL	
320-18704-A-8	OF-FB42B-0516	3535, WS-LC-0025	Т	553.10 g	44.11 g	509 mL	1.00 mL	50 uL	
320-18704-A-9	OF-RW42C-516	3535, WS-LC-0025	Т	585.34 g	44.77 g	540.6 mL	1.00 mL	50 uL	
320-18704-A-10	OF-RW42CD-0516	3535, WS-LC-0025	Т	579.81 g	44.76 g	535.1 mL	1.00 mL	50 uL	
320-18704-A-11	OF-FB42C-0516	3535, WS-LC-0025	T	503.22 g	44.32 g	458.9 mL	1.00 mL	50 uL	

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.

WS-LC-0025

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LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-18704-1

SDG No.:

Batch Number: 109334 Batch Start Date: 05/09/16 16:04 Batch Analyst: Reed, Jonathan E

Batch Method: 3535 Batch End Date: 05/10/16 18:26

	Batch Notes
Balance ID	QA-070
Batch Comment	0.1N NaOH/H2O: 624176, HEXANE: 0000125986, MeOH: 620224, mANIFOLDS: 5, 6
H2O ID	5/09/16
Pipette ID	EC15219
Analyst ID - Reagent Drop	JER
Analyst ID - SU Reagent Drop	JER
Analyst ID - SU Reagent Drop Witness	SNE
Solvent Lot #	626675
Solvent Name	0.3% NH4OH/MeOH
SOP Number	WS-LC-0025
SPE Cartridge Type	WAX 500mg
Solid Phase Extraction Disk ID	002736075A

Basis	Basis Description
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.

WS-LC-0025 Page 2 of 2



West Sacramento

HPLC/LCMS Data Review Checklist

Job Number(s): 320-19704, 320-19719	Work List ID(s):	31021,310	65	
Extraction Batch: 109334	Analysis Batch(es)	111182,	111390	
Delivery Rank 4	Due Date:	٠ ١ سو		
A Calibration/Instrument Run QC		1 st Level	2 nd Level	N/A
1, ICAL locked in Chrom and TALS? ICAL Batch#		1	V	
2. ICAL, CCV Frequency & Criteria met.			1	
RF _{average} criteria appropriate for the method.	·-·· · · · · · · · · ·	1	1	
Linear Regression criteria appropriate if required	(r > 0.995).	1/		
 Quadratic fit criteria appropriate if required (r² > 		1	<u> </u>	/
For Linear Regression and Quadratic fit – Does		rt ·		
1/2 the reporting limit as described in CA-Q-S-005			./	
 All curve points show calculated concentrations. 	 		- 	
Peaks correctly ID'd by data system.		1/		
5. Tune check frequency & criteria met and Tune check	report attached.			
B. QA/QC		on de la companya de		
Are all QC samples properly linked in TALS?	The state of the s		V.	1100 1100 00000000000000000000000000000
2. Method blank, LCS/LCSD and MS/SD frequencies me	et.		V.	
3. LCS/LCSD and MB data are within control limits. If no	ot, NCM is present.			
4. Are MS/MSD recoveries and RPD within control limits				
5. Holding Times were met for prep and analytical.				<u> </u>
6. IS/Surrogate recoveries meet criteria or properly note	d. NEW	1	V	
C. Sample Analysis				
1. Was correct analysis performed and were project inst	ructions followed?		V	
2. If required, are compounds within RT windows?				
3. If required, are positive hits confirmed and >40% RPD) flagged?			
4. Manual Integrations reviewed and appropriate.		V	V.	
All analytes correctly reported. (Primary, secondary, a				
Correct reporting limits used. (based on client reques	t, prep factors, and			
dilutions)			<i></i>	
D. Documentation	<u>3283,53282 </u>			
Are all non-conformances documented/attached? NO.	M# 53264, 632	34		
2. Do results make sense (e.g. dilutions, etc.)?	<u></u>			
3. Have all flags been reviewed for appropriateness?				
4. For level 3 and 4 reports, have forms and raw data b	een reviewed?			
5. Was QC Checker run for this job?	·····			
*Upon completion of this checklist, the reviewer must sca	n and attach the che	cklist to the TAL	S job.	
1 st Level (Analyst):	Date:	5-26-16	:	_
2 nd Level Reviewer:	Date:	5-26-16		_

Method Code: 320-3535_IVWT-320

Batch Number: 320-109334

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

only of

Batch End: 9-10-16 18:26 Batch Open: 5/9/2016 4:04:39PM

Solid-Phase Extraction (SPE)

N/A 500.00 mL 1.00 m	Input Sample Lab ID	SDG	GrossWt InitAmnt		PHs Rcvd Adj1	s 1 Adj2	Due Date	Analytical TAT	DIv Rank	Comments	Output Sample Lab ID
N/A 500.00 mL N/A 500.00 mL N/A S79.20 g 531.5 mL S710.16 11_Days 1.00 mL 1.00 m	(Analytical Meulod) MB~320-109334/1	N/A	_	#	1			A/N	A/N		M B 3 2 8 - 1 8 9 3 3 4 / 1 - A
N/A 500.00 mL N/A 500.00 mL N/A N/A S00.00 mL 1.00 mL N/A S00.00 mL N/A S00.00 mL N/A S00.00 mL 1.00 mL N/A S02.01 g 517.8 mL 5710/16 11_Days N/A S02.01 g 510.9 mL S03.01 mL	<u>-</u>			1.00 mL							
N/A 500.00 mL 1.00 m	5~320-109334/2	N/A		500.00 mL			N/A	N/A	A/N		L C S 3 2 0 - 1 6 9 3 3 4 7 2 - A
N/A 500.00 mL N/A 1.00 mL	 ∀ Z			1.00 mL							
NIA 579.20 g 531.5 mL 570.16 11_Days 4	5D~320-109334/3	N/A		500.00 mL			A/N	A/N	A/N		C S D 3 2 8 - 1 8 9 3 4 1 3 - A
N/A 579.20 g 531.5 mL	N/A			1.00 mL							
NIA 56.2.1 g 1.00 mL 1.00 mL 14.44 g 1.00 mL 14.44 g 1.00 mL 14.56 g 1.00 mL 14.56 g 1.00 mL 14.56 g 1.00 mL 14.31 g 1.00 mL 14.31 g 1.00 mL 14.21 g 1.00 mL 14.57 g	320-18704-A-1 FC IDA DOD5)	N/A (320-18704-1)	579.20 g	531.5 mL			5/10/16	11_Days	4		
NIA 562.21g 517.8 mL 1.00 mL 14.44g 1.00 mL 14.44g 1.00 mL 14.44g 1.00 mL 14.56g 1.00 mL 14.56g 1.00 mL 14.56g 1.00 mL 14.31g 1.00 mL 14.31g 1.00 mL 14.51g 1.00 mL 14.57g 1.0			47.69 g	1.00 mL							
N/A 555.49 g 1.00 mL 5/10/16 11_Days 1.00 mL 44.56 g 1.00 mL 5/10/16 11_Days 1.00 mL 44.31 g 1.00 mL 5/10/16 11_Days 1.00 mL 44.57 g 1.00 mL 5/10/16 11_Days 1.00 mL 44.68 g 1.00 mL 5/10/16 11_Days 1.00 mL 5/10/16 1.00 mL 5/10/16 1.00 mL 5/10/16 1.00 mL	320-18704-A-2 FC IDA DOD5)	N/A (320-18704-1)	562.21 g	517.8 mL			5/10/16	11_Days	4		
N/A 555.49 g 510.9 mL 1.Days 1.00 mL 14.56 g 1.00 mL 14.31 g 1.00 mL			44.44 g	1.00 mL		_					
N/A 557.56 g 513.3 mL 547.56 g 513.3 mL 547.00 mL 11_Days 1.00 mL 14.31 g 1.00 mL 14.31 g 1.00 mL 14.21 g 1.00 mL 14.21 g 1.00 mL 14.57 g 1.00 mL 14.58 g 1.00 mL 14	320-18704-A-3 FC IDA DOD5)	N/A (320-18704-1)	555.49 g	510.9 mL			5/10/16	11_Days	4		3 2 9 - 1 8 7 6 4 - A - 3 - A
N/A 557.56 g 513.3 mL 1.00 mL 14.31 g 1.00 mL 14.31 g 1.00 mL 14.21 g 1.00 mL 14.21 g 1.00 mL 14.57 g 1.00 mL 14.58 g 1.00 mL 14.08			44.56 g	1.00 mL		_					
N/A 574.38 g 530.2 mL 5/10/16 11_Days 1.00 mL 14.21 g 1.00 mL 14.21 g 1.00 mL 14.57 g 1.00 mL 14.08	320-18704-A-4 FC IDA DODS)	N/A (320-18704-1)	\$57.56 g	513.3 mL	<u>-</u> ·		5/10/16	11_Days	4		3 2 0 - 1 8 7 9 4 - A 4 4 A
N/A 574.38 g 530.2 mL 1.Days 11.Days 11.Days 120-18704-1) 14.21 g 1.00 mL 14.57 g 1.00 mL 14.57 g 1.00 mL 14.08 g 14.00 mL 14.08 g 14.00 mL 14.08 g 14.00 mL 14.00 mL			44.31 g	1.00 mL					_		
N/A (320-18704-1)	320-18704-A-5 FC IDA DOD5)	N/A (320-18704-1)	574.38 g	530.2 mL			5/10/16	11_Days	4		3 2 8 - 1 8 7 8 4 - A - 5 - A
N/A 563.11 g 518.5 mL 5/10/16 11_Days 1320-18704-1) 44.57 g 1.00 mL 5/10/16 11_Days 1320-18704-1) 14.08 g 1.00 mL 14.08 g 14.0	I		44.21 g	1.00 mL							
N/A 583.90 g 539.8 mL 5/10/16 11_Days (320-18704-1) 44.08 g 1.00 mL	320-18704-A-6	N/A (320-18704-1)	563.11 g	518.5 mL	-		5/10/16	11_Days	4		3 2 0 - 1 8 7 6 4 - A - 6 - A
N/A 583.90 g 539.8 mL 5/10/16 11_Days (320-18704-1)			44.57 g	1.00 mL					_		
44.08 g	320-18704-A-7 PFC_IDA_DOD5)	N/A (320-18704-1)	583.90 g	539.8 mL			5/10/16	11_Days	4		
			44.08 g	1.00 mL					_		

