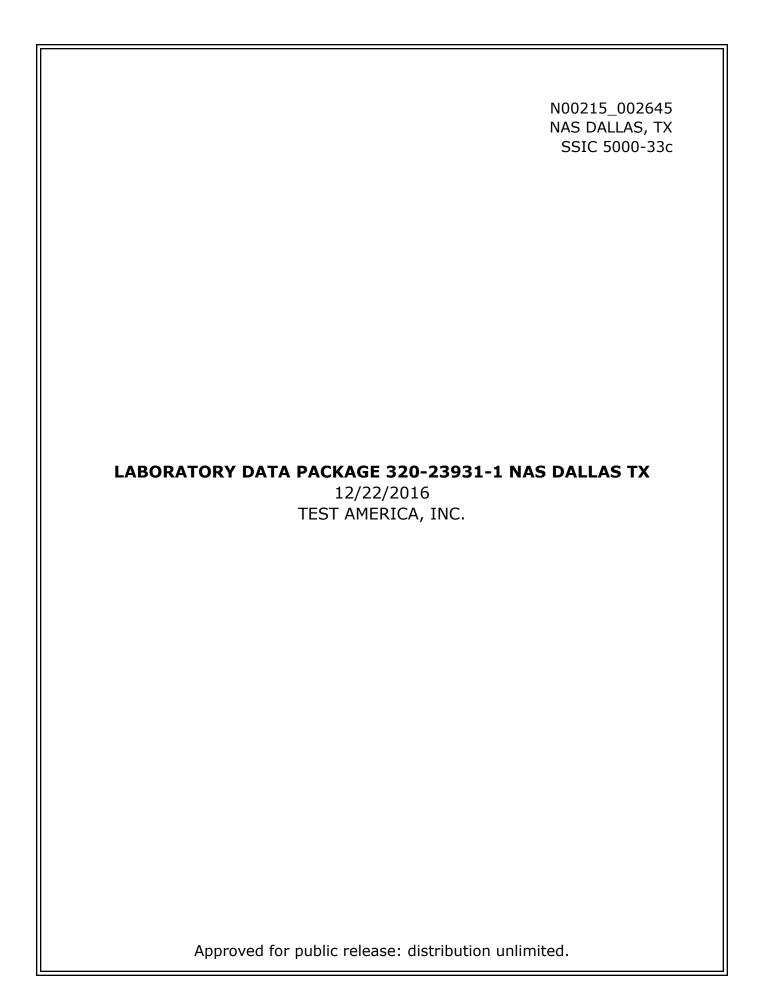


Groundwater Sample Results, Level 4 Laboratory Report, and the Sample Location Report, SDG EML22 (1608156)

Naval Air Station Pensacola Pensacola, Florida

July 2019





ANALYTICAL REPORT

Job Number: 320-23931-1

Job Description: PFAS, NAS Dallas

For: EnSafe, Inc. 4545 Fuller Drive Suite 342 Irving, TX 75038

Attention: Thomas Wiberg

Approved for release David R Alltucker Project Manager I 12/22/2016 2:47 PM

Designee for
Jill Kellmann, Manager of Project Management
880 Riverside Parkway, West Sacramento, CA, 95605
(916)374-4402
jill.kellmann@testamericainc.com
12/22/2016



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Definitions/Glossary

Definitions/Glossa

Toxicity Equivalent Quotient (Dioxin)

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Qualifiers

LCMS

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

Glossary

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
TEF	Toxicity Equivalent Factor (Dioxin)

CASE NARRATIVE

Client: EnSafe, Inc.

Project: PFAS, NAS Dallas

Report Number: 320-23931-1

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 12/01/2016; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 0.4 C.

PFAS

Perfluorotetradecanoic acid (PFTeA) was detected in method blank MB 320-140536/1-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. Refer to the QC report for details.

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

The continuing calibration verification (CCV) associated with batch 320-142751 recovered above the upper control limit for Perfluorobutanesulfonic acid (PFBS). The following samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported: FB113016 (320-23931-6) and (CCV 320-142751/16).

The Isotope Dilution Analyte (IDA) recoveries for several analytes in the following sample are below the method recommended limit: 608D132MW-LF-1116 (320-23931-1), 608D33MW-LF-1116 (320-23931-2), 61301MW-LF-1116 (320-23931-3), 613D41MW-LF-1116 (320-23931-4), 613D39MW-LF-1116 (320-23931-5) and (320-23884-A-3-C MSD). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the samples.

The Isotope Dilution Analyte (IDA) recovery for 13C8 FOSA in the following sample is below the method recommended limit in the diluted sample analysis: 608D33MW-LF-1116 (320-23931-2). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Isotope Dilution Analyte (IDA) recoveries for several analytes are above the method recommended limit for the following samples in the diluted sample analysis: 608D132MW-LF-1116 (320-23931-1) and 608D33MW-LF-1116 (320-23931-2). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: 608D132MW-LF-1116 (320-23931-1) and 608D33MW-LF-1116 (320-23931-2). These samples have been run at dilution and both sets of data have been reported.

The following sample was diluted due to the nature of the sample matrix: 608D132MW-LF-1116 (320-23931-1) and 608D33MW-LF-1116 (320-23931-2). Elevated reporting limits (RLs) are provided.

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

Detection Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-23931-1

Client Sample ID: 608D132MW-LF-1116

I ah	Sample	ID:	320	-23931	I_1
Lab	Jailible	ID.	JZU	-2333	

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.50	E	0.0024	0.00043	ug/L		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.61	E	0.0024	0.00093	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.5	E	0.0024	0.00074	ug/L	1	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.32		0.0024	0.00076	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.52	EM	0.0024	0.00071	ug/L	1	537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.00064	J	0.0024	0.00062	ug/L	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00056	J	0.0024	0.00038	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.6	E	0.0024	0.00082	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.2	E	0.0038	0.0012	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	0.52	D	0.12	0.022	ug/L	50	537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	0.76	D	0.12	0.047	ug/L	50	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	2.1	D	0.12	0.037	ug/L	50	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.34	D	0.12	0.038	ug/L	50	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.55	DM	0.12	0.035	ug/L	50	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	1.5	D	0.12	0.043	ug/L	50	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	3.7	D	0.12	0.041	ug/L	50	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	1.4	D	0.19	0.060	ug/L	50	537 (Modified)	Total/NA

Client Sample ID: 608D33MW-LF-1116

Lab Sample ID: 320-23931-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.26	M	0.0024	0.00044	ug/L	1	_	537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.40	E	0.0024	0.00095	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.80	E	0.0024	0.00076	ug/L	1		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.21		0.0024	0.00077	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.38	M	0.0024	0.00072	ug/L	1		537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.017		0.0024	0.00063	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.0022	JM	0.0024	0.00042	ug/L	1		537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00039	J	0.0024	0.00038	ug/L	1		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	2.4	Е	0.0024	0.00084	ug/L	1		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	10	EM	0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorodecanesulfonic acid (PFDS)	0.0039		0.0038	0.0012	ug/L	1		537 (Modified)	Total/NA
Perfluorooctane Sulfonamide (FOSA)	0.043		0.0024	0.00061	ug/L	1		537 (Modified)	Total/NA
Perfluorobutanoic acid (PFBA) - DL	0.29	D	0.24	0.044	ug/L	100		537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA) - DL	0.47	D	0.24	0.095	ug/L	100		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA) - DL	0.94	D	0.24	0.076	ug/L	100		537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA) - DL	0.21	JD	0.24	0.077	ug/L	100		537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA) - DL	0.43	D M	0.24	0.072	ug/L	100		537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - DL	0.73	D	0.24	0.088	ug/L	100		537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS) - DL	5.4	D	0.24	0.084	ug/L	100		537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS) - DL	21	D	0.38	0.12	ug/L	100		537 (Modified)	Total/NA

Client Sample ID: 61301MW-LF-1116

Lab Sample ID: 320-23931-3

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil	Fac	D Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.17	M	0.0024	0.00043	ug/L		1	537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-23931-1

Client Sample ID: 61301MW	-LF-111	6 (Contin	ued)			Lab Sa	ample ID: 32	0-23931
Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D) Method	Prep Type
Perfluoropentanoic acid (PFPeA)	0.18		0.0024	0.00093	ug/L		537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.15		0.0024	0.00074	ug/L	1	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.11		0.0024	0.00076	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.10	M	0.0024	0.00070	ug/L	1	537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.0080		0.0024	0.00062	ug/L	1	537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.0016	J	0.0024	0.00041	_	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00079	J	0.0024	0.00038	-	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.071		0.0024	0.00082	_	1	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.061		0.0038	0.0012	-	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - RA	0.014		0.0024	0.00086	-	1	537 (Modified)	Total/NA
Client Sample ID: 613D41M	W-LF-11	16				Lab Sa	ample ID: 32	0-23931
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.012	M	0.0024	0.00043	ug/L	1	537 (Modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	0.0063		0.0024	0.00093	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	0.0074		0.0024	0.00074	ug/L	1	537 (Modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.0036	M	0.0024	0.00075	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.035	M	0.0024	0.00070	ug/L	1	537 (Modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.00092	J M	0.0024	0.00062	ug/L	1	537 (Modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.00063	J	0.0024	0.00041	ug/L	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00078	J M	0.0024	0.00038	-	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.032		0.0024	0.00082	-	1	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.070		0.0038	0.0012	•	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - RA	0.0053		0.0024	0.00086	-	1	537 (Modified)	Total/NA
Client Sample ID: 613D39M	W-LF-11	16				Lab Sa	ample ID: 32	0-23931
Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	0.0028		0.0023	0.00041	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanoic acid (PFOA)	0.0013	J	0.0023	0.00067	ug/L	1	537 (Modified)	Total/NA
Perfluorotetradecanoic acid (PFTeA)	0.00062	J	0.0023	0.00036	ug/L	1	537 (Modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.022		0.0023	0.00078	ug/L	1	537 (Modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	0.026		0.0036	0.0011	ug/L	1	537 (Modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS) - RA	0.0062		0.0023	0.00083	ug/L	1	537 (Modified)	Total/NA
Client Sample ID: FB113016	6					Lab Sa	ample ID: 32	0-23931
- Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac D) Method	Prep Type
Perfluorotetradecanoic acid (PFTeA)	0.00041		0.0022	0.00036			537 (Modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Date Collected: 11/30/16 09:40 Matrix: Water

Date Received: 12/01/16 09:50

(PFOS)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.50	E	0.0024	0.00043	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluoropentanoic acid (PFPeA)	0.61	E	0.0024	0.00093	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorohexanoic acid (PFHxA)	1.5	E	0.0024	0.00074	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluoroheptanoic acid (PFHpA)	0.32		0.0024	0.00076	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorooctanoic acid (PFOA)	0.52	EM	0.0024	0.00071	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorononanoic acid (PFNA)	0.00064	J	0.0024	0.00062	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorodecanoic acid (PFDA)	0.00095	U	0.0024	0.00042	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00071	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorotetradecanoic acid (PFTeA)	0.00056	J	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorohexanesulfonic acid (PFHxS)	2.6	E	0.0024	0.00082	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorooctanesulfonic acid (PFOS)	1.2	E	0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/05/16 08:31	12/16/16 19:30	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/05/16 08:31	12/16/16 19:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	18	Q	25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C4 PFBA	32		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C2 PFHxA	41		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C4 PFOA	62		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C5 PFNA	72		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C2 PFDA	106		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C2 PFUnA	104		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C2 PFDoA	104		25 - 150				12/05/16 08:31	12/16/16 19:30	1
1802 PFHxS	35		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C4 PFOS	84		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C5-PFPeA	52		25 - 150				12/05/16 08:31	12/16/16 19:30	1
13C4-PFHpA	37		25 - 150				12/05/16 08:31	12/16/16 19:30	1

Method: 537 (Modified) - Perflu							
Analyte	Result Qualifier	LOQ	LOQ DL		D	Prepared	Analyzed
Perfluorobutanoic acid (PFBA)	0.52 D	0.12	0.022	ug/L		12/05/16 08:31	12/20/16 18:37
Perfluoropentanoic acid (PFPeA)	0.76 D	0.12	0.047	ug/L		12/05/16 08:31	12/20/16 18:37

Perfluorohexanoic acid (PFHxA)	2.1	D	0.12	0.037	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluoroheptanoic acid (PFHpA)	0.34	D	0.12	0.038	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorooctanoic acid (PFOA)	0.55	D M	0.12	0.035	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorononanoic acid (PFNA)	0.095	U	0.12	0.031	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorodecanoic acid (PFDA)	0.047	U	0.12	0.021	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluoroundecanoic acid (PFUnA)	0.095	U	0.12	0.035	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorododecanoic acid (PFDoA)	0.095	U	0.12	0.028	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorotridecanoic Acid (PFTriA)	0.095	U	0.12	0.026	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorotetradecanoic acid (PFTeA)	0.047	U	0.12	0.019	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorobutanesulfonic acid (PFBS)	1.5	D	0.12	0.043	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorohexanesulfonic acid (PFHxS)	3.7	D	0.12	0.041	ug/L	12/05/16 08:31	12/20/16 18:37	50
Perfluorooctanesulfonic acid	1.4	D	0.19	0.060	ug/L	12/05/16 08:31	12/20/16 18:37	50

Dil Fac

50

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Date Collected: 11/30/16 09:40 Matrix: Water

Date Received: 12/01/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorodecanesulfonic acid (PFDS)	0.14	U	0.19	0.057	ug/L		12/05/16 08:31	12/20/16 18:37	50
Perfluorooctane Sulfonamide (FOSA)	0.095	U	0.12	0.030	ug/L		12/05/16 08:31	12/20/16 18:37	50
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	224	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C4 PFBA	802	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C2 PFHxA	857	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C4 PFOA	1153	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C5 PFNA	1303	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C2 PFDA	1335	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C2 PFUnA	1305	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C2 PFDoA	1231	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
18O2 PFHxS	842	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C4 PFOS	1317	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C5-PFPeA	1140	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50
13C4-PFHpA	751	Q	25 - 150				12/05/16 08:31	12/20/16 18:37	50

Date Collected: 11/30/16 11:00 Matrix: Water Date Received: 12/01/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.26	M	0.0024	0.00044	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluoropentanoic acid (PFPeA)	0.40	E	0.0024	0.00095	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorohexanoic acid (PFHxA)	0.80	E	0.0024	0.00076	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluoroheptanoic acid (PFHpA)	0.21		0.0024	0.00077	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorooctanoic acid (PFOA)	0.38	M	0.0024	0.00072	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorononanoic acid (PFNA)	0.017		0.0024	0.00063	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorodecanoic acid (PFDA)	0.0022	JM	0.0024	0.00042	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00072	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00056	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00053	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorotetradecanoic acid (PFTeA)	0.00039	J	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorohexanesulfonic acid (PFHxS)	2.4	E	0.0024	0.00084	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorooctanesulfonic acid (PFOS)	10	EM	0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorodecanesulfonic acid (PFDS)	0.0039		0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 19:37	1
Perfluorooctane Sulfonamide (FOSA)	0.043		0.0024	0.00061	ug/L		12/05/16 08:31	12/16/16 19:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	8	Q	25 - 150				12/05/16 08:31	12/16/16 19:37	1
13C4 PFBA	9	Q	25 - 150				12/05/16 08:31	12/16/16 19:37	1
13C2 PFHxA	47		25 - 150				12/05/16 08:31	12/16/16 19:37	1
13C4 PFOA	60		25 - 150				12/05/16 08:31	12/16/16 19:37	1
13C5 PFNA	27		25 - 150				12/05/16 08:31	12/16/16 19:37	1
13C2 PFDA	97		25 - 150				12/05/16 08:31	12/16/16 19:37	1
13C2 PFUnA	112		25 - 150				12/05/16 08:31	12/16/16 19:37	1

Client: EnSafe, Inc. TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Client Sample ID: 608D33MW-LF-1116 Lab Sample ID: 320-23931-2

Date Collected: 11/30/16 11:00 **Matrix: Water**

Date Received: 12/01/16 09:50

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	108	25 - 150	12/05/16 08:31	12/16/16 19:37	1
1802 PFHxS	34	25 - 150	12/05/16 08:31	12/16/16 19:37	1
13C4 PFOS	21 Q	25 - 150	12/05/16 08:31	12/16/16 19:37	1
13C5-PFPeA	42	25 - 150	12/05/16 08:31	12/16/16 19:37	1
13C4-PFHpA	36	25 - 150	12/05/16 08:31	12/16/16 19:37	1

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.29	D	0.24	0.044	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluoropentanoic acid (PFPeA)	0.47	D	0.24	0.095	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorohexanoic acid (PFHxA)	0.94	D	0.24	0.076	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluoroheptanoic acid (PFHpA)	0.21	JD	0.24	0.077	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorooctanoic acid (PFOA)	0.43	D M	0.24	0.072	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorononanoic acid (PFNA)	0.19	U	0.24	0.063	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorodecanoic acid (PFDA)	0.096	U	0.24	0.042	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluoroundecanoic acid (PFUnA)	0.19	U	0.24	0.072	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorododecanoic acid (PFDoA)	0.19	U	0.24	0.056	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorotridecanoic Acid (PFTriA)	0.19	U	0.24	0.053	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorotetradecanoic acid (PFTeA)	0.096	U	0.24	0.038	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorobutanesulfonic acid (PFBS)	0.73	D	0.24	0.088	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorohexanesulfonic acid (PFHxS)	5.4	D	0.24	0.084	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorooctanesulfonic acid (PFOS)	21	D	0.38	0.12	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorodecanesulfonic acid (PFDS)	0.29	U	0.38	0.12	ug/L		12/05/16 08:31	12/20/16 18:22	100
Perfluorooctane Sulfonamide (FOSA)	0.19	U	0.24	0.061	ug/L		12/05/16 08:31	12/20/16 18:22	100
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	17	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C4 PFBA	54		25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C2 PFHxA	154	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C4 PFOA	181	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C5 PFNA	145		25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C2 PFDA	162	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C2 PFUnA	163	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C2 PFDoA	155	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
18O2 PFHxS	150		25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C4 PFOS	144		25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C5-PFPeA	179	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100
13C4-PFHpA	154	Q	25 - 150				12/05/16 08:31	12/20/16 18:22	100

Client Sample ID: 61301MW-LF-1116 Lab Sample ID: 320-23931-3 Date Collected: 11/30/16 12:45

Date Received: 12/01/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons										
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac	
Perfluorobutanoic acid (PFBA)	0.17	M	0.0024	0.00043	ug/L		12/05/16 08:31	12/16/16 20:15	1	
Perfluoropentanoic acid (PFPeA)	0.18		0.0024	0.00093	ug/L		12/05/16 08:31	12/16/16 20:15	1	
Perfluorohexanoic acid (PFHxA)	0.15		0.0024	0.00074	ug/L		12/05/16 08:31	12/16/16 20:15	1	

Matrix: Water

Client: EnSafe, Inc. TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Client Sample ID: 61301MW-LF-1116 Lab Sample ID: 320-23931-3

Date Collected: 11/30/16 12:45 **Matrix: Water**

LOQ

DL Unit

Prepared

Date Received: 12/01/16 09:50

Analyte

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

Result Qualifier

Analyte	Result	Qualifier	LOQ	DL	Ullit	U	riepaieu	Allalyzeu	DII Fac
Perfluoroheptanoic acid (PFHpA)	0.11		0.0024	0.00076	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorooctanoic acid (PFOA)	0.10	M	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorononanoic acid (PFNA)	0.0080		0.0024	0.00062	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorodecanoic acid (PFDA)	0.0016	J	0.0024	0.00041	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorotetradecanoic acid (PFTeA)	0.00079	J	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorohexanesulfonic acid (PFHxS)	0.071		0.0024	0.00082	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorooctanesulfonic acid (PFOS)	0.061		0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/05/16 08:31	12/16/16 20:15	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/05/16 08:31	12/16/16 20:15	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	9	Q	25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C4 PFBA	45		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C2 PFHxA	78		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C4 PFOA	85		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C5 PFNA	88		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C2 PFDA	97		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C2 PFUnA	104		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C2 PFDoA	104		25 - 150				12/05/16 08:31	12/16/16 20:15	1
1802 PFHxS	93		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C4 PFOS	102		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C5-PFPeA	78		25 - 150				12/05/16 08:31	12/16/16 20:15	1
13C4-PFHpA	82		25 - 150				12/05/16 08:31	12/16/16 20:15	1
Method: 537 (Modified) - Perfl	uorinated H	lydrocarbo	ons - RA						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	0.014		0.0024	0.00086	ug/L		12/05/16 08:31	12/20/16 18:52	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
	,	4						7 u.y 20 u	<i>D.</i> , , ao

Client Sample ID: 613D41MW-LF-1116

Lab Sample ID: 320-23931-4 Date Collected: 11/30/16 13:55 **Matrix: Water**

Date Received: 12/01/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.012	M	0.0024	0.00043	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluoropentanoic acid (PFPeA)	0.0063		0.0024	0.00093	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorohexanoic acid (PFHxA)	0.0074		0.0024	0.00074	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluoroheptanoic acid (PFHpA)	0.0036	M	0.0024	0.00075	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorooctanoic acid (PFOA)	0.035	M	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorononanoic acid (PFNA)	0.00092	J M	0.0024	0.00062	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorodecanoic acid (PFDA)	0.00063	J	0.0024	0.00041	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.00070	ug/L		12/05/16 08:31	12/16/16 20:22	1

Dil Fac

Analyzed

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Date Collected: 11/30/16 13:55 Matrix: Water

Date Received: 12/01/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.00055	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.00052	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorotetradecanoic acid (PFTeA)	0.00078	J M	0.0024	0.00038	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorohexanesulfonic acid (PFHxS)	0.032		0.0024	0.00082	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorooctanesulfonic acid (PFOS)	0.070		0.0038	0.0012	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0011	ug/L		12/05/16 08:31	12/16/16 20:22	1
Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.00060	ug/L		12/05/16 08:31	12/16/16 20:22	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	15	Q	25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C4 PFBA	48		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C2 PFHxA	77		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C4 PFOA	77		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C5 PFNA	70		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C2 PFDA	68		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C2 PFUnA	70		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C2 PFDoA	77		25 - 150				12/05/16 08:31	12/16/16 20:22	1
1802 PFHxS	96		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C4 PFOS	101		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C5-PFPeA	80		25 - 150				12/05/16 08:31	12/16/16 20:22	1
13C4-PFHpA	77		25 - 150				12/05/16 08:31	12/16/16 20:22	1

Method: 537 (Modified) - Perfl	uorinated H	ydrocarbo	ons - RA						
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	0.0053		0.0024	0.00086	ug/L		12/05/16 08:31	12/20/16 18:59	1
Isotope Dilution 1802 PFHxS	%Recovery 126	Qualifier	Limits 25 - 150				Prepared 12/05/16 08:31	Analyzed 12/20/16 18:59	Dil Fac

Date Collected: 11/30/16 15:20 Matrix: Water Date Received: 12/01/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.0028		0.0023	0.00041	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0023	0.00089	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorohexanoic acid (PFHxA)	0.0018	U	0.0023	0.00071	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.00072	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorooctanoic acid (PFOA)	0.0013	J	0.0023	0.00067	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorononanoic acid (PFNA)	0.0018	U	0.0023	0.00059	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorodecanoic acid (PFDA)	0.00090	U	0.0023	0.00040	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0023	0.00067	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.00053	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.00050	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorotetradecanoic acid	0.00062	J	0.0023	0.00036	ug/L		12/05/16 08:31	12/16/16 20:30	1
(PFTeA)									
Perfluorohexanesulfonic acid (PFHxS)	0.022		0.0023	0.00078	ug/L		12/05/16 08:31	12/16/16 20:30	1

Client: EnSafe, Inc. TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Client Sample ID: 613D39MW-LF-1116 Lab Sample ID: 320-23931-5

Date Collected: 11/30/16 15:20 **Matrix: Water**

Date Received: 12/01/16 09:50

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	0.026		0.0036	0.0011	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorodecanesulfonic acid (PFDS)	0.0027	U	0.0036	0.0011	ug/L		12/05/16 08:31	12/16/16 20:30	1
Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0023	0.00057	ug/L		12/05/16 08:31	12/16/16 20:30	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	13	Q	25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C4 PFBA	43		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C2 PFHxA	77		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C4 PFOA	92		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C5 PFNA	93		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C2 PFDA	97		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C2 PFUnA	97		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C2 PFDoA	86		25 - 150				12/05/16 08:31	12/16/16 20:30	1
1802 PFHxS	92		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C4 PFOS	99		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C5-PFPeA	76		25 - 150				12/05/16 08:31	12/16/16 20:30	1
13C4-PFHpA	86		25 - 150				12/05/16 08:31	12/16/16 20:30	1
Method: 537 (Modified) - Perfl	uorinated H	vdrocarbo	ons - RA						
Analyte		Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	0.0062		0.0023	0.00083	ug/L		12/05/16 08:31	12/20/16 19:07	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	116		25 - 150				12/05/16 08:31	12/20/16 19:07	1

Client Sample ID: FB113016 Lab Sample ID: 320-23931-6 Date Collected: 11/30/16 15:35

Date Received: 12/01/16 09:50

Method: 537 (Modified) - Perfluorinated Hydrocarbons Result Qualifier Analyte LOQ DL Unit Prepared Analyzed Dil Fac Perfluorobutanoic acid (PFBA) 0.00089 U 0.0022 0.00041 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluoropentanoic acid (PFPeA) 0.0018 U 0.0022 0.00088 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluorohexanoic acid (PFHxA) 0.0018 U 0.0022 0.00070 ug/L 12/05/16 08:31 12/16/16 20:37 Perfluoroheptanoic acid (PFHpA) 0.0018 U 0.0022 0.00072 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluorooctanoic acid (PFOA) 0.0018 U 0.0022 0.00067 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluorononanoic acid (PFNA) 0.00058 ug/L 1 0.0018 U 0.0022 12/05/16 08:31 12/16/16 20:37 Perfluorodecanoic acid (PFDA) 0.00089 U 0.0022 0.00039 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluoroundecanoic acid (PFUnA) 0.00067 ug/L 0.0018 U 0.0022 12/05/16 08:31 12/16/16 20:37 1 Perfluorododecanoic acid (PFDoA) 0.0018 U 0.0022 0.00052 ug/L 12/05/16 08:31 12/16/16 20:37 1 0.00049 ug/L Perfluorotridecanoic Acid (PFTriA) 0.0018 U 0.0022 12/05/16 08:31 12/16/16 20:37 0.00041 J 0.0022 0.00036 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluorotetradecanoic acid (PFTeA) Perfluorobutanesulfonic acid (PFBS) 0.0018 UQ 0.0022 0.00082 ug/L 12/05/16 08:31 12/16/16 20:37 1 0.00078 ug/L Perfluorohexanesulfonic acid (PFHxS) 0.0018 U 0.0022 12/05/16 08:31 12/16/16 20:37 Perfluorooctanesulfonic acid (PFOS) 0.0027 U 0.0036 0.0011 ug/L 12/05/16 08:31 12/16/16 20:37 1 Perfluorodecanesulfonic acid (PFDS) 0.0027 U 0.0036 0.0011 ug/L 12/05/16 08:31 12/16/16 20:37 Perfluorooctane Sulfonamide (FOSA) 0.0018 U 12/05/16 08:31 12/16/16 20:37 0.0022 0.00057 ug/L 1 Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 13C8 FOSA 25 - 150 12/05/16 08:31 12/16/16 20:37 55

Matrix: Water

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Client Sample ID: FB113016 Lab Sample ID: 320-23931-6

Date Collected: 11/30/16 15:35

Date Received: 12/01/16 09:50

Matrix: Water

Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	106	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFHxA	105	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C4 PFOA	110	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C5 PFNA	109	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFDA	115	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFUnA	116	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C2 PFDoA	104	25 - 150	12/05/16 08:31	12/16/16 20:37	1
1802 PFHxS	102	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C4 PFOS	102	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C5-PFPeA	113	25 - 150	12/05/16 08:31	12/16/16 20:37	1
13C4-PFHpA	111	25 - 150	12/05/16 08:31	12/16/16 20:37	1

Default Detection Limits

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

Analyte	LOQ	DL	Units	Method
Perfluorobutanesulfonic acid (PFBS)	0.0025	0.00092	ug/L	537 (Modified)
Perfluorobutanoic acid (PFBA)	0.0025	0.00046	ug/L	537 (Modified)
Perfluorodecanesulfonic acid (PFDS)	0.0040	0.0012	ug/L	537 (Modified)
Perfluorodecanoic acid (PFDA)	0.0025	0.00044	ug/L	537 (Modified)
Perfluorododecanoic acid (PFDoA)	0.0025	0.00058	ug/L	537 (Modified)
Perfluoroheptanoic acid (PFHpA)	0.0025	0.00080	ug/L	537 (Modified)
Perfluorohexanesulfonic acid (PFHxS)	0.0025	0.00087	ug/L	537 (Modified)
Perfluorohexanoic acid (PFHxA)	0.0025	0.00079	ug/L	537 (Modified)
Perfluorononanoic acid (PFNA)	0.0025	0.00065	ug/L	537 (Modified)
Perfluorooctane Sulfonamide (FOSA)	0.0025	0.00064	ug/L	537 (Modified)
Perfluorooctanesulfonic acid (PFOS)	0.0040	0.0013	ug/L	537 (Modified)
Perfluorooctanoic acid (PFOA)	0.0025	0.00075	ug/L	537 (Modified)
Perfluoropentanoic acid (PFPeA)	0.0025	0.00099	ug/L	537 (Modified)
Perfluorotetradecanoic acid (PFTeA)	0.0025	0.00040	ug/L	537 (Modified)
Perfluorotridecanoic Acid (PFTriA)	0.0025	0.00055	ug/L	537 (Modified)
Perfluoroundecanoic acid (PFUnA)	0.0025	0.00075	ug/L	537 (Modified)

Isotope Dilution Summary

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water Prep Type: Total/NA

			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)	
		3C8 FOSA	3C4 PFB/	3C2 PFHx	3C4 PFO	3C5 PFN/	3C2 PFD/	3C2 PFUn	3C2 PFDc
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
320-23931-1	608D132MW-LF-1116	18 Q	32	41	62	72	106	104	104
320-23931-1 - DL	608D132MW-LF-1116	224 Q	802 Q	857 Q	1153 Q	1303 Q	1335 Q	1305 Q	1231 Q
320-23931-2	608D33MW-LF-1116	8 Q	9 Q	47	60	27	97	112	108
320-23931-2 - DL	608D33MW-LF-1116	17 Q	54	154 Q	181 Q	145	162 Q	163 Q	155 Q
320-23931-3	61301MW-LF-1116	9 Q	45	78	85	88	97	104	104
320-23931-3 - RA	61301MW-LF-1116								
320-23931-4	613D41MW-LF-1116	15 Q	48	77	77	70	68	70	77
320-23931-4 - RA	613D41MW-LF-1116								
320-23931-5	613D39MW-LF-1116	13 Q	43	77	92	93	97	97	86
320-23931-5 - RA	613D39MW-LF-1116								
320-23931-6	FB113016	55	106	105	110	109	115	116	104
LCS 320-140536/2-A	Lab Control Sample	90	106	103	103	103	104	104	107
MB 320-140536/1-A	Method Blank	100	112	109	116	109	111	115	111

Percent Isotope Dilution Recovery (Acceptance Limits)

		BO2 PFHx	3C4 PFOS	3C5-PFPe	3C4-PFHp
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)
320-23931-1	608D132MW-LF-1116	35	84	52	37
320-23931-1 - DL	608D132MW-LF-1116	842 Q	1317 Q	1140 Q	751 Q
320-23931-2	608D33MW-LF-1116	34	21 Q	42	36
320-23931-2 - DL	608D33MW-LF-1116	150	144	179 Q	154 Q
320-23931-3	61301MW-LF-1116	93	102	78	82
320-23931-3 - RA	61301MW-LF-1116	111			
320-23931-4	613D41MW-LF-1116	96	101	80	77
320-23931-4 - RA	613D41MW-LF-1116	126			
320-23931-5	613D39MW-LF-1116	92	99	76	86
320-23931-5 - RA	613D39MW-LF-1116	116			
320-23931-6	FB113016	102	102	113	111
LCS 320-140536/2-A	Lab Control Sample	97	99	109	102
MB 320-140536/1-A	Method Blank	105	102	118	112

Surrogate Legend

13C8 FOSA = 13C8 FOSA

13C4 PFBA = 13C4 PFBA

13C2 PFHxA = 13C2 PFHxA

13C4 PFOA = 13C4 PFOA

13C5 PFNA = 13C5 PFNA

13C2 PFDA = 13C2 PFDA

13C2 PFUnA = 13C2 PFUnA

13C2 PFDoA = 13C2 PFDoA

18O2 PFHxS = 18O2 PFHxS

13C4 PFOS = 13C4 PFOS

13C5-PFPeA = 13C5-PFPeA

13C4-PFHpA = 13C4-PFHpA

QC Sample Results

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

Method: 537 (Modified) - Perfluorinated Hydrocarbons

115

111

105

102

118

112

Lab Sample ID: MB 320-140536/1-A

Matrix: Water

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 140536

Analysis Batch: 142751								Prep Batch:	140536
		MB				_			
Analyte		Qualifier	LOQ		Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	0.0010	U	0.0025	0.00046	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.00099	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorohexanoic acid (PFHxA)	0.0020	U	0.0025	0.00079	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluoroheptanoic acid (PFHpA)	0.0020	U	0.0025	0.00080	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorooctanoic acid (PFOA)	0.0020	U	0.0025	0.00075	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorononanoic acid (PFNA)	0.0020	U	0.0025	0.00065	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.00044	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.00075	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.00058	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.00055	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorotetradecanoic acid (PFTeA)	0.000656	J	0.0025	0.00040	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.00092	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.00087	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0013	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0012	ug/L		12/05/16 08:31	12/16/16 18:30	1
Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.00064	ug/L		12/05/16 08:31	12/16/16 18:30	1
	MB	MB							
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C8 FOSA	100		25 - 150				12/05/16 08:31	12/16/16 18:30	1
13C4 PFBA	112		25 - 150				12/05/16 08:31	12/16/16 18:30	1
13C2 PFHxA	109		25 - 150				12/05/16 08:31	12/16/16 18:30	1
13C4 PFOA	116		25 - 150				12/05/16 08:31	12/16/16 18:30	1
13C5 PFNA	109		25 - 150				12/05/16 08:31	12/16/16 18:30	1
13C2 PFDA	111		25 - 150				12/05/16 08:31	12/16/16 18:30	1

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

25 - 150

Lab Sample ID: LCS 320-140536/2-A

Matrix: Water

13C2 PFUnA

13C2 PFDoA

1802 PFHxS

13C4 PFOS

13C5-PFPeA

13C4-PFHpA

Analysis Batch: 142751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 140536

12/05/16 08:31 12/16/16 18:30

12/05/16 08:31 12/16/16 18:30

12/05/16 08:31 12/16/16 18:30

12/05/16 08:31 12/16/16 18:30

12/05/16 08:31 12/16/16 18:30

12/05/16 08:31 12/16/16 18:30

1

1

Analysis Batch: 142751	Spike	LCS L	cs			%Rec.
Analyte	Added	Result Q	ualifier U	nit D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	0.0400	0.0446	u	g/L	112	60 - 140
Perfluoropentanoic acid (PFPeA)	0.0400	0.0431	u	g/L	108	60 - 140
Perfluorohexanoic acid (PFHxA)	0.0400	0.0427	u	g/L	107	60 - 140
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0443	u	g/L	111	60 - 140
Perfluorooctanoic acid (PFOA)	0.0400	0.0425	u	g/L	106	60 - 140
Perfluorononanoic acid (PFNA)	0.0400	0.0428	u	g/L	107	60 - 140
Perfluorodecanoic acid (PFDA)	0.0400	0.0420	u	g/L	105	60 - 140
Perfluoroundecanoic acid (PFUnA)	0.0400	0.0410	u	g/L	103	60 - 140
Perfluorododecanoic acid (PFDoA)	0.0400	0.0422	u	g/L	105	60 - 140
Perfluorotridecanoic Acid (PFTriA)	0.0400	0.0436	u	g/L	109	50 - 150

TestAmerica Sacramento

QC Sample Results

Client: EnSafe, Inc. TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

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

Lab Sample ID: LCS 320- Matrix: Water Analysis Batch: 142751	140536/2-A					Clie	ent Sar	nple ID	: Lab Control Sample Prep Type: Total/NA Prep Batch: 140536
			Spike	LCS	LCS				%Rec.
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorotetradecanoic acid (PFTeA)	-		0.0400	0.0557		ug/L		139	50 - 150
Perfluorobutanesulfonic acid (PFBS)			0.0354	0.0464		ug/L		131	50 - 150
Perfluorohexanesulfonic acid (PFHxS)			0.0364	0.0375		ug/L		103	60 - 140
Perfluorooctanesulfonic acid (PFOS)			0.0371	0.0398		ug/L		107	60 - 140
Perfluorodecanesulfonic acid (PFDS)			0.0386	0.0412		ug/L		107	50 - 150
Perfluorooctane Sulfonamide (FOSA)			0.0400	0.0445		ug/L		111	60 - 140
()	LCS	LCS							
Isotope Dilution	%Recovery	Qualifier	Limits						
13C8 FOSA	90		25 - 150						
13C4 PFBA	106		25 - 150						
13C2 PFHxA	103		25 - 150						
13C4 PFOA	103		25 - 150						
13C5 PFNA	103		25 - 150						
13C2 PFDA	104		25 - 150						
13C2 PFUnA	104		25 - 150						
13C2 PFDoA	107		25 - 150						
18O2 PFHxS	97		25 - 150						
13C4 PFOS	99		25 - 150						
13C5-PFPeA	109		25 - 150						
13C4-PFHpA	102		25 - 150						

QC Association Summary

Client: EnSafe, Inc. Project/Site: PFAS, NAS Dallas

LCMS

Prep Batch: 140536

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23931-1 - DL	608D132MW-LF-1116	Total/NA	Water	3535	
320-23931-1	608D132MW-LF-1116	Total/NA	Water	3535	
320-23931-2 - DL	608D33MW-LF-1116	Total/NA	Water	3535	
320-23931-2	608D33MW-LF-1116	Total/NA	Water	3535	
320-23931-3	61301MW-LF-1116	Total/NA	Water	3535	
320-23931-3 - RA	61301MW-LF-1116	Total/NA	Water	3535	
320-23931-4 - RA	613D41MW-LF-1116	Total/NA	Water	3535	
320-23931-4	613D41MW-LF-1116	Total/NA	Water	3535	
320-23931-5	613D39MW-LF-1116	Total/NA	Water	3535	
320-23931-5 - RA	613D39MW-LF-1116	Total/NA	Water	3535	
320-23931-6	FB113016	Total/NA	Water	3535	
MB 320-140536/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-140536/2-A	Lab Control Sample	Total/NA	Water	3535	

Analysis Batch: 142751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23931-1	608D132MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-2	608D33MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-3	61301MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-4	613D41MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-5	613D39MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-6	FB113016	Total/NA	Water	537 (Modified)	140536
MB 320-140536/1-A	Method Blank	Total/NA	Water	537 (Modified)	140536
LCS 320-140536/2-A	Lab Control Sample	Total/NA	Water	537 (Modified)	140536

Analysis Batch: 143259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-23931-1 - DL	608D132MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-2 - DL	608D33MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-3 - RA	61301MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-4 - RA	613D41MW-LF-1116	Total/NA	Water	537 (Modified)	140536
320-23931-5 - RA	613D39MW-LF-1116	Total/NA	Water	537 (Modified)	140536

TestAmerica Job ID: 320-23931-1

Lab Chronicle

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-23931-1

Client Sample ID: 608D132MW-LF-1116

Lab Sample ID: 320-23931-1 Date Collected: 11/30/16 09:40 **Matrix: Water**

Date Received: 12/01/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 19:30	SBC	TAL SAC
Total/NA	Prep	3535	DL		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	50	143259	12/20/16 18:37	SBC	TAL SAC

Client Sample ID: 608D33MW-LF-1116

Lab Sample ID: 320-23931-2

Date Collected: 11/30/16 11:00 **Matrix: Water** Date Received: 12/01/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 19:37	SBC	TAL SAC
Total/NA	Prep	3535	DL		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	DL	100	143259	12/20/16 18:22	SBC	TAL SAC

Client Sample ID: 61301MW-LF-1116 Lab Sample ID: 320-23931-3

Date Collected: 11/30/16 12:45 Date Received: 12/01/16 09:50

Batch Dilution Batch Batch Prepared Type Method Number or Analyzed Analyst **Prep Type** Run **Factor** Lab Total/NA Prep 3535 TAL SAC 140536 12/05/16 08:31 HJA Total/NA Analysis 537 (Modified) 142751 12/16/16 20:15 SBC TAL SAC TAL SAC Total/NA Prep 3535 RA 140536 12/05/16 08:31 HJA Total/NA Analysis 537 (Modified) RA 143259 12/20/16 18:52 SBC TAL SAC

Client Sample ID: 613D41MW-LF-1116 Lab Sample ID: 320-23931-4

Date Collected: 11/30/16 13:55

Date Received: 12/01/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 20:22	SBC	TAL SAC
Total/NA	Prep	3535	RA		140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)	RA	1	143259	12/20/16 18:59	SBC	TAL SAC

Client Sample ID: 613D39MW-LF-1116 Lab Sample ID: 320-23931-5

Date Collected: 11/30/16 15:20 Date Received: 12/01/16 09:50

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			140536	12/05/16 08:31	HJA	TAL SAC
Total/NA	Analysis	537 (Modified)		1	142751	12/16/16 20:30	SBC	TAL SAC
Total/NA	Prep	3535	RA		140536	12/05/16 08:31	HJA	TAL SAC

Matrix: Water

Matrix: Water

Matrix: Water

Lab Chronicle

Client: EnSafe, Inc.

TestAmerica Job ID: 320-23931-1 Project/Site: PFAS, NAS Dallas

Client Sample ID: 613D39MW-LF-1116

Lab Sample ID: 320-23931-5 Date Collected: 11/30/16 15:20

Matrix: Water

Date Received: 12/01/16 09:50

	Bat	tch	Batch		Dilution	Batch	Prepared		
Prep Typ	е Тур	pe	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Ana	alysis	537 (Modified)	RA	1	143259	12/20/16 19:07	SBC	TAL SAC

Client Sample ID: FB113016 Lab Sample ID: 320-23931-6

Date Collected: 11/30/16 15:35 **Matrix: Water** Date Received: 12/01/16 09:50

Batch Batch Dilution Batch **Prepared Prep Type** Type Method Run **Factor** Number or Analyzed Analyst Lab Total/NA Prep 3535 140536 12/05/16 08:31 HJA TAL SAC Total/NA Analysis 537 (Modified) 1 142751 12/16/16 20:37 SBC TAL SAC

Laboratory References:

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

Certification Summary

Client: EnSafe, Inc. TestAmerica Job ID: 320-23931-1

Project/Site: PFAS, NAS Dallas

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

Authority	Program		EPA Region	Certification ID	Expiration Date	
\2LA	DoD ELA	P		2928-01	01-31-17	
Dregon	NELAP		10	4040	01-29-17	
The following analytes	s are included in this repo	ort, but certification is	s not offered by the g	overning authority:		
Analysis Method	Prep Method	Matrix	Analy	te		
537 (Modified)	3535	Water	Perflu	orobutanesulfonic acid ((PFBS)	
537 (Modified)	3535	Water	Perflu	orobutanoic acid (PFBA	۸)	
537 (Modified)	3535	Water	Perflu	orodecanesulfonic acid	(PFDS)	
537 (Modified)	3535	Water	Perflu	Perfluorodecanoic acid (PFDA)		
537 (Modified)	3535	Water	Perflu	Perfluorododecanoic acid (PFDoA)		
537 (Modified)	3535	Water	Perflu	erfluoroheptanoic acid (PFHpA)		
537 (Modified)	3535	Water	Perflu	rfluorohexanesulfonic acid (PFHxS)		
537 (Modified)	3535	Water	Perflu	orohexanoic acid (PFH)	(A)	
537 (Modified)	3535	Water	Perflu	orononanoic acid (PFNA	A)	
537 (Modified)	3535	Water	Perflu	orooctane Sulfonamide	(FOSA)	
537 (Modified)	3535	Water	Perflu	orooctanesulfonic acid ((PFOS)	
537 (Modified)	3535	Water	Perflu	orooctanoic acid (PFOA	۸)	
537 (Modified)	3535	Water	Perflu	oropentanoic acid (PFP	eA)	
537 (Modified)	3535	Water	Perflu	orotetradecanoic acid (F	PFTeA)	
537 (Modified)	3535	Water	Perflu	orotridecanoic Acid (PF	TriA)	
537 (Modified)	3535	Water	Perflu	oroundecanoic acid (PF	UnA)	

Method Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-23931-1

Method	Method Description	Protocol	Laboratory
537 (Modified)	Perfluorinated Hydrocarbons	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

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

Sample Summary

Client: EnSafe, Inc.

Project/Site: PFAS, NAS Dallas

TestAmerica Job ID: 320-23931-1

Lab Sample ID	Client Sample ID	Matrix	Collected Received
320-23931-1	608D132MW-LF-1116	Water	11/30/16 09:40 12/01/16 09:50
320-23931-2	608D33MW-LF-1116	Water	11/30/16 11:00 12/01/16 09:50
320-23931-3	61301MW-LF-1116	Water	11/30/16 12:45 12/01/16 09:50
320-23931-4	613D41MW-LF-1116	Water	11/30/16 13:55 12/01/16 09:50
320-23931-5	613D39MW-LF-1116	Water	11/30/16 15:20 12/01/16 09:50
320-23931-6	FB113016	Water	11/30/16 15:35 12/01/16 09:50

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 142379

Lab Sample ID: IC 320-142379/4 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluoroheptanoic acid (PFHpA)	2.43	Assign Peak	chandrase	12/15/16 13:48	
			nas		
Perfluorohexanesulfonic acid	2.44	Assign Peak	chandrase	12/15/16 13:48	
(PFHxS)			nas		
Perfluorooctanesulfonic acid	3.15	Assign Peak	chandrase	12/15/16 13:48	
(PFOS)			nas		
Perfluorododecanoic acid (PFDoA)	4.14	Incomplete Integration	chandrase	12/15/16 13:48	
			nas		

Lab Sample ID: IC 320-142379/5 Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctanesulfonic acid	3.15	Assign Peak	chandrase	12/15/16 13:50
(PFOS)			nas	

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142571

Lab Sample ID: CCV 320-142571/4 CCVL Client Sample ID:

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorooctanesulfonic acid	3.29	Assign Peak	chandrase	12/16/16 14:29
(PFOS)			nas	

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 142751

Lab Sample ID: 320-23931-1 Client Sample ID: 608D132MW-LF-1116

Date Analyzed: 12/16/16 19:30 Lab File ID: 16DEC2016C 013.d GC Column: Acquity ID: 2.1(mm)

COMPOUND NAME	RETENTION	MANUAL INTEGRATION			
	TIME	REASON	ANALYST	DATE	
Perfluorooctanoic acid (PFOA)	2.86	Isomers	chandrase	12/18/16 17:38	
			nas		

Lab Sample ID: 320-23931-2 Client Sample ID: 608D33MW-LF-1116

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorobutanoic acid (PFBA)	1.58	Baseline	chandrase	12/18/16 17:40		
			nas			
Perfluorooctanoic acid (PFOA)	2.85	Isomers	chandrase	12/18/16 17:40		
			nas			
Perfluorooctanesulfonic acid	3.18	Baseline	chandrase	12/18/16 17:40		
(PFOS)			nas			
Perfluorodecanoic acid (PFDA)	3.58	Baseline	chandrase	12/18/16 17:40		
			nas			

Lab Sample ID: 320-23931-3 Client Sample ID: 61301MW-LF-1116

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.59	Baseline	chandrase	12/18/16 17:45
			nas	
Perfluorooctanoic acid (PFOA)	2.84	Isomers	chandrase	12/18/16 17:45
			nas	

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8_N Analysis Batch Number: 142751

Lab Sample ID: 320-23931-4 Client Sample ID: 613D41MW-LF-1116

COMPOUND NAME	RETENTION	MANUAL INTEGRATION		
	TIME	REASON	ANALYST	DATE
Perfluorobutanoic acid (PFBA)	1.57	Baseline	chandrase	12/18/16 17:47
			nas	
Perfluoroheptanoic acid (PFHpA)	2.48	Baseline	chandrase	12/18/16 17:47
			nas	
Perfluorooctanoic acid (PFOA)	2.84	Isomers	chandrase	12/18/16 17:47
			nas	
Perfluorononanoic acid (PFNA)	3.22	Incomplete Integration	chandrase	12/18/16 17:47
			nas	
Perfluorotetradecanoic acid	4.71	Incomplete Integration	chandrase	12/18/16 17:47
(PFTeA)			nas	

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Instrument ID: A8 N Analysis Batch Number: 143259

Lab Sample ID: 320-23931-2 DL Client Sample ID: 608D33MW-LF-1116 DL

COMPOUND NAME	RETENTION	MANUAL INTEGRATION				
	TIME	REASON	ANALYST	DATE		
Perfluorooctanoic acid (PFOA)	2.83	Isomers	chandrase	12/21/16 10:16		
			nas			

Lab Sample ID: 320-23931-1 DL Client Sample ID: 608D132MW-LF-1116 DL

COMPOUND NAME	RETENTION	MANUAL INTE	GRATION	
	TIME	REASON	ANALYST	DATE
Perfluorooctanoic acid (PFOA)	2.83	Isomers	chandrase	12/21/16 10:17
			nas	

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1
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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_00046	03/01/17	11/03/16	Methanol, Lot Bakes	r 50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
.LCM2PFHxDA_00008			on Laboratories, Lo		(Purchased Rea		13C2-PFHxDA	50 ug/mL
.LCM2PFTeDA_00007	12/07/20		on Laboratories, Lo		(Purchased Rea		13C2-PFTeDA	50 ug/mL
.LCM4PFHPA_00007	05/27/21		ton Laboratories, Lo		(Purchased Rea		13C4-PFHpA	50 ug/mL
.LCM5PFPEA_00008	05/22/20		ton Laboratories, Lo		(Purchased Rea		13C5-PFPeA	50 ug/mL
.LCM8FOSA_00011	12/22/17		ton Laboratories, Lo		(Purchased Rea		13C8 FOSA	50 ug/mL
.LCMPFBA_00008	05/24/21		gton Laboratories, I		(Purchased Rea		13C4 PFBA	50 ug/mL
.LCMPFDA_00011	08/19/20		gton Laboratories, I		(Purchased Rea		13C2 PFDA	50 ug/mL
.LCMPFDoA_00008	04/08/21		ton Laboratories, L		(Purchased Rea		13C2 PFDoA	50 ug/mL
.LCMPFHxA_00012	04/08/21		ton Laboratories, L		(Purchased Rea		13C2 PFHxA	50 ug/mL
.LCMPFHxS_00008	10/23/20		ton Laboratories, L		(Purchased Rea		1802 PFHxS	47.3 ug/mL
.LCMPFNA_00008	04/13/19		gton Laboratories, I		(Purchased Rea		13C5 PFNA	50 ug/mL
.LCMPFOA_00012	01/22/21		gton Laboratories, L		(Purchased Rea		13C4 PFOA	50 ug/mL
.LCMPFOS_00017	08/03/21		gton Laboratories, L		(Purchased Rea		13C4 PFOS	47.8 ug/mL
.LCMPFUdA_00009	02/12/21	Welling	ton Laboratories, L	ot MPFUdA0216	(Purchased Rea	gent)	13C2 PFUnA	50 ug/mL
LCPFC-L1_00022	05/15/17	12/15/16	MeOH/H2O, Lot 90285	5 5 mL	LCMPFCSU 00047	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 00071	25 uL	Perfluorobutanoic acid (PFBA)	
						1 22 42	Perfluorobutanesulfonic acid	0.442 ng/mL
							(PFBS)	0.5 / -
			I				Perfluorodecanoic acid (PFDA)	0.5 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1

				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorododecanoic acid (PFDoA)	0.5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	0.482 ng/mL
							Perfluoroheptanoic acid (PFHpA)	0.5 ng/mL
							Perfluoroheptanesulfonic Acid	0.476 ng/mL
							Perfluorohexanoic acid (PFHxA)	0.5 ng/mL
							Perfluorohexadecanoic acid	0.5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.455 ng/mL
							Perfluorononanoic acid (PFNA)	0.5 ng/mL
							Perfluorooctanoic acid (PFOA)	0.5 ng/mL
							Perfluorooctadecanoic acid	0.5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	0.464 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	0.5 ng/mL
							Perfluoropentanoic acid (PFPeA)	0.5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	0.5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	0.5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	0.5 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
	0.1 /0= /01				LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008			on Laboratories, Lot M2P		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007			on Laboratories, Lot M2P		(Purchased Read		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007	05/27/21		ton Laboratories, Lot M4F		(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008	05/22/20		ton Laboratories, Lot M5F		(Purchased Read		13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17		ton Laboratories, Lot M8F		(Purchased Read		13C8 FOSA	50 ug/mL
LCMPFBA_00008	05/24/21		gton Laboratories, Lot ME		(Purchased Read		13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20		gton Laboratories, Lot ME		(Purchased Read		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21	welling	ton Laboratories, Lot MP	r DOAU416	(Purchased Read	gent)	13C2 PFDoA	50 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFHxA 00012	04/08/21	Welling	ton Laboratories, Lot M	PFHxA0416	(Purchased Read	gent)	13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20	Welling	ton Laboratories, Lot M	PFHxS1015	(Purchased Read	gent)	1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19		ton Laboratories, Lot M		(Purchased Read	-	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21		gton Laboratories, Lot M		(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		gton Laboratories, Lot M		(Purchased Read	-	13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot M		(Purchased Read		13C2 PFUnA	50 ug/mL
.LCPFCSP 00071	05/15/17		Methanol, Lot 090285	10000 uL	-	2000 uL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
	33, 23, 21		, 200				Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid (PFHxS)	0.091 ug/mL
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
T OD TOO DO OO TO	05/15/17	11/15/16	1 7 1 000005	10000 7	T. GD. D. D. O. O. D. S.	100 7	Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00070	05/15/17	11/12/16	Methanol, Lot 090285	IUUUU uL	LCPFBA_00005		Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005		Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005		Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	(PFDS)	0.482 ug/mL
					LCPFHpA_00005		Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS_00009		Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004		Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA 00005	100 uL	Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005		Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
LCPFBA 00005	05/27/21	Wellin	gton Laboratories, Lot 1	PFBA0516	(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	Welling	ton Laboratories, Lot L	PFBS0316	(Purchased Rea	igent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20		gton Laboratories, Lot 1	PFDA0615	(Purchased Rea	igent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	Welling	ton Laboratories, Lot P	FDoA0115	(Purchased Rea	igent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories, Lot L		(Purchased Rea	igent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00005	01/22/21		ton Laboratories, Lot P	-	(Purchased Rea	igent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20	Welling	ton Laboratories, Lot L	PFHpS1115	(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		gton Laboratories, Lot P		(Purchased Rea	igent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21		ton Laboratories, Lot Pl		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20	Wellingt	on Laboratories, Lot br	PFHxSK0615	(Purchased Rea	igent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories, Lot 1		(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00006	11/06/20		gton Laboratories, Lot 1		(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	_	on Laboratories, Lot br		(Purchased Rea	-	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	_	ton Laboratories, Lot F		(Purchased Rea		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20		ton Laboratories, Lot P		(Purchased Rea	igent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00004	12/09/20	_	ton Laboratories, Lot Pl		(Purchased Rea	-	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00004	12/10/18		ton Laboratories, Lot Pl		(Purchased Rea	_	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	gton Laboratories, Lot P	FUdA0815	(Purchased Rea	igent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L2 00023	05/15/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00047	250 uL	13C2-PFHxDA	50 ng/mL
			,		_		13C2-PFTeDA	50 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.:	: 320-23931-1
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			Reagent	Parent Reage	ent		
Exp	Prep	Dilutant	Final		Volume		
Reagent ID Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
						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
				LCDECCD 00071	E 0T	13C2 PFUnA	50 ng/mL
				LCPFCSP_00071	50 uL	Perfluorobutanoic acid (PFBA) Perfluorobutanesulfonic acid	1 ng/mL 0.884 ng/mL
						(PFBS)	0.004 Hg/IIIL
						Perfluorodecanoic acid (PFDA)	1 ng/mL
						Perfluorododecanoic acid	1 ng/mL
						(PFDoA)	, ,
						Perfluorodecanesulfonic acid (PFDS)	0.964 ng/mL
						Perfluoroheptanoic acid (PFHpA)	1 ng/mL
						Perfluoroheptanesulfonic Acid	0.952 ng/mL
						Perfluorohexanoic acid (PFHxA)	1 ng/mL
						Perfluorohexadecanoic acid	1 ng/mL
						Perfluorohexanesulfonic acid (PFHxS)	0.91 ng/mL
						Perfluorononanoic acid (PFNA)	1 ng/mL
						Perfluorooctanoic acid (PFOA)	1 ng/mL
						Perfluorooctadecanoic acid	1 ng/mL
						Perfluorooctanesulfonic acid (PFOS)	0.928 ng/mL
						Perfluorooctane Sulfonamide (FOSA)	1 ng/mL
						Perfluoropentanoic acid (PFPeA)	1 ng/mL
						Perfluorotetradecanoic acid (PFTeA)	1 ng/mL
						Perfluorotridecanoic Acid (PFTriA)	1 ng/mL
						Perfluoroundecanoic acid (PFUnA)	1 ng/mL
.LCMPFCSU_00047 06/14/	7 12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
				LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
				LCM4PFHPA_00007	1000 uL	13C4-PFHpA	1 ug/mL
				LCM5PFPEA 00008		13C5-PFPeA	1 ug/mL
				LCM8FOSA_00011		13C8 FOSA	1 ug/mL
				LCMPFBA_00008	1000 uL	13C4 PFBA	1 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

				Reagent	Parent Reage:	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
					LCMPFDA 00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA 00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00009	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00008	01/07/21	Wellingt	on Laboratories, Lot M2	PFHxDA1112	(Purchased Read	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M2		(Purchased Read	gent)	13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00007	05/27/21	Wellingt	on Laboratories, Lot M4	PFHpA0516	(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00008	05/22/20		on Laboratories, Lot M5		(Purchased Read		13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17	Wellingt	on Laboratories, Lot M8	FOSA1215I	(Purchased Read	rent)	13C8 FOSA	50 ug/mL
LCMPFBA 00008	05/24/21	Welling	ton Laboratories, Lot M	MPFBA0516	(Purchased Read	rent)	13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20	Welling	ton Laboratories, Lot M	MPFDA0815	(Purchased Read	rent)	13C2 PFDA	50 ug/mL
LCMPFDoA 00008	04/08/21		ton Laboratories, Lot M		(Purchased Read		13C2 PFDoA	50 ug/mL
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot M		(Purchased Read		13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20		ton Laboratories, Lot M		(Purchased Read		1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19		ton Laboratories, Lot M		(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21	_	ton Laboratories, Lot M		(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		ton Laboratories, Lot M		(Purchased Read		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot M		(Purchased Read		13C2 PFUnA	50 ug/mL
.LCPFCSP 00071	05/15/17		Methanol, Lot 090285		LCPFCSP 00070	2000 uL		0.1 ug/mL
	00/10/1/	11,10,10	neonanoi, zee esezee	10000 42		2000 42	Perfluorobutanesulfonic acid	0.0884 ug/mL
							(PFBS)	0.0001 ag/
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid	0.1 ug/mL
							(PFDoA)	
							Perfluorodecanesulfonic acid	0.0964 ug/mL
							(PFDS)	
							Perfluoroheptanoic acid	0.1 ug/mL
							(PFHpA)	_
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							(PFHxS)	J.
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide (FOSA)	0.1 ug/mL
							Perfluoropentanoic acid (PFPeA)	0.1 ug/mL
							Perfluorotetradecanoic acid (PFTeA)	0.1 ug/mL

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			Reagent Dilutant Final Used Volume	Parent Reage	ent			
Reagent ID	Exp Prep Date Date	-		Final	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005		Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA 00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005		Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS 00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA 00004	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006	100 uL	Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA 00005	100 uL	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA 00006	100 uL	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA 00005		Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006		Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004		Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
LCPFBA_00005	05/27/21		gton Laboratories, Lot P		(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21		gton Laboratories, Lot L		(Purchased Rea	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, Lot P		(Purchased Rea		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20		gton Laboratories, Lot Pl		(Purchased Rea		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	Welling	gton Laboratories, Lot Ll	PFDS0516	(Purchased Rea	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00005	01/22/21	•	gton Laboratories, Lot Pl	-	(Purchased Rea	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories, Lot LP		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00004	12/22/20		gton Laboratories, Lot Pl		(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21		ton Laboratories, Lot PF		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20		on Laboratories, Lot brP		(Purchased Rea		Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20	Wellin	gton Laboratories, Lot P	FNA1015	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL

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				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFOA 00006	11/06/20	Wellin	gton Laboratories, Lot	PFOA1115	(Purchased Read	ent)	Perfluorooctanoic acid (PFOA)	50 ug/mI
LCPFODA 00005	01/30/20		gton Laboratories, Lot E		(Purchased Reag	ent)	Perfluorooctadecanoic acid	50 ug/mI
LCPFOS-br_00002	10/14/20	Wellingt	on Laboratories, Lot br	PFOSK1015	(Purchased Reag	ent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	=	ton Laboratories, Lot E		(Purchased Reag	ent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	Welling	ton Laboratories, Lot E	PFPeA0115	(Purchased Reag	ent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00004	12/09/20	Welling	ton Laboratories, Lot P	FTeDA1215	(Purchased Reag	ent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00004		_	ton Laboratories, Lot P		(Purchased Reag	ment)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot F	PFUdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L3 00020	05/15/17 1	2/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00047	250 uL	13C2-PFHxDA	50 ng/mL
-					_		13C2-PFTeDA	50 ng/mI
							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 00071	250 uL	Perfluorobutanoic acid (PFBA)	5 ng/mL
					_		Perfluorobutanesulfonic acid (PFBS)	4.42 ng/mL
							Perfluorodecanoic acid (PFDA)	5 ng/mL
							Perfluorododecanoic acid (PFDoA)	5 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	4.82 ng/mL
							Perfluoroheptanoic acid (PFHpA)	5 ng/mL
							Perfluoroheptanesulfonic Acid	4.76 ng/mL
							Perfluorohexanoic acid (PFHxA)	5 ng/mL
							Perfluorohexadecanoic acid	5 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	4.55 ng/mL
							Perfluorononanoic acid (PFNA)	5 ng/mL
							Perfluorooctanoic acid (PFOA)	5 ng/mL
							Perfluorooctadecanoic acid	5 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	4.64 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1

				Reagent	Parent Reag	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctane Sulfonamide (FOSA)	5 ng/mL
							Perfluoropentanoic acid (PFPeA)	5 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	5 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	5 ng/mL
							Perfluoroundecanoic acid (PFUnA)	5 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008		13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008	01/07/21	Wellingt	on Laboratories, Lot M2P	FHxDA1112	(Purchased Rea	agent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007			on Laboratories, Lot M2P		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007	05/27/21		on Laboratories, Lot M4F		(Purchased Rea		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008	05/22/20		on Laboratories, Lot M5E		(Purchased Rea		13C5-PFPeA	50 ug/mL
LCM8FOSA_00011	12/22/17		on Laboratories, Lot M8F		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA_00008	05/24/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA_00011	08/19/20		ton Laboratories, Lot ME		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA_00012	04/08/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS_00008	10/23/20		ton Laboratories, Lot MP		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA_00008	04/13/19		ton Laboratories, Lot ME		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA_00012	01/22/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS_00017	08/03/21		ton Laboratories, Lot ME		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00009	02/12/21		ton Laboratories, Lot MP		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP_00071	05/15/17	11/10/16	Methanol, Lot 090285	10000 uL	LCPFCSP_00070	2000 uL	Perfluorobutanoic acid (PFBA)	0.1 ug/mL
							Perfluorobutanesulfonic acid (PFBS)	0.0884 ug/mL
							Perfluorodecanoic acid (PFDA)	0.1 ug/mL
							Perfluorododecanoic acid (PFDoA)	0.1 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	0.0964 ug/mL
							Perfluoroheptanoic acid (PFHpA)	0.1 ug/mL

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				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluoroheptanesulfonic Acid	0.0952 ug/mL
							Perfluorohexanoic acid (PFHxA)	0.1 ug/mL
							Perfluorohexadecanoic acid	0.1 ug/mL
							Perfluorohexanesulfonic acid	0.091 ug/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	0.1 ug/mL
							Perfluorooctanoic acid (PFOA)	0.1 ug/mL
							Perfluorooctadecanoic acid	0.1 ug/mL
							Perfluorooctanesulfonic acid (PFOS)	0.0928 ug/mL
							Perfluorooctane Sulfonamide	0.1 ug/mL
							(FOSA)	0.1 49/1111
							Perfluoropentanoic acid	0.1 ug/mL
							(PFPeA)	J.
							Perfluorotetradecanoic acid	0.1 ug/mL
							(PFTeA)	
							Perfluorotridecanoic Acid (PFTriA)	0.1 ug/mL
							Perfluoroundecanoic acid (PFUnA)	0.1 ug/mL
LCPFCSP_00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
					LCPFBS_00005	100 uL	Perfluorobutanesulfonic acid (PFBS)	0.442 ug/mL
					LCPFDA_00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA_00005	100 uL	Perfluorododecanoic acid (PFDoA)	0.5 ug/mL
					LCPFDS_00006	100 uL	Perfluorodecanesulfonic acid (PFDS)	0.482 ug/mL
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid (PFHpA)	0.5 ug/mL
					LCPFHpS 00009	100 uL	Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA 00004		Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
					LCPFHxDA_00006		Perfluorohexadecanoic acid	0.5 ug/mL
					LCPFHxS-br_00002	100 uL	Perfluorohexanesulfonic acid (PFHxS)	0.455 ug/mL
					LCPFNA_00005		Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA_00005		Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br_00002	100 uL	Perfluorooctanesulfonic acid (PFOS)	0.464 ug/mL
					LCPFOSA_00006	100 uL	Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005	100 uL	Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004		Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL

Lab Name:	TestAmerica	Sacramento	Job No.: 320-)-23931-1
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					Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used		Final Volume	Reagent ID	Volume Added	- Analyte	Concentration
LCPFBA 00005	05/27/21		gton Laboratories,			(Purchased Rea	igent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	Welling	ton Laboratories,	Lot	LPFBS0316	(Purchased Rea	,	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA 00005	07/02/20	Welling	gton Laboratories,	Lot	PFDA0615	(Purchased Rea	igent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	Welling	ton Laboratories,	Lot	PFDoA0115	(Purchased Rea	igent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories,			(Purchased Rea	igent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00005	01/22/21	_	ton Laboratories,		-	(Purchased Rea	igent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories,			(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00004	12/22/20		ton Laboratories,			(Purchased Rea		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA 00006	05/25/21		ton Laboratories,			(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20	_	on Laboratories, I			(Purchased Rea	igent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00005	10/23/20		gton Laboratories,			(Purchased Rea		Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00006	11/06/20		gton Laboratories,			(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00005	01/30/20		ton Laboratories,			(Purchased Rea	,	Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	_	on Laboratories,			(Purchased Rea	igent)	Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00006	09/02/17	_	ton Laboratories,			(Purchased Rea	igent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20		ton Laboratories,			(Purchased Rea	_	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00004	12/09/20	=	ton Laboratories,			(Purchased Rea	igent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00004	12/10/18	_	ton Laboratories,			(Purchased Rea		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories,	Lot	PFUdA0815	(Purchased Rea	igent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L4 00024	06/14/17	12/15/16	MeOH/H2O, Lot 090	285	5 mL	LCMPFCSU 00047	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_00074	100 uI	Perfluorobutanoic acid (PFBA)	20 ng/mL
						=		Perfluorobutanesulfonic acid (PFBS)	17.68 ng/mL
								Perfluorodecanoic acid (PFDA)	20 ng/mL

ab Name: TestAmerica Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorododecanoic acid (PFDoA)	20 ng/mL
							Perfluorodecanesulfonic acid (PFDS)	19.28 ng/mL
							Perfluoroheptanoic acid (PFHpA)	20 ng/mL
							Perfluoroheptanesulfonic Acid	19.04 ng/mL
							Perfluorohexanoic acid (PFHxA)	20 ng/mL
							Perfluorohexadecanoic acid	20 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	18.2 ng/mL
							Perfluorononanoic acid (PFNA)	20 ng/mL
							Perfluorooctanoic acid (PFOA)	20 ng/mL
							Perfluorooctadecanoic acid	20 ng/mL
							Perfluorooctanesulfonic acid (PFOS)	18.56 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	20 ng/mL
							Perfluoropentanoic acid (PFPeA)	20 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	20 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	20 ng/mL
							Perfluoroundecanoic acid (PFUnA)	20 ng/mL
.LCMPFCSU_00047	06/14/17 12	2/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA 00007		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
T 01/07 77 00000	01/07/01				LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008			on Laboratories, Lot M2P		(Purchased Read		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA_00007			on Laboratories, Lot M2Pl		(Purchased Read		13C2-PFTeDA	50 ug/mL
LCM4PFHPA_00007			ton Laboratories, Lot M4F		(Purchased Read		13C4-PFHpA	50 ug/mL
LCM5PFPEA_00008			ton Laboratories, Lot MSF		(Purchased Read		13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17 V 05/24/21		ton Laboratories, Lot M8F		(Purchased Read		13C8 FOSA 13C4 PFBA	50 ug/mL
LCMPFBA_00008			gton Laboratories, Lot ME		(Purchased Read			50 ug/mL
LCMPFDA 00011			gton Laboratories, Lot MP		(Purchased Read		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21	weiling	ton Laboratories, Lot MP	DOAU410	(Purchased Read	gent)	13C2 PFDoA	50 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1

				Reagent	Parent Reage	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MPI		3		13C2 PFHxA	
LCMPFHXA_00012	10/23/20		ton Laboratories, Lot MPI		(Purchased Read (Purchased Read		1802 PFHXS	50 ug/mL 47.3 ug/mL
LCMPFNA 00008	04/13/19		ton Laboratories, Lot MP		(Purchased Read		13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21		ton Laboratories, Lot MP		(Purchased Read		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		ton Laboratories, Lot MP		(Purchased Read		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot MP		(Purchased Read		13C2 PFUnA	50 ug/mL
.LCPFCSP 00074			Methanol, Lot 090285	10000 uL			Perfluorobutanoic acid (PFBA)	1 ug/mL
	, , , , , , , ,				LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL		1 ug/mL
					LCPFDoA 00005		Perfluorododecanoic acid	1 ug/mL
							(PFDoA)	
					LCPFDS_00006	200 uL	(PFDS)	0.964 ug/mL
					LCPFHpA_00006		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA 00006	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA_00006		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005	200 uL	Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005	200 uL	Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA_00005	05/27/21		gton Laboratories, Lot Pl		(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	_	ton Laboratories, Lot LP		(Purchased Read	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20	Wellin	gton Laboratories, Lot Pl	FDA0615	(Purchased Read		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	Welling	ton Laboratories, Lot PF	DoA0115	(Purchased Read	gent)	Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	Welling	ton Laboratories, Lot LP	FDS0516	(Purchased Read	gent)	Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00006	01/22/21	Welling	ton Laboratories, Lot PF	НрА0116	(Purchased Read	gent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS 00009	11/06/20	Welling	ton Laboratories, Lot LP1	FHpS1115	(Purchased Read	gent)	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA 00005	12/22/20		ton Laboratories, Lot PF		(Purchased Read		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA 00006	05/25/21	Welling	ton Laboratories, Lot PF	HxDA0516	(Purchased Read	gent)	Perfluorohexadecanoic acid	50 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 320-23	931-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCPFHxS-br_00002	07/03/20	Wellingt	on Laboratories, Lot b	rPFHxSK0615	(Purchased Rea	gent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA 00006	10/23/20	Wellin	gton Laboratories, Lot	PFNA1015	(Purchased Rea	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00006	11/06/20	Wellin	gton Laboratories, Lot	PFOA1115	(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00006	04/29/21		ton Laboratories, Lot		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	_	on Laboratories, Lot b		(Purchased Rea		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00008	09/02/17	_	ton Laboratories, Lot		(Purchased Rea		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20		ton Laboratories, Lot		(Purchased Rea	· .	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00005	12/09/20		ton Laboratories, Lot 1		(Purchased Rea		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00005	02/12/21		ton Laboratories, Lot 1		(Purchased Rea		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ston Laboratories, Lot	PFUdA0815	(Purchased Rea	gent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC-L5 00022	06/14/17	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU 00047	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
					LCPFCSP 00074	250 7	13C2 PFUnA Perfluorobutanoic acid (PFBA)	50 ng/mL
					LCPFCSP_000/4	250 uL	Perfluorobutanesulfonic acid	50 ng/mL 44.2 ng/mL
							(PFBS)	
							Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid	50 ng/mL
							(PFDoA)	50 ng/mL
							Perfluorodecanesulfonic acid	48.2 ng/mL
							(PFDS)	40.2 119/1111
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluoroheptanesulfonic Acid	47.6 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorohexadecanoic acid	50 ng/mL
							Perfluorohexanesulfonic acid	45.5 ng/mL
							(PFHxS)	
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluorooctadecanoic acid	50 ng/mL

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				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Perfluorooctanesulfonic acid (PFOS)	46.4 ng/mL
							Perfluorooctane Sulfonamide (FOSA)	50 ng/mL
							Perfluoropentanoic acid (PFPeA)	50 ng/mL
							Perfluorotetradecanoic acid (PFTeA)	50 ng/mL
							Perfluorotridecanoic Acid (PFTriA)	50 ng/mL
							Perfluoroundecanoic acid (PFUnA)	50 ng/mL
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
					LCM2PFTeDA_00007		13C2-PFTeDA	1 ug/mL
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA_00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA_00011		13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012		13C4 PFOA	1 ug/mL
					LCMPFOS_00017		13C4 PFOS	0.956 ug/mL
					LCMPFUdA_00009		13C2 PFUnA	1 ug/mL
LCM2PFHxDA_00008	01/07/21		on Laboratories, Lot M2P		(Purchased Reag		13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M2P		(Purchased Reag		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00007	05/27/21	Wellingt	on Laboratories, Lot M4F	FHpA0516	(Purchased Reag	ent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00008	05/22/20		on Laboratories, Lot M5F		(Purchased Reag		13C5-PFPeA	50 ug/mL
LCM8FOSA_00011	12/22/17	Wellingt	ton Laboratories, Lot M8F	OSA1215I	(Purchased Reag		13C8 FOSA	50 ug/mL
LCMPFBA 00008	05/24/21	Welling	gton Laboratories, Lot MF	FBA0516	(Purchased Reag	ent)	13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20		gton Laboratories, Lot MF		(Purchased Reag	ent)	13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21		ton Laboratories, Lot MP		(Purchased Reag		13C2 PFDoA	50 ug/mL
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MP		(Purchased Reag		13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20		ton Laboratories, Lot MP		(Purchased Reag		1802 PFHxS	47.3 ug/mL
LCMPFNA_00008	04/13/19	Welling	gton Laboratories, Lot MF	FNA0414	(Purchased Reag		13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21		gton Laboratories, Lot MF	FOA0116	(Purchased Reag		13C4 PFOA	50 ug/mL
LCMPFOS_00017	08/03/21		gton Laboratories, Lot ME		(Purchased Reag		13C4 PFOS	47.8 ug/mL
LCMPFUdA_00009	02/12/21	Welling	ton Laboratories, Lot MP:	FUdA0216	(Purchased Reag		13C2 PFUnA	50 ug/mL
.LCPFCSP_00074	06/14/17	12/14/16	Methanol, Lot 090285	10000 uL	LCPFBA_00005		Perfluorobutanoic acid (PFBA)	1 ug/mL
					LCPFBS_00005	200 uL	Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 עד.	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00005		Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00006	200 uL	Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL

Lab Name: TestAmeric	a Sacramento	Job No.: 320-23931-1
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				Doogont	Parent Reage	ent		
	Exp	Prep	Dilutant	Reagent Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFHpA_00006	200 uL	Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00009	200 117.	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00005	200 ub	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00006		Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid	0.91 ug/mL
					LCPFNA 00006	200 uL	Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA 00006	200 uL	Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00006		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008		Perfluorooctane Sulfonamide (FOSA)	1 ug/mL
					LCPFPeA_00005	200 uL	Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA 00005	05/27/21	Welling	gton Laboratories, Lot P	FBA0516	(Purchased Read	gent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	_	ton Laboratories, Lot L		(Purchased Read	gent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, Lot P		(Purchased Read		Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	_	ton Laboratories, Lot Pl		(Purchased Read		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories, Lot L		(Purchased Read		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00006	01/22/21	_	ton Laboratories, Lot Pl	_	(Purchased Read	· .	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories, Lot LP		(Purchased Read	-	Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00005	12/22/20		ton Laboratories, Lot Pl		(Purchased Read		Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006 LCPFHxS-br_00002	05/25/21 07/03/20		ton Laboratories, Lot PF on Laboratories, Lot brF		(Purchased Read		Perfluorohexadecanoic acid Perfluorohexanesulfonic acid (PFHxS)	50 ug/mL 45.5 ug/mL
LCPFNA 00006	10/23/20	Wellin	gton Laboratories, Lot P	FNA1015	(Purchased Read	gent)	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA 00006	11/06/20		gton Laboratories, Lot F		(Purchased Read	,	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA 00006	04/29/21	Welling	ton Laboratories, Lot Pl	TODA 0 4 1 6	(Purchased Read		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	Wellingt	on Laboratories, Lot bri	PFOSK1015	(Purchased Read		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00008	09/02/17	Welling	ton Laboratories, Lot F	DSA0815I	(Purchased Read	gent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories, Lot P		(Purchased Read	gent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00005	12/09/20	Wellingt	ton Laboratories, Lot PF	TeDA1215	(Purchased Read	gent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00005	02/12/21	Wellingt	ton Laboratories, Lot PF	TrDA0216	(Purchased Read	gent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL

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		-		Reagent Final Volume	Parent Reage	ent		
Reagent ID	Exp Date		Dilutant Used		Reagent ID	Volume Added	Analyte	Concentration
LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot F	PFUdA0815	(Purchased Rea	igent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mI
LCPFC-L6_00020	12/28/16	12/15/16	MeOH/H2O, Lot 090285	5 mL	LCMPFCSU_00047	250 uL	13C2-PFHxDA	50 ng/mI
-							13C2-PFTeDA	50 ng/mI
							13C4-PFHpA	50 ng/mI
							13C5-PFPeA	50 ng/mI
							13C8 FOSA	50 ng/mI
							13C4 PFBA	50 ng/mI
							13C2 PFDA	50 ng/mI
							13C2 PFDoA	50 ng/mI
							13C2 PFHxA	50 ng/mI
							1802 PFHxS	47.3 ng/mI
							13C5 PFNA	50 ng/mI
							13C4 PFOA	50 ng/mI
							13C4 PFOS	47.8 ng/mI
							13C2 PFUnA	50 ng/mI
					T.CDECCD 00074	1000 uL		
					LCPFCSP_00074	1000 uL	Perfluorobutanesulfonic acid	200 ng/mI
								176.8 ng/mI
							(PFBS)	200
							Perfluorodecanoic acid (PFDA)	200 ng/mI
							Perfluorododecanoic acid	200 ng/mI
							(PFDoA) Perfluorodecanesulfonic acid	100 0/
							(PFDS)	192.8 ng/mI
							Perfluoroheptanoic acid (PFHpA)	200 ng/mI
							Perfluoroheptanesulfonic Acid	190.4 ng/mI
							Perfluorohexanoic acid (PFHxA)	200 ng/mI
							Perfluorohexadecanoic acid	200 ng/mI
							Perfluorohexanesulfonic acid (PFHxS)	182 ng/mI
							Perfluorononanoic acid (PFNA)	200 ng/mI
							Perfluorooctanoic acid (PFOA)	200 ng/mI
							Perfluorooctadecanoic acid	200 ng/mI
							Perfluorooctanesulfonic acid	185.6 ng/mI
							Perfluorooctane Sulfonamide (FOSA)	200 ng/mI
							Perfluoropentanoic acid (PFPeA)	200 ng/mI
							Perfluorotetradecanoic acid (PFTeA)	200 ng/mI
							Perfluorotridecanoic Acid (PFTriA)	200 ng/mI
							Perfluoroundecanoic acid (PFUnA)	200 ng/mI
.LCMPFCSU_00047	06/14/17	12/14/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mI
					LCM2PFTeDA_00007	1000 uL	13C2-PFTeDA	1 ug/mI