Printed: 5/9/2016

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TestAmerica Sacramento

TestAmerica Sacramento

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Number: 320-109334

Batch End:

Batch Open: 5/9/2016 4:04:39PM

																			3 2 8 7 1 9 1 A 1 B 1 B	
	4		4		4		4		4		4	_	4	1	4	_	4		4	_
	11_Days		11_Days		11_Days		11_Days		11_Days		11_Days		11_Days		11_Days		11_Days		11_Days	
- 	5/10/16		5/10/16		5/10/16		5/10/16		5/13/16		5/13/16		5/13/16		5/13/16		5/13/16		5/13/16	
	209 mL	1.00 mL	540.6 mL	1.00 mL	535.1 mL	1.00 mL	458.9 mL	1.00 mL	487.5 mL	1.00 mL	535 mL	1.00 mL	513 mL	1.00 mL	510.9 mL	1.00 mL	535 mL	1.00 mL	524 mL	1.00 mL
	53.10 g	44.11 g	585.34 g	14.77 g	579.81 g	44.76 g	503.22 g	44.32 g	532,20 g	44.67 g	579.19 g	14.16 g	557.67 g	14.67 g	555.73 g	44.81 g	582.07 g	47.05 g	568.43 g	44.42 g
5_IVWT-320	N/A (320-18704-1)		N/A (320-18704-1)		N/A (320-18704-1)		N/A (320-18704-1)		N/A (320-18719-1)		N/A (320-18719-1)		N/A (320-18719-1)		N/A (320-18719-1)	,	N/A (320-18719-1)		N/A (320-18719-1)	
Method Code: 320-3535_IVWT-320	320-18704-A-8 (PEC IDA DOD5)	``	320-18704-A-9 (PFC IDA DOD5)		320-18704-A-10 (PFC IDA DOD5)		320-18704-A-11 (PFC IDA DOD5)	 I	320-18719-A-1 (PFC IDA DOD5)		320-18719-A-2 (PFC IDA DOD5)		320-18719-A-3 (PFC_IDA_DOD5)		320-18719-A-4 (PFC IDA DOD5)		320-18719-A-5 (PFC IDA DOD5)		320-18719-A-6 (PEC, IDA, DOD5)	
Ž	Ε		5		5.	_	4	_	₹ <u></u>	Pag	je <u>76</u> ε	8 0	1 776 12		<u>\$</u>		- 6		20	

Page 2 of 6

TestAmerica Sacramento

Aqueous Extraction Analysis Sheet

month for the contract of the

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Method Code: 320-3535_IVWT-320

Batch Number: 320-109334

Batch Open: 5/9/2016 4:04:39PM

Batch End:

Batch Notes	time NA	time NA	Balance ID, OA-070	Time WAX 500mg	1) pp. 20.203.9			Pipette ID EC 122 13	Solvent Name 0.3% NH4OH/MeOH	Solvent Lot # 626675	Dron IEB		Drop JER	Drop SNE	Witness ———————————————————————————————————	Acid ID NA	NA CITATION OF THE PROPERTY OF	imber NA	NaCIID NA	SOP Number WS-LC-0025	Batch Comment 0.1N NaOH/H2O: 624176, HEXANE: 0000125986, MeOH: 620224, mANIFOLDS: 5, 6	
	First Start time NA	First End time NA	A against A	MAX 500mg	SPE Callings Type 1900 Section 300736075A	Solid Fridse Extraction Disk is	יי ביי ביי ביי ביי ביי ביי ביי ביי ביי	Pipette II.	Solvent Nami	Solvent Lot		Analyst ID - Reagelit Diop 3EN	Analyst ID - SU Reagent Drop JER	Analyst ID - SU Reagent Drop	Witnes Acid Nam	Acid II	l taepced	Reagent Lot Number NA	NaCII	san Numb	Batch Comme	במים כייייי

Page 3 of 6

Page 4 of 6

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Method Code: 320-3535_IVWT-320

Batch Number: 320-109334

Batch Open: 5/9/2016 4:04:39PM

Batch End:

Comments

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Printed: 5/9/2016

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Method Code: 320-3535_IVWT-320

Batch Number: 320-109334

Batch Open: 5/9/2016 4:04:39PM

Batch End:

Reagent Additions Worksheet

SNE 5/9/16																	>
Jahn) Stooles																	
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	1.00 mL	1.00 mL	1.00 mL
50 uL	20 nF	20 nL	20 nF	20 uL	50 uL	50 nL	50 uL	20 nF	20 nF	50 uL	20 nF	50 uL	50 uL	50 uL	20 nF	20 nF	20 nF
LCMPFCSU_00039	LCMPFCSU_00039	LCPFCSP_00046	LCMPFCSU_00039	LCPFCSP_00046	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039	LCMPFCSU_00039
MB 320-109334/1	LCS 320-109334/2	LCS 320-109334/2	LCSD 320-109334/3	LCSD 320-109334/3	320-18704-A-1	320-18704-A-2	320-18704-A-3	320-18704-A-4	320-18704-A-5	320-18704-A-6	320-18704-A-7	320-18704-A-8	320-18704-A-9	320-18704-A-10	320-18704-A-11	320-18719-A-1	320-18719-A-2
	LCMPFCSU_00039 50 uL 1.00 mL /// S/be//C	LCMPFCSU_00039 50 uL 1.00 mL /// 5/eg/rC LCMPFCSU_00039 50 uL 1.00 mL	LCMPFCSU_00039 50 uL 1.00 mL 7/6e/rc LCMPFCSU_00039 50 uL 1.00 mL LCPFCSP_00046 20 uL 1.00 mL	LCMPFCSU_00039 50 uL 1.00 mL MAX S/es/rc LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	LCMPFCSU_00039 50 uL 1.00 mL MAX Sfes/f.c LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCMPFCSU_00046 20 uL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MA. Sfor/CE LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 1.00 mL LCS 320-109334/2 LCMPFCSP_00046 20 uL 1.00 mL 1.00 mL 1.00 mL LCSD 320-109334/3 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MAX Sfor/fC LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 60 uL 1.00 mL LCS 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 1.00 mL LCSD 320-109334/3 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL 1.00 mL J20-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MAJ SYeg/CG LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	LCMPFCSU_00039 50 uL 1.00 mL MAX) S/Ge/IC LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCPFCSP_00046 20 uL 1.00 mL 1.00 mL LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MAL 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL And 320-109334/2 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-4 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MA. J S/oe//C LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MA. Sfeq/f.C LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MACA 5764/LC LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/2 LCMPFCSP_00046 20 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL A.A. Sfep/rg LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/2 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCPFCSP_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 320-18704-A-9 LCMPFCSU_00039 50 uL 1.00 mL <th>MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL ACAPTION LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 1320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 1320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL</th> <th>MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MA. 3764/LE LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-4 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-9 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-9 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL</th>	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL ACAPTION LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCPFCSP_00046 20 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 1320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 1320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL	MB 320-109334/1 LCMPFCSU_00039 50 uL 1.00 mL MA. 3764/LE LCS 320-109334/2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCS 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL LCSD 320-109334/3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-2 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-3 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-4 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-5 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-9 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-6 LCMPFCSU_00039 50 uL 1.00 mL 1.00 mL 320-18704-A-9 LCMPFCSU_00039 50 uL 1.00 mL 320-18704-A-1 LCMPFCSU_00039 50 uL 1.00 mL

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TestAmerica Sacramento

TestAmerica Sacramento

Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Reed, Jonathan E

Batch Number: 320-109334

Batch Open: 5/9/2016 4:04:39PM

Batch End:

222 42740 A CMPECSU 00039 50 ut 1.00 mL //

	Lot#:			
Other Reagents:	Amount/Units			
	Readent			

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Sacramento Preparation Data Review Checklist

Preparation Batch Number(s): 109334 Test: PFC_1DA.	_0005	
Earliest Holding Time: 5/11/16		
Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method		
All necessary NCMs filed (including holding time)		/.
Method/sample/login/QAS checked and correct		
Worksheet Tab	1 st Level Reviewer	2 nd Level Revjewer
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	NK	NA
All additional information transcribed into TALS is correct and raw data is attached	V	
Comments are transcribed correctly in TALS	V	
Reagents Tab	1 st Levei Reviewer	2 nd Level Reviewer
All necessary reagents not expired and entered into TALS		
All spike amounts correct and added to necessary samples and QC	✓ ✓	
Batch Information	1 st Leve! Reviewer	2 nd Level Reviewer
Date and time accurate and entered into TALS correctly	V	
All necessary 'batch information' complete and entered into TALS correctly		
1st Level Reviewer. Date: 5/	1./16	

Shipping and Receiving Documents

Temperature on Receipt Of Color Temperature on Receipt Of Color

SAB-

Drinking Water? Yest № No

Custody Record

Chain of

THE LEADER IN ENVIRONMENTAL TESTING

Special Instructions/ Conditions of Receipt 0950 (A fee may be assessed if samples are retained Months fonger than 1 month) Time 28361 320-18704 Chain of Custody Page Date 05/05/10 Lab Number Analysis (Attach list if more space is needed) Archive For _ \overline{c} OC Requirements (Specify) \oAnS HO§N Disposal By Lab Containers & Preservatives HOEN 1. Received By 3. Received By ЮH Telephone Number (Area Code)Fax Number 子ろ子- (G 子(- (G と ころ Sile Contact EONH Project Manager Bill Friedmann DOSZH X saudun 7 X ☐ Unknown ☐ Return To Client Sample Disposa 1105 Time Carner/Waybill Number Matrix pes メ 又 メ ァ R メ ァ 105/05/14 □ Other_ 40 1923 0210 P010 1905 1007 0955 M35 1004 15/04/16 69:12 03/50 05/05/16 09 4H Date Тіте 🗌 21 Days ☐ Poison B Date ☐ 14 Days BF-RW482-RW4282-05(6) BF-F64282-0516 (Containers for each sample may be combined on one line) Skin Imitani 5701 Clargary St SWR 200 OF-RW-19-FB 42C-05110 Sample I D. No. and Description Contract/Purchase Order/Quote No. Zyea Z TBD -CHZM WED OF-RW42CD-BSILE OF-RW42C-05516 | Flammable 05-58428-6516 OF-RW42B-0516 DE-RW42A-0516 OF-F842A-0516 Virania Beach 01-PM-4-05/6 ☐ 48 Hours 0F-F844- 65[b Possible Hazard Identification CH2M Hill Tum Around Time Required Comments 202/5/2020 12 Non-Hazard 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: CH2M Hill Constructors, Inc.