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reage	ent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCM4PFHPA_00007		13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008	1000 uL	13C5-PFPeA	1 ug/mL
					LCM8FOSA 00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA 00008	1000 uL	13C4 PFBA	1 ug/mL
					LCMPFDA 00011	1000 uL	13C2 PFDA	1 ug/mL
					LCMPFDoA 00008	1000 uL	13C2 PFDoA	1 ug/mL
					LCMPFHxA 00012	1000 uL	13C2 PFHxA	1 ug/mL
					LCMPFHxS 00008	1000 uL	1802 PFHxS	0.946 ug/mL
					LCMPFNA 00008	1000 uL	13C5 PFNA	1 ug/mL
					LCMPFOA 00012	1000 uL	13C4 PFOA	1 ug/mL
					LCMPFOS 00017	1000 uL	13C4 PFOS	0.956 ug/mL
					LCMPFUdA 00009	1000 uL	13C2 PFUnA	1 ug/mL
LCM2PFHxDA 00008	01/07/21	Wellingt	on Laboratories, Lot M21	PFHxDA1112	(Purchased Rea	gent)	13C2-PFHxDA	50 ug/mL
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M21		(Purchased Rea		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00007	05/27/21	Wellingt	on Laboratories, Lot M4	PFHpA0516	(Purchased Rea	gent)	13C4-PFHpA	50 ug/mL
LCM5PFPEA 00008	05/22/20	Wellingt	on Laboratories, Lot M5	PFPeA0515	(Purchased Rea	gent)	13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17		on Laboratories, Lot M8		(Purchased Rea		13C8 FOSA	50 ug/mL
LCMPFBA 00008	05/24/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20		ton Laboratories, Lot M		(Purchased Rea		13C2 PFDA	50 ug/mL
LCMPFDoA 00008	04/08/21		ton Laboratories, Lot MI		(Purchased Rea		13C2 PFDoA	50 ug/mL
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MI		(Purchased Rea		13C2 PFHxA	50 ug/mL
LCMPFHxS 00008	10/23/20		ton Laboratories, Lot MI		(Purchased Rea		1802 PFHxS	47.3 ug/mL
LCMPFNA 00008	04/13/19		ton Laboratories, Lot M		(Purchased Rea		13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21		gton Laboratories, Lot M		(Purchased Rea		13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		ton Laboratories, Lot M		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot MI		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFCSP 00074	06/14/17		Methanol, Lot 090285		LCPFBA 00005		Perfluorobutanoic acid (PFBA)	1 ug/mL
_			,		LCPFBS_00005		Perfluorobutanesulfonic acid (PFBS)	0.884 ug/mL
					LCPFDA 00005	200 uL	Perfluorodecanoic acid (PFDA)	1 ug/mL
					LCPFDoA_00005	200 uL	Perfluorododecanoic acid (PFDoA)	1 ug/mL
					LCPFDS_00006		Perfluorodecanesulfonic acid (PFDS)	0.964 ug/mL
					LCPFHpA_00006		Perfluoroheptanoic acid (PFHpA)	1 ug/mL
					LCPFHpS 00009	200 uL	Perfluoroheptanesulfonic Acid	0.952 ug/mL
					LCPFHxA 00005	200 uL	Perfluorohexanoic acid (PFHxA)	1 ug/mL
					LCPFHxDA 00006	200 uL	Perfluorohexadecanoic acid	1 ug/mL
					LCPFHxS-br_00002		Perfluorohexanesulfonic acid (PFHxS)	0.91 ug/mL
					LCPFNA_00006		Perfluorononanoic acid (PFNA)	1 ug/mL
					LCPFOA_00006		Perfluorooctanoic acid (PFOA)	1 ug/mL
					LCPFODA 00006		Perfluorooctadecanoic acid	1 ug/mL
					LCPFOS-br_00002		Perfluorooctanesulfonic acid (PFOS)	0.928 ug/mL
					LCPFOSA_00008	200 uL	Perfluorooctane Sulfonamide (FOSA)	1 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reag	gent		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	1 ug/mL
					LCPFTeDA_00005		Perfluorotetradecanoic acid (PFTeA)	1 ug/mL
					LCPFTrDA_00005		Perfluorotridecanoic Acid (PFTriA)	1 ug/mL
					LCPFUdA_00005	200 uL	Perfluoroundecanoic acid (PFUnA)	1 ug/mL
LCPFBA 00005	05/27/21		gton Laboratories, I		(Purchased Rea		Perfluorobutanoic acid (PFBA)	50 ug/mL
LCPFBS_00005	03/15/21	_	ton Laboratories, L		(Purchased Red	agent)	Perfluorobutanesulfonic acid (PFBS)	44.2 ug/mL
LCPFDA_00005	07/02/20		gton Laboratories, I		(Purchased Rea	agent)	Perfluorodecanoic acid (PFDA)	50 ug/mL
LCPFDoA_00005	01/30/20	_	ton Laboratories, L		(Purchased Rea		Perfluorododecanoic acid (PFDoA)	50 ug/mL
LCPFDS_00006	05/24/21	_	ton Laboratories, L		(Purchased Re		Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
LCPFHpA_00006	01/22/21	_	ton Laboratories, L	-	(Purchased Red		Perfluoroheptanoic acid (PFHpA)	50 ug/mL
LCPFHpS_00009	11/06/20		ton Laboratories, Lo		(Purchased Rea		Perfluoroheptanesulfonic Acid	47.6 ug/mL
LCPFHxA_00005	12/22/20		ton Laboratories, L		(Purchased Rea	agent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
LCPFHxDA_00006	05/25/21		ton Laboratories, Lo		(Purchased Rea	J '	Perfluorohexadecanoic acid	50 ug/mL
LCPFHxS-br_00002	07/03/20	Wellingt	on Laboratories, Lot	t brPFHxSK0615	(Purchased Rea	agent)	Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
LCPFNA_00006	10/23/20		gton Laboratories, I		(Purchased Rea	<i></i>	Perfluorononanoic acid (PFNA)	50 ug/mL
LCPFOA_00006	11/06/20	Wellin	gton Laboratories, I	Lot PFOA1115	(Purchased Rea	<i></i>	Perfluorooctanoic acid (PFOA)	50 ug/mL
LCPFODA_00006	04/29/21		ton Laboratories, L		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
LCPFOS-br_00002	10/14/20	2	on Laboratories, Lo		(Purchased Re		Perfluorooctanesulfonic acid (PFOS)	46.4 ug/mL
LCPFOSA_00008	09/02/17		ton Laboratories, L		(Purchased Red		Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
LCPFPeA_00005	01/30/20	_	ton Laboratories, L		(Purchased Rea	_	Perfluoropentanoic acid (PFPeA)	50 ug/mL
LCPFTeDA_00005	12/09/20	_	ton Laboratories, Lo		(Purchased Re		Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
LCPFTrDA_00005	02/12/21	_	ton Laboratories, Lo		(Purchased Red		Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
LCPFUdA_00005	08/19/20	Welling	ton Laboratories, L	ot PFUdA0815	(Purchased Rea	agent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL
LCPFC2-L1 00002	01/08/17	07/20/16	MeOH/H2O, Lot 10445	53 5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
	. , ,	, = -	, ,				d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	25 uL	Sodium 1H,1H,2H,2H-perfluorooctane	0.474 ng/mL
I							sulfonate (6:2)	

Lab	Name:	TestAmerica	Sacramento	Job	No.	: 320-23931-	1	

				Reagent	Parent Reagen	t		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.479 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	0.5 ng/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
							MeFOSA	0.5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M_00001	200 uL	d-N-EtFOSA-M	1 ug/mL
_					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M_00001	03/10/19		LLINGTON, Lot dNEtFOSA03		(Purchased Reage		d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M_00001	01/28/19		LLINGTON, Lot dNMeFOSA011		(Purchased Reage		d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA_00001	01/31/18		LINGTON, Lot d3NMeFOSAA0		(Purchased Reage		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00001	05/08/20		LINGTON, Lot d5NEtFOSAA0		(Purchased Reage		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reage		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00001	04/13/17		ELLINGTON, Lot M282FTS041		(Purchased Reage		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0958 ug/mL
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M 00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL

Lab Nam	ne: TestAmerica	Sacramento	Job No.: 320-23931-1

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS	31014	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS	31014	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	W	ELLINGTON, Lot NETFOS	A0714M	(Purchased Reag		N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	W.	ELLINGTON, Lot NEtFOS	AA0113	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	W.	ELLINGTON, Lot NMeFOS	A0714M	(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	W	ELLINGTON, Lot NMeFOS	AA1214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L2_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mI	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
	, , , , ,						d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00014	50 uTi	Sodium	0.948 ng/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	
							N-ethyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
							MeFOSA	1 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	1 ng/mL
.LCMPFC2SU_00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uI	LCd-NEtFOSA-M_00001		d-N-EtFOSA-M	1 ug/mL
					LCd-NMeFOSA-M_00001		d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001		d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M_00001	03/10/19		LLINGTON, Lot dNEtFOS		(Purchased Reag		d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M_00001	01/28/19		LLINGTON, Lot dNMeFOS		(Purchased Reag	,	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA_00001	01/31/18		LLINGTON, Lot d3NMeFO		(Purchased Reag		d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA_00001	05/08/20		LLINGTON, Lot d5NEtFO		(Purchased Reag		d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS_00001	07/15/17		ELLINGTON, Lot M262F1		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS_00001	04/13/17		ELLINGTON, Lot M282F1		(Purchased Reag		M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uI	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.0948 ug/mL

Lab Name: TestAmerica Sacramento Job No.: 33	320-23931-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					3		Sodium	0.0958 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.0550 ag/mi
							N-ethylperfluoro-1-octanesulfo namide	0.1 ug/mL
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002	200 uL	N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M 00001	200 uL	MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17	1	WELLINGTON, Lot 62FTS101	4	(Purchased Reag	rent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17	Ī	WELLINGTON, Lot 82FTS101	4	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WE	LLINGTON, Lot NEtFOSA071	L4M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WE	LLINGTON, Lot NETFOSAA0	113	(Purchased Reag	rent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M_00001	07/15/19		LLINGTON, Lot NMeFOSA071		(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WE	LLINGTON, Lot NMeFOSAA12	214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L3_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00005	250 uL	d-N-EtFOSA-M	50 ng/mL
					_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00014	250 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	4.74 ng/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	4.79 ng/mL
							N-ethylperfluoro-1-octanesulfo namide	5 ng/mL

Lab	Name:	TestAmerica	Sacramento	Job N	0.:	320-239	931-1		

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							N-ethyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
							MeFOSA	5 ng/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	5 ng/mL
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mL
_					LCd-NMeFOSA-M 00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA 00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA 00001	200 uL	d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS 00001	200 uL	M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS 00001	200 uL	M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M 00001	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reag	ent)	d-N-EtFOSA-M	50 ug/mL
LCd-NMeFOSA-M 00001	01/28/19	WE	LLINGTON, Lot dNMeFOSA01	14M	(Purchased Reag	ent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18	WE	LINGTON, Lot d3NMeFOSAA	0113	(Purchased Reag	ent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20	WE	LINGTON, Lot d5NEtFOSAA	0515	(Purchased Reag	ent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reag		M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17	W	ELLINGTON, Lot M282FTS04		(Purchased Reag	ent)	M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00014	01/20/17	07/20/16	Methanol, Lot 104453	5000 uL	LCPFC2SP_00013	500 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) Sodium	0.0948 ug/mL 0.0958 ug/mL
							Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) N-ethylperfluoro-1-octanesulfo	0.0958 ug/mL 0.1 ug/mL
							namide	
							N-ethyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
							MeFOSA	0.1 ug/mL
							N-methyl perfluorooctane sulfonamidoacetic acid	0.1 ug/mL
LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	1 ug/mL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M 00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17		WELLINGTON, Lot 62FTS101		(Purchased Reag		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS101	4	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	-	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
LCN-EtFOSA-M_00002	07/14/19	WE	ELLINGTON, Lot NETFOSA07	14M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WE	CLLINGTON, Lot NETFOSAAO	113	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	WE	LLINGTON, Lot NMeFOSA07	14M	(Purchased Reag	ent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WE	LLINGTON, Lot NMeFOSAA1	214	(Purchased Reag	ent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFC2-L4 00003	02/26/17 09	9/22/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU 00008	250 uL	d-N-EtFOSA-M	50 ng/mL
_					_		d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
							M2-8:2FTS	47.9 ng/mL
					LCPFC2SP 00017	200 uL	Sodium	18.96 ng/mL
							1H,1H,2H,2H-perfluorooctane	, , , , , , , , , , , , , , , , , , , ,
							sulfonate (6:2)	
							Sodium	19.16 ng/mL
							1H,1H,2H,2H-perfluorooctane	
							sulfonate (8:2)	
							N-ethylperfluoro-1-octanesulfo	20 ng/mL
							namide	
							N-ethyl perfluorooctane	20 ng/mL
							sulfonamidoacetic acid	00 / -
							MeFOSA	20 ng/mL
							N-methyl perfluorooctane	20 ng/mL
TOMBEGOGIL 00000	00/06/17 00	100/10	Methanol, Lot 104453	10000	LCd-NEtFOSA-M 00002	200	sulfonamidoacetic acid	1 ug/mL
.LCMPFC2SU_00008	02/26/1/ 08	3/20/10	Methanol, Lot 104453	10000 uL			d-N-MeFOSA-M	
					LCd-NMeFOSA-M_00002			1 ug/mL
					LCd3-NMeFOSAA_00002		d3-NMeFOSAA	1 ug/mL 1 ug/mL
					LCd5-NEtFOSAA_00002 LCM2-6:FTS 00002		d5-NEtFOSAA M2-6:2FTS	
					LCM2-8:2FTS 00002		M2-8:2FTS M2-8:2FTS	0.95 ug/mL
LCd-NEtFOSA-M 00002	02/10/10	T-7777	TITNOMON TAL ANDERDOGACI	21.434	_			0.958 ug/mL
LCd-NMeFOSA-M 00002	03/10/19 06/10/21		LLINGTON, Lot dNEtFOSA03 LLINGTON, Lot dNMeFOSA06		(Purchased Reag (Purchased Reag		d-N-EtFOSA-M d-N-MeFOSA-M	50 ug/mL
								50 ug/mL
LCd3-NMeFOSAA_00002 LCd5-NEtFOSAA_00002	01/20/21 12/07/20		LINGTON, Lot d3NMeFOSAA LINGTON, Lot d5NEtFOSAA		(Purchased Reag		d3-NMeFOSAA d5-NEtFOSAA	50 ug/mL 50 ug/mL
LCM2-6:FTS 00002			ELLINGTON, LOT M262FTS01		(Purchased Reag (Purchased Reag			
LCM2-8:2FTS 00002	01/08/21 01/08/21		ELLINGTON, LOT M282FTS01		(Purchased Reag		M2-6:2FTS M2-8:2FTS	47.5 ug/mL 47.9 ug/mL
				110000	LC6:2FTS 00002			
.LCPFC2SP_00017	03/02/1/09	0/02/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00002	100 uL	Sodium 1H,1H,2H,2H-perfluorooctane	0.474 ug/mL
							sulfonate (6:2)	
					LC8:2FTS 00002	100 11	Sodium	0.479 ug/mL
					100.2112_00002	100 ul	1H,1H,2H,2H-perfluorooctane	U.T/J ug/IIIL
							sulfonate (8:2)	
					LCN-EtFOSA-M 00003	100 117.	N-ethylperfluoro-1-octanesulfo	0.5 ug/mL
					1201 1201 11 00000	100 41	namide	0.5 49/1111
					LCN-EtFOSAA 00002	100 117.	N-ethyl perfluorooctane	0.5 ug/mL
						100 42	sulfonamidoacetic acid	0.0 09/1112
	1				LCN-MeFOSA-M 00002	100 uL		0.5 ug/mL

Lab	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LCN-MeFOSAA_00003	100 uL	N-methyl perfluorooctane sulfonamidoacetic acid	0.5 ug/mI
LC6:2FTS 00002	06/25/21		WELLINGTON, Lot 62FTS061	. 6	(Purchased Reag	ent)	Sodium	47.4 ug/mI
_							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
LC8:2FTS_00002	10/23/20		WELLINGTON, Lot 82FTS101	.5	(Purchased Reag	ent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mI
LCN-EtFOSA-M_00003	05/24/21	WI	ELLINGTON, Lot NETFOSA05	16M	(Purchased Reag	ent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mI
LCN-EtFOSAA_00002	01/20/21	WI	ELLINGTON, Lot NETFOSAA0	116	(Purchased Reag	ent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mI
LCN-MeFOSA-M_00002	05/24/21		ELLINGTON, Lot NMeFOSA07		(Purchased Reag		MeFOSA	50 ug/mI
LCN-MeFOSAA_00003	01/20/21	W	ELLINGTON, Lot NMeFOSAA0	116	(Purchased Reag	ent)	N-methyl perfluorooctane	50 ug/mI
							sulfonamidoacetic acid	
LCPFC2-L5_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mI
							d-N-MeFOSA-M	50 ng/mI
							d3-NMeFOSAA	50 ng/mI
							d5-NEtFOSAA	50 ng/mI
							M2-6:2FTS	47.5 ng/mI
							M2-8:2FTS	47.9 ng/mI
					LCPFC2SP_00013	250 uL	Sodium	47.4 ng/mI
							1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	
							Sodium	47.9 ng/mI
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	
							N-ethylperfluoro-1-octanesulfo namide	50 ng/mI
							N-ethyl perfluorooctane sulfonamidoacetic acid	50 ng/mI
							MeFOSA	50 ng/mI
							N-methyl perfluorooctane sulfonamidoacetic acid	50 ng/mI
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mI
_					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mI
					LCd3-NMeFOSAA 00001		d3-NMeFOSAA	1 ug/mI
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mI
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mI
					LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mI
LCd-NEtFOSA-M_00001	03/10/19		LLINGTON, Lot dNEtFOSA03		(Purchased Reag		d-N-EtFOSA-M	50 ug/mI
LCd-NMeFOSA-M_00001	01/28/19		LLINGTON, Lot dNMeFOSA01		(Purchased Reag		d-N-MeFOSA-M	50 ug/mI
LCd3-NMeFOSAA_00001	01/31/18		LLINGTON, Lot d3NMeFOSAA		(Purchased Reag		d3-NMeFOSAA	50 ug/mI
LCd5-NEtFOSAA_00001	05/08/20		LLINGTON, Lot d5NEtFOSAA		(Purchased Reag		d5-NEtFOSAA	50 ug/mI
LCM2-6:FTS_00001	07/15/17		ELLINGTON, Lot M262FTS07		(Purchased Reag		M2-6:2FTS	47.5 ug/mI
LCM2-8:2FTS_00001	04/13/17		ELLINGTON, Lot M282FTS04		(Purchased Reag		M2-8:2FTS	47.9 ug/mI
.LCPFC2SP_00013	01/20/17	07/20/16	Methanol, Lot 104453	10000 uL	LC6:2FTS_00001	200 uL	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mI

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1	Tab Nama, Mag+7maniaa Caanamanta Tab Na , 200 22021 1
	Lab Name: lestamerica sacramento Job No.: 320-23931-1

				Reagent	Parent Reager	nt		
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
					LC8:2FTS_00001	200 uL	Sodium	0.958 ug/mL
							1H, 1H, 2H, 2H-perfluorooctane	
					LCN-EtFOSA-M 00002	200 117	sulfonate (8:2) N-ethylperfluoro-1-octanesulfo	1 ug/mL
					LCN-ECFOSA-M_00002	200 uL	namide	I ug/IIIL
					LCN-EtFOSAA_00001	200 uL	N-ethyl perfluorooctane	1 ug/mL
							sulfonamidoacetic acid	
					LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS 00001	10/03/17		WELLINGTON, Lot 62FTS101	4	(Purchased Reag	ent)	Sodium	47.4 ug/mL
_							1H,1H,2H,2H-perfluorooctane	
							sulfonate (6:2)	
LC8:2FTS_00001	10/03/17		WELLINGTON, Lot 82FTS101	4	(Purchased Reag	ent)	Sodium	47.9 ug/mL
							1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	
LCN-EtFOSA-M 00002	07/14/19	W	ELLINGTON, Lot NEtFOSA071	1 4 M	(Purchased Reag	rent.)	N-ethylperfluoro-1-octanesulfo	50 ug/mL
		***	EEEEMOTOM, EGG NEGFGOMO		(raronassa noag	(0110)	namide	_
LCN-EtFOSAA_00001	01/29/18	W	ELLINGTON, Lot NETFOSAA01	113	(Purchased Reag	ent)	N-ethyl perfluorooctane	50 ug/mL
TON M. FOOD M. 00001	07/15/10	F-71	DITINGEON THE MATERIAL PORT OF THE	1 436	(D		sulfonamidoacetic acid	F0 - /
LCN-MeFOSA-M_00001	07/15/19 12/09/19		ELLINGTON, Lot NMeFOSA071 ELLINGTON, Lot NMeFOSAA12		(Purchased Reag		MeFOSA N-methyl perfluorooctane	50 ug/mL 50 ug/mL
LCN-Merosaa_00001	12/09/19	VVI	ELLINGION, LOC NMEROSAAL2	214	(Purchased Reag	enc)	sulfonamidoacetic acid	30 ug/IIIL
LCPFC2-L6_00002	01/08/17	07/20/16	MeOH/H2O, Lot 104453	5 mL	LCMPFC2SU_00005	250 uL	d-N-EtFOSA-M	50 ng/mL
							d-N-MeFOSA-M	50 ng/mL
							d3-NMeFOSAA	50 ng/mL
							d5-NEtFOSAA	50 ng/mL
							M2-6:2FTS	47.5 ng/mL
					T. G.D.T. G.O. G.O. G.O. G.O. G.O. G.O. G.O. G	1000 -	M2-8:2FTS	47.9 ng/mL
					LCPFC2SP_00013	1000 uL	1H,1H,2H,2H-perfluorooctane	189.6 ng/mL
							sulfonate (6:2)	
							Sodium	191.6 ng/mL
							1H,1H,2H,2H-perfluorooctane	
							sulfonate (8:2)	
							N-ethylperfluoro-1-octanesulfo	200 ng/mL
							namide	
							N-ethyl perfluorooctane sulfonamidoacetic acid	200 ng/mL
							MeFOSA	200 ng/mL
							N-methyl perfluorooctane	200 ng/mL
							sulfonamidoacetic acid	200 1197 1111
.LCMPFC2SU 00005	01/08/17	07/08/16	Methanol, Lot 104453	10000 uL	LCd-NEtFOSA-M 00001	200 uL	d-N-EtFOSA-M	1 ug/mL
_					LCd-NMeFOSA-M_00001	200 uL	d-N-MeFOSA-M	1 ug/mL
					LCd3-NMeFOSAA_00001	200 uL	d3-NMeFOSAA	1 ug/mL
					LCd5-NEtFOSAA_00001		d5-NEtFOSAA	1 ug/mL
					LCM2-6:FTS_00001		M2-6:2FTS	0.95 ug/mL
					LCM2-8:2FTS_00001		M2-8:2FTS	0.958 ug/mL
LCd-NEtFOSA-M_00001	03/10/19	WE	LLINGTON, Lot dNEtFOSA03	14M	(Purchased Reag	ent)	d-N-EtFOSA-M	50 ug/mL

Lab 1	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reage	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCd-NMeFOSA-M 00001	01/28/19	WELLI	NGTON, Lot dNMeFOSAC)114M	(Purchased Read	rent)	d-N-MeFOSA-M	50 ug/mL
LCd3-NMeFOSAA 00001	01/31/18	WELLIN	NGTON, Lot d3NMeFOSA	A0113	(Purchased Read	gent)	d3-NMeFOSAA	50 ug/mL
LCd5-NEtFOSAA 00001	05/08/20	WELLIN	NGTON, Lot d5NEtFOSA	A0515	(Purchased Read	gent)	d5-NEtFOSAA	50 ug/mL
LCM2-6:FTS 00001	07/15/17	WELL	INGTON, Lot M262FTS0	714	(Purchased Read	gent)	M2-6:2FTS	47.5 ug/mL
LCM2-8:2FTS 00001	04/13/17	WELL	INGTON, Lot M282FTSO)414	(Purchased Read	gent)	M2-8:2FTS	47.9 ug/mL
.LCPFC2SP_00013	01/20/17 07	7/20/16 Me	thanol, Lot 104453	10000 uL	LC6:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	0.948 ug/mL
					LC8:2FTS_00001		Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	0.958 ug/mL
					LCN-EtFOSA-M_00002		N-ethylperfluoro-1-octanesulfo namide	
					LCN-EtFOSAA_00001		N-ethyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
					LCN-MeFOSA-M_00001		MeFOSA	1 ug/mL
					LCN-MeFOSAA_00001	200 uL	N-methyl perfluorooctane sulfonamidoacetic acid	1 ug/mL
LC6:2FTS_00001	10/03/17	WEL	LINGTON, Lot 62FTS10)14	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	47.4 ug/mL
LC8:2FTS_00001	10/03/17	WEL	LINGTON, Lot 82FTS10)14	(Purchased Read	gent)	Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)	47.9 ug/mL
LCN-EtFOSA-M_00002	07/14/19	WELL]	INGTON, Lot NETFOSAO	714M	(Purchased Reac	gent)	N-ethylperfluoro-1-octanesulfo namide	50 ug/mL
LCN-EtFOSAA_00001	01/29/18	WELL]	INGTON, Lot NETFOSAA	0113	(Purchased Reac	gent)	N-ethyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCN-MeFOSA-M 00001	07/15/19	WELLI	INGTON, Lot NMeFOSAO	714M	(Purchased Read	gent)	MeFOSA	50 ug/mL
LCN-MeFOSAA_00001	12/09/19	WELL	INGTON, Lot NMeFOSAA	1214	(Purchased Read	gent)	N-methyl perfluorooctane sulfonamidoacetic acid	50 ug/mL
LCPFCIC 00020	03/01/17 12	2/01/16 Me	OH/H2O, Lot 09285	5 mI	LCMPFCSU 00046	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
							Perfluorobutanoic acid (PFBA)	50 ng/mL

Lab	Name: TestAmer	rica Sacramento	Job No.: 320-23931-1	

				Reagent	Parent Reager	nt		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
							Perfluorodecanesulfonic acid (PFDS)	48.25 ng/mL
							Perfluorodecanoic acid (PFDA)	50 ng/mL
							Perfluorododecanoic acid	50 ng/mL
							(PFDoA)	
							Perfluoroheptanoic acid (PFHpA)	50 ng/mL
							Perfluorohexanesulfonic acid (PFHxS)	47.25 ng/mL
							Perfluorohexanoic acid (PFHxA)	50 ng/mL
							Perfluorononanoic acid (PFNA)	50 ng/mL
							Perfluorooctanesulfonic acid	47.75 ng/mL
							(PFOS)	
							Perfluorooctanoic acid (PFOA)	50 ng/mL
							Perfluoropentanoic acid	50 ng/mL
							(PFPeA) Perfluorotetradecanoic acid	50 ng/mL
							(PFTeA)	JU 119/11111
							Perfluorotridecanoic Acid	50 ng/mL
							(PFTriA)	, , ,
							Perfluoroundecanoic acid	50 ng/mL
					LODECTIM OCCUP	250	(PFUnA) Perfluorooctane Sulfonamide	E O / T
					LCPFC3IM_00005	250 UL	(FOSA)	50 ng/mL
.LCMPFCSU_00046	03/01/17	11/03/16	Methanol, Lot Baker 144541	50000 uL	LCM2PFHxDA_00008	1000 uL	13C2-PFHxDA	1 ug/mL
			111011		LCM2PFTeDA 00007	1000 uL	13C2-PFTeDA	1 ug/mL
					LCM4PFHPA 00007	1000 uL	13C4-PFHpA	1 ug/mL
					LCM5PFPEA 00008		13C5-PFPeA	1 ug/mL
					LCM8FOSA 00011	1000 uL	13C8 FOSA	1 ug/mL
					LCMPFBA_00008		13C4 PFBA	1 ug/mL
					LCMPFDA_00011		13C2 PFDA	1 ug/mL
					LCMPFDoA_00008		13C2 PFDoA	1 ug/mL
					LCMPFHxA_00012		13C2 PFHxA	1 ug/mL
					LCMPFHxS_00008		1802 PFHxS	0.946 ug/mL
					LCMPFNA_00008		13C5 PFNA	1 ug/mL
					LCMPFOA_00012 LCMPFOS 00017		13C4 PFOA 13C4 PFOS	1 ug/mL
					LCMPFUGA 00009		13C2 PFUNA	0.956 ug/mL 1 ug/mL
LCM2PFHxDA 00008	01/07/21	Wellingt	l on Laboratories, Lot M2F	FH~DA1112	(Purchased Reag		13C2-PFHXDA	50 ug/mL
LCM2PFTeDA 00007	12/07/20		on Laboratories, Lot M2F		(Purchased Reag		13C2-PFTeDA	50 ug/mL
LCM4PFHPA 00007	05/27/21		on Laboratories, Lot M41		(Purchased Reag		13C4-PFHpA	50 ug/mL
LCM5PFPEA 00008	05/22/20		on Laboratories, Lot M51		(Purchased Reag		13C5-PFPeA	50 ug/mL
LCM8FOSA 00011	12/22/17		on Laboratories, Lot M81		(Purchased Reag		13C8 FOSA	50 ug/mL
LCMPFBA 00008	05/24/21		ton Laboratories, Lot M		(Purchased Reag		13C4 PFBA	50 ug/mL
LCMPFDA 00011	08/19/20		gton Laboratories, Lot M		(Purchased Reag		13C2 PFDA	50 ug/mL
LCMPFDoA_00008	04/08/21	Welling	ton Laboratories, Lot MP	FDoA0416	(Purchased Reag	ent)	13C2 PFDoA	50 ug/mL
LCMPFHxA 00012	04/08/21		ton Laboratories, Lot MP		(Purchased Reag		13C2 PFHxA	50 ug/mL
LCMPFHxS_00008	10/23/20	Welling	ton Laboratories, Lot MP	FHxS1015	(Purchased Reag	ent)	1802 PFHxS	47.3 ug/mL

Lab 1	Name:	TestAmerica	Sacramento	Job No.: 320-23931-1
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				Reagent	Parent Reag	ent		
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
LCMPFNA 00008	04/13/19	Welling	gton Laboratories, Lo	t MPFNA0414	(Purchased Rea	agent)	13C5 PFNA	50 ug/mL
LCMPFOA 00012	01/22/21	Welling	ton Laboratories, Lo	t MPFOA0116	(Purchased Rea	agent)	13C4 PFOA	50 ug/mL
LCMPFOS 00017	08/03/21		gton Laboratories, Lo		(Purchased Rea		13C4 PFOS	47.8 ug/mL
LCMPFUdA 00009	02/12/21		ton Laboratories, Lot		(Purchased Rea		13C2 PFUnA	50 ug/mL
.LCPFACMXB 00007	11/06/20		on Laboratories, Lot		(Purchased Rea		Perfluorobutanesulfonic acid	1.77 ug/mL
	,,				(= == =================================	- 5 7	(PFBS)	
							Perfluorobutanoic acid (PFBA)	2 ug/mL
							Perfluorodecanesulfonic acid	1.93 ug/mL
							(PFDS)	, , , ,
							Perfluorodecanoic acid (PFDA)	2 ug/mL
							Perfluorododecanoic acid	2 ug/mL
							(PFDoA)	
							Perfluoroheptanoic acid	2 ug/mL
							(PFHpA)	3.
							Perfluorohexanesulfonic acid	1.89 ug/mL
							(PFHxS)	
							Perfluorohexanoic acid (PFHxA)	2 ug/mL
							Perfluorononanoic acid (PFNA)	2 ug/mL
							Perfluorooctanesulfonic acid	1.91 ug/mL
							(PFOS)	
							Perfluorooctanoic acid (PFOA)	2 ug/mL
							Perfluoropentanoic acid	2 ug/mL
							(PFPeA)	_
							Perfluorotetradecanoic acid	2 ug/mL
							(PFTeA)	
							Perfluorotridecanoic Acid	2 ug/mL
							(PFTriA)	
							Perfluoroundecanoic acid	2 ug/mL
							(PFUnA)	
.LCPFC3IM_00005	06/01/17	12/01/16	Methanol, Lot 090285	5 mL	LCPFOSA_00008	0.1 mL	Perfluorooctane Sulfonamide	1000 ng/mL
							(FOSA)	
LCPFOSA_00008	09/02/17	Welling	gton Laboratories, Lo	t FOSA0815I	(Purchased Rea	agent)	Perfluorooctane Sulfonamide	50 ug/mL
							(FOSA)	
LCPFCSP 00070	05/15/17	11/15/16	Methanol, Lot 090285	10000 uL	LCPFBA 00005	100 uL	Perfluorobutanoic acid (PFBA)	0.5 ug/mL
_					LCPFBS_00005	100 uL	Perfluorobutane Sulfonate	0.442 ug/mL
					_		Perfluorobutanesulfonic acid	0.442 ug/mL
							(PFBS)	_
					LCPFDA 00005	100 uL	Perfluorodecanoic acid (PFDA)	0.5 ug/mL
					LCPFDoA 00005	100 uL	Perfluorododecanoic acid	0.5 ug/mL
					_		(PFDoA)	
					LCPFDS 00006	100 uL	Perfluorodecane Sulfonate	0.482 ug/mL
					_		Perfluorodecanesulfonic acid	0.482 ug/mL
							(PFDS)	
					LCPFHpA_00005	100 uL	Perfluoroheptanoic acid	0.5 ug/mL
					_		(PFHpA)	
					LCPFHpS_00009	100 uL	Perfluoroheptane Sulfonate	0.476 ug/mL
							Perfluoroheptanesulfonic Acid	0.476 ug/mL
					LCPFHxA_00004	100 uL	Perfluorohexanoic acid (PFHxA)	0.5 ug/mL
				1	LCPFHxDA 00006		Perfluorohexadecanoic acid	0.5 ug/mL

Lab	Name: TestAmerica	Sacramento	Job No.: 320-23931-1

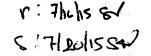
				Reagent	Parent Reagent			
	Exp	Prep	Dilutant	Final		Volume		
Reagent ID	Date	Date	Used	Volume	Reagent ID	Added	Analyte	Concentration
neagene 12	2400	2400		10141110			-	
					LCPFHxS-br_00002	100 uL	Perfluorohexane Sulfonate Perfluorohexanesulfonic acid	0.455 ug/mL
							(PFHxS)	0.455 ug/mL
					LCPFNA 00005	100 117.	Perfluorononanoic acid (PFNA)	0.5 ug/mL
					LCPFOA 00006	100 ul	Perfluorooctanoic acid (PFOA)	0.5 ug/mL
					LCPFODA 00005		Perfluorooctadecanoic acid	0.5 ug/mL
					LCPFOS-br 00002		Perfluorooctanesulfonic acid	0.464 ug/mL
					_		(PFOS)	
					LCPFOSA_00006		Perfluorooctane Sulfonamide (FOSA)	0.5 ug/mL
					LCPFPeA_00005		Perfluoropentanoic acid (PFPeA)	0.5 ug/mL
					LCPFTeDA_00004	100 uL	Perfluorotetradecanoic acid (PFTeA)	0.5 ug/mL
					LCPFTrDA_00004	100 uL	Perfluorotridecanoic Acid (PFTriA)	0.5 ug/mL
					LCPFUdA_00005	100 uL	Perfluoroundecanoic acid (PFUnA)	0.5 ug/mL
.LCPFBA 00005	05/27/21	Wellin	gton Laboratories, Lot P	I FBA0516	(Purchased Rea	agent)	Perfluorobutanoic acid (PFBA)	50 ug/mL
.LCPFBS 00005	03/15/21		ton Laboratories, Lot LE		` ,		Perfluorobutane Sulfonate	44.2 ug/mL
.1011180_00000	00, 10, 21		2001 200010001100, 200 21	1200010	(= 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	-9	Perfluorobutanesulfonic acid	44.2 ug/mL
.LCPFDA 00005	07/02/20	T-7 - 1 1	gton Laboratories, Lot P	DD3061E	(Purchased Rea	± \	(PFBS) Perfluorodecanoic acid (PFDA)	50 ug/mL
.LCPFDoA 00005	01/30/20	Wellin	ton Laboratories, Lot P	FDAUGIJ	(Purchased Rea		Perfluorododecanoic acid	50 ug/mL
_					(Fulchased Rea	agent)	(PFDoA)	JU ug/IIIL
.LCPFDS_00006	05/24/21	Welling	ton Laboratories, Lot LE	PFDS0516	(Purchased Rea	agent)	Perfluorodecane Sulfonate	48.2 ug/mL
							Perfluorodecanesulfonic acid (PFDS)	48.2 ug/mL
.LCPFHpA_00005	01/22/21	Welling	ton Laboratories, Lot PA	THpA0116	(Purchased Rea	agent)	Perfluoroheptanoic acid (PFHpA)	50 ug/mL
.LCPFHpS 00009	11/06/20	Welling	ton Laboratories, Lot LP	FHn91115	(Purchased Rea	agent)	Perfluoroheptane Sulfonate	47.6 ug/mL
. Herrings_ooos	11/00/20	WCITING	con haboracories, hot hi	Inpoilio	(rarenasea kea	igene/	Perfluoroheptanesulfonic Acid	47.6 ug/mL
.LCPFHxA 00004	12/22/20	Welling	ton Laboratories, Lot PE	TH×A1215	(Purchased Rea	agent)	Perfluorohexanoic acid (PFHxA)	50 ug/mL
.LCPFHxDA 00006	05/25/21		ton Laboratories, Lot PF		(Purchased Rea		Perfluorohexadecanoic acid	50 ug/mL
.LCPFHxS-br 00002	07/03/20		on Laboratories, Lot brP		(Purchased Rea		Perfluorohexane Sulfonate	45.5 ug/mL
		, ,					Perfluorohexanesulfonic acid (PFHxS)	45.5 ug/mL
.LCPFNA 00005	10/23/20	Wellin	gton Laboratories, Lot P	FNA1015	(Purchased Rea	agent)	Perfluorononanoic acid (PFNA)	50 ug/mL
.LCPFOA 00006	11/06/20	Wellin	gton Laboratories, Lot P	FOA1115	(Purchased Rea		Perfluorooctanoic acid (PFOA)	50 ug/mL
.LCPFODA 00005	01/30/20		ton Laboratories, Lot PE		(Purchased Rea		Perfluorooctadecanoic acid	50 ug/mL
.LCPFOS-br 00002	10/14/20		on Laboratories, Lot br		(Purchased Rea	-	Perfluorooctanesulfonic acid	46.4 ug/mL
	-, ,				, , , , , , , , , , , , , , , , , , , ,	J - /	(PFOS)	
.LCPFOSA_00006	09/02/17	Welling	ton Laboratories, Lot FC)SA0815I	(Purchased Rea	agent)	Perfluorooctane Sulfonamide (FOSA)	50 ug/mL
.LCPFPeA_00005	01/30/20	Welling	ton Laboratories, Lot PF	PeA0115	(Purchased Rea	agent)	Perfluoropentanoic acid (PFPeA)	50 ug/mL
.LCPFTeDA_00004	12/09/20	Welling	ton Laboratories, Lot PF	TeDA1215	(Purchased Rea	agent)	Perfluorotetradecanoic acid (PFTeA)	50 ug/mL
.LCPFTrDA_00004	12/10/18	Welling	ton Laboratories, Lot PF	TrDA1213	(Purchased Rea	agent)	Perfluorotridecanoic Acid (PFTriA)	50 ug/mL
					l .		(/	