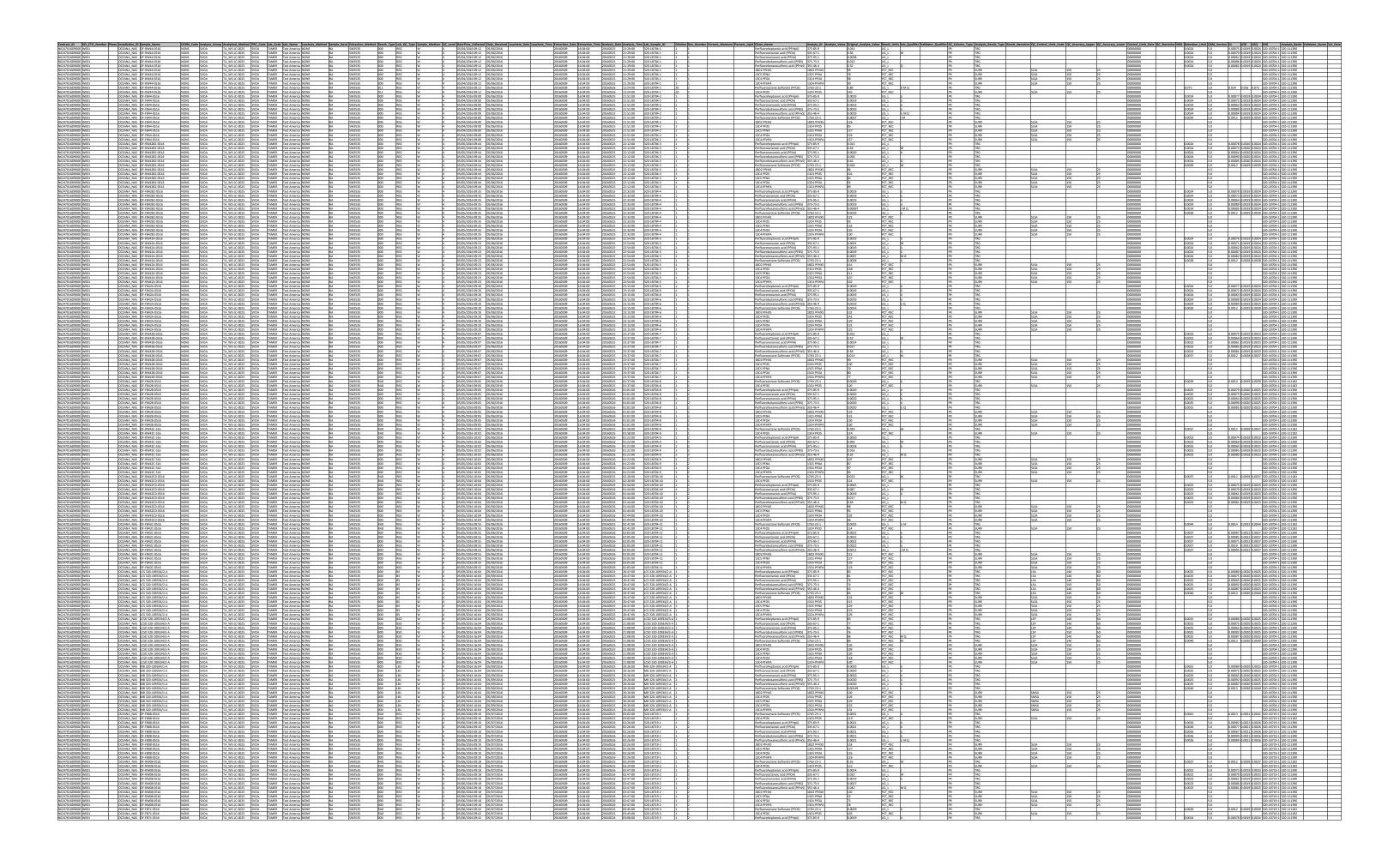
Job Number: 320-18704-1

Login Number: 18704 List Source: TestAmerica Sacramento

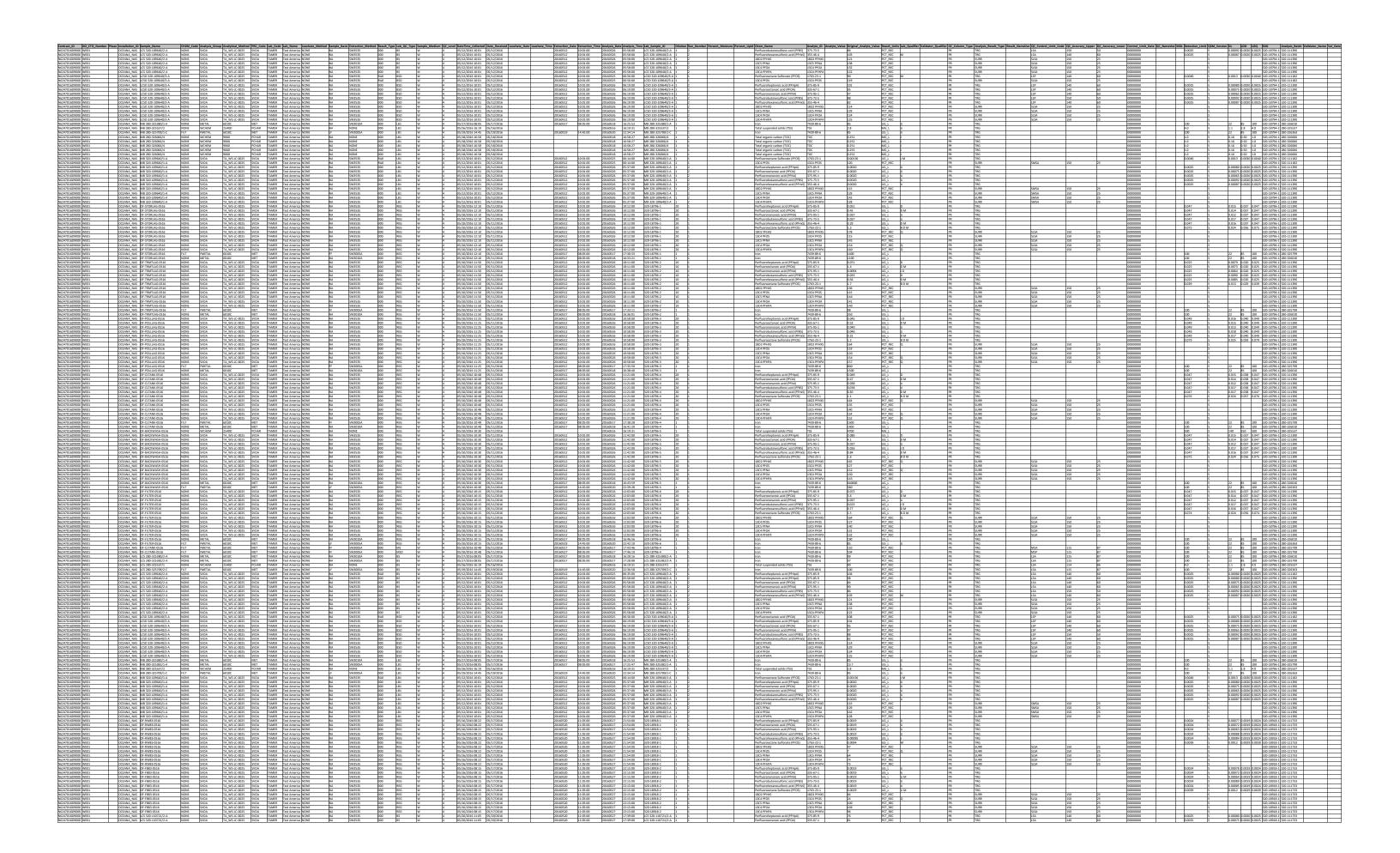
List Number: 1

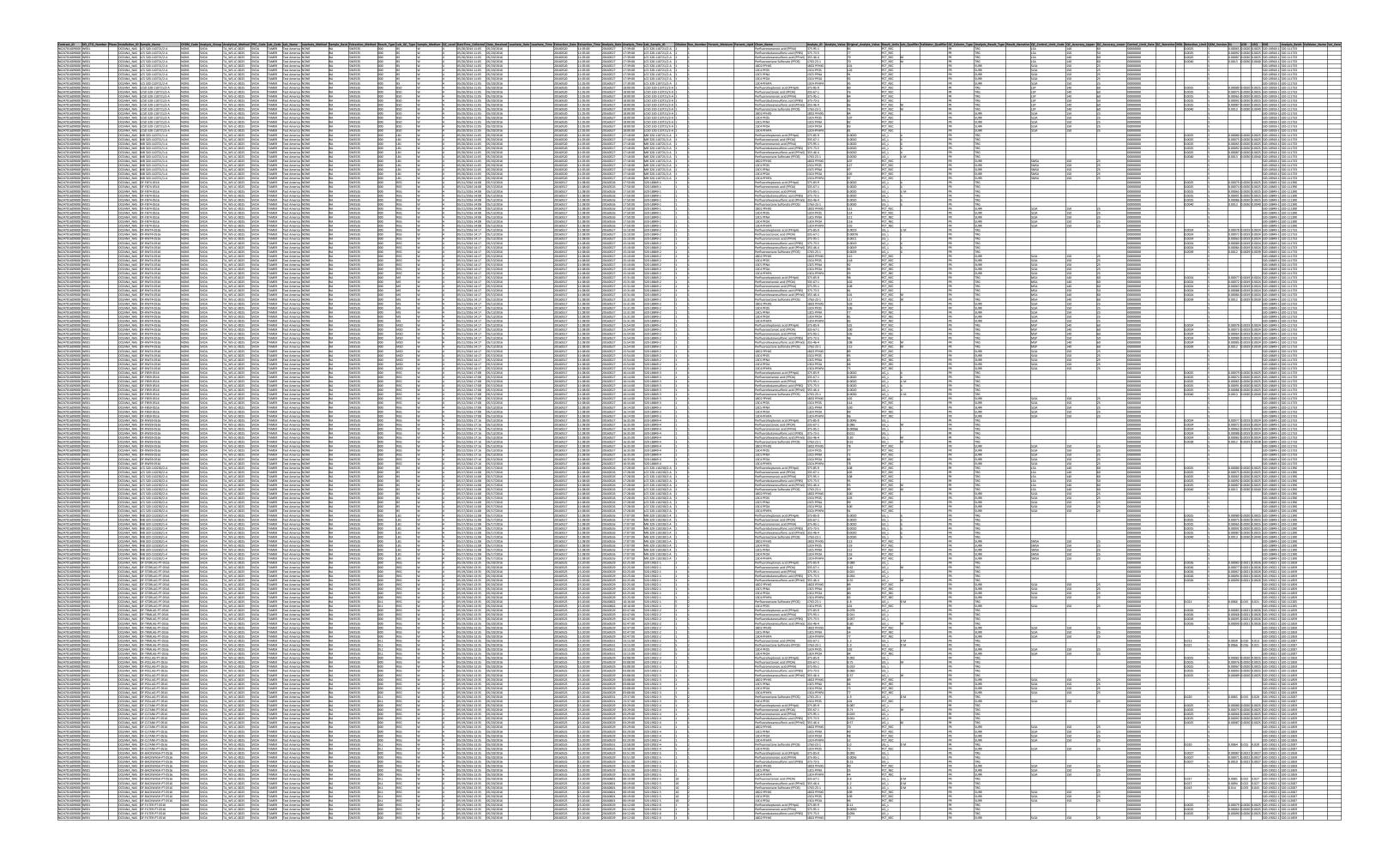
Creator: Nelson, Kym D

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



Contract_ID DO_CTO_Number Phase Institution_ID Sample_Name Contract_ID C	The Result_Type Lab_QC_Type Sample_Medium QC_Level DaleTime_Collected Date_Received Leachate_Date Leachate Date Leachate_Date Leachate	ate_Time Estraction_Date Catraction_Time Inadysks_Date Mosayks_Time Lab_Sample_0 Dilution Row-Number Percent_N 2016/599 160-000 2016/6736 010-000 230-1879-3 1 2 2016/599 160-000 2016/6736 010-000 230-1879-3 1 2 2016/599 201		te Value Result, Units Lab, Qualifier Validator, Qualifier OC, Column, Type Analysis, Result, Type Result, Narrative US_1. U FR TRG US_1. U FR TRG US_1. U FR TRG TRG US_1. U FR TRG US_2. U FR TRG US_3. U TRG US_4. U TRG US_5. U TRG US_5. U TRG US_5. U US_6. US_5. US_5	QC_Control_Limit_Code QC_Accuracy_Upper QC_Accuracy_Lower Control_Limit_Date QC_Narrath	ve MOL Detection_Unit QSM_Version DL
MACHINERODO MICES SCARA, NAS \$P + PRI-SES MORE NORE NORE NORE TANKE TO SEE TO SE	000 REG W 4 95,042745 6942 56707,0266 000 REG W 4 95,042745 6940 69407,0266 000 REG W 4 95,042745 6940 6940 69407,0266 000 REG W 4 95,042745 6940 6940 69407,0266 000 REG W 4 95,042745 6940 6940 6940 6940 6940 6940 6940 6940	2016/2009 16-04-00 2016/05/36 2016/200 2016/15/36 2 120-1279-3 1 2	Perfusion/benarises/India and (PFH) 855-07-04 0.0019 1802 PFHS 1802 PFHS 1802 PFHS 112 1802 PFHS 1802 PFHS 1802 PFHS 112 1804 PFHS 1802	UG L UG PR TMG	\$15A 150 25 00000000 \$15A 150 25 000000000 \$15A 150 25 00000000 \$15A 150 25 00000000 \$15A 150 25 000000000 \$15A 150 25 00000000 \$15A 150 25 00000000 \$15A 150 25 000000000 \$15A 150 25 0000000000 \$15A 150 25 0000000000 \$15A 150 25 0000000000000 \$15A 150 25 00000000000000000000000000000000	0.0004 5.0 0.00085 0.0019 0.001175 1.0011190
Re-2012160000 REGI	MAD	2016/2009 16:04:00 2016/2009 16:04:00 16:04:04:00 16:04:0	13.4 PH.D. 13.6 PH.D.	MT MAC MT DUMM MT MT DUMM MT MT MT MT MT MT MT	1534 150 25 0000000 1 1 1 1 1 1 1	0.0004 0.0000 0
REAT/RESPOON REST CLASHA AND S F-88/F1/5/5/5 NOTE STOCK FLAVS.CO.25 SVOK LAWRES REAT/RESPOON REST REAT/RESPOON REST REAT/RESPOON REST	000 885 W 4 95,642745 695 95 65,07206 6 000 885 W 4 90,642745 695 95 65,07206 6 000 885 W 4 90,642745 695 95 65,07206 6 000 885 W 4 95,642745 695 95 65,07206 6 000 885 W 4 95,642745 695 95 65,07206 6 000 885 W 4 95,642745 695 95 65,07206 6 000 885 W 4 95,642745 695 95 65,07206 6 000 885 W 4 95,642745 95 95 65,07206 6	2010/5099 16:00-00 2010/5736 329:00 120-1279-4 1 2 2010/5099 16:00-00 2010/5736 329:00 120-1279-5 1 2 2010/5099 16:00-00 2010/5736 329:00 120-1279-5 1 1 2010/5099 16:00-00 2010/5736 329:00 120-1279-5 1 1	1802 FPHOS 1802 FPHOS 121 1802 FPHOS 121 1802 FPHOS 121 1802 FPHOA 1802 FPHOA 60 1804 FPHOA 1304 FPHOA 77 1804 FPHOA 76 77 1804 FPHOA 76 77 78 78 78 78 78 78	PCT REC PR SUMBR	\$15A 150 25 00000000 150A 150 25 000000000 150A 150 25 000000000 150A 150 25 000000000 150A 150 25 000000000 150A 1	5.0 230-1475-5 [200-11390] 5.0 230-1475-5 [200-11390] 5.0 230-1475-5 [200-11390] 5.0 230-1475-5 [200-11390] 5.0 5.0 230-1475-5 [200-11390] 5.0 5
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		CH2M_Code Analysis_Group Analytical_Method PRC_Code La	ab_Code Lab_Name Leachate_Method	Sample_Basis Extraction_Method Result_Type Lab_QC_Type Sample_Medium 0	QC_Level DateTime_Collected Date_Received Leachate_Date Leachate_Tim		Analysis_Date Analysis_Time Lab_Sample_ID	Dilution Run_Number	Percent_Moisture Percent_Lipid Chem_Name	Analyte_ID Analyte_Value	e Original_Analyte_Value Result_Units Lab_Qualifier	Validator_Qualifier GC_C	_Column_Type Analysis_Result_Type P	tesult_Narrative QC_Control_Limit_Code	QC_Accuracy_Upper	QC_Accuracy_Lower Control_Limit_Date QC_Narrative	MDL Detection_Limit QSM_Ver	arsion DL LOD	LOQ SDG	Analysis_Batch Validator_Name Val_Date
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N6247016D9000 WE01	OCEANA NAS OF-FILTER-PT-0516	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 00:41:00 320-19022-6 20160601 00:41:00 320-19022-6	10 2	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	1.1 UG L D M	PR	TRG			00000000	0.025 5	0.0085 0.020		
N6247016D9000 WE01	OCEANA NAS OF-FILTER-PT-0516	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 00:41:00 320-19022-6	10 2	Perfluorooctane Sulfonate (PFOS)	1763-23-1	1.5 UG L D M	PR	TRG			00000000	0.039 5	0.013 0.029	0.039 320-19022-1	1 320-112007
N6247016D9000 WE01 N6247016D9000 WE01 N6247016D9000 WE01	OCEANA NAS OF-FILTER-PT-0516	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 00:41:00 320-19022-6	10 2	1902 BEHVS	19/13 DEUVE	107 PCT REC	PR PR	SURR	SLSA	150	25 00000000	5	\neg	320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA NAS OF FILTER PT 0516	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 00:41:00 320:19022-6	10 2	13C4 PFOS	13C4 PFOS	117 PCT_REC	PR	SURR	SLSA	150	25 00000000	5		320-19022-1 320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA NAS OF FILTER PT-0516	NONS SVOA TA WS-IC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 DI1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 00:41:00 320:19022:6	10 2	13C4 PEOA	13C4 PEOA		PR	SURR	KI SA	150	25 00000000			320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	MA EMIZEZE DOD BEG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 04:33:00 320:19022:7	1 1	Perfluoroheptanoic acid (PFHpA)	375,85,9	0.12	00	TRG			00000000	0.0036	0.00092 0.0021	0.0026 320-19022-1 0.0026 320-19022-1 0.0026 320-19022-1 0.0026 320-19022-1 320-19022-1	1 230 111859