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-23931-1
~~~					
SDG	No.:				

				Reagent	Parent Reagent			
Reagent ID	Exp Date	Prep Date	Dilutant Used	Final Volume	Reagent ID	Volume Added	Analyte	Concentration
.LCPFUdA_00005	08/19/20	Welling	ton Laboratories, Lot PF	UdA0815	(Purchased Reag	ent)	Perfluoroundecanoic acid (PFUnA)	50 ug/mL

# Reagent

LC6:2FTS_00001





## **CERTIFICATE OF ANALYSIS DOCUMENTATION**

**PRODUCT CODE:** 

6:2FTS

LOT NUMBER:

62FTS1014

**COMPOUND:** 

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

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

C_aH₄F₁₃SO₃Na

**MOLECULAR WEIGHT:** 

450.15

**CONCENTRATION:** 

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

(6:2FTS anion) 47.4 ± 2.4 µg/ml

Methanol

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

10/03/2014

EXPIRY DATE: (mm/dd/yyyy)

10/03/2017

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

**Date**: 03/27/2015

#### INTENDED USE:

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

#### **HAZARDS:**

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

#### **SYNTHESIS / CHARACTERIZATION:**

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

## **HOMOGENEITY:**

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

## **UNCERTAINTY:**

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

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

#### TRACEABILITY:

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

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

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

## **LIMITED WARRANTY:**

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

## **QUALITY MANAGEMENT:**

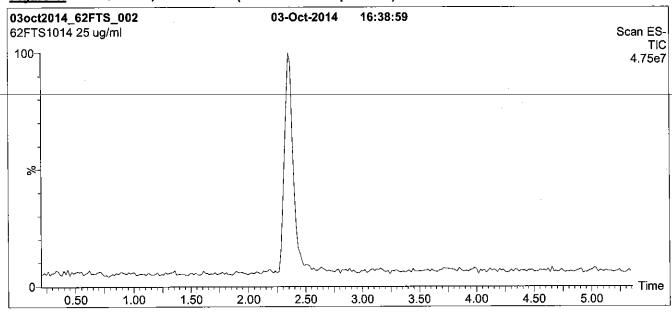
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

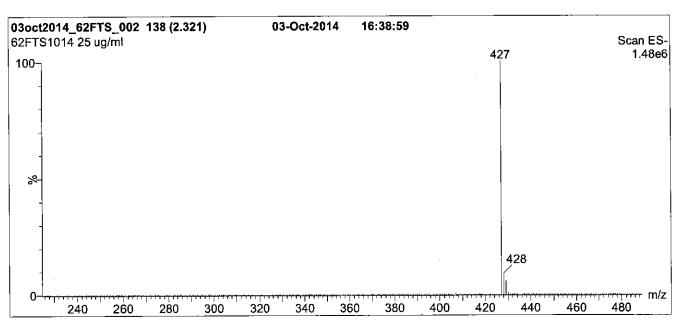




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





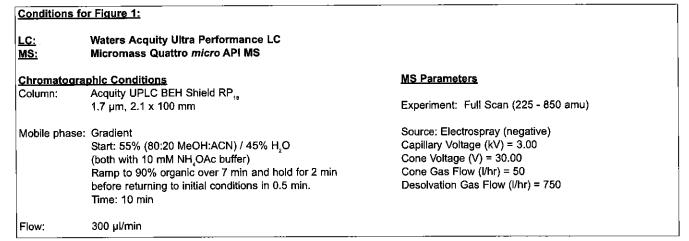
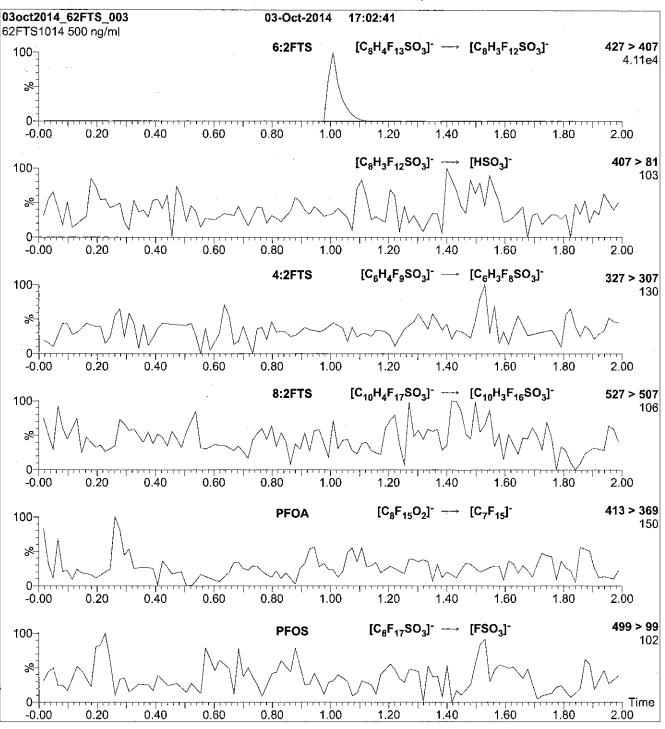
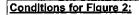


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml 6:2FTS)

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

(both with 10 mM NH,OAc buffer)

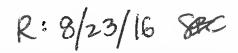
300 µl/min

**MS Parameters** 

Collision Gas (mbar) = 3.50e-3 Collision Energy (eV) = 25

# Reagent

LC6:2FTS_00002





Exp: 05/25/21 Prpd; SBC



## **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

6:2FTS

**LOT NUMBER:** 

62FTS0616

**COMPOUND:** 

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C_aH₄F₁₃SO₃Na

**MOLECULAR WEIGHT:** 

450.15

**CONCENTRATION:** 

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

47.4 ± 2.4 µg/ml

SOLVENT(S): (Na salt)

(6:2FTS anion)

Methanol

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

06/25/2016

EXPIRY DATE: (mm/dd/yyyy)

06/25/2021

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 06/29/2016

## INTENDED USE:

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

## **HAZARDS:**

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

## SYNTHESIS / CHARACTERIZATION:

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

## HOMOGENEITY:

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

## **UNCERTAINTY:**

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

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

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

## TRACEABILITY:

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

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

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

## LIMITED WARRANTY:

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

## **QUALITY MANAGEMENT:**

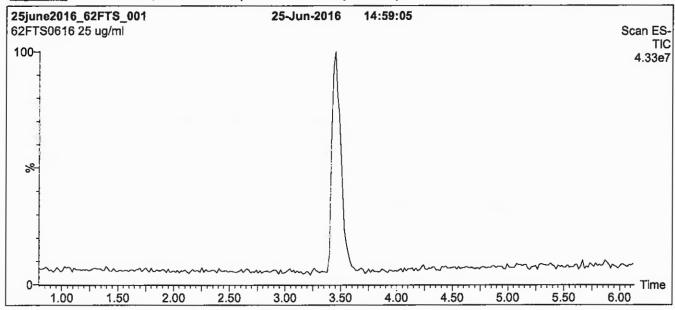
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

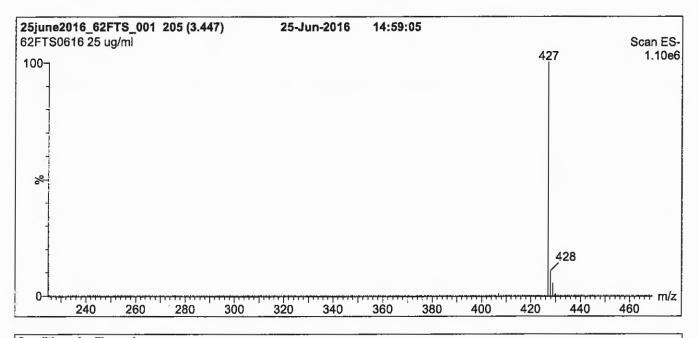




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





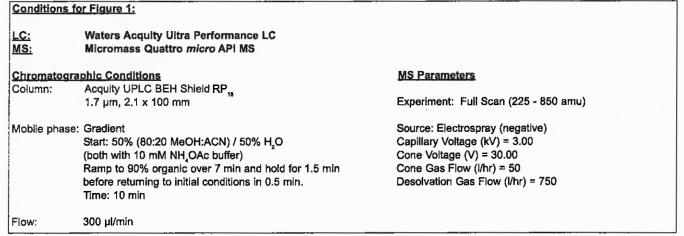
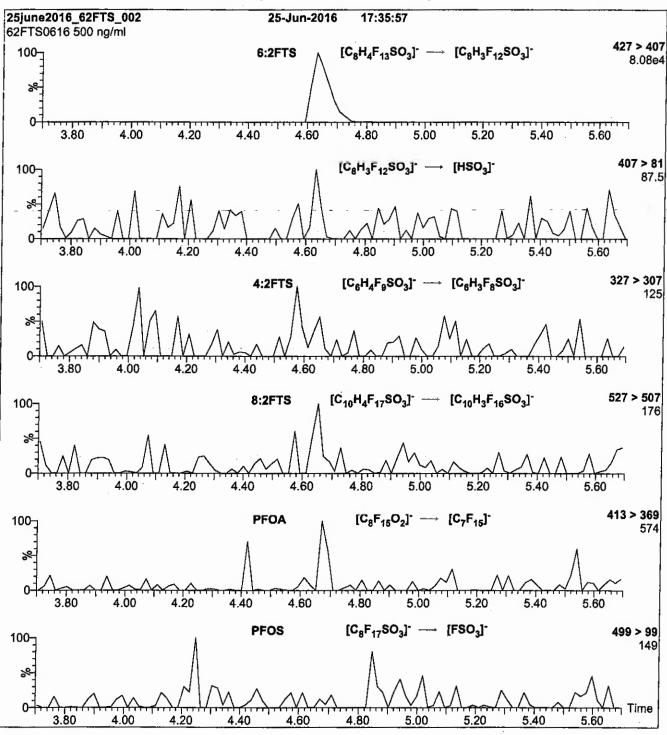
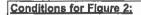


Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml 6:2FTS)

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

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

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

LC8:2FTS_00001

7: 711clis 87 5: 712dis 57



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

8:2FTS

LOT NUMBER:

82FTS1014

COMPOUND.

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

**STRUCTURE:** 

CAS #:

Not available

F F F F F F F H H

**MOLECULAR FORMULA:** 

C,,H,F,,SO,Na

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

**MOLECULAR WEIGHT:** 

550.16

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/03/2014

EXPIRY DATE: (mm/dd/yyyy)

10/03/2017

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

(8:2FTS anion)

Certified By:

D C Christian

Date:

<u>03/27/2015</u>

(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:**

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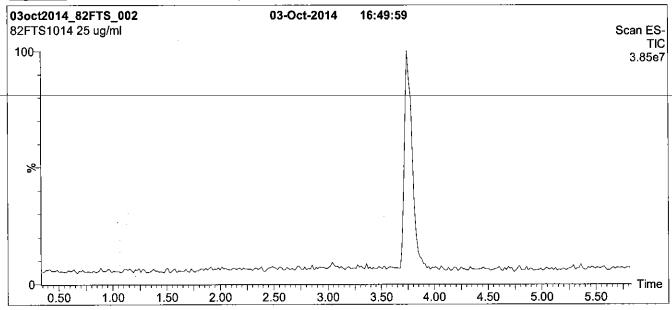
#### **QUALITY MANAGEMENT:**

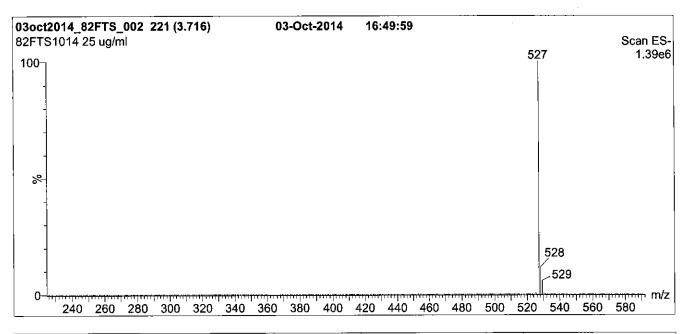
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Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)





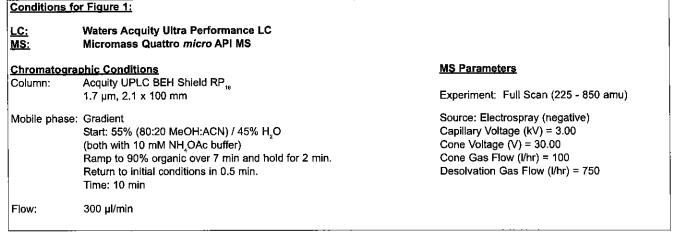
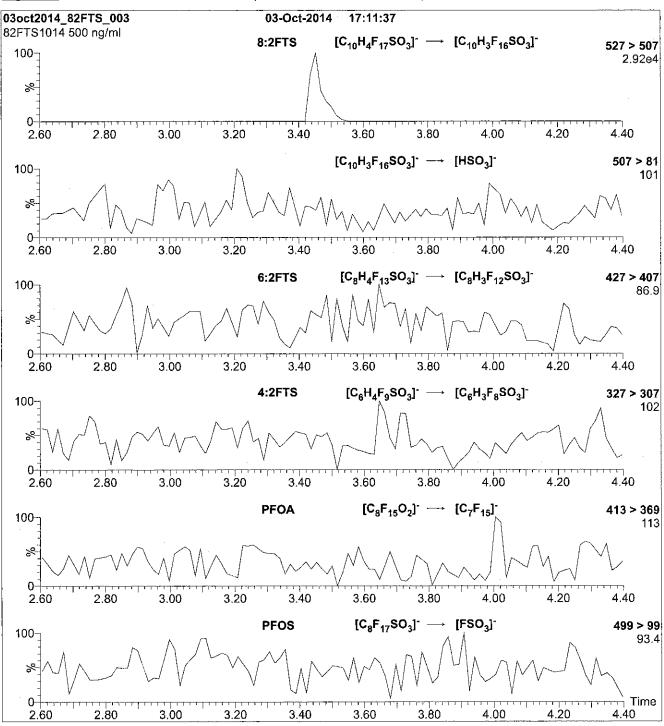
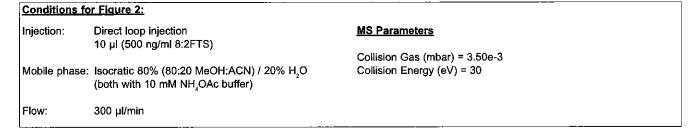


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LC8:2FTS_00002

R: 8/23/16 880





### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

8:2FTS

LOT NUMBER:

82FTS1015

COMPOUND:

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

**STRUCTURE:** 

CAS #:

Not available

F F F F F F F H H SO₃ Na⁺

**MOLECULAR FORMULA:** 

C₁₀H₄F₁₇SO₃Na

**MOLECULAR WEIGHT:** 

550.16

**CONCENTRATION:** 

50.0 ± 2.5 μg/ml 47.9 ± 2.4 μg/ml

(Na salt) SOLVENT(S):

(8:2FTS anion)

Methanol

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

D.C. Chittim

Date:

<u> 10/27/2015</u>

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

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#### **HAZARDS:**

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 furne 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.

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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.

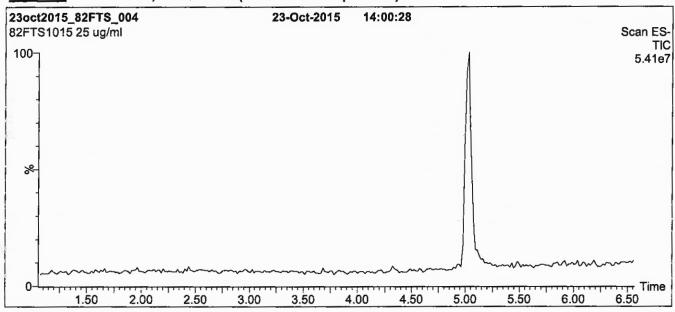
#### QUALITY MANAGEMENT:

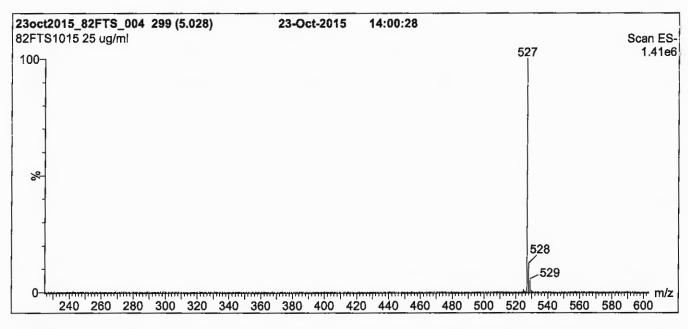
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Figure 1: 8:2FTS; LC/MS Data (TIC and Mass Spectrum)





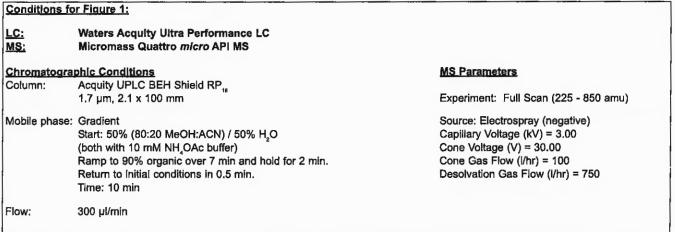
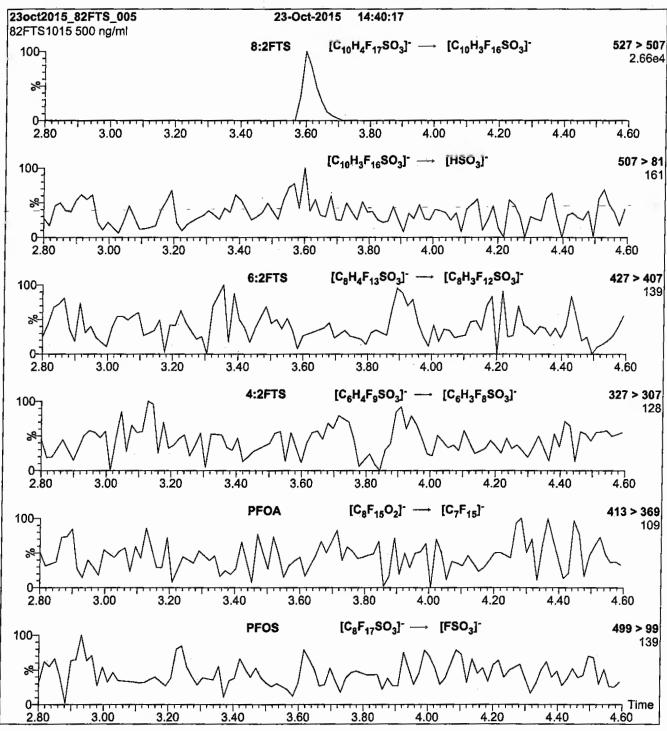
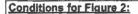


Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml 8:2FTS)

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

(both with 10 mM NH OAc buffer)

#### **MS Parameters**

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

Flow:

300 µl/min

# LCd-NEtFOSA-M_00001



### **CERTIFICATE OF ANALYSIS DOCUMENTATION**

**PRODUCT CODE:** 

d-N-EtFOSA-M

**LOT NUMBER:** 

dNEtFOSA0314M

**COMPOUND:** 

N-ethyl-d_e-perfluoro-1-octanesulfonamide

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C₁₀D₅HF₁₇NO₂S

**CONCENTRATION:** 

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

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

03/10/2014

EXPIRY DATE: (mm/dd/yyyy)

03/10/2019

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:** 

532.23

SOLVENT(S):

Methanol

**ISOTOPIC PURITY:** 

≥98% ²H₅

#### **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>

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#### **HAZARDS:**

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#### **HOMOGENEITY:**

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

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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.

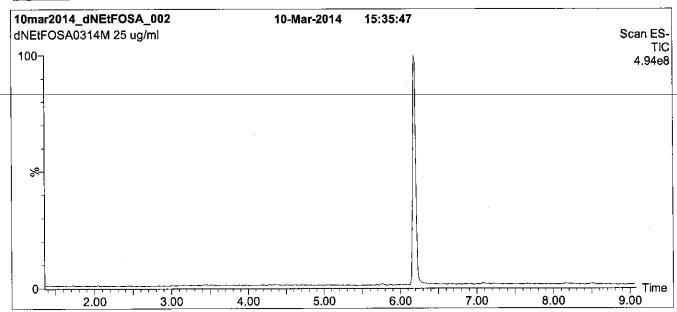
#### **QUALITY MANAGEMENT:**

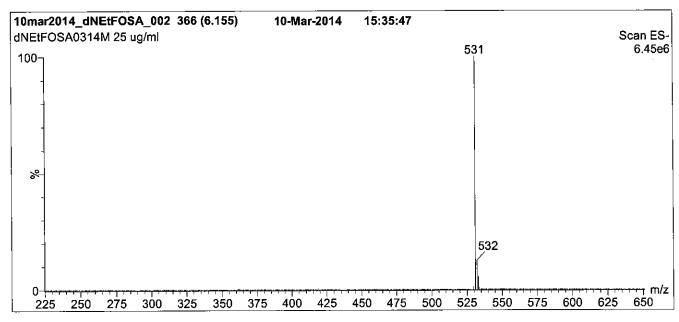
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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





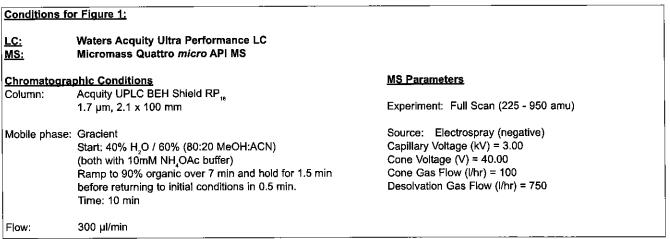
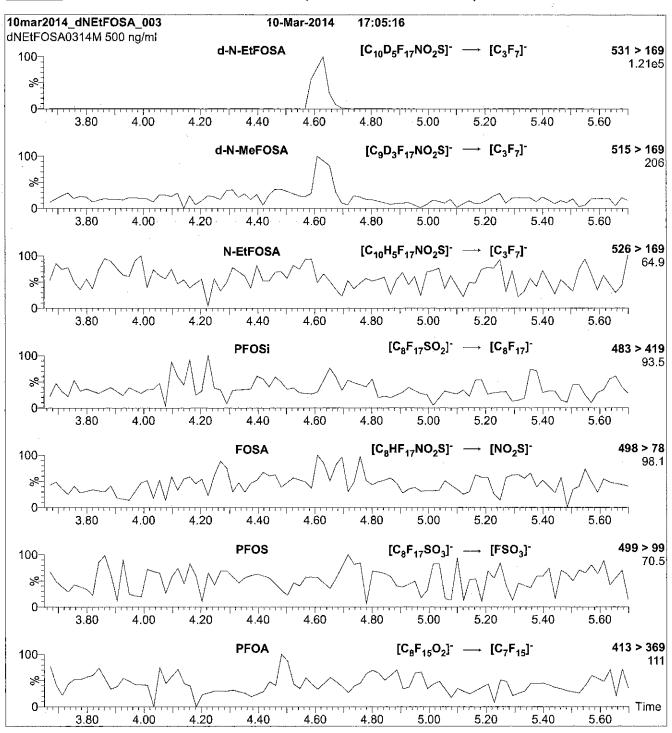
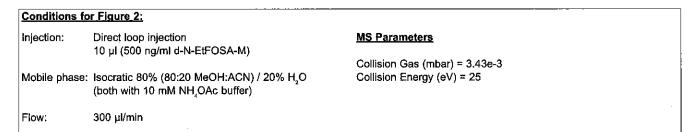


Figure 2: d-N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





# LCd-NEtFOSA-M_00002



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

d-N-EtFOSA-M

LOT NUMBER:

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

SOLVENT(S):

dNEtFOSA0314M

532.23

Methanol

≥98% ²H_e

COMPOUND:

N-ethyl-d_-perfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

Not available

**MOLECULAR FORMULA:** 

C₁₀D₅HF₁₇NO₂S

**CONCENTRATION:** 

 $50 \pm 2.5 \mu g/ml$ 

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

03/10/2014

EXPIRY DATE: (mm/dd/yyyy)

03/10/2019

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### ADDITIONAL INFORMATION:

See page 2 for further details.

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Certified By:

Date: 04/01/2015

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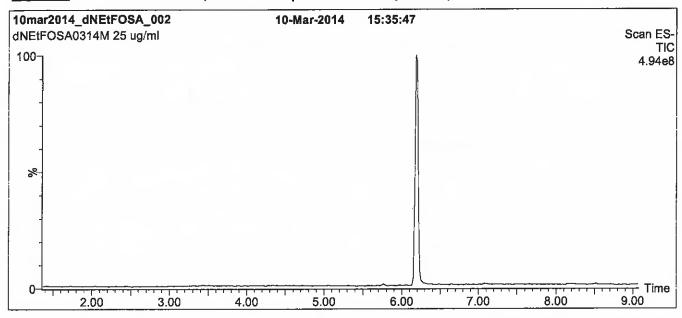
#### **QUALITY MANAGEMENT:**

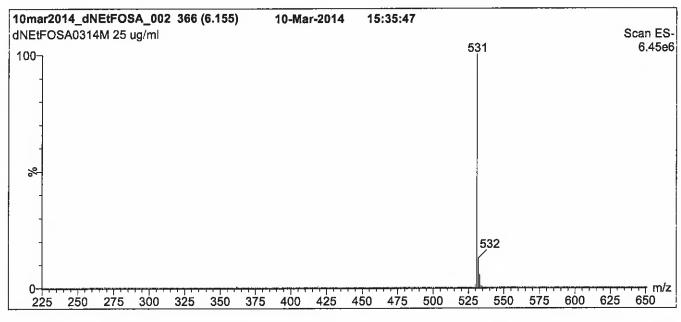
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Figure 1: d-N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





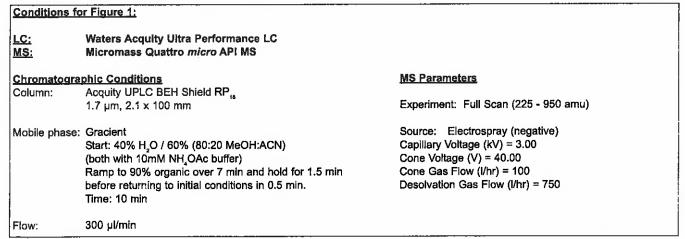
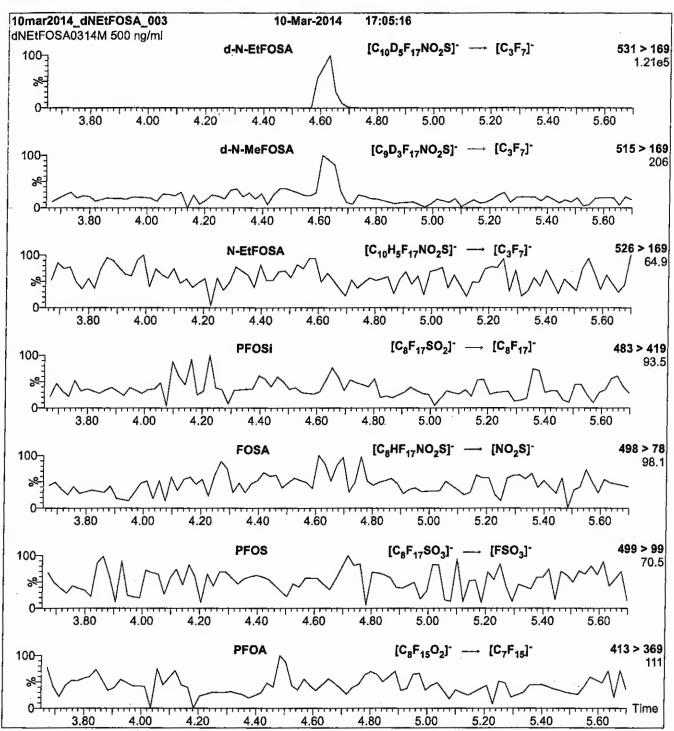
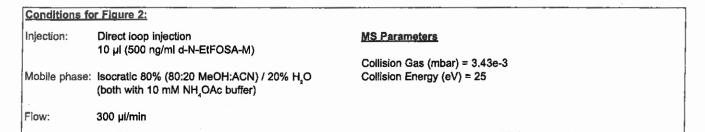


Figure 2: d-N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





# LCd-NMeFOSA-M_00001



### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

d-N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

**ISOTOPIC PURITY:** 

dNMeFOSA0114M

516.19

Methanol

≥98% 2H,

**COMPOUND:** 

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C₉D₃HF₁₇NO₂S

**CONCENTRATION:** 

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

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/28/2014

EXPIRY DATE: (mm/dd/yyyy)

01/28/2019

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

#### ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 04/01/2015

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

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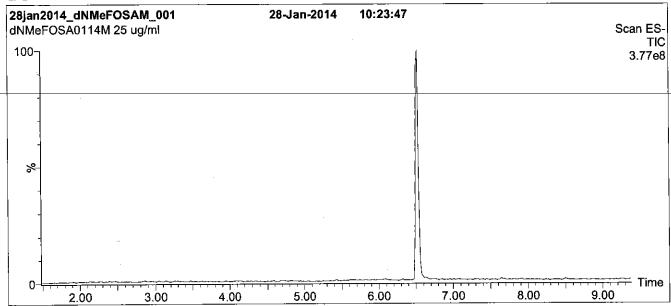
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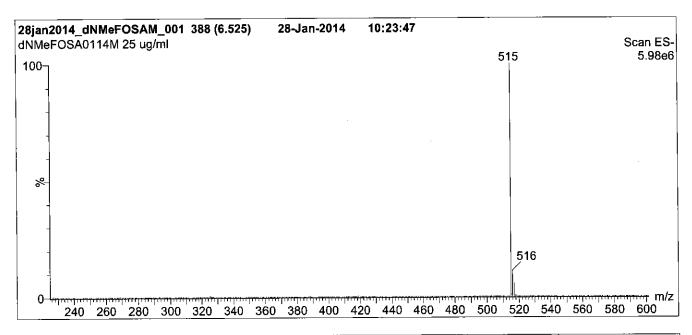
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Figure 1: d-N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





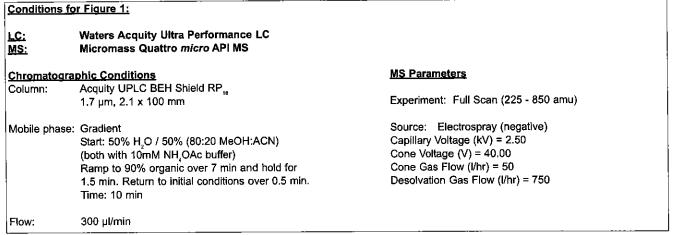
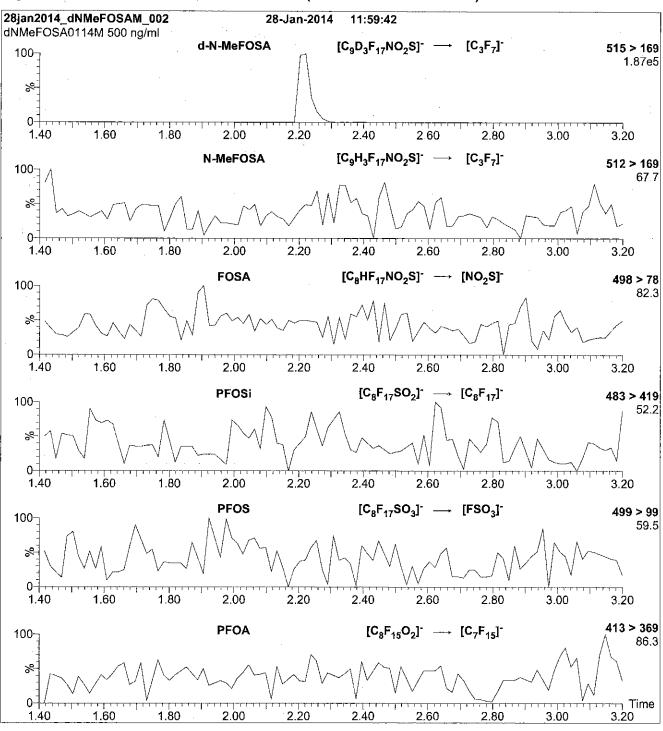
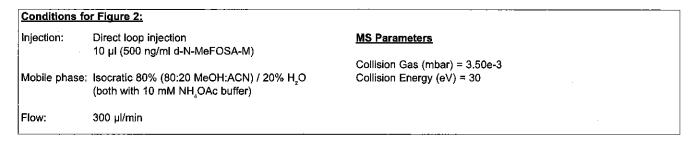


Figure 2: d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





# LCd-NMeFOSA-M_00002

R: +16/16 CBW

ID: LCd-NMeFOSA-M 00002 m: 06/13/21 Prod: CB d-N-MeFOSA-M



### CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

d-N-MeFOSA-M

LOT NUMBER:

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

SOLVENT(S):

dNMeFOSA0616M

516.19

Methanol

≥98% 2H,

**COMPOUND:** 

N-methyl-d₃-perfluoro-1-octanesulfonamide

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

C₀D₃HF₁₇NO₂S

**CONCENTRATION:** 

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

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/eid/yyyy)

06/10/2016

EXPIRY DATE: (mm/dd/yyyy)

06/10/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 06/16/2016

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:

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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

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

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

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

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

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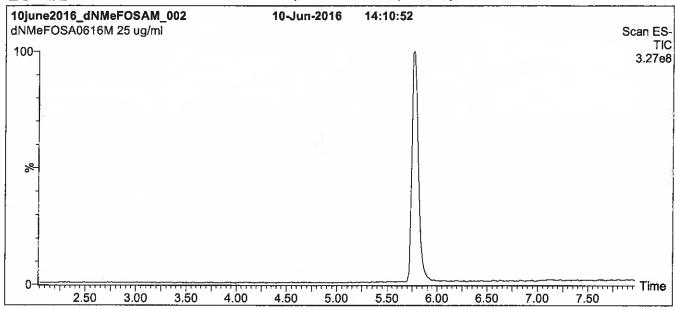
#### **QUALITY MANAGEMENT:**

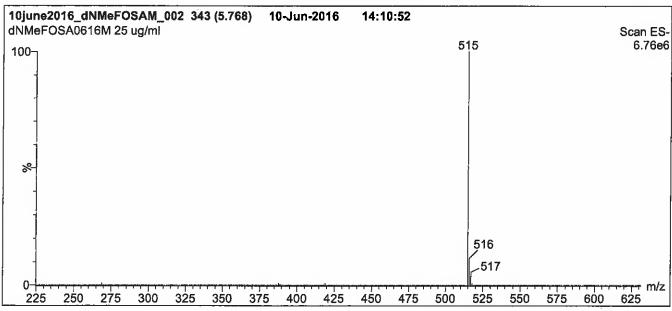
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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





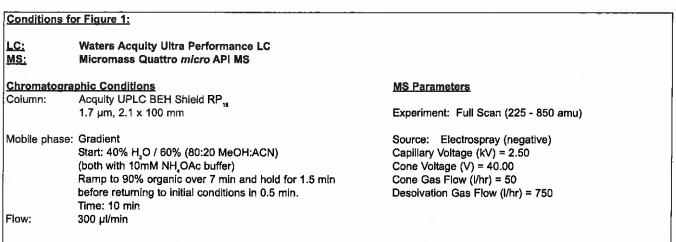
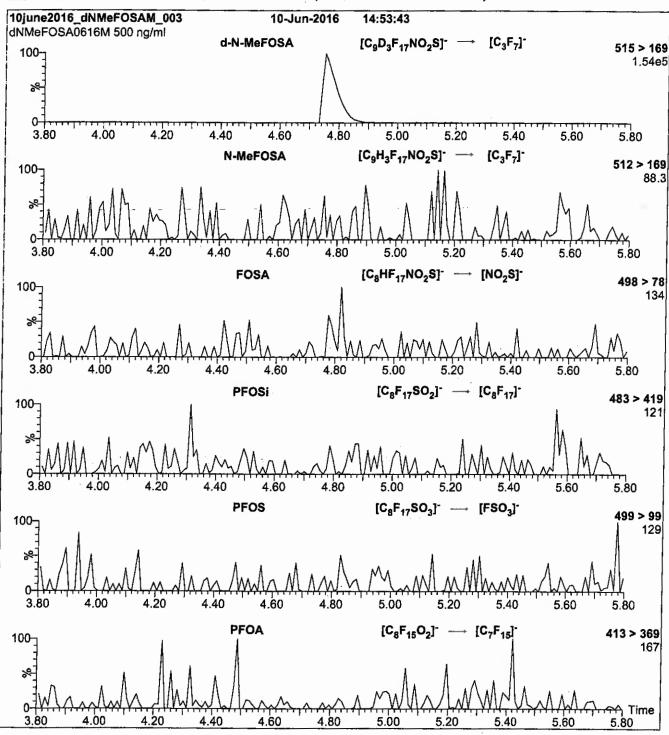


Figure 2: d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μi (500 ng/ml d-N-MeFOSA-M)

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

(both with 10 mM NH,OAc buffer)

Flow: 300

300 µl/min

#### MS Parameters

Collision Gas (mbar) = 3.39e-3 Collision Energy (eV) = 25

# LCd3-NMeFOSAA_00001



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

d3-N-MeFOSAA

**LOT NUMBER:** 

d3NMeFOSAA0113

COMPOUND:

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C₁₁D₃H₃F₁₇NO₄S

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

574.23

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

Water (<1%) ≥98% ²H₃

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/31/2013

EXPIRY DATE: (mm/dd/yyyy)

01/31/2018

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

(mm/dd/yyyy)

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

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

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#### **LIMITED WARRANTY:**

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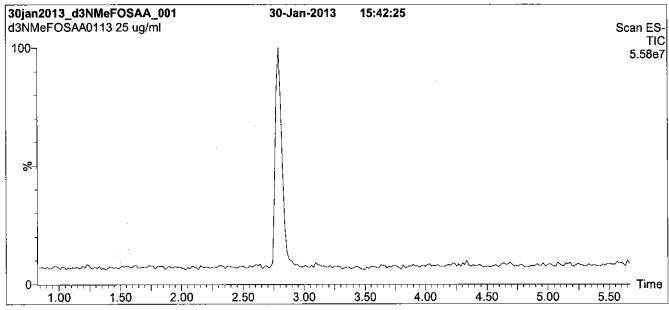
#### **QUALITY MANAGEMENT:**

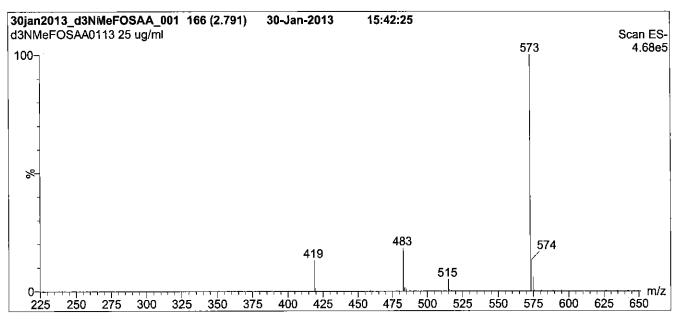
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Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





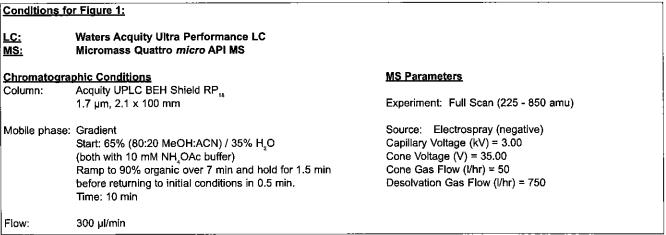
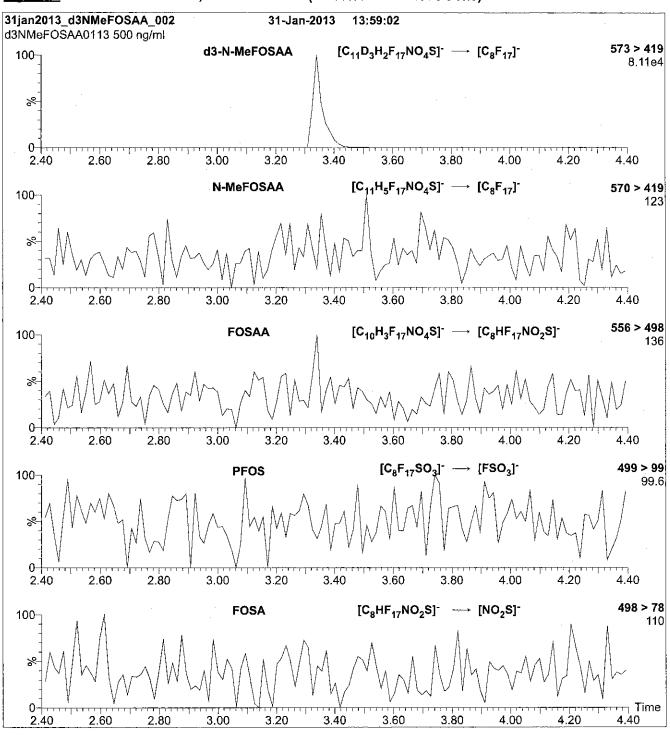


Figure 2: d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml d3-N-MeFOSAA)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

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

d3NMeFQSAA0113 (4 of 4)

# LCd3-NMeFOSAA_00002

**PRODUCT CODE:** 

d3-N-MeFOSAA

LOT NUMBER:

d3NMeFOSAA0116

COMPOUND:

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C₁₁D₃H₃F₁₇NO₄S

**MOLECULAR WEIGHT:** 

574.23

**CONCENTRATION:** 

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

SOLVENT(S):

**ISOTOPIC PURITY:** 

Methanol

≥98% 2H,

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u>01/25/2016</u>

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

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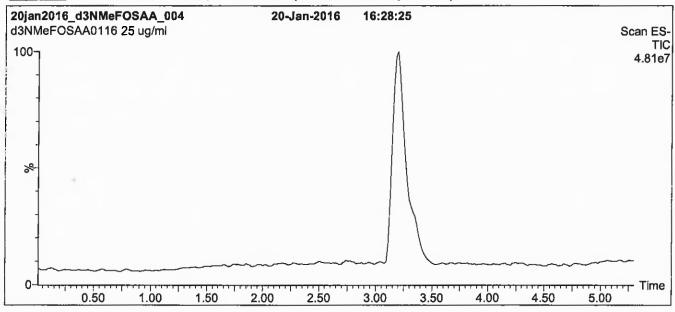
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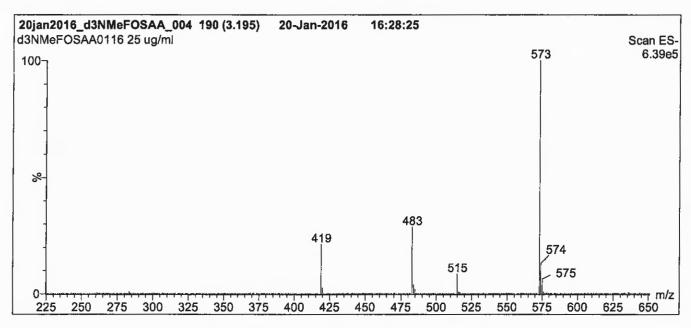


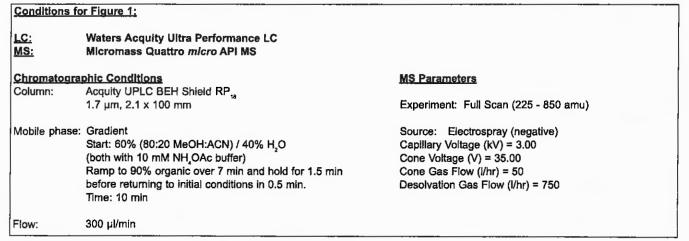


**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.weil-labs.com">www.weil-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

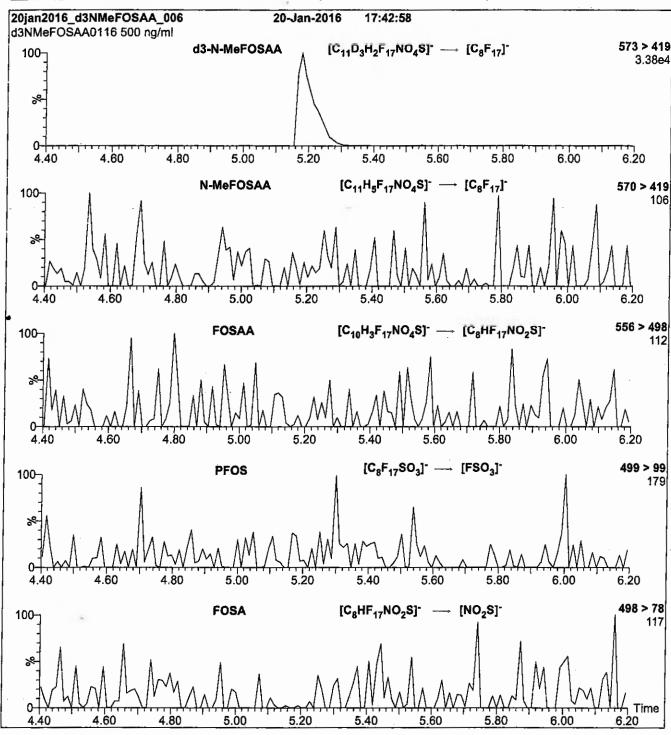
Figure 1: d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)







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





Injection:

Direct loop injection

10 µl (500 ng/ml d3-N-MeFOSAA)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

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

# LCd5-NEtFOSAA_00001



**PRODUCT CODE:** 

d5-N-EtFOSAA

**LOT NUMBER:** 

d5NEtFOSAA0515

**COMPOUND:** 

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

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

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

**MOLECULAR WEIGHT:** 

590.27

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

≥98% ²H_E

LAST TESTED: (mm/dd/yyyy)

05/08/2015

EXPIRY DATE: (mm/dd/yyyy)

05/08/2020

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/11/2015

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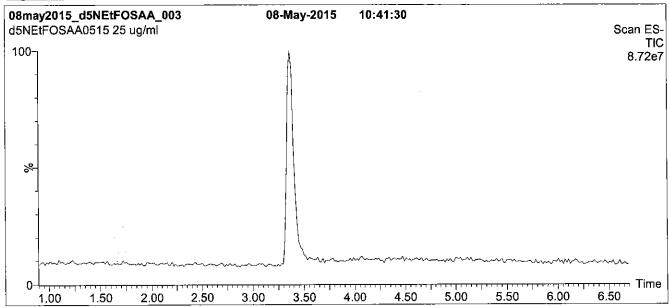
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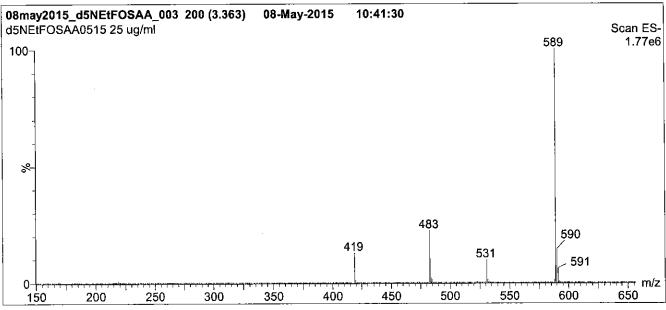




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





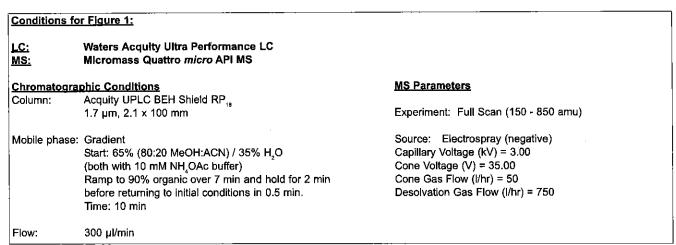
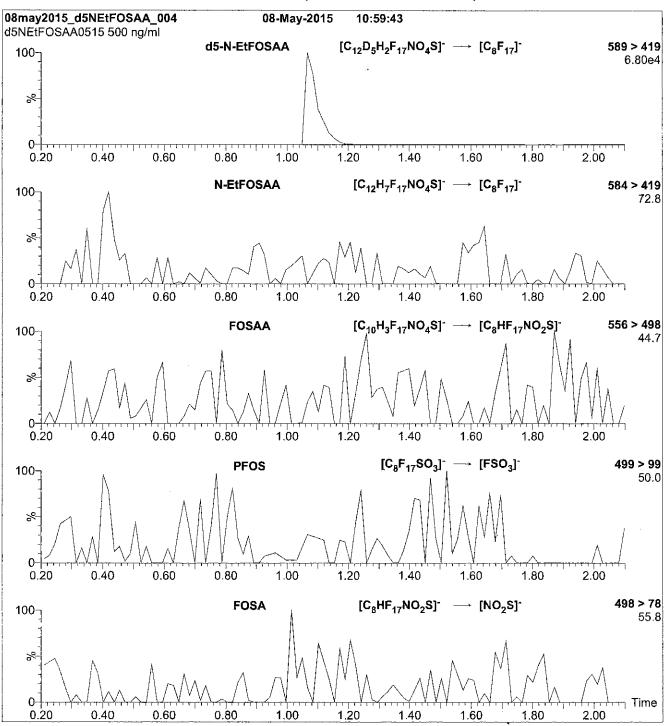
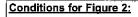


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 μl (500 ng/ml d5-N-EtFOSAA)

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

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

# LCd5-NEtFOSAA_00002

PRODUCT CODE:

d5-N-EtFOSAA

**LOT NUMBER:** 

d5NEtFOSAA1115

**COMPOUND:** 

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

C,2D,H3F,7NO,S

**MOLECULAR WEIGHT:** 

590.27

**CONCENTRATION:** 

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

SOLVENT(S):

**ISOTOPIC PURITY:** 

Methano!

**CHEMICAL PURITY:** 

>98%

Water (<1%) ≥98% ²H_e

LAST TESTED: (mm/dd/yyyy)

12/07/2015

EXPIRY DATE: (mm/dd/yyyy)

12/07/2020

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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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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#### QUALITY MANAGEMENT:

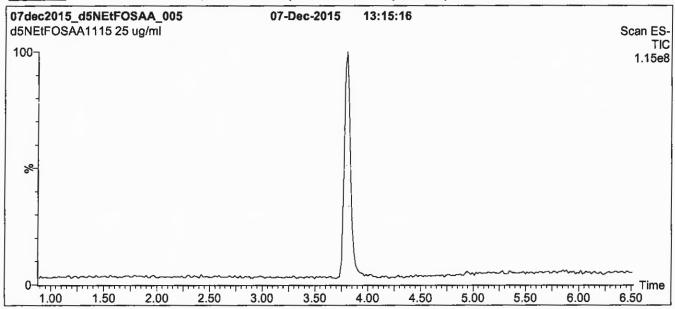
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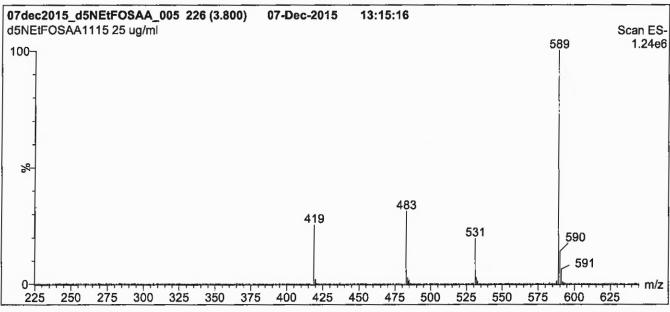




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Figure 1: d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





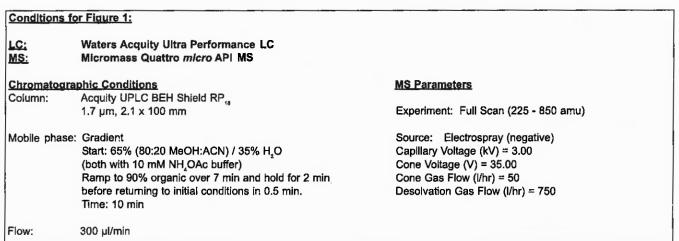
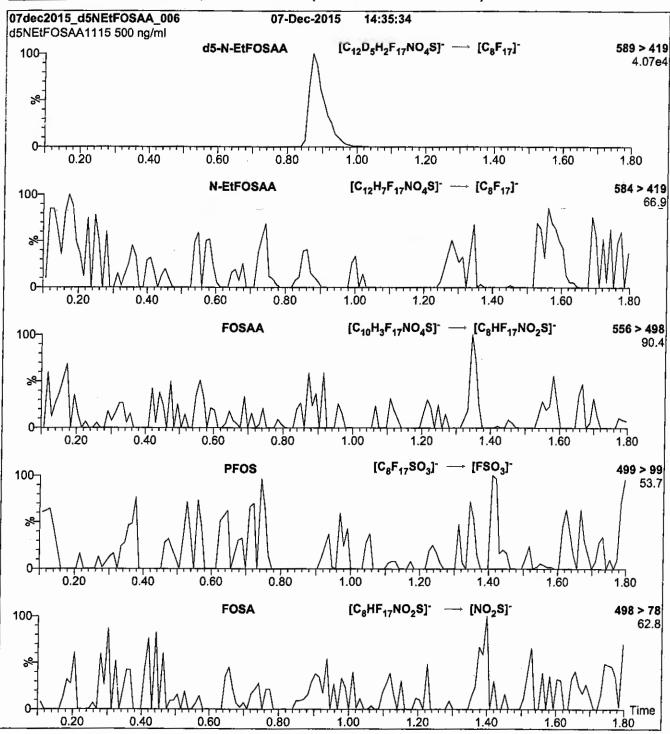
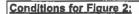


Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml d5-N-EtFOSAA)

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

(both with 10 mM NH,OAc buffer)

MS Parameters

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

Flow:

300 µl/min

LCM2-6:FTS_00001



**PRODUCT CODE:** 

M2-6:2FTS

LOT NUMBER:

M262FTS0714

**COMPOUND:** 

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

¹³C₂¹²C₆H₄F₁₃SO₃Na

**MOLECULAR WEIGHT:** 

452.13

**CONCENTRATION:** 

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

Methanol

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

(M2-6:2FTS anion)

**CHEMICAL PURITY:** 

>98%

>99% 13C

LAST TESTED: (mm/dd/yyyy)

07/15/2014

**ISOTOPIC PURITY:** 

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

EXPIRY DATE: (mm/dd/yyyy)

07/15/2017

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

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#### **HAZARDS**:

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#### **SYNTHESIS / CHARACTERIZATION:**

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$$x_i, x_0,...x_1$$
 on which it depends is:

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#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

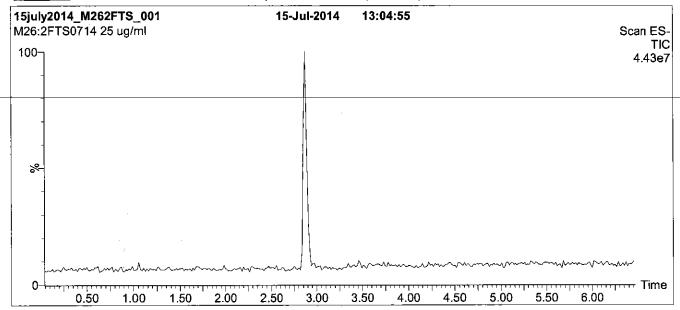
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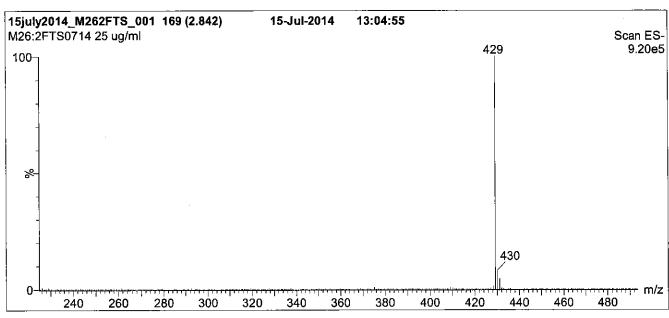




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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





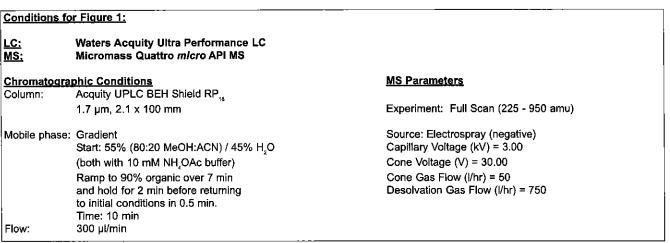
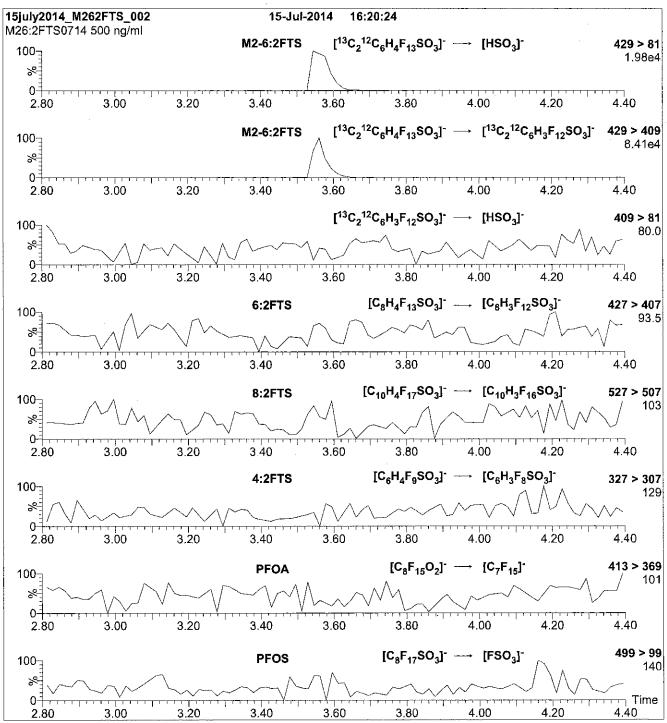
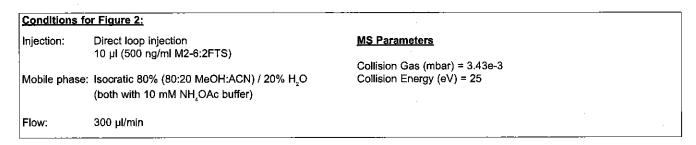


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-6:FTS_00002



PRODUCT CODE:

M2-6:2FTS

**LOT NUMBER:** 

M262FTS0116

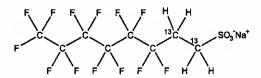
**COMPOUND:** 

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

STRUCTURE:

CAS #:

Not available



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

**MOLECULAR FORMULA:** 

¹³C, ¹²C, H, F, SO, Na

**MOLECULAR WEIGHT:** 

452.13

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

>99% 13C

LAST TESTED: (mm/dd/yyyy)

(1,2-13C₂)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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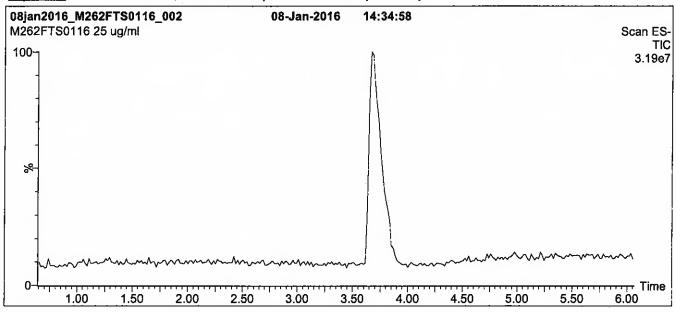
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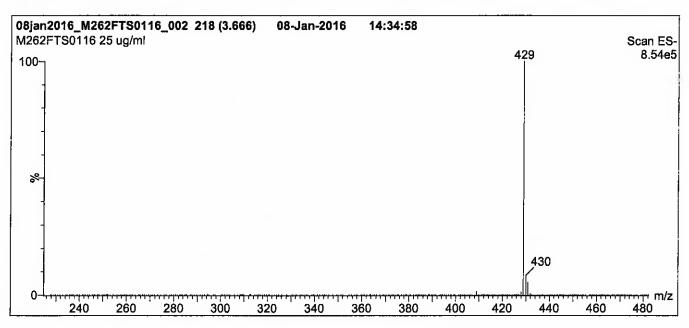




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Figure 1: M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)





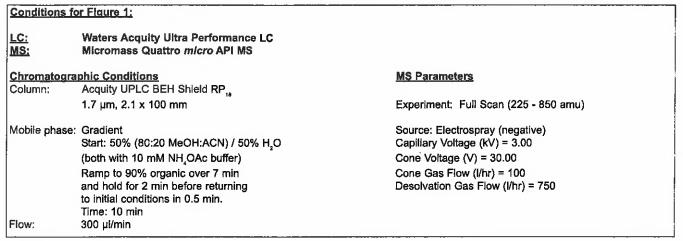
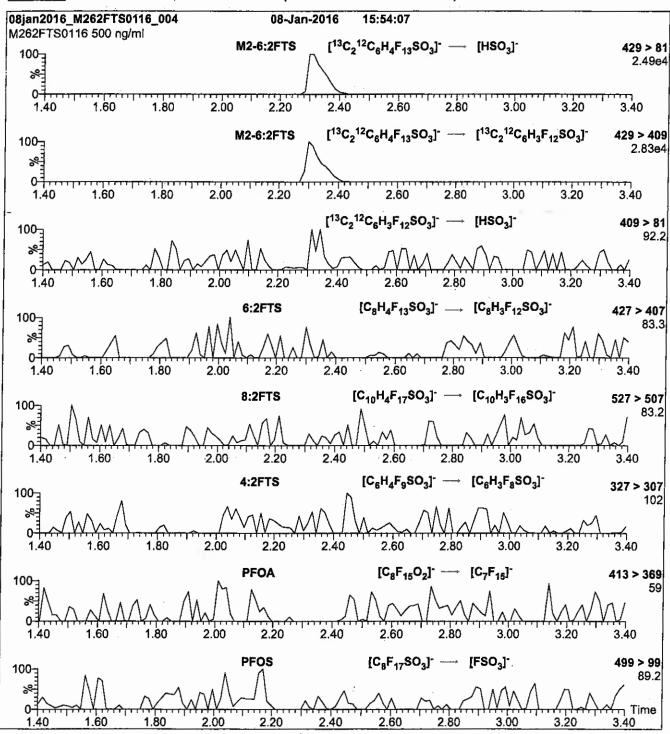
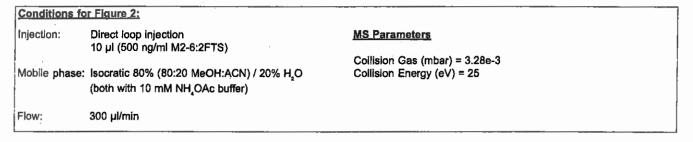


Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-8:2FTS 00001



PRODUCT CODE:

M2-8:2FTS

**LOT NUMBER:** 

M282FTS0414

**COMPOUND:** 

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

¹³C₂¹²C₈H₄F₁₇SO₃Na

**MOLECULAR WEIGHT:** 

552.15

**CONCENTRATION:** 

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

Methanol

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

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

≥99% 13C

LAST TESTED: (mm/dd/yyyy)

04/13/2014

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

EXPIRY DATE: (mm/dd/yyyy)

04/13/2017

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

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See page 2 for further details.

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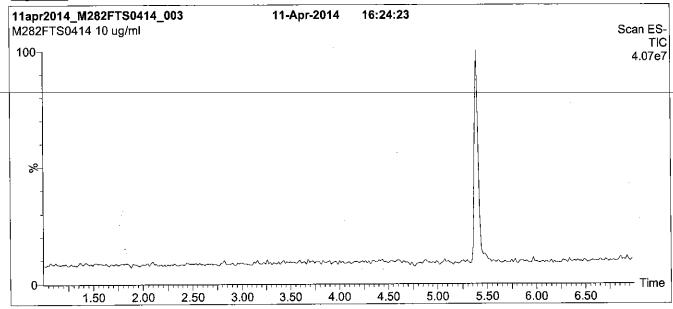
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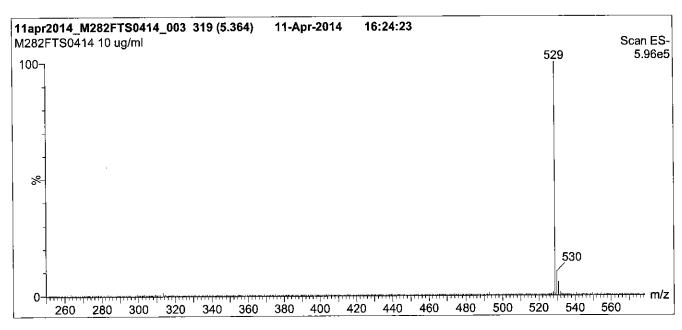




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





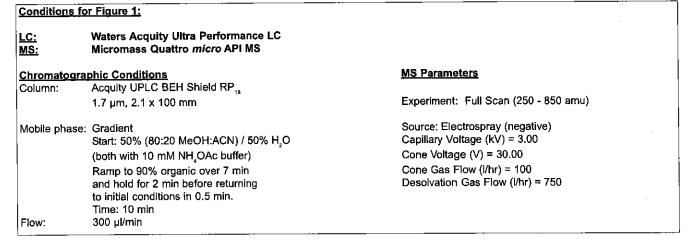
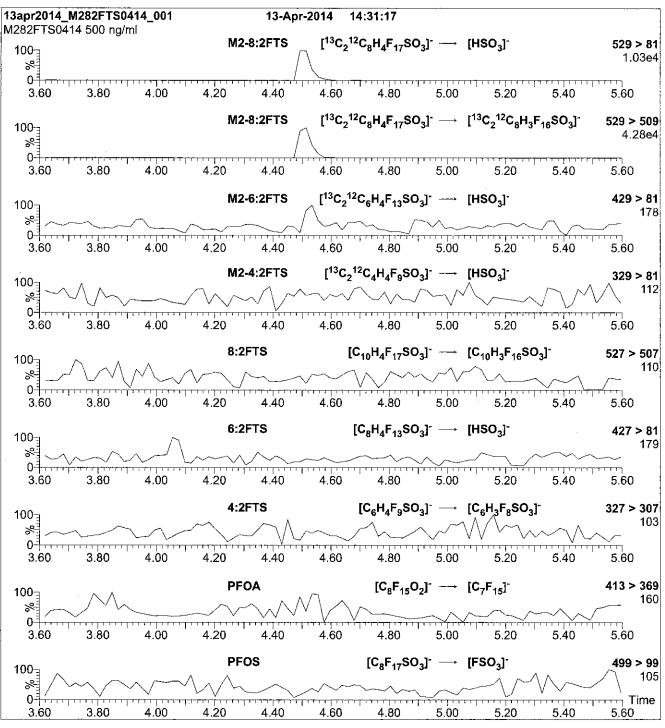
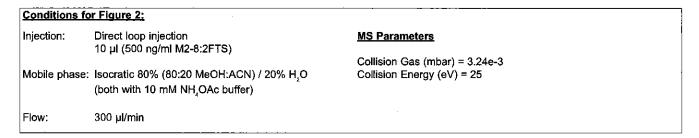


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





LCM2-8:2FTS_00002



### WELLINGTON LABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

M2-8:2FTS

LOT NUMBER:

M282FTS0116

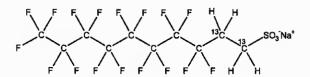
COMPOUND:

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

**STRUCTURE:** 

CAS #:

Not available



**MOLECULAR FORMULA:** 

¹³C₂¹²C₂H₄F₄,SO₃Na

MOLECULAR WEIGHT:

552.15

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

O TO ENTINATION.

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

≥99% ¹³C

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

(1,2-13C_a)

LAST TESTED: (mm/dd/yyyy)

EXPIRY DATE: (mm/dd/yyyy)

01/08/2016

EXTINI DATE. (mm/cd/yyyy)

01/08/2021

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date: 01/18/2016

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

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

#### HAZARDS:

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

#### SYNTHESIS / CHARACTERIZATION:

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

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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:

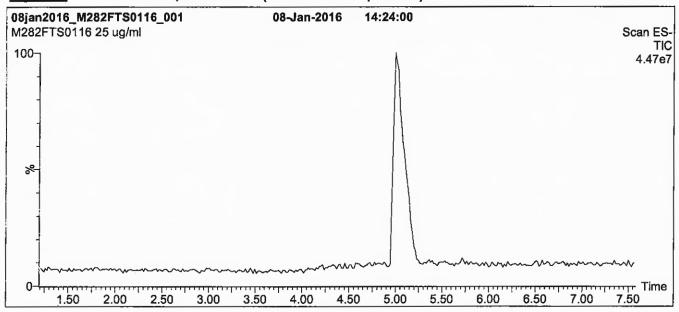
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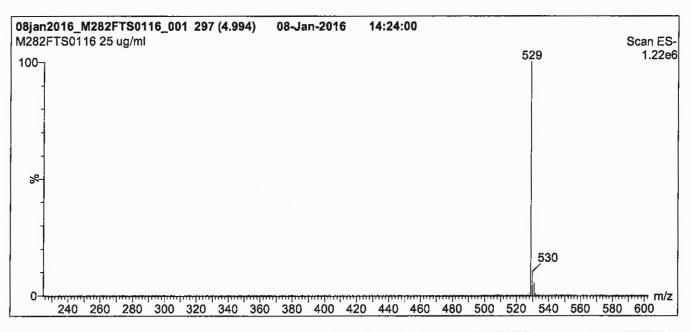




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





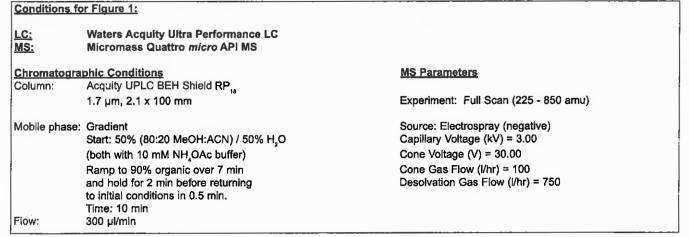
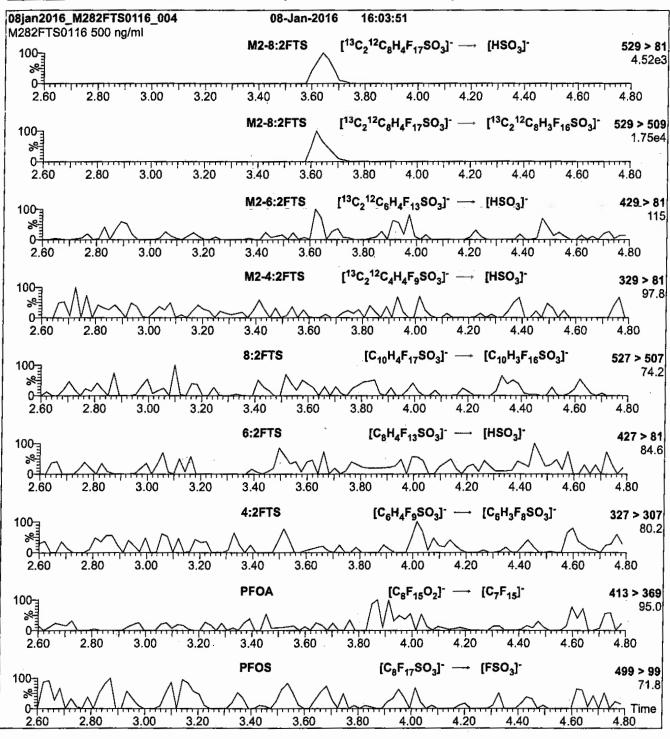
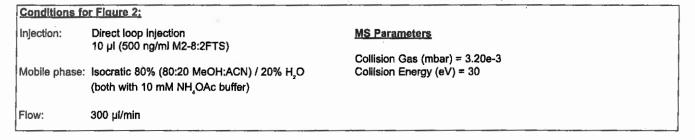


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)





# LCM2PFHxDA_00008



739512

ID: LCM2PFHxDA_00008 Exp: 01/07/21 Prod: SBC 13C2-PFHxDA at 50ug/miL



## CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

M2PFHxDA

**LOT NUMBER:** 

M2PFHxDA1112

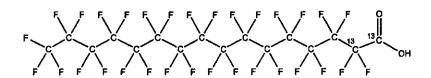
COMPOUND:

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

**STRUCTURE:** 

CAS#:

Not available



**MOLECULAR FORMULA:** 

¹³C₂¹²C₁₄HF₃₁O₂

**MOLECULAR WEIGHT: 810** 

816.11

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol Water (<1%)

≥99% ¹³C

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

≥99% °C (1,2-¹³C,)

LAST TESTED: (mm/dd/yyyy)

01/07/2016

EXPIRY_DATE: (mm/dd/yyyy)

01/07/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

01/11/2016

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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## EXPIRY DATE / PERIOD OF VALIDITY:

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

## LIMITED WARRANTY:

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## **QUALITY MANAGEMENT:**

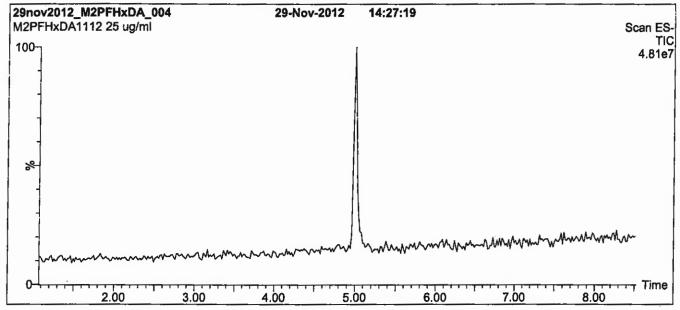
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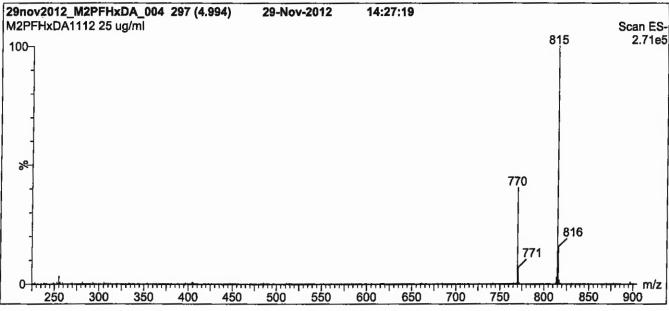




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Figure 1: M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)





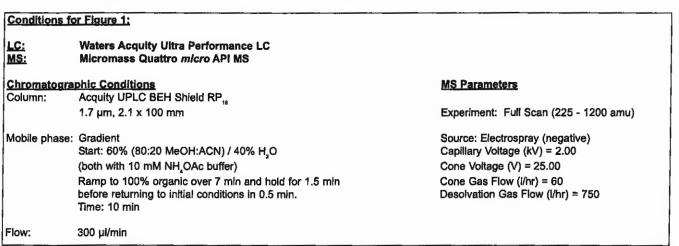
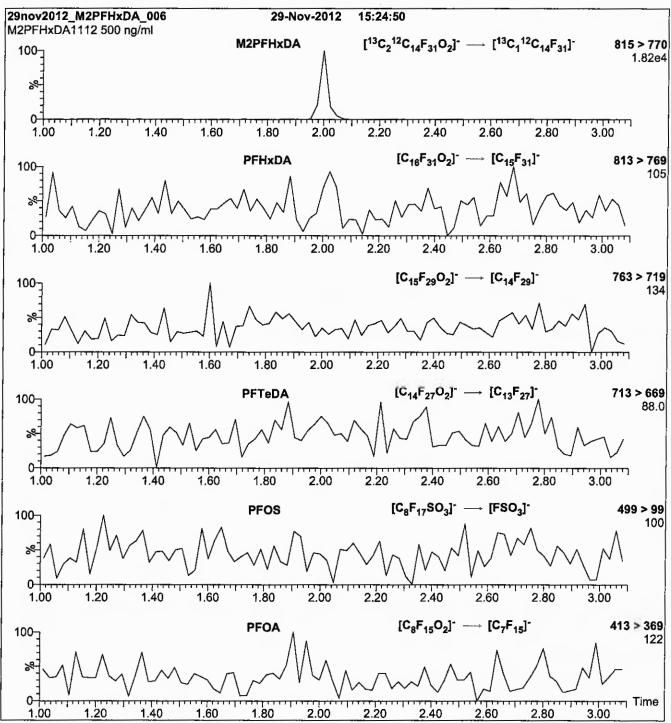


Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml M2PFHxDA)

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

(both with 10 mM NH₄OAc buffer)

Flow:

300 µl/min

## **MS Parameters**

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

# LCM2PFTeDA_00007





Exp: 12/07/20 Prpd: SBC 13C2-PFTeDA at 50ug/n

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

M2PFTeDA

**LOT NUMBER:** 

M2PFTeDA1115

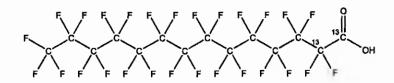
**COMPOUND:** 

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

STRUCTURE:

CAS #:

Not available



**MOLECULAR FORMULA:** 

13C, 12C, HF,,O,

**MOLECULAR WEIGHT:** 

716.10

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

≥99% ¹³C

LAST TESTED: (mm/dd/yyyy)

12/07/2015

(1,2-13C₂)

Water (<1%)

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:

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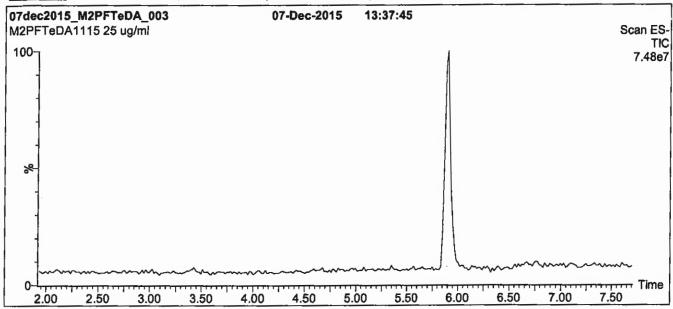
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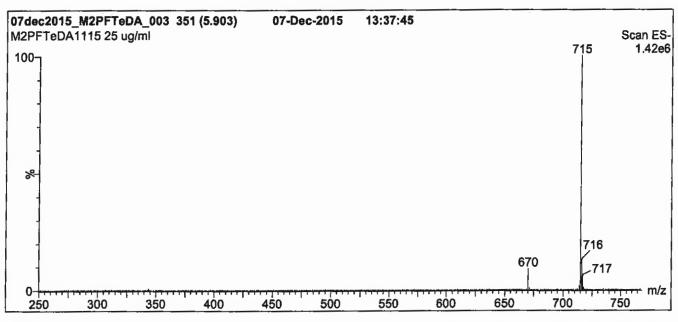




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Figure 1: M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)





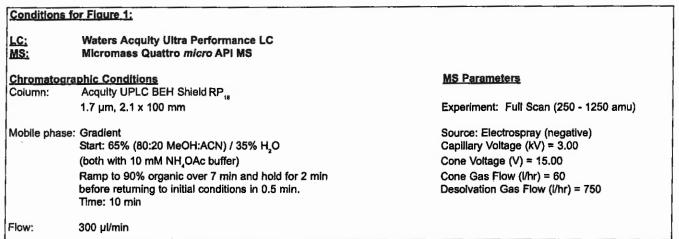
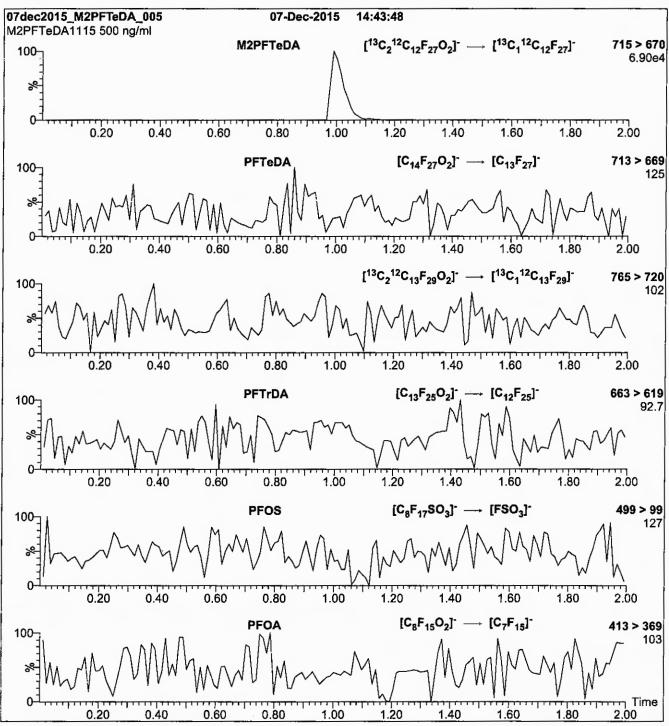
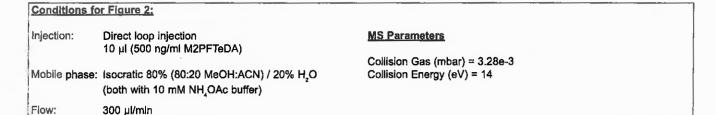


Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





# LCM4PFHPA_00007

P: 880 0/22/16



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



VELLINGTON ABORATORIES

CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

M4PFHpA

LOT NUMBER:

M4PFHpA0516

**COMPOUND:** 

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

STRUCTURE:

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

13C, 12C, HF, 3O,

**MOLECULAR WEIGHT:** 

368.03

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

ISOTOPIC PURITY:

Water (<1%) >99%13C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

05/27/2016

>98%

**CHEMICAL PURITY:** 

EXPIRY DATE: (mm/dd/yyyy)

05/27/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## ADDITIONAL INFORMATION:

See page 2 for further details.

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

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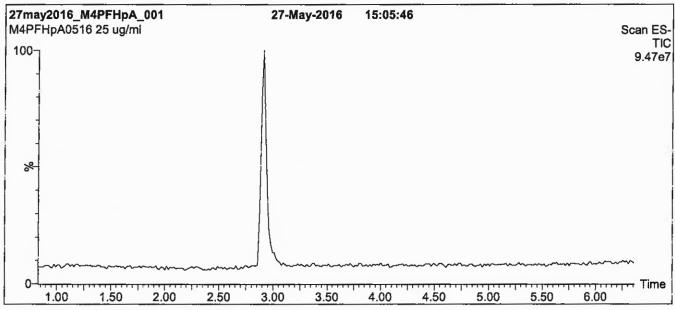
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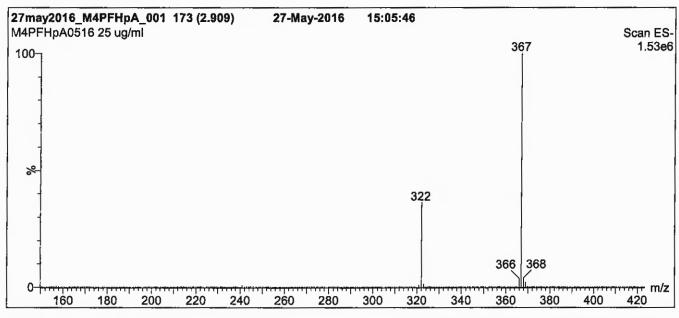




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Figure 1: M4PFHpA; LC/MS Data (TIC and Mass Spectrum)





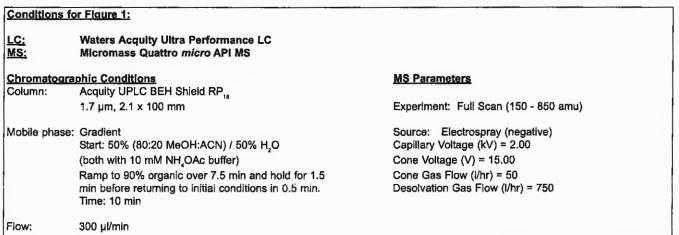
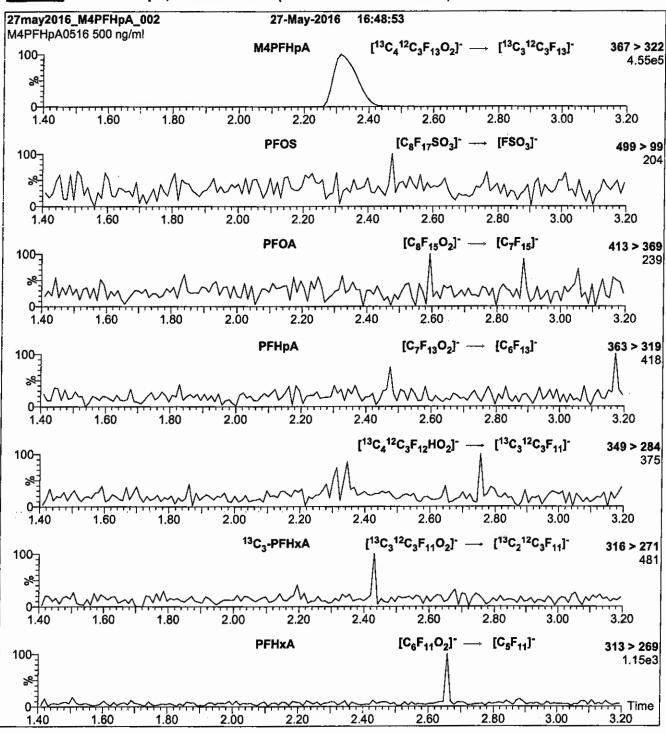
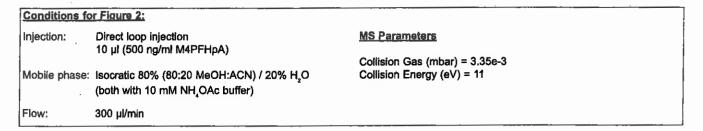


Figure 2: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)





# LCM5PFPEA_00008



ID: LCM5PFPEA_00008 Exp: 05/22/20 Prpd; SBC 13C5-Perfluoropentanoic a



CERTIFICATE OF ANALYSIS

DOCUMENTATION

**PRODUCT CODE:** 

M5PFPeA

**LOT NUMBER:** 

M5PFPeA0515

**COMPOUND:** 

Perfluoro-n-[13C,]pentanoic acid

CAS #:

Not available

STRUCTURE:

**MOLECULAR FORMULA:** 

13C,HF,O,

**MOLECULAR WEIGHT:** 

269.01

(13C_e)

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

Water (<1%) >99% 13C

LAST TESTED: (mm/cki/yyyy)

05/22/2015

EXPIRY DATE: (mm/dd/yyyy)

05/22/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/25/2015

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

### HAZARDS:

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

## **SYNTHESIS / CHARACTERIZATION:**

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

## **HOMOGENEITY:**

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

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x,, x,...x on which it depends is:

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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:

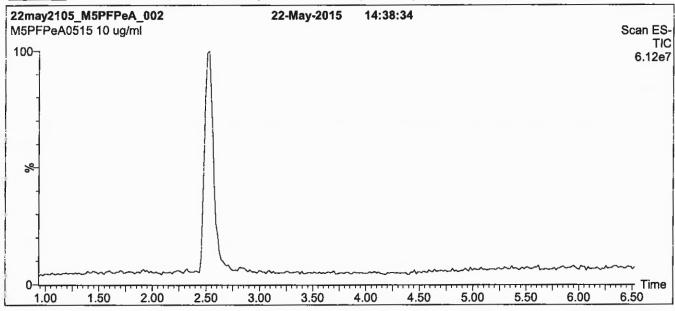
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

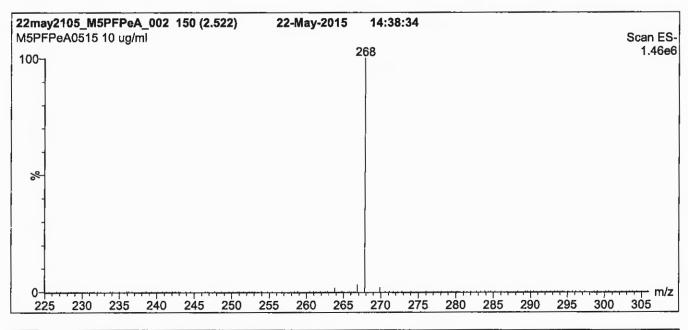




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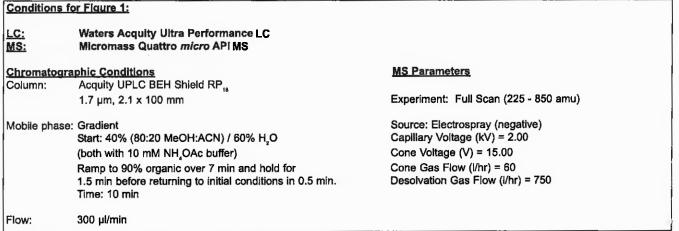
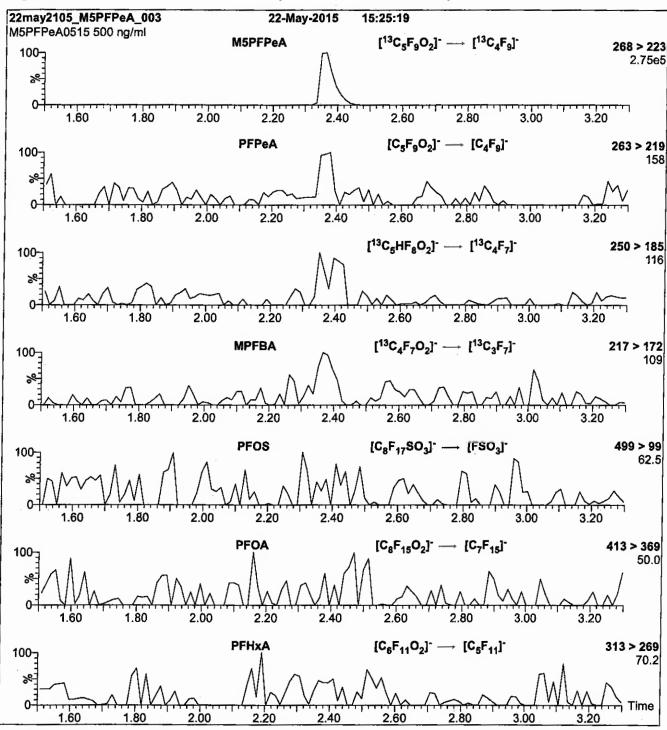


Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)





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)

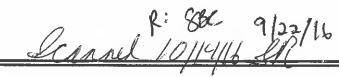
Flow:

300 µl/min

## MS Parameters

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

# LCM8FOSA_00011





ID: LCM8FOSA_00011 E:p: 12/22/17 Prpd: SBC 13C8-Perfluorooctanesulfo



## CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

M8FOSA-I

**LOT NUMBER:** 

**M8FOSA1215I** 

**COMPOUND:** 

Perfluoro-1-[13C_]octanesulfonamide

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

¹³C₈H₂F₁₂NO₂S

**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:** 

SOLVENT(S):

507.09 Isopropanol

**ISOTOPIC PURITY:** 

≥99% ¹³C

(13C_a)

## **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: 01/14/2016

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

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

## **HAZARDS**:

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

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

## LIMITED WARRANTY:

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## **QUALITY MANAGEMENT:**

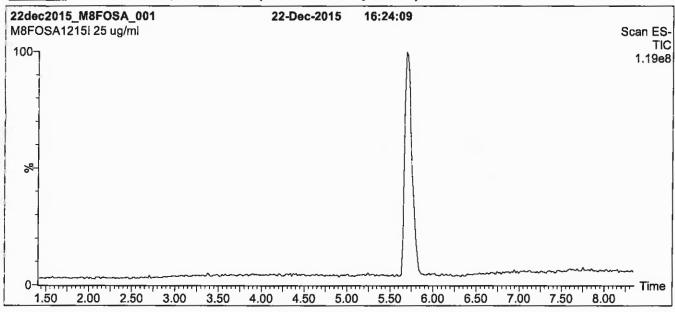
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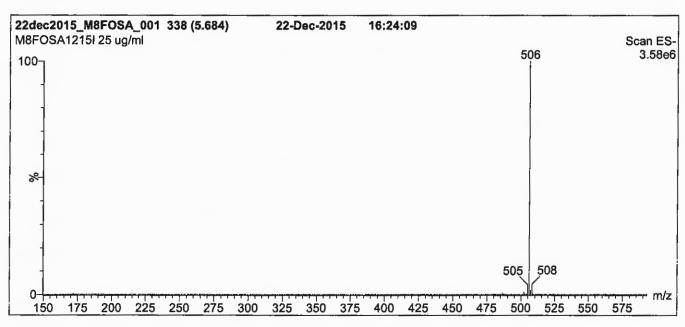




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Figure 1: M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)





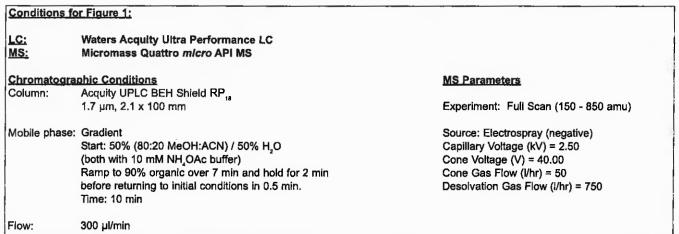
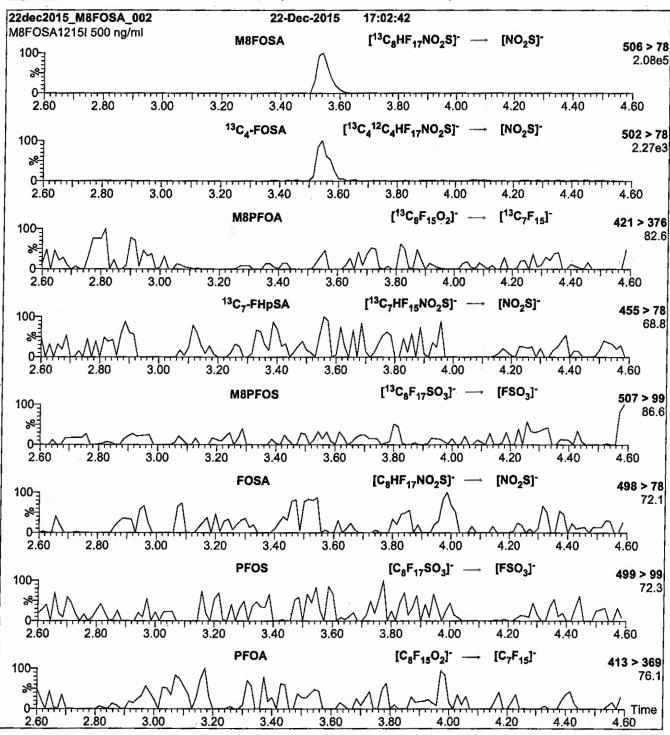
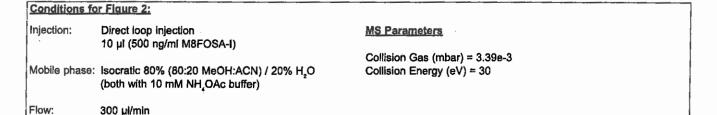


Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFBA_00008



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



## **CERTIFICATE OF ANALYSIS DOCUMENTATION**

Scanner 10/14/16

**PRODUCT CODE:** 

**MPFBA** 

**LOT NUMBER:** 

MPFBA0516

COMPOUND:

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

**STRUCTURE:** 

CAS #:

Not available

**MOLECULAR FORMULA:** 

¹³C₄HF₇O₂

**MOLECULAR WEIGHT:** 

218.01

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

Water (<1%) ≥99%¹³C

LAST TESTED: (mm/dd/yyyy)

**ISOTOPIC PURITY:** 

(1,2,3,4-13C₄)

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

05/24/2016

05/24/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

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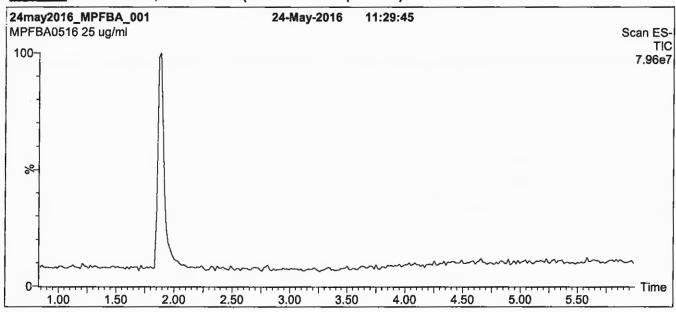
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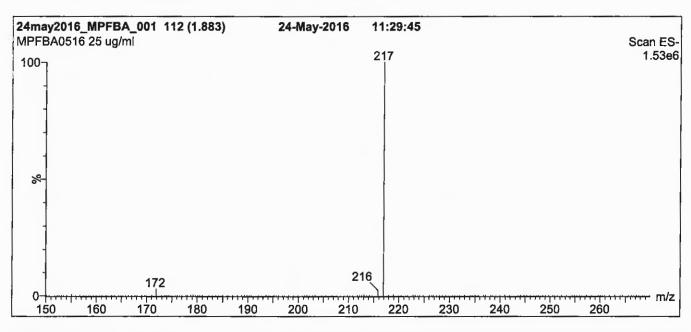




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Figure 1: MPFBA; LC/MS Data (TIC and Mass Spectrum)





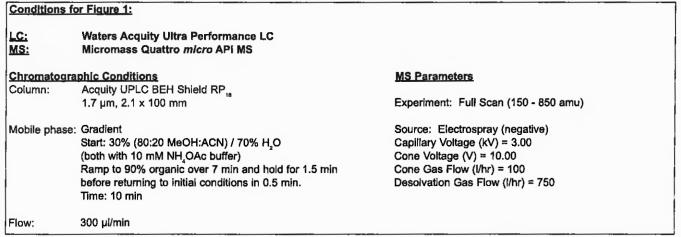
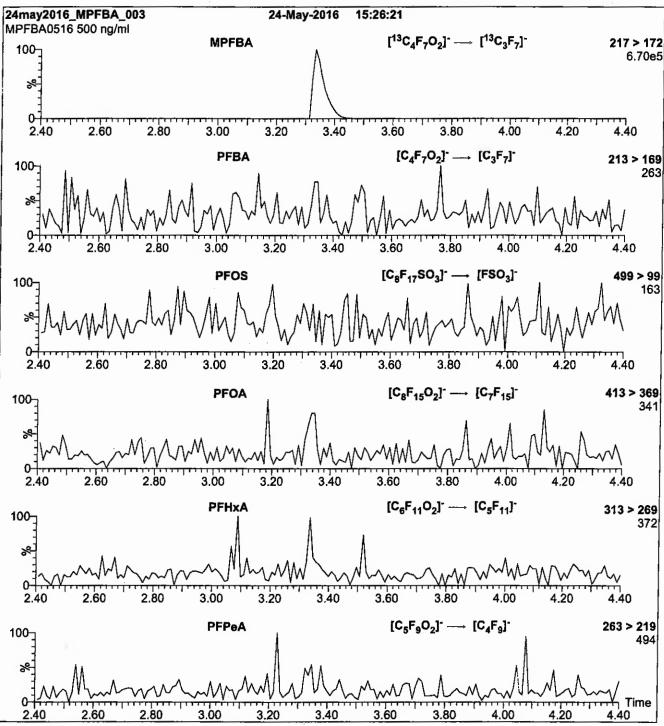


Figure 2: MPFBA; LC/MS/MS Data (Selected MRM Transitions)





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 µI/min

## MS Parameters

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

# LCMPFDA_00011



ID: LCMPFDA_00011 Exp: 08/19/20 Prpd: SBC 13C2-Perfluomodecariok

## CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**MPFDA** 

**LOT NUMBER:** 

MPFDA0815

COMPOUND:

Perfluoro-n-[1,2-13C₃]decanoic acid

**STRUCTURE:** 

CAS #:

Not available

F F F F F F OH

**MOLECULAR FORMULA:** 

¹³C₂¹²C₈HF₁₉O₂

**MOLECULAR WEIGHT:** 

ISOTOPIC PURITY:

516.07

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

>99% 13C

(1,2-13C₂)

SOLALIATION.

Water (<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

## **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 ¹³C₁-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B C Phittim

Date: 08

(mm/dd/sssv)

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

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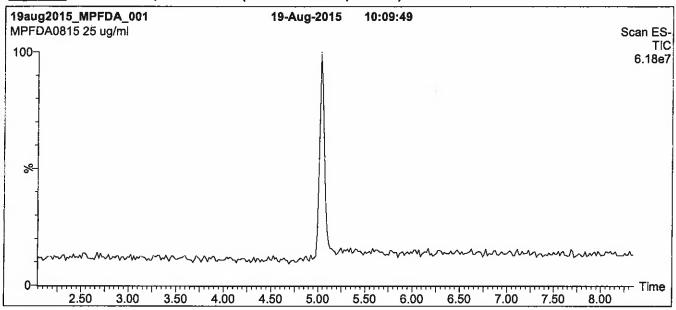
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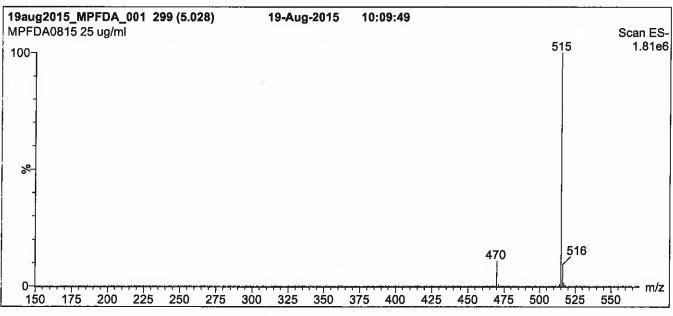




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Figure 1: MPFDA; LC/MS Data (TIC and Mass Spectrum)





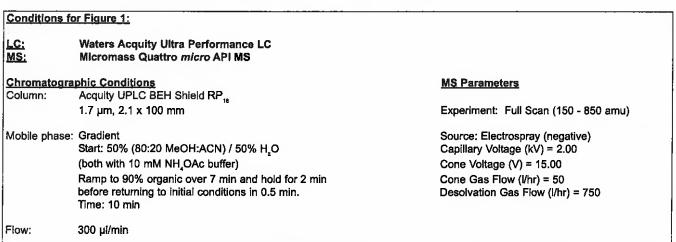
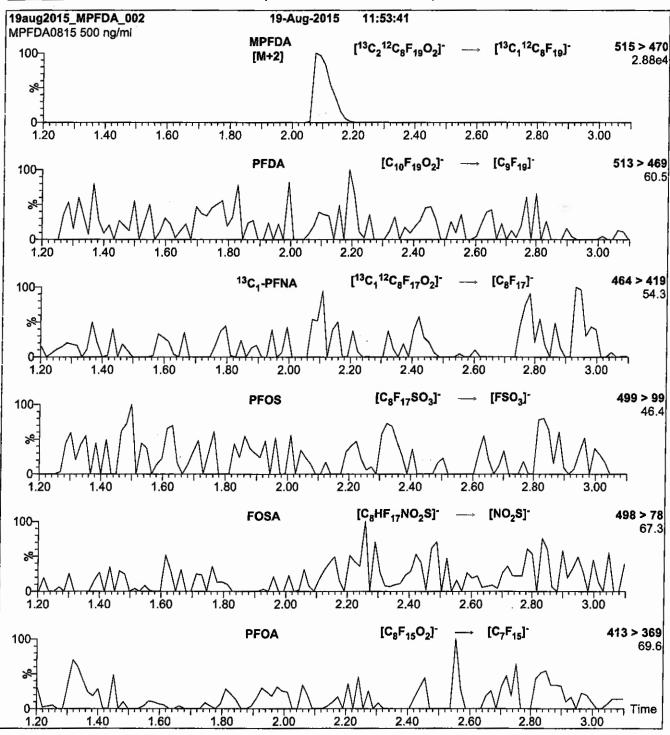


Figure 2: MPFDA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml MPFDA)

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

(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

## MS Parameters

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

# LCMPFDoA_00008



ID: LCMPFDoA_00008 13C2-Perfluornocodecanoic



# VELLINGTON ABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**MPFDoA** 

10/14/16 SR LOT NUMBER: MPFDoA0416

**COMPOUND:** 

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

STRUCTURE:

CAS #:

Not available

**MOLECULAR FORMULA:** 

¹³C₂¹²C₁₀HF₂₃O₂

MOLECULAR WEIGHT:

616.08

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

Methanol Water (<1%)

ISOTOPIC PURITY:

>99% 13C (1,2-13C₂)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

04/08/2016

EXPIRY DATE: (mm/dd/yyyy)

04/08/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

## **DOCUMENTATION/ DATA ATTACHED:**

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

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

## **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

#### HAZARDS:

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

#### SYNTHESIS / CHARACTERIZATION:

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

#### **HOMOGENEITY:**

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

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

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

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

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

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#### 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:

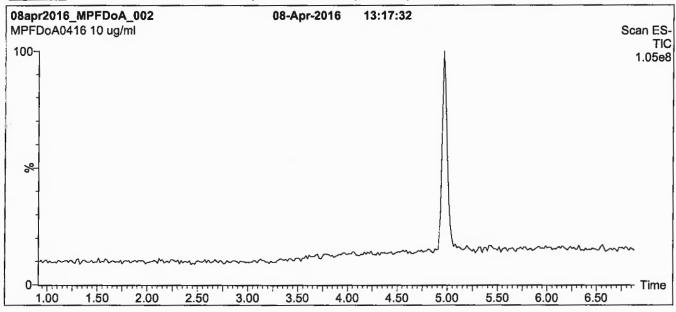
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

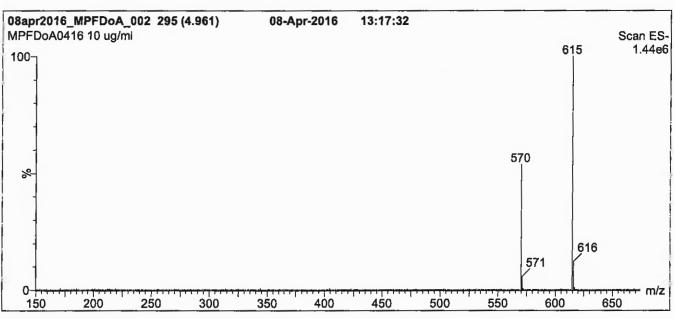




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Figure 1: MPFDoA; LC/MS Data (TIC and Mass Spectrum)





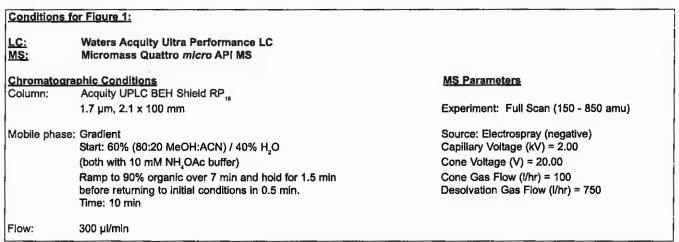
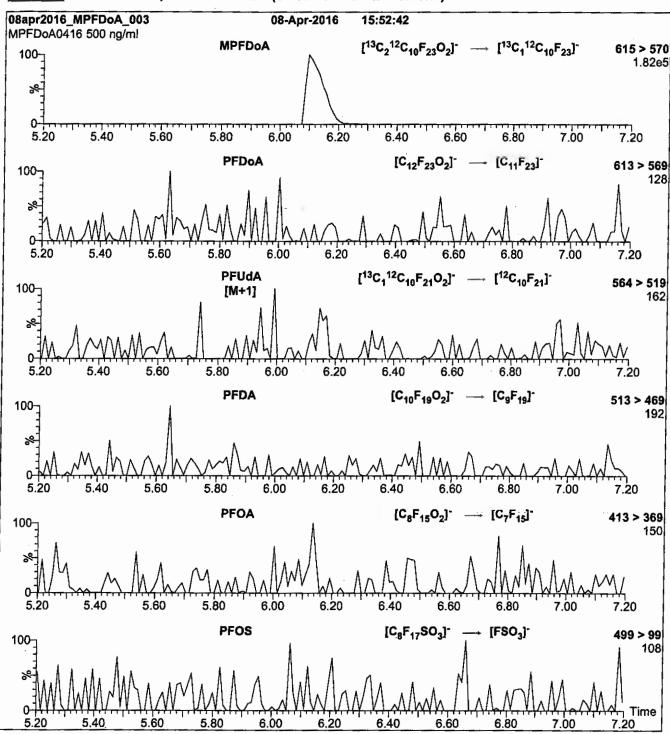
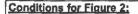


Figure 2: MPFDoA; LC/MS/MS Data (Selected MRM Transitions)





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) = 3.24e-3 Collision Energy (eV) = 13

# LCMPFHxA_00012





739612

ID: LCMPFHxA_00012 Exp: 04/08/21 Prpd: SBC 13C2-Perfluorohexanoic ad



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**MPFHxA** 

LOT NUMBER:

MPFHxA0416

COMPOUND:

Perfluoro-n-[1,2-13C₂]hexanoic acid

**STRUCTURE:** 

CAS #:

Not available

MOLECULAR FORMULA:

¹³C₂¹²C₄HF₁₁O₂

**MOLECULAR WEIGHT:** 

316.04

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

≥99%¹³C (1,2-¹³C₂)

Water (<1%)

LAST TESTED: (mm/dd/yyyy)

>98%

04/08/2016

EXPIRY DATE: (mm/dd/yyyy)

04/08/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: (

04/29/2016

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

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

#### **HAZARDS:**

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

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#### EXPIRY DATE / PERIOD OF VALIDITY:

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

#### LIMITED WARRANTY:

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#### QUALITY MANAGEMENT:

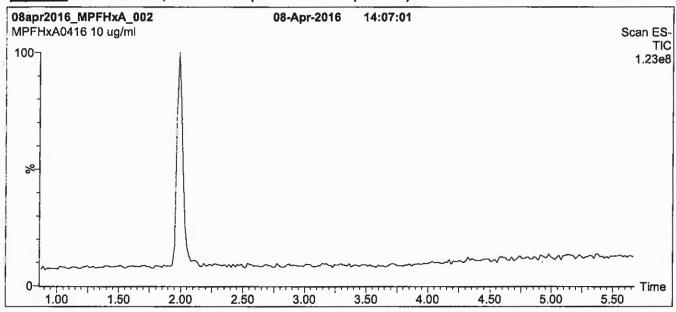
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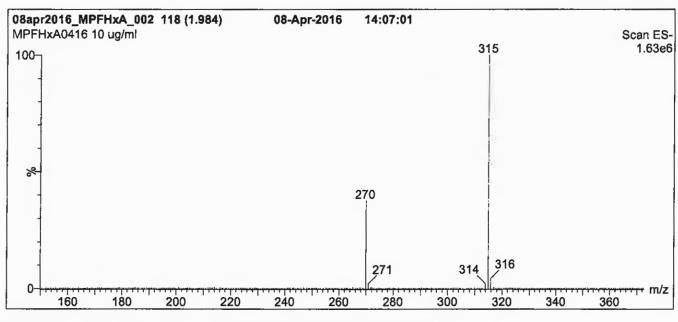




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Figure 1: MPFHxA; LC/MS Data (TIC and Mass Spectrum)





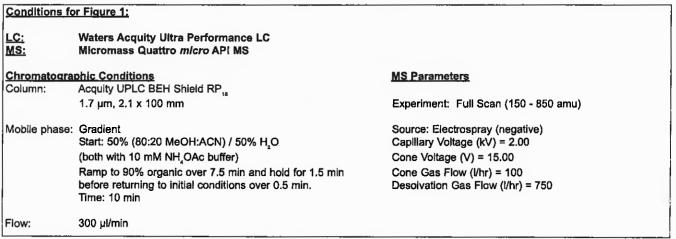
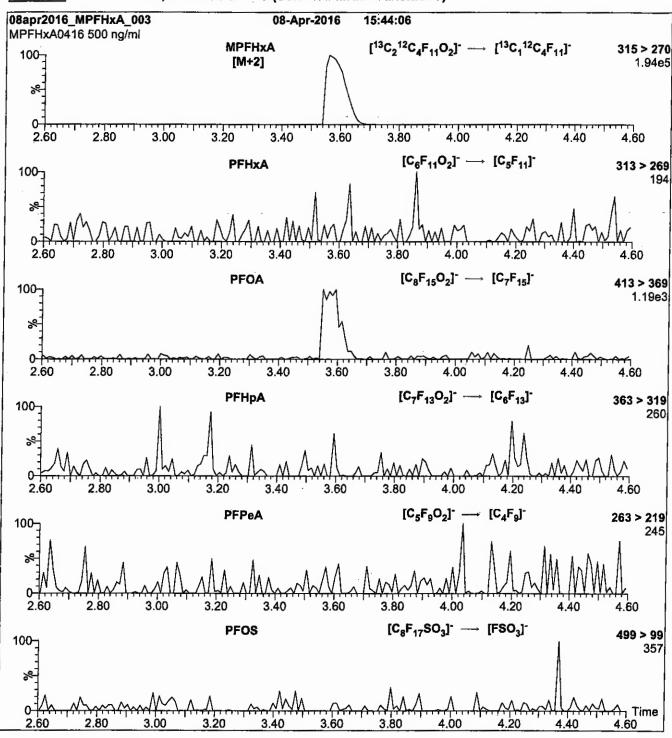
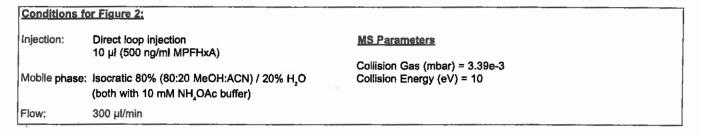


Figure 2: MPFHxA; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFHxS_00008



CERTIFICATE OF ANALYSIS

DOCUMENTATION

PRODUCT CODE:

**MPFHxS** 

**LOT NUMBER:** 

MPFHxS1015

**COMPOUND:** 

Sodium perfluoro-1-hexane[18O2]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

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 (C₆F₁₃S¹⁸O₂¹⁶O⁻) has been observed to be up to 10% lower than for PFHxS (C₆F₁₃S¹⁶O₃·) when both compounds are injected together. This difference may vary between instruments.

Due to the isotopic purity of the starting material (180, >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:

Page 188 of 678

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#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

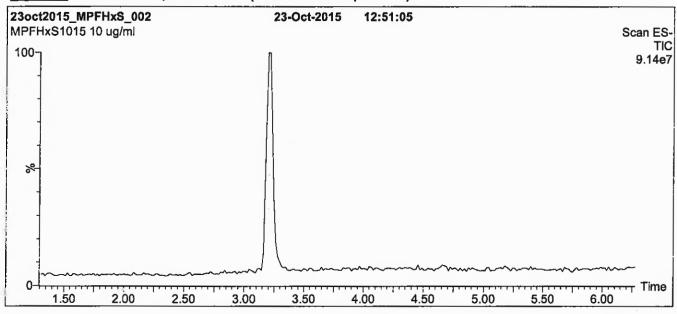
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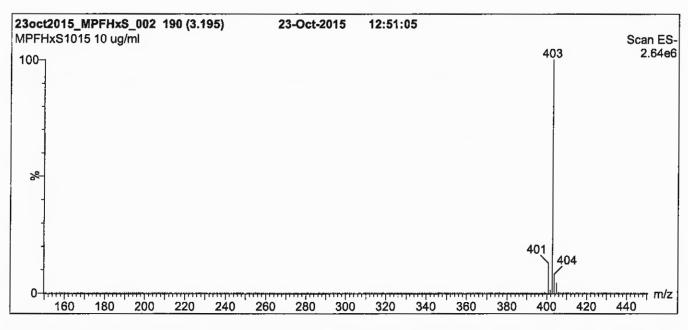




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Figure 1: MPFHxS; LC/MS Data (TIC and Mass Spectrum)





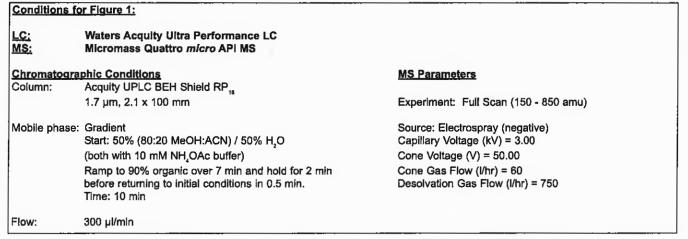
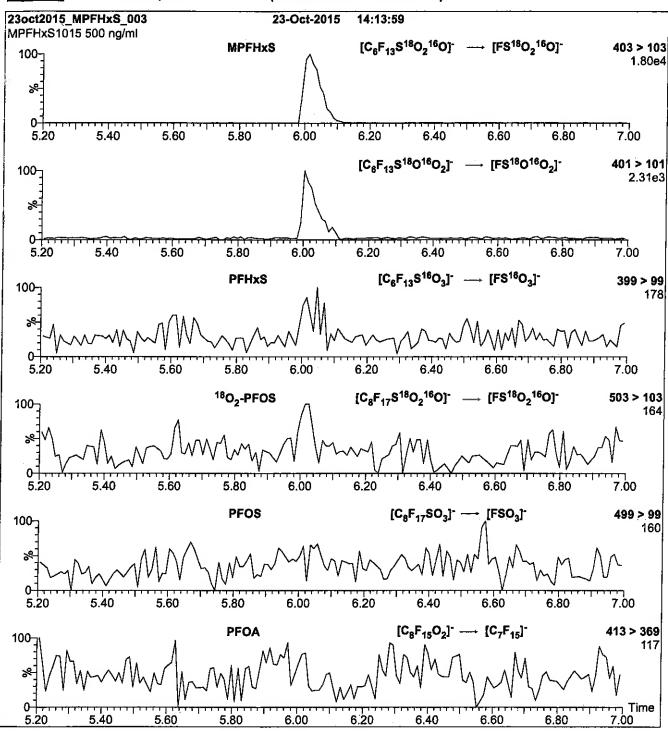
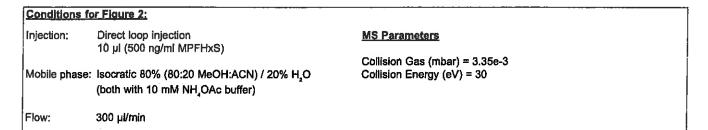


Figure 2: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)





## LCMPFNA_00008



## BORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**MPFNA** 

**LOT NUMBER:** 

MPFNA0414

**COMPOUND:** 

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

**CAS #:** 

Not available

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

13C, 12C, HF,,O,

**MOLECULAR WEIGHT:** 

469.04

**CONCENTRATION:** 

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

SOLVENT(S):

Methanoi

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

Water (<1%) ≥99%13C

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

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.

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Certified By:

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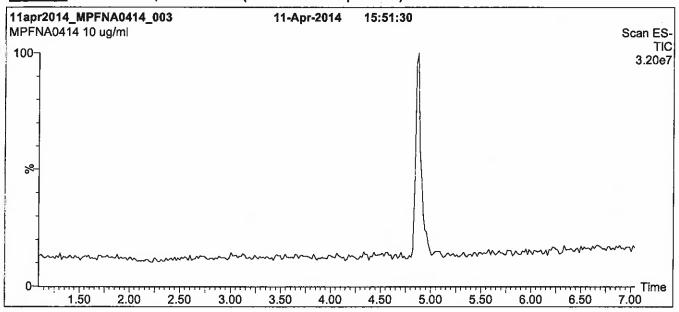
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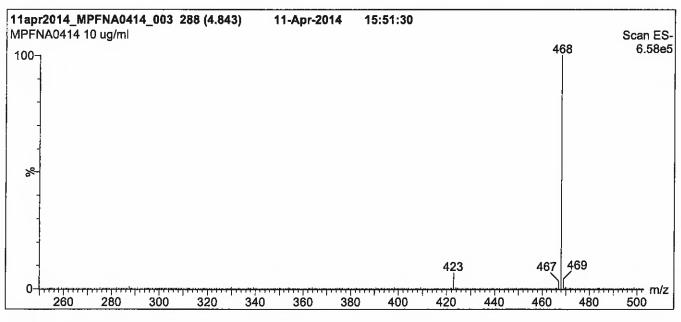




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Figure 1: MPFNA; LC/MS Data (TIC and Mass Spectrum)





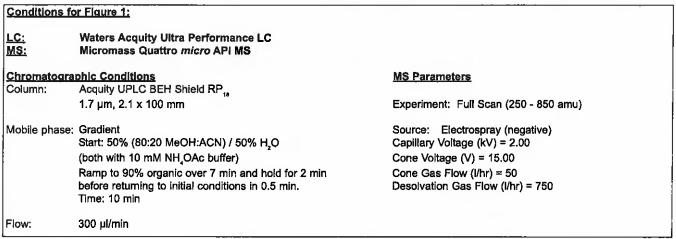
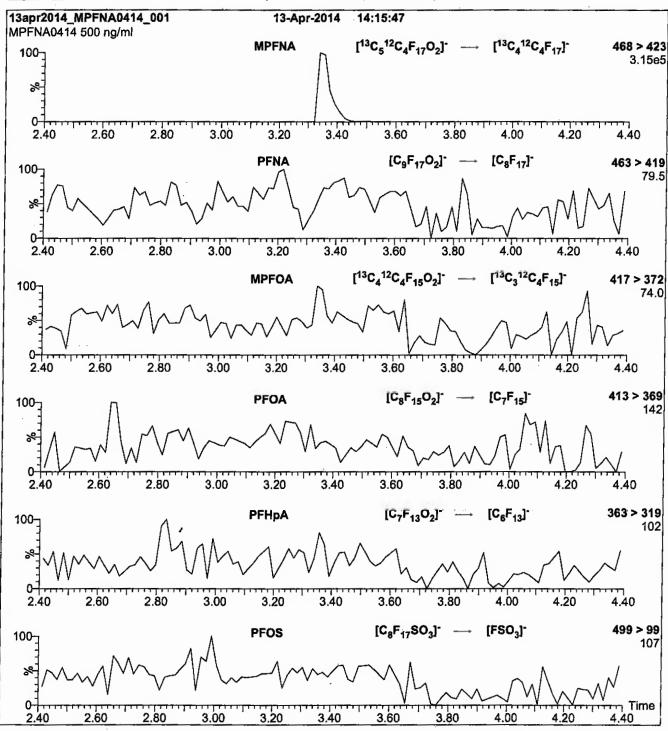
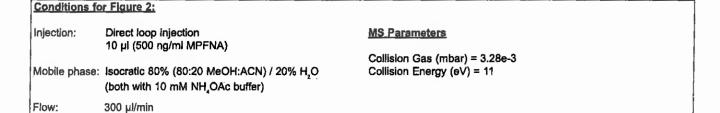


Figure 2: MPFNA; LC/MS/MS Data (Selected MRM Transitions)





# LCMPFOA_00012



738683

ID: LCMPFOA_00012 Exp: 01/22/21 Prpd: SBC 13C4-Perfluorooctanoic ac



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**MPFOA** 

LOT NUMBER:

MPFOA0116

COMPOUND:

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

**STRUCTURE:** 

CAS #:

Not available

F C C C 13 13 C 13 C OH

**MOLECULAR FORMULA:** 

¹³C₄¹²C₄HF₁₅O₂

**CONCENTRATION:** 

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 

**ISOTOPIC PURITY:** 

418.04

2.5 μg/mi SOLVENT(S);

Methanol

(1,2,3,4-13C,)

Water (<1%) >99% 13C

CHEMICAL PURITY:

LAST TESTED: (mm/dd/yyyy)

>98%

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

02/01/2010

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:

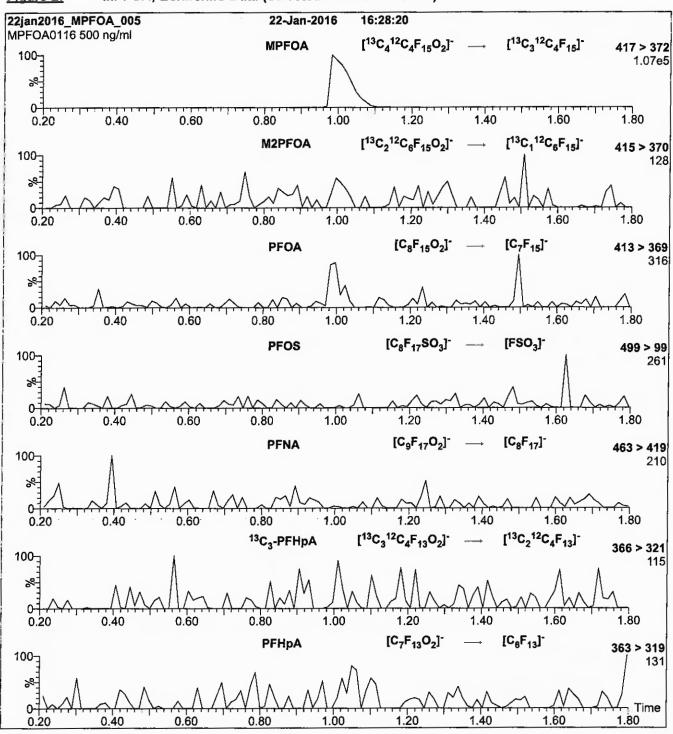
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).





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

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



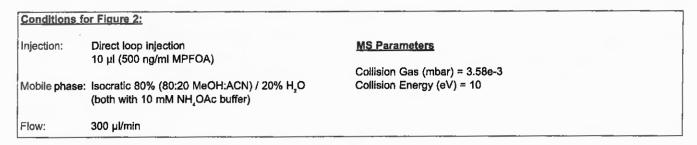
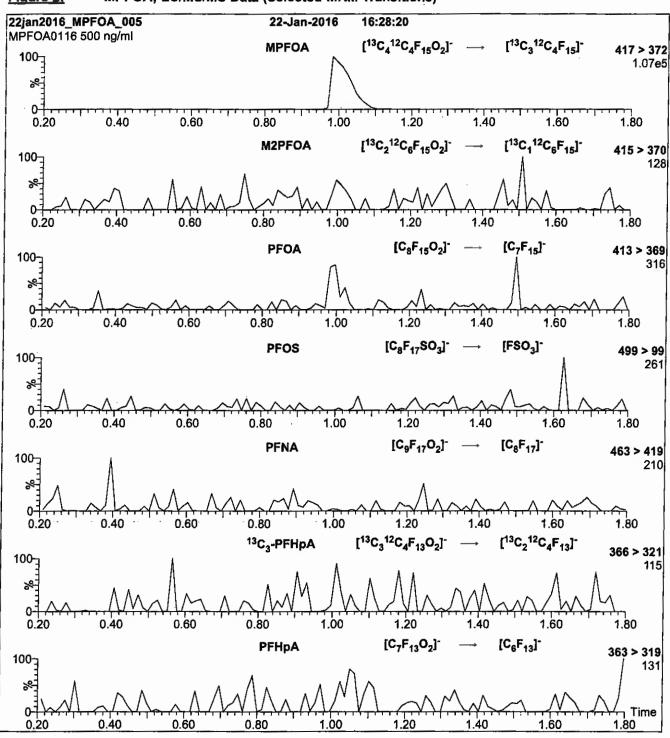
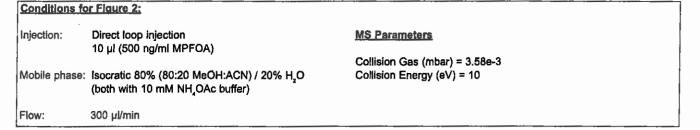


Figure 2: MPFOA; LC/MS/MS Data (Selected MRM Transitions)





## LCMPFOS_00017

R: 9/9/16 8BC





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

### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**MPFOS** 

LOT NUMBER:

**MPFOS0816** 

**COMPOUND:** 

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

**STRUCTURE:** 

**CAS #:** 

Not available

**MOLECULAR FORMULA:** 

¹³C₄¹²C₄F₁₇SO₃Na

MOLECULAR WEIGHT:

526.08

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

CHEMICAL PURITY:

>98%

**ISOTOPIC PURITY:** 

≥99% ¹³C

(1,2,3,4-13C₄)

LAST TESTED: (mm/dd/yyyy)

08/03/2016

EXPIRY DATE: (mm/dd/yyyy)

08/03/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 08/05/2016

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

#### **HAZARDS:**

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and 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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#### 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:

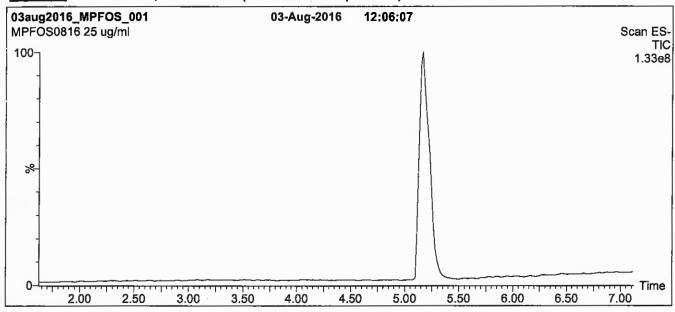
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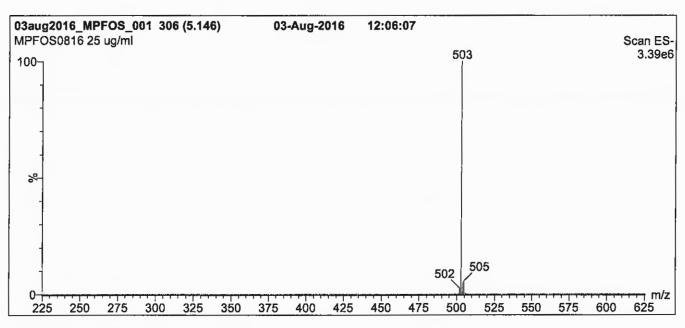




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Figure 1: MPFOS; LC/MS Data (TIC and Mass Spectrum)





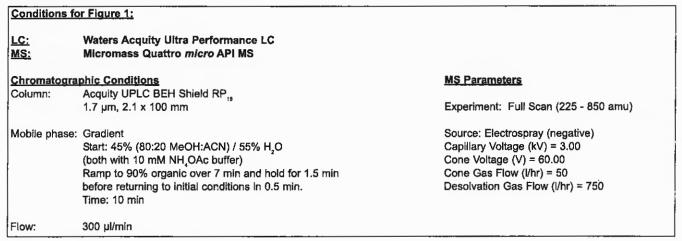
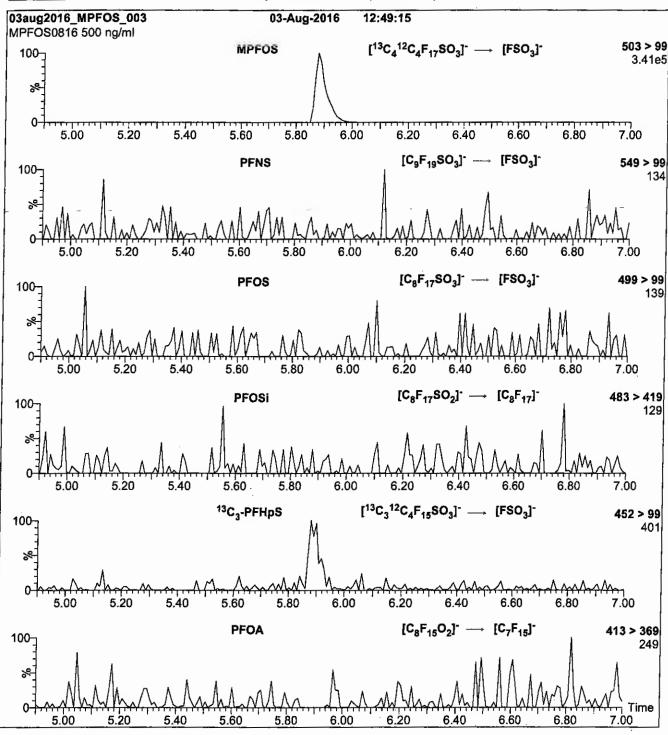
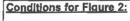


Figure 2: MPFOS; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml MPFOS)

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

(both with 10 mM NH OAc buffer)

Collision Gas (mbar) = 3.46e-3 Collision Energy (eV) = 40

MS Parameters

Flow:

300 µl/min

## LCMPFUdA_00009



# VELLINGTON ABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

PRODUCT CODE:

**MPFUdA** 

**LOT NUMBER:** 

MPFUdA0216

**COMPOUND:** 

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

STRUCTURE:

CAS#:

Not available

**MOLECULAR FORMULA:** 

13C, 12C, HF, O,

**MOLECULAR WEIGHT:** 

566.08

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

**CHEMICAL PURITY:** 

>98%

**ISOTOPIC PURITY:** 

Water (<1%) >99% 13C (1,2-13C_a)

LAST TESTED: (mm/dd/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### ADDITIONAL INFORMATION:

See page 2 for further details.

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

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 Bv:

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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#### LIMITED WARRANTY:

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

#### **QUALITY MANAGEMENT:**

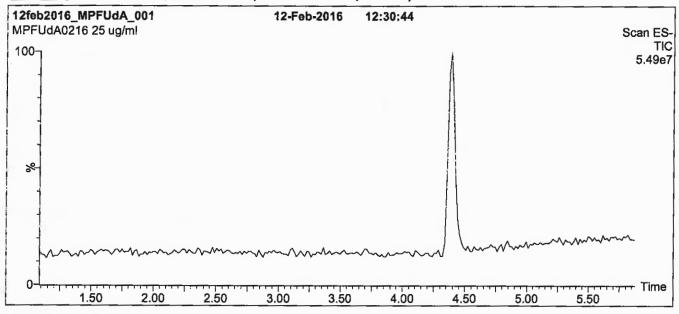
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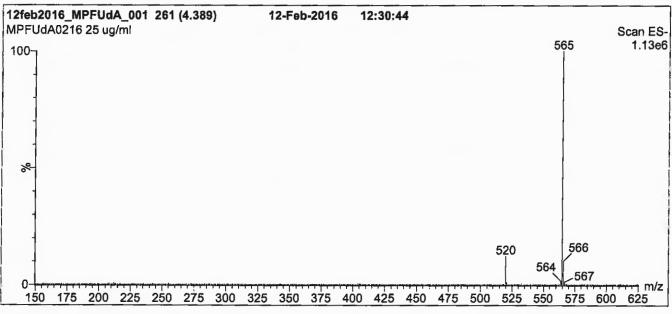




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Figure 1: MPFUdA; LC/MS Data (TIC and Mass Spectrum)





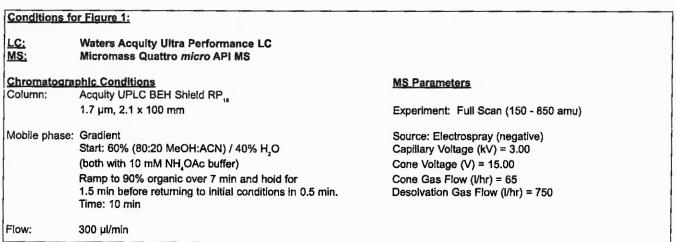
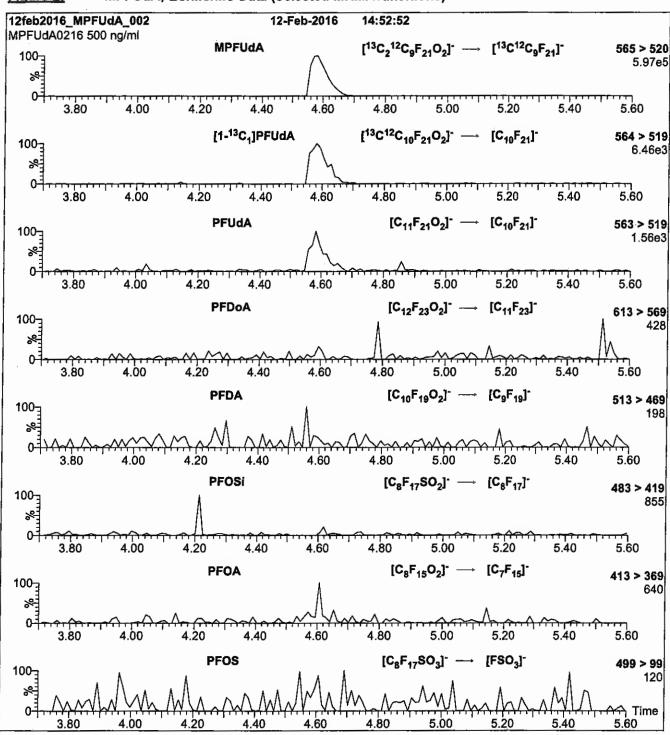
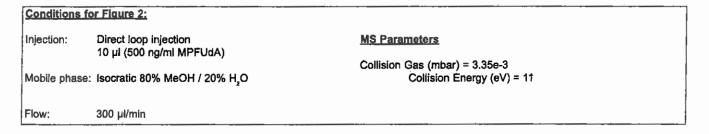


Figure 2: MPFUdA; LC/MS/MS Data (Selected MRM Transitions)





## LCN-EtFOSA-M_00002



### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

N-EtFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

NEtFQSA0714M

527.20

Methanol

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamide

CAS #:

4151-50-2

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

C₁₀H₈F₁₇NO₂S

**CONCENTRATION:** 

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

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

07/14/2014

EXPIRY DATE: (mm/dd/yyyy)

07/14/2019

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 04/01/2015

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

#### **HAZARDS:**

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

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#### **QUALITY MANAGEMENT:**

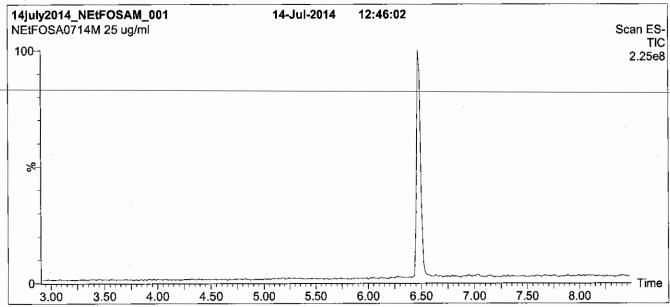
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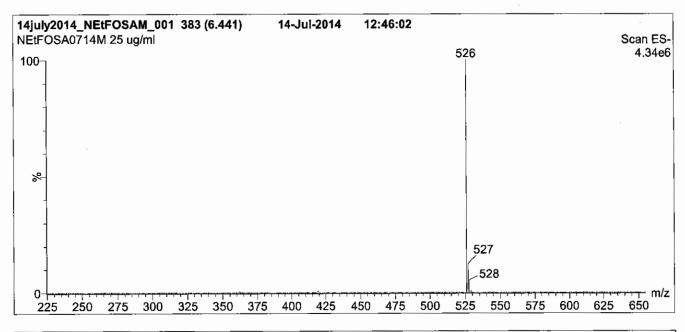




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Figure 1: N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)





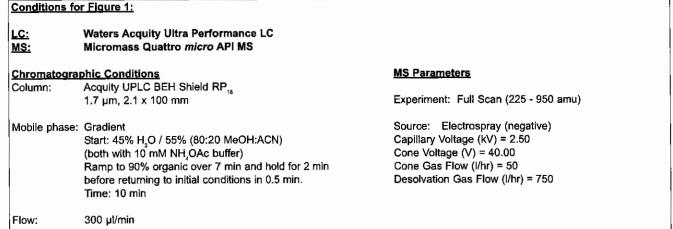
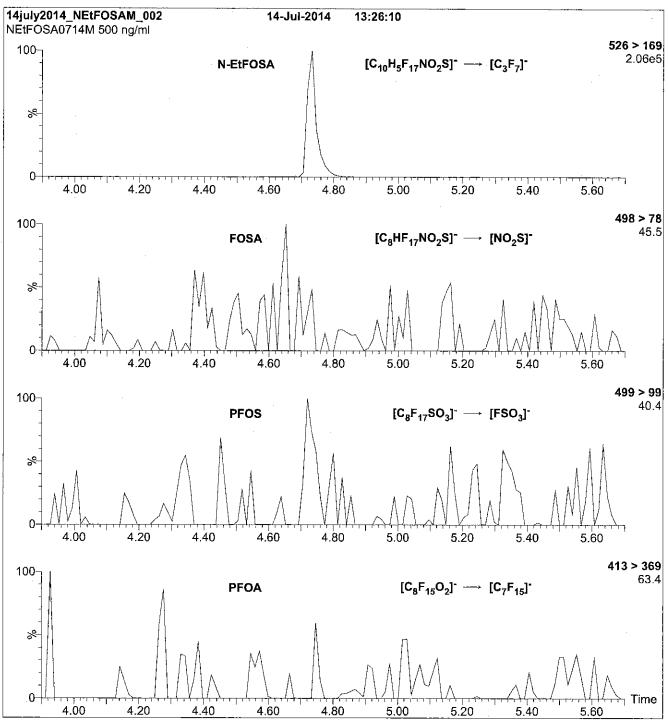
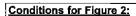


Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml N-EtFOSA-M)

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

(both with 10 mM NH,OAc buffer)

#### MS Parameters

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

Flow:

300 µl/min

# LCN-EtFOSA-M_00003

R: 8/23/16 SEC







### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

N-EtFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

NEtFOSA0516M

527.20

Methanol

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamide

STRUCTURE:

**CAS #:** 

4151-50-2

**MOLECULAR FORMULA:** 

C,H,F,NO,S

**CONCENTRATION:** 

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

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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Certified By:

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#### **HAZARDS:**

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

 $x_4$ ,  $x_2$ ,... $x_n$  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:**

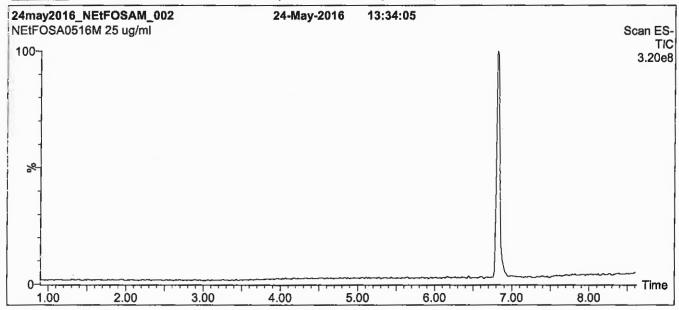
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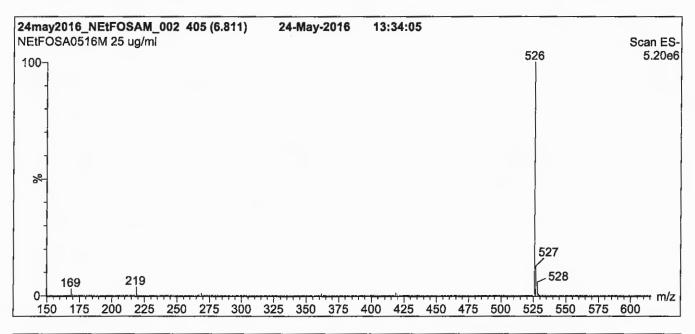




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





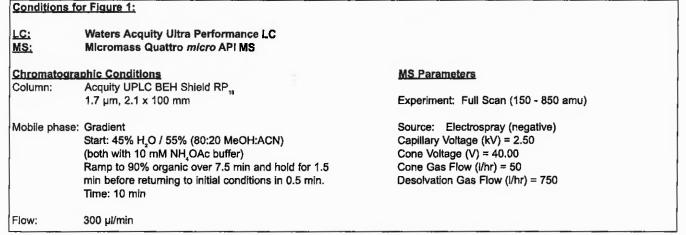
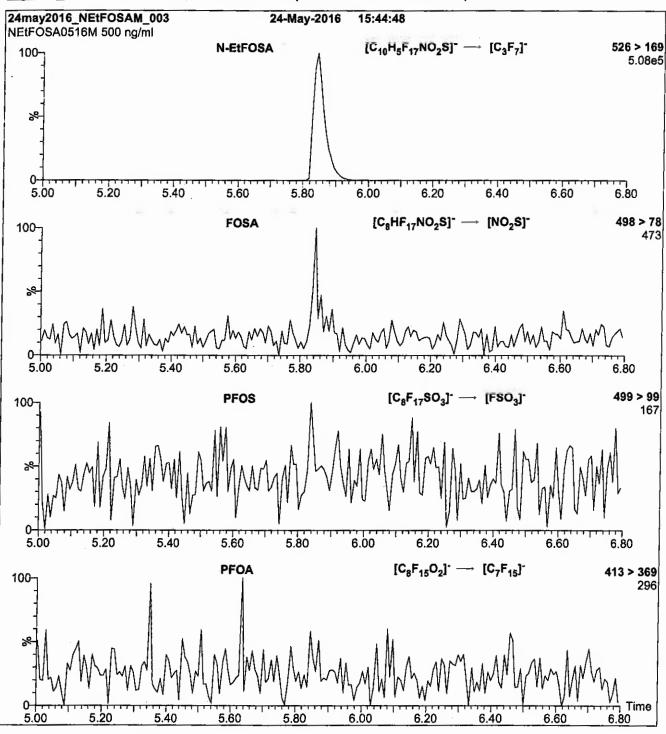


Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop Injection

10 µl (500 ng/ml N-EtFOSA-M)

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

(both with 10 mM NH OAc buffer)

Flow: 300 µl/min MS Parameters

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

# LCN-EtFOSAA_00001



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-EtFOSAA

**LOT NUMBER:** 

NEtFOSAA0113

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

**CAS #:** 

2991-50-6

ÇH₂CH₃

**MOLECULAR FORMULA:** 

C₁₂H₈F₁₇NO₄S

**MOLECULAR WEIGHT:** 

585.23

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

Water (<1%)

CHEMICAL PURITY:

>98%

LAST TESTED: (mm/dd/yyyy)

01/29/2013

EXPIRY DATE: (mm/dd/yyyy)

01/29/2018

RECOMMENDED STORAGE:

Refrigerate ampoule

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

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

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

### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 04/06/2015

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

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

#### **HAZARDS:**

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

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

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#### TRACEABILITY:

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

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

#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

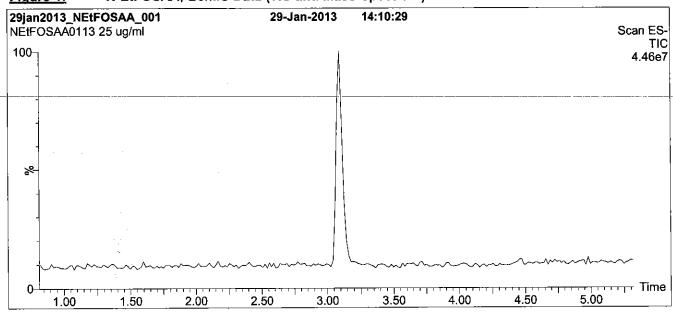
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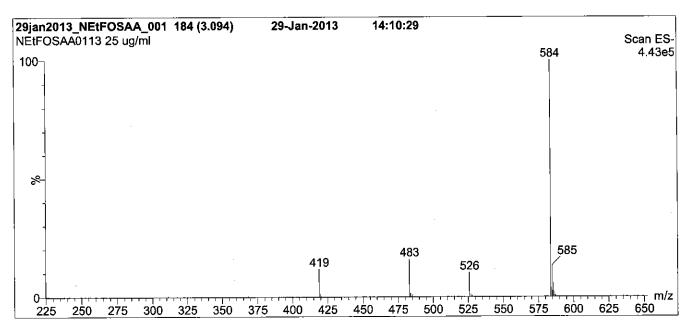




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Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





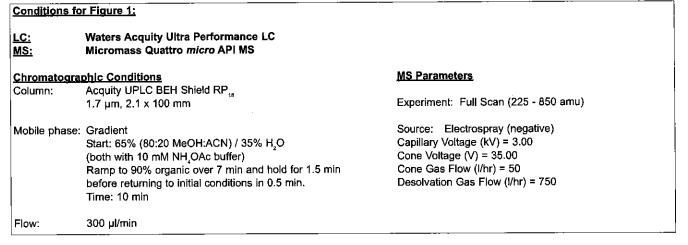
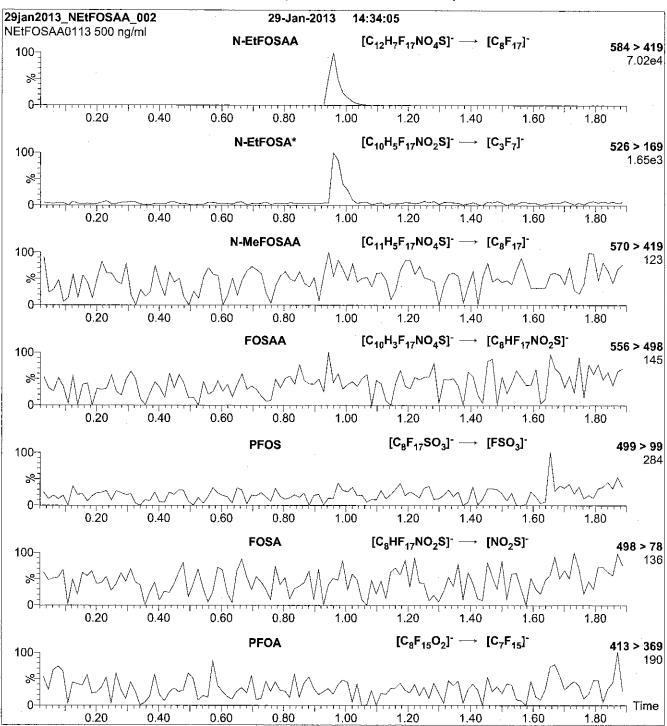
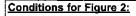


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



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



Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml N-EtFOSAA)

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

(both with 10 mM NH₄OAc buffer)

300 µl/min

#### MS Parameters

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

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

# LCN-EtFOSAA_00002





### CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

N-EtFOSAA

**LOT NUMBER:** 

NEtFOSAA0116

**COMPOUND:** 

N-ethylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

CAS #:

2991-50-6

**MOLECULAR FORMULA:** 

C₁₂H_BF₁₇NO₄S

**MOLECULAR WEIGHT:** 

585.23

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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:

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#### QUALITY MANAGEMENT:

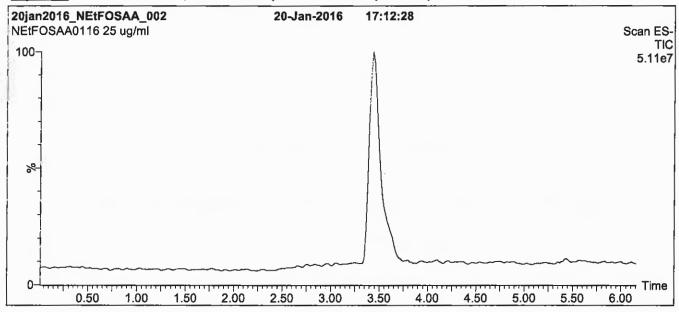
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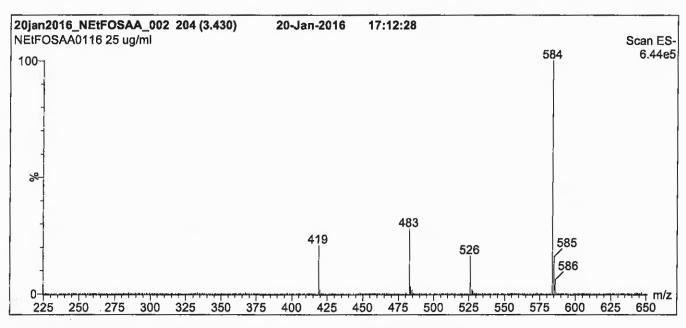




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Figure 1: N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)





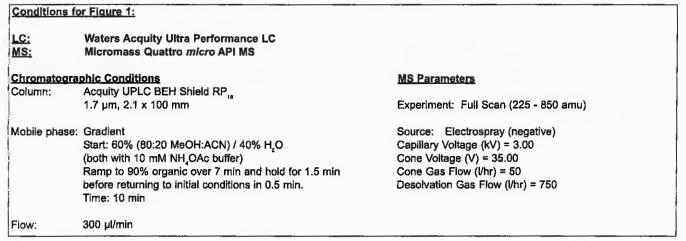
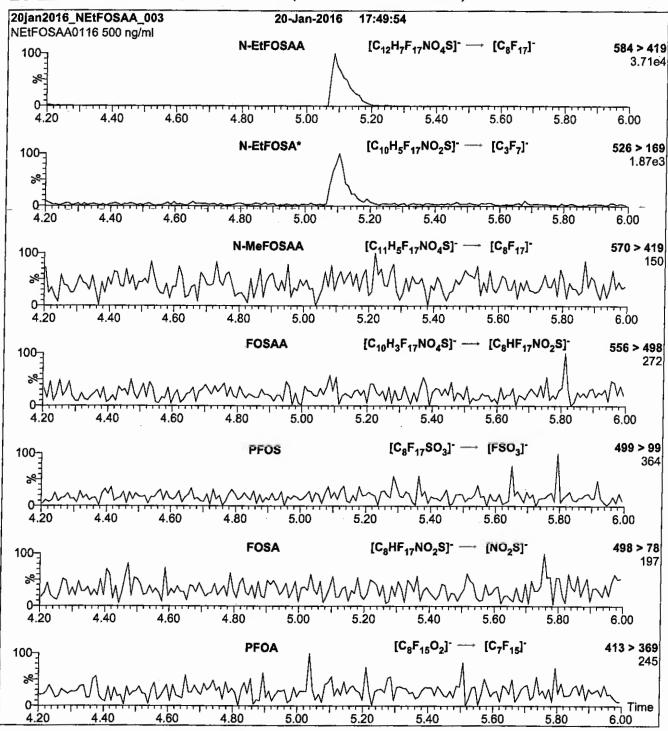
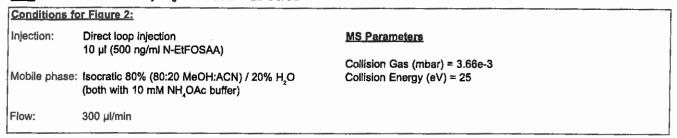


Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



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



# LCN-MeFOSA-M_00001



### **CERTIFICATE OF ANALYSIS DOCUMENTATION**

**PRODUCT CODE:** 

N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

NMeFOSA0714M

513.17

Methanol

**COMPOUND:** 

N-methylperfluoro-1-octanesulfonamide

STRUCTURE:

CAS #:

31506-32-8

**MOLECULAR FORMULA:** 

C₂H₄F₁₇NO₂S

**CONCENTRATION:** 

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

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

07/15/2014

EXPIRY DATE: (mm/dd/yyyy)

07/15/2019

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### ADDITIONAL INFORMATION:

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 04/01/2015

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

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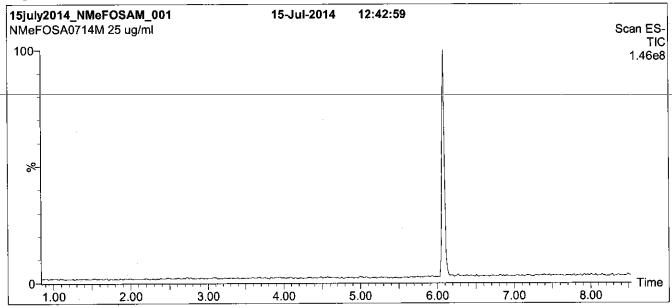
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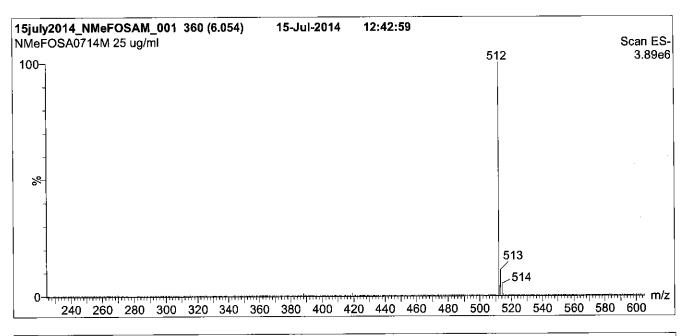




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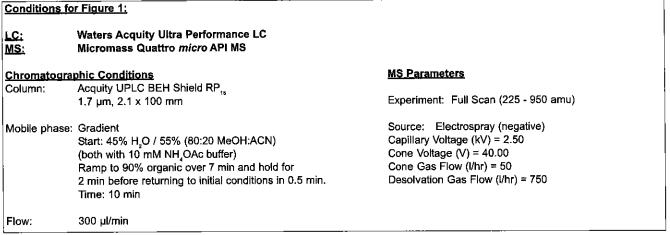
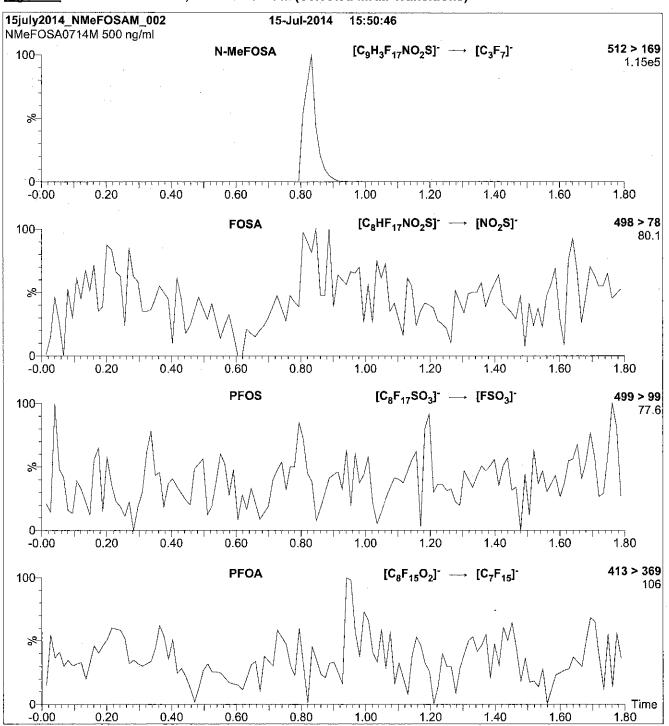
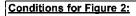


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml N-MeFOSA-M)

Flow:

300 µl/min

#### **MS Parameters**

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

# LCN-MeFOSA-M_00002



# WELLINGTON LABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

N-MeFOSA-M

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

NMeFOSA0516M

513.17

Methanol

COMPOUND:

N-methylperfluoro-1-octanesulfonamide

CAS #:

31506-32**-**8

STRUCTURE:

**MOLECULAR FORMULA:** 

C₀H₄F₄,NO₂S

**CONCENTRATION:** 

50 ± 2.5 µg/ml

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

05/24/2016

EXPIRY DATE: (mm/dd/yyyy)

05/24/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/26/2016

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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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

 $x_{i}, x_{2},...x_{n}$  on which it depends is:

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

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

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

#### TRACEABILITY:

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

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

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

#### LIMITED WARRANTY:

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

#### **QUALITY MANAGEMENT:**

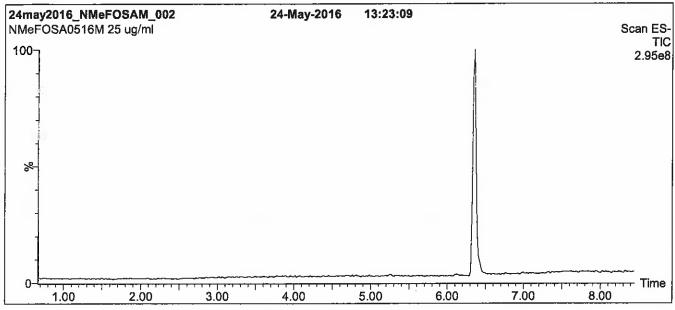
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

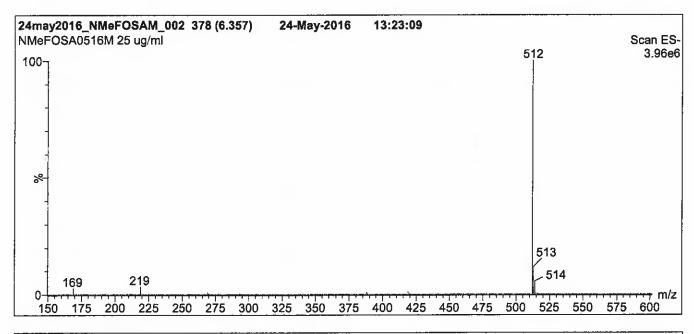




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Figure 1: N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)





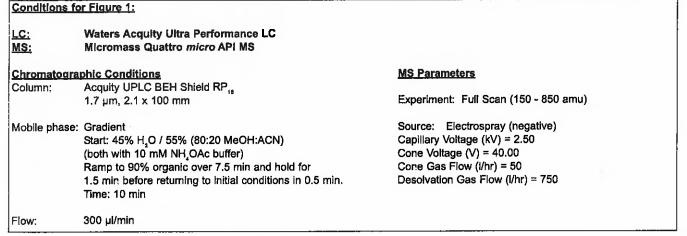
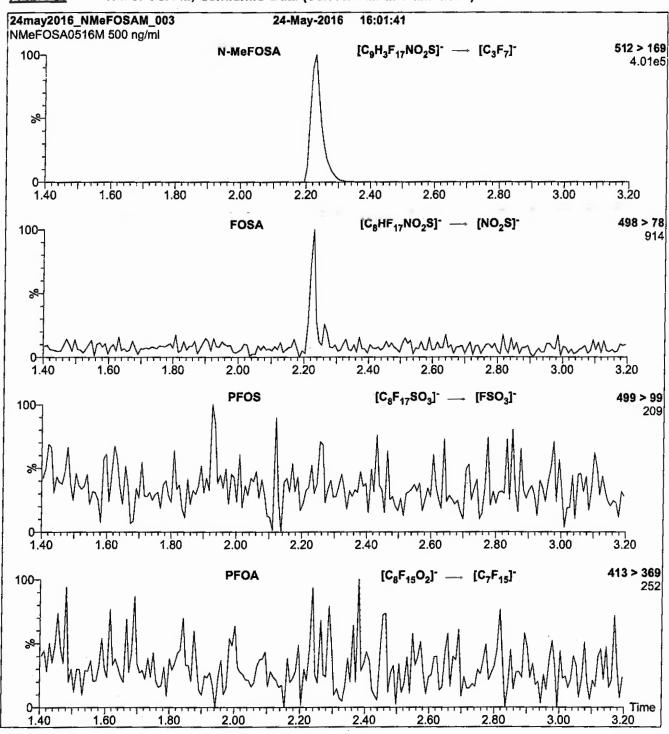


Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml N-MeFOSA-M)

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

(both with 10 mM NH, OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

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

# LCN-MeFOSAA_00001



### CERTIFICATE OF ANALYSIS **DOCUMENTATION**

PRODUCT CODE:

N-MeFOSAA

**LOT NUMBER:** 

NMeFOSAA1214

**COMPOUND:** 

N-methylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** 

CAS #:

2355-31-9

**MOLECULAR FORMULA:** 

C₁₁H₆F₁₇NO₄S

**MOLECULAR WEIGHT:** 

571.21

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

12/09/2014

EXPIRY DATE: (mm/dd/yyyy)

12/09/2019

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

### ADDITIONAL INFORMATION:

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 04/06/2015

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

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

#### **HAZARDS:**

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

#### **SYNTHESIS / CHARACTERIZATION:**

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#### **HOMOGENEITY:**

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

#### **UNCERTAINTY:**

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

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

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:**

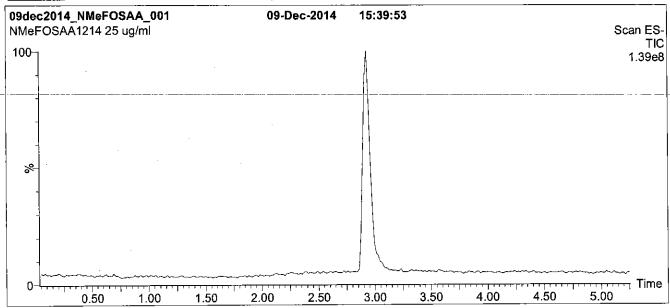
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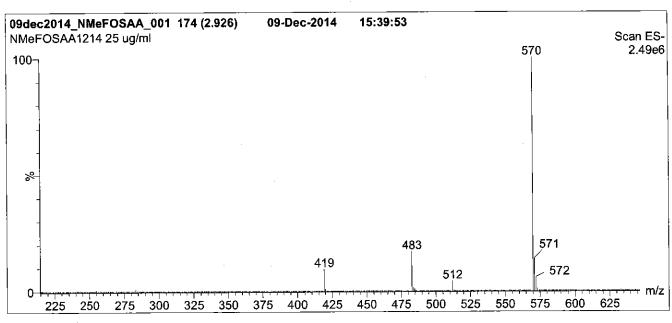




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Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





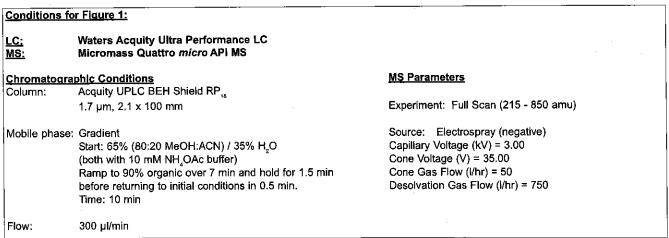
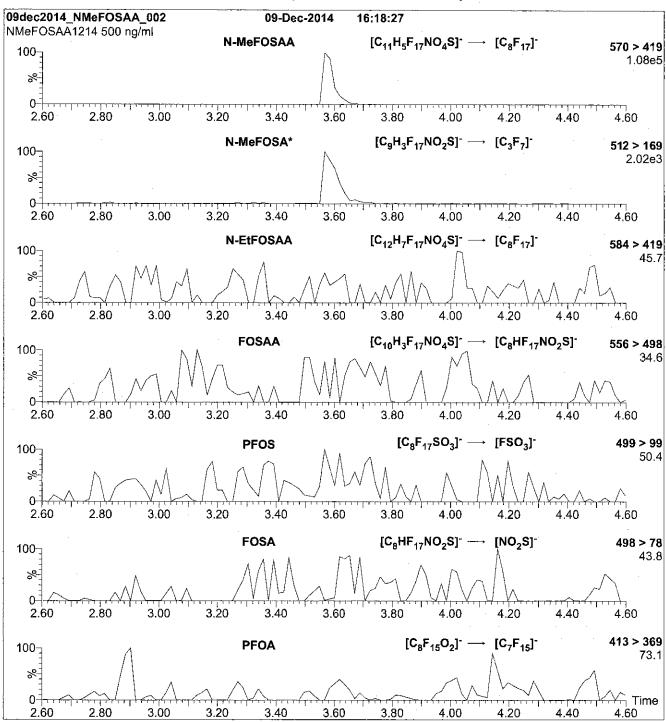
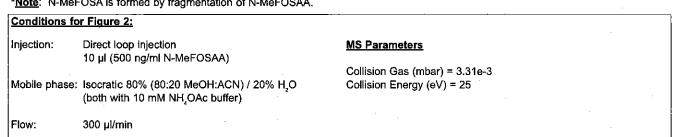


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-MeFOSA is formed by fragmentation of N-MeFOSAA.



# LCN-MeFOSAA_00003

R: 8/23/16 890





## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

N-MeFOSAA

LOT NUMBER:

NMeFOSAA0116

COMPOUND:

N-methylperfluoro-1-octanesulfonamidoacetic acid

STRUCTURE:

CAS #:

2355-31-9

**MOLECULAR FORMULA:** 

C₁₁H₆F₁₇NO₄S

MOLECULAR WEIGHT:

571.21

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/20/2016

EXPIRY DATE: (mm/dd/yyyy)

01/20/2021

RECOMMENDED STORAGE:

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

(mm/ddhasa)

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:**

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

#### LIMITED WARRANTY:

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#### QUALITY MANAGEMENT:

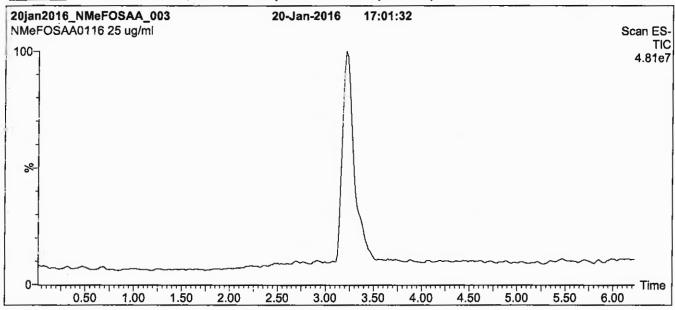
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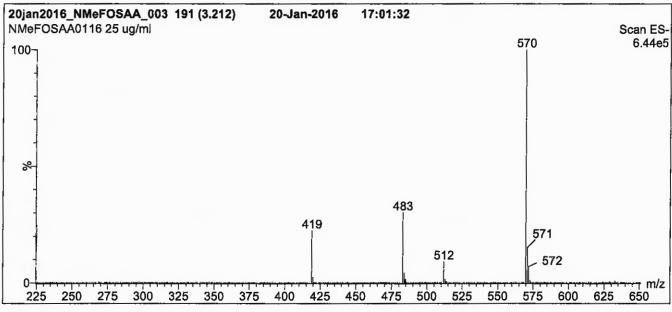




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Figure 1: N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)





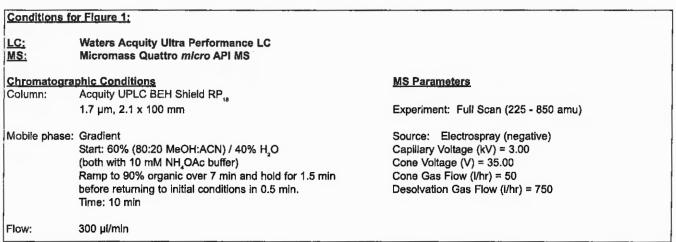
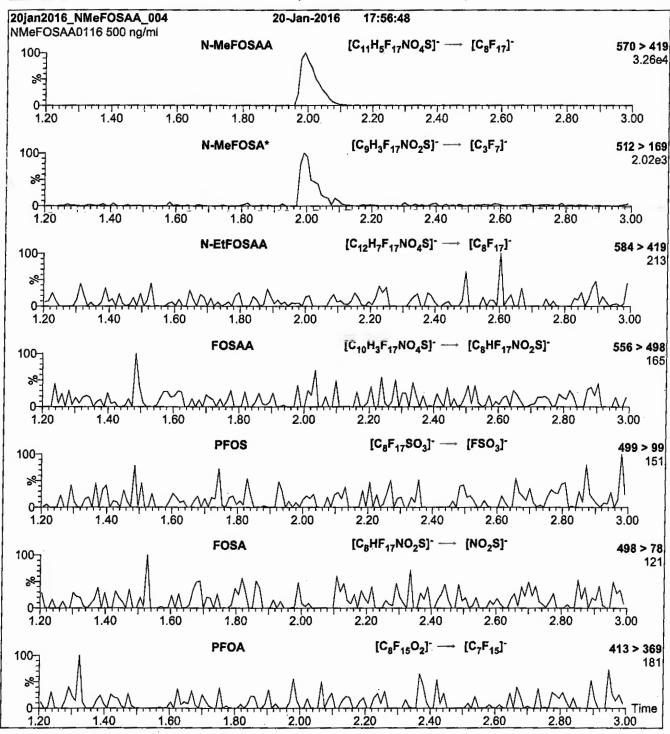
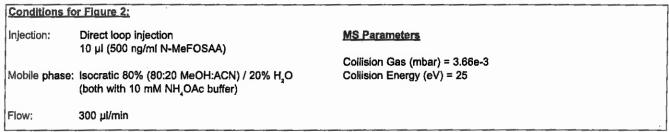


Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)



*Note: N-MeFOSA is formed by in-source fragmentation.



# 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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#### **HAZARDS:**

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#### SYNTHESIS / CHARACTERIZATION:

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#### **HOMOGENEITY:**

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 $x_{ij} x_{ij} ... x_{ij}$  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.

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#### **LIMITED WARRANTY:**

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#### **QUALITY MANAGEMENT:**

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

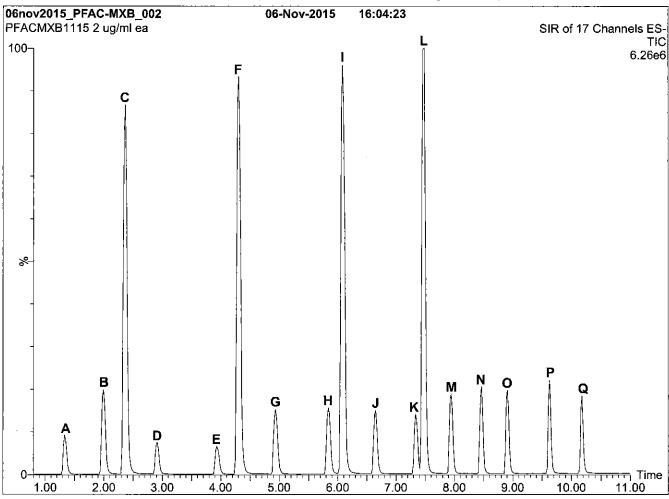
Name	Abbreviation	Concentration (ng/ml)		Peak Assignment In Figure 1
Perfluoro-n-butanoic acid	PFBA	2000		Α
Perfluoro-n-pentanoic acid	PFPeA	2000		В
Perfluoro-n-hexanoic acid	PFHxA	2000		D
Perfluoro-n-heptanoic acid	PFHpA	2000		E
Perfluoro-n-octanoic acid	PFOA	2000		G
Perfluoro-n-nonanoic acid	PFNA	2000		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:

R C Chittim

Date: 11/11/201

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

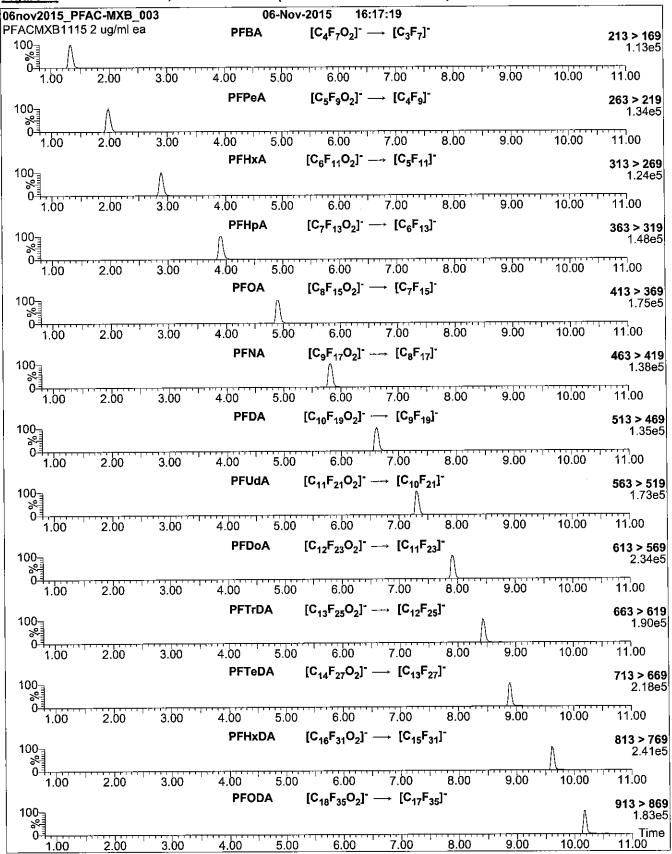
#### MS Parameters

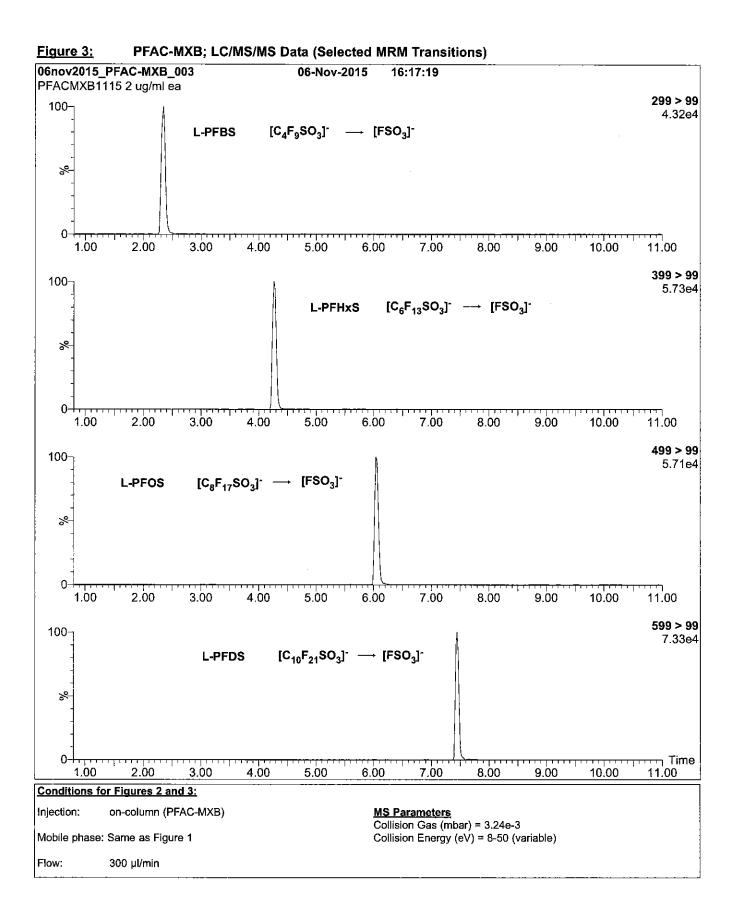
Experiment: SIR of 17 Channels

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_00005

P:8BC 9/13/16

ID: LCPFBA_00005 Exp: 05/27/21 Prpd: SBC

ID: LCPFBA_00006 Exp: 05/27/21 Prod: SBC PF-n-butanoic acid



### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**PFBA** 

**LOT NUMBER:** 

PFBA0516

**COMPOUND:** 

Perfluoro-n-butanoic acid

STRUCTURE:

**CAS #:** 

375-22-4

C₄HF₂O₂

**MOLECULAR WEIGHT:** 

214.04

**CONCENTRATION:** 

**MOLECULAR FORMULA:** 

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

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

05/27/2016

EXPIRY DATE: (mm/dd/yyyy)

05/27/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 05/31/2016

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

#### **HAZARDS:**

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

#### SYNTHESIS / CHARACTERIZATION:

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

#### **HOMOGENEITY:**

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

#### **UNCERTAINTY:**

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

The combined relative standard uncertainty, u_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 explry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

#### **LIMITED WARRANTY:**

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

#### **QUALITY MANAGEMENT:**

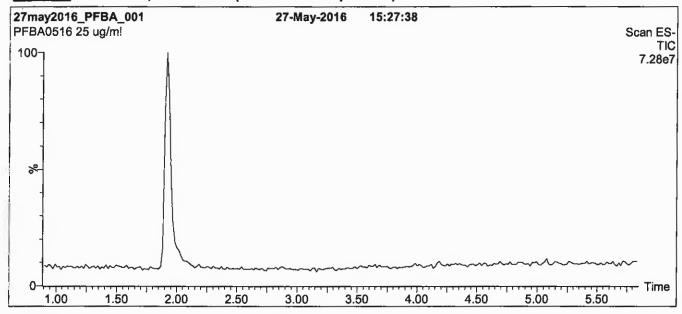
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

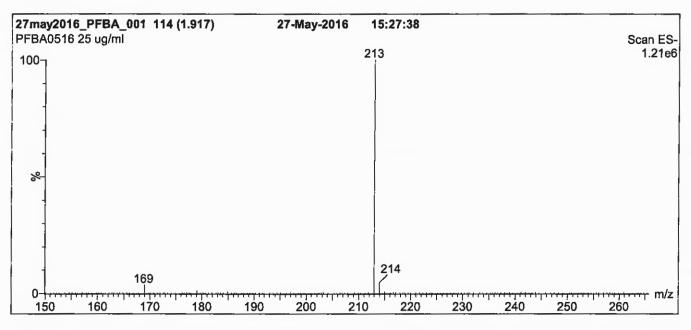




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Figure 1: PFBA; LC/MS Data (TIC and Mass Spectrum)





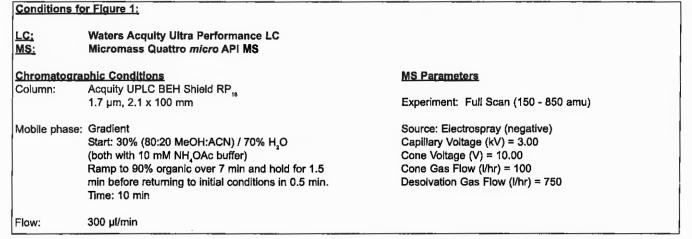
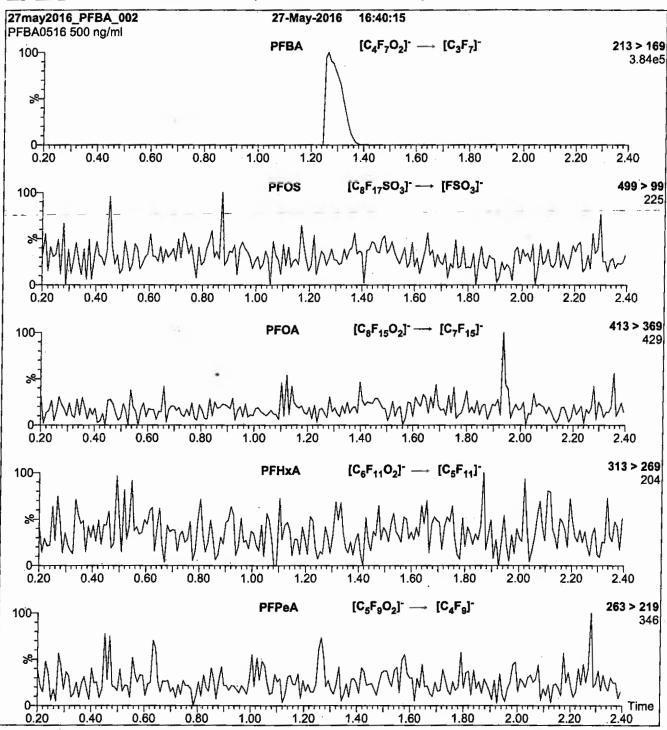


Figure 2: PFBA; LC/MS/MS Data (Selected MRM Transitions)





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)

#### MS Parameters

Collision Gas (mbar) = 3.62e-3 Collision Energy (eV) = 10

Flow:

300 µl/min

# LCPFBS 00005

R: 9/9/16 8BC







### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

PRODUCT CODE:

M2-8:2FTS

**LOT NUMBER:** 

M282FTS0116

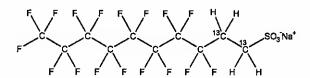
**COMPOUND:** 

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

**STRUCTURE:** 

CAS #:

Not available



**MOLECULAR FORMULA:** 

¹³C₂¹²C₈H₄F₁₇SO₃Na

**MOLECULAR WEIGHT:** 

552.15

**CONCENTRATION:** 

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

Methanol

47.9 ± 2.4 µg/ml

(M2-8:2FTS anion)

≥99% ¹³C

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

**ISOTOPIC PURITY:** 

(1,2-13C_n)

01/08/2016

EXPIRY DATE: (mm/dd/yyyy)

01/08/2021

**RECOMMENDED STORAGE:** 

Refrigerate ampoule

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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

Certified By:

Date: 01/18/2016

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

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

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

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

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

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

#### TRACEABILITY:

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

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

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

#### LIMITED WARRANTY:

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

#### QUALITY MANAGEMENT:

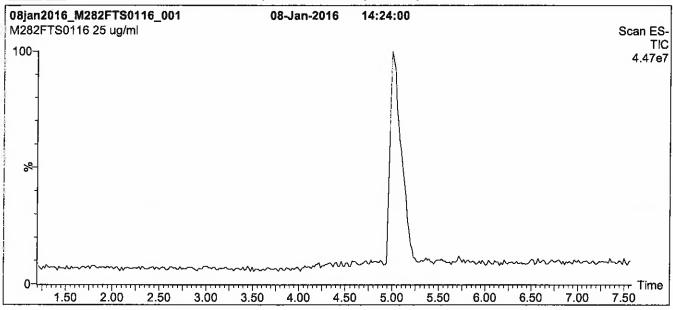
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc, (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

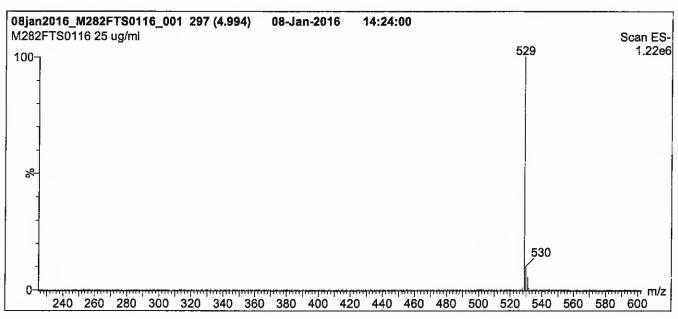




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Figure 1: M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)





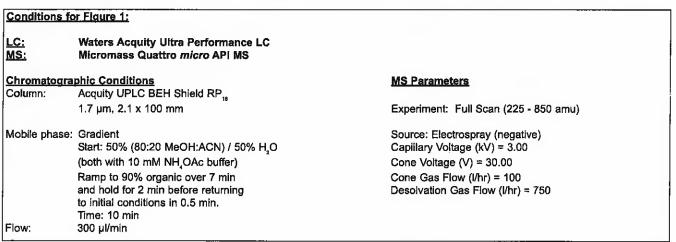
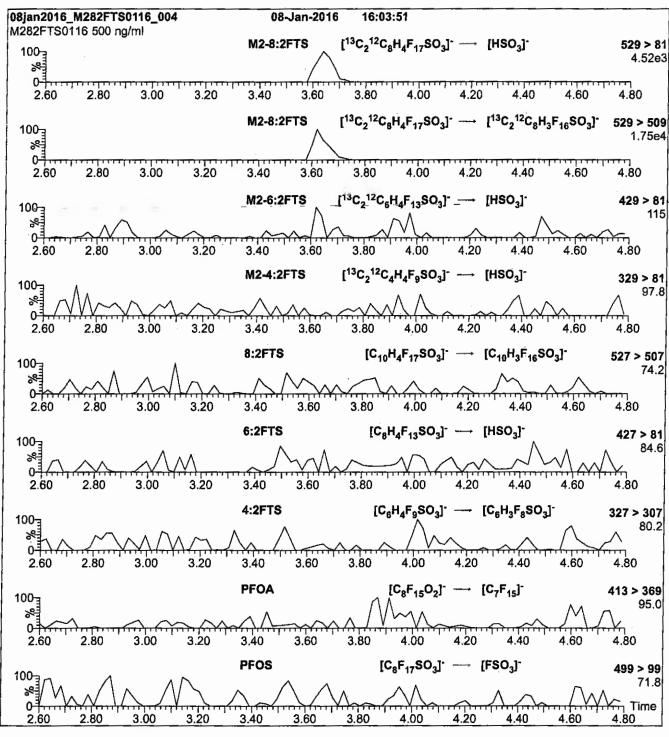
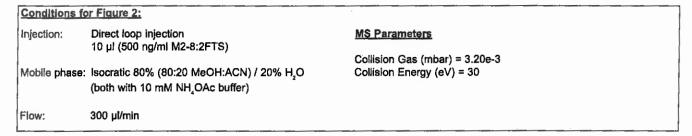


Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)







ID: LCPFBS 00005 Exp: 03/15/21 Prpd: SBC





# VELLINGTON ABORATORIES

ID: LCPFBS_00006 Exp: 03/15/21 Prpd: SBC PF-1-butanesulfonate K sa

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFBS

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

LPFBS0316

COMPOUND:

Potassium perfluoro-1-butanesulfonate

CAS #:

29420-49-3

338.19

Methanol

STRUCTURE:

**MOLECULAR FORMULA:** 

C₄F₆SO₃K

50.0 ± 2.5 μg/ml (K salt)

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

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>98%

LAST TESTED: (mm/dd/yyyy)

03/15/2016

EXPIRY DATE: (mm/dd/yyyy)

03/15/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: <u>03/21/2016</u>

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

#### **HAZARDS:**

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#### SYNTHESIS / CHARACTERIZATION:

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#### **HOMOGENEITY:**

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

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#### EXPIRY DATE / PERIOD OF VALIDITY:

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

#### LIMITED WARRANTY:

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#### QUALITY MANAGEMENT:

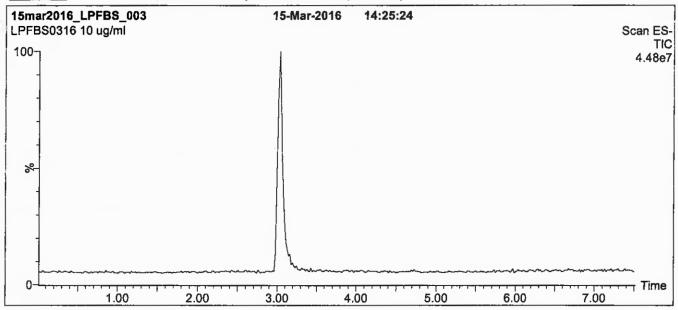
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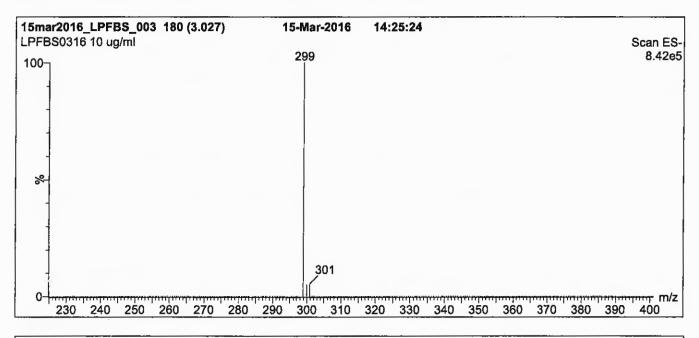




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Figure 1: L-PFBS; LC/MS Data (TIC and Mass Spectrum)





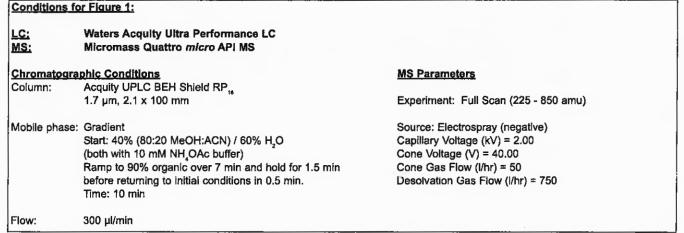
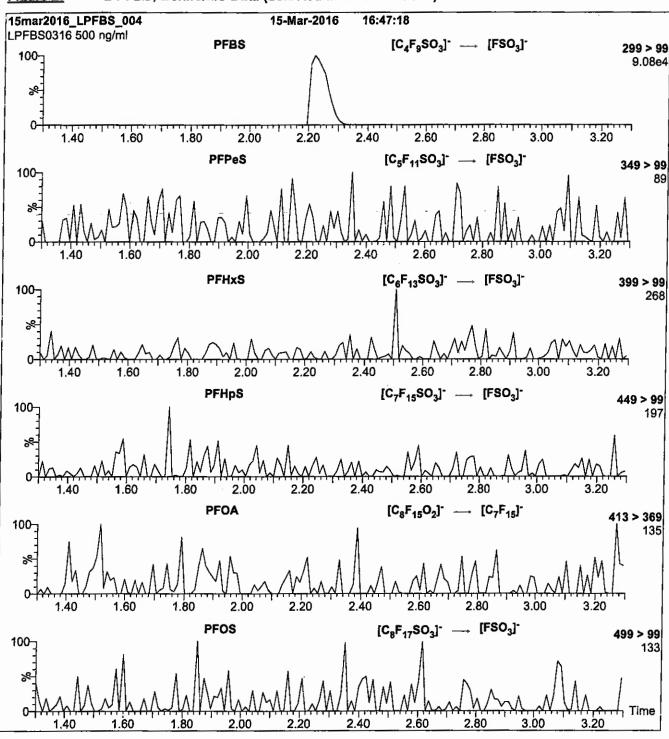
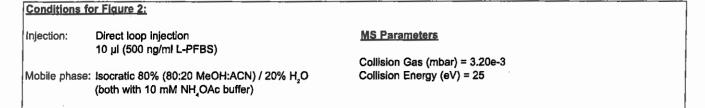


Figure 2: L-PFBS; LC/MS/MS Data (Selected MRM Transitions)





300 µl/min

Flow:

## LCPFDA 00005







### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

PFDA

**LOT NUMBER:** 

PFDA0615

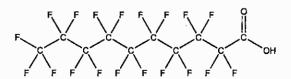
COMPOUND:

Perfluoro-n-decanoic acid

**STRUCTURE:** 

CAS #:

335-76-2



**MOLECULAR FORMULA:** 

C,HF,O,

**MOLECULAR WEIGHT:** 

514.08

**CONCENTRATION:** 

50 ± 2.5 μg/ml

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

07/02/2015

EXPIRY DATE: (mm/dd/yyyy)

07/02/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

Contains ~ 0.6% PFNA and ~ 0.3% PFOA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 07/24/2015

U1124/2U1

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

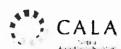
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#### **LIMITED WARRANTY:**

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#### QUALITY MANAGEMENT:

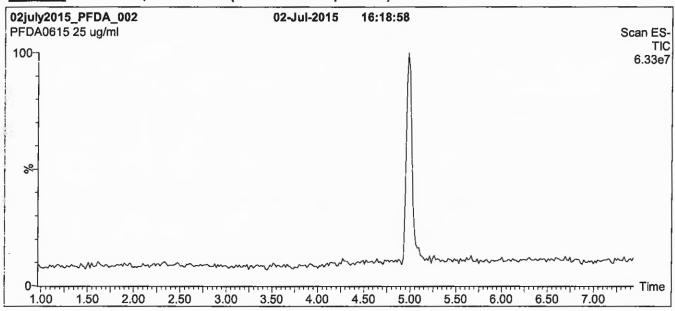
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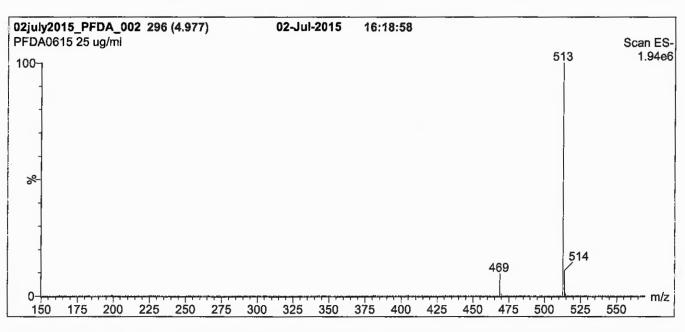


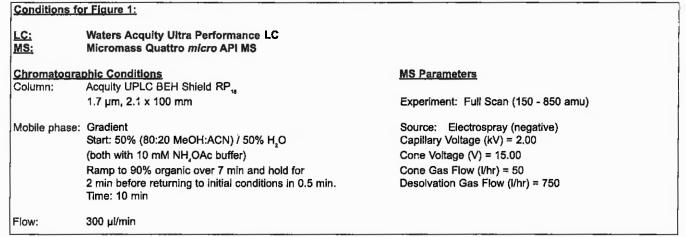


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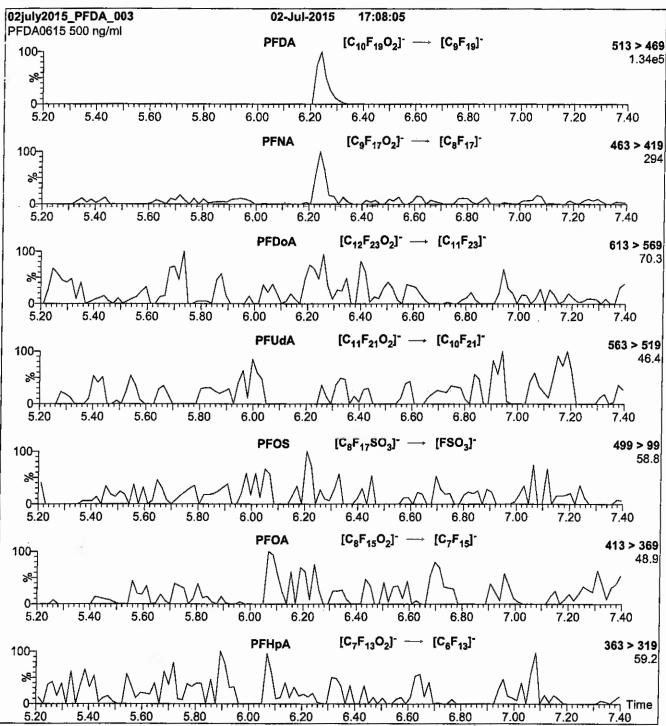
Figure 1: PFDA; LC/MS Data (TIC and Mass Spectrum)







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





Injection:

Direct loop injection

10 µl (500 ng/ml PFDA)

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) = 3.62e-3 Collision Energy (eV) = 13

# LCPFDoA_00005

### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFDoA** 

**LOT NUMBER:** 

PFDoA0115

COMPOUND:

Perfluoro-n-dodecanoic acid

STRUCTURE:

CAS #:

307-55-1

**MOLECULAR FORMULA:** 

C,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)

01/30/2015

EXPIRY DATE: (mm/dd/yyyy)

01/30/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

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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#### **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

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

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

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

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

#### TRACEABILITY:

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

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

#### **LIMITED WARRANTY:**

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

#### **QUALITY MANAGEMENT:**

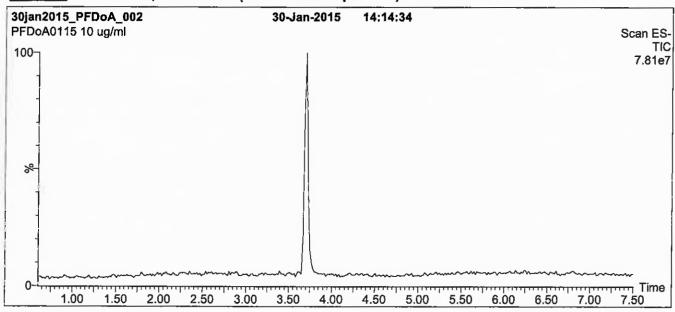
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

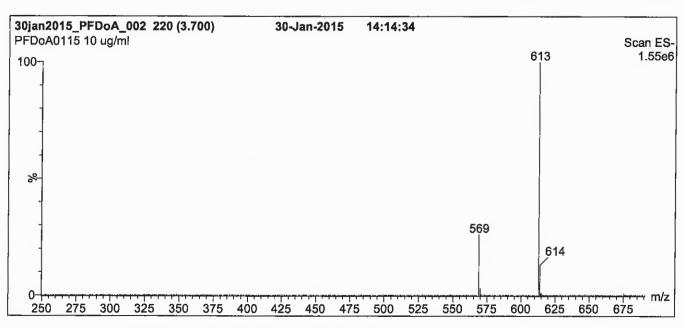




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Figure 1: PFDoA; LC/MS Data (TIC and Mass Spectrum)





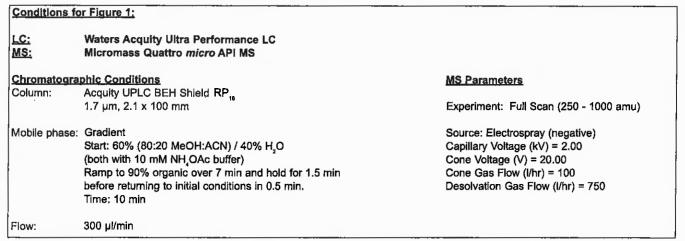
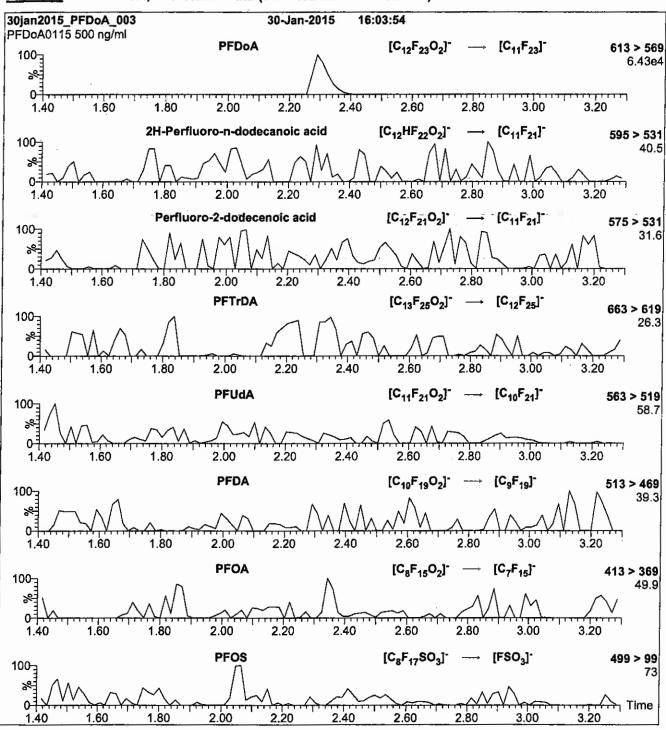
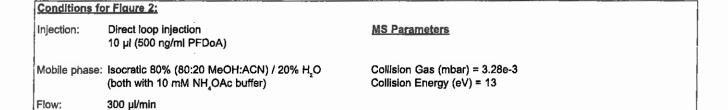


Figure 2: PFDoA; LC/MS/MS Data (Selected MRM Transitions)





# LCPFHpA_00005



ID: LCPFHpA_00005 Exp: 01/22/21 Prpd: CBW PF-n-heptanoic acid

R: 4/7/16 CBW



### CERTIFICATE OF ANALYSIS **DOCUMENTATION**

**PRODUCT CODE:** 

**PFHpA** 

LOT NUMBER:

PFHpA0116

COMPOUND:

Perfluoro-n-heptanoic acid

CAS #:

375-85-9

STRUCTURE:

MOLECULAR FORMULA:

C,HF,O2

**CONCENTRATION:** 

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

**MOLECULAR WEIGHT:** 

364.06

**SOLVENT(S):** 

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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

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:** 02/02/2016

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

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

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

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

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

#### LIMITED WARRANTY:

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#### **QUALITY MANAGEMENT:**

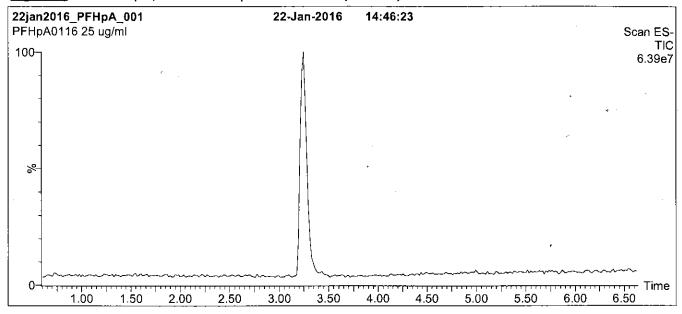
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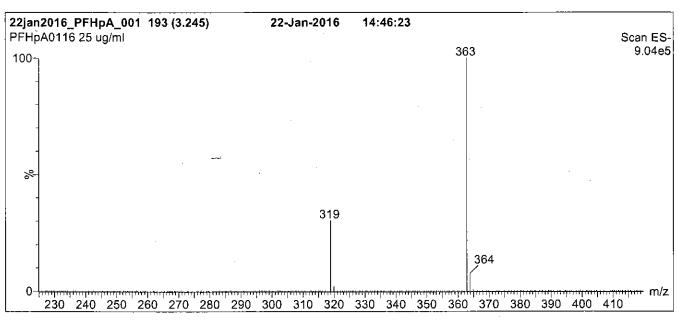




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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





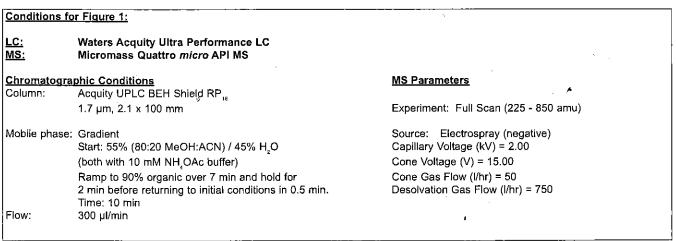
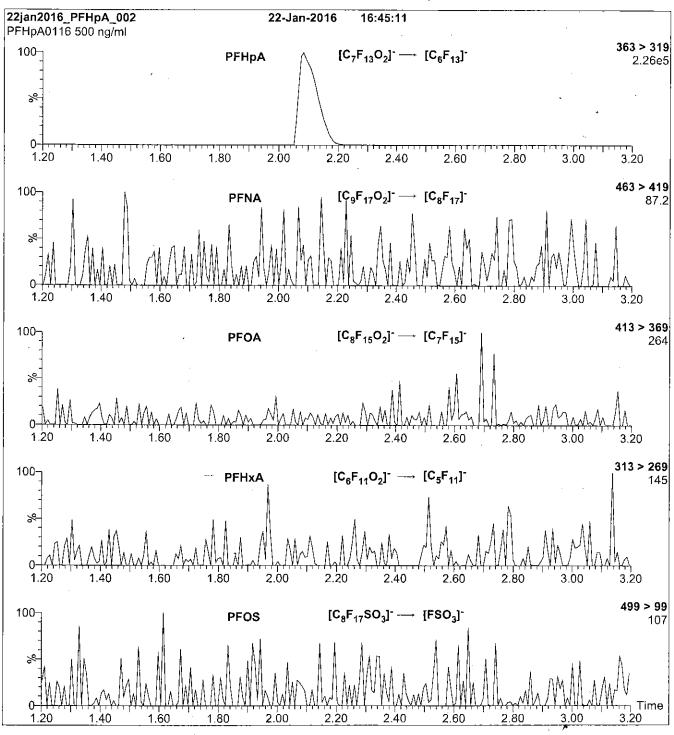
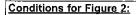


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHpA)

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

(both with 10 mM NH₄OAc buffer)

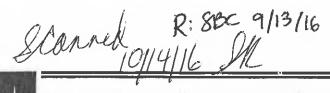
Flow:

300 µl/min

#### MS Parameters

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

# LCPFHpA_00006



ID: LCPFHpA_00006 Exp: 01/22/21 Prpd: SBC PF-n-heptanoic acid





### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFHpA** 

**LOT NUMBER:** 

PFHpA0116

**COMPOUND:** 

Perfluoro-n-heptanoic acid

STRUCTURE:

**CAS #:** 

375-85-9

**MOLECULAR FORMULA:** 

C,HF,O,

**CONCENTRATION:** 

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 

364.06

SOLVENT(S):

Methanol Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/22/2016

EXPIRY DATE: (mm/dd/yyyy)

01/22/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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Certified By:

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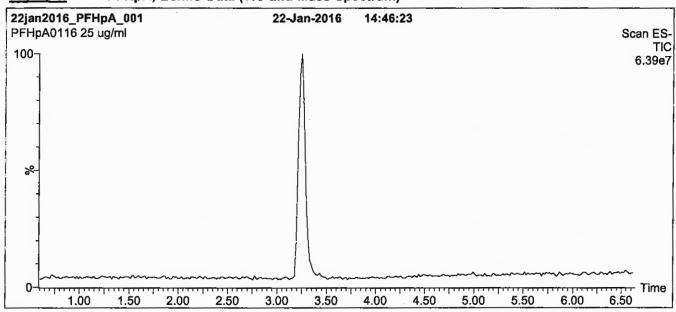
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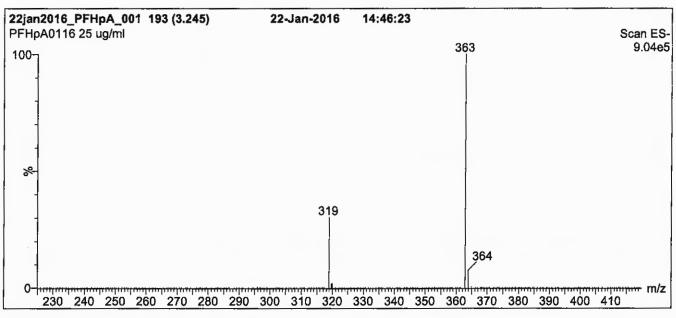




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Figure 1: PFHpA; LC/MS Data (TIC and Mass Spectrum)





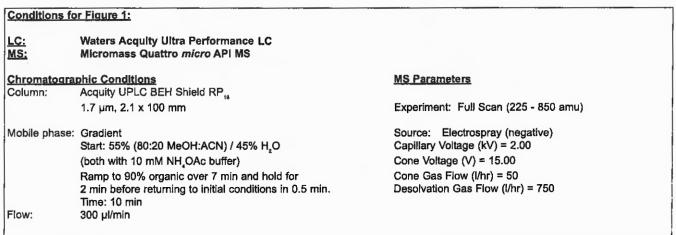
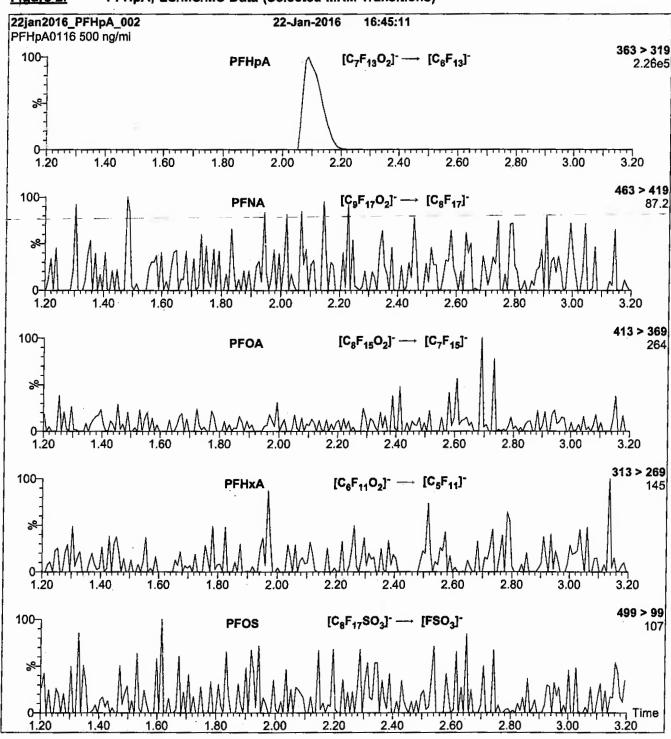


Figure 2: PFHpA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Flow:

Direct loop injection

10 µl (500 ng/ml PFHpA)

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

## LCPFHpS_00009

Scarred R: 8BC 9/13/16







### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

L-PFHpS

**LOT NUMBER:** 

LPFHpS1115

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: (m:m/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

11/06/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

47.6 ± 2.4 µg/ml (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 (C_xF_{x3}SO_xNa) and ~ 0.2% of L-PFOS (C_xF_{x2}SO_xNa).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u>11/09/2015</u>

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

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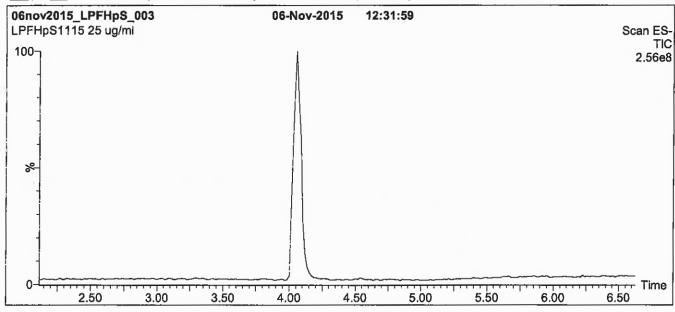
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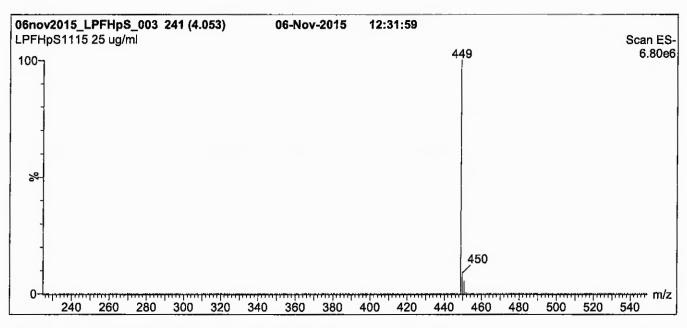




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Figure 1: L-PFHpS; LC/MS Data (TIC and Mass Spectrum)





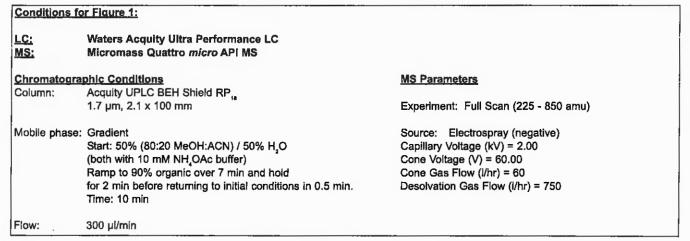
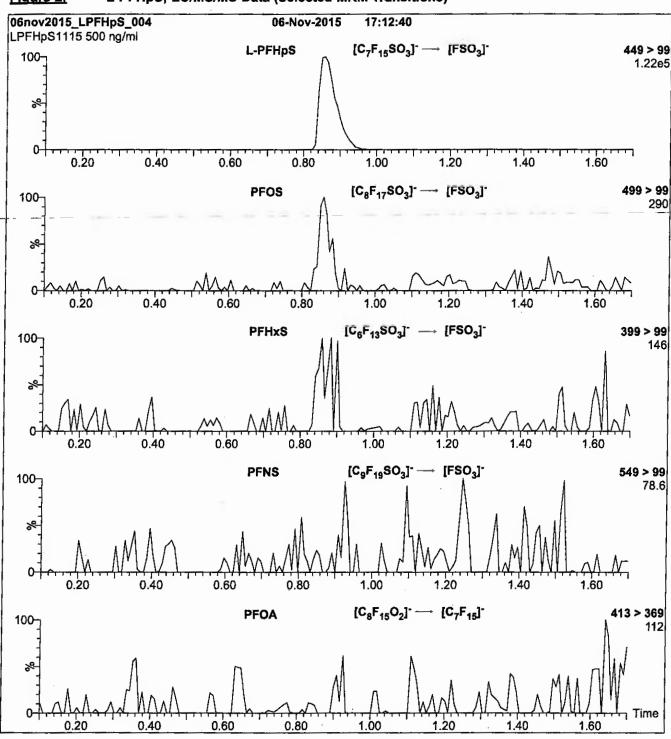
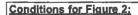


Figure 2: L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)





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) = 3.31e-3 Collision Energy (eV) = 35

# LCPFHxA 00004

PF-n-hexanoic acid



# ELLINGTON BORATORIES

### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**PFHxA** 

**LOT NUMBER:** 

PFHxA1215

**COMPOUND:** 

Perfluoro-n-hexanoic acid

STRUCTURE:

**CAS #:** 

307-24-4

**MOLECULAR FORMULA:** 

C,HF,O,

**MOLECULAR WEIGHT:** 

314.05

**CONCENTRATION:** 

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

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 12/23/2015

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

#### **HAZARDS**:

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

#### 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:**

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

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

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

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

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

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

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

#### LIMITED WARRANTY:

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

#### **QUALITY MANAGEMENT:**

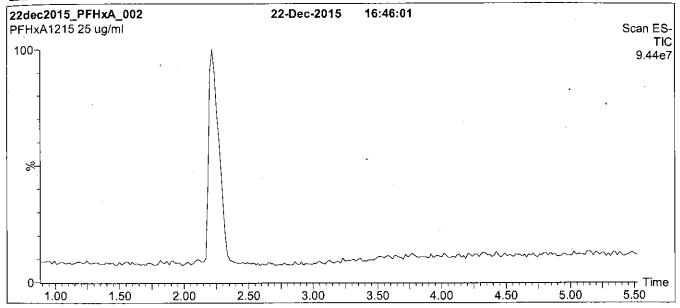
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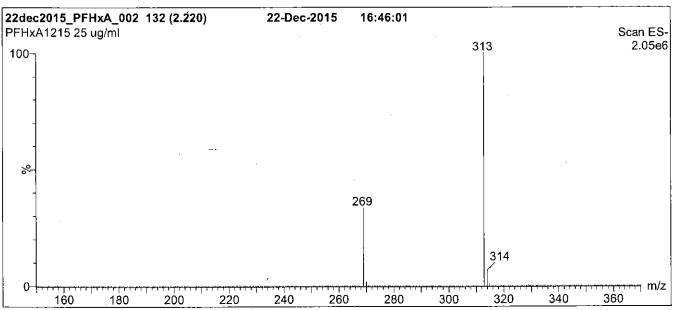




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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





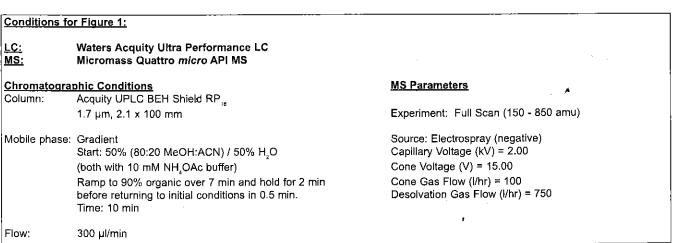
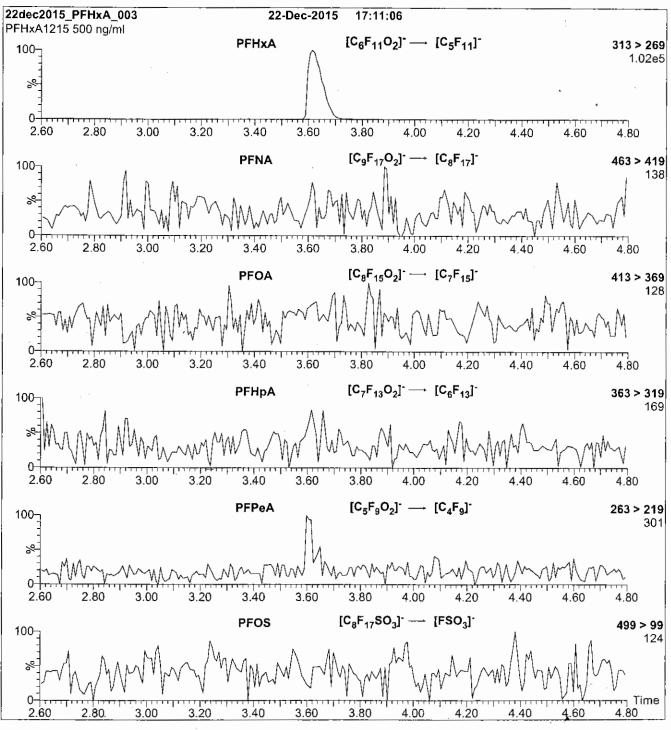
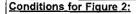


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHxA)

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

(both with 10 mM NH, OAc buffer)

Flow:

300 µl/min

#### MS Parameters

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

# LCPFHxA_00005

R: 8Be 9/13/16



iD: LCPFHxA_00005 Exp: 12/22/20 Prpd: SBC PF-n-hexanoic acid



/30002 ID: LCPFHxA_00006 Exp: 12/22/20 Prpd: SBC



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFHxA** 

**LOT NUMBER:** 

PFHxA1215

COMPOUND:

Perfluoro-n-hexanoic acid

STRUCTURE:

CAS #:

307-24-4

F F F F OH

**MOLECULAR FORMULA:** 

C_rHF_uO_s

50 + 0 5 · · · · /··

**MOLECULAR WEIGHT:** 

314.05

 $50 \pm 2.5 \,\mu\text{g/ml}$  SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>98%

LAST TESTED: (mm/dd/yyyy)

12/22/2015

EXPIRY DATE: (mm/dd/yyyy)

12/22/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

Contains ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

12/23/2015

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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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:

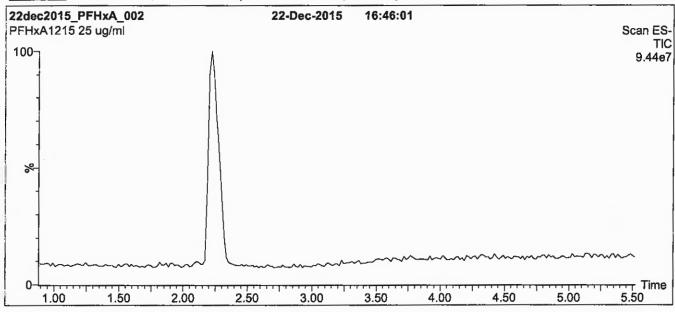
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

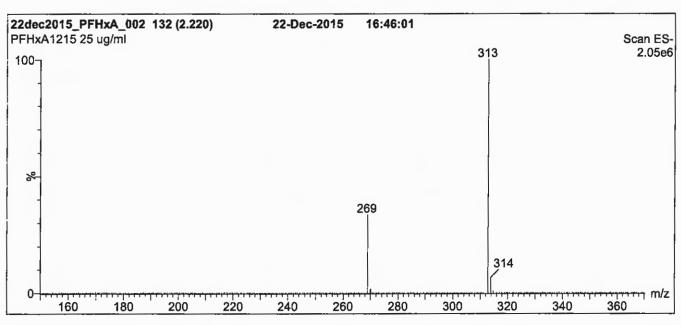




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Figure 1: PFHxA; LC/MS Data (TIC and Mass Spectrum)





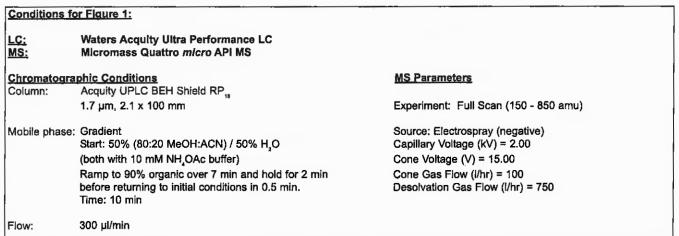
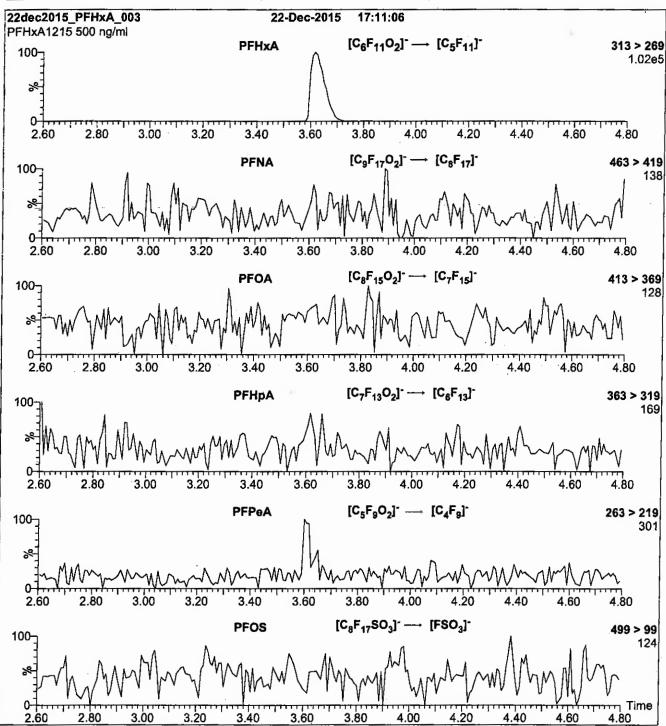
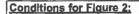


Figure 2: PFHxA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 μl (500 ng/ml PFHxA)

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

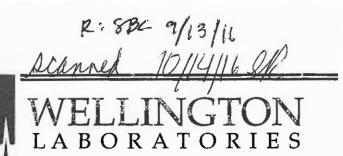
(both with 10 mM NH,OAc buffer)

Flow: 300 µl/min

#### MS Parameters

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

# LCPFHxDA_00006







### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFHxDA** 

LOT NUMBER:

PFHxDA0516

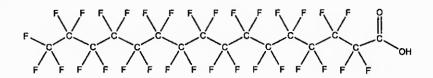
COMPOUND:

Perfluoro-n-hexadecanoic acid

**STRUCTURE:** 

CAS #:

67905-19-5



**MOLECULAR FORMULA:** 

C, HF, O,

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 

814.13

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>98%

LAST TESTED: (mm/dd/yyyy)

05/25/2016

EXPIRY DATE: (mm/dd/yyyy)

05/25/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

Contains ~ 0.4% of PFODA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

05/27/201

(mm/dd/yyyy

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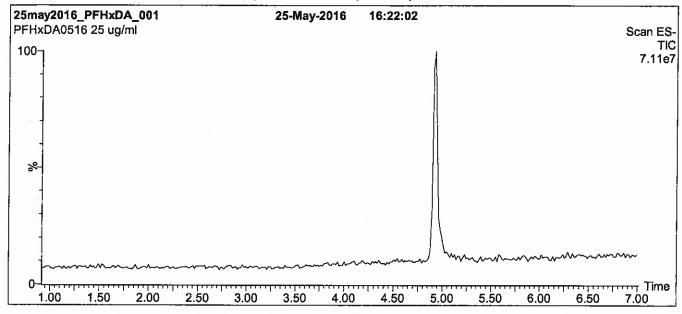
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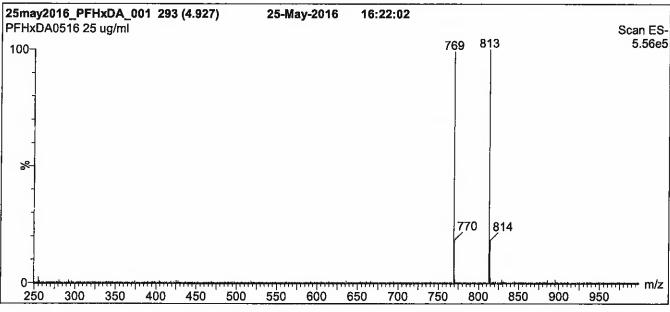




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### Figure 1: PFHxDA; LC/MS Data (TIC and Mass Spectrum)





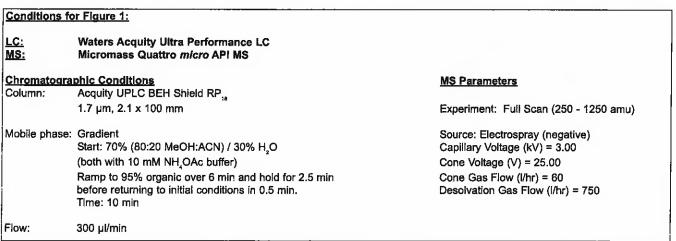
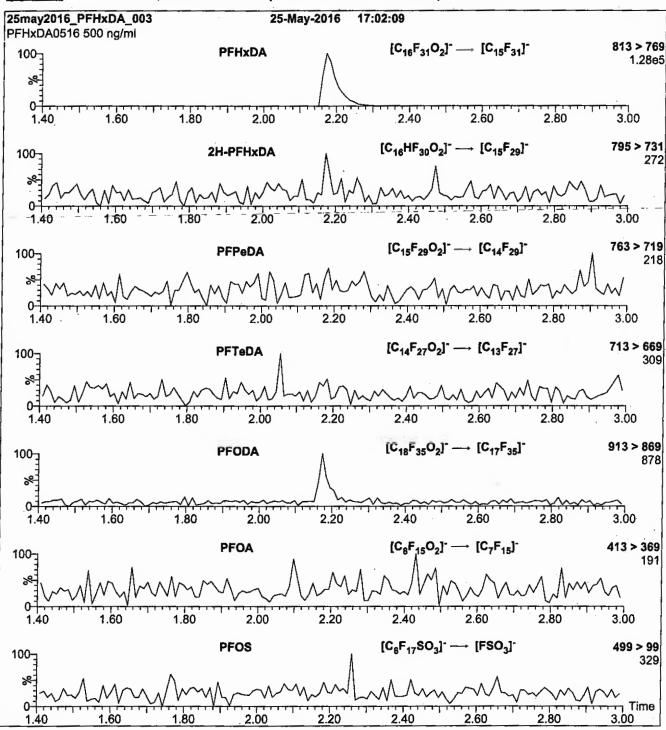
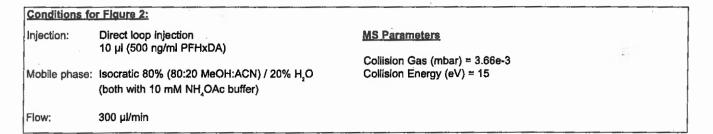
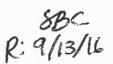


Figure 2: PFHxDA; LC/MS/MS Data (Selected MRM Transitions)





LCPFHxS-br_00002





ID: LCPFHxS-br_00002 Exp:07/03/20 Prpd: SBC Potassium Perfluorchexarie



ID: LCPFHxS-br_00003
Exp: 07/03/20 Prpd: SBC
Potassium Perfluorohexane



## WELLINGTON LABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

#### br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFHxSK

**LOT NUMBER:** 

brPFHxSK0615

**CONCENTRATION:** 

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

45.5 ± 2.3 μg/ml (total PFHxS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

06/29/2015

LAST TESTED: (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).

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

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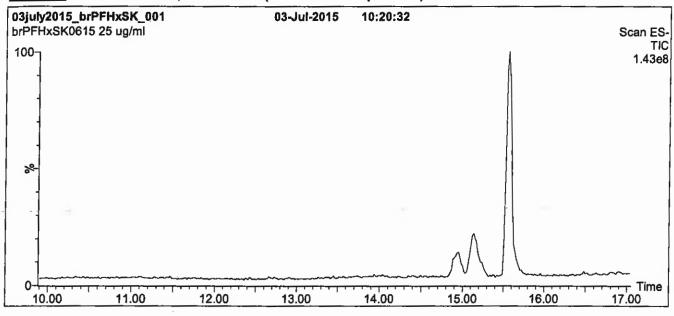
Table A: br-PFHxSK; Isomeric Components and Percent Composition (by 19F-NMR)*

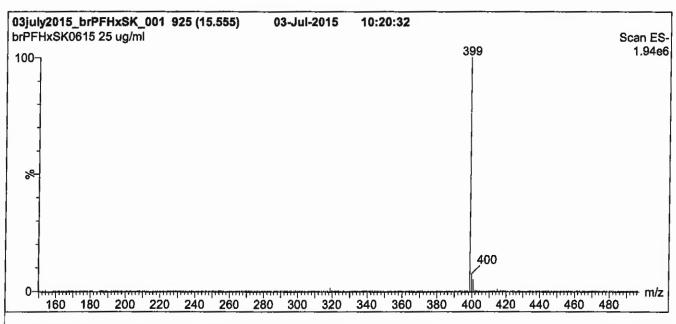
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-hexanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ -K ⁺	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ SO ₃ ·K ⁺ CF ₃	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	CF ₃ CF 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)







Acquity UPLC BEH Shield RP. Column:

1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient

Conditions for Figure 1:

Start: 20% (80:20 MeOH:ACN) / 80% H₂O (both with 10 mM NH,OAc buffer) Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.

Waters Acquity Ultra Performance LC

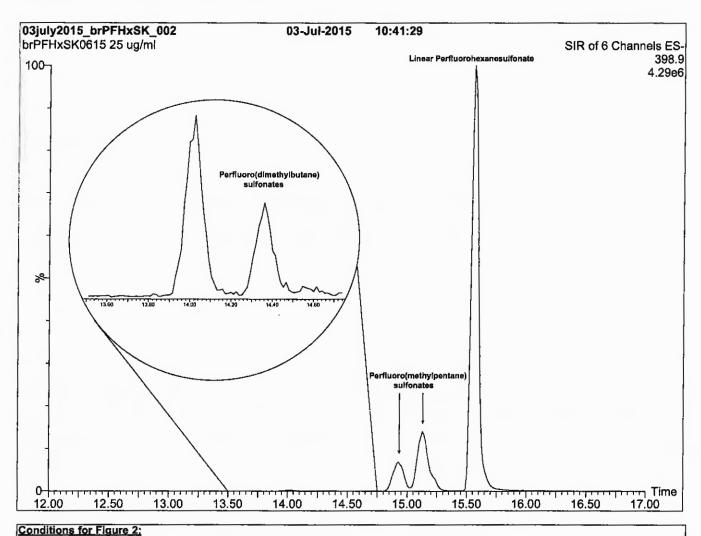
Time: 20 min 300 µl/min

Experiment: Full Scan (150 - 850 amu)

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

Flow:

Figure 2: br-PFHxSK; LC/MS Data

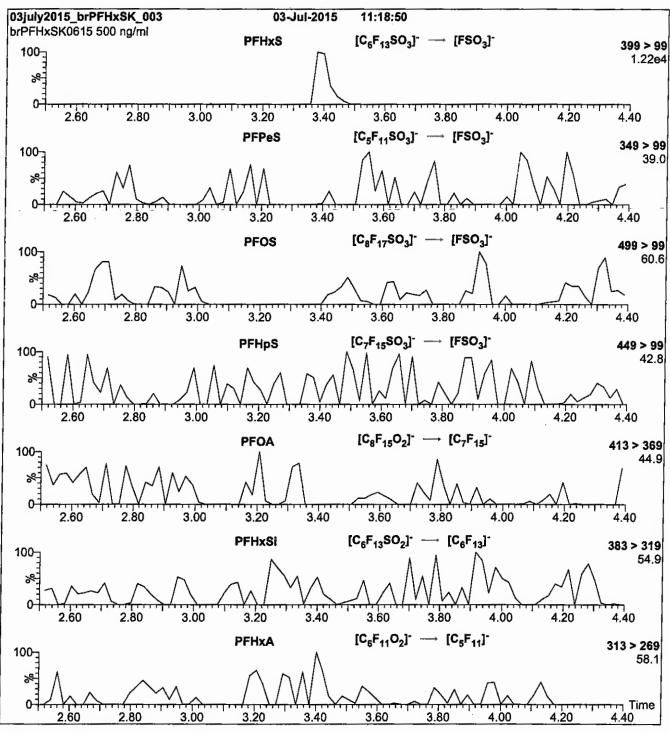


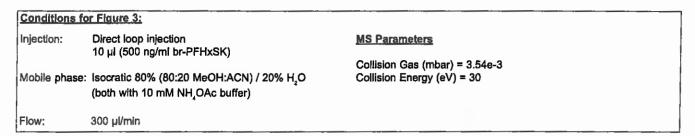
#### LC: MS: Waters Acquity Ultra Performance LC Micromass Quattro micro API MS Chromatographic Conditions **MS Parameters** Acquity UPLC BEH Shield RP, Column: 1.7 µm, 2.1 x 100 mm Experiment: SIR (6 channels) Mobile phase: Gradient Source: Electrospray (negative) Start: 20% (80:20 MeOH:ACN) / 80% H,O Capillary Voltage (kV) = 3.00 (both with 10 mM NH, OAc buffer) Cone Voltage (V) = 50.00 Ramp to 50% organic over 14 min. Ramp to Cone Gas Flow (I/hr) = 60 90% organic over 3 min and hold for 1.5 min Desolvation Gas Flow (I/hr) = 750 before returning to initial conditions in 0.5 min. Time: 20 min

Flow:

300 µl/min

Figure 3: br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)





## LCPFNA 00005

Exp: 10/23/20 Prpd: CBW

### **CERTIFICATE OF ANALYSIS** DOCUMENTATION

**PRODUCT CODE:** 

**PFNA** 

**LOT NUMBER:** 

PFNA1015

**COMPOUND:** 

Perfluoro-n-nonanoic acid

**STRUCTURE:** 

CAS #:

375-95-1

**MOLECULAR FORMULA:** 

C_aHF₁₇O₂

**CONCENTRATION:** 

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

MOLECULAR WEIGHT:

464.08

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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

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

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

#### ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

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:**

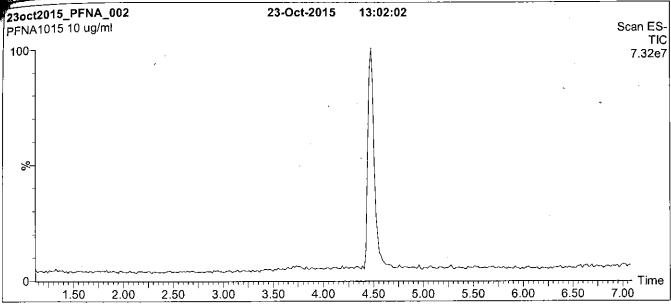
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

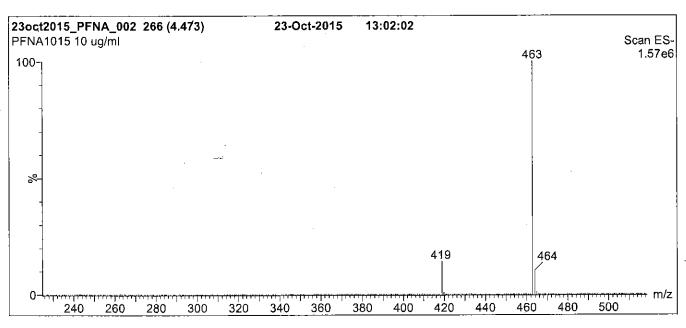


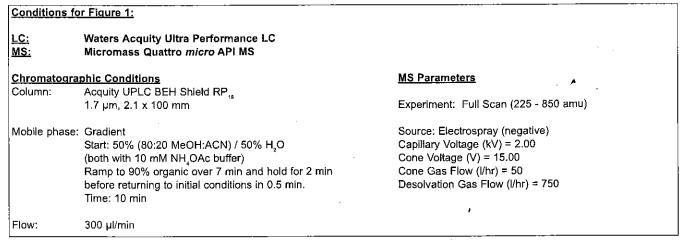


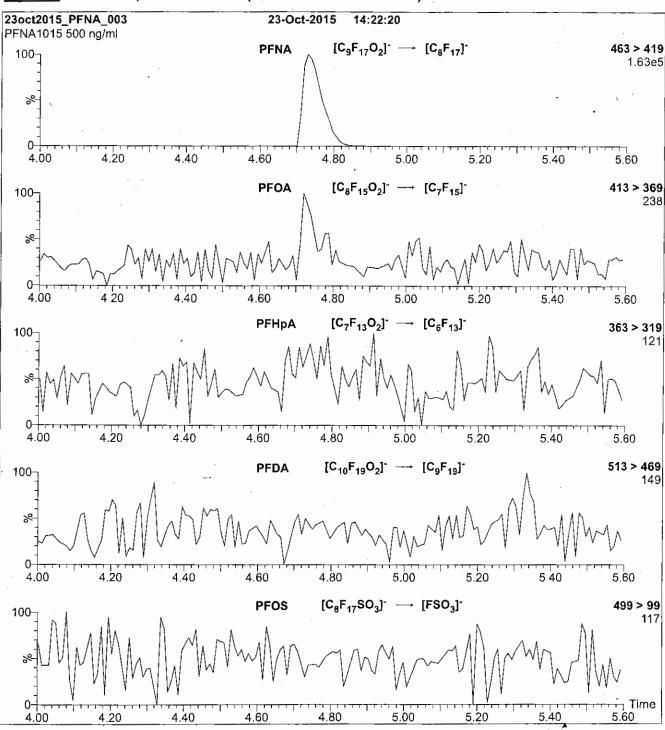
**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

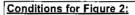












Injection:

Direct loop injection

10 μI (500 ng/ml PFNA)

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

(both with 10 mM NH OAc buffer)

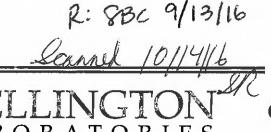
Flow:

300 µl/min

#### MS Parameters

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

## LCPFNA 00006





ID: LCPFNA_00006 Exp: 10/23/20 Prpd: SBC PF-n-nonanoic acid



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE;

**PFNA** 

**LOT NUMBER:** 

PFNA1015

**COMPOUND:** 

Perfluoro-n-nonanoic acid

CAS #:

375-95-1

STRUCTURE:

F C C C C C C C OH

**MOLECULAR FORMULA:** 

C,HF,O,

**CONCENTRATION:** 

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

**MOLECULAR WEIGHT:** 

464.08

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

10/23/2015

EXPIRY DATE: (mm/dd/yyyy)

10/23/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

 Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

<u>10/30/2015</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:**

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 welf 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 of our products.

#### TRACEABILITY:

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

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

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

#### **LIMITED WARRANTY:**

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

#### **QUALITY MANAGEMENT:**

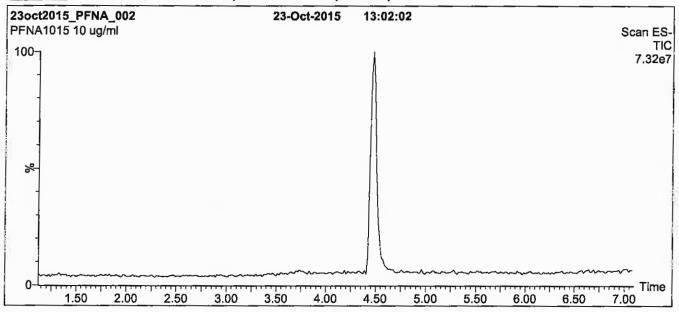
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

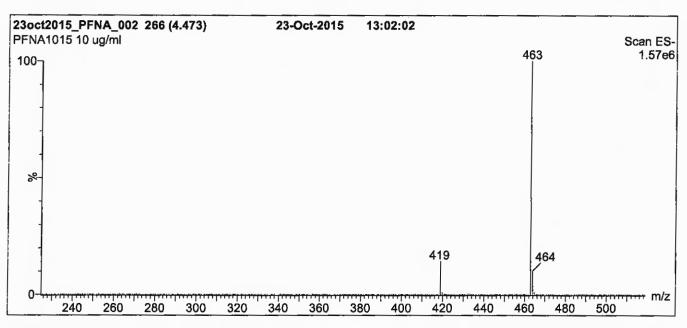




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





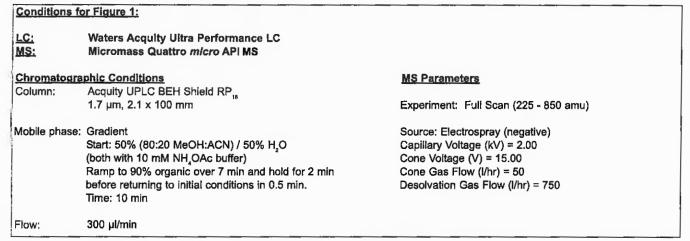
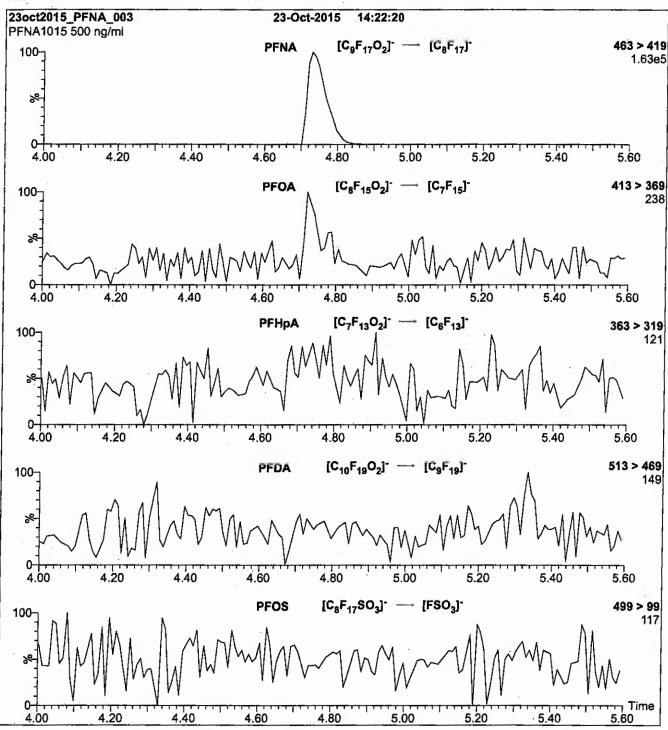
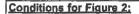


Figure 2: PFNA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFNA)

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

(both with 10 mM NH,OAc buffer)

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

**MS Parameters** 

Flow:

300 µl/min

# LCPFOA 00006



### WELLINGTON LABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFOA** 

**LOT NUMBER:** 

PFOA1115

COMPOUND:

Perfluoro-n-octanoic acid

**STRUCTURE:** 

CAS #:

335-67-1

**MOLECULAR FORMULA:** 

C,HF,O,

**CONCENTRATION:** 

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

**MOLECULAR WEIGHT:** 

414.07

/ml <u>SOLVENT(S):</u>

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

11/06/2015

EXPIRY DATE: (mm/dd/yyyy)

11/06/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chillim

Date:

11/11/2015

(mm/dd/yyyy

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#### **HAZARDS:**

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#### **SYNTHESIS / CHARACTERIZATION:**

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

#### **HOMOGENEITY:**

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

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

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

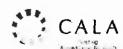
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

#### 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:**

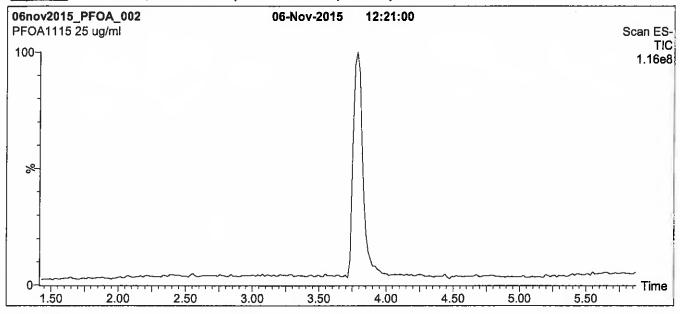
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

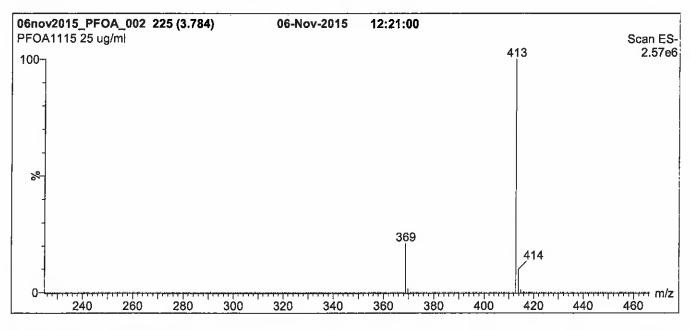




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:lnfo@well-labs.com">lnfo@well-labs.com</a>**

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





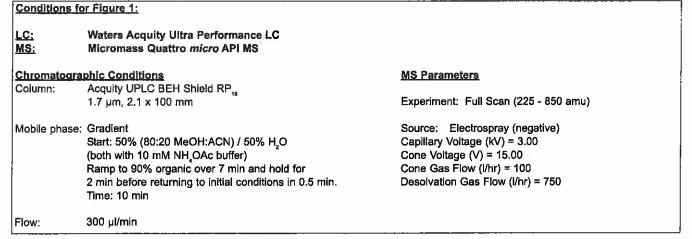
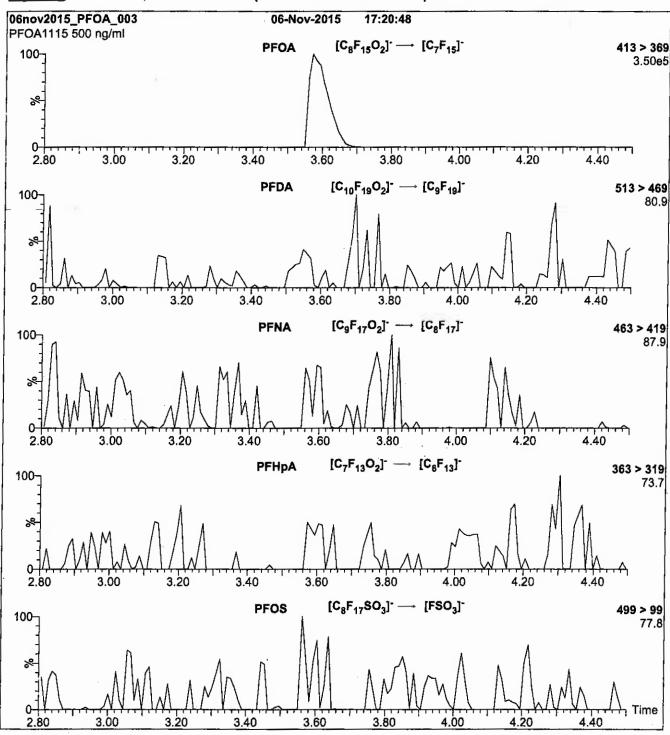


Figure 2; PFOA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFOA)

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

(both with 10 mM NH,OAc buffer)

Flow:

300 µl/min

#### **MS Parameters**

Collision Gas (mbar) = 3.17e-3 Collision Energy (eV) = 10

# LCPFODA_00005

#### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFODA** 

**LOT NUMBER:** 

PFODA0115

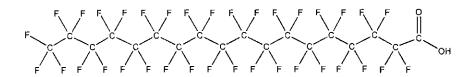
**COMPOUND:** 

Perfluoro-n-octadecanoic acid

STRUCTURE:

CAS #:

16517-11-6



**MOLECULAR FORMULA:** 

C, HF, O,

**CONCENTRATION:** 

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

**MOLECULAR WEIGHT:** 

914.14

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mm/dd/yyyy)

01/30/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

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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#### **HOMOGENEITY:**

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

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

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

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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:**

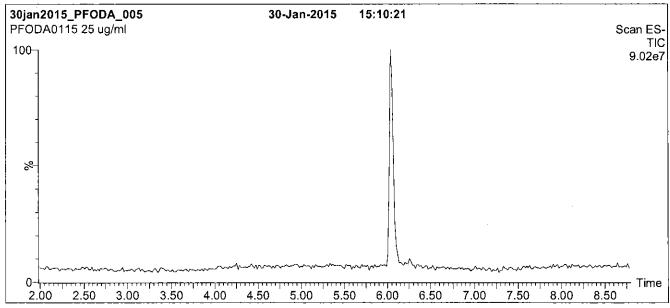
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

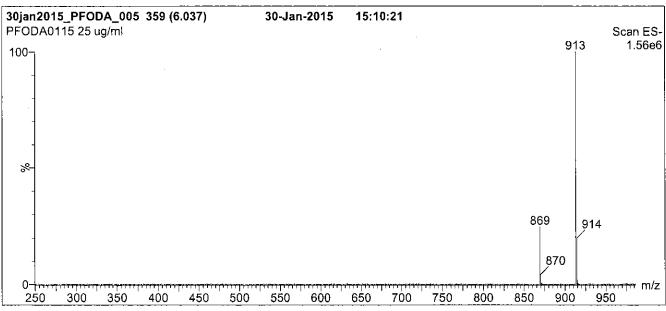




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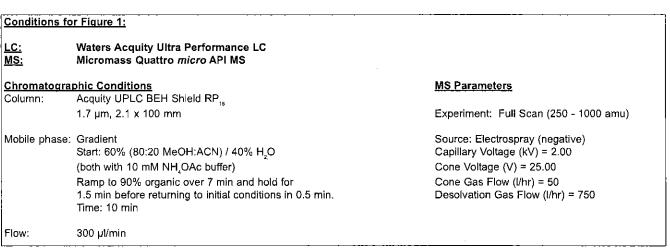
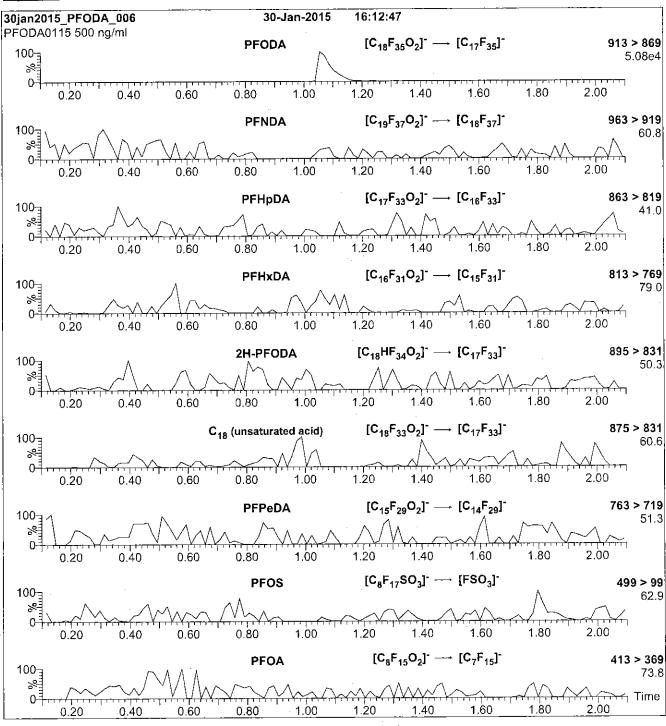
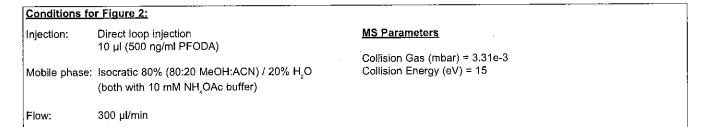
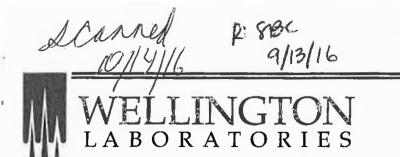


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)

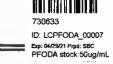




# LCPFODA_00006







### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFODA** 

LOT NUMBER:

PFODA0416

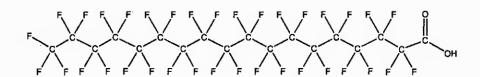
COMPOUND:

Perfluoro-n-octadecanoic acid

**STRUCTURE:** 

CAS #:

16517-11-6



**MOLECULAR FORMULA:** 

C₁₈HF₃₅O₂

MOLECULAR WEIGHT:

914.14

**CONCENTRATION:** 

50 ± 2.5 µg/ml

SOLVENT(S):

Methanoi

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

04/29/2016

EXPIRY DATE: (mm/dd/yyyy)

04/29/2021

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

#### **ADDITIONAL INFORMATION:**

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date:

(mm/dd/ssss)

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

#### **HAZARDS:**

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

#### **SYNTHESIS / CHARACTERIZATION:**

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

#### **HOMOGENEITY:**

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

#### **UNCERTAINTY:**

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

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

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#### LIMITED WARRANTY:

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#### **QUALITY MANAGEMENT:**

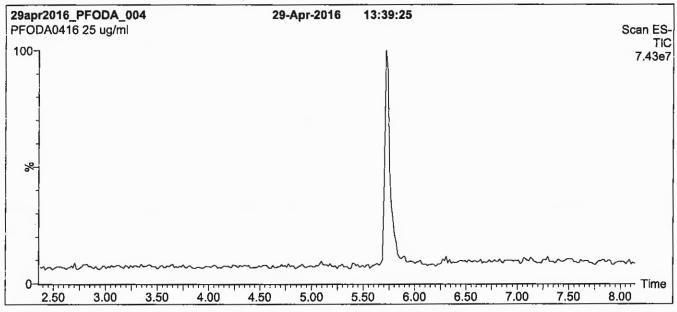
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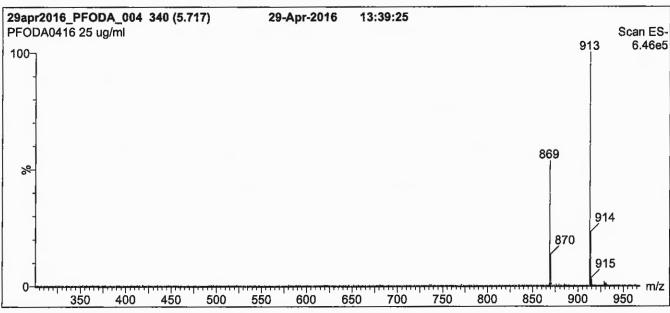




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Figure 1: PFODA; LC/MS Data (TIC and Mass Spectrum)





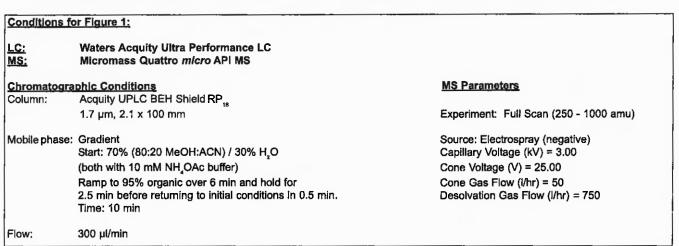
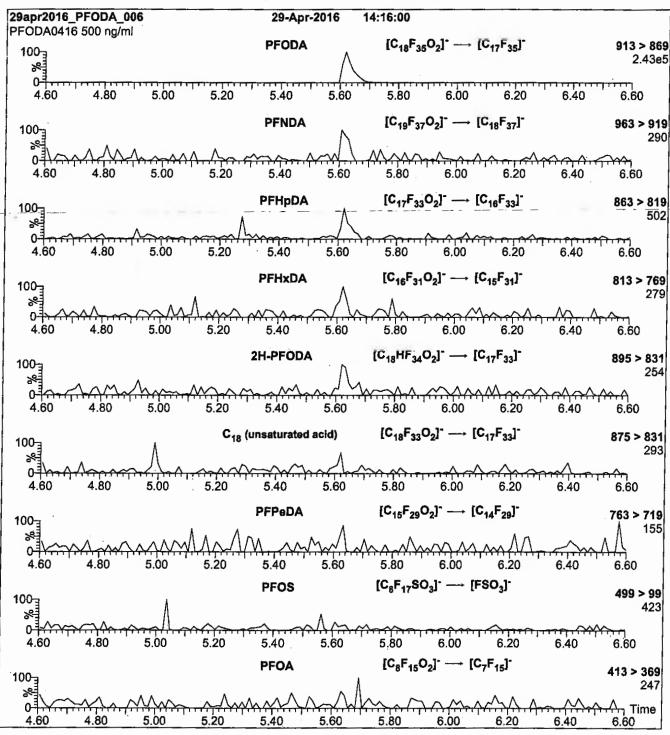
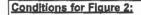


Figure 2: PFODA; LC/MS/MS Data (Selected MRM Transitions)





Injection:

Direct loop injection

10 µl (500 ng/ml PFODA)

**MS Parameters** 

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% H₂O

Collision Gas (mbar) = 3.39e-3

(both with 10 mM NH,OAc buffer)

Collision Energy (eV) = 15

Flow:

300 µl/min

LCPFOS-br_00002

Acanal R: SBC 9/13/16
101/4/16 SR
WELLINGTON
LABORATORIES



ID: LCPFOS-br_00002

Exp: 10/14/20 Prpd: SBC

Potassium Perfluorooctane

ID: LCPFOS-br_00003

Exp: 10/14/20 Prpd: SBC

Potassium Perfluorooctane



#### br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:

br-PFOSK

LOT NUMBER:

brPFOSK1015

**CONCENTRATION:** 

50 ± 2.5 μg/ml (total potassium salt)

46.4 ± 2.3 μg/ml (total PFOS anion)

SOLVENT(S):

Methanol

DATE PREPARED: (mm/dd/yyyy)

10/13/2015

LAST TESTED: (mm/dd/yyyy)

10/14/2015

EXPIRY DATE: (mm/dd/yyyy)

10/14/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

#### **DESCRIPTION:**

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

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

Table A: Isomeric Components and Percent Composition by 19F-NMR

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

Figure 2: LC/MS Data (SIR)

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

#### **ADDITIONAL INFORMATION:**

See page 2 for further details.

- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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#### **HAZARDS:**

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#### SYNTHESIS / CHARACTERIZATION:

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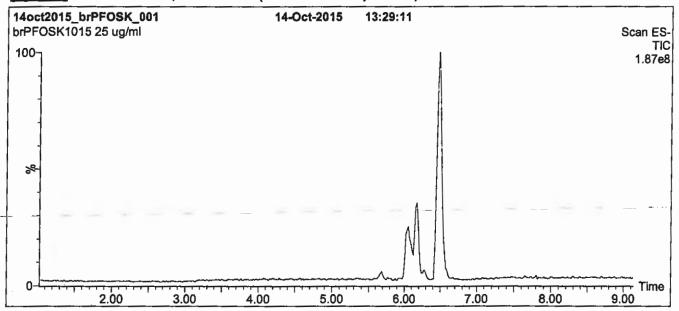
<u>Table A:</u> br-PFOSK; Isomeric Components and Percent Composition (by ¹⁶F-NMR)*

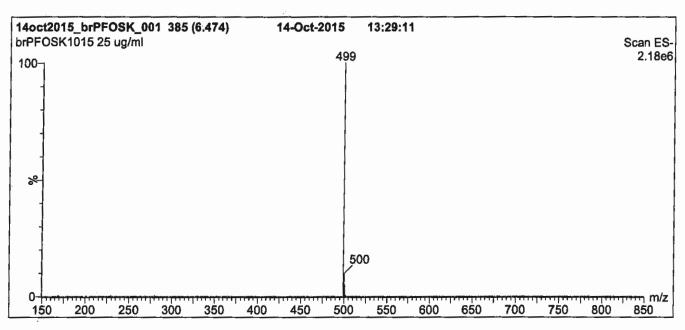
Isomer	Name	Structure	Percent Composition by ¹⁹ F-NMR
1	Potassium perfluoro-1-octanesulfonate	CF ₃ CF ₂ SO ₃ K*	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CF ₂ CFSO ₃ K ⁺ CF ₃	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CF ₂ CFCF ₂ SO ₃ K ⁴ CF ₃	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	CF ₃ CF ₂ CF ₂ CF ₂ CFCF 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 ₂ 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 ⁴ 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: 10/15/2015

Figure 1: br-PFOSK; LC/MS Data (TIC and Mass Spectrum)





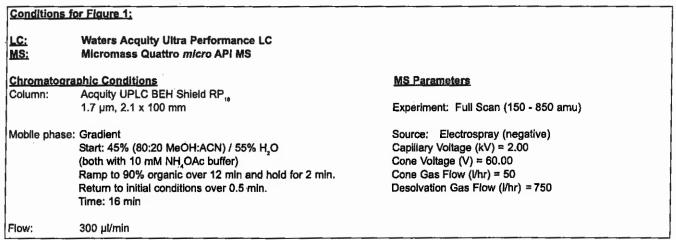
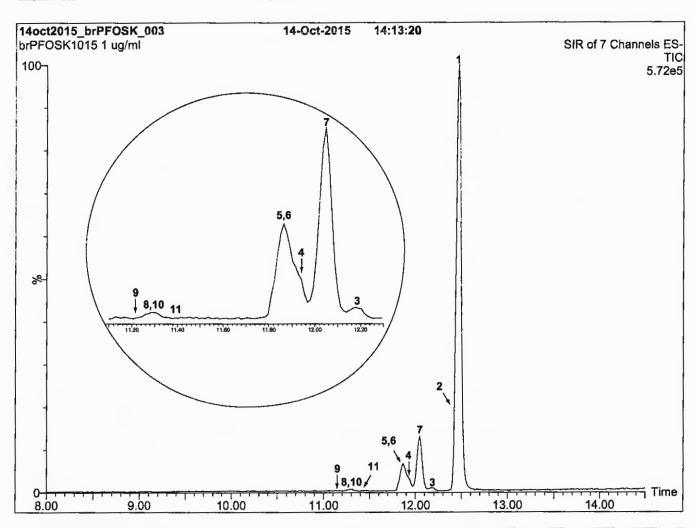


Figure 2: br-PFOSK; LC/MS Data (SIR)



#### Conditions for Figure 2:

LC: Waters Acquity Ultra Performance LC

MS: Micromass Quattro micro API MS

#### Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP, (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

Mobile Phase: Gradient 45% (80:20 MeOH:ACN) / 55% H₂O (both with 10 mM NH₄OAc buffer)

Ramp to 90% organic over 15 min and hold for 3 min.

Return to initial conditions over 1 min.

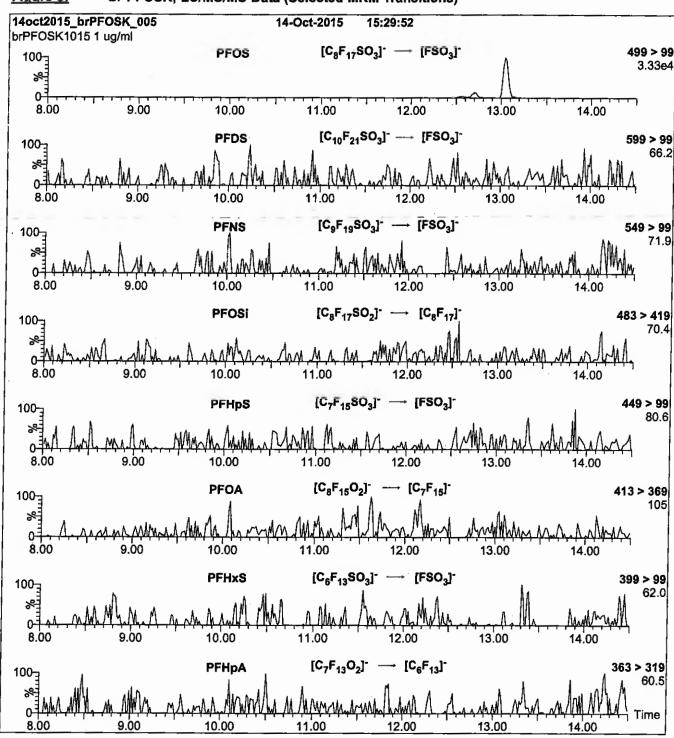
Time: 20 min

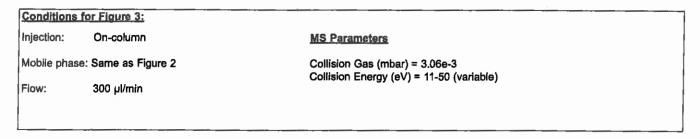
Flow: 300 µl/min

#### MS Conditions:

SIR (ES⁻) Source = 110 °C Desolvation = 325 °C Cone Voltage = 60V

Figure 3: br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)





# LCPFOSA_00006



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

FOSA-I

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(S):

FOSA0815I

COMPOUND:

Perfluoro-1-octanesulfonamide

**STRUCTURE:** 

**CAS #:** 

754-91-6

499.14

Isopropanol

F F F F F F

**MOLECULAR FORMULA:** 

C,H,F,NO,S

**CONCENTRATION:** 

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

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

09/02/2015

EXPIRY DATE: (mm/dd/yyyy)

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/vvvv)