N6247016D9000 WED1	OCEANA NAS OF INFO1 PT 0615	NONS SVOA TA WS-LC-0025 SVOA TO	AMER Test America NONE	NA EWISSE DOD BEG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160639 04:22:00 220:19022-7		Perfluorononanoic acid (PFNA)		0.0064 U.G.1	99	TRG			00000000	0.0026 5	0.00069 0.0021	0.0036 230.19033-1	1 220 111959
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615	NONS SVOA TA WS-LC-0025 SVOA TI	AMER Test America NONE	NA 593333 000 NCC W	4 05/19/2016 13:35 05/20/2016	20100323 15:20:00	20160529 04:33:00 320-19022-7 20160529 04:33:00 320-19022-7	: :	Perfluorobutanesulfonic acid (PFBS)	375-33-1	0.0064 UG_L	200	TRE			00000000	0.0026 5	0.00000 0.0024	0.0020 320-19022-1	1 220 111059
N6247016D9000 WE01	OCEANA NAS OF-INFO1-PT-0615	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	MM 2M3232 000 BEG W	4 05/19/2016 13:35 05/20/2016 4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 04:33:00 320:19022:7			1802 PFHXS	0.15 UG_L 27 PCT REC	PR.	FLIDD	5154	450	25 00000000	0.0026 5	0.00095 0.0021	330 40033 4	320-111839
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615		AMER Test America NONE	NA 5W3333 000 REG W			20160529 04:33:00 320:19022-7		1302 PFNA 13C5 PFNA	13CS PFNA	27 PCI_NEC	PA	SURR	SLSA	150	25 0000000		-+-	520-19022-1	. 320-111839
	UCEANA_NAS UF-INFU1-PT-0615			NA 5W3535 000 NEG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00		1 1	13C4-PFHPA	13CS PFNA	23 PCT_REC Q	PK	SURR	SLSA	150					
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 04:33:00 320-19022-7	1 1	15C4-PFHPA	13C4-PFHPA	29 PCT_REC	PK	SUKK	SLSA	150	25 00000000	-		320-19022-1	. 320-111859
N6247016D9000 WE01	OCEANA_NAS OF INFO1-PT-0615	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 01:02:00 320-19022-7	10 2			5.9 UG_L D.M	PR PR	TRG			00000000	0.026 5	0.0077 0.021	0.026 320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA_NAS OF INFO1-PT-0615	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 01:02:00 320:19022-7 20160601 01:02:00 320:19022-7	10 2	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	1.3 UG_L D.M	PR PR	TRG			00000000	0.026 5	0.0090 0.021	0.026 320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 01:02:00 320-19022-7	10 2	Perfluorooctane Sulfonate (PFOS)	1763-23-1	2.3 UG_L D.M	PR	TRG			00000000	0.041 5	0.013 0.031	0.041 320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 01:02:00 320:19022:7 20160601 01:02:00 320:19022:7	10 2	1802 PFHXS	1802 PFHXS	105 PCT_REC 89 PCT_REC	PR	SURR	SLSA	150	25 00000000	5		320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 01:02:00 320-19022-7	10 2	13C4 PFOS	13C4 PFOS	89 PCT_REC	PR	SURR	SLSA	150	25 00000000	5		320-19022-1	ı 320-112007
N6247016D9000 WE01	OCEANA_NAS OF-INF01-PT-0615		AMER Test America NONE	NA SW3535 DL1 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160601 01:02:00 320:19022-7	10 2	13C4 PFOA	13C4 PFOA	75 PCT_REC	PR	SURR	SLSA	150	25 00000000	5	()	320-19022-1	a 320-112007
N6247016D9000 WE01	OCEANA_NAS OF-PROCESS BLANK-PT-05	16 NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320-19022-8	1 1	Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0019 UG_L U	PR	TRG			00000000	0.0024 5	0.00076 0.0019	0.0024 320-19022-1	1 320-111859
N6247016D9000 WE01	OCEANA NAS OF-PROCESS BLANK-PT-05	16 NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320-19022-8	1 1	Perfluorooctanoic acid (PFOA)	335-67-1	0.0019 UG_L U	PR	TRG			00000000	0.0024 5	0.00071 0.0019	0.0024 320-19022-1	
N6247016D9000 WE01	OCEANA NAS OF-PROCESS BLANK-PT-05	16 NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320-19022-8	1 1	Perfluorononanoic acid (PFNA)	375-95-1	0.0019 UG_L U M	PR	TRG			00000000	0.0024 5	0.00062 0.0019		
N6247016D9000 WE01	OCEANA NAS OF-PROCESS BLANK-PT-05	16 NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320:19022:8 20160529 05:58:00 320:19022:8	1 1	Perfluorobutanesulfonic acid (PFBS)	375-73-5		PR.	TRG			00000000	0.0024 5	0.00087 0.0019	0.0024 320-19022-1	
N6247016D9000 WE01	OCEANA_NAS OF-PROCESS BLANK-PT-05 OCEANA_NAS OF-PROCESS BLANK-PT-05 OCEANA_NAS OF-PROCESS BLANK-PT-05	16 NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320-19022-8	1 1	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	0.0019 UG L U	PR	TRG			00000000	0.0024 5	0.00083 0.0019	0.0024 320-19022-1	1 320-111859
N6247016D9000 WE01	OCEANA NAS OF PROCESS RI ANK PT.OS	16 NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320:19022:8	1 1	Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.0019 UG L U M	PR	TRG			00000000	0.0038 5	0.0012 0.0029	0.0024 320-19022-1 0.0038 320-19022-1	1 320-111859
N624701609000 WE01 N624701609000 WE01	OCEANA NAS OF PROCESS BLANK-PT-05	16 NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00		1 1	1802 PEHXS	18O2 PEHXS	129 PCT REC	PR	SLIRR	KISA	150	25 00000000	5		320,19022-1	1 320.111859