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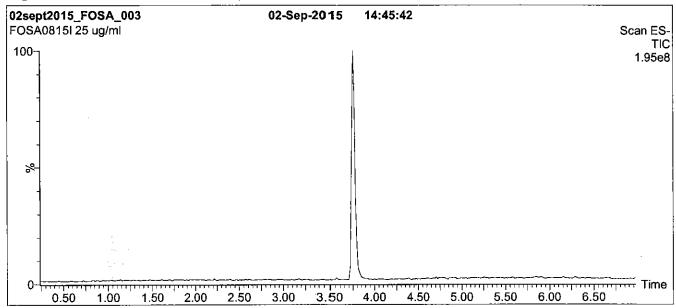
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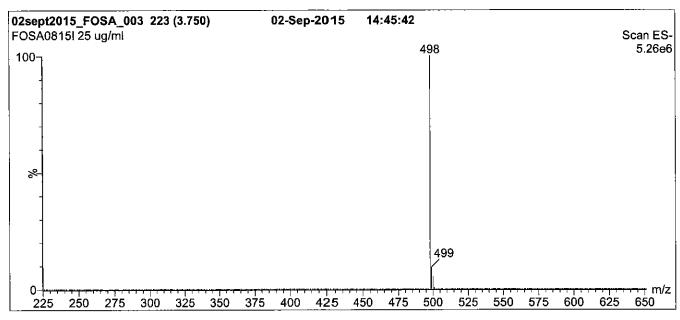




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Figure 1: FOSA-I; LC/MS Data (TIC and Mass Spectrum)





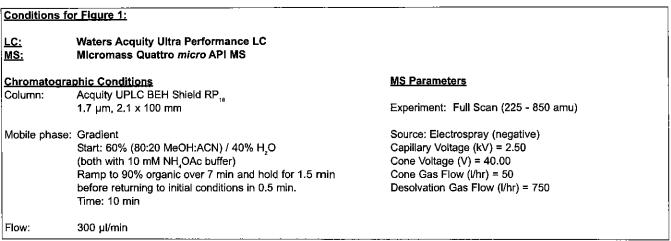
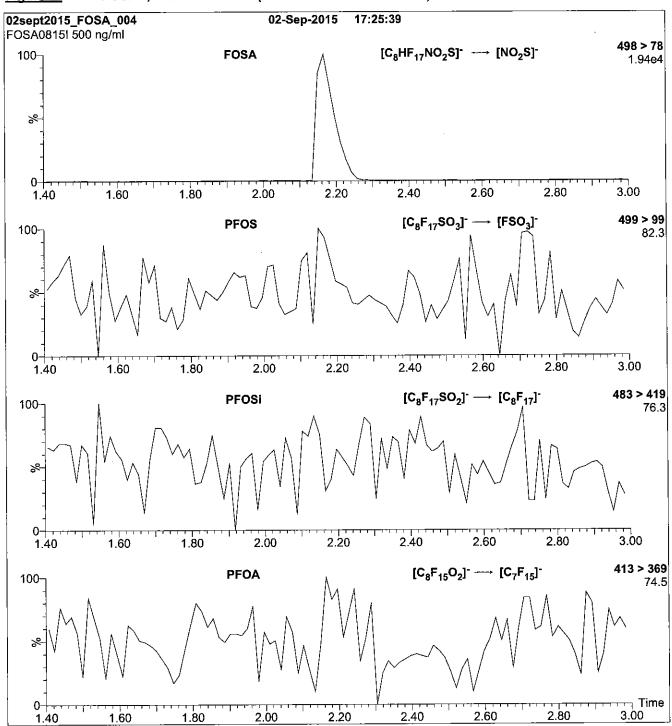
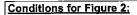


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





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

# LCPFOSA_00008

R: 8BC 9/13/16

ID: LCPFOSA_00009

Exp: 09/02/17 Prpd: SBC PF-1-octanesulfonamide

ID: LCPFOSA_00008 Exp: 09/02/17 Prpd: SBC PF-1-octanesulfonamide



CERTIFICATE OF ANALYSIS **DOCUMENTATION** 

PRODUCT CODE:

FOSA-I

**LOT NUMBER:** 

**MOLECULAR WEIGHT:** 

SOLVENT(\$):

FOSA08151

**COMPOUND:** 

Perfluoro-1-octanesulfonamide

CAS #:

754-91-6

499.14

isopropanol

STRUCTURE:

**MOLECULAR FORMULA:** 

C₈H₂F₁₇NO₂S

**CONCENTRATION:** 

50 ± 2.5 µg/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:

Date: <u>09/11/2015</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:**

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:

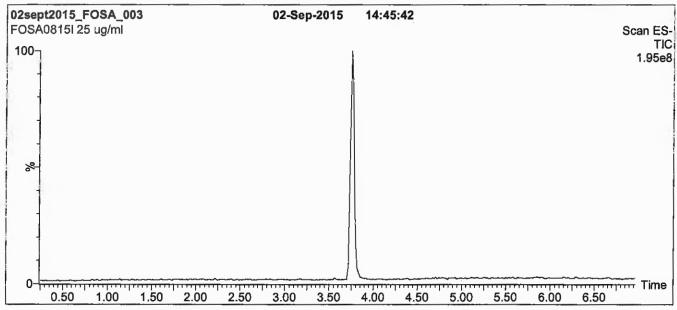
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

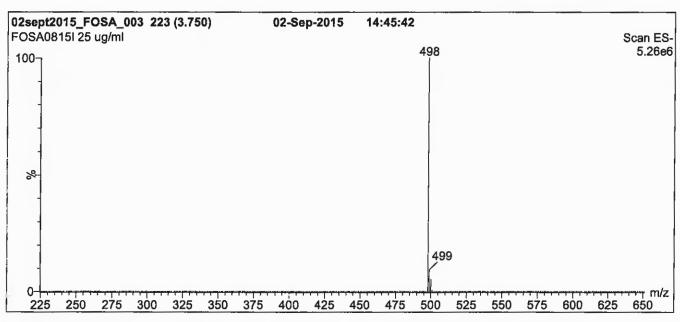




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





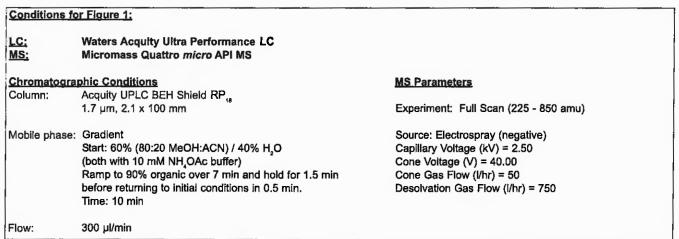
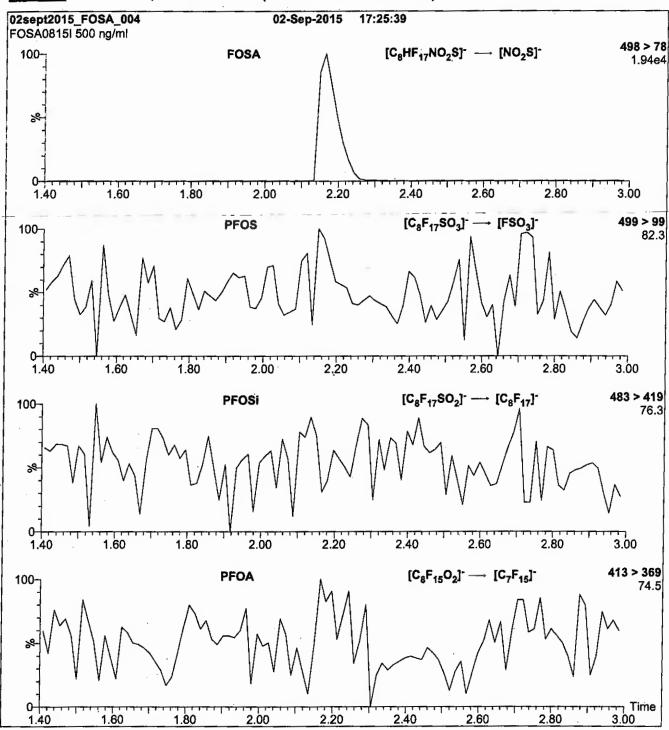


Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml FOSA-I)

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

# LCPFPeA_00005



ID: LCPFPeA 00005 Exp: 01/30/20 Prod: CBW PF-n-pentanoic acid



## ELLINGTON BORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFPeA** 

**LOT NUMBER:** 

PFPeA0115

**COMPOUND:** 

Perfluoro-n-pentanoic acid

**CAS #:** 

2706-90-3

**STRUCTURE:** 

**MOLECULAR FORMULA:** 

C,HF,O,

**MOLECULAR WEIGHT:** 

264.05

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

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>98%

LAST TESTED; (mm/dd/yyyy)

01/30/2015

EXPIRY DATE: (mm/dd/yyyy)

01/30/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of C₅H₂F₈O₂ (hydrido - derivative) as measured by 19F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 03/26/2015

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

### **HAZARDS**:

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

### **SYNTHESIS / CHARACTERIZATION:**

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

### **HOMOGENEITY:**

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

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

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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 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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

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

### LIMITED WARRANTY:

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

### **QUALITY MANAGEMENT:**

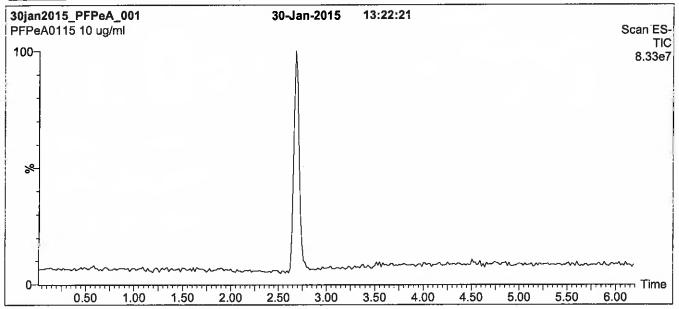
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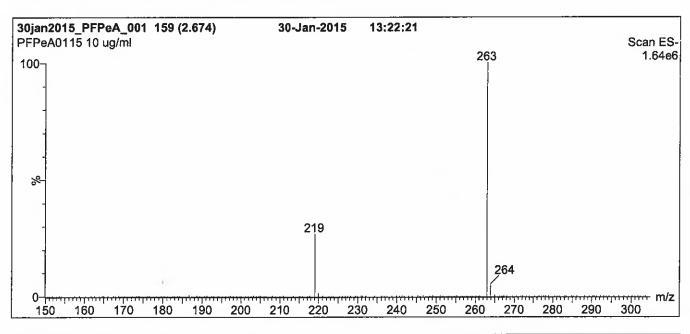




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Figure 1: PFPeA; LC/MS Data (TIC and Mass Spectrum)





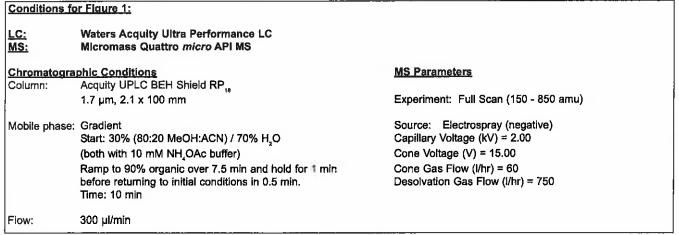
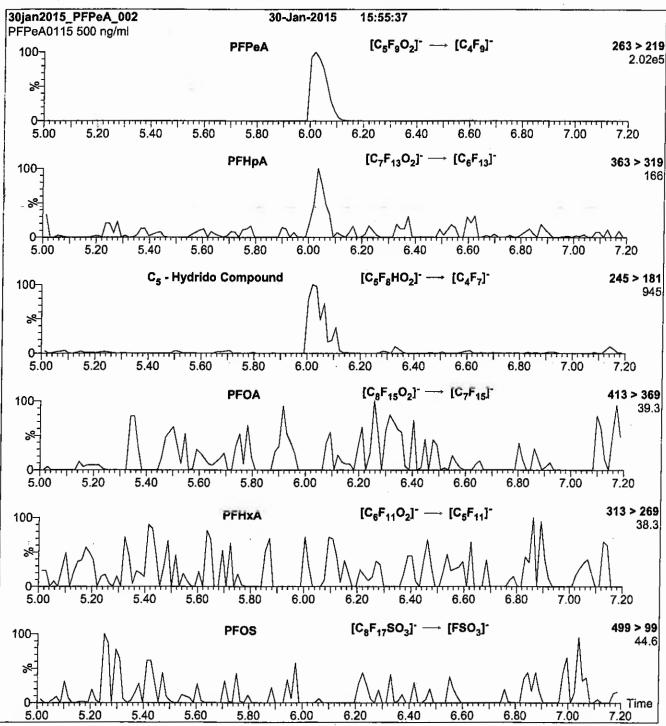
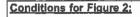


Figure 2: PFPeA; LC/MS/MS Data (Selected MRM Transitions)





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)

### MS Parameters

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

Flow:

300 µl/min

# LCPFTeDA_00004



ID: I CEFTeDA O

ID: LCPFTeDA_00004 Exp: 12/09/20 Ppd: CBW PF-n-tetradecanoic acid



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFTeDA** 

LOT NUMBER:

PFTeDA1215

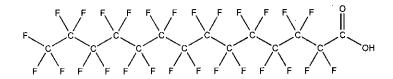
COMPOUND:

Perfluoro-n-tetradecanoic acid

STRUCTURE:

CAS #:

376-06-7



MOLECULAR FORMULA:

C₁₄HF₂₇O₂

MOLECULAR WEIGHT:

714.11

50 ± 2.5 μg/ml **SOLVENT(S)**:

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

,>98%

LAST TESTED: (mm/dd/yyyy)

12/09/2015

EXPIRY DATE: (mm/dd/yyyy)

12/09/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

Contains ~ 0.2% of PFDoA (C₁₂HF₂₃O₂) and ~ 0.2% of PFPeDA (C₁₅HF₂₃O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B.G. Chittim

Date: 12/09/2015

(mm/dd/mm/)

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:**

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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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:

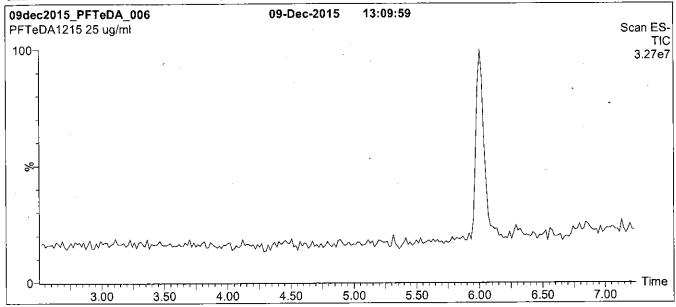
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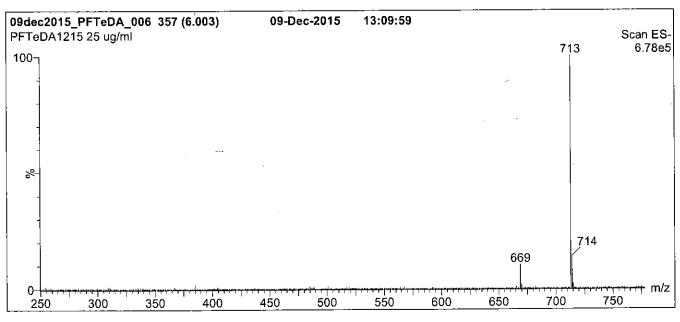




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Figure 1: PFTeDA; LC/MS Data (TIC and Mass Spectrum)





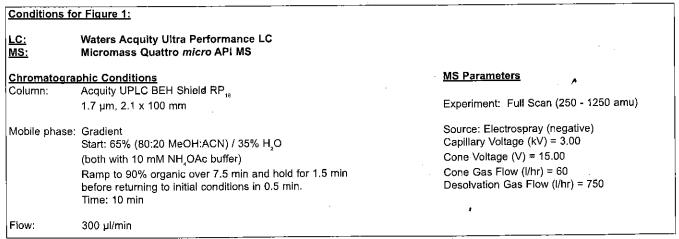
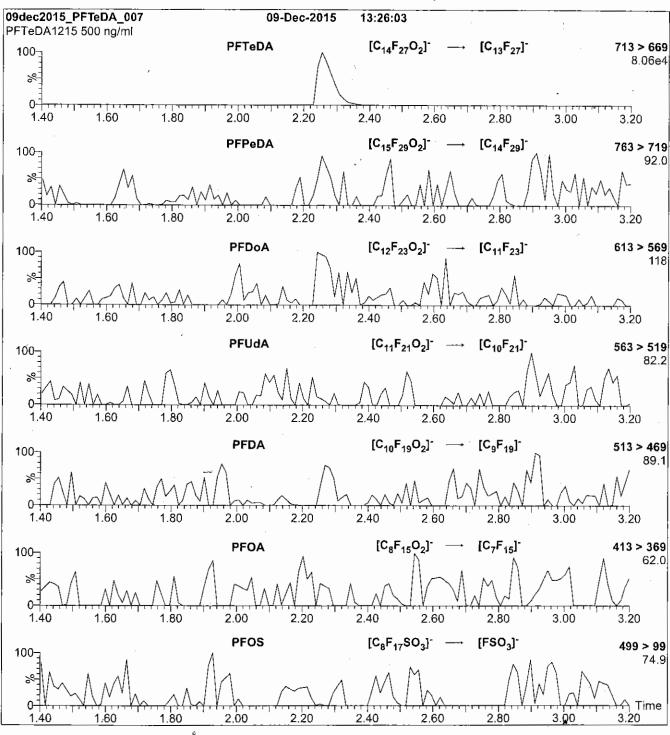
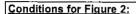


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml PFTeDA)

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) = 14

# LCPFTeDA_00005



ID: LCPFTeDA 00005 Exp: 12/09/20 Prod: SBC



ID: LCPFTeDA_00006 Exp: 12/09/20 Prpd: SBC PF-n-tetradecanoic acid



### ELLINGTON ABORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFTeDA** 

LOT NUMBER:

PFTeDA1215

**COMPOUND:** 

STRUCTURE:

Perfluoro-n-tetradecanoic acid

CAS #:

376-06-7

**MOLECULAR FORMULA:** 

C,HF,O,

**MOLECULAR WEIGHT:** 

714.11

50 ± 2.5 μg/ml SOLVENT(S): Methanol Water (<1%)

**CHEMICAL PURITY:** 

**CONCENTRATION:** 

>98%

LAST TESTED: (mm/dd/yyyy)

12/09/2015

EXPIRY DATE: (mm/dd/yyyy)

12/09/2020

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

### **ADDITIONAL INFORMATION:**

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains  $\sim 0.2\%$  of PFDoA (C₁₂HF₂₃O₂) and  $\sim 0.2\%$  of PFPeDA (C₁₅HF₂₈O₂).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

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

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

#### **HAZARDS:**

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### SYNTHESIS / CHARACTERIZATION:

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### **HOMOGENEITY:**

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

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

### TRACEABILITY:

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

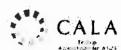
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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

#### **QUALITY MANAGEMENT:**

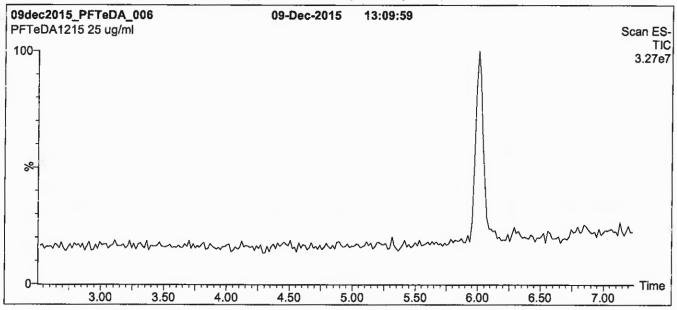
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

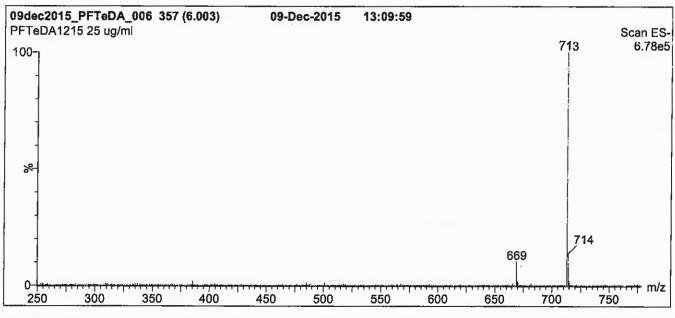




**For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at <a href="https://www.well-labs.com">www.well-labs.com</a> or contact us directly at <a href="mailto:info@well-labs.com">info@well-labs.com</a>**

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





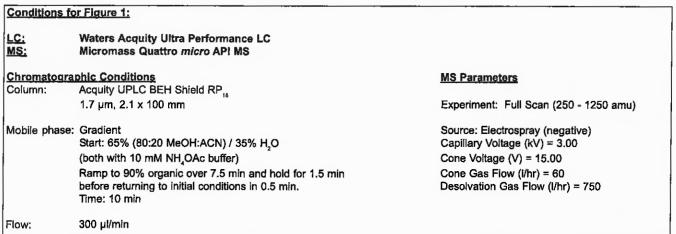
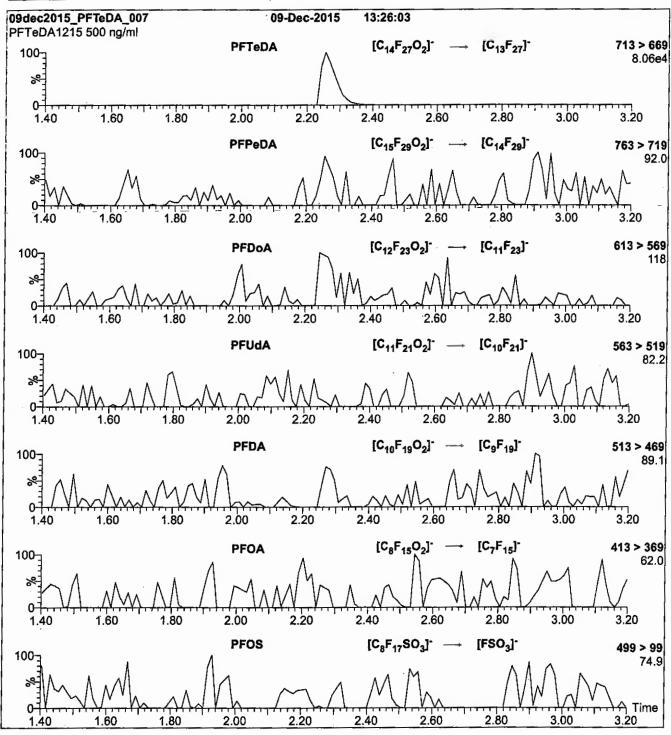
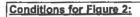


Figure 2: PFTeDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml PFTeDA)

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

(both with 10 mM NH,OAc buffer)

### MS Parameters

Collision Gas (mbar) = 3.43e-3 Collision Energy (eV) = 14

Flow:

300 µl/min

# LCPFTrDA_00004



ID: LCPFTrDA_00004 Exp: 12/10/18 Prpd: CBW PF-n-tridecanoic acid



### CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 

**PFTrDA** 

**LOT NUMBER:** 

PFTrDA1213

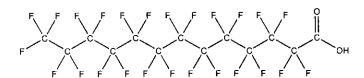
**COMPOUND:** 

Perfluoro-n-tridecanoic acid

**STRUCTURE:** 

CAS#:

72629-94-8



**MOLECULAR FORMULA:** 

C, HF, O,

**CONCENTRATION:** 

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:** 

664.11

SOLVENT(S):

Methanol

Water (<1%)

**CHEMICAL PURITY:** 

>98%

LAST TESTED: (mm/dd/yyyy)

12/10/2013

EXPIRY DATE: (mm/dd/yyyy)

12/10/2018

**RECOMMENDED STORAGE:** 

Store ampoule in a cool, dark place

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

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

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

### ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.1% of PFUdA ( $C_{11}HF_{21}O_2$ ); ~ 0.4% of PFDoA ( $C_{12}HF_{23}O_2$ ), and ~ 0.1% of PFTeDA (C, HF, O,).

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:

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

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.

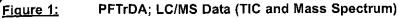
### **QUALITY MANAGEMENT:**

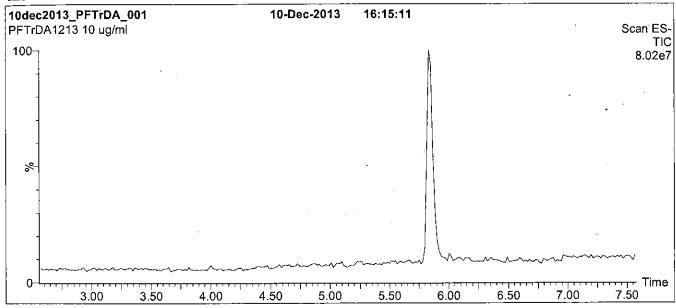
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDÉ 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

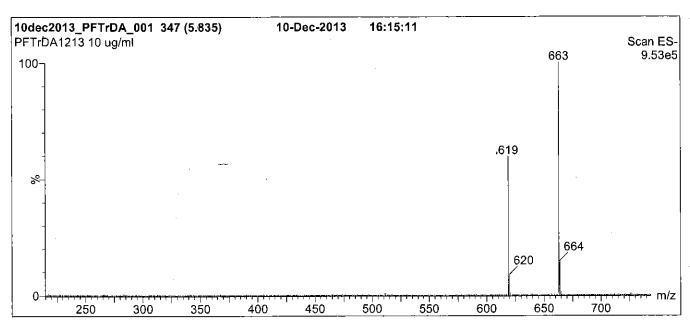




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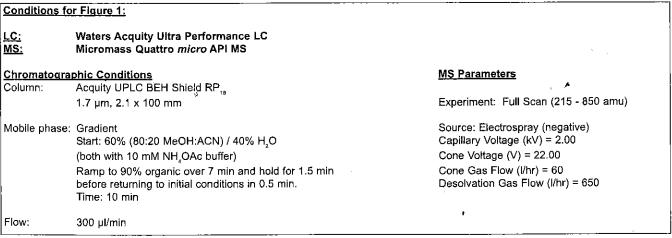
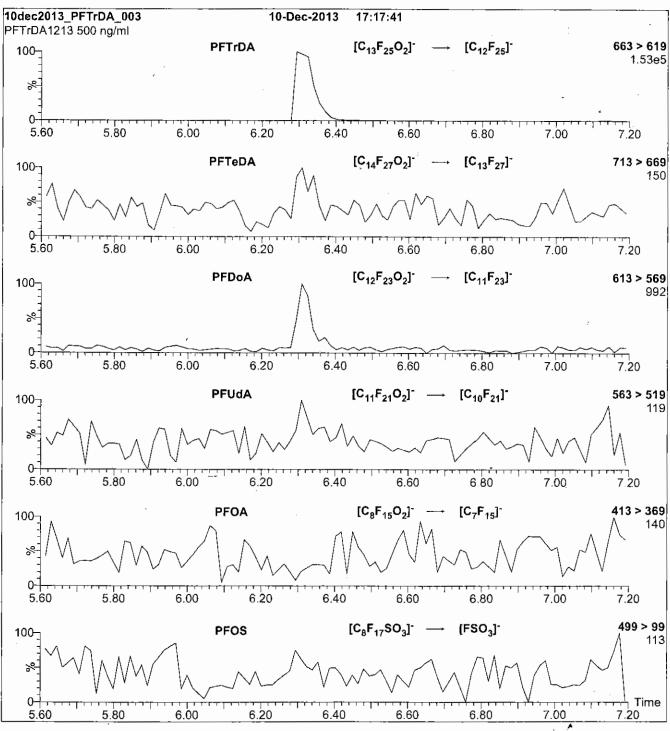
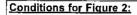


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 µl (500 ng/ml PFTrDA)

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

(both with 10 mM NH,OAc buffer)

Flow:

 $300 \, \mu l/min$ 

### MS Parameters

Collision Gas (mbar) = 3.28e-3 Collision Energy (eV) = 15

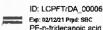
# LCPFTrDA_00005



Exp: 02/12/21 Prpd: SBC

PF-n-tridecanoic acid







# BORATORIES

### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFTrDA** 

LOT NUMBER:

PFTrDA0216

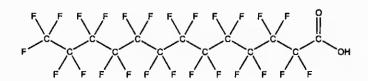
**COMPOUND:** 

**STRUCTURE:** 

Perfluoro-n-tridecanoic acid

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: (mrn/ddi/yyyy)

02/12/2016

EXPIRY DATE: (mm/dd/yyyy)

02/12/2021

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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

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

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

### ADDITIONAL INFORMATION:

See page 2 for further details.

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

Contains ~ 0.1% of PFUdA (C,HF,O,), ~ 0.4% of PFDoA (C,HF,O,), and ~ 0.1% of PFTeDA (C, HF, O,).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

Date: 02/16/2016

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

### **HAZARDS:**

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

### SYNTHESIS / CHARACTERIZATION:

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

### **HOMOGENEITY:**

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

### **UNCERTAINTY:**

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

The combined relative standard uncertainty,  $u_c(y)$ , 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:

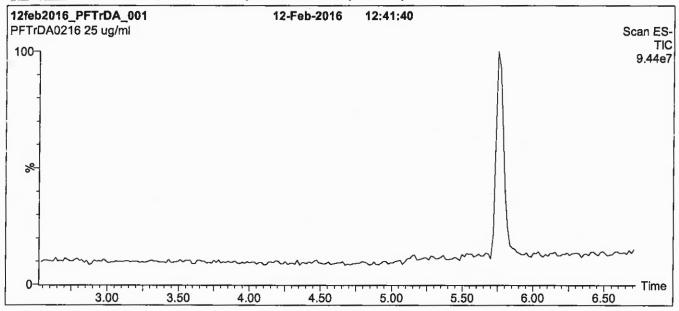
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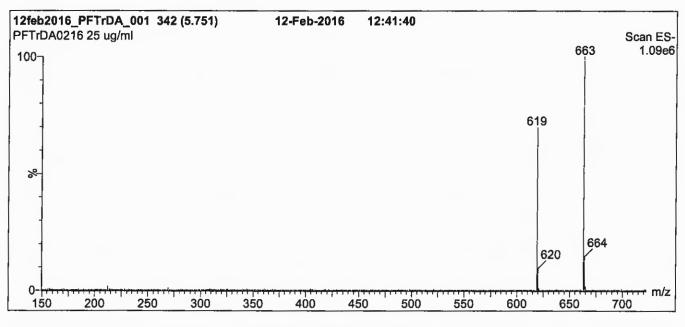




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Figure 1: PFTrDA; LC/MS Data (TIC and Mass Spectrum)





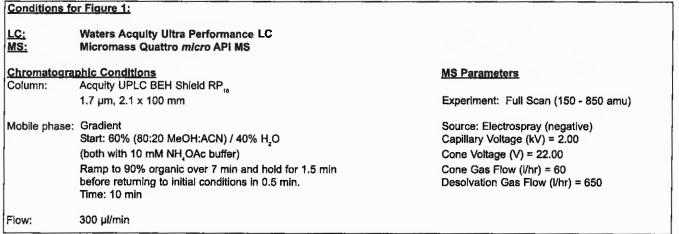
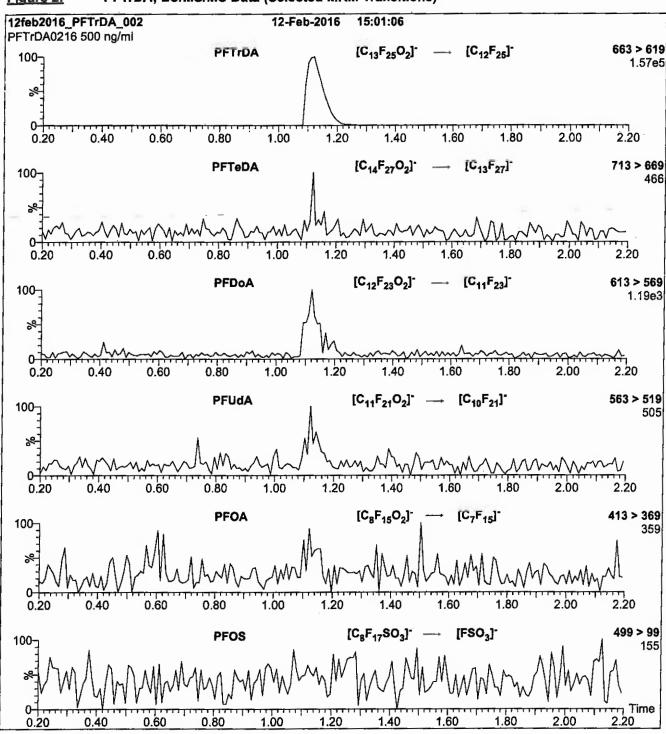
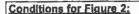


Figure 2: PFTrDA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% MeOH / 20% H₂O

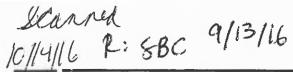
### MS Parameters

Collision Gas (mbar) = 3.35e-3 Collision Energy (eV) = 15

Flow:

300 µl/min

## LCPFUdA_00005





ID: LCPFUdA_00005 Exp: 08/19/20 Prpd: SBC PF-ri-undecanoic acid



ID: LCPFUdA_00006

Exp: 09/19/20 Prpd: SBC

PF-n-undecanoic acid



### CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:

**PFUdA** 

**LOT NUMBER:** 

PFUdA0815

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)

08/19/2015

EXPIRY DATE: (mm/dd/yyyy)

08/19/2020

RECOMMENDED STORAGE:

Store ampoule in a cool, dark place

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

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

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

### **ADDITIONAL INFORMATION:**

See page 2 for further details.

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

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By:

B G Chittim

Date:

08/21/201

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:

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

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

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

### LIMITED WARRANTY:

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### QUALITY MANAGEMENT:

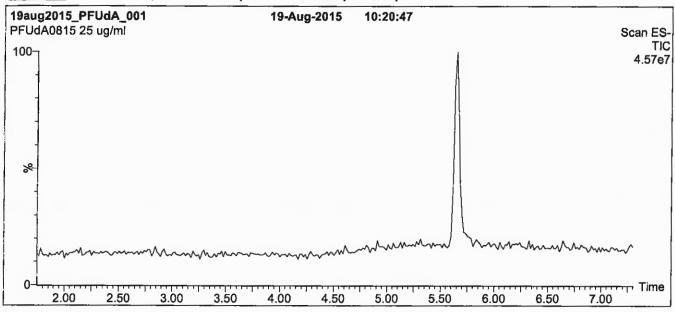
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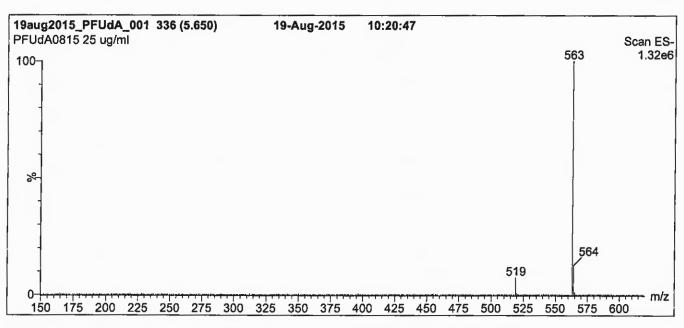




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Figure 1: PFUdA; LC/MS Data (TIC and Mass Spectrum)





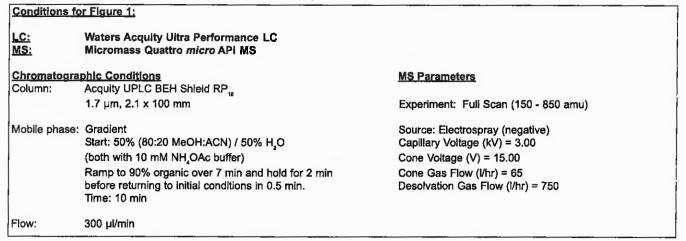
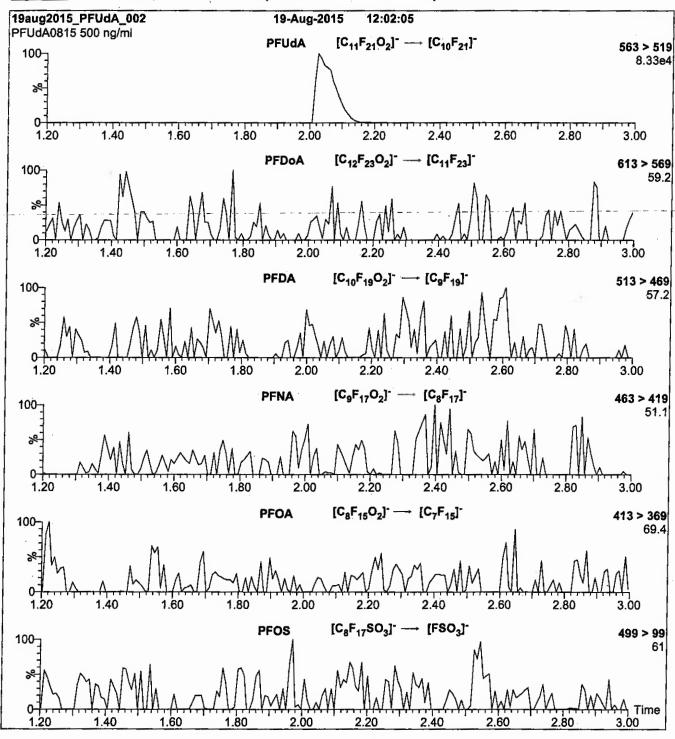


Figure 2: PFUdA; LC/MS/MS Data (Selected MRM Transitions)





Direct loop injection

10 μl (500 ng/ml PFUdA)

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) = 3.31e-3 Collision Energy (eV) = 11

Flow:

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

### Method PFC DOD

Perfluronated Hydrocarbons (LC/MS) by Method PFC_DOD

### FORM II LCMS SURROGATE RECOVERY

Lab	Name:	TestAmerica	Sacramento	Job No.:	320-23931-1
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SDG No.:

Matrix: Water Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFBA	#	13CPeA	#	PFHxA	#	13СНрА	#	PFHxS	#	PFOA	#	PFOS	#	PFNA	#
608D132MW-LF-1116	320-23931-1	32		52		41		37		35		62		84		72	_
608D132MW-LF-1116 DL	320-23931-1 DL	802	Q	1140	Q	857	Q	751	Q	842	Q	1153	Q	1317	Q	1303	ζ
608D33MW-LF-1116	320-23931-2	9	Q	42		47		36		34		60		21	Q	27	
608D33MW-LF-1116 DL	320-23931-2 DL	54		179	Q	154	Q	154	Q	150		181	Q	144		145	
61301MW-LF-1116	320-23931-3	45		78		78		82		93		85		102		88	
613D41MW-LF-1116	320-23931-4	48		80		77		77		96		77		101		70	
613D39MW-LF-1116	320-23931-5	43		76		77		86		92		92		99		93	
FB113016	320-23931-6	106		113		105		111		102		110		102		109	
	MB 320-140536/1-A	112		118		109		112		105		116		102		109	
	LCS 320-140536/2-A	106		109		103		102		97		103		99		103	

	QC LIMITS
PFBA = 13C4 PFBA	25-150
13CPeA = 13C5-PFPeA	25-150
PFHxA = 13C2 PFHxA	25-150
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 537 (Modified)

### FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 3	320-23931-1
---------------------------------------------	-------------

SDG No.:

Matrix: Water Level: Low

GC Column (1): <u>Acquity</u> ID: <u>2.1 (mm)</u>

Client Sample ID	Lab Sample ID	13C8F0	s#	PFDA	#	PFUnA	#	PFDoA	#
608D132MW-LF-1116	320-23931-1	18	Q	106		104		104	П
608D132MW-LF-1116 DL	320-23931-1 DL	224	Q	1335	Q	1305	Q	1231	Q
608D33MW-LF-1116	320-23931-2	8	Q	97		112		108	
608D33MW-LF-1116 DL	320-23931-2 DL	17	Q	162	Q	163	Q	155	Q
61301MW-LF-1116	320-23931-3	9	Q	97		104		104	
613D41MW-LF-1116	320-23931-4	15	Q	68		70		77	
613D39MW-LF-1116	320-23931-5	13	Q	97		97		86	
FB113016	320-23931-6	55		115		116		104	
	MB 320-140536/1-A	100		111		115		111	
	LCS 320-140536/2-A	90		104		104		107	

QC LIMITS
25-150
25-150
25-150
25-150

 $[\]ensuremath{\text{\#}}$  Column to be used to flag recovery values

## FORM II LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento	Job No.:	320-23931-1
----------------------------------	----------	-------------

SDG No.:

Matrix: Water Level: Low

GC Column (1): <u>Acquity</u> ID: <u>2.1 (mm)</u>

Client Sample ID	Lab Sample ID	PFHxS #
61301MW-LF-1116 RA	320-23931-3 RA	111
613D41MW-LF-1116 RA	320-23931-4 RA	126
613D39MW-LF-1116 RA	320-23931-5 RA	116

 $\frac{QC LIMITS}{25-150}$ 

PFHxS = 1802 PFHxS

# FORM III LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name	e: TestAmerica Sacra	amento	Job No.:	320-23931-1	
SDG No.	:				
Matrix:	Water	Level: Low	Lab File	ID: 16DEC2016C_006.d	
Lab ID:	LCS 320-140536/2-A		Client ID	•	

	_				
	SPIKE	LCS	LCS	QC	
	ADDED	CONCENTRATION	용	LIMITS	#
COMPOUND	(ug/L)	(ug/L)	REC	REC	
Perfluorobutanoic acid (PFBA)	0.0400	0.0446	112		
Perfluoropentanoic acid	0.0400	0.0431	108	60-140	
(PFPeA)					
Perfluorohexanoic acid (PFHxA)	0.0400	0.0427	107	60-140	
Perfluoroheptanoic acid (PFHpA)	0.0400	0.0443	111		
Perfluorooctanoic acid (PFOA)	0.0400	0.0425	106	60-140	
Perfluorononanoic acid (PFNA)	0.0400	0.0428	107	60-140	
Perfluorodecanoic acid (PFDA)	0.0400	0.0420	105	60-140	
Perfluoroundecanoic acid	0.0400	0.0410	103	60-140	
(PFUnA)					
Perfluorododecanoic acid	0.0400	0.0422	105	60-140	
(PFDoA)	0.0400	0.0426	100	F0 1F0	
Perfluorotridecanoic Acid	0.0400	0.0436	109	50-150	
(PFTriA) Perfluorotetradecanoic acid	0.0400	0.0557	139	50-150	
(PFTeA)	0.0400	0.0557	139	30-130	
Perfluorobutanesulfonic acid	0.0354	0.0464	131	50-150	
(PFBS)					
Perfluorohexanesulfonic acid	0.0364	0.0375	103	60-140	
(PFHxS)					
Perfluorooctanesulfonic acid	0.0371	0.0398	107	60-140	
(PFOS)	0.0006	0.0410	4.05	50 150	
Perfluorodecanesulfonic acid (PFDS)	0.0386	0.0412	107	50-150	
Perfluorooctane Sulfonamide	0.0400	0.0445	111	60-140	
(FOSA)	0.0400	0.0445	+++	80-140	
13C8 FOSA	0.100	0.0900	90	25-150	
13C4 PFBA	0.100	0.106	106		
13C2 PFHxA	0.100	0.103	103	25-150	
13C4 PFOA	0.100	0.103	103	25-150	
13C5 PFNA	0.100	0.103	103	25-150	
13C2 PFDA	0.100	0.104	104		
13C2 PFUnA	0.100	0.104	104	25-150	
13C2 PFDoA	0.100	0.107	107	25-150	
1802 PFHxS	0.0946	0.0918	97	25-150	
13C4 PFOS	0.0956	0.0918	99		
13C5-PFPeA	0.100	0.109	109		
13C4-PFHpA	0.100	0.109	103		
TOGALLUNA	0.100	0.102	102	25-150	

[#] Column to be used to flag recovery and RPD values FORM III 537 (Modified)

# FORM IV LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1
SDG No.:	
Lab File ID: 16DEC2016C_005.d	Lab Sample ID: MB 320-140536/1-A
Matrix: Water	Date Extracted: 12/05/2016 08:31
Instrument ID: A8_N	Date Analyzed: 12/16/2016 18:30
Level: (Low/Med) Low	

#### THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

		LAB		
CLIENT SAMPLE ID	LAB SAMPLE ID	FILE ID	DATE ANALYZE	D
	LCS 320-140536/2-A	16DEC2016C_ 006.d	12/16/2016 18	8:37
608D132MW-LF-1116	320-23931-1	16DEC2016C_ 013.d	12/16/2016 19	9:30
608D33MW-LF-1116	320-23931-2	16DEC2016C_ 014.d	12/16/2016 19	9:37
61301MW-LF-1116	320-23931-3	16DEC2016C_ 019.d	12/16/2016 20	0:15
613D41MW-LF-1116	320-23931-4	16DEC2016C_ 020.d	12/16/2016 20	0:22
613D39MW-LF-1116	320-23931-5	16DEC2016C_ 021.d	12/16/2016 20	0:30
FB113016	320-23931-6	16DEC2016C_ 022.d	12/16/2016 20	0:37
608D33MW-LF-1116 DL	320-23931-2 DL	20DEC2016C_ 008.d	12/20/2016 18	8:22
608D132MW-LF-1116 DL	320-23931-1 DL	20DEC2016C_ 010.d	12/20/2016 18	8:37
61301MW-LF-1116 RA	320-23931-3 RA	20DEC2016C_ 012.d	12/20/2016 18	8:52
613D41MW-LF-1116 RA	320-23931-4 RA	20DEC2016C_ 013.d	12/20/2016 18	8:59
613D39MW-LF-1116 RA	320-23931-5 RA	20DEC2016C_ 014.d	12/20/2016 19	9:07

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 Lab Sample ID: 320-23931-1

Matrix: Water Lab File ID: 16DEC2016C_013.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 09:40

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) Date Analyzed: 12/16/2016 19:30

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

				i I	
COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
Perfluorobutanoic acid (PFBA)	0.50	E	0.0024	0.00095	0.00043
Perfluoropentanoic acid (PFPeA)	0.61	E	0.0024	0.0019	0.00093
Perfluorohexanoic acid (PFHxA)	1.5	E	0.0024	0.0019	0.00074
Perfluoroheptanoic acid (PFHpA)	0.32		0.0024	0.0019	0.00076
Perfluorooctanoic acid (PFOA)	0.52	E M	0.0024	0.0019	0.00071
Perfluorononanoic acid (PFNA)	0.00064	J	0.0024	0.0019	0.00062
Perfluorodecanoic acid (PFDA)	0.00095	U	0.0024	0.00095	0.00042
Perfluoroundecanoic acid (PFUnA)	0.0019	Ū	0.0024	0.0019	0.00071
Perfluorododecanoic acid (PFDoA)	0.0019	Ū	0.0024	0.0019	0.00055
Perfluorotridecanoic Acid (PFTriA)	0.0019	Ū	0.0024	0.0019	0.00052
Perfluorotetradecanoic acid (PFTeA)	0.00056	J	0.0024	0.00095	0.00038
Perfluorohexanesulfonic acid (PFHxS)	2.6	E	0.0024	0.0019	0.00082
Perfluorooctanesulfonic acid (PFOS)	1.2	E	0.0038	0.0028	0.0012
Perfluorodecanesulfonic acid (PFDS)	0.0028	Ū	0.0038	0.0028	0.0011
Perfluorooctane Sulfonamide (FOSA)	0.0019	Ū	0.0024	0.0019	0.00060
	Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA) Perfluoroctanoic acid (PFOA) Perfluorononanoic acid (PFNA) Perfluorodecanoic acid (PFDA) Perfluorodecanoic acid (PFDA) Perfluorotetradecanoic acid (PFDA) Perfluorotetradecanoic acid (PFDA) Perfluorotetradecanoic acid (PFDA) Perfluorotetradecanoic acid (PFTIA) Perfluorotetradecanoic acid (PFTEA) Perfluoroctanesulfonic acid (PFOS) Perfluorodecanesulfonic acid (PFOS) Perfluoroctane Sulfonamide	Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluorohexanoic acid (PFHxA) Perfluorooctanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluorononanoic acid (PFNA) Perfluorodecanoic acid (PFNA) Perfluorodecanoic acid (PFDA) Perfluorododecanoic acid (PFUA) Perfluorotridecanoic acid (PFDA) Perfluorotridecanoic acid (PFDA) Perfluorotridecanoic acid (PFDA) Perfluorotridecanoic acid (PFDA) Perfluorotridecanoic acid (PFTEA) Perfluorotetradecanoic acid (PFTEA) Perfluorotetradecanoic acid (PFTEA) Perfluorotetradecanoic acid (PFTEA) Perfluorodecanesulfonic acid (PFHxS) Perfluorooctanesulfonic acid (PFOS) Perfluorodecanesulfonic acid (PFDS) Perfluorooctane Sulfonamide 0.0019	Perfluorobutanoic acid (PFBA)  Perfluoropentanoic acid (PFPeA)  Perfluorohexanoic acid (PFHxA)  Perfluorohexanoic acid (PFHxA)  Perfluorooctanoic acid (PFHpA)  Perfluorooctanoic acid (PFOA)  Perfluorononanoic acid (PFNA)  Perfluorodecanoic acid (PFNA)  Perfluorodecanoic acid (PFDA)  Perfluoroundecanoic acid (PFDA)  Perfluoroundecanoic acid (PFDA)  Perfluorotridecanoic acid (PFUnA)  Perfluorotridecanoic acid (PFDoA)  Perfluorotridecanoic acid (PFTDA)  Perfluorotridecanoic acid (PFTDA)  Perfluorotridecanoic acid (PFTDA)  Perfluorotridecanoic acid (PFTA)  Perfluorotridecanoic acid (PFTA)  Perfluorohexanesulfonic acid (PFHxS)  Perfluorooctanesulfonic acid (PFOS)  Perfluorodecanesulfonic acid (PFDS)  Perfluorooctane Sulfonamide 0.0019 U	Perfluorobutanoic acid	Perfluorobutanoic acid   O.50   E

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 Lab Sample ID: 320-23931-1

Matrix: Water Lab File ID: 16DEC2016C_013.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 09:40

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) Date Analyzed: 12/16/2016 19:30

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	18	Q	25-150
STL00992	13C4 PFBA	32		25-150
STL00993	13C2 PFHxA	41		25-150
STL00990	13C4 PFOA	62		25-150
STL00995	13C5 PFNA	72		25-150
STL00996	13C2 PFDA	106		25-150
STL00997	13C2 PFUnA	104		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	1802 PFHxS	35		25-150
STL00991	13C4 PFOS	84		25-150
STL01893	13C5-PFPeA	52		25-150
STL01892	13C4-PFHpA	37		25-150

Report Date: 18-Dec-2016 17:57:56 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_013.d

Lims ID: 320-23931-B-1-A Client ID: 608D132MW-LF-1116

Sample Type: Client

Inject. Date: 16-Dec-2016 19:30:14 ALS Bottle#: 33 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-b-1-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:38:55

First Level Revie	wer: cha	ındraser	nas		Date:	1	18-Dec-2016 17:38:5	<u>,5</u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	١									
217.00 > 172.00	1.582	1.582	0.0		5589368	16.1		32.1	439263	
1 Perfluorobut	•									E
212.90 > 169.00		1.582	0.0	1.000	25243744	264.5			96614	E
3 Perfluoroper				1 000		0000			04/77	E
262.90 > 219.00		1.858	0.009	1.000	44160115	322.2			81677	Ł
D 4 13C5-PFPe 267.90 > 223.00		1.858	0.0		6944609	26.1		52.2	248786	
5 Perfluorobut			0.0		0744007	20.1		JZ.Z	240700	EM
	1.925	1.896	0.029	1.000	78334775	478.5				EM
298.90 > 99.00		1.896	0.010	0.990	61927799		1.26(0.00-0.00)			
D 613C2 PFHx	κA									
315.00 > 270.00	2.155	2.155	0.0		5047070	20.6		41.2	452904	
7 Perfluorohex										E
313.00 > 269.00		2.164		1.000	76614448	817.2			175225	
9 Perfluorohex				1 000	1/4507524	1202.2				E
399.00 > 80.00		2.433	-0.010	1.000	164507534	1382.3				E
D 11 13C4-PFH 367.00 > 322.00	•	2 /19/	-0.003		4213454	18.6		37.2	367049	
12 Perfluorohe			0.003		4210404	10.0		37.2	307047	
363.00 > 319.00	•		-0.011	1.000	14133276	171.3			7636	
D 10 18O2 PFH:	xS									
403.00 > 84.00	2.511	2.510	0.001		5465247	16.7		35.3	114252	
15 Perfluorooct	tanoic ac	cid								EM
413.00 > 369.00		2.858	0.003	1.000	39358014	272.5			136044	
413.00 > 169.00		2.858	0.003	1.000	29360328		1.34(0.90-1.10)		108118	8
D 14 13C4 PFO		2.050	0.002		710001/	21.2		40 E	400715	
417.00 > 372.00	2.80 l	2.858	0.003		7198216	31.2		62.5	480715	
					Page 400 of 0	378				

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Report Date: 18-Dec-2016 17:57:56 Chrom Revision: 2.2 05-Dec-2016 12:37:22 \\Chrom\\a\Sacramento\\Chrom\Data\A8 \\\20161218-37972 \b\\16\DEC2016C \0.013 d

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61218-37972	2.b\16DEC2016C_0	13.d		
Cianal	DT	EXP	DLT	REL	Doonones	Amount	Datio (Limita)	0/ Doo	C/N	Floor
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooct	ane sulf	onic acid	b							Ε
499.00 > 80.00	3.101	3.115	-0.014	1.000	132305023	636.2			729751	Е
499.00 > 99.00	3.110	3.115	-0.005	1.003	35849743		3.69(0.90-1.10)		651230	
D 19 13C5 PFN/										
468.00 > 423.00		3.230	0.005		6411488	36.1		72.2	256057	
D 17 13C4 PFO										
503.00 > 80.00		3.230	-0.004		9996179	40.2		84.0	99288	
20 Perfluoronoi			0.004	1 000	44007	0.0000			000	
463.00 > 419.00		3.239	-0.004	1.000	41296	0.3383			229	
D 21 13C8 FOS		2 5 / 1	0.000		2202007	0.00		177	420/72	
506.00 > 78.00		3.561	0.002		3392996	8.83		17.7	428672	
22 Perfluorooct 498.00 > 78.00		onamide 3.561	e 0.010	1.000	7662	0.1211			620	
			0.010	1.000	7002	0.1211			020	
24 Perfluorodeo 513.00 > 469.00		3.586	0.010	1.000	13480	0.0860			157	
D 23 13C2 PFD/		3.300	0.010	1.000	13400	0.0000			107	
515.00 > 470.00		3.595	-0.007		8299376	52.8		106	417922	
26 Perfluorode					02//0/0	02.0			,	
599.00 > 80.00			-0.001	1.000	876	0.007173				
D 27 13C2 PFUr	nΑ									
565.00 > 520.00		3.907	0.0		6088402	51.9		104	252495	
28 Perfluoround	decanoio	c acid								
563.00 > 519.00			-0.009	1.000	15927	0.1368			241	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.210	4.203	0.007		5785231	52.1		104	209948	
33 Perfluorotetr	radecan	oic acid								
712.50 > 668.90		4.711	0.012	1.000	54199	0.2956			43.5	
713.00 > 169.00	4.707	4.711	-0.004	0.997	7103		7.63(0.00-0.00)		3164	

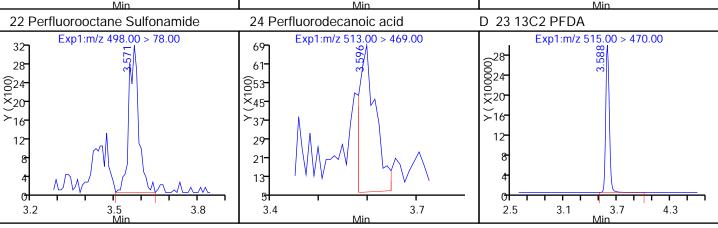
# OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 18-Dec-2016 17:57:56 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 19:30:14 Instrument ID: A8_N Lims ID: 320-23931-B-1-A Lab Sample ID: 320-23931-1 Client ID: 608D132MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 33 Worklist Smp#: 13 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 70-0060-50-(0000015⁻¹ ) × (9 ×40 30 20 10 1.9 1.0 1.3 1.6 1.4 1.7 2.0 1.2 1.5 1.8 2.1 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid (M) D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0028 16<del>-</del> (X1000000) (X1000000) (X1000000) (000000 12-0024 0000 20 1.9 1.9 2.2 2.5 1.5 2.1 2.2 1.0 1.3 1.6 1.2 1.8 2.4 1.3 1.6 2.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 (0000015-X12 (0000001X) 155 (00000015⁻ X) × 9 2.2 1.7 2.9 1.8 2.4 3.0 1.0 1.6 2.8 2.3 1.2 3.6 1.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 (X100000) (X1000012) 642 6036 ×30 **≻**24 18 12 0 0 2.9 2.0 2.6 3.2 2.0 Page 402h of 678 1.9 2.2 2.5 2.8 3.1 3.4 1.4 1.6



8

0

4.4

4.9

0

4.3

4.6

4.7

5.0

#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_013.d

Client ID: 608D132MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 33 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

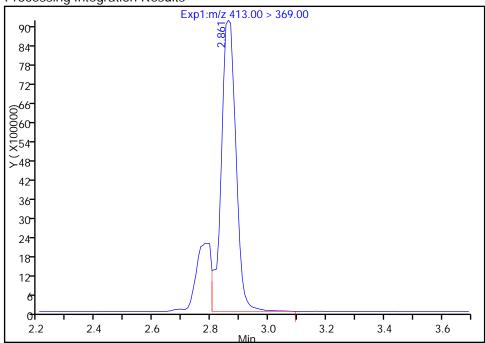
Column: Detector EXP1

#### 15 Perfluorooctanoic acid, CAS: 335-67-1

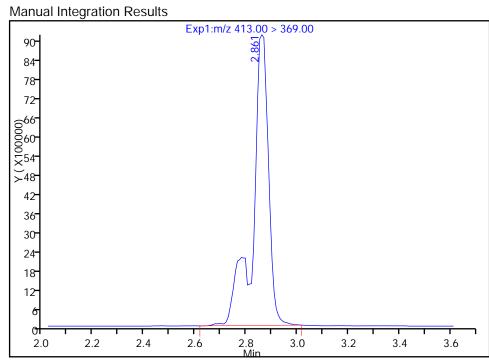
Signal: 1

RT: 2.86
Area: 32157632
Amount: 222.6723
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.86 Area: 39358014 Amount: 272.5306 Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:38:55

Audit Action: Manually Integrated

Audit Reason: Isomers

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Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 DL Lab Sample ID: 320-23931-1 DL

Matrix: Water Lab File ID: 20DEC2016C_010.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 09:40

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) Date Analyzed: 12/20/2016 18:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 50

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.52	D	0.12	0.047	0.022
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.76	D	0.12	0.095	0.047
307-24-4	Perfluorohexanoic acid (PFHxA)	2.1	D	0.12	0.095	0.037
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.34	D	0.12	0.095	0.038
335-67-1	Perfluorooctanoic acid (PFOA)	0.55	D M	0.12	0.095	0.035
375-95-1	Perfluorononanoic acid (PFNA)	0.095	U	0.12	0.095	0.031
335-76-2	Perfluorodecanoic acid (PFDA)	0.047	U	0.12	0.047	0.021
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.095	U	0.12	0.095	0.035
307-55-1	Perfluorododecanoic acid (PFDoA)	0.095	U	0.12	0.095	0.028
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.095	U	0.12	0.095	0.026
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.047	U	0.12	0.047	0.019
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.5	D	0.12	0.095	0.043
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.7	D	0.12	0.095	0.041
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.4	D	0.19	0.14	0.060
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.14	U	0.19	0.14	0.057
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.095	U	0.12	0.095	0.030

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D132MW-LF-1116 DL Lab Sample ID: 320-23931-1 DL

Matrix: Water Lab File ID: 20DEC2016C_010.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 09:40

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 264.5(mL) Date Analyzed: 12/20/2016 18:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 50

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	224	Q	25-150
STL00992	13C4 PFBA	802	Q	25-150
STL00993	13C2 PFHxA	857	Q	25-150
STL00990	13C4 PFOA	1153	Q	25-150
STL00995	13C5 PFNA	1303	Q	25-150
STL00996	13C2 PFDA	1335	Q	25-150
STL00997	13C2 PFUnA	1305	Q	25-150
STL00998	13C2 PFDoA	1231	Q	25-150
STL00994	1802 PFHxS	842	Q	25-150
STL00991	13C4 PFOS	1317	Q	25-150
STL01893	13C5-PFPeA	1140	Q	25-150
STL01892	13C4-PFHpA	751	Q	25-150

Report Date: 21-Dec-2016 10:21:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File:

Lims ID: 320-23931-B-1-A Client ID: 608D132MW-LF-1116

Sample Type: Client

Inject. Date: 20-Dec-2016 18:37:20 ALS Bottle#: Worklist Smp#: 10 11

Injection Vol: 2.0 ul Dil. Factor: 50.0000

Sample Info: 320-23931-b-1-a 50X

Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method:

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution **Initial Calibration** Quant By:

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Rev	First Level Reviewer: chandrasenas					Date: 21-Dec-2016 10:17:58				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFE	3A									
217.00 > 172.0		1.558	0.0		2789348	8.02		16.0	301243	
1 Perfluorob	utyric acid									
212.90 > 169.0	•		-0.008	1.000	13154444	5.52			63246	
3 Perfluorope	entanoic a	cid								
262.90 > 219.0	00 1.839	1.839	0.0	1.000	24007880	8.02			105452	
D 4 13C5-PFF	PeA									
267.90 > 223.0	00 1.839	1.839	0.0		3033296	11.4		22.8	176747	
5 Perfluorob	utanesulfo	nic acid								
298.90 > 80.00		1.878	0.0	1.000	60591787	15.5				
298.90 > 99.00		1.878	0.0	1.000	36054109		1.68(0.00-0.00)			
7 Perfluoroh										
313.00 > 269.0		2.135	-0.002	1.000	43142892	22.1			198848	
D 613C2 PF										
315.00 > 270.0		2.135	-0.002		2100743	8.57		17.1	164544	
12 Perfluoroh	-									
363.00 > 319.0		2.472	-0.012	1.000	6012999	3.61			7640	
D 11 13C4-PF	•									
367.00 > 322.0		2.480	-0.020		1699372	7.51		15.0	124285	
D 10 18O2 PF										
403.00 > 84.00		2.487	0.002		2605372	7.97		16.8	138730	
9 Perfluoroh										
399.00 > 80.00		2.495	-0.006	1.000	110272551	38.9				
15 Perfluoroc										M
413.00 > 369.0		2.835	-0.004	1.000	15392771	5.77	1 42(0 00 1 10)		119942	M
413.00 > 169.0		2.835	-0.004	1.000	10756009		1.43(0.90-1.10)		484625	
D 14 13C4 PF		2.025	0.004		2/57470	11 -		22.4	107/00	
417.00 > 372.0	JU 2.831	2.835	-0.004		2657170	11.5		23.1	197682	
					Dogg 100 of (	270				

Report Date: 21-Dec-2016 10:21:28
Data File: \ChromNa\Sacra Chrom Revision: 2.2 05-Dec-2016 12:37:22 \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078_b\20DEC2016C_010_d

Data File:	Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_010.d										
Sign	ıal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfl	uorooct	ane sulf	onic acid	d							
499.00 >				-0.061	1.000	47905859	14.7			103570	
499.00 >	99.00	3.087	3.099	-0.012	1.016	11002967		4.35(0.90-1.10)		254661	
D 17 13C	4 PFOS	S									
503.00 >	80.00	3.201	3.204	-0.003		3133868	12.6		26.3	61833	
20 Perfl											
463.00 >	419.00	3.201	3.213	-0.012	1.000	36817	0.0167			456	
D 19 13C											
468.00 >			3.213	-0.012		2314614	13.0		26.1	160433	
D 21 13C											
506.00 >			3.536	-0.005		859631	2.24		4.5	64848	
24 Perfl				0.000	4 000	5044	0.000/45			444	
513.00 >			3.570	-0.022	1.000	5241	0.002645			111	
D 23 13C 515.00 >			2 570	0.014		2099422	13.3		24.7	96959	
						2099422	13.3		26.7	90939	
26 Perfl 599.00 >				-0.043	1.000	609	0.000318				
D 27 13C			3.077	-0.043	1.000	007	0.000310				
565.00 >			3.895	-0.009		1530385	13.1		26.1	196322	
28 Perfl				0.007		1000000	10.1		20.1	170022	
563.00 >				-0.018	1.000	6072	0.004149			133	
D 30 13C			0.070	0.0.0		3372	0.001.17				
615.00 >			4.182	-0.006		1365646	12.3		24.6	49999	
33 Perfl											
712.50 >			4.698	-0.010	1.000	19075	0.008813			156	
713.00 >				-0.019	0.998	1631		11.70(0.00-0.00)		765	

# QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 21-Dec-2016 10:21:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_010.d **Injection Date:** 20-Dec-2016 18:37:20 Instrument ID: A8_N Lims ID: 320-23931-B-1-A Lab Sample ID: 320-23931-1 Client ID: 608D132MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 11 Worklist Smp#: 10 Injection Vol: Dil. Factor: 50.0000 2.0 ul LC PFC_DOD ICAL Method:  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 42 (77<del>°</del> (0066° (55° ©72-<u>830</u> <del>∑</del>60 **≻**48 >4418 33 36 12 24 22 12 1.9 1.9 1.0 1.3 1.6 1.0 1.3 1.6 1.2 1.5 1.8 2.1 4 13C5-PFPeA D 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0012 (X1000000) (X1000000) (X1000000) (12 X 100000) X (X 100000) X (X 100000) (X1000000) X 1.9 2.1 2.2 1.9 2.2 1.2 1.5 1.8 2.4 2.7 1.3 1.6 2.5 1.3 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 363.00 > 319.00 12 (X1000000) Y 77-(21°00018° ×15° 0066 ×55 >-44 33 22 2.0 2.3 2.1 2.3 1.7 2.6 2.9 1.5 1.8 2.4 2.7 2.6 2.9 D 11 13C4-PFHpA D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 399.00 > 80.00 Exp1:m/z 367,00 > 322.00 Exp1:m/z 403.00 > 84.00 (00000012-X) 77<del>-</del> 656 0048 <del>-</del>55<del>-</del> ×40 **≻**44 **≻**32 33 24 22 0 0 1.9 2.2 2.5 2.8 1.2 1.8 2.4 3.0 3.6

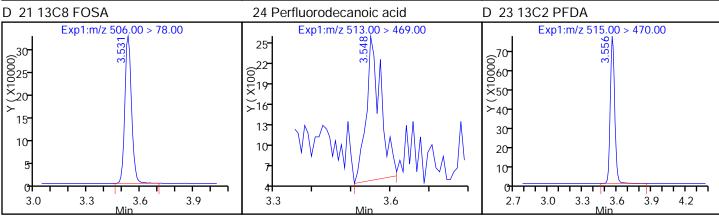
3.1

1.6

3.4

1.6

3.1



20

10

4.4

5.0

25

16<del>-</del>

4.4

4.7

4.7

5.0

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_010.d

Client ID: 608D132MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 11 Worklist Smp#: 10

Injection Vol: 2.0 ul Dil. Factor: 50.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

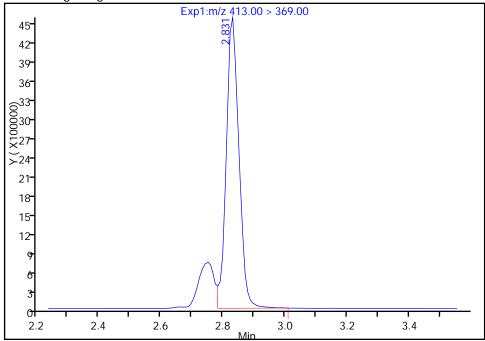
Column: Detector EXP1

#### 15 Perfluorooctanoic acid, CAS: 335-67-1

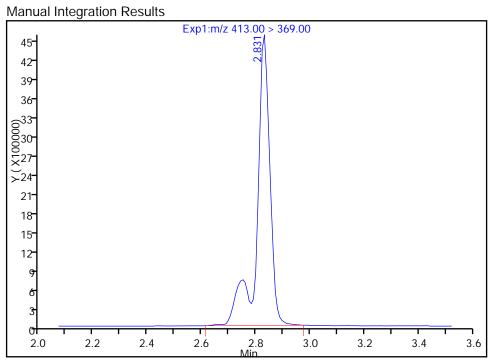
Signal: 1

RT: 2.83
Area: 12884602
Amount: 4.833800
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.83
Area: 15392771
Amount: 5.774767
Amount Units: ng/ml



Reviewer: chandrasenas, 21-Dec-2016 10:17:58

Audit Action: Manually Integrated Audit Reason: Isomers

Page 413 of 678

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 Lab Sample ID: 320-23931-2

Matrix: Water Lab File ID: 16DEC2016C_014.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 11:00

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) Date Analyzed: 12/16/2016 19:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

		T				
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.26	М	0.0024	0.00096	0.00044
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.40	E	0.0024	0.0019	0.00095
307-24-4	Perfluorohexanoic acid (PFHxA)	0.80	E	0.0024	0.0019	0.00076
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21		0.0024	0.0019	0.00077
335-67-1	Perfluorooctanoic acid (PFOA)	0.38	M	0.0024	0.0019	0.00072
375-95-1	Perfluorononanoic acid (PFNA)	0.017		0.0024	0.0019	0.00063
335-76-2	Perfluorodecanoic acid (PFDA)	0.0022	JM	0.0024	0.00096	0.00042
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00072
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00056
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00053
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00039	J	0.0024	0.00096	0.00038
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.4	E	0.0024	0.0019	0.00084
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	10	E M	0.0038	0.0029	0.0012
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0039		0.0038	0.0029	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.043		0.0024	0.0019	0.00061

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 Lab Sample ID: 320-23931-2

Matrix: Water Lab File ID: 16DEC2016C_014.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 11:00

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) Date Analyzed: 12/16/2016 19:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	8	Q	25-150
STL00992	13C4 PFBA	9	Q	25-150
STL00993	13C2 PFHxA	47		25-150
STL00990	13C4 PFOA	60		25-150
STL00995	13C5 PFNA	27		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	112		25-150
STL00998	13C2 PFDoA	108		25-150
STL00994	1802 PFHxS	34		25-150
STL00991	13C4 PFOS	21	Q	25-150
STL01893	13C5-PFPeA	42		25-150
STL01892	13C4-PFHpA	36		25-150

Report Date: 18-Dec-2016 17:57:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

Lims ID: 320-23931-A-2-A Client ID: 608D33MW-LF-1116

Sample Type: Client

Inject. Date: 16-Dec-2016 19:37:45 ALS Bottle#: 34 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-2-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:39:03

First Level Revie	First Level Reviewer: chandrasenas				Date:	1	18-Dec-2016 17:39:03			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	\									
217.00 > 172.00		1.582	-0.008		1532100	4.41		8.8	121936	
1 Perfluorobuty	yric acid									M
212.90 > 169.00	1.582	1.582	0.0	1.000	3542414	135.4			8941	M
3 Perfluoropen										E
262.90 > 219.00		1.858	-0.010	1.000	23042163	210.2			14395	E
D 4 13C5-PFPe										
267.90 > 223.00			0.0		5555305	20.9		41.8	163421	
5 Perfluorobuta			0.000	1 000	FF044770	240.7				E
298.90 > 80.00 298.90 > 99.00		1.896 1.896	-0.009 -0.009	1.000 1.000	55311770 31673288	349.7	1.75(0.00-0.00)			E
D 6 13C2 PFHx		1.070	-0.007	1.000	31073200		1.73(0.00-0.00)			
315.00 > 270.00		2.155	-0.007		5777974	23.6		47.1	448441	
7 Perfluorohex			0.007		0,,,,,,	20.0				E
313.00 > 269.00		2.164	-0.016	1.000	44820326	417.6			26923	E
9 Perfluorohex	anesulfo	nic acid								E
399.00 > 80.00	2.481	2.433	0.048	1.000	143828422	1250.9				E
D 11 13C4-PFH	рА									
367.00 > 322.00	2.481	2.494	-0.013		4068135	18.0		35.9	179871	
12 Perfluorohe	-	acid								
363.00 > 319.00	2.481	2.502	-0.021	1.000	8623337	108.3			8047	
D 10 18O2 PFH:										
403.00 > 84.00	2.498	2.510	-0.012		5280110	16.1		34.1	172067	
15 Perfluorooct			0.010	4 000	07570004	0000			07000	M
413.00 > 369.00 413.00 > 169.00		2.858 2.858	-0.012 -0.036	1.000 0.991	27570391 19985436	200.0	1.38(0.90-1.10)		37909	M
		2.000	-0.030	0.771	17700430		1.30(0.70-1.10)		199382	
D 14 13C4 PFO 417.00 > 372.00		2.858	-0.012		6871301	29.8		59.7	405645	
717.00 / 372.00	2.040	2.000	0.012		0071301			57.1	<del>-100040</del>	

Report Date: 18-Dec-2016 17:57:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

L	Data File:	\\Chrc	omina\Sa	acrament	io\Chrom	Data\A8_N\201	61218-3797	2.b\16DEC2016C_0	)14.d		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	18 Perfluorooct 199.00 > 80.00 199.00 > 99.00	3.183	onic acio 3.115 3.115	0.068 0.094	1.000 1.008	278074031 129880966	5251.2	2.14(0.90-1.10)		68064 0.0	EM EM
4	) 19 13C5 PFN, 468.00 > 423.00 ) 17 13C4 PFO	3.218	3.230	-0.012		2375402	13.4		26.7	87168	
	503.00 > 80.00		3.230	-0.021		2545360	10.2		21.4	9363	
	20 Perfluoronoi 463.00 > 419.00	3.218	cid 3.239	-0.021	1.000	407835	9.02			1157	
	) 21 13C8 FOS 506.00 > 78.00		3.561	-0.004		1629329	4.24		8.5	68956	
4	22 Perfluorooct 198.00 > 78.00			e -0.004	1.000	675097	22.2			1721	
í	24 Perfluorode 513.00 > 469.00			-0.004	1.000	168886	1.17			646	M M
	) 23 13C2 PFD 515.00 > 470.00	3.574	3.595			7662425	48.7		97.4	317696	
ŗ	26 Perfluorode 599.00 > 80.00			id -0.013	1.000	62369	2.01				
	) 27 13C2 PFUi		3.077	0.013	1.000	02307	2.01				
į	565.00 > 520.00		3.907	0.005		6574379	56.1		112	324124	
	28 Perfluoroun 563.00 > 519.00	3.903	acid 3.916	-0.013	1.000	32430	0.2579			244	
	) 30 13C2 PFDo 515.00 > 570.00	4.200		-0.003		5997073	54.0		108	215984	
ć	29 Perfluorodo 613.00 > 569.00			-0.017	1.000	8826	0.0802			76.6	
	33 Perfluoroteti 712.50 > 668.90 713.00 > 169.00	4.710	oic acid 4.711 4.711	-0.001 -0.017	1.000 0.996	38316 8244	0.2016	4.65(0.00-0.00)		55.6 3291	

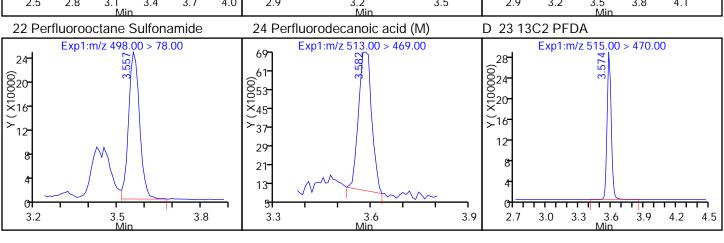
# OC Flag Legend Processing Flags

E - Exceeded Maximum Amount

Review Flags

M - Manually Integrated

Report Date: 18-Dec-2016 17:57:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 19:37:45 Instrument ID: A8_N Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2 Client ID: 608D33MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 34 Worklist Smp#: 14 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid (M) 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 12 57 Y (X100000) 670 660 60 (042 0035 × × >28 <del>×</del>50  $\succ$ 40 21 30 20 10 1.9 1.0 1.3 1.6 2.2 1.2 1.5 1.8 1.6 1.9 2.2 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 (0000018-(000001X) > 12-(X1000000) (X1000000) (X1000000) (X1000000) Y 2.0 2.3 1.7 2.0 1.9 2.2 2.5 1.7 2.3 1.0 1.3 1.6 1.4 1.4 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 399.00 > 80.00 (00000010⁻ × ) × (00000015⁻ X) × 9 (21-000018-X15-1.7 2.3 2.9 1.8 2.1 2.7 2.0 1.5 2.4 1.4 2.6 3.2 1.1 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 32 16 (X100000) (X1000012) 0014 00012 ×10 ©28**-**×20 ≻₁₆-12 0 01.9 2.2 2.5 2.8 3.4 1.9 2.2 Page 4M8hof 678 2.8 3.1 1.9 2.2 2.5 2.8 3.4 1.6 3.1 1.6 3.1



15<del>-</del>

0

4.3

4.6

4.9

5.0

0

4.4

4.7

#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

Injection Date: 16-Dec-2016 19:37:45 Instrument ID: A8_N

Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2

Client ID: 608D33MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 34 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

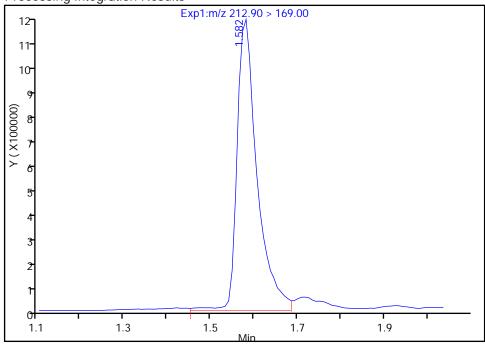
Column: Detector EXP1

#### 1 Perfluorobutyric acid, CAS: 375-22-4

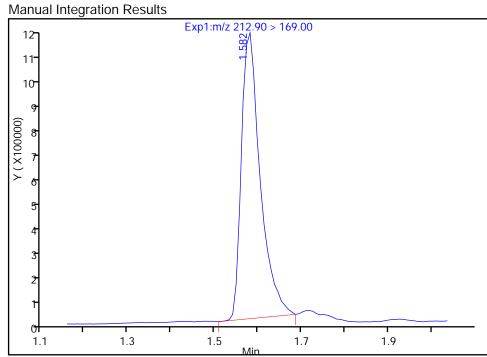
Signal: 1

RT: 1.58
Area: 3844300
Amount: 146.9584
Amount Units: ng/ml

**Processing Integration Results** 



RT: 1.58
Area: 3542414
Amount: 135.4180
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated

Audit Reason: Baseline

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#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

Injection Date: 16-Dec-2016 19:37:45 Instrument ID: A8_N

Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2

Client ID: 608D33MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 34 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

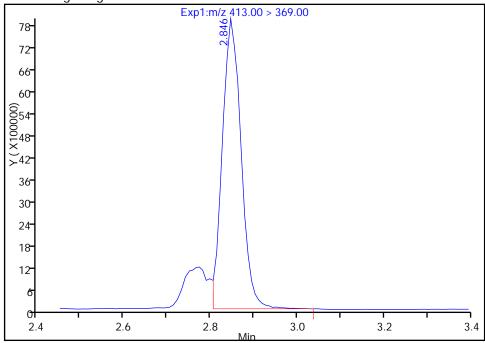
Column: Detector EXP1

### 15 Perfluorooctanoic acid, CAS: 335-67-1

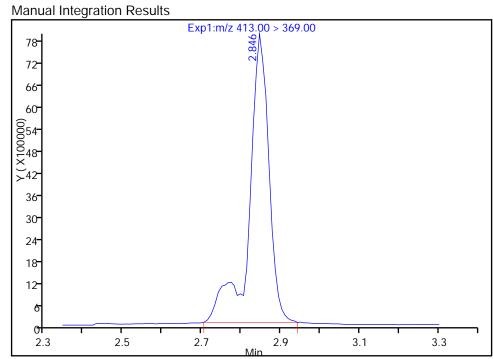
Signal: 1

RT: 2.85
Area: 23756618
Amount: 172.3267
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.85 Area: 27570391 Amount: 199.9912 Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated Audit Reason: Isomers

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#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

Injection Date: 16-Dec-2016 19:37:45 Instrument ID: A8_N

Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2

Client ID: 608D33MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 34 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

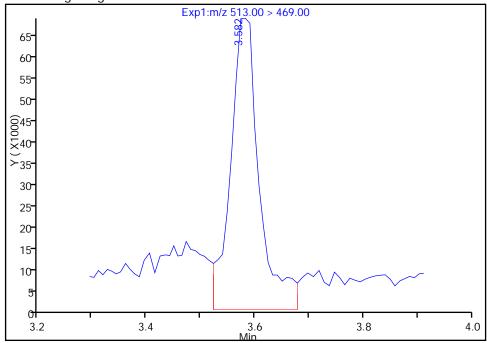
Column: Detector EXP1

#### 24 Perfluorodecanoic acid, CAS: 335-76-2

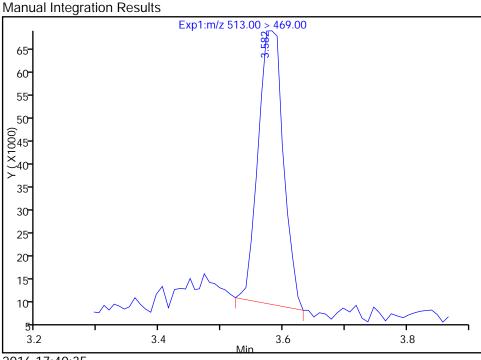
Signal: 1

RT: 3.58
Area: 251941
Amount: 1.741907
Amount Units: ng/ml

**Processing Integration Results** 



RT: 3.58
Area: 168886
Amount: 1.167669
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated

Audit Reason: Baseline

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#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_014.d

Injection Date: 16-Dec-2016 19:37:45 Instrument ID: A8_N

Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2

Client ID: 608D33MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 34 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

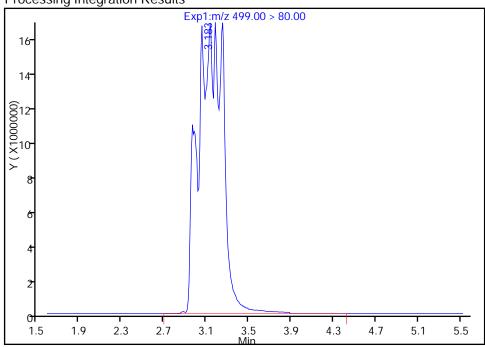
Column: Detector EXP1

#### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

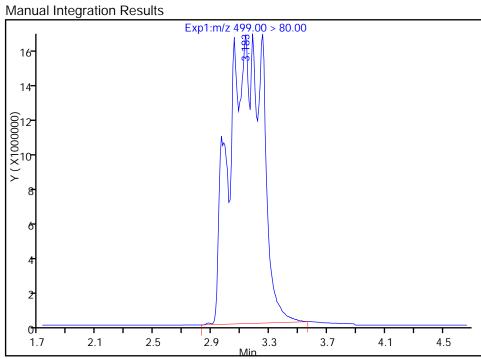
Signal: 1

RT: 3.18
Area: 285246019
Amount: 5386.5914
Amount Units: ng/ml

**Processing Integration Results** 



RT: 3.18
Area: 278074031
Amount: 5251.1555
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:40:35

Audit Action: Manually Integrated

Audit Reason: Baseline

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Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 DL Lab Sample ID: 320-23931-2 DL

Matrix: Water Lab File ID: 20DEC2016C_008.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 11:00

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) Date Analyzed: 12/20/2016 18:22

Con. Extract Vol.: 0.5(mL) Dilution Factor: 100

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.29	D	0.24	0.096	0.044
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.47	D	0.24	0.19	0.095
307-24-4	Perfluorohexanoic acid (PFHxA)	0.94	D	0.24	0.19	0.076
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.21	JD	0.24	0.19	0.077
335-67-1	Perfluorooctanoic acid (PFOA)	0.43	D M	0.24	0.19	0.072
375-95-1	Perfluorononanoic acid (PFNA)	0.19	U	0.24	0.19	0.063
335-76-2	Perfluorodecanoic acid (PFDA)	0.096	U	0.24	0.096	0.042
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.19	U	0.24	0.19	0.072
307-55-1	Perfluorododecanoic acid (PFDoA)	0.19	U	0.24	0.19	0.056
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.19	U	0.24	0.19	0.053
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.096	U	0.24	0.096	0.038
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.73	D	0.24	0.19	0.088
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	5.4	D	0.24	0.19	0.084
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	21	D	0.38	0.29	0.12
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.29	U	0.38	0.29	0.12
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.19	U	0.24	0.19	0.061

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 608D33MW-LF-1116 DL Lab Sample ID: 320-23931-2 DL

Matrix: Water Lab File ID: 20DEC2016C_008.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 11:00

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 260.2(mL) Date Analyzed: 12/20/2016 18:22

Con. Extract Vol.: 0.5(mL) Dilution Factor: 100

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	17	Q	25-150
STL00992	13C4 PFBA	54		25-150
STL00993	13C2 PFHxA	154	Q	25-150
STL00990	13C4 PFOA	181	Q	25-150
STL00995	13C5 PFNA	145		25-150
STL00996	13C2 PFDA	162	Q	25-150
STL00997	13C2 PFUnA	163	Q	25-150
STL00998	13C2 PFDoA	155	Q	25-150
STL00994	1802 PFHxS	150		25-150
STL00991	13C4 PFOS	144		25-150
STL01893	13C5-PFPeA	179	Q	25-150
STL01892	13C4-PFHpA	154	Q	25-150

Report Date: 21-Dec-2016 10:21:23 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_008.d

Lims ID: 320-23931-A-2-A Client ID: 608D33MW-LF-1116

Sample Type: Client

Inject. Date: 20-Dec-2016 18:22:18 ALS Bottle#: 9 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 100.0000

Sample Info: 320-23931-a-2-a 100X

Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:15:20

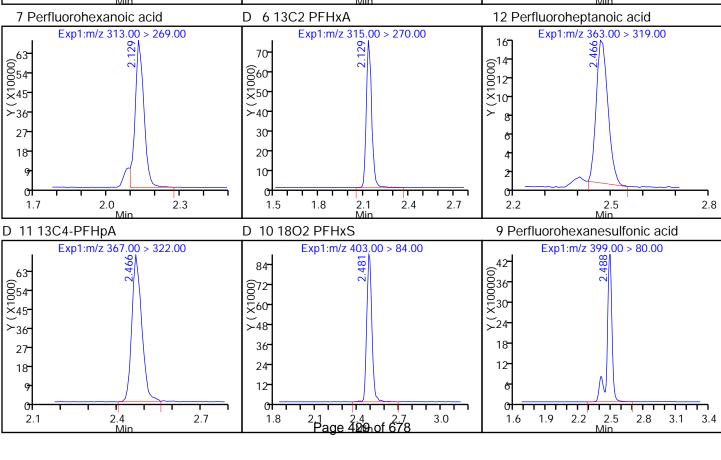
First Level Revie	First Level Reviewer: chandrasenas					21-Dec-2016 10:15:20				
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.558	0.0		93921	0.2701		0.5	10437	
1 Perfluorobut	yric acid									
212.90 > 169.00	•		-0.008	1.000	240670	1.50			1361	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00		1.839	0.001	1.000	1139411	2.42			9321	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.840	1.839	0.001		238276	0.8955		1.8	32993	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.878	0.0	1.000	2643501	3.81				
298.90 > 99.00	1.878	1.878	0.0	1.000	1110652		2.38(0.00-0.00)			
7 Perfluorohex										
313.00 > 269.00		2.135	-0.006	1.000	1705210	4.88			16643	
D 6 13C2 PFHx										
315.00 > 270.00		2.135	-0.006		188217	0.7679		1.5	37659	
12 Perfluorohe	•									
363.00 > 319.00		2.472	-0.006	1.000	367963	1.08			2841	
D 11 13C4-PFH	•									
367.00 > 322.00		2.480	-0.014		174429	0.7706		1.5	17621	
D 10 1802 PFH										
403.00 > 84.00		2.487			231775	0.7088		1.5	44713	
9 Perfluorohex				1 000	1.100.1000	07.0				
399.00 > 80.00		2.495	-0.007	1.000	14094390	27.9				
15 Perfluorooc			0.007	1 000	00/000	0.04			(740	M
413.00 > 369.00 413.00 > 169.00		2.835 2.835	-0.007 -0.031	1.000 0.991	926939 601075	2.21	1.54(0.90-1.10)		6743 11211	M
		2.035	-0.031	0.991	001075		1.34(0.70-1.10)		11211	
D 14 13C4 PFO 417.00 > 372.00		2.835	-0.007		208817	0.9065		1.8	39500	
417.00 > 372.00	2.020	2.033	-0.007					1.0	37300	
					Dogg 427 of (	270				

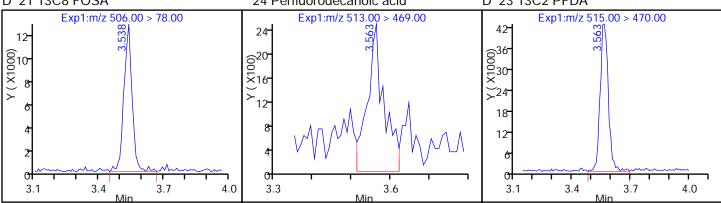
Data File:	\\Chrc	miva\Sa	acrament	:o\Chrom	Data\A8_N\201	61221-3807	8.b\20DEC2016C_C	08.a		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooct	tane sulf	onic acid	d							
499.00 > 80.00	3.083	3.099	-0.016	1.000	38917583	109.3			263540	
499.00 > 99.00	3.083	3.099	-0.016	1.000	9690405		4.02(0.90-1.10)		67557	
D 17 13C4 PFO										
503.00 > 80.00			-0.007		171094	0.6875		1.4	7160	
20 Perfluorono			0.007	4 000	F.(000	0.0007			4054	
463.00 > 419.00		3.213	-0.007	1.000	56328	0.2296			1051	
D 19 13C5 PFN/ 468.00 > 423.00		2 212	0.007		128850	0.7252		1.5	14828	
22 Perfluorooct					120000	0.7232		1.5	14020	
498.00 > 78.00				1.000	16554	0.2682			721	
D 21 13C8 FOS		0.000	0.002	1.000	10001	0.2002			,	
506.00 > 78.00		3.536	0.002		33084	0.0861		0.2	2482	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.563	3.570	-0.007	1.000	7116	0.0297			151	
D 23 13C2 PFD/	Д									
515.00 > 470.00	3.563	3.570	-0.007		127119	0.8081		1.6	3564	
26 Perfluorode		fonic ac	id							
599.00 > 80.00	3.734	3.877	-0.143	1.000	6653	0.0318				
D 27 13C2 PFU										
565.00 > 520.00		3.895	-0.010		95498	0.8145		1.6	12208	
D 30 13C2 PFD		4 100	0.0		05011	0.7704		<b>4</b> F	44.47	
615.00 > 570.00	4.182	4.182	0.0		85811	0.7734		1.5	4147	

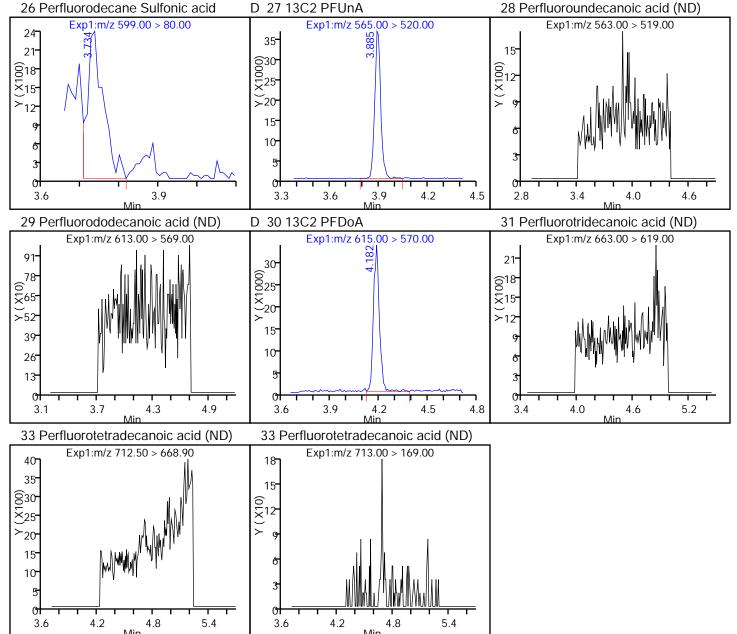
QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 21-Dec-2016 10:21:23 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_008.d **Injection Date:** 20-Dec-2016 18:22:18 Instrument ID: A8_N Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2 Client ID: 608D33MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 100.0000 LC PFC_DOD ICAL Method:  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 42 70 28 ×30-660 ×50 ©24  $\stackrel{\smile}{\times}_{20}$ ∑40⁻ 30 18 12 20 10 1.2 1.8 1.7 1.5 1.8 2.1 1.1 1.4 2.0 2.3 2.1 2.4 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0012 48 X (×100000) کا د 91 (F) 78 <del>∑</del>65 ×30 <del>-</del>52 ≻₂₄ 39 18 26 12 13 1.8 1.9 1.5 1.8 2.1 2.4 2.1 1.5 2.2 1.2 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 16 63-00054-×45-70 614 6012 12 660 ×50 <u>≻</u>10 **≻**36 >40 27 30 18 20 10 2.0 2.3 2.7 2.5 1.8 2.1 2.4 2.2 2.8 1.7 1.5







#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_008.d

Injection Date: 20-Dec-2016 18:22:18 Instrument ID: A8_N

Lims ID: 320-23931-A-2-A Lab Sample ID: 320-23931-2

Client ID: 608D33MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 9 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 100.0000

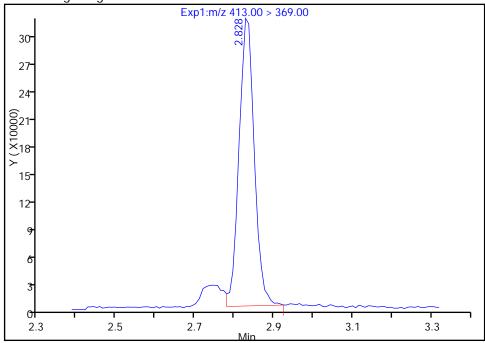
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

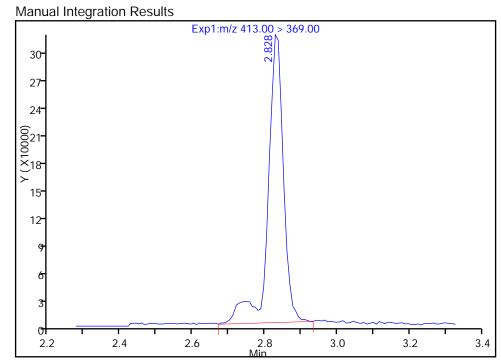
### 15 Perfluorooctanoic acid, CAS: 335-67-1

Signal: 1

RT: 2.83 Area: 835594 Amount: 1.994511 Amount Units: ng/ml **Processing Integration Results** 



RT: 2.83
Area: 926939
Amount: 2.212546
Amount Units: ng/ml



Reviewer: chandrasenas, 21-Dec-2016 10:16:22

Audit Action: Manually Integrated Audit Reason: Isomers

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 61301MW-LF-1116 Lab Sample ID: <u>320-23931-3</u>

Matrix: Water Lab File ID: 16DEC2016C_019.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 12:45

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.5(mL) Date Analyzed: 12/16/2016 20:15

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.17	М	0.0024	0.00094	0.00043
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.18		0.0024	0.0019	0.00093
307-24-4	Perfluorohexanoic acid (PFHxA)	0.15		0.0024	0.0019	0.00074
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.11		0.0024	0.0019	0.00076
335-67-1	Perfluorooctanoic acid (PFOA)	0.10	М	0.0024	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.0080		0.0024	0.0019	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.0016	J	0.0024	0.00094	0.00041
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	U	0.0024	0.0019	0.00070
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	U	0.0024	0.0019	0.00055
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	U	0.0024	0.0019	0.00052
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00079	J	0.0024	0.00094	0.00038
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.071		0.0024	0.0019	0.00082
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.061		0.0038	0.0028	0.0012
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.0019	0.00060

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 61301MW-LF-1116 Lab Sample ID: 320-23931-3

Matrix: Water Lab File ID: 16DEC2016C_019.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 12:45

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.5(mL) Date Analyzed: 12/16/2016 20:15

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	9	Q	25-150
STL00992	13C4 PFBA	45		25-150
STL00993	13C2 PFHxA	78		25-150
STL00990	13C4 PFOA	85		25-150
STL00995	13C5 PFNA	88		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	104		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	1802 PFHxS	93		25-150
STL00991	13C4 PFOS	102		25-150
STL01893	13C5-PFPeA	78		25-150
STL01892	13C4-PFHpA	82		25-150

Report Date: 18-Dec-2016 17:59:55 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d

Lims ID: 320-23931-A-3-A Client ID: 61301MW-LF-1116

Sample Type: Client

Inject. Date: 16-Dec-2016 20:15:12 ALS Bottle#: 35 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-3-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:45:38

First Level F	Reviewer: ch	andraser	nas		Date:	1	8-Dec-2016 17:45:3	38		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 213C41	PFRA									
	72.00 1.577	1.582	-0.005		7811286	22.5		44.9	487724	
1 Perfluo	robutyric acid	t								M
	69.00 1.585	1.582	0.003	1.000	11952434	89.6			35305	М
3 Perfluo	ropentanoic	acid								
	19.00 1.861	1.858	0.003	1.000	19129180	93.6			43962	
D 413C5-	PFPeA									
267.90 > 22	23.00 1.861	1.858	0.003		10360496	38.9		77.9	364435	
5 Perfluo	robutanesulf	onic acid								
	0.00 1.890	1.896	-0.006	1.000	3053573	7.12				
298.90 > 99	9.00 1.890	1.896	-0.006	1.000	1275052		2.39(0.00-0.00)			
D 613C21										
315.00 > 27	70.00 2.154	2.153	0.001		9543265	38.9		77.9	515294	
	rohexanoic a									
	69.00 2.145	2.153	-0.008	1.000	14052757	79.3			50627	
	oroheptanoic									
	19.00 2.482	2.492	-0.010	1.000	10174686	56.3			47454	
D 11 13C4	•									
	22.00 2.482	2.500	-0.018		9232275	40.8		81.6	655316	
D 10 18O2										_
	4.00 2.497		-0.011		14307907	43.8		92.5	265679	0
	rohexanesulf			1 000	44047000	07.0				
	0.00 2.420		-0.095	1.000	11817983	37.9				
	prooctanoic a		0.000	1 000	10500/0/	F2.0			F4.407	M
	69.00 2.838 69.00 2.846	2.847 2.847	-0.009 -0.001	1.000 1.003	10508626 7006411	53.8	1.50(0.90-1.10)		51426 323632	M
		2.047	-0.001	1.003	7000411		1.50(0.70-1.10)		JZJUJZ	
D 14 13C4	72.00 2.838	2.855	-0.017		9744611	42.3		84.6	707416	
T17.00 / 3	72.00 2.030	2.000	-0.017		7/44011			04.0	707410	
					Dogo 125 of 6	2 / 0				

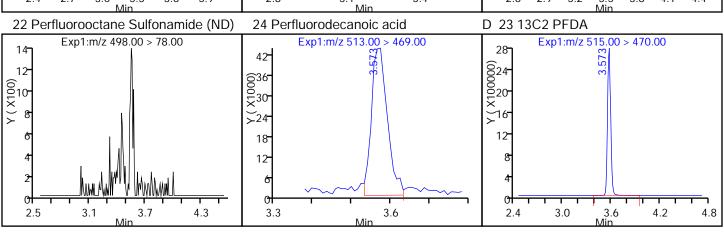
Chrom Revision: 2.2 05-Dec-2016 12:37:22 Report Date: 18-Dec-2016 17:59:55 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d

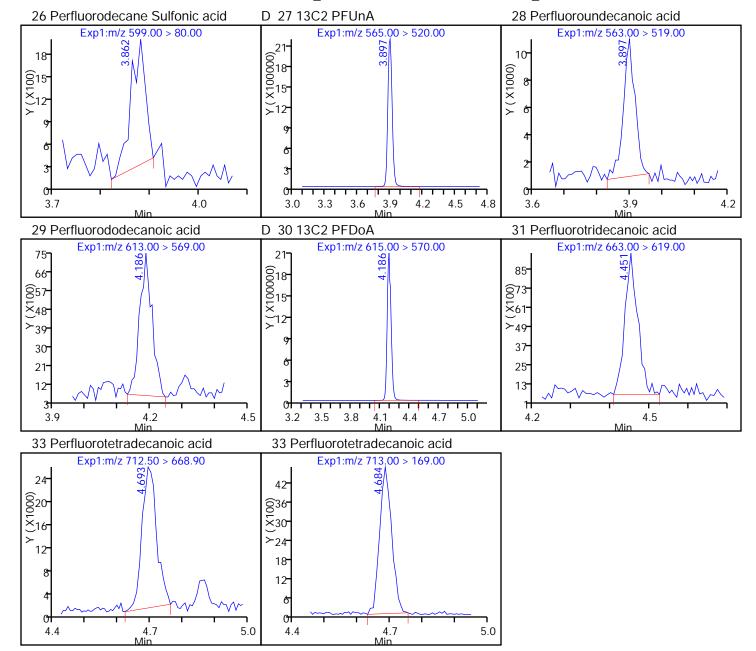
l	Jata File:	\\Chrc	mina\Sa	acrament	:o\Chrom	Data\A8_N\201	61218-3797	2.b\16DEC2016C_C	)19.d		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	18 Perfluorooct	ane sulf	onic acid	d	•				•		
	499.00 > 80.00	3.095	3.120	-0.025	1.000	8176964	32.5			100054	
	499.00 > 99.00	3.095	3.120	-0.025	1.000	1621577		5.04(0.90-1.10)		22272	
[	D 19 13C5 PFN	4									
	468.00 > 423.00	3.208	3.227	-0.019		7844040	44.1		88.3	343652	
	D 17 13C4 PFO										
	503.00 > 80.00	3.208	3.227	-0.019		12111530	48.7		102	169245	
	20 Perfluoronoi										
	463.00 > 419.00	3.217	3.227	-0.010	1.000	631434	4.23			4694	
	21 13C8 FOS										
	506.00 > 78.00	3.548	3.558	-0.010		1758958	4.58		9.2	134628	
	24 Perfluorode										
	513.00 > 469.00	3.573	3.583	-0.010	1.000	122869	0.8514			1223	
	D 23 13C2 PFD/										
	515.00 > 470.00	3.573	3.583	-0.010		7645751	48.6		97.2	463747	
	26 Perfluorode										
	599.00 > 80.00		3.893	-0.031	1.000	3463	0.0234				
	D 27 13C2 PFUr										
	565.00 > 520.00			-0.005		6070872	51.8		104	431117	
	28 Perfluoround										
	563.00 > 519.00			-0.014	1.000	25060	0.2158			411	
	29 Perfluorodo										
	613.00 > 569.00	4.186	4.192	-0.006	1.000	18200	0.1722			427	
	O 30 13C2 PFD										
	615.00 > 570.00	4.186	4.198	-0.012		5757442	51.9		104	294521	
	31 Perfluorotrid										
	663.00 > 619.00			-0.008	1.000	20782	0.1990			426	
	33 Perfluorotetr										
	712.50 > 668.90		4.702	-0.009	1.000	76713	0.4204	( 00/0 00 0 05)		175	
	713.00 > 169.00	4.684	4.702	-0.018	0.998	12119		6.33(0.00-0.00)		4651	

# QC Flag Legend Review Flags

M - Manually Integrated

Report Date: 18-Dec-2016 17:59:55 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d **Injection Date:** 16-Dec-2016 20:15:12 Instrument ID: A8_N Lims ID: 320-23931-A-3-A Lab Sample ID: 320-23931-3 Client ID: 61301MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 35 Worklist Smp#: 19 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid (M) 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 63 00054 ×45 (0020-0020-635 630 30 ×16 ×25 **≻**36  $\geq 20$ 27 15 10 18 1.7 2.0 1.7 2.0 1.1 1.4 2.3 1.4 2.0 1.4 1.7 2.3 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0056<del>-</del> (00000 30-×35 ≻₂₈-18 21 12 1.9 1.9 1.9 2.2 2.5 2.2 1.0 1.3 1.6 2.2 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 12 Perfluoroheptanoic acid Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 363.00 > 319.00 (000001X) (000001X 35 635<u>-</u> ×25 ∑20<del>-</del> ∑28<del>-</del> 21 15 15 10 10 1.9 2.2 1.7 2.0 2.3 2.9 2.2 2.5 2.5 2.8 2.6 2.8 3.1 1.6 1.4 D 11 13C4-PFHpA 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 (35⁻ (0030⁻ (25⁻ 161 (30 00 00 25 649 0042 0042 ×35-**≻**28 <del>-</del>20 15 15 21 10 14 0 1.9 2.2 2.5 2.8 3.4 1.8 Page 48% of 678 3.6 2.0 2.3 2.6 2.9 3.2 3.1 1.2 1.6 1.7





#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d

Injection Date: 16-Dec-2016 20:15:12 Instrument ID: A8_N

Lims ID: 320-23931-A-3-A Lab Sample ID: 320-23931-3

Client ID: 61301MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 35 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

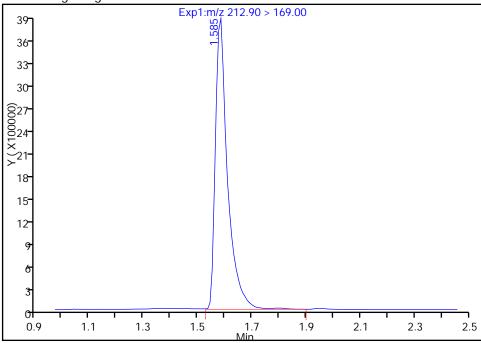
Column: Detector EXP1

## 1 Perfluorobutyric acid, CAS: 375-22-4

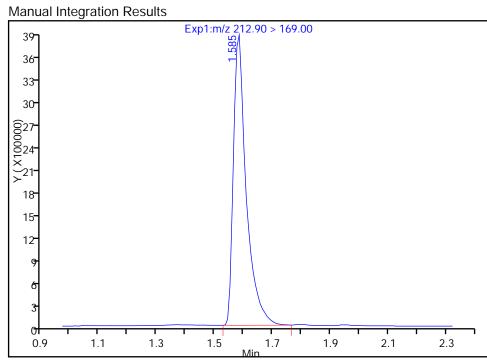
Signal: 1

RT: 1.58
Area: 12121855
Amount: 90.888860
Amount Units: ng/ml

**Processing Integration Results** 



RT: 1.58
Area: 11952434
Amount: 89.618552
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:45:38

Audit Action: Manually Integrated

Audit Reason: Baseline

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#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_019.d

Injection Date: 16-Dec-2016 20:15:12 Instrument ID: A8_N

Lims ID: 320-23931-A-3-A Lab Sample ID: 320-23931-3

Client ID: 61301MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 35 Worklist Smp#: 19

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

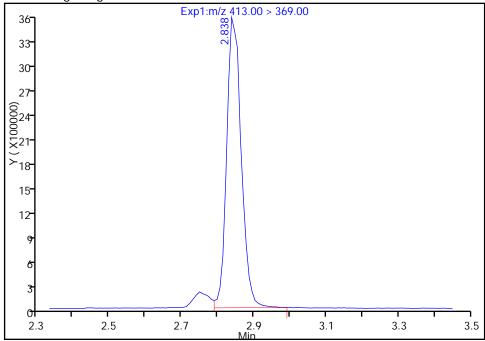
Column: Detector EXP1

### 15 Perfluorooctanoic acid, CAS: 335-67-1

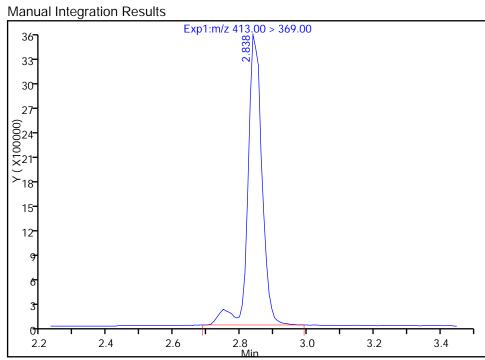
Signal: 1

RT: 2.84
Area: 9963124
Amount: 50.961010
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.84
Area: 10508626
Amount: 53.751233
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:45:38

Audit Action: Manually Integrated

Audit Reason: Isomers

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Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 61301MW-LF-1116 RA Lab Sample ID: 320-23931-3 RA

Matrix: Water Lab File ID: 20DEC2016C_012.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 12:45

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.5(mL) Date Analyzed: 12/20/2016 18:52

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.014		0.0024	0.0019	0.00086

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	111		25-150

Report Date: 21-Dec-2016 10:21:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_012.d

Lims ID: 320-23931-A-3-A Client ID: 61301MW-LF-1116

Sample Type: Client

Inject. Date: 20-Dec-2016 18:52:22 ALS Bottle#: 13 Worklist Smp#: 12

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-3-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

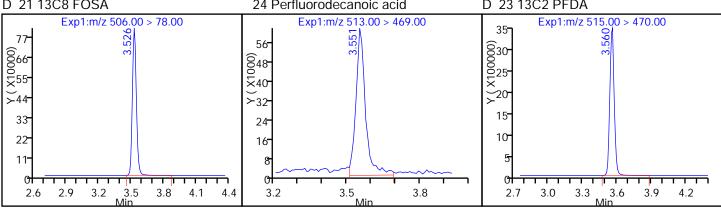
First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:19:27

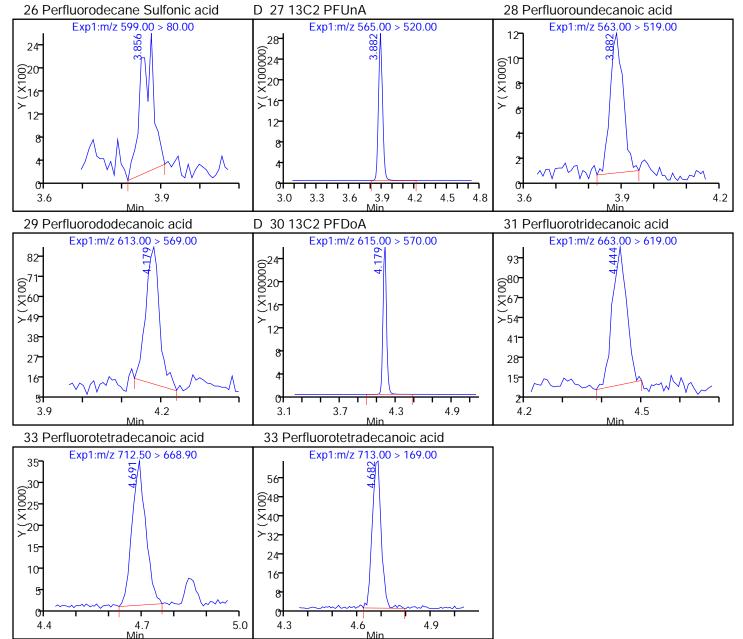
First Level Revie	First Level Reviewer: chandrasenas				Date:	2	21-Dec-2016 10:19:2	0:19:27			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 2 13C4 PFBA	\										
217.00 > 172.00		1.558	-0.005		8460736	24.3		48.7	474265		
1 Perfluorobut											
212.90 > 169.00	•	1.566	-0.005	1.000	13197793	91.4			37454		
3 Perfluoroper											
262.90 > 219.00		1.839	-0.007	1.000	21268097	89.7			54295		
D 4 13C5-PFPe											
267.90 > 223.00		1.839	-0.007		12013635	45.2		90.3	420155		
5 Perfluorobut	anesulfo	nic acid									
	1.871	1.878	-0.007	1.000	3793522	7.41					
298.90 > 99.00	1.871	1.878	-0.007	1.000	1609731		2.36(0.00-0.00)				
7 Perfluorohex	canoic ac	cid									
313.00 > 269.00	2.129	2.135	-0.006	1.000	16328758	76.0			53468		
D 613C2 PFHx	κA										
315.00 > 270.00	2.129	2.135	-0.006		11571735	47.2		94.4	723038		
12 Perfluorohe	ptanoic a	acid									
363.00 > 319.00	2.463	2.472	-0.009	1.000	12474267	57.3			61858		
D 11 13C4-PFH	рА										
367.00 > 322.00	2.463	2.480	-0.017		11122669	49.1		98.3	441456		
D 10 18O2 PFH	xS										
403.00 > 84.00	2.478	2.487	-0.009		17095741	52.3		111	782642		
9 Perfluorohex											
399.00 > 80.00	2.478	2.495	-0.017	1.000	11774495	31.6					
15 Perfluorooc											
413.00 > 369.00		2.835	-0.018	1.000	11952661	49.6			17292		
413.00 > 169.00		2.835	-0.010	1.003	8432704		1.42(0.90-1.10)		446651		
D 14 13C4 PFO											
417.00 > 372.00	2.825	2.835	-0.010		12007381	52.1		104	596819		
					Page 443 of 6	678					

Data File:	NCIII	เมลเอเ	aciaineni	OCHOH	iDaiaiA6_N\201	01221-3807	8.D/20DEC2016C_(	J12.U		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooct	tano culf	onic aci	1					•		
499.00 > 80.00			и -0.077	1.000	10026968	31.7			9219	
499.00 > 99.00		3.099	0.095	1.057	2073493	01.7	4.84(0.90-1.10)		95602	
D 17 13C4 PFO							,			
503.00 > 80.00		3.204	-0.010		15209033	61.1		128	203867	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00			-0.019	1.000	766993	4.22			5521	
D 19 13C5 PFN	Α									
468.00 > 423.00	3.194	3.213	-0.019		9557809	53.8		108	562578	
D 21 13C8 FOS	Α									
506.00 > 78.00	3.526	3.536	-0.010		2101419	5.47		10.9	270448	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.551	3.570	-0.019	1.000	166626	0.9385			1896	
D 23 13C2 PFD										
515.00 > 470.00	3.560	3.570	-0.010		9405410	59.8		120	388532	
26 Perfluorode										
599.00 > 80.00	3.856	3.877	-0.021	1.000	5580	0.0300				
D 27 13C2 PFU										
565.00 > 520.00		3.895	-0.013		7348116	62.7		125	561772	
28 Perfluoroun										
563.00 > 519.00			-0.013	1.000	29276	0.2083			414	
29 Perfluorodo										
613.00 > 569.00		4.182	-0.003	1.000	18712	0.1484			471	
D 30 13C2 PFD		4.400	0.000			(4.0		404	004000	
615.00 > 570.00			-0.003		6866087	61.9		124	284990	
31 Perfluorotrio			0.005	1 000	22272	0.10/0			477	
663.00 > 619.00			-0.005	1.000	23273	0.1869			477	
33 Perfluoroteti			0.007	1 000	07222	0.4470			<b>1</b> E1	
712.50 > 668.90 713.00 > 169.00			-0.007	1.000 0.998	97332 16200	0.4472	6.01(0.00-0.00)		451 6238	
113.00 / 109.00	4.002	4.070	-0.010	0.770	10200		0.01(0.00-0.00)		0230	

Report Date: 21-Dec-2016 10:21:33 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 20-Dec-2016 18:52:22 Instrument ID: A8_N Lims ID: 320-23931-A-3-A Lab Sample ID: 320-23931-3 Client ID: 61301MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 13 Worklist Smp#: 12 Injection Vol: 2.0 ul Dil. Factor: 1.0000 LC PFC_DOD ICAL Method:  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 28 42 (000024-000024-000020-(000001 30-30-()70° ()60° ()60° <del>∑</del>50 **≻**40 12 18 30 12 20 10 1.9 1.9 1.0 1.3 1.6 2.2 1.0 1.3 1.6 1.4 1.7 2.0 2.3 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 267.90 > 223.00Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.0072 (0000012 |X) X 642 000 36 63⁶³ ×30 ×45 ≻₃₆-18 27 18 12 1.3 1.9 2.5 1.8 2.1 1.8 2.1 1.5 1.5 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 315.00 > 270.00 48 (0000048-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-1240-12 42 (000001X 30-30- $\times$ 30 <u>~</u>24⁼ <del>-</del>32 ≻₂₄ 18 18 12 16 12 1.7 2.0 2.3 2.9 2.1 2.2 2.5 2.6 1.5 1.8 2.4 2.7 2.8 3.1 1.2 9 Perfluorohexanesulfonic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 367,00 > 322.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 40 (42⁻ (0036⁻ (30⁻ ©56<del>-</del> 0048<del>-</del> 035 030 30 ×25 ×40 **≻**20 ≻32-18 24 15 12 16 0 0  $^{\circ}$ 2.0 2.3 2.6 2.9 3.2 1.5 1.8 3.0 2.3 2.9 2.0 2.6 1.7

Min





Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D41MW-LF-1116 Lab Sample ID: 320-23931-4

Matrix: Water Lab File ID: 16DEC2016C_020.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 13:55

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.7(mL) Date Analyzed: 12/16/2016 20:22

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.012	М	0.0024	0.00094	0.00043
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0063		0.0024	0.0019	0.00093
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0074		0.0024	0.0019	0.00074
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0036	М	0.0024	0.0019	0.00075
335-67-1	Perfluorooctanoic acid (PFOA)	0.035	М	0.0024	0.0019	0.00070
375-95-1	Perfluorononanoic acid (PFNA)	0.00092	JМ	0.0024	0.0019	0.00062
335-76-2	Perfluorodecanoic acid (PFDA)	0.00063	J	0.0024	0.00094	0.00041
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0019	Ū	0.0024	0.0019	0.00070
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0019	Ū	0.0024	0.0019	0.00055
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0019	Ū	0.0024	0.0019	0.00052
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00078	JМ	0.0024	0.00094	0.00038
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.032		0.0024	0.0019	0.00082
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.070		0.0038	0.0028	0.0012
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0028	U	0.0038	0.0028	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0019	U	0.0024	0.0019	0.00060

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D41MW-LF-1116 Lab Sample ID: 320-23931-4

Matrix: Water Lab File ID: 16DEC2016C_020.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 13:55

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.7(mL) Date Analyzed: 12/16/2016 20:22

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	15	Q	25-150
STL00992	13C4 PFBA	48		25-150
STL00993	13C2 PFHxA	77		25-150
STL00990	13C4 PFOA	77		25-150
STL00995	13C5 PFNA	70		25-150
STL00996	13C2 PFDA	68		25-150
STL00997	13C2 PFUnA	70		25-150
STL00998	13C2 PFDoA	77		25-150
STL00994	1802 PFHxS	96		25-150
STL00991	13C4 PFOS	101		25-150
STL01893	13C5-PFPeA	80		25-150
STL01892	13C4-PFHpA	77		25-150

Report Date: 18-Dec-2016 17:59:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Lims ID: 320-23931-A-4-A Client ID: 613D41MW-LF-1116

Sample Type: Client

Inject. Date: 16-Dec-2016 20:22:42 ALS Bottle#: 36 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-4-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:47:37

First Level Reviewer: chandrasenas				Date:	1	8-Dec-2016 17:47:3	.7			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.582	-0.016		8365287	24.1		48.1	530103	
1 Perfluorobuty										М
212.90 > 169.00	•	1.582	-0.008	1.000	926471	6.49			3095	М
3 Perfluoropen	itanoic a	cid								
262.90 > 219.00	1.848	1.858	-0.010	1.000	703078	3.34			2744	
D 413C5-PFPe	A									
267.90 > 223.00	1.848	1.858	-0.010		10677658	40.1		80.3	463753	
5 Perfluorobuta	anesulfo	nic acid								
298.90 > 80.00		1.896	-0.009	1.000	1179352	2.66				
298.90 > 99.00	1.887	1.896	-0.009	1.000	496360		2.38(0.00-0.00)			
D 613C2 PFHx										
315.00 > 270.00	2.150	2.153	-0.003		9461366	38.6		77.2	609156	
7 Perfluorohex										
313.00 > 269.00	2.141	2.153	-0.012	1.000	692629	3.94			2366	
12 Perfluorohe _l										M
363.00 > 319.00	2.481	2.492	-0.011	1.000	332446	1.94			1801	M
D 11 13C4-PFH _I										
367.00 > 322.00	2.481	2.500	-0.019		8767210	38.7		77.5	570315	
D 10 1802 PFH										
403.00 > 84.00	2.496	2.508	-0.012		14821293	45.3		95.8	747032	
9 Perfluorohex										
399.00 > 80.00	2.414	2.515	-0.101	1.000	5412573	16.8				
15 Perfluorooct										M
413.00 > 369.00		2.847	-0.003	1.000	3331067	18.7	4 40/0 00 4 40			M
413.00 > 169.00		2.847	-0.003	1.000	2232062		1.49(0.90-1.10)		96437	
D 14 13C4 PFO		0.055	0.04.5		000000	22.4		77.0	-4//	
417.00 > 372.00	2.844	2.855	-0.011		8892093	38.6		77.2	516672	
					D 450 (4	270				

Report Date: 18-Dec-2016 17:59:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Data File:	\\Chr	omNa\Sa	acrament	io\Chrom	Data\A8_N\201	61218-3797	2.b\16DEC2016C_C	)20.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooct	ane sulf	onic acid	1							
499.00 > 80.00		3.120	0.068	1.000	9366956	37.3			150965	
499.00 > 99.00	3.206	3.120	0.086	1.005	1916522		4.89(0.90-1.10)		78651	
D 19 13C5 PFN	Д									
468.00 > 423.00	3.215	3.227	-0.013		6219847	35.0		70.0	697885	
D 17 13C4 PFO	S									
503.00 > 80.00	3.215	3.227	-0.013		12058890	48.5		101	269034	
20 Perfluorono										M
463.00 > 419.00		3.227	-0.013	1.000	57941	0.4894			515	M
D 21 13C8 FOS		0.550	0.010		0000011			45.4	150547	
506.00 > 78.00					2908214	7.57		15.1	158516	
22 Perfluorooct				1 000	10000	0.4047			1000	
498.00 > 78.00		3.558	-0.012	1.000	10022	0.1847			1020	
24 Perfluorode 513.00 > 469.00			-0.020	1.000	34076	0.3371			447	
		3.363	-0.020	1.000	34070	0.3371			447	
D 23 13C2 PFD, 515.00 > 470.00		3 583	-0.012		5355112	34.0		68.1	278843	
26 Perfluorode					3333112	34.0		00.1	270043	
599.00 > 80.00			-0.041	1.000	2633	0.0179				
D 27 13C2 PFUi		0.070	0.011	1.000	2000	0.0177				
565.00 > 520.00		3.902	-0.007		4130707	35.2		70.5	393443	
28 Perfluoround										
563.00 > 519.00		3.911	-0.007	1.000	9829	0.1244			207	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00		4.192	-0.006	1.000	4544	0.0581			107	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.186	4.198	-0.012		4259764	38.4		76.8	143678	
31 Perfluorotrio	lecanoic	acid								
663.00 > 619.00	4.451	4.459	-0.008	1.000	7989	0.1034			192	
33 Perfluoroteti	radecan	oic acid								M
712.50 > 668.90		4.702	0.006	1.000	55931	0.4142			216	M
713.00 > 169.00	4.691	4.702	-0.011	0.996	7386		7.57(0.00-0.00)		3067	

# **QC Flag Legend** Review Flags

M - Manually Integrated

Report Date: 18-Dec-2016 17:59:57 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d **Injection Date:** 16-Dec-2016 20:22:42 Instrument ID: A8_N Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4 Client ID: 613D41MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid (M) 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212,90 > 169.00 Exp1:m/z 262.90 > 219.00 32 024 0020 6²⁸ 824  $\stackrel{\smile}{\times}_{20}$  $\stackrel{\smile}{\times}_{20}$ 12 12 1.9 1.7 1.0 1.3 1.6 1.1 1.4 2.0 1.5 1.8 2.1 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0042 21-00018-X15-(0042 (0042 00001 0036 <del>×</del>35<del>-</del> **≻**28 21 14 1.9 1.9 1.9 2.2 2.5 2.2 1.0 1.3 1.6 2.2 1.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 12 Perfluoroheptanoic acid (M) Exp1:m/z 363,00 > 319.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 14 (00030 (00001×25-) × 20 20 624 620 20 (000010 X), ∑₁₆-15 10 1.7 2.3 2.9 2.1 2.4 2.5 1.8 2.2 2.8 1.1 9 Perfluorohexanesulfonic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 399.00 > 80.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 35<del>-</del> 18 8 649 00042 ×35 000015⁻ X1200012 ∑₂₀ <del>-</del>28 15 21 10 14 0 0 1.9 2.2 2.5 2.8 Page 45% of 678

2.0

1.7

3.1

2.3

2.6

2.9

3.2

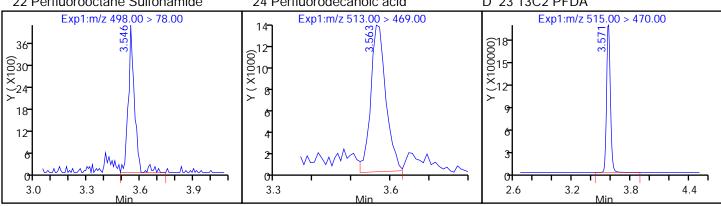
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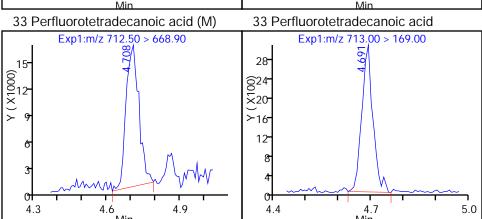
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2.7

3.3

1.6





#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Injection Date: 16-Dec-2016 20:22:42 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

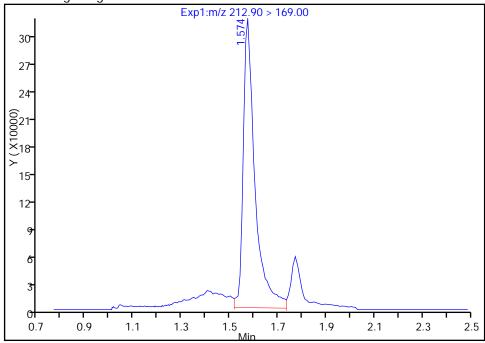
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### 1 Perfluorobutyric acid, CAS: 375-22-4

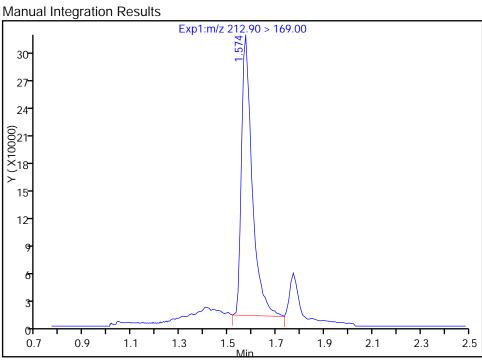
Signal: 1

RT: 1.57
Area: 1044848
Amount: 7.315371
Amount Units: ng/ml

**Processing Integration Results** 



RT: 1.57
Area: 926471
Amount: 6.486570
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated

Audit Reason: Baseline

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#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Injection Date: 16-Dec-2016 20:22:42 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

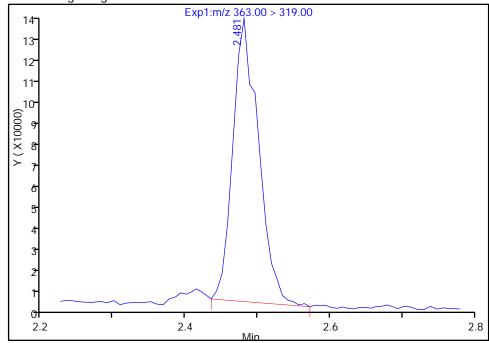
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# 12 Perfluoroheptanoic acid, CAS: 375-85-9

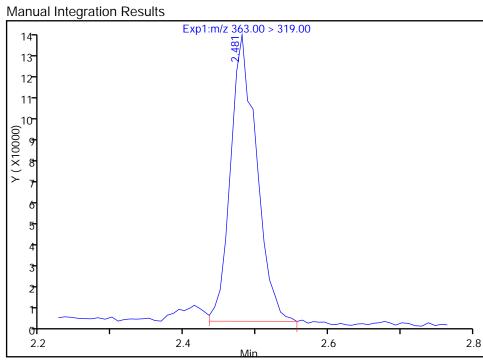
Signal: 1

RT: 2.48
Area: 325245
Amount: 1.895033
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.48
Area: 332446
Amount: 1.936990
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated

Audit Reason: Baseline

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#### TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Injection Date: 16-Dec-2016 20:22:42 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

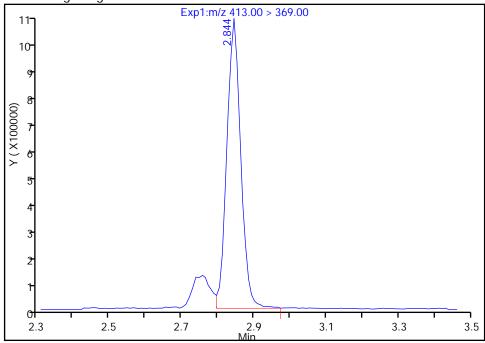
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# 15 Perfluorooctanoic acid, CAS: 335-67-1

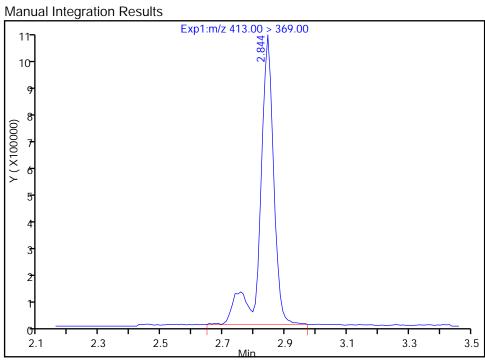
Signal: 1

RT: 2.84
Area: 2897142
Amount: 16.239505
Amount Units: ng/ml

**Processing Integration Results** 



RT: 2.84
Area: 3331067
Amount: 18.671808
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated Audit R

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#### TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Injection Date: 16-Dec-2016 20:22:42 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

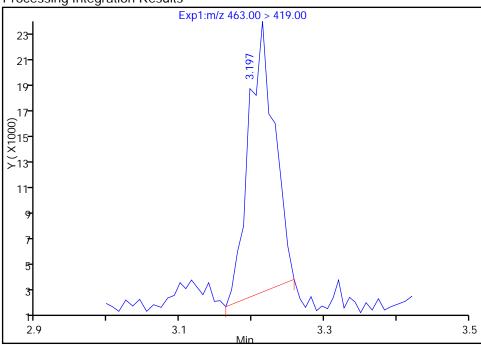
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

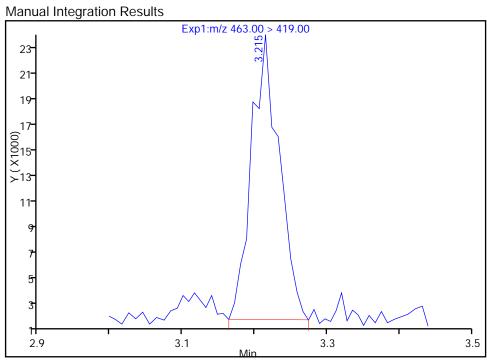
# 20 Perfluorononanoic acid, CAS: 375-95-1

Signal: 1

RT: 3.20 Area: 51205 Amount: 0.432461 Amount Units: ng/ml **Processing Integration Results** 



RT: 3.21
Area: 57941
Amount: 0.489352
Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 458 of 678

#### TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_020.d

Injection Date: 16-Dec-2016 20:22:42 Instrument ID: A8_N

Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4

Client ID: 613D41MW-LF-1116

Operator ID: A8-PC\A8 ALS Bottle#: 36 Worklist Smp#: 20

Injection Vol: 2.0 ul Dil. Factor: 1.0000

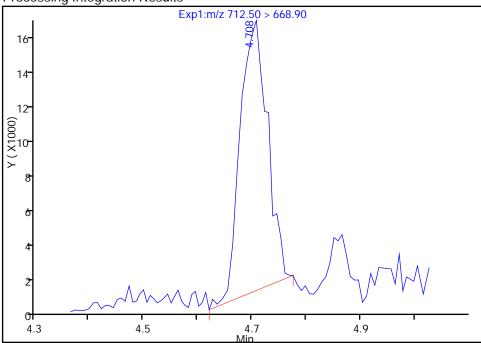
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

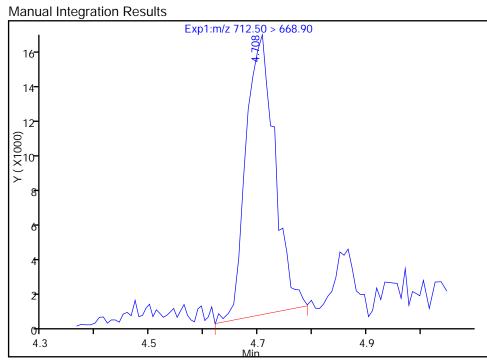
## 33 Perfluorotetradecanoic acid, CAS: 376-06-7

Signal: 1

RT: 4.71 Area: 51263 Amount: 0.379671 Amount Units: ng/ml **Processing Integration Results** 



RT: 4.71 Area: 55931 Amount: 0.414244 Amount Units: ng/ml



Reviewer: chandrasenas, 18-Dec-2016 17:47:37

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

Page 459 of 678

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D41MW-LF-1116 RA Lab Sample ID: 320-23931-4 RA

Matrix: Water Lab File ID: 20DEC2016C_013.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 13:55

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 265.7(mL) Date Analyzed: 12/20/2016 18:59

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT Q		LOQ	LOD	DL	
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0053		0.0024	0.0019	0.00086	

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	126		25-150

Report Date: 21-Dec-2016 10:24:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_013.d

Lims ID: 320-23931-A-4-A Client ID: 613D41MW-LF-1116

Sample Type: Client

Inject. Date: 20-Dec-2016 18:59:53 ALS Bottle#: 14 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-4-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:23:56 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

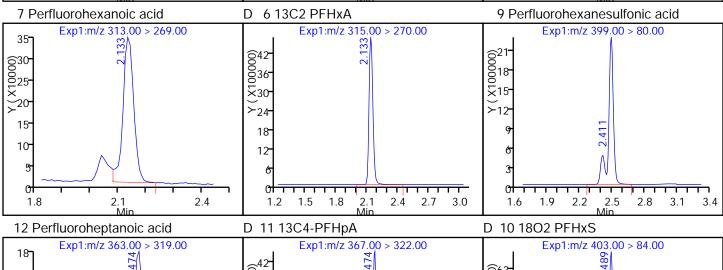
First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:24:02

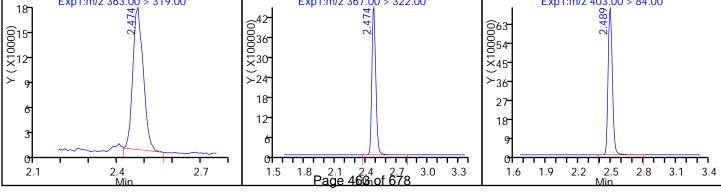
First Level Reviewer: chandrasenas				Date:	Date: 21-Dec-2016 10:24:02						
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags	
D 2 13C4 PFBA	D. 2.13C4 DERA										
217.00 > 172.00		1.558	0.0		10080357	29.0		58.0	672081		
1 Perfluorobut											
212.90 > 169.00	•	1.566	-0.008	1.000	1182783	6.87			3127		
3 Perfluoroper	ntanoic a	cid									
262.90 > 219.00		1.839	0.0	1.000	906414	3.39			3020		
D 4 13C5-PFPe	eΑ										
267.90 > 223.00	1.839	1.839	0.0		13542044	50.9		102	766951		
5 Perfluorobut	anesulfo	nic acid									
298.90 > 80.00	1.878	1.878	0.0	1.000	1650665	2.82					
298.90 > 99.00	1.878	1.878	0.0	1.000	686640		2.40(0.00-0.00)				
7 Perfluorohex											
313.00 > 269.00		2.135	-0.002	1.000	904085	3.92			2840		
D 6 13C2 PFHx		0.405	0.000		40447007	F0.7		404	50/400		
315.00 > 270.00					12417337	50.7		101	586108		
9 Perfluorohex 399.00 > 80.00		onic acid 2.495		1.000	7220527	17.2					
			-0.084	1.000	7329527	17.2					
12 Perfluorohe 363.00 > 319.00	•	acid 2.472	0.002	1.000	431108	1.84			1983		
		2.472	0.002	1.000	431100	1.04			1903		
D 11 13C4-PFH 367.00 > 322.00	•	2.480	-0.006		11957608	52.8		106	890269		
D 10 1802 PFH		2.400	-0.000		11737000	32.0		100	070207		
403.00 > 84.00		2.487	0.002		19531448	59.7		126	883368		
D 14 13C4 PFO		2.407	0.002		17551446	37.7		120	000000		
417.00 > 372.00		2.835	-0.006		11959610	51.9		104	858142		
15 Perfluorooc			0.000		,0,0.0	0			000.12		
413.00 > 369.00		2.835	0.003	1.000	3875639	16.2			7940		
413.00 > 169.00		2.835	0.003	1.000	3065791		1.26(0.90-1.10)		145496		
					Page 461 of (	678					

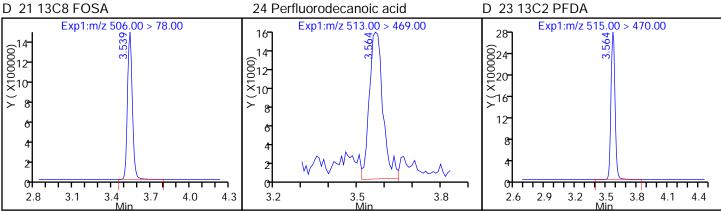
Report Date: 21-Dec-2016 10:24:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_013.d

Data File:	NUTIC	JIIIVa\Sa	crament		Dala MO_IN\ZU I	01221-3807	8.D/20DEC2016C_C	713.U		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluorooctane sulfonic acid										
499.00 > 80.00		3.099	0.082	1.000	12781462	37.9			183224	
499.00 > 99.00		3.099	0.082	1.000	2657320		4.81(0.90-1.10)		59868	
D 17 13C4 PFOS	5									
503.00 > 80.00	3.207	3.204	0.003		16191988	65.1		136	374096	
20 Perfluoronor										
463.00 > 419.00		3.213	-0.014	1.000	73713	0.4795			498	
D 19 13C5 PFNA		0.040	0.007		0075045	45.4		00.0	500540	
468.00 > 423.00					8075045	45.4		90.9	528513	
22 Perfluoroocta 498.00 > 78.00		onamide 3.536		1.000	11039	0.1507			827	
D 21 13C8 FOSA		3.330	0.003	1.000	11039	0.1307			027	
506.00 > 78.00		3 536	0.003		3927692	10.2		20.4	299655	
24 Perfluorodeo			0.000		0,2,0,2	10.2		20.1	277000	
513.00 > 469.00		3.570	-0.006	1.000	50262	0.3513			491	
D 23 13C2 PFDA	Ą									
515.00 > 470.00	3.564	3.570	-0.006		7580640	48.2		96.4	249265	
26 Perfluorodeo	ane Sul	lfonic aci	id							
599.00 > 80.00	3.870	3.877	-0.007	1.000	4649	0.0235				
28 Perfluoround										
563.00 > 519.00		3.895	-0.008	1.000	19564	0.1869			329	
D 27 13C2 PFUr		0.005			5.470000				0.47570	
565.00 > 520.00		3.895	-0.008		5473339	46.7		93.4	347573	
D 30 13C2 PFDc		4 100	0.005		E701071	E2 2		104	200775	
615.00 > 570.00		4.182	0.005		5791861	52.2		104	208775	
31 Perfluorotrid 663.00 > 619.00			-0.005	1.000	10851	0.1033			251	
33 Perfluorotetr			-0.005	1.000	10001	0.1033			ZJ I	
712.50 > 668.90		4.698	-0.006	1.000	73312	0.3993			277	
713.00 > 169.00		4.698		1.000	9641	0.0770	7.60(0.00-0.00)		1874	
							*			

Report Date: 21-Dec-2016 10:24:03 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_013.d **Injection Date:** 20-Dec-2016 18:59:53 Instrument ID: A8_N Lims ID: 320-23931-A-4-A Lab Sample ID: 320-23931-4 Client ID: 613D41MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 14 Worklist Smp#: 13 Dil. Factor: Injection Vol: 2.0 ul 1.0000 LC PFC_DOD ICAL Method:  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 36<del>-</del> 635<u>-</u> 630<u>-</u> ©30 ©25 031<del>-</del> ×25 ∑21[°]  $\geq 20$ 15<del>-</del> 16 15 10 10 11 1.9 1.7 1.0 1.3 1.6 1.4 2.0 1.4 1.7 2.0 2.3 5 Perfluorobutanesulfonic acid 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0072 (049 00042 ×35 28 63 654 <del>∑</del>20 ×₄₅-≻28 ≻16 36 21 12 27 18 1.9 1.9 2.1 2.2 2.2 1.2 1.5 1.8 2.4 2.7 1.6 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00Exp1:m/z 399.00 > 80.00 35<del>-</del> (21°00018° ×15° 042 0036 **630** 0025-× >20-×30 15 18 10 12







15⁻

0

4.4

5.0

0

4.4

4.7

4.7

5.0

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D39MW-LF-1116 Lab Sample ID: 320-23931-5

Matrix: Water Lab File ID: 16DEC2016C_021.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 15:20

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 277.6(mL) Date Analyzed: 12/16/2016 20:30

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0028		0.0023	0.00090	0.00041
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0018	U	0.0023	0.0018	0.00089
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0018	Ū	0.0023	0.0018	0.00071
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0023	0.0018	0.00072
335-67-1	Perfluorooctanoic acid (PFOA)	0.0013	J	0.0023	0.0018	0.00067
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	Ū	0.0023	0.0018	0.00059
335-76-2	Perfluorodecanoic acid (PFDA)	0.00090	Ū	0.0023	0.00090	0.00040
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	Ū	0.0023	0.0018	0.00067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0023	0.0018	0.00053
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	U	0.0023	0.0018	0.00050
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00062	J	0.0023	0.00090	0.00036
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.022		0.0023	0.0018	0.00078
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.026		0.0036	0.0027	0.0011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0027	Ū	0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0018	U	0.0023	0.0018	0.00057

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D39MW-LF-1116 Lab Sample ID: 320-23931-5

Matrix: Water Lab File ID: 16DEC2016C_021.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 15:20

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 277.6(mL) Date Analyzed: 12/16/2016 20:30

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	13	Q	25-150
STL00992	13C4 PFBA	43		25-150
STL00993	13C2 PFHxA	77		25-150
STL00990	13C4 PFOA	92		25-150
STL00995	13C5 PFNA	93		25-150
STL00996	13C2 PFDA	97		25-150
STL00997	13C2 PFUnA	97		25-150
STL00998	13C2 PFDoA	86		25-150
STL00994	1802 PFHxS	92		25-150
STL00991	13C4 PFOS	99		25-150
STL01893	13C5-PFPeA	76		25-150
STL01892	13C4-PFHpA	86		25-150

Report Date: 18-Dec-2016 17:59:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_021.d

Lims ID: 320-23931-A-5-A Client ID: 613D39MW-LF-1116

Sample Type: Client

Inject. Date: 16-Dec-2016 20:30:12 ALS Bottle#: 37 Worklist Smp#: 21

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-5-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:48:03

	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	O 2 13C4 PFBA 217.00 > 172.00		1.582	-0.008		7451065	21.4		42.9	469863	
:	1 Perfluorobut 212.90 > 169.00 3 Perfluoropen	1.574	1.582	-0.008	1.000	194295	1.53			1149	
	262.90 > 219.00 2 4 13C5-PFPe	1.849		-0.009	1.000	43654	0.2202			111	
	267.90 > 223.00	1.859	1.858	0.001		10045149	37.8		75.5	623293	
		1.888 1.888	1.896 1.896	-0.008 -0.008	1.000 1.000	1390782 588049	3.25	2.37(0.00-0.00)			
	0 6 13C2 PFHx 315.00 > 270.00	2.141	2.153	-0.012		9470921	38.6		77.3	400119	
	7 Perfluorohex 313.00 > 269.00	2.141	2.153	-0.012	1.000	19748	0.1122			108	
	D 11 13C4-PFH  367.00 > 322.00		2.500	-0.019		9773819	43.2		86.4	745129	
	0 10 1802 PFH: 403.00 > 84.00		2.508	-0.012		14302399	43.7		92.5	598260	
;	9 Perfluorohex 399.00 > 80.00	2.496	2.515		1.000	3780800	12.1				
	15 Perfluorooct 413.00 > 369.00 413.00 > 169.00	2.844 2.844	2.847 2.847 2.847	-0.003 -0.003	1.000 1.000	149176 94892	0.6986	1.57(0.90-1.10)		522 4271	
	0 14 13C4 PFO 417.00 > 372.00		2.855	-0.011		10642805	46.2		92.4	629415	

Data File:	\\Cnrc	miva\Sa	acrament	OCHROM	Data\A8_N\201	01218-3/9/2	2.D\16DEC2016C_0	J2 1.0		
Cianal	рт	EXP	DLT	REL	Desman	Amount	Datie (Linette)	0/ D = -	C/N	Flage
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
18 Perfluoroocta	ane sulf	onic acio	d							
499.00 > 80.00		3.120		1.000	3511987	14.4			69146	
499.00 > 99.00	3.214	3.120	0.094	1.037	629850		5.58(0.90-1.10)		43344	
D 19 13C5 PFNA										
468.00 > 423.00	3.214	3.227	-0.013		8269190	46.5		93.1	464654	
D 17 13C4 PFOS	6									
503.00 > 80.00	3.214	3.227	-0.013		11757272	47.2		98.8	234990	
20 Perfluoronon	anoic a	cid								
463.00 > 419.00	3.206	3.227	-0.021	1.000	24499	0.1556			126	
D 21 13C8 FOSA	١									
506.00 > 78.00	3.546	3.558	-0.012		2420339	6.30		12.6	309808	
24 Perfluorodec	anoic a	cid								
513.00 > 469.00	3.571	3.583	-0.012	1.000	12854	0.0892			175	
D 23 13C2 PFDA	١									
515.00 > 470.00	3.571	3.583	-0.012		7630427	48.5		97.0	281862	
26 Perfluorodec	ane Sul	fonic ac	id							
599.00 > 80.00	3.929	3.893	0.036	1.000	936	0.006517				
D 27 13C2 PFUn	Α									
565.00 > 520.00	3.894	3.902	-0.008		5695059	48.6		97.1	530841	
28 Perfluoround										
563.00 > 519.00	3.894	3.911	-0.017	1.000	16451	0.1510			285	
D 30 13C2 PFDo	Α									
615.00 > 570.00	4.191	4.198	-0.007		4785622	43.1		86.3	172275	
33 Perfluorotetra		oic acid								
712.50 > 668.90		4.702	0.012	1.000	51960	0.3425			94.2	
713.00 > 169.00	4.681	4.702	-0.021	0.993	5761		9.02(0.00-0.00)		2268	

Report Date: 18-Dec-2016 17:59:58 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_021.d Data File: **Injection Date:** 16-Dec-2016 20:30:12 Instrument ID: A8_N Lims ID: 320-23931-A-5-A Lab Sample ID: 320-23931-5 Client ID: 613D39MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 21 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 65<del>-</del> ©21<del>-</del> 630 830 ∑₁₅  $\stackrel{\smile}{\times}_{26}$ 33 18 25 17 14 10 1.3 1.9 1.8 Mi 1.0 1.6 2.2 1.4 1.7 2.0 1.5 2.1 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 64 (00030 X25 24 656 0048 ×40<del>-</del> ≻20 ≻₃₂-15 24 10 16 1.9 2.0 2.6 1.8 2.1 2.2 8.0 1.4 1.5 1.6 12 Perfluoroheptanoic acid (ND) D 6 13C2 PFHxA 7 Perfluorohexanoic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 363.00 > 319.00 25 18 (00030 (00001×25-) × 20 (23-(00021-×)19-×)19-17 15 15 10 13 114 1.7 2.0 2.3 2.9 1.9 2.2 2.0 2.6 3.2 2.6 D 11 13C4-PFHpA D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 12 481 496 (35 0030 ×25 649 0042 0042 (X100000) 8 ×35-<del>-</del>20 **≻**28 15 21 10 14

0

1.6

1.9 2.2 2.5 2.8 Page 4700hof 678

3.4

3.1

2.1

1.8

2.4

2.7

3.0

3.3

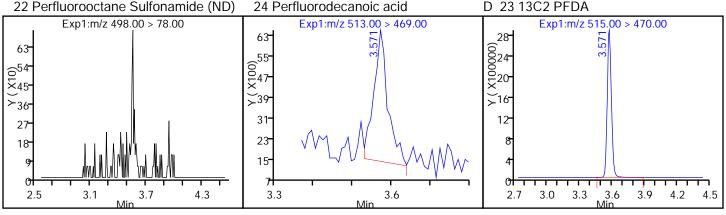
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### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: 613D39MW-LF-1116 RA Lab Sample ID: 320-23931-5 RA

Matrix: Water Lab File ID: 20DEC2016C_014.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 15:20

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 277.6(mL) Date Analyzed: 12/20/2016 19:07

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 143259 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0062		0.0023	0.0018	0.00083

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	1802 PFHxS	116		25-150

Report Date: 21-Dec-2016 10:21:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_014.d

Lims ID: 320-23931-A-5-A Client ID: 613D39MW-LF-1116

Sample Type: Client

Inject. Date: 20-Dec-2016 19:07:24 ALS Bottle#: 15 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-5-a Misc. Info.: Plate: 1 Rack: 4

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:21:06 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:19:56

I II St Level Kevie	WEI. CHE	iliulasei	ias		Date.		21-Dec-2010 10.19.5	0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	4									
217.00 > 172.00		1.558	0.002		8629438	24.8		49.6	588480	
1 Perfluorobut	yric acid									
212.90 > 169.00	1.560	1.566	-0.006	1.000	215591	1.46			1236	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.841	1.839	0.002	1.000	51923	0.2117			148	
D 413C5-PFP6										
267.90 > 223.00	1.841	1.839	0.002		12427822	46.7		93.4	552533	
5 Perfluorobut										
298.90 > 80.00		1.878	0.002	1.000	1847814	3.45	2.2/(0.00.0.00)			
	1.880	1.878	0.002	1.000	781377		2.36(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00			-0.001	1.000	38568	0.1720			141	
D 6 13C2 PFH		2.133	-0.001	1.000	36306	0.1720			141	
315.00 > 270.00		2 135	-0.001		12071697	49.3		98.5	593376	
D 11 13C4-PFH		2.100	0.001		12071077	17.0		70.0	070070	
367.00 > 322.00		2.480	-0.011		12406460	54.8		110	920470	
D 10 1802 PFH	xS									
403.00 > 84.00		2.487	-0.003		17897566	54.7		116	930371	
9 Perfluorohex	kanesulfo	onic acid								
399.00 > 80.00	2.407	2.495	-0.088	1.000	4928844	12.6				
15 Perfluorooc	tanoic ad	cid								
413.00 > 369.00		2.835	0.004	1.000	185101	0.6789			748	
413.00 > 169.00		2.835	-0.004	0.997	128053		1.45(0.90-1.10)		4484	
D 14 13C4 PFO		0.00-	0.55.		1050555			4.5	00011-	
417.00 > 372.00	2.831	2.835	-0.004		13590010	59.0		118	820413	

	Data File.	NOTIL	JIIIVa\36	acrament		Dala MO_IN 20 I	01221-30070	5.DIZUDECZU 10C_C	ODEC2018C_014.d		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
•	18 Perfluorooct	ane sulf	onic acid	d							
	499.00 > 80.00			-0.012	1.000	4663886	14.6			63634	
	499.00 > 99.00	3.183	3.099	0.084	1.031	839588		5.55(0.90-1.10)		55025	
	D 17 13C4 PFO										
	503.00 > 80.00		3.204	-0.003		15313477	61.5		129	304164	
	20 Perfluorono				1 000	0.4000	0.4007			405	
	463.00 > 419.00		3.213	-0.003	1.000	24320	0.1207			135	
	D 19 13C5 PFN, 468.00 > 423.00		2 212	-0.003		10502700	59.6		119	724075	
			3.213	-0.003		10583798	39.0		119	734075	
	D 21 13C8 FOS, 506.00 > 78.00		3 536	-0 003		3161317	8.23		16.5	206594	
	24 Perfluorode			-0.003		3101317	0.23		10.5	200374	
	513.00 > 469.00			-0.012	1.000	16022	0.0849			170	
	D 23 13C2 PFD/										
	515.00 > 470.00	3.566	3.570	-0.004		10002369	63.6		127	428755	
	26 Perfluorode	cane Sul	lfonic ac	id							
	599.00 > 80.00	3.872	3.877	-0.005	1.000	1145	0.006120				
	D 27 13C2 PFUi										
	565.00 > 520.00		3.895	-0.005		7597346	64.8		130	480605	
	28 Perfluoround										
	563.00 > 519.00		3.895	-0.005	1.000	25493	0.1754			319	
	D 30 13C2 PFD		4 100	0.001		/14707/	FF 4		111	240422	
	615.00 > 570.00			-0.001		6147976	55.4		111	248422	
	33 Perfluoroteti 712.50 > 668.90			0.007	1.000	64301	0.3300			197	
	713.00 > 169.00			-0.019	0.994	8265	0.3300	7.78(0.00-0.00)		3564	
								,(2:22 2:20)			

Report Date: 21-Dec-2016 10:21:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 20-Dec-2016 19:07:24 Instrument ID: A8_N Lims ID: 320-23931-A-5-A Lab Sample ID: 320-23931-5 Client ID: 613D39MW-LF-1116 Operator ID: A8-PC\A8 ALS Bottle#: 15 Worklist Smp#: 14 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 262.90 > 219.00 )28 ()33 ()33 <del>≻</del>16 23 12 32 18 22 13 12 1.5 1.8 1.7 0.9 2.1 1.4 1.5 1.8 2.1 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid D Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 35 78 (00042 × )28 × )28 667 67 630 625 <del>∑</del>56 -20 ≻45<del>-</del> 15 21 34 10 23 12 1.2 1.8 2.1 2.4 2.7 1.8 2.1 1.8 2.1 1.5 1.5 1.5 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid (ND)  $Exp1:m/z \overline{363.00 > 319.00}$ Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 33 48 21 042-036-30-00027-×)24-(018 000 15 × 12 ×30-≻₂₄-21 18 18 12 15 1.8 2.1 2.0 1.8 2.1 2.4 1.5 2.4 2.7 3.2 2.6 9 Perfluorohexanesulfonic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 16 63-(000054-×45-042 0036 0014 00012 X10 ×30 <del>_</del>36<del>-</del> 27 18 18 0 0

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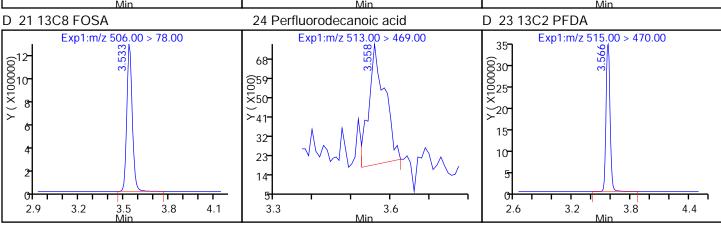
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2.3

2.6

2.9

3.2



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4.3

4.6

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5.0

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Client Sample ID: FB113016 Lab Sample ID: 320-23931-6

Matrix: Water Lab File ID: 16DEC2016C_022.d

Analysis Method: 537 (Modified) Date Collected: 11/30/2016 15:35

Extraction Method: 3535 Date Extracted: 12/05/2016 08:31

Sample wt/vol: 280.2(mL) Date Analyzed: 12/16/2016 20:37

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.00089	U	0.0022	0.00089	0.00041
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0018	Ū	0.0022	0.0018	0.00088
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0018	Ū	0.0022	0.0018	0.00070
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0018	U	0.0022	0.0018	0.00072
335-67-1	Perfluorooctanoic acid (PFOA)	0.0018	U	0.0022	0.0018	0.00067
375-95-1	Perfluorononanoic acid (PFNA)	0.0018	Ū	0.0022	0.0018	0.00058
335-76-2	Perfluorodecanoic acid (PFDA)	0.00089	Ū	0.0022	0.00089	0.00039
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0018	U	0.0022	0.0018	0.00067
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0018	U	0.0022	0.0018	0.00052
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0018	Ū	0.0022	0.0018	0.00049
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.00041	J	0.0022	0.00089	0.00036
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0018	U Q	0.0022	0.0018	0.00082
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0018	U	0.0022	0.0018	0.00078
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0027	Ū	0.0036	0.0027	0.0011
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0027	Ū	0.0036	0.0027	0.0011
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0018	Ū	0.0022	0.0018	0.00057

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 SDG No.: Client Sample ID: FB113016 Lab Sample ID: 320-23931-6 Matrix: Water Lab File ID: 16DEC2016C_022.d Analysis Method: 537 (Modified) Date Collected: 11/30/2016 15:35 Date Extracted: 12/05/2016 08:31 Extraction Method: 3535 Sample wt/vol: 280.2(mL) Date Analyzed: 12/16/2016 20:37 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1 Injection Volume: 2(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 142751 Units: ug/L

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	55		25-150
STL00992	13C4 PFBA	106		25-150
STL00993	13C2 PFHxA	105		25-150
STL00990	13C4 PFOA	110		25-150
STL00995	13C5 PFNA	109		25-150
STL00996	13C2 PFDA	115		25-150
STL00997	13C2 PFUnA	116		25-150
STL00998	13C2 PFDoA	104		25-150
STL00994	1802 PFHxS	102		25-150
STL00991	13C4 PFOS	102		25-150
STL01893	13C5-PFPeA	113		25-150
STL01892	13C4-PFHpA	111		25-150

Report Date: 18-Dec-2016 17:59:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_022.d

Lims ID: 320-23931-A-6-A

Client ID: FB113016 Sample Type: Client

Inject. Date: 16-Dec-2016 20:37:43

ALS Bottle#: 38

Worklist Smp#:

22

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: 320-23931-a-6-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:59:51 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Revie	wer: cha	ındraser	nas		Date:	1	8-Dec-2016 17:48:3	8		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.582	-0.009		18405480	52.9		106	933287	
1 Perfluorobuty	vric acid									
212.90 > 169.00	,	1.582	-0.001	1.000	20536	0.0653			81.8	
3 Perfluoropen	itanoic a	cid								
262.90 > 219.00	1.858	1.858	0.0	1.000	32400	0.1090			135	
D 413C5-PFPe	eΑ									
267.90 > 223.00	1.858	1.858	0.0		15066980	56.6		113	912788	
D 613C2 PFHx	Α									
315.00 > 270.00	2.145	2.153	-0.008		12810077	52.3		105	797384	
7 Perfluorohex	anoic ac	cid								
313.00 > 269.00	2.145	2.153	-0.008	1.000	11474	0.0482			240	
D 11 13C4-PFH	pΑ									
367.00 > 322.00	2.489	2.500	-0.011		12552877	55.5		111	110425	9
D 10 18O2 PFH	xS									
403.00 > 84.00	2.497	2.508	-0.011		15735978	48.1		102	754258	
D 14 13C4 PFO										
417.00 > 372.00	2.846	2.855	-0.009		12683473	55.1		110	754072	
D 19 13C5 PFN/										
468.00 > 423.00	3.226	3.227	-0.001		9642527	54.3		109	102355	5
D 17 13C4 PFO										
503.00 > 80.00	3.217	3.227	-0.010		12136250	48.8		102	734757	
D 21 13C8 FOS										
506.00 > 78.00	3.548	3.558	-0.010		10590323	27.6		55.1	569451	
	24 Perfluorodecanoic acid			4143						
513.00 > 469.00	513.00 > 469.00 3.565 3.583 -0.018 1.0					0.0242			140	
	D 23 13C2 PFDA									
515.00 > 470.00	3.573	3.583	-0.010		9051517	57.5		115	555738	
					Page 481 of	678				

**EXP** DLT **REL Amount** Ratio(Limits) %Rec S/N Signal **RT** RT RT RT Response ng/ml Flags 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.905 3.893 0.012 365 0.002462 1.000 D 27 13C2 PFUnA 565.00 > 520.00 3.897 3.902 -0.006 6786777 57.9 116 486213 28 Perfluoroundecanoic acid 563.00 > 519.00 3.905 489 3.911 -0.006 1.000 20738 0.1598 D 30 13C2 PFDoA 615.00 > 570.00 4.188 4.198 -0.010 5788472 52.2 104 205327 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.714 4.702 0.012 1.000 41661 0.2271 71.2 2318 713.00 > 169.00 4.679 4.702 -0.023 0.993 5615 7.42(0.00-0.00)

Report Date: 18-Dec-2016 17:59:59 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_022.d **Injection Date:** 16-Dec-2016 20:37:43 Instrument ID: A8_N Lims ID: 320-23931-A-6-A Lab Sample ID: 320-23931-6 Client ID: FB113016 Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 22 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: LC PFC_DOD ICAL  $A8_N$ Limit Group: D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 262.90 > 219.00 56 63 118 049 042 ×94 606 845-×45- $\times_{35}$ ____36<del>-</del> <del>−</del>82 27 70 21 18 58 46 34 1.9 1.9 1.0 1.3 1.6 1.0 1.3 1.6 1.5 1.8 2.1 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) D Exp1:m/z 298.90 > 80.00Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 24 10 <u>20</u> Y (X1000) ×16 ×35 12 21 1.8 2.1 2.4 1.4 2.0 2.6 2.0 1.2 1.5 2.7 8.0 8.0 1.4 2.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 12 Perfluoroheptanoic acid (ND) Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 363.00 > 319.00 48 45 12 042 036 ×33 (0010 X)  $\times$ 30 ⁻27 >₂₄ 21 18 15 12 2.1 2.4 2.0 1.8 2.7 1.8 2.1 2.4 1.4 2.6 3.2 1.5 D 11 13C4-PFHpA D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid (ND) Exp1:m/z 399.00 > 80.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 (0000 36-1000 30-(56⁻ (000048⁻ 21 <del>-</del>40 **≻**32 18 24 12 16 0 0 0 1.9 2.2 2.5 2.8 Page 486hof 678 2.1 2.7 3.3 3.4 1.5 2.1 2.7 3.3 1.5 1.6 3.1 Min

Min

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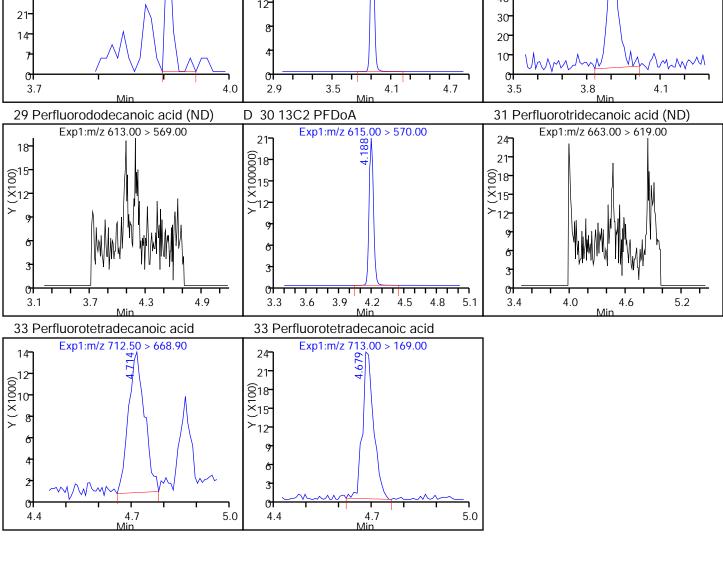
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### LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

#### Calibration Files:

LEVEL:		LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-142379/4	15DEC2016B 004.d
Level	2	IC 320-142379/13	15DEC2016BB 013.d
Level	3	IC 320-142379/5	15DEC2016B 005.d
Level	4	IC 320-142379/14	15DEC2016B 014.d
Level	5	IC 320-142379/6	15DEC2016B 006.d
Level	6	IC 320-142379/15	15DEC2016B 015.d
Level	7	IC 320-142379/7	15DEC2016B 007.d
Level	8	IC 320-142379/16	15DEC2016B 016.d
Level	9	IC 320-142379/8	15DEC2016B 008.d
Level	10	IC 320-142379/17	15DEC2016B 017.d
Level	11	IC 320-142379/9	15DEC2016B 009.d
Level	12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
Perfluorobutanoic acid (PFBA)	1.542 1.537		1.530		1.534		1.534		1.533		1.285 - 1.785	1.535
Perfluoropentanoic acid (PFPeA)	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
Perfluorobutanesulfonic acid (PFBS)	1.849 1.852		1.844		1.849		1.849		1.848		1.668 - 2.028	1.849
Perfluorohexanoic acid (PFHxA)	2.097 2.096		2.092		2.097		2.093		2.098		1.846 - 2.346	2.096
Perfluorohexanesulfonic acid (PFHxS)	+++++ 2.444		2.445		2.364		2.440		2.446		2.181 - 2.681	2.428
Perfluoroheptanoic acid (PFHpA)	2.430 2.426		2.430		2.432		2.426		2.424		2.178 - 2.678	2.428
6:2FTS		+++++ 2.769		2.761		2.768		2.767		2.767	2.518 - 3.018	2.766
Perfluorooctanoic acid (PFOA)	+++++ 2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
Perfluoroheptanesulfonic Acid (PFHpS)	2.790 2.791		2.789		2.792		2.785		2.791		2.540 - 3.040	2.790
Perfluorooctanesulfonic acid (PFOS)	+++++ 2.977		3.149		3.153		3.129		3.151		2.868 - 3.368	3.112
Perfluorononanoic acid (PFNA)	3.159 3.160		3.157		3.153		3.153		3.151		2.905 - 3.405	3.156
Perfluorooctane Sulfonamide (FOSA)	3.490 3.491		3.489		3.492		3.492		3.490		3.241 - 3.741	3.491
Perfluorodecanoic acid (PFDA)	3.515 3.516		3.506		3.509		3.509		3.507		3.260 - 3.760	3.510
8:2FTS		3.511 3.516		3.502		3.511		3.511		3.512	3.261 - 3.761	3.511

### LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	LVL 1 LVL 11	LVL 2 LVL 12	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)		3.684 3.680		3.673		3.683		3.683		3.684	3.431 - 3.931	3.681
Perfluorodecanesulfonic acid (PFDS)	3.826 3.819		3.824		3.819		3.827		3.818		3.572 - 4.072	3.822
Perfluoroundecanoic acid (PFUnA)	3.834 3.845		3.833		3.837		3.844		3.844		3.589 - 4.089	3.840
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)		3.865 3.853		3.855		3.847		3.847		3.857	3.604 - 4.104	3.854
MeFOSA		3.998 4.004		3.997		3.997		3.997		3.999	3.749 - 4.249	3.999
Perfluorododecanoic acid (PFDoA)	4.141 4.136		4.133		4.136		4.135		4.135		3.886 - 4.386	4.136
N-EtFOSA-M		4.187 4.193		4.179		4.186		4.186		4.189	3.937 - 4.437	4.187
Perfluorotridecanoic Acid (PFTriA)	4.404 4.407		4.396		4.398		4.398		4.398		4.150 - 4.650	4.400
Perfluorotetradecanoic acid (PFTeA)	4.643 4.635		4.643		4.645		4.644		4.645		4.392 - 4.892	4.643
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 5.060		5.058		5.059		5.059		5.059		4.809 - 5.309	5.059
Perfluoro-n-octadecanoic acid (PFODA)	5.413 5.414		5.413		5.414		5.413		5.413		5.164 - 5.664	5.413
13C4 PFBA	1.534 1.537		1.530		1.534		1.534		1.533		1.284 - 1.784	1.534
13C5-PFPeA	1.810 1.813		1.805		1.810		1.810		1.810		1.560 - 2.060	1.810
13C2 PFHxA	2.097 2.096		2.092		2.097		2.102		2.098		1.847 - 2.347	2.097
13C4-PFHpA	2.430 2.426		2.423		2.425		2.426		2.424		2.176 - 2.676	2.426
1802 PFHxS	2.452 2.444		2.445		2.447		2.440		2.446		2.196 - 2.696	2.446
M2-6:2FTS		2.760 2.776		2.761		2.768		2.767		2.767	2.517 - 3.017	2.767
13C4 PFOA	2.782 2.783		2.781		2.783		2.785		2.782		2.533 - 3.033	2.783
13C4 PFOS	3.151 3.152		3.149		3.153		3.153		3.151		2.901 - 3.401	3.152
13C5 PFNA	3.159 3.152		3.149		3.153		3.153		3.151		2.903 - 3.403	3.153
13C8 FOSA	3.490 3.491		3.489		3.484		3.484		3.490		3.238 - 3.738	3.488
13C2 PFDA	3.515 3.508		3.514		3.509		3.517		3.516		3.263 - 3.763	3.513

## LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	RT WINDOW	AVG RT
	LVL 11	LVL 12										
M2-8:2FTS		3.511		3.511		3.511		3.511		3.520	3.263 - 3.763	3.513
		3.516										
d3-NMeFOSAA		3.684		3.673		3.673		3.673		3.675	3.426 - 3.926	3.676
		3.680										
13C2 PFUnA	3.843		3.842		3.845		3.835		3.844		3.592 - 4.092	3.842
	3.845											
d5-NEtFOSAA		3.848		3.838		3.838		3.838		3.848	3.592 - 4.092	3.843
		3.845										
d-N-MeFOSA-M		3.988		3.987		3.987		3.997		3.999	3.742 - 4.242	3.992
		3.995										
13C2 PFDoA	4.134		4.133		4.129		4.135		4.135		3.882 - 4.382	4.133
	4.129											
d-N-EtFOSA-M		4.180		4.172		4.179		4.179		4.182	3.930 - 4.430	4.180
		4.186										
13C2-PFTeDA	4.643		4.633		4.645		4.644		4.645		4.391 - 4.891	4.641
	4.635											
13C2-PFHxDA	5.058		5.047		5.059		5.059		5.059		4.807 - 5.307	5.057
	5.060											

### LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

#### Calibration Files:

LEVEL:	LA	AB SAMPLE ID:	LAB FILE ID:
Level :	1 IC	320-142379/4	15DEC2016B 004.d
Level 2	2 IC	320-142379/13	15DEC2016BB 013.d
Level 3	3 IC	320-142379/5	15DEC2016B 005.d
Level	4 IC	320-142379/14	15DEC2016B 014.d
Level 5	5 IC	320-142379/6	15DEC2016B 006.d
Level	6 IC	320-142379/15	15DEC2016B 015.d
Level 7	7 IC	320-142379/7	15DEC2016B 007.d
Level 8	8 IC	320-142379/16	15DEC2016B 016.d
Level 9	9 IC	320-142379/8	15DEC2016B 008.d
Level 1	10 IC	320-142379/17	15DEC2016B 017.d
Level :	11 IC	320-142379/9	15DEC2016B 009.d
Level 1	12 IC	320-142379/18	15DEC2016B 018.d

ANALYTE		C	₹		CURVE		COEFFICIENT		# MIN CF	%RSD	# MAX %RSI	R^2 OR COD	# MIN R^2
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TYPE	В	M1	M2			8851	OR COD	OR COD
13C4 PFBA	365277 360742 345484		364028 351708 299221		Ave		347743.167			7.2	50.0		
13C5-PFPeA	282426 281261 261073		281354 272343 217976		Ave		266072.353			9.4	50.0	)	
13C2 PFHxA	253106 254198 247986		256296 252164 206910		Ave		245109.910			7.7	50.0	)	
13C4-PFHpA	244814 245211 216032		244964 235764 171281		Ave		226344.393			12.9	50.0	)	
1802 PFHxS	341723 342975 323020		340234 339593 274309		Ave		326975.747			8.2	50.0	)	
M2-6:2FTS		112694 117279 110718		107543 136249 117410			116982.140			8.7	50.0	)	
13C4 PFOA	250090 252701 222856		252554 236364 167605		Ave		230361.637			14.3	50.0		

Note: The m1 coefficient is the same as Ave CF for an Ave curve type.

# FORM VI LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID:  $A8_N$  GC Column: Acquity ID: 2.1 (mm) Heated Purge: (Y/N) N

ANALYTE		CI			CURVE		COEFFICIENT		#	MIN CF	%RSD	# M.Z	
	LVL 1 LVL 5 LVL 9	LVL 2 LVL 6 LVL 10	LVL 3 LVL 7 LVL 11	LVL 4 LVL 8 LVL 12	TYPE	В	M1	М2				*R	SD OR COD OR COD
13C4 PFOS	256822 261188 249930		260657 254876 209612		Ave		248847.249				7.9	50	.0
13C5 PFNA	189110 195552 171630		190741 184721 134367		Ave		177686.923				12.8	50	.0
13C8 FOSA	407109 400699 376084		404776 394065 322114		Ave		384141.077				8.4	50	.0
13C2 PFDA	168454 164694 153437		169609 162695 124922		Ave		157301.833				10.7	50	.0
M2-8:2FTS		100584 111541 99917		96024 124933 111666	Ave		107444.339				10.0	50	.0
d3-NMeFOSAA		72700 80292 68450		71182 87583 71744	Ave		75324.9433				9.6	50	.0
13C2 PFUnA	127043 125252 113156		124385 124531 89132		Ave		117249.927				12.5	50	.0
d5-NEtFOSAA		77796 84707 69727		75140 88209 74518	Ave		78349.4833				8.8	50	.0
d-N-MeFOSA-M		86501 102439 90246		92791 105280 93163	Ave		95069.8233				7.6	50	.0
13C2 PFDoA	116302 115598 108083		116442 116336 92982		Ave		110957.213				8.5	50	.0
d-N-EtFOSA-M		75857 91238 82985		82198 93456 88971	Ave		85784.0067				7.7	50	.0
13C2-PFTeDA	239125 244965 219010		237709 233101 190415		Ave		227387.480				8.8	50	.0
13C2-PFH×DA	131492 130859 120547		133987 126716 103803		Ave		124567.543				9.0	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.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIE	T	# MIN RRF	%RSD	#	MAX	R^2		MIN R^2
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	TYPE	В	M1	M2				%RSD	OR COD		OR COD
Perfluorobutanoic acid (PFBA)	310962	334546	310647	308231	310088	AveID		0.8537			9.1		35.0			
	213818															
Perfluoropentanoic acid (PFPeA)	304642	288512	287573	263221	271648	AveID		0.9868			10.7		35.0			
7 (1 (7770)	171455		479895		500060	7 70		1 11 70			1 1 1		F0 0			
Perfluorobutanesulfonic acid (PFBS)	490041	557732		487779	500362	AveID		1.4170			14.1		50.0			
Perfluorohexanoic acid (PFHxA)	286903 252858		239458		226657	AveID		0.9288			7.3		35.0		_	
Perliuoronexanoic acid (PFHXA)	166120	246488		230141	230037	Aveid		0.9288			7.3		33.0			
Perfluorohexanesulfonic acid (PFHxS)	++++	363991	382940	335246	339121	AveID		1.0300			7.4		35.0			
	253974															
Perfluoroheptanoic acid (PFHpA)	258208	237386	237734	215989	235022	AveID		0.9788			5.9		35.0			
6.0779	151171	+++++		110010		7 70		0.0014			15.0		25.0			
6:2FTS	85456	89174	127446	112813	109001	AveID		0.8914			15.8		35.0			
Perfluorooctanoic acid (PFOA)	++++	255488	254861	228712	247908	AveID		1.0031			6.0		35.0			
	153922															
Perfluoroheptanesulfonic Acid (PFHpS)	283576	315862	279184	286553	283857	AveID		1.1019			8.2		50.0			
	201995															
Perfluorooctanesulfonic acid (PFOS)	+++++	272566	237468	253058	247933	AveID		0.9945			6.4		35.0			
	215911															
Perfluorononanoic acid (PFNA)	180132	178149	188341	164925	180502	AveID		0.9518			2.7		35.0			
	123966															
Perfluorooctane Sulfonamide (FOSA)	391498	399542	381363	354739	397863	AveID		0.9327			10.5		35.0			
	239019															

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

#### CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE			RRF			CURVE		COEFFICIE	NT #	MIN RRF	%RSD	1 "	MAX	R^2	 MIN R^2
	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	TYPE	В	M1	M2				%RSD	OR COD	OR COD
Perfluorodecanoic acid (PFDA)	164274 113084	158337	155537	146490	154381	AveID		0.9438			3.1		35.0		
8:2FTS	83185	83106 84092	116095	79051	100536	AveID		0.8473			12.1		35.0		
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	57133	59646 64621	85412	57389	74839	AveID		0.8846			15.4		35.0		
Perfluorodecanesulfonic acid (PFDS)	143714 124235	159960	145051	150246	147895	AveID		0.5840			4.8		50.0		
Perfluoroundecanoic acid (PFUnA)	130000 84265	121036	119189	108755	109942	AveID		0.9563			4.9		35.0		
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	53544	59930 59690	75946	53623	68286	AveID		0.7929			15.1		35.0		
MeFOSA	68699	72138 80570	97349	70049	88147	AveID		0.8376			13.3		35.0		
Perfluorododecanoic acid (PFDoA)	105614 87129	111590	103481	101460	101274	AveID		0.9180			3.5		35.0		
N-EtFOSA-M	65375	61986 78901	90659	62962	85286	AveID		0.8640			13.9		35.0		
Perfluorotridecanoic Acid (PFTriA)	106640 80194	104393	109461	99013	105018	AveID		0.9069			2.9		50.0		
Perfluorotetradecanoic acid (PFTeA)	197042 136554	183949	187123	172910	180115			1.5848			4.6		50.0		
Perfluoro-n-hexadecanoic acid (PFHxDA)	+++++ 88775	113395		106364	119906		0.5185	0.9555						1.0000	0.9900
Perfluoro-n-octadecanoic acid (PFODA)	123098 91965	122262	114997	117393	116752	AveID		1.0304			3.9		50.0		

Note: The m1 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.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

#### Calibration Files:

LEVEL:		LAB SAMPLE ID:	LAB FILE ID:
Level	1	IC 320-142379/4	15DEC2016B 004.d
Level	2	IC 320-142379/13	15DEC2016BB 013.d
Level	3	IC 320-142379/5	15DEC2016B 005.d
Level	4	IC 320-142379/14	15DEC2016B 014.d
Level	5	IC 320-142379/6	15DEC2016B 006.d
Level	6	IC 320-142379/15	15DEC2016B 015.d
Level	7	IC 320-142379/7	15DEC2016B 007.d
Level	8	IC 320-142379/16	15DEC2016B 016.d
Level	9	IC 320-142379/8	15DEC2016B 008.d
Level	10	IC 320-142379/17	15DEC2016B 017.d
Level	11	IC 320-142379/9	15DEC2016B 009.d
Level	12	IC 320-142379/18	15DEC2016B_018.d

ANALYTE	CURVE			RESPONSE			CONCENTRATION (NG/ML)						
	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 8	LVL 4 LVL 9	LVL 5 LVL 10		
13C4 PFBA	Ave	18263829 14961055	17585378	18201393	17274187	18037108	50.0	50.0	50.0	50.0	50.0		
13C5-PFPeA	Ave	14121285 10898820	13617158	14067714	13053659	14063070	50.0	50.0	50.0	50.0	50.0		
13C2 PFHxA	Ave	12655304 10345480	12608210	12814780	12399280	12709919	50.0	50.0	50.0	50.0	50.0		
13C4-PFHpA	Ave	12240718 8564025	11788221	12248222	10801604	12260528	50.0 50.0	50.0	50.0	50.0	50.0		
1802 PFHxS	Ave	16163510 12974829	16062766	16093048	15278828	16222736	47.3 47.3	47.3	47.3	47.3	47.3		
M2-6:2FTS	Ave	5570739	5352965 5576967	6471813	5108306	5259120	47.5	47.5 47.5	47.5	47.5	47.5		
13C4 PFOA	Ave	12504504 8380251	11818203	12627691	11142777	12635065	50.0	50.0	50.0	50.0	50.0		
13C4 PFOS	Ave	12276070 10019454	12183062	12459383	11946650	12484772	47.8 47.8	47.8	47.8	47.8	47.8		

### LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1	Analy Batch No.: 142379
-------------------------------------------------------	-------------------------

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	CURVE			RESPONSE				CONCE	NTRATION (N	G/ML)	
	TYPE	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
13C5 PFNA	Ave	9455492 6718354	9236073	9537045	8581504	9777609	50.0	50.0	50.0	50.0	50.0
13C8 FOSA	Ave	20355431	19703272	20238792	18804188	20034933	50.0	50.0	50.0	50.0	50.0
13C2 PFDA	Ave	8422718	8134734	8480447	7671861	8234678	50.0	50.0	50.0	50.0	50.0
M2-8:2FTS	Ave	5342826	4817997 5348797	5984276	4599569	4786038	47.9	47.9 47.9	47.9	47.9	47.9
d3-NMeFOSAA	Ave	4014623	3634985 3587176	4379131	3559083	3422485	50.0	50.0	50.0	50.0	50.0
13C2 PFUnA	Ave	6352135 4456593	6226562	6219248	5657823	6262617	50.0	50.0	50.0	50.0	50.0
d5-NEtFOSAA	Ave	4235352	3889792 3725902	4410456	3757014	3486329	50.0	50.0 50.0	50.0	50.0	50.0
d-N-MeFOSA-M	Ave	5121953	4325034	5263980	4639527	4512300	50.0	50.0	50.0	50.0	50.0
13C2 PFDoA	Ave	5815120 4649092	5816809	5822114	5404154	5779875	50.0	50.0	50.0	50.0	50.0
d-N-EtFOSA-M	Ave	4561882	3792851 4448546	4672820	4109875	4149228	50.0	50.0 50.0	50.0	50.0	50.0
13C2-PFTeDA	Ave	11956257 9520749	11655048	11885446	10950502	12248242	50.0	50.0	50.0	50.0	50.0
13C2-PFH×DA	Ave	6574607 5190172	6335821	6699329	6027362	6542972	50.0	50.0	50.0	50.0	50.0

Curve Type Legend:

Ave = Average

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:	
Level 1	IC 320-142379/4	15DEC2016B 004.d	
Level 2	IC 320-142379/13	15DEC2016BB 013.d	
Level 3	IC 320-142379/5	15DEC2016B 005.d	
Level 4	IC 320-142379/14	15DEC2016B 014.d	
Level 5	IC 320-142379/6	15DEC2016B 006.d	
Level 6	IC 320-142379/15	15DEC2016B 015.d	
Level 7	IC 320-142379/7	15DEC2016B 007.d	
Level 8	IC 320-142379/16	15DEC2016B 016.d	
Level 9	IC 320-142379/8	15DEC2016B 008.d	
Level 10	IC 320-142379/17	15DEC2016B 017.d	
Level 11	IC 320-142379/9	15DEC2016B 009.d	
Level 12	IC 320-142379/18	15DEC2016B 018.d	

ANALYTE	IS	CURVE			RESPONSE				CONCE	ITRATION (N	G/ML)	
	REF	TYPE -	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluorobutanoic acid (PFBA)		AveID	155481 42763611	6690917	310647	15411527	1550440	0.500	20.0	1.00	50.0	5.00
Perfluoropentanoic acid (PFPeA)		AveID	152321 34291076	5770240	287573	13161065	1358239	0.500	20.0	1.00	50.0	5.00
Perfluorobutanesulfonic acid (PFBS)		AveID	216598 50724469	9860707	424227	21559838	2211602	0.442	17.7	0.884	44.2	4.42
Perfluorohexanoic acid (PFHxA)		AveID	126429 33223923	4929766	239458	11507044	1183286	0.500	20.0	1.00	50.0	5.00
Perfluorohexanesulfonic acid (PFHxS)		AveID	+++++ 46223186	6624638	348475	15253691	1543002	182	18.2	0.910	45.5	4.55
Perfluoroheptanoic acid (PFHpA)		AveID	129104 30234194	4747711	237734	10799449	1175112	0.500	20.0	1.00	50.0	5.00
6:2FTS		AveID	405060	+++++ 16907459	2416384	106947	5166665	4.74	+++++ 190	19.0	0.948	47.4
Perfluorooctanoic acid (PFOA)		AveID	+++++ 30784387	5109766	254861	11435583	1239541	200	20.0	1.00	50.0	5.00

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8_N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE		RVE			RESPONSE				CONCEN	TRATION (N	G/ML)	
	REF TY	PE -	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3	LVL 4 LVL 9	LVL 5 LVL 10	LVL 1 LVL 6 LVL 11	LVL 2 LVL 7 LVL 12	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5 LVL 10
Perfluoroheptanesulfonic Acid (PFHpS)	Av	eID	134982 38459925	6014021	265783	13639927	1351160	0.476	19.0	0.952	47.6	4.76
Perfluorooctanesulfonic acid (PFOS)	Av	eID	+++++ 40073141	5058824	220370	11741891	1150410	186	18.6	0.928	46.4	4.64
Perfluorononanoic acid (PFNA)	Av	eID	90066	3562981	188341	8246252	902512	0.500	20.0	1.00	50.0	5.00
Perfluorooctane Sulfonamide (FOSA)	Av	eID	195749 47803717	7990835	381363	17736944	1989314	0.500	20.0	1.00	50.0	5.00
Perfluorodecanoic acid (PFDA)	Av	eID	82137 22616781	3166735	155537	7324495	771905	0.500	20.0	1.00	50.0	5.00
8:2FTS	Av	eID	398457	39808 16111959	2224381	75731	4815680	4.79	0.479	19.2	0.958	47.9
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	Av	eID	285665	29823 12924122	1708231	57389	3741936	5.00	0.500	20.0	1.00	50.0
Perfluorodecanesulfonic acid (PFDS)	Av	eID	69270 23952412	3084031	139829	7241868	712852	0.482	19.3	0.964	48.2	4.82
Perfluoroundecanoic acid (PFUnA)	Av	eID	65000 16852945	2420719	119189	5437764	549708	0.500	20.0	1.00	50.0	5.00
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	Av	eID	267721	29965 11938061	1518918	53623	3414301	5.00	0.500	20.0	1.00	50.0
MeFOSA	Av	eID	343493	36069 16114020	1946985	70049	4407328	5.00	0.500	20.0	1.00	50.0
Perfluorododecanoic acid (PFDoA)	Av	eID	52807 17425873	2231794	103481	5072994	506369	0.500	20.0	1.00	50.0	5.00
N-EtFOSA-M	Av	eID	326877	30993 15780196	1813178	62962	4264314	5.00	0.500	20.0	1.00	50.0

#### RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1 Analy Batch No.: 142379

SDG No.:

Instrument ID: A8 N GC Column: Acquity ID: 2.1(mm) Heated Purge: (Y/N) N

ANALYTE	IS	CURVE		CONCENTRATION (NG/ML)								
	REF	TYPE	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7	LVL 8	LVL 9	LVL 10	LVL 6	LVL 7	LVL 8	LVL 9	LVL 10
			LVL 11	LVL 12				LVL 11	LVL 12			
Perfluorotridecanoic Acid (PFTriA)		AveID	53320		109461		525090	0.500		1.00		5.00
				2087859		4950651			20.0		50.0	
			16038809					200				
Perfluorotetradecanoic acid (PFTeA)		AveID	98521		187123		900575	0.500		1.00		5.00
				3678976		8645519			20.0		50.0	
			27310864					200				
Perfluoro-n-hexadecanoic acid		L1ID	++++		173261		599529	++++		1.00		5.00
(PFHxDA)				2267892		5318207			20.0		50.0	
			17754908					200				
Perfluoro-n-octadecanoic acid		AveID	61549		114997		583761	0.500		1.00		5.00
(PFODA)				2445236		5869666			20.0		50.0	
			18392980					200				

Curve Type Legend:

AveID = Average isotope dilution L1ID = Linear 1/conc IsoDil Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Lims ID: IC L1

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 15-Dec-2016 12:29:18 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:11 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:48:59

	_							_		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	1									
217.00 > 172.00		1.534	0.0		18263829	52.5		105	146908	9
1 Perfluorobut	yric acid									
212.90 > 169.00	-	1.535	0.007	1.000	155481	0.4986		99.7	1121	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00	1.810	1.810	0.0		14121285	53.1		106	107932	3
3 Perfluoroper	3 Perfluoropentanoic acid									
262.90 > 219.00	1.810	1.810	0.0	1.000	152321	0.5465		109	1332	
5 Perfluorobut										
	1.849	1.848	0.001	1.000	216598	0.4473		101		
298.90 > 99.00	1.849	1.848	0.001	1.000	87630		2.47(0.00-0.00)	101		
7 Perfluorohex			0.004	1 000	10/100	0.5070		400	4447	
313.00 > 269.00		2.096	0.001	1.000	126429	0.5378		108	4416	
D 6 13C2 PFHx		2 007	0.0		12/55204	F1 /		100	E00404	
315.00 > 270.00		2.097	0.0		12655304	51.6		103	589404	
D 11 13C4-PFH 367.00 > 322.00	•	2.426	0.004		12240718	54.1		108	647338	
			0.004		12240718	54.1		108	04/338	D 4
12 Perfluorohe 363.00 > 319.00	•	acia 2.428	0.002	1.000	129104	0.5388		108	1246	M M
				1.000	129104	0.5566		106	1240	
9 Perfluorohex 399.00 > 80.00		2.431	0.013	1.000	204063	0.5798		127		M M
D 10 1802 PFH		2.431	0.013	1.000	204003	0.5770		127		IVI
403.00 > 84.00		2.446	0.006		16163510	49.4		105	140532	Ω
D 14 13C4 PFO		2.440	0.000		10103310	47.4		103	140002	O
417.00 > 372.00		2.783	-0.001		12504504	54.3		109	532215	
717.00 / 372.00	2.702	2.703	-0.001		12304304	34.3		107	552215	

Data File:	\\Chr	omNa\S	acramen	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_0	004.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	annic ac	rid.								
413.00 > 369.00		2.783	-0.001	1.000	145696	0.5807		116	1257	
413.00 > 169.00		2.783	0.007	1.003	87089		1.67(0.90-1.10)	116	4416	
13 Perfluorohe	ptanesul	fonic Ac	id							
449.00 > 80.00		2.790		1.000	134982	0.4770		100		
18 Perfluorooct	ane sulf	onic aci	d							M
499.00 > 80.00		3.118	0.033	1.000	116569	0.4564		98.4	7996	M
499.00 > 99.00	3.159	3.118	0.041	1.003	24244		4.81(0.90-1.10)	98.4	1329	M
D 17 13C4 PFO										
503.00 > 80.00		3.151	0.0		12276070	49.3		103	112800	19
D 19 13C5 PFN/		0.450	0.007		0.455.400	F0.0		407	500740	
468.00 > 423.00		3.153	0.006		9455492	53.2		106	520740	)
20 Perfluorono			0.004	1 000	000//	0.5004		100	1240	
463.00 > 419.00		3.155	0.004	1.000	90066	0.5004		100	1349	
D 21 13C8 FOSA 506.00 > 78.00		3.488	0.002		20355431	53.0		106	727464	
22 Perfluorooct					20333431	33.0		100	727404	
498.00 > 78.00		3.491		1.000	195749	0.5155		103	25454	
24 Perfluorode			0.00.		.,.,,	0.0.00			20.0.	
513.00 > 469.00		3.510	0.005	1.000	82137	0.5166		103	2772	
D 23 13C2 PFD/	Д									
515.00 > 470.00		3.513	0.002		8422718	53.5		107	284895	,
26 Perfluorode	cane Su	lfonic ac	id							
599.00 > 80.00	3.826	3.822	0.004	1.000	69270	0.4619		95.8		
28 Perfluoround	decanoi	c acid								
563.00 > 519.00	3.834	3.839	-0.005	1.000	65000	0.5350		107	1918	
D 27 13C2 PFUr										
565.00 > 520.00		3.842	0.001		6352135	54.2		108	398643	}
D 30 13C2 PFD										
615.00 > 570.00		4.132	0.002		5815120	52.4		105	205155	ì
29 Perfluorodo			0.005	1 000	50007	0.4047			1001	M
613.00 > 569.00		4.136	0.005	1.000	52807	0.4946		98.9	1204	M
31 Perfluorotrid			0.004	1 000	E2220	0.5055		101	1054	
663.00 > 619.00		4.400	0.004	1.000	53320	0.5055		101	1256	
D 32 13C2-PFT6 715.00 > 670.00		4.641	0.002		11956257	52.6		105	663687	,
			0.002		11730237	32.0		103	003007	
33 Perfluoroteti 712.50 > 668.90		4.642	0.001	1.000	98521	0.5345		107	1284	
713.00 > 169.00		4.642	-0.009	0.998	17902	0.5545	5.50(0.00-0.00)	107	7022	
D 34 13C2-PFH				2.1.70	, <b></b>		(2.20 0.00)		·	
815.00 > 770.00		5.057	0.001		6574607	52.8		106	132486	)
35 Perfluorohe										
813.00 > 769.00		5.059		1.000	125860	0.5899		118	92.5	
36 Perfluorooct	adecano	oic acid								
913.00 > 869.00			-0.001	1.000	61549	0.5136		103	54.0	

Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L1_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: 15-Dec-2016 12:29:18 **Injection Date:** Instrument ID: A8_N Lims ID: IC L1 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 (000001X) (000001X) (0001X) <del>∑</del>35• ∑32-≻28 24 24 21 16 16 14 2.2 1.7 1.3 1.9 1.0 1.6 1.4 2.0 1.0 1.6 2.2 2.5 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 96 59 36<del>-</del> 84 630-630-60°4 872 051<del>-</del> ×43<del>-</del> ∑₂₄ ×60 <del>-</del>35 ≻₄₈-18 27 36 12 19 24 11 12 1.9 1.9 1.7 2.0 1.6 1.6 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 48 49 760 (32 (00036 (30 (30 042 036 000 35 × >28 ×30-**≻24** ≻₂₄-18 18 12 12 2.0 1.8 2.1 2.4 2.7 2.0 2.6 2.3 1.5 1.4 3.2 12 Perfluoroheptanoic acid (M) 9 Perfluorohexanesulfonic acid (M) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 56 000048<del>-</del> 000040 × 63 (0001 ×)28-654<del>-</del> ×45 ≻₃₆-21 24 27 14 16 18 0 0 2.1 Page 50/1h of 678 2.7 1.9 2.0 2.3 1.8 3.0 1.3 2.5 3.1 2.6

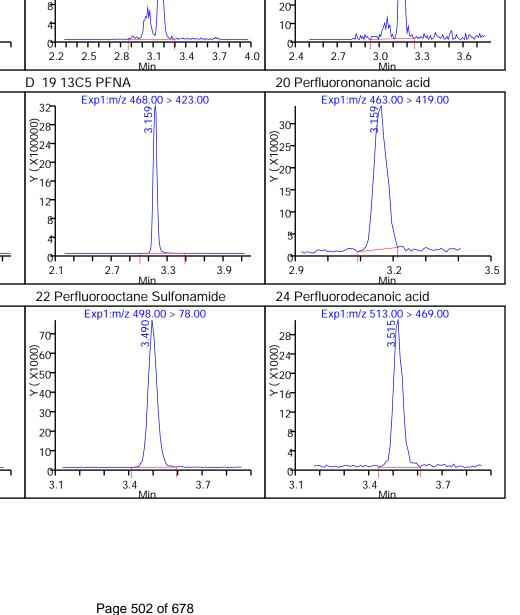
27 18

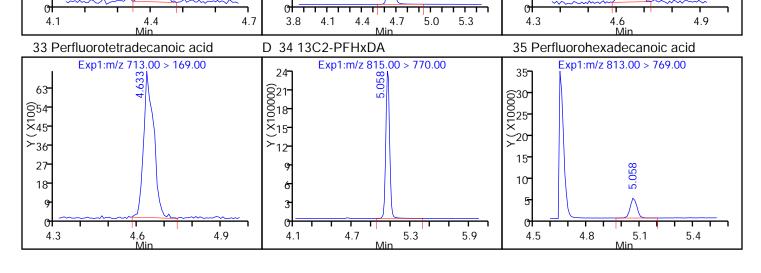
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3.0

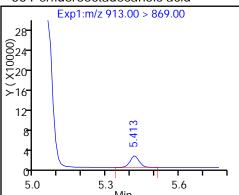
3.6

4.2





#### 36 Perfluorooctadecanoic acid



TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

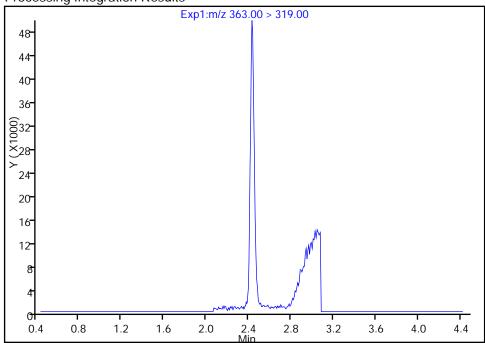
# 12 Perfluoroheptanoic acid, CAS: 375-85-9

Signal: 1

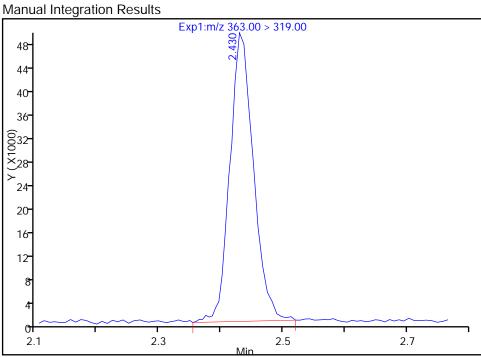
Not Detected

Expected RT: 2.43

**Processing Integration Results** 



RT: 2.43
Area: 129104
Amount: 0.538766
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

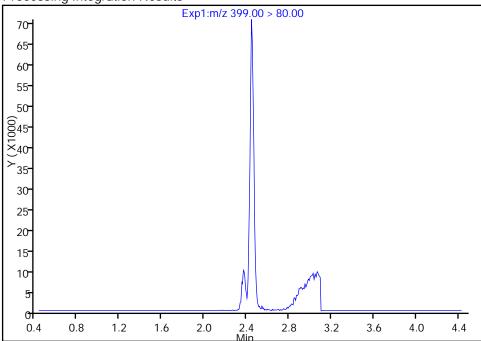
### 9 Perfluorohexanesulfonic acid, CAS: 355-46-4

Signal: 1

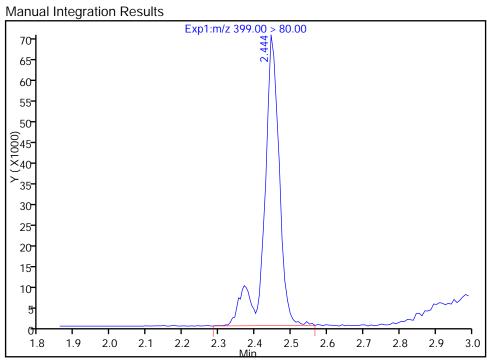
Not Detected

Expected RT: 2.43

**Processing Integration Results** 



RT: 2.44
Area: 204063
Amount: 0.579783
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

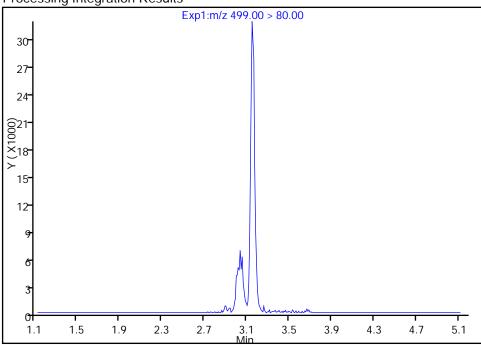
### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

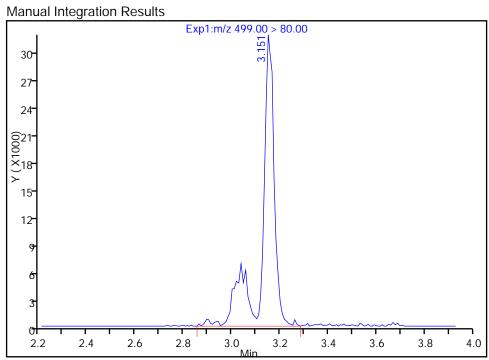
Not Detected

Expected RT: 3.12

**Processing Integration Results** 



RT: 3.15
Area: 116569
Amount: 0.456423
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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#### TestAmerica Sacramento

Data File:

Injection Date: 15-Dec-2016 12:29:18 Instrument ID:  $A8_N$ 

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#:

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: LC PFC_DOD ICAL A8_N Limit Group:

Column: Detector EXP1

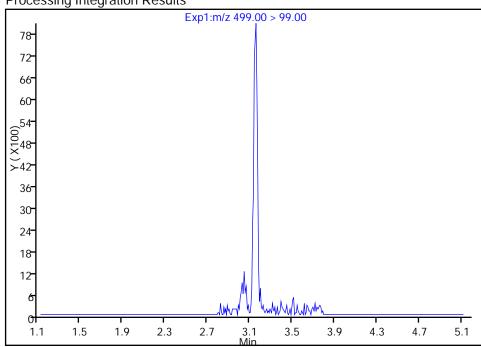
### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 2

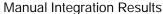
Not Detected

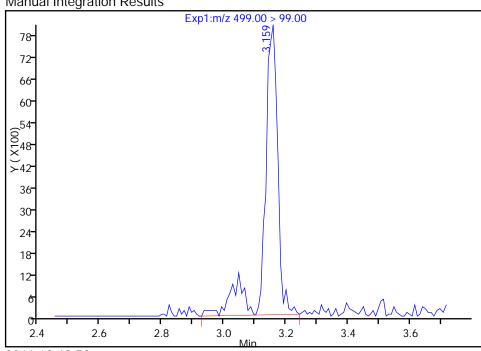
Expected RT: 3.12

#### **Processing Integration Results**



RT: 3.16 Area: 24244 0.456423 Amount: Amount Units: ng/ml





Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_004.d

Injection Date: 15-Dec-2016 12:29:18 Instrument ID: A8_N

Lims ID: IC L1

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 37 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

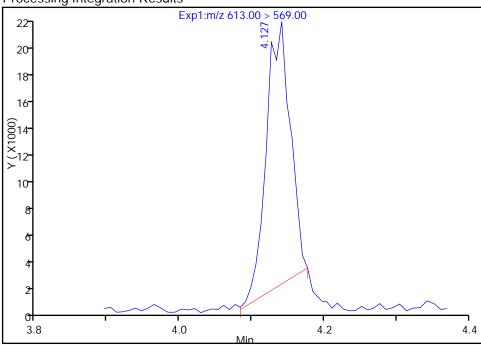
Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

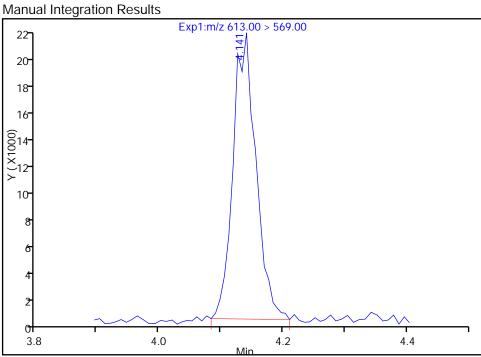
## 29 Perfluorododecanoic acid, CAS: 307-55-1

Signal: 1

RT: 4.13 Area: 43489 Amount: 0.419548 Amount Units: ng/ml **Processing Integration Results** 



RT: 4.14
Area: 52807
Amount: 0.494620
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:48:59

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

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Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Lims ID: IC L2

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 15-Dec-2016 12:36:48 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:15 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:02

I IISt Level Revie	WCI. CIIC	marasci	ius		Date.		10 DC0 2010 10.00.02			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	1									
217.00 > 172.00		1.534	-0.004		18201393	52.3		105	100029	1
1 Perfluorobut										
212.90 > 169.00	,		-0.005	1.000	310647	1.00		100.0	2583	
D 4 13C5-PFP6	eΑ									
267.90 > 223.00		1.810	-0.005		14067714	52.9		106	109344	7
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.805	1.810	-0.005	1.000	287573	1.04		104	2935	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.848	-0.004	1.000	424227	0.8800		99.5		
298.90 > 99.00	1.844	1.848	-0.004	1.000	171864		2.47(0.00-0.00)	99.5		
7 Perfluorohex										
313.00 > 269.00	2.092	2.096	-0.004	1.000	239458	1.01		101	6854	
D 6 13C2 PFHx										
315.00 > 270.00		2.097	-0.005		12814780	52.3		105	582538	
D 11 13C4-PFH	•									
367.00 > 322.00			-0.003		12248222	54.1		108	431068	
12 Perfluorohe	•		0.000	1 000	007704	0.00		00.4	1001	
363.00 > 319.00			0.002	1.000	237734	0.99		99.1	1884	
9 Perfluorohex				1 000	240475	0.00		100		
399.00 > 80.00		2.431	0.014	1.000	348475	0.99		109		
D 10 18O2 PFH		2.447	0.001		1/002040	40.0		104	0/0000	
403.00 > 84.00		2.446	-0.001		16093048	49.2		104	960828	
D 14 13C4 PFO 417.00 > 372.00		2.783	-0.002		12627691	54.8		110	657205	
417.00 > 372.00	2.701	2.703	-0.002		1202/091	34.0		110	037203	

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_0	005.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