NE247016D9000 WED1	OCEANA NAS OF PROCESS BLANK PT OS		AMER Text America NONE	NA EWISSE DOD REG W	4 05/19/2016 13:35 05/20/2016		20160529 05:58:00 320:19022-8		12010000	13C4 PEOC	129 PCT_REC 127 PCT_REC 105 PCT_REC	99	SURR	SISA	150	25 00000000		+	320-19022-1 320-19022-1 320-19022-1	1 220 111959
N6247016D9000 WE01	OCEANA NAS OF PROCESS BLANK-PT-05		AMER Test America NONE	NA EWISSE DOD REG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320:19022-8		13CS PFNA	13C5 PFNA 13C4 PFOA	105 PCT REC	99	SURR	SISA	150	25 00000000		+	220-19022-1	1 220 111959
N624701609000 WE01	OCEANA_NAS OF-PROCESS BLANK-PT-05		AMER Test America NONE	NA 593333 000 NEG W	4 05/19/2016 13:35 05/20/2016	20160525 15:20:00		: :	13C4 PFOA	13C4 Pros	133 PCT REC	20	SURR	CLEA	150	25 00000000		-+-	220-12022-1	1 220 111059
	OCEANA NAS OF-PROCESS BLANK-PT-05	16 NONS SVOA TA WS-LC-0025 SVOA TA		NA 3M3333 000 REG W	4 05/19/2016 13:35 05/20/2016 4 05/19/2016 13:35 05/20/2016	20160525 15:20:00	20160529 05:58:00 320:19022-8 20160529 05:58:00 320:19022-8		13C4 PFUA 13C4-PFHPA	13C4 PPOA	123 PCT_REC	70	SURR	SLSA.	150	25 00000000		-	320-19022-1	320-111839
N6247016D9000 WE01 N6247016D9000 WE01	OCEANA NAS LCS 320-111374/2-A		AMER Test America NONE AMER Test America NONE	NA 5W3333 000 REG W	4 05/25/2016 15:33 05/20/2016 4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160529 05:58:00 520-19022-6 20160531 18:18:00 LCS 320-111374/2-A		13C4-PFHPA Perfluoroheptanoic acid (PFHpA)	I3C4-PPHPA	121 PCT_REC 90 PCT_REC	PA	SURK	SLSA .	150	60 0000000	0.0025 5	 '	320-19022-1 0.0025 320-19022-1	. 320-111839
N6247016D9000 WE01	OCEANA NAS LCS 320-111374/2-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 UUU B5 W	4 05/25/2016 15:20 05/25/2016 4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A 20160531 18:18:00 LCS 320-111374/2-A	1 1	Perfluoroneptanoic acid (PFDA) Perfluoronetanoic acid (PFDA)	3/5-85-9	85 PCT REC	PK	ING	LSA	140	50 00000000	0.0025 5	0.00080 0.0020	0.0025 320-19022-1	. 320-112007
N624701609000 WE01				NA 5W3535 000 B5 W		20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A					PK	ING	LSA	140			0.00075 0.0020	3.0025 320-19022-1	. 320-112007
	OCEANA_NAS LCS 320-111374/2-A		AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00				375-95-1	87 PCT_REC	PR	TRG	LSA	140	60 00000000	0.0025 5	0.00065 0.0020	0.0025 320-19022-1 0.0025 320-19022-1 0.0025 320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS LCS 320-111374/2-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	Perfluorobutanesulfonic acid (PFBS)	375-73-5	87 PCT_REC	PR	TRG	LSA	150	50 00000000	0.0025 5	0.00092 0.0020	0.0025 320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS LCS 320-111374/2-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	Perfluorohexanesulfonic acid (PFHxS)	355-46-4	87 PCT_REC 85 PCT_REC M 104 PCT_REC M	PR	TRG	LSA	140	60 00000000	0.0025 5	0.00087 0.0020	0.0025 320-19022-1	A 320-112007
N6247016D9000 WE01	OCEANA_NAS LCS 320-111374/2-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	Perfluorooctane Sulfonate (PFOS)	1763-23-1	104 PCT_REC M	PR	TRG	LSA	140	60 00000000	0.0040 5	0.0013 0.0030	0.0040 320-19022-1	ı 320-112007
N6247016D9000 WE01	OCEANA_NAS LCS 320-111374/2-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	1802 PFHXS	18O2 PFHXS		PR	SURR	SLSA	150	25 00000000	5			
N6247016D9000 WE01	OCEANA_NAS LCS 320-111374/2-A	NONS SVOA TA_WS-LC-0025 SVOA T/ NONS SVOA TA_WS-LC-0025 SVOA T/	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	13C4 PFOS	13C4 PFOS	111 PCT REC	PR	SURR	SLSA	150	25 00000000				
N6247016D9000 WE01	OCEANA NAS ILCS 320-111374/2-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	13CS PFNA	13CS PFNA	110 PCT_REC	PR	SURR	SLSA	150	25 00000000	5			
N6247016D9000 WE01	OCEANA_NAS LCS 320-111374/2-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1	13C4 PFOA	13C4 PFOA	113 PCT REC	PR	SURR	SLSA	150	25 00000000	5		320-19022-1 320-19022-1 320-19022-1	1 320-112007
N6247016D9000 WE01 N6247016D9000 WE01	OCEANA NAS LCS 320-111374/2-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 BS W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:18:00 LCS 320-111374/2-A	1 1		13C4-PFHPA	110 PCT_REC 113 PCT_REC 111 PCT_REC 111 PCT_REC	PR	SURR	SLSA	150	25 00000000	5			
N6247016D9000 WE01	OCEANA NAS LCSD 320-111374/3-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BSD W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A	1 1	Perfluoroheptanoic acid (PFHpA)	375-85-9	86 PCT REC	PR	TRG	LSP	140	60 00000000	0.0025 5	0.00080 0.0020	0.0025 320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA NAS LCSD 320-111374/3-A	NONS SVOA TA WS.IC.0025 SVOA TA	AMER Test America NONE	NA SW3535 000 BSD W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A		Perfluorooctanoic acid (PFOA)	335-67-1		PR PR	TRG	LSP	140	60 00000000	0.0025 5	0.00075 0.0020	0.0025 320-19022-1	1 320-112007
N624701609000 WE01	OCEANA NAS LOSO 320-111374/3-A	NONS SVOA TA WS-IC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 RSD W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 ICSD 320:111374/3:4		Perfluorononanoic acid (PENA)	375.95.1	85 PCT_REC 84 PCT_REC	PR	TRG	- QP	140	60 00000000	0.0025	0.00065 0.0020	0.0025 320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA NAS LCSD 320-111374/3-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 850 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320:111374/3-A	1 1	Perfluorobutanesulfonic acid (PFBS)	375,73.5	86 PCT_REC 85 PCT_REC M	100	TRG	i o	150	50 0000000	0.0025	0.00092 0.0020	0.0025 320.19022-1	1 320.412007
NC34701CD0000 WC01	OCEANA NAS LCSD 320-111374/3-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Tort America NONE	MA CM2C2C 000 BCD W	4 05/25/2016 15:20 05/25/2016 4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A	1 1	Perfluorobexanesulfonic acid (PFHxS)		DE DET DEC MA	PR 00	Tec	100	140	60 00000000	0.0025 5	0.00097 0.0020	0.0035 230.19022-1	1 220 41 2007
N624701609000 WE01 N624701609000 WE01	OCEANA NAS LCSD 320-111374/3-A		AMER Test America NONE	MA CM2C2C 000 BCD W	4 05/25/2016 15:20 05/25/2016 4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A	1 1	Perfluoroctane Sulfonate (PFOS)		112 DCT DCC MA	PR 00	Tec	100	140	60 00000000	0.0040 5	0.0000, 0.0020	0.0025 320-19022-1 0.0025 320-19022-1 0.0040 320-19022-1	1 220-112007
NEXATOLEOPORO WEDI	OCEANA NAS LCSD 320-111374/3-A		AMER Test America NONE	MV CM3C3C 000 BCD M	4 05/25/2016 15:20 05/25/2016 4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A		1902 95005	1902 DEUVE	113 PCT_REC M 118 PCT_REC 114 PCT_REC	PR 00	SURR	SI SA	150	25 0000000	5	0.0030	320-19022-1	1 220 112007
N6247016D9000 WE01	OCEANA_NAS_LCSD 320-111374/3-A OCEANA_NAS_LCSD 320-111374/3-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	FIG. 1747-232 1000 1000 W	4 05/25/2016 15:20 05/25/2016 4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A 20160531 18:39:00 LCSD 320-111374/3-A		1802 PFHIS 13C4 PFOS	13C4 PFOS	AND PLINE	PK	SURR	DESM.	450	25 00000000 25 00000000		-+-	320-19022-1	1 320-112007
N624701609000 WE01	OCCANA NAS ECSD 320-1113/4/3-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	MW DAMAGAS DOO BED MY	4 05/25/2016 15:20 05/25/2016 4 05/25/2016 15:20 05/25/2016				13C4 PFUS 13C5 PFNA	13C4 PPU3	114 PC REC	PR	SURK	DL3M	100	25 00000000		++-	320-19022-1	520-112007
	OCEANA_NAS LCSD 320-111374/3-A			MM DAMOSOS DOO BED W		20160525 15:20:00			13C4 PFOA	13CS PFNA	112 PCT_REC	PK	SURK	363M	130	25 00000000				520-112007
	OCEANA_NAS LCSD 320-111374/3-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	We pwards onn RPD M	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A	1 1	15t4 PFUA	13C4 PFOA	115 PCT_REC 114 PCT_REC	PR	SURK	DLSA	130	25 0000000			520-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA_NAS LCSD 320-111374/3-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA DW3535 UUU BSD W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 18:39:00 LCSD 320-111374/3-A	1 1	1sC4-PFHPA	13C4-PFHPA	114 PCT_REC	PR	SURK	NZA	150	25 00000000	5		szu-19022-1	320-112007
N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Fest America NONE	NA DW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160551 17:56:00 MB 320-111374/1-A	1 1	Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0020 UG_L U	PR	TRG			00000000	U.U025 5	0.00080 0.0020	0.0025 320-19022-1	. 320-112007
N624/01609000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00		1 1	Perfluorooctanoic acid (PFOA)	335-67-1	0.0020 UG_L U	PR	TRG			00000000	0.0025 5	0.00075 0.0020	0.0025 320-19022-1	
N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320-111374/1-A	1 1	Perfluorononanoic acid (PFNA)	375-95-1	0.0020 UG_L U	PR	TRG			00000000	0.0025 5	0.00065 0.0020	0.0025 320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320:111374/1:A	1 1	Perfluorobutanesulfonic acid (PFBS)	375-73-5	0.0020 UG_L U	PR	TRG	1		00000000	0.0025 5	0.00092 0.0020	0.0025 320-19022-1	. 320-112007
N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320-111374/1-A	1 1	Perfluorohexanesulfonic acid (PFHxS)		0.0020 UG_L U	PR	TRG			00000000	0.0025	0.00087 0.0020	0.0025 320-19022-1	320-112007
N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320:111374/1-A	1 1	Perfluorooctane Sulfonate (PFOS)	1763-23-1	0.0030 UG_L U	PR	TRG	1		00000000	0.0040 5	0.0013 0.0030	0.0040 320-19022-1	ı 320-112007
N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A	NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA SW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320:111374/1-A	1 1	1802 PFHXS	18O2 PFHXS	127 PCT_REC	PR	SURR	SMSA	150	25 00000000	5		320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA NAS MB 320-111374/1-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320:111374/1-A	1 1	13C4 PFOS	13C4 PFOS	125 PCT REC	PR	SURR	SMSA	150	25 00000000	5			1 320-112007
N6247016D9000 WE01	OCEANA NAS MB 320-111374/1-A	NONS SVOA TA WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320:111374/1-A	1 1	13CS PENA	13CS PFNA	121 PCT REC	PR	SURR	SMSA	150	25 00000000	5			1 320-112007
		NONS SVOA TA_WS-LC-0025 SVOA TA	AMER Test America NONE	NA 5W3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320:111374/1-A	1 1	13C4 PFOA 13C4-PFHPA	13C4 PFOA 13C4-PFHPA	127 PCT_REC 125 PCT_REC 121 PCT_REC 132 PCT_REC 124 PCT_REC	PR	SURR	SMSA	150	25 00000000	5		320-19022-1	1 320-112007
N6247016D9000 WE01	OCEANA NAS MB 320-111374/1-A																			
N6247016D9000 WE01 N6247016D9000 WE01	OCEANA_NAS MB 320-111374/1-A OCEANA NAS MB 320-111374/1-A	NONS SVOA TA WS-LC-0025 SVOA TO	AMER Test America NONE	NA SW3535 000 LB1 W	4 05/25/2016 15:20 05/25/2016	20160525 15:20:00	20160531 17:56:00 MB 320-111374/1-A	1 1	13C4-PFHPA	13C4-PFHPA	124 PCT REC	PR	SURR	SMSA	150	25 00000000	5		320-19022-1	320-112007

MEMORANDUM CH2MHILL

Data Validation Summary

Oceana CTO-WE44, NALF Fentress

To: Tiffany Hill/CVO

Anita Dodson/VBO

FROM: Tiffany McGlynn/GNV

CC: Herb Kelly/GNV

DATE: June 14, 2016

Introduction

The following data validation report discusses the data validation process and findings for TestAmerica Laboratories in the Sample Delivery Groups (SDGs) listed in the table below.

Samples were analyzed using the following analytical methods:

- WS-LC-0025 Perfluorinated Hydrocarbons
- SW6010C Iron, total & dissolved

The samples included in these SDGs are listed in the table below.

SDG	Sample_Name	Matrix
320-18704-1	OF-RW44-0516	Water
320-18704-1	OF-FB44-0516	Water
320-18704-1	OF-RW42B2-0516	Water
320-18704-1	OF-FB42B2-0516	Water
320-18704-1	OF-RW42A-0516	Water
320-18704-1	OF-FB42A-0516	Water
320-18704-1	OF-RW42B-0516	Water
320-18704-1	OF-FB42B-0516	Water
320-18704-1	OF-RW42C-516	Water
320-18704-1	OF-RW42CD-0516	Water

SDG	Sample_Name	Matrix
320-18704-1	OF-FB42C-0516	Water
320-18719-1	OF-FB08-0516	Water
320-18719-1	OF-RW08-0516	Water
320-18719-1	OF-FB71-0516	Water
320-18719-1	OF-RW71-0516	Water
320-18719-1	OF-FB84-0516	Water
320-18719-1	OF-RW84-0516	Water
320-18794-1	OF-INF01-0516	Water
320-18794-1	OF-EFF01-0516	Water
320-18794-1	OF-FB78-0516	Water
320-18794-1	OF-RW78-0516	Water
320-18794-1	OF-RW78D-0516	Water
320-18794-1	OF-FB77-0516	Water
320-18794-1	OF-RW77-0516	Water
320-18796-1	OF-STORLAG-0516	Water
320-18796-1	OF-TRMTLAG-0516	Water
320-18796-1	OF-POLLLAG-0516	Water
320-18796-1	OF-CLTANK-0516	Water
320-18796-1	OF-BACKWASH-0516	Water
320-18796-1	OF-FILTER-0516	Water
320-18918-1	OF-RW83-0516	Water
320-18918-1	OF-FB83-0516	Water
320-18849-1	OF-FB74-0516	Water
320-18849-1	OF-RW74-0516	Water
320-18849-1	OF-FB59-0516	Water
320-18849-1	OF-RW59-0516	Water
320-19022-1	OF-STORLAG-PT-0516	Water
320-19022-1	OF-TRMLAG-PT-0516	Water
320-19022-1	OF-POLLAG-PT-0516	Water
320-19022-1	OF-CLTANK-PT-0516	Water
320-19022-1	OF-BACKWASH-PT-0516	Water
320-19022-1	OF-FILTER-PT-0516	Water
320-19022-1	OF-INF01-PT-0615	Water
320-19022-1	OF-PROCESS BLANK-PT-0516	Water

Data Evaluation

Data was evaluated in accordance with the analytical methods and with the criteria found in the following guidance documents: Sampling and Analysis Plan Perfluorinated Compound Investigation, Naval Auxiliary Landing Field Fentress, Chesapeake, Virginia Contract Task Order WE44 (December 2015), National Functional Guidelines for Organic Data Review

(August 2014), and National Functional Guidelines for Inorganic Data Review (August 2014), with Region 3 Modification (Use of 'B' qualifier) as applicable. The samples were evaluated based on the following criteria:

- Data Completeness
- Technical Holding Times
- Tuning Instrument
- Initial/Continuing Calibrations
- Blanks
- Internal Standards
- Laboratory Control Samples
- Matrix Spike/Spike Duplicate
- Serial Dilution
- Isotope Dilution Analyte
- Field Duplicates
- Identification/Quantitation
- Reporting Limits
- Total vs. Dissolved

Overall Evaluation of Data/Potential Usability Issues

Specific details regarding qualification of the data are addressed in the sections below. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte, the validator has chosen the qualifier that best indicates possible bias in the results and qualified these data accordingly.

Data Completeness

The SDGs were received complete and intact.

Technical Holding Times

According to the chain of custody records, sampling was performed on 5/4/16 through 5/19/16. Samples were received at the laboratory 5/6/16 through 5/20/16. All sample preparation and analyses were performed within holding time requirements.

Blanks

Several compounds were detected in the field blanks and method blanks as listed below. Affected data are summarized in **Attachment 1**.

Blank ID	Compound	Conc.	Units
OF-FB42C-0516	Perfluorohexanesulfonic acid (PFHxS)	0.0011	UG_L
OF-FB44-0516	Perfluorooctane Sulfonate (PFOS)	0.0037	UG_L
OF-FB42B2-0516	Perfluorohexanesulfonic acid (PFHxS)	0.00097	UG_L
OF-FB42A-0516	Perfluorooctane Sulfonate (PFOS)	0.0029	UG_L
OF-FB78-0516	Perfluorooctane Sulfonate (PFOS)	0.011	UG_L
OF-FB78-0516	Perfluorooctanoic acid (PFOA)	0.0040	UG_L
OF-FB78-0516	Perfluorohexanesulfonic acid (PFHxS)	0.0016	UG_L
MB 280-325382/1-A	Iron	23.7	UG_L
MB 320-109334/1-A	Perfluorooctane Sulfonate (PFOS)	0.00149	UG_L
MB 320-109334/1-A	Perfluorooctane Sulfonate (PFOS)	0.00149	UG_L
MB 320-109640/1-A	Perfluorooctane Sulfonate (PFOS)	0.00136	UG_L
MB 320-109640/1-A	Perfluorooctane Sulfonate (PFOS)	0.00136	UG_L

Lab Control Sample/Sample Duplicate

Perfluorohexanesulfonic acid (PFHxS) did not meet RPD criteria between the LCS and LCSD in SDGs 320-18719-1 and 320-18704-1. Affected data are summarized in **Attachment 1**.

Isotope Dilution Analyte

Internal standards exhibited low or high recoveries for the samples listed below. Affected data are summarized in **Attachment 1**.

SDG	Sample_Name
320-18794-1	OF-INF01-0516
320-18794-1	OF-EFF01-0516
320-18794-1	OF-RW78-0516
320-18796-1	OF-STORLAG-0516
320-18796-1	OF-POLLLAG-0516
320-18796-1	OF-CLTANK-0516
320-18796-1	OF-BACKWASH-0516

SDG	Sample_Name
320-18918-1	OF-RW83-0516
320-18918-1	OF-FB83-0516
320-19022-1	OF-INF01-PT-0615

Total vs. Dissolved

Iron did not meet criteria for total and dissolved for sample OF-STORLAG-0516. Affected data are summarized in **Attachment 1**.

Conclusion

These data can be used in the project decision-making process as qualified by the data quality evaluation process.

Please do not hesitate to contact us about this validation report.

Sincerely,

Tiffany McGlynn

Tillary Wellyn

Qualification Flags

Exclude More appropriate data exist for this analyte.

R Data were rejected for use.

Analyte not detected, quantitation limit is potentially biased

UL low.

UJ Analyte not detected, estimated quantitation limit.

U Analyte not detected.

Not detected substantially above the level reported in

B laboratory or field blanks.

L Analyte present, estimated value potentially biased low.
K Analyte present, estimated value potentially biased high.

Analyte identification presumptive; no second column analysis

N performed or GC/MS tentative identification.

J Analyte present, estimated value.

Analysis indicates the presence of an analyte that was

"tentatively identified" and the associated value represents its

NJ approximate concentration.

Placeholder for calculating quality control issues that do not

None require flagging.

Analyte was detected at a concentration greater than the

= quantitation limit.

Qualifier Code Reference

Value	Description	
%SOL	High Moisture content	
70002	Second Column – Poor Dual Column	
2C	Reproducibility	
	Second Source – Bad reproducibility	
2S	between tandem detectors	
	Blank Spike/Blank Spike	
BD	Duplicate(LCS/LCSD) Precision	
BRL	Below Reporting Limit	
	3	
BSH	Blank Spike/LCS – High Recovery	
BSL	Blank Spike/LCS – Low Recovery	
CC	Continuing Calibration	
	Continuing Calibration Blank	
CCBL	Contamination	
	Continuing Calibration Verification – High	
CCH	Recovery	
0.01	Continuing Calibration Verification – Low	
CCL	Recovery	
DL	Redundant Result – due to Dilution	
EBL	Equipment Blank Contamination	
EMPC	Estimated Possible Maximum Concentration	
ESH	Extraction Standard - High Recovery	
ESL	Extraction Standard - Low Recovery	
FBL	Field Blank Contamination	
FD		
	Field Duplicate	
HT	Holding Time	
ICB	Initial Calibration – Bad Linearity or Curve Function	
100	Initial Calibration – High Relative	
ICH	Response Factors	
	Initial Calibration – Low Relative	
ICL	Response Factors	
IR15	Ion ratio exceeds +/- 15% difference	
ISH	Internal Standard – High Recovery	
ISL	Internal Standard – Low Recovery	
LD	Lab Duplicate Reproducibility	
LR	Concentration Exceeds Linear Range	
MBL	Method Blank Contamination	
IVIDL		
MDP	Matrix Spike/Matrix Spike Duplicate Precision	
MI	Matrix interference obscuring the raw data	

Value	Description
MSH	Matrix Spike and/or Matrix Spike Duplicate – High Recovery
MSL	Matrix Spike and/or Matrix Spike Duplicate – Low Recovery
OT	Other
PD	Pesticide Degradation
RE	Redundant Result - due to Reanalysis or Re-extraction
SD	Serial Dilution Reproducibility
SSH	Spiked Surrogate – High Recovery
SSL	Spiked Surrogate – Low Recovery
TBL	Trip Blank Contamination
TN	Tune