						J.				J
15 Perfluorooct 413.00 > 369.00		2.783	-0.002	1.000	254861	1.01		101	2003	
413.00 > 169.00		2.783	-0.002	1.000	159259	1.01	1.60(0.90-1.10)	101	7007	
13 Perfluorohe	ptanesul	fonic Ac	id							
449.00 > 80.00	2.789	2.790	-0.001	1.000	265783	0.9254		97.2		
18 Perfluorooct										M
499.00 > 80.00		3.118	0.031	1.000	220370	0.8502	4.1/(0.00.1.10)	91.6	15877	M
499.00 > 99.00		3.118	0.039	1.003	52990		4.16(0.90-1.10)	91.6	5530	M
D 17 13C4 PFOS 503.00 > 80.00		3.151	-0.002		12459383	50.1		105	110546	7
D 19 13C5 PFN/		0.101	0.002		12107000	00.1		100	110010	•
468.00 > 423.00		3.153	-0.004		9537045	53.7		107	472742	
20 Perfluoronoi	nanoic a	cid								
463.00 > 419.00	3.157	3.155	0.002	1.000	188341	1.04		104	2906	
D 21 13C8 FOS										
506.00 > 78.00		3.488	0.001		20238792	52.7		105	766772	
22 Perfluorooct				1 000	2012/2	1 01		101	4/57/	
498.00 > 78.00		3.491	-0.002	1.000	381363	1.01		101	46576	
24 Perfluorodeo 513.00 > 469.00			-0.004	1.000	155537	0.9716		97.2	5243	
D 23 13C2 PFD		3.310	0.004	1.000	100007	0.7710		77.2	3243	
515.00 > 470.00		3.513	0.001		8480447	53.9		108	439565	
26 Perfluorodeo	cane Su	lfonic ac	id							
599.00 > 80.00	3.824	3.822	0.002	1.000	139829	0.9186		95.3		
28 Perfluoround										
563.00 > 519.00		3.839	-0.006	1.000	119189	1.00		100	2937	
D 27 13C2 PFUr		0.040	0.0		(010010	F0.0		407	000074	
565.00 > 520.00		3.842	0.0		6219248	53.0		106	280274	
D 30 13C2 PFDc 615.00 > 570.00		4.132	0.001		5822114	52.5		105	270055	
29 Perfluorodo			0.001		3022114	32.3		103	270033	'
613.00 > 569.00		4.136	-0.003	1.000	103481	0.9681		96.8	2745	
31 Perfluorotrid	lecanoic	acid								
663.00 > 619.00		4.400	-0.004	1.000	109461	1.04		104	2155	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.633	4.641	-0.008		11885446	52.3		105	710542	
33 Perfluorotetr										
712.50 > 668.90		4.642	0.001	1.000	187123	1.01	F 0/ (0 00 0 00)	101	2896	
713.00 > 169.00		4.642	-0.009	0.998	31916		5.86(0.00-0.00)	101	12057	
D 34 13C2-PFH; 815.00 > 770.00		5.057	-0.010		6699329	53.8		108	126940	)
35 Perfluorohe			0.010		00//02/	55.0		100	120770	
813.00 > 769.00		5.059	-0.001	1.000	173261	1.01		101	135	
36 Perfluorooct	adecan	oic acid								
913.00 > 869.00	5.413	5.414	-0.001	1.000	114997	0.9585		95.8	91.0	

Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22

QC Flag Legend Review Flags

M - Manually Integrated

Reagents:

LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 12:36:48 Instrument ID: A8_N Lims ID: IC L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 Y (X10000) (56⁻ 00048⁻ <del>∑</del>40  $\times$ 35 ≻28 24 21 16 1.9 1.7 1.0 1.3 1.6 1.1 1.4 2.0 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298,90 > 99.00 12 80 18 70 × (×10000) 00015<del>-</del> ×12-660 660 ×50 ≻₄₀-30 20 10 1.5 1.8 2.4 1.8 2.1 1.9 1.2 2.1 1.5 1.6 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 42 84 042 0036 X30-©72 ×60 ×30 <u>~</u>24 >48 18 36 18 12 24 12 12 2.0 1.8 2.1 2.7 1.9 2.2 2.3 1.5 2.4 2.5 2.8 3.1 1.6 1.7 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 12 56 84 00048 00048 ×40 (X10000) 8 ©72 <del>×</del>60 <del>_</del>32 <del>-</del>48 24 36 16 24 12 0 0 2.1 Page 51/3 of 678^{2.7} 2.4 2.7 1.8 3.0 1.8 2.1 2.4 2.7 2.1 1.5 3.0

3.5

3.8

18

2.3

2.9

3.5

4.1

2.9

3.2

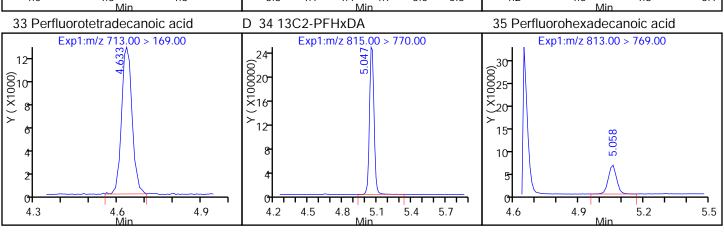
16

3.1

3.4

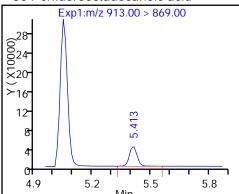
3.7

4.0



Report Date: 16-Dec-2016 14:34:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:  $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d$ 

## 36 Perfluorooctadecanoic acid



TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

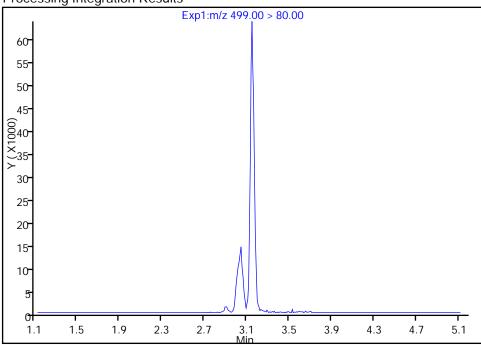
### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

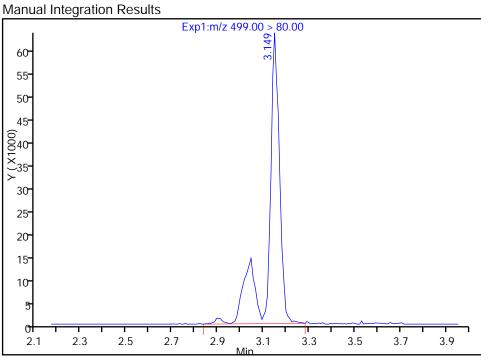
Not Detected

Expected RT: 3.12

**Processing Integration Results** 



RT: 3.15
Area: 220370
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_005.d

Injection Date: 15-Dec-2016 12:36:48 Instrument ID: A8_N

Lims ID: IC L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 5

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

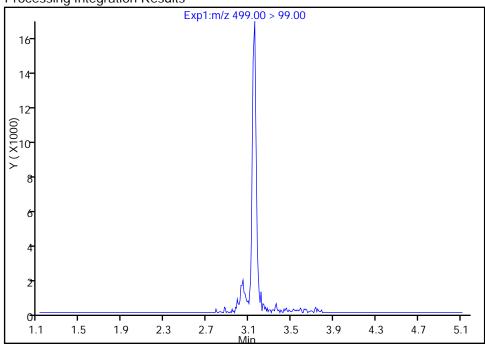
Column: Detector EXP1

## 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

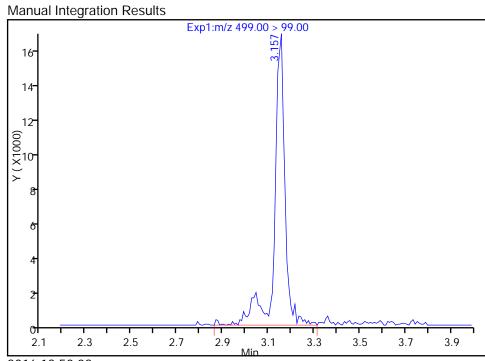
Signal: 2

Not Detected Expected RT: 3.12

**Processing Integration Results** 



RT: 3.16
Area: 52990
Amount: 0.850158
Amount Units: ng/ml



Reviewer: chandrasenas, 15-Dec-2016 13:50:02

Audit Action: Manually Integrated

Audit Reason: Assign Peak

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Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d

Lims ID: IC L3

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 15-Dec-2016 12:44:16 ALS Bottle#: 39 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:18 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:50:22

I II St Ecvel I tevie	Worr oria	ii idi dooi	iuo	Duto.			10 DC0 Z010 10:00:22					
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
D 2 13C4 PFBA	1											
217.00 > 172.00		1.534	0.0		18037108	51.9		104	828248			
1 Perfluorobut	vric acid											
212.90 > 169.00	,		-0.001	1.000	1550440	5.03		101	13427			
D 4 13C5-PFPe	eΑ											
267.90 > 223.00	1.810	1.810	0.0		14063070	52.9		106	107869	7		
3 Perfluoroper	ntanoic a	cid										
262.90 > 219.00	1.810	1.810	0.0	1.000	1358239	4.89		97.9	15178			
5 Perfluorobut	anesulfo	nic acid										
298.90 > 80.00		1.848	0.001	1.000	2211602	4.55		103				
298.90 > 99.00	1.849	1.848	0.001	1.000	918055		2.41(0.00-0.00)	103				
7 Perfluorohex												
313.00 > 269.00	2.097	2.096	0.001	1.000	1183286	5.01		100	39266			
D 6 13C2 PFHx												
315.00 > 270.00		2.097	0.0		12709919	51.9		104	753338			
D 11 13C4-PFH	•											
367.00 > 322.00		2.426	-0.001		12260528	54.2		108	146707	9		
12 Perfluorohe	•		0.004	1 000	4475440	4.00		07.0	0011			
363.00 > 319.00			0.004	1.000	1175112	4.90		97.9	8914			
9 Perfluorohex				1 000	15 42000	4.07		04.0				
399.00 > 80.00		2.431	-0.067	1.000	1543002	4.37		96.0				
D 10 1802 PFH		0.447	0.001		1/00070/	40.7		105	/ 54 450			
403.00 > 84.00		2.446	0.001		16222736	49.6		105	651458			
D 14 13C4 PFO. 417.00 > 372.00		2 702	0.0		12425045	E 4 O		110	744410			
417.00 > 372.00	2.783	2.783	0.0		12635065	54.8		110	746410			

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_(	006.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
			101	101	rtosponso	119/1111	rtatio(Eirinto)	701100	Ont	riago
15 Perfluorooct 413.00 > 369.00		2.783	0.0	1.000	1239541	4.89		97.8	9812	
413.00 > 369.00		2.783	0.0	1.000	731249	4.07	1.70(0.90-1.10)	97.8 97.8	28264	
13 Perfluorohe					, 5 . 2 . ,			77.0		
449.00 > 80.00	-	2.790	0.002	1.000	1351160	4.69		98.6		
18 Perfluorooct	tane sulf	onic aci	d							
499.00 > 80.00	3.153	3.118	0.035	1.000	1150410	4.43		95.5	65030	
499.00 > 99.00	3.153	3.118	0.035	1.000	246751		4.66(0.90-1.10)	95.5	15530	
D 17 13C4 PFO										
503.00 > 80.00		3.151	0.002		12484772	50.2		105	473035	
D 19 13C5 PFN		0.450	0.0		0777/00	FF 0		110	(50004	
468.00 > 423.00		3.153	0.0		9777609	55.0		110	653324	
20 Perfluorono 463.00 > 419.00			-0.002	1.000	902512	4.85		97.0	13825	
D 21 13C8 FOS		5.155	-0.002	1.000	702312	4.03		77.0	13023	
506.00 > 78.00		3.488	-0.004		20034933	52.2		104	309657	
22 Perfluorooct										
498.00 > 78.00		3.491	0.001	1.000	1989314	5.32		106	140153	
24 Perfluorode	canoic a	cid								
513.00 > 469.00	3.509	3.510	-0.001	1.000	771905	4.97		99.3	27905	
D 23 13C2 PFD	A									
515.00 > 470.00	3.509	3.513	-0.004		8234678	52.3		105	259288	
26 Perfluorode										
599.00 > 80.00			-0.003	1.000	712852	4.67		97.0		
28 Perfluoroun			0.000	1 000	F 40700	4.50		01.0	14017	
563.00 > 519.00		3.839	-0.002	1.000	549708	4.59		91.8	14816	
D 27 13C2 PFU ₁ 565.00 > 520.00		3.842	0.003		6262617	53.4		107	379922	
D 30 13C2 PFD		3.042	0.003		0202017	55.4		107	317722	
615.00 > 570.00		4.132	-0.003		5779875	52.1		104	227122	
29 Perfluorodo			0.000		0	02				
613.00 > 569.00		4.136	0.0	1.000	506369	4.77		95.4	11299	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00	4.398	4.400	-0.002	1.000	525090	5.01		100	10475	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.645	4.641	0.004		12248242	53.9		108	104927	4
33 Perfluorotetradecanoic acid										
712.50 > 668.90		4.642	0.003	1.000	900575	4.92	( 0 1 ( 0 0 0 0 0 0 )	98.3	12522	
713.00 > 169.00		4.642	-0.007	0.998	149199		6.04(0.00-0.00)	98.3	58819	
D 34 13C2-PFH:		F 0F7	0.000		/ F 42072	F2 F		105	140/05	
815.00 > 770.00		5.057	0.002		6542972	52.5		105	140605	
35 Perfluorohe: 813.00 > 769.00		oic acid 5.059		1.000	599529	4.89		97.7	502	
36 Perfluorooct			0.0	1.000	377327	7.07		71.1	302	
913.00 > 869.00			0.0	1.000	583761	4.90		98.0	536	

Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L3_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:19 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_006.d **Injection Date:** 15-Dec-2016 12:44:16 Instrument ID: A8_N Lims ID: IC L3 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 39 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56 000048 40 40 0042 ×35 <del>∑</del>35• <del>-</del>28 ≻28 24 21 21 16 14 1.0 1.9 1.3 1.6 2.2 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 Mir 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 56 40 91 6³⁵ 65-65-×35 ×25 ∑52<del>-</del> ≻₂₈ ≻₂₀ 39 21 15 26 10 13 1.8 1.8 2.1 1.5 2.1 2.4 1.5 1.5 1.8 2.1 1.2 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 315.00 > 270.00 42 760 (42 0036 X30 642 0036 ×30 0036-30-× 24-~24° ≻24 18 18 18 12 12 12 1.9 2.2 2.5 1.8 2.1 2.7 1.9 2.5 1.5 2.4 1.3 3.1 1.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 42 56⁻ (00048⁻ (100001) (10001) 642 636 (036 00030 × × )24 ×30 <del>-</del>32 **≻**24 18 24 18 12 16 12 0 0 2.0 2.3 2.6 2.9 1.8 2.1 2.4 2.7 1.7 1.5 3.0

3.0

2.7

3.3

3.6

3.9

4.2

2.7

3.0

3.3

3.6

3.9

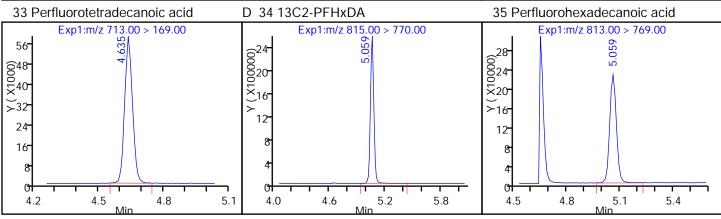
4.2

3.0

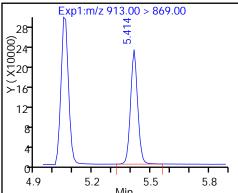
3.3

3.6

3.9



## 36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_007.d

Lims ID: IC L4

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 15-Dec-2016 12:51:47 ALS Bottle#: 40 Worklist Smp#: 7

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:21 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:46:14

	115t Edver Revie	Wor. ona	Harasci	ius	Bate.			0 BCC 2010 10:10:1					
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags		
ı	D 2 13C4 PFBA												
	217.00 > 172.00		1.534	0.0		17585378	50.6		101	114097	7		
	1 Perfluorobuty												
	212.90 > 169.00	•	1.535	-0.001	1.000	6690917	22.3		111	52374			
	D 4 13C5-PFPe			0.00.		0070711				0207.			
	267.90 > 223.00		1.810	0.0		13617158	51.2		102	860552			
	3 Perfluoropen			0.0		10017100	01.2		.02	000002			
	262.90 > 219.00		1.810	0.0	1.000	5770240	21.5		107	61088			
	5 Perfluorobuta			0.0	1.000	0770210	21.0		107	01000			
	298.90 > 80.00		1.848	0.001	1.000	9860707	20.5		116				
	298.90 > 99.00		1.848	0.001	1.000	4111615	20.0	2.40(0.00-0.00)	116				
	7 Perfluorohex			0.00.				2.10(0.00 0.00)					
	313.00 > 269.00		2.096	-0.003	1.000	4929766	21.0		105	144495			
	D 6 13C2 PFHx		2.070	0.000		.,_,,							
	315.00 > 270.00		2.097	0.005		12608210	51.4		103	627430			
	D 11 13C4-PFH _I		2.077	0.000		12000210	01.1		.00	027 100			
	367.00 > 322.00		2.426	0.0		11788221	52.1		104	459454			
				0.0		11700221	JZ. 1		104	407404			
	12 Perfluorohej 363.00 > 319.00			-0.002	1.000	4747711	20.6		103	44179			
					1.000	4747711	20.0		103	44177			
	9 Perfluorohex 399.00 > 80.00		nic acid 2.431	0.009	1.000	6624638	18.9		104				
			2.431	0.009	1.000	0024030	10.9		104				
	D 10 18O2 PFH:		0.447	0.007		1/0/07//	40.1		104	(07270			
	403.00 > 84.00		2.446	-0.006		16062766	49.1		104	697379			
	D 14 13C4 PFO		0.706	0.000		44040000	<b>54.0</b>		400	400767			
	417.00 > 372.00	2.785	2.783	0.002		11818203	51.3		103	403727			

Data File:	\\Chr	mNa\S	acramen [*]	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_0	007.d		
Signal	RT	EXP RT	DLT RT	REL RT	Docnanco	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flogs
			KI	KI	Response	rig/iiii	Ratio(Limits)	70 Rec	3/11	Flags
15 Perfluorooct			0.000	1 000	F1007//	21 (		100	40000	
413.00 > 369.00 413.00 > 169.00		2.783 2.783	0.002 0.002	1.000 1.000	5109766 3083663	21.6	1.66(0.90-1.10)	108 108	40900 124075	
13 Perfluorohep				1.000	3003003		1.00(0.70 1.10)	100	124073	
449.00 > 80.00			-0.005	1.000	6014021	21.4		112		
18 Perfluoroocta	ane sulf	onic aci	d							
499.00 > 80.00		3.118	0.011	1.000	5058824	20.0		108	109804	
499.00 > 99.00		3.118	0.035	1.008	1125313		4.50(0.90-1.10)	108	92390	
D 17 13C4 PFOS		0 1 5 1	0.000		121020/2	40.0		100	250702	
503.00 > 80.00		3.151	0.002		12183062	49.0		102	250792	
D 19 13C5 PFNA 468.00 > 423.00		3.153	0.0		9236073	52.0		104	341338	
20 Perfluoronor			0.0		7200070	02.0		101	011000	
463.00 > 419.00			-0.002	1.000	3562981	20.3		101	53054	
D 21 13C8 FOSA	4									
506.00 > 78.00	3.484	3.488	-0.004		19703272	51.3		103	612200	
22 Perfluoroocta										
498.00 > 78.00		3.491	0.001	1.000	7990835	21.7		109	298669	
24 Perfluorodeo			0.001	1 000	24//725	20.7		100	04047	
513.00 > 469.00		3.510	-0.001	1.000	3166735	20.6		103	81817	
D 23 13C2 PFDA 515.00 > 470.00		3.513	0.004		8134734	51.7		103	195073	
26 Perfluoroded					0104704	31.7		105	175075	
599.00 > 80.00		3.822	0.005	1.000	3084031	20.7		107		
28 Perfluoround	decanoio	c acid								
563.00 > 519.00	3.844	3.839	0.005	1.000	2420719	20.3		102	65024	
D 27 13C2 PFUn										
565.00 > 520.00		3.842	-0.007		6226562	53.1		106	471162	
D 30 13C2 PFDc					504/000	<b>50</b> 4		405	000045	
615.00 > 570.00		4.132	0.003		5816809	52.4		105	222845	
29 Perfluorodoc 613.00 > 569.00		4.136	-0.001	1.000	2231794	20.9		104	47124	
31 Perfluorotrid			-0.001	1.000	2231794	20.9		104	4/124	
663.00 > 619.00		4.400	-0.002	1.000	2087859	19.8		98.9	37986	
D 32 13C2-PFTe										
715.00 > 670.00		4.641	0.003		11655048	51.3		103	471362	
33 Perfluorotetr	adecan	oic acid								
712.50 > 668.90		4.642	0.002	1.000	3678976	20.0		99.8	48461	
713.00 > 169.00		4.642	-0.007	0.998	596997		6.16(0.00-0.00)	99.8	56132	
D 34 13C2-PFHx		F 0F7	0.000		/225024	F0.0		100	100001	
815.00 > 770.00		5.057	0.002		6335821	50.9		102	120381	
35 Perfluorohex 813.00 > 769.00		oic acid 5.059		1.000	2267892	19.9		99.3	1990	
36 Perfluoroocta			0.0	1.000	2201072	17.7		97.J	1770	
913.00 > 869.00		5.414	-0.001	1.000	2445236	20.4		102	2369	

Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:22 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 12:51:47 Instrument ID: A8_N Lims ID: IC L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 7 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method:  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 56 (000042 X35 534 000048 40 40 ∑28⁻ 24 21 16 14 2.2 1.0 1.6 1.1 1.4 1.7 2.0 1.0 1.3 1.6 1.9 2.2 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 262.90 > 219.0018 (21⁻ 00018 ×15 00030-036-(00005 X12 2 3 4 9 × ~24 18 12 2.2 1.9 1.8 2.1 1.3 1.6 1.5 1.5 1.8 2.1 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 42 (0000015-X12 42 (000001X 30-30-00030<del>-</del> \<u>\.</u> 18 18 12 12 1.8 2.1 2.0 2.3 2.6 1.8 2.1 2.4 3.0 2.4 1.4 1.7 2.7 1.5 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399,00 > 80.00 Exp1:m/z 403.00 > 84.00 18 21 56<del>-</del> (00005 X) 000015 X 049 042 ×35 ≻28 21 0<del>|</del> 0 1.9 2.2 2.5 2.8 1.9 2.2 2.5 2.8 Page 529 of 678 3.1 1.8 2.1 2.4 2.7 1.6 3.0

3.4

3.7

4.0

2.9

3.2

3.5 /lin 3.8

4.1

2.4

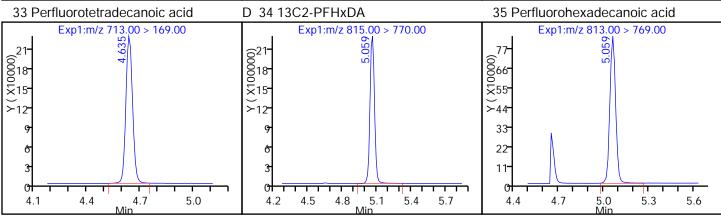
3.0

3.6

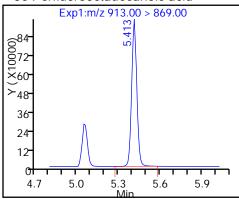
4.2

2.8

3.1



36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_008.d

Lims ID: IC L5

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 15-Dec-2016 12:59:16 ALS Bottle#: 41 Worklist Smp#: 8

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:24 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:06

	115t Ecver Revie	wor. ona	Harasci	ius		Bate.		10 BCC 2010 10.01.0			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
Γ	2 13C4 PFBA										
	217.00 > 172.00		1.534	-0.001		17274187	49.7		99.4	927175	
	1 Perfluorobuty	yric acid									
2	212.90 > 169.00		1.535	-0.002	1.000	15411527	52.3		105	124871	
С	4 13C5-PFPe	A									
2	267.90 > 223.00	1.810	1.810	0.0		13053659	49.1		98.1	126110	4
	3 Perfluoropen	itanoic a	cid								
2	262.90 > 219.00	1.810	1.810	0.0	1.000	13161065	51.1		102	158308	
	5 Perfluorobuta	anesulfo	nic acid								
	298.90 > 80.00		1.848	0.0	1.000	21559838	47.1		107		
2	298.90 > 99.00		1.848	0.0	1.000	10128422		2.13(0.00-0.00)	107		
	7 Perfluorohex										
	313.00 > 269.00		2.096	0.002	1.000	11507044	50.0		99.9	330809	
	6 13C2 PFHx			0.004		1000000	<b>50</b> /		404		
	315.00 > 270.00		2.097	0.001		12399280	50.6		101	688050	
	) 11 13C4-PFH _I		2.427	0.000		10001/04	47.7		05.4	F2000/	
٠	367.00 > 322.00			-0.002		10801604	47.7		95.4	530896	
,	12 Perfluorohe; 363.00 > 319.00			0.004	1 000	10700440	51.1		102	85838	
					1.000	10799449	51.1		102	00000	
-	9 Perfluorohex 399.00 > 80.00		onic acid 2.431	0.015	1.000	15253691	45.8		101		
			2.431	0.013	1.000	13233091	43.0		101		
	) 10 18O2 PFH) 103.00 > 84.00		2.446	0.0		15278828	46.7		98.8	104673 ⁻	7
			2.440	0.0		13270020	40.7		70.0	104073	,
	) 14 13C4 PFO 117.00 > 372.00		2.783	-0.001		11142777	48.4		96.7	755641	
_	117.00 / 372.00	2.702	2.703	-0.001		11144111	40.4		70.7	755041	

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61215-3788	1.b\15DEC2016B_(	008.d		
	БТ	EXP	DLT	REL	1	Amount	D !! (! ! !! )	04.5	0/101	
Signal	RT	RT	RT	RT	Response	ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooctar										
413.00 > 369.00 2		2.783	-0.001	1.000	11435583	51.2	1 (7(0.00.1.10)	102	92940	
413.00 > 169.00 2			-0.001	1.000	6849991		1.67(0.90-1.10)	102	293728	
13 Perfluorohepta 449.00 > 80.00 2			0.001	1.000	13639927	49.5		104		
18 Perfluorooctar				1.000	13037727	47.5		104		
499.00 > 80.00 3		3.118	0.033	1.000	11741891	47.2		102	399791	
499.00 > 99.00 3		3.118	0.033	1.000	2632984		4.46(0.90-1.10)	102	139087	
D 17 13C4 PFOS										
503.00 > 80.00 3	3.151	3.151	0.0		11946650	48.0		100	237614	
D 19 13C5 PFNA										
468.00 > 423.00 3	3.151	3.153	-0.002		8581504	48.3		96.6	574194	
20 Perfluoronona				1 000	004/050	50.5		404	100501	
463.00 > 419.00 3	3.151	3.155	-0.004	1.000	8246252	50.5		101	123521	
D 21 13C8 FOSA 506.00 > 78.00 3	400	3.488	0.002		18804188	49.0		97.9	642404	
22 Perfluorooctar					10004100	49.0		91.9	042404	
498.00 > 78.00 3		3.491		1.000	17736944	50.6		101	676782	
24 Perfluorodeca			0.001	1.000	1,,,00,11	00.0			0,0,02	
513.00 > 469.00 3			-0.003	1.000	7324495	50.6		101	172410	
D 23 13C2 PFDA										
515.00 > 470.00 3	3.516	3.513	0.003		7671861	48.8		97.5	212001	
26 Perfluorodeca	ne Su	lfonic ac	id							
599.00 > 80.00 3	3.818	3.822	-0.004	1.000	7241868	49.6		103		
28 Perfluorounde										
563.00 > 519.00 3		3.839	0.005	1.000	5437764	50.3		101	105822	
D 27 13C2 PFUnA		2.042	0.000		F/F7022	40.0		0/ 5	250074	
565.00 > 520.00 3		3.842	0.002		5657823	48.3		96.5	259964	
D 30 13C2 PFDoA 615.00 > 570.00 4		4.132	0.003		5404154	48.7		97.4	211794	
29 Perfluorodode			0.003		3404134	40.7		77.4	211774	
613.00 > 569.00 4		4.136	-0.001	1.000	5072994	51.1		102	98593	
31 Perfluorotrideo										
663.00 > 619.00 4			-0.002	1.000	4950651	50.5		101	84213	
D 32 13C2-PFTeD	Α									
715.00 > 670.00 4	.645	4.641	0.004		10950502	48.2		96.3	504805	
33 Perfluorotetra	decan	oic acid								
712.50 > 668.90 4		4.642	0.003	1.000	8645519	50.5		101	145963	
713.00 > 169.00 4		4.642	-0.007	0.998	1380699		6.26(0.00-0.00)	101	249413	
D 34 13C2-PFHxD		F 057	0.000		(0070/0	40.4		0/.0	440750	
815.00 > 770.00 5		5.057	0.002		6027362	48.4		96.8	112750	
35 Perfluorohexa			0.0	1 000	F210207	E1 0		102	1101	
813.00 > 769.00 5		5.059	0.0	1.000	5318207	51.0		102	4484	
36 Perfluorooctad 913.00 > 869.00 5			-0.001	1.000	5869666	52.7		105	5549	
713.00 / 007.00 3	,, 413	5.717	0.001	1.000	3007000	52.1		100	JJ 7	

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:25 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 12:59:16 Instrument ID: A8_N Lims ID: IC L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 8 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Limit Group: LC PFC_DOD ICAL Method:  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 267.90 > 223.00 56 49 049 042 000042 X 35 8 235  $\times_{35}$ ²⁸ <u></u>∠28 ≻₂₈-21 21 21 14 1.0 1.3 1.6 1.9 2.2 8.0 1.1 1.4 1.7 2.0 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 42 (77<del>-</del> 00042 35 (000001 X1000000 30-<del>-</del>55<del>-</del> ∑28<del>-</del> **≻44** 18 21 33 12 22 11 1.7 2.0 1.8 2.1 1.4 2.3 1.8 2.1 1.1 1.5 1.5 D 11 13C4-PFHpA 7 Perfluorohexanoic acid D 6 13C2 PFHxA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 40 42 (35-0030-1×25-035<del>-</del> <u>830</u>-×₂₄ ×25 ≻₂₀ ≻20 18 15 12 10 10 2.0 2.0 2.3 2.6 2.1 2.4 1.7 2.3 2.6 1.4 1.7 1.8 2.7 3.0 1.4 12 Perfluoroheptanoic acid 9 Perfluorohexanesulfonic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 (000001X 30⁴² (35-0030-1×25-(49⁻ 0042⁻ ×35⁻ <del>-</del>20 ≻28 15 18 21 12 10 14 0 0 1.8 2.1 2.4 2.7 Page 586 of 678 2.0 2.3 2.6 2.9 1.5 3.0 2.0 3.2 1.7 1.4 2.6

3.6

4.2

3.0

3.3

3.6

3.9

3.0

16

2.4

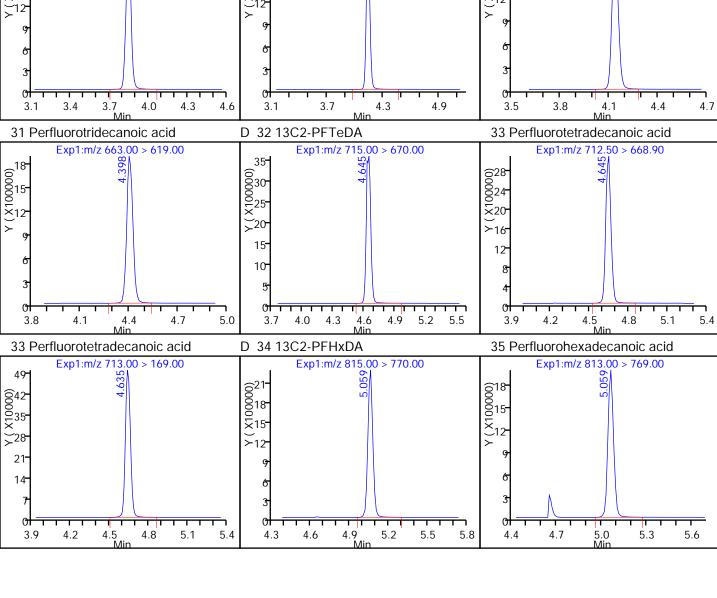
16

2.5

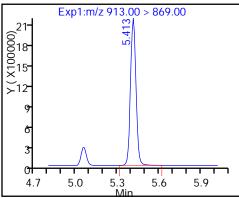
3.1

3.7

4.3



36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d

Lims ID: IC L6

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 15-Dec-2016 13:06:46 ALS Bottle#: 42 Worklist Smp#: 9

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:27 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:51:28

. 11 5	THE ECVENTION OF CHANGE OF COLUMN			Bate:		10 200 2010 10.01.2		,			
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 3	2 13C4 PFBA										
	.00 > 172.00		1.534	0.003		14961055	43.0		86.0	920014	
	Perfluorobut		1.001	0.000		11701000	10.0		00.0	720011	
	.90 > 169.00	•	1.535	0.002	1.000	42763611	167.4		83.7	246189	
	13C5-PFPe		1.000	0.002	1.000	42703011	107.4		00.7	240107	
	.90 > 223.00		1.810	0.003		10898820	41.0		81.9	100702	6
				0.003		10070020	41.0		01.7	100702	O
	Perfluoropen .90 > 219.00		1.810	0.003	1.000	34291076	159.4		79.7	297823	
				0.003	1.000	34291070	139.4		19.1	29/023	
	Perfluorobuta			0.004	1 000	E0724440	130.5		72.0		
	.90 > 80.00 .90 > 99.00		1.848 1.848	0.004	1.000 0.995	50724469 28243355	130.5	1.80(0.00-0.00)	73.8 73.8		
				-0.000	0.773	20243333		1.60(0.00-0.00)	73.0		
	Perfluorohex .00 > 269.00		a 2.096	0.0	1.000	33223923	172.9		86.4	549724	
			2.090	0.0	1.000	33223923	172.9		00.4	349724	
	5 13C2 PFHx		2.007	0.001		10245400	40.0		04.4	F00001	
	.00 > 270.00		2.097	-0.001		10345480	42.2		84.4	508201	
	1 13C4-PFH	•	0.407			05/1005	27.0			407707	
	.00 > 322.00		2.426	0.0		8564025	37.8		75.7	487796	
	Perfluorohe	-									
363	.00 > 319.00	2.426	2.428	-0.002	1.000	30234194	180.3		90.2	213534	
	Perfluorohex										
399	00.08 < 00.	2.444	2.431	0.013	1.000	46223186	163.6		89.9		
D 1	0 18O2 PFH:	xS									
403	.00 > 84.00	2.444	2.446	-0.002		12974829	39.7		83.9	628886	
D 1	4 13C4 PFO	A									
417	.00 > 372.00	2.783	2.783	0.0		8380251	36.4		72.8	402245	

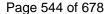
Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
			KI	KI	Response	rig/iiii	Ratio(Littits)	70 KeC	3/11	riays
15 Perfluorooct			0.0	1 000	20704207	100.1		01 5	220101	
413.00 > 369.00 413.00 > 169.00		2.783 2.783	0.0	1.000 1.000	30784387 20338648	183.1	1.51(0.90-1.10)	91.5 91.5	229181 70063	
13 Perfluorohe				1.000	20330040		1.51(0.70-1.10)	71.5	70003	
449.00 > 80.00		2.790	0.001	1.000	38459925	166.5		87.5		
18 Perfluorooct	ane sulf	onic aci	d							
499.00 > 80.00	2.977	3.118	-0.141	1.000	40073141	192.2		104	5896	
499.00 > 99.00	3.152	3.118	0.034	1.059	9632026		4.16(0.90-1.10)	104	407968	
D 17 13C4 PFO										
503.00 > 80.00		3.151	0.001		10019454	40.3		84.2	105595	
D 19 13C5 PFN/ 468.00 > 423.00		3.153	-0.001		6718354	37.8		75.6	515582	
			-0.001		0710334	37.0		73.0	313362	
20 Perfluoronoi 463.00 > 419.00		3.155	0.005	1.000	24793148	193.9		96.9	307568	
D 21 13C8 FOS		0.100	0.000	1.000	21770110	170.7		, 0. ,	007000	
506.00 > 78.00		3.488	0.003		16105707	41.9		83.9	486146	
22 Perfluorooct	ane Sul	fonamid	е							
498.00 > 78.00	3.491	3.491	0.0	1.000	47803717	159.1		79.6	542400	
24 Perfluorodeo	canoic a	cid								
513.00 > 469.00	3.516	3.510	0.006	1.000	22616781	191.8		95.9	376094	
D 23 13C2 PFD										
515.00 > 470.00			-0.005		6246112	39.7		79.4	243806	
26 Perfluorodeo 599.00 > 80.00				1.000	23952412	195.7		101		
			-0.004	1.000	23932412	193.7		101		
28 Perfluoround 563.00 > 519.00		3.839	0.006	1.000	16852945	197.7		98.9	570796	
D 27 13C2 PFUr		0.007	0.000	1.000	10002710	. , , , ,		, 0. ,	0,0,70	
565.00 > 520.00		3.842	0.003		4456593	38.0		76.0	208308	
D 30 13C2 PFD	οA									
615.00 > 570.00	4.129	4.132	-0.003		4649092	41.9		83.8	168499	
29 Perfluorodo	decanoi	c acid								
613.00 > 569.00	4.136	4.136	0.0	1.000	17425873	204.2		102	228085	
31 Perfluorotrid										
663.00 > 619.00		4.400	0.007	1.000	16038809	190.2		95.1	237459	
D 32 13C2-PFT6			0.007		0500740	44.0		00.7	074044	
715.00 > 670.00		4.641	-0.006		9520749	41.9		83.7	374846	
33 Perfluorotetr 712.50 > 668.90		4.642	-0.007	1.000	27310864	185.3		92.7	329988	
713.00 > 169.00		4.642		1.000	4963804	100.3	5.50(0.00-0.00)	92.7 92.7	195544	
D 34 13C2-PFH			2.007		.,00001		3.55(3.55 0.55)	. = . 1		
815.00 > 770.00		5.057	0.003		5190172	41.7		83.3	150380	
35 Perfluorohex										
813.00 > 769.00		5.059	0.001	1.000	17754908	199.3		99.6	19037	
36 Perfluorooct	adecan	oic acid								
913.00 > 869.00	5.414	5.414	0.0	1.000	18392980	192.0		96.0	19845	

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC-L6_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 13:06:46 Instrument ID: A8_N Lims ID: IC L6 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 42 Worklist Smp#: 9 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 (X1000000) 042 0036 ©36 00 00 00 30 ∑₂₄  $\approx$ 30 ≻₂₄-18 18 12 1.5 0.9 1.2 1.8 2.1 0.9 1.2 1.5 1.8 1.2 1.5 1.8 2.1 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 16 (X1000000) Y (0000001 12-(91<del>°</del> (00078 ×65 ∑₁₀ **≻**52 39 26 13 1.9 2.2 2.5 1.6 1.9 2.2 1.7 2.0 1.0 1.3 1.6 1.3 2.3 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 35 960 28-0024-0024-0024-(91⁻ 00078⁻ ×65⁻ 830 8₂₅-Ç₂₀ ~16<del>-</del> ≻52 15 39 10 26 1.9 2.2 2.5 1.8 2.1 2.7 2.1 2.4 1.6 2.8 1.5 2.4 1.8 2.7 3.0 1.5 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 (X1000000) (0000 36-1 30-684 0072 <del>∑</del>60 **≻**48 18 36 12 24 0 0 2.1 2.4 2.7 3.0 1.4 2.0 Page 546h of 678 3.2 1.8 2.1 2.4 2.7 1.8 3.0



3.4

3.7

4.0

3.0

2.7

3.3

3.6

3.9

4.2

2.4

3.0

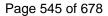
3.6

4.2

2.5

2.8

3.1



4.4

4.1

4.7

5.0

4.2

4.5

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5.4

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4.6

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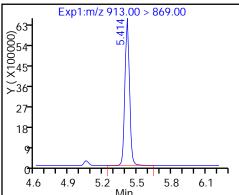
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5.5

5.8

Report Date: 16-Dec-2016 14:34:28 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:  $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_009.d$ 

## 36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d

Lims ID: IC L1 Add-on

Client ID:

Sample Type: IC Calib Level: 1

Inject. Date: 15-Dec-2016 13:41:05 ALS Bottle#: 46 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L1 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:44 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:58

i iist Level Neviewel, chandraselias				Date.	J	3-Dec-2010 10.37.3	10				
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 47 M2-6:2FTS	:									
	429.00 > 409.00		2.767	-0.007		5352965	45.8		96.3		
	48 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
	427.00 > 407.00	2.776	2.768	0.008	1.000	48011	0.4779		101		
	43 Sodium 1H,	1H,2H,2I	H-perflu	orooctan	е						
	527.00 > 507.00	3.511	3.511	0.0	1.000	39808	0.4671		97.5		
	D 42 M2-8:2FTS										
	529.00 > 509.00	3.511	3.513	-0.002		4817997	44.8		93.6		
	D 45 d3-NMeFO	SAA									
	573.00 > 419.00	3.684	3.676	0.008		3634985	48.3		96.5		
	44 N-methyl pe	rfluorood	ctane su	lfonami							
	570.00 > 419.00	3.684	3.681	0.003	1.000	29823	0.4637		92.7		
	D 46 d5-NEtFOS	SAA									
	589.00 > 419.00	3.848	3.842	0.006		3889792	49.6		99.3		
	49 N-ethyl perfl	uoroocta	ane sulfo	onamid							
	584.00 > 419.00	3.865	3.854	0.011	1.005	29965	0.4858		97.2		
	D 52 d-N-MeFO	SA-M									
	515.00 > 169.00	3.988	3.992	-0.004		4325034	45.5		91.0		
	54 MeFOSA										
	512.00 > 169.00	3.998	3.999	-0.001	1.000	36069	0.4978		99.6		
	D 51 d-N-EtFOS	A-M									
	531.00 > 169.00	4.180	4.180	0.0		3792851	44.2		88.4		
	53 N-ethylperflu	uoro-1-o	ctanesu	lfonami							
	526.00 > 169.00	4.187	4.187	0.0	1.000	30993	0.4729		94.6		

Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L1_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016BB_013.d

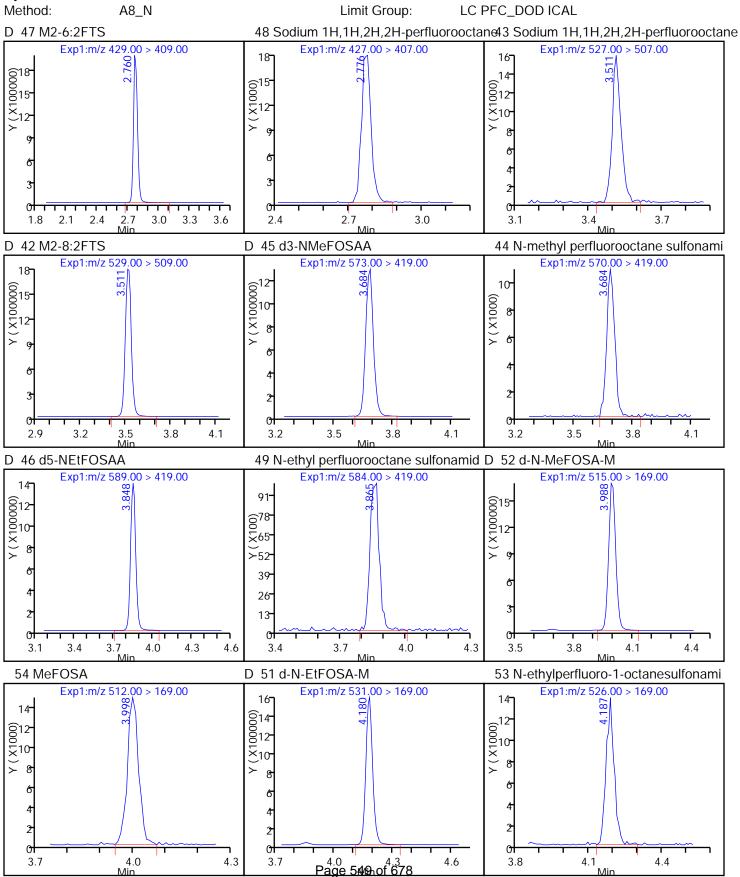
Injection Date: 15-Dec-2016 13:41:05 Instrument ID: A8_N

Lims ID: IC L1 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 46 Worklist Smp#: 13

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d

Lims ID: IC L2 Add-on

Client ID:

Sample Type: IC Calib Level: 2

Inject. Date: 15-Dec-2016 13:48:34 ALS Bottle#: 47 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L2 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:46 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:07

riist Level Reviewer. Chandrasenas						Date.	I	3-Dec-2016 16.36.C	) /		
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
	D 47 M2-6:2FTS										
	429.00 > 409.00		2.767	-0.006		5108306	43.7		91.9		
	48 Sodium 1H,		H-perflu	orooctan	e						
	427.00 > 407.00		•			106947	1.12		118		
	43 Sodium 1H,	1H 2H 2I	H-perflu	orooctan	e						
	527.00 > 507.00		•			75731	0.9308		97.2		
	D 42 M2-8:2FTS										
	529.00 > 509.00		3.513	-0.002		4599569	42.8		89.4		
	D 45 d3-NMeFO	SAA									
	573.00 > 419.00		3.676	-0.003		3559083	47.2		94.5		
	44 N-methyl pe	rfluorood	ctane su	lfonami							
	570.00 > 419.00				1.000	57389	0.9114		91.1		
	D 46 d5-NEtFOS	SAA									
	589.00 > 419.00	3.838	3.842	-0.004		3757014	48.0		95.9		
	49 N-ethyl perfl	luoroocta	ane sulfo	onamid							
	584.00 > 419.00		3.854		1.005	53623	0.9000		90.0		
	D 52 d-N-MeFO	SA-M									
	515.00 > 169.00	3.987	3.992	-0.005		4639527	48.8		97.6		
	54 MeFOSA										
	512.00 > 169.00	3.997	3.999	-0.002	1.000	70049	0.9013		90.1		
	D 51 d-N-EtFOS	A-M									
	531.00 > 169.00	4.172	4.180	-0.008		4109875	47.9		95.8		
	53 N-ethylperflu	uoro-1-o	ctanesul	lfonami							
	526.00 > 169.00				1.000	62962	0.8865		88.7		

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L2_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:47 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_014.d

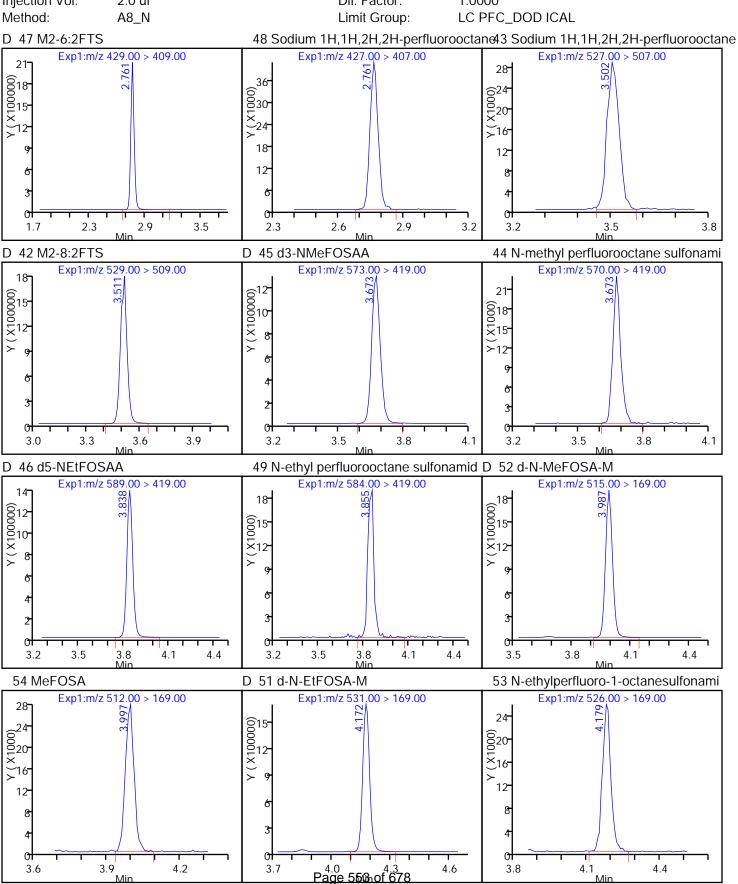
Injection Date: 15-Dec-2016 13:48:34 Instrument ID: A8_N

Lims ID: IC L2 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 47 Worklist Smp#: 14

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

Lims ID: IC L3 Add-on

Client ID:

Sample Type: IC Calib Level: 3

Inject. Date: 15-Dec-2016 13:56:03 ALS Bottle#: 48 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L3 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:48 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:17

. Hot 2010: Notice of Granding accorde											
	Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 4	7 M2-6:2FTS	;									
	9.00 > 409.00		2.767	0.001		5570739	47.6		100		
	Sodium 1H,		•								
	7.00 > 407.00				1.000	405060	3.87		81.7		
	Sodium 1H,		•			200457	4.00		00.0		
	7.00 > 507.00		3.511	0.0	1.000	398457	4.22		88.0		
	2 M2-8:2FTS 9.00 > 509.00		3 513	-0.002		5342826	49.7		104		
	5 d3-NMeFO		0.010	0.002		3342020	77.7		104		
	3.00 > 419.00		3.676	-0.003		4014623	53.3		107		
44	N-methyl pe	rfluoroo	ctane su	lfonami							
570	0.00 > 419.00	3.683	3.681	0.002	1.003	285665	4.02		80.4		
	6 d5-NEtFOS										
	9.00 > 419.00					4235352	54.1		108		
	N-ethyl perfl				1 000	0/7704	2.00		70.7		
	1.00 > 419.00		3.854	-0.007	1.002	267721	3.99		79.7		
	52 d-N-MeFO 5.00 > 169.00		3 003	-0.005		5121953	53.9		108		
	1.00 > 109.00 I MeFOSA	3.707	J. 77Z	-0.003		3121733	33.7		100		
	2.00 > 169.00	3.997	3.999	-0.002	1.000	343493	4.00		80.1		
D 5	1 d-N-EtFOS	A-M									
	.00 > 169.00		4.180	-0.001		4561882	53.2		106		
53	N-ethylperflu	uoro-1-o	ctanesu	lfonami							
526	5.00 > 169.00	4.186	4.187	-0.001	1.000	326877	4.15		82.9		

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L3_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:48 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_015.d

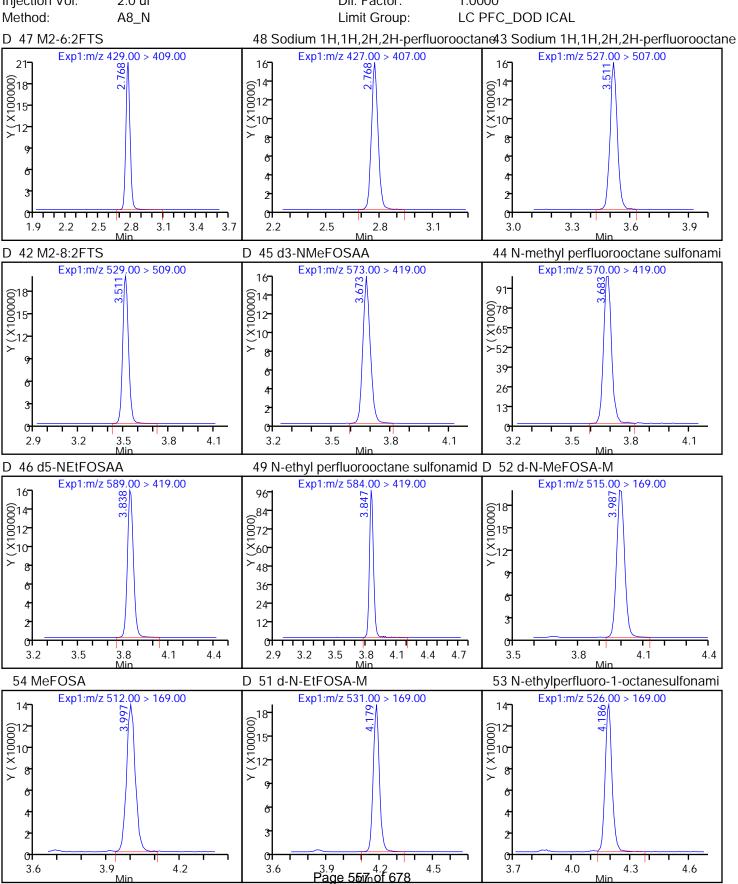
Injection Date: 15-Dec-2016 13:56:03 Instrument ID: A8_N

Lims ID: IC L3 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 48 Worklist Smp#: 15

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d

Lims ID: IC L4 Add-on

Client ID:

Sample Type: IC Calib Level: 4

Inject. Date: 15-Dec-2016 14:03:33 ALS Bottle#: 49 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L4 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:49 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:37:50

i ii ot 2010i i totiotioi i oriai aracciiac					24.0.	•	0 200 2010 1010710			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	6									
429.00 > 409.00	2.767	2.767	0.0		6471813	55.3		116		
48 Sodium 1H,		•								
427.00 > 407.00				1.000	2416384	19.9		105		
43 Sodium 1H, 527.00 > 507.00		•		e 1.000	2224381	21.0		110		
D 42 M2-8:2FTS		3.311	0.0	1.000	2224301	21.0		110		
529.00 > 509.00		3.513	-0.002		5984276	55.7		116		
D 45 d3-NMeFC	SAA									
573.00 > 419.00	3.673	3.676	-0.003		4379131	58.1		116		
44 N-methyl pe										
570.00 > 419.00		3.681	0.002	1.003	1708231	22.0		110		
D 46 d5-NEtFOS 589.00 > 419.00		2 0 1 2	0.004		4410456	56.3		113		
49 N-ethyl perf					4410430	50.5		113		
584.00 > 419.00			-0.007	1.002	1518918	21.7		109		
D 52 d-N-MeFO	SA-M									
515.00 > 169.00	3.997	3.992	0.005		5263980	55.4		111		
54 MeFOSA										
512.00 > 169.00		3.999	-0.002	1.000	1946985	22.1		110		
D 51 d-N-EtFOS		4.100	0.001		4/72020	<b>545</b>		100		
531.00 > 169.00					4672820	54.5		109		
53 N-ethylperfl 526.00 > 169.00			-0.001	1.000	1813178	22.5		112		
020.00 > 107.00	7. 100	1.107	3.001	1.000	1010170	22.0		112		

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L4_00003 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:50 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_016.d **Injection Date:** 15-Dec-2016 14:03:33 Instrument ID: A8_N Lims ID: IC L4 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 49 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 88 ©21<del>-</del> (277<del>-</del> (266-(270 (260 (260 ∑₁₅- $\stackrel{\smile}{\times}_{55}$  $\stackrel{\smile}{\times}_{50}$ ≻₄₀ 33 30 22 20 10 2.3 2.9 3.5 3.0 3.3 3.2 3.5 3.8 2.4 D 45 d3-NMeFOSAA D 42 M2-8:2FTS 44 N-methyl perfluorooctane sulfonami Exp1:m/z 570.00 > 419.00 Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.0051 (21⁻ 00018 ×15 56<del>-</del> (0048-1240-1240-**≻**32 24 4.0 3.9 3.2 3.5 3.8 3.4 3.7 4.3 3.3 4.2 2.9 4.1 3.1 3.0 3.6 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M D 46 d5-NEtFOSAA Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 > 169.00 16 217 847 0014 00 0012 00 (049-0042-000015-× ×35-<u>≻</u>10 ≻₂₈-21 3.6 3.9 4.2 3.3 3.9 4.2 3.8 4.1 3.3 3.6 4.5 54 MeFOSA D 51 d-N-EtFOSA-M 53 N-ethylperfluoro-1-octanesulfonami Exp1:m/z 512.00 > 169.00 Exp1:m/z 531.00 > 169.00 Exp1:m/z 526.00 > 169.00 (70-(060-63 0054 ×45 ×50 ≻40 ≻₃₆-30 27 20 18 10 0<del>0|</del> 3.8 4.1 4.4 3.5 3.8 4.1 4.4 Page 5611nof 678 4.7 3.7 4.0 4.3 4.6 3.5

Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_017.d

Lims ID: IC L5 Add-on

Client ID:

Sample Type: IC Calib Level: 5

Inject. Date: 15-Dec-2016 14:11:03 ALS Bottle#: 50 Worklist Smp#: 17

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L5 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:51 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:32

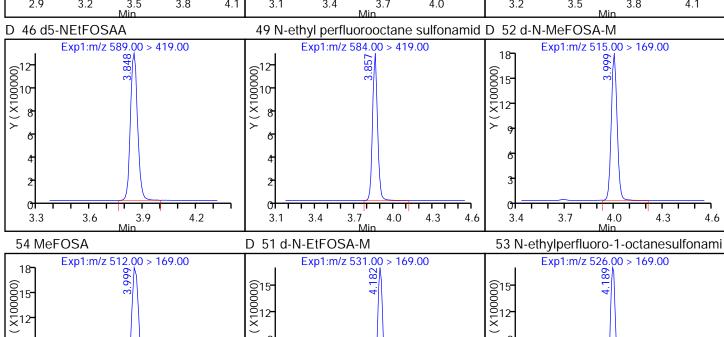
. Hot 2010: Hothorion dilana accinac										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	5									
429.00 > 409.00	2.767	2.767	0.0		5259120	45.0		94.6		
48 Sodium 1H,		•								
427.00 > 407.00				1.000	5166665	52.3		110		
43 Sodium 1H, 527.00 > 507.00		•			4015400	56.9		119		
D 42 M2-8:2FTS		3.311	0.001	0.998	4815680	30.9		119		
529.00 > 509.00		3.513	0.007		4786038	44.5		93.0		
D 45 d3-NMeFC		0.0.0	0.007					70.0		
573.00 > 419.00		3.676	-0.001		3422485	45.4		90.9		
44 N-methyl pe	erfluoroo	ctane su	lfonami							
570.00 > 419.00	3.684	3.681	0.003	1.003	3741936	61.8		124		
D 46 d5-NEtFOS										
589.00 > 419.00		3.842	0.006		3486329	44.5		89.0		
49 N-ethyl perf 584.00 > 419.00		ane sulfo 3.854		1.002	3414301	61.8		124		
D 52 d-N-MeFO		3.034	0.003	1.002	3414301	01.0		124		
515.00 > 169.00		3.992	0.007		4512300	47.5		94.9		
54 MeFOSA										
512.00 > 169.00	3.999	3.999	0.0	1.000	4407328	58.3		117		
D 51 d-N-EtFOS	SA-M									
531.00 > 169.00	4.182	4.180	0.002		4149228	48.4		96.7		
53 N-ethylperfl										
526.00 > 169.00	4.189	4.187	0.002	1.000	4264314	59.5		119		

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L5_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:51 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 15-Dec-2016 14:11:03 Instrument ID: A8_N Lims ID: IC L5 Add-on Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 50 Worklist Smp#: 17 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 47 M2-6:2FTS 48 Sodium 1H,1H,2H,2H-perfluorooctane43 Sodium 1H,1H,2H,2H-perfluorooctane Exp1:m/z 429.00 > 409.00 Exp1:m/z 427.00 > 407.00 Exp1:m/z 527.00 > 507.00 (0000015 (X) (X) (18 (000015 X12 18 15 \tau \( \tau \) 2.8 3.0 3.3 2.8 2.5 3.1 3.4 2.1 2.4 3.1 3.7 4.0 D 42 M2-8:2FTS D 45 d3-NMeFOSAA 44 N-methyl perfluorooctane sulfonami Exp1:m/z 529.00 > 509.00 Exp1:m/z 573.00 > 419.00Exp1:m/z 570.00 > 419.0018 12 14 Y (X100000) (X100000) × (X100000) × (X100000) (0000015⁻12⁻2 × 9 4.0 3.2 3.5 3.8 3.4 3.7 3.2 3.5 3.8 2.9 4.1 3.1 4.1 D 46 d5-NEtFOSAA 49 N-ethyl perfluorooctane sulfonamid D 52 d-N-MeFOSA-M Exp1:m/z 589.00 > 419.00 Exp1:m/z 584.00 > 419.00 Exp1:m/z 515.00 > 169.00 18 848 (X (X100000)) X (X100000) (X100000) X (X1000000) 000015 X 12



3.9 Page 565 of 678

4.5

3.9

3.6

4.2

4.5

4.8

0

3.6

0

3.6

3.9

4.2

Chrom Revision: 2.2 05-Dec-2016 12:37:22

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Lims ID: IC L6 Add-on

Client ID:

Sample Type: IC Calib Level: 6

Inject. Date: 15-Dec-2016 14:18:33 ALS Bottle#: 51 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: L6 ADD ON Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub6

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:34:52 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 16:38:39

. Hot 2010: Notice of Granding accorde										
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 47 M2-6:2FTS	S									
429.00 > 409.00		2.767	0.009		5576967	47.7		100		
48 Sodium 1H		•								
427.00 > 407.00				1.000	16907459	161.5		85.2		
43 Sodium 1H		•			1/111050	170.0		00.0		
527.00 > 507.00		3.511	0.005	1.000	16111959	170.3		88.9		
D 42 M2-8:2FTS 529.00 > 509.00		3.513	0.003		5348797	49.8		104		
D 45 d3-NMeF0		0.0.0	0.000		0010777	17.0				
573.00 > 419.00		3.676	0.004		3587176	47.6		95.2		
44 N-methyl pe	erfluoroo	ctane su	lfonami							
570.00 > 419.00	3.680	3.681	-0.001	1.000	12924122	203.6		102		
D 46 d5-NEtFO										
589.00 > 419.00			0.003		3725902	47.6		95.1		
49 N-ethyl perf 584.00 > 419.00				1 002	11020041	202.0		101		
D 52 d-N-MeFO		3.854	-0.001	1.002	11938061	202.0		101		
515.00 > 169.00		3.992	0.003		4658153	49.0		98.0		
54 MeFOSA	2 0.770	0.772	0.000		, 555 . 55	.,,,		70.0		
512.00 > 169.00	4.004	3.999	0.005	1.000	16114020	206.5		103		
D 51 d-N-EtFOS	SA-M									
531.00 > 169.00	4.186	4.180	0.006		4448546	51.9		104		
53 N-ethylperfl										
526.00 > 169.00	4.193	4.187	0.006	1.000	15780196	205.3		103		

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

LCPFC2-L6_00002 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:34:53 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

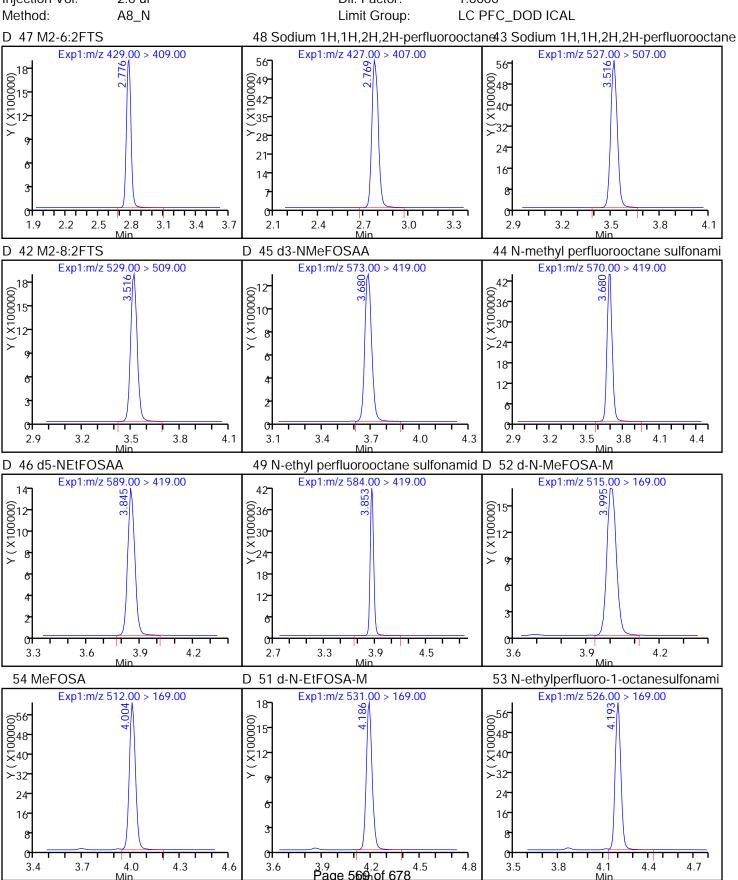
Injection Date: 15-Dec-2016 14:18:33 Instrument ID: A8_N

Lims ID: IC L6 Add-on

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 51 Worklist Smp#: 18

Injection Vol: 2.0 ul Dil. Factor: 1.0000



Chrom Revision: 2.2 05-Dec-2016 12:37:22

## FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: <u>ICV 320-142379/11</u> Calibration Date: <u>12/15/2016</u> 13:21

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 15DEC2016B_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.8479		49.7	50.0	-0.7	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	0.9654		48.9	50.0	-2.2	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.478		46.2	44.3	4.3	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9123		49.1	50.0	-1.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9679		49.4	50.0	-1.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	0.9556		43.8	47.3	-7.2	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.000		49.9	50.0	-0.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.160		50.1	47.6	5.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9360		49.2	50.0	-1.7	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9040		43.4	47.8	-9.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9182		49.2	50.0	-1.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9109		48.3	50.0	-3.5	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.5921		48.9	48.3	1.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9285		48.5	50.0	-2.9	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8958		48.8	50.0	-2.4	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9189		50.7	50.0	1.3	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.555		49.1	50.0	-1.9	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9309		48.2	50.0	-3.7	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8547		41.5	50.0	-17.0	25.0
13C4 PFBA	Ave	347743	335296		48.2	50.0	-3.6	50.0
13C5-PFPeA	Ave	266072	251719		47.3	50.0	-5.4	50.0
13C2 PFHxA	Ave	245110	240514		49.1	50.0	-1.9	50.0
13C4-PFHpA	Ave	226344	215455		47.6	50.0	-4.8	50.0
1802 PFHxS	Ave	326976	320282		46.3	47.3	-2.0	50.0
13C4 PFOA	Ave	230362	219488		47.6	50.0	-4.7	50.0
13C4 PFOS	Ave	248847	244549		47.0	47.8	-1.7	50.0
13C5 PFNA	Ave	177687	171464		48.2	50.0	-3.5	50.0
13C8 FOSA	Ave	384141	381142		49.6	50.0	-0.8	50.0
13C2 PFDA	Ave	157302	151370		48.1	50.0	-3.8	50.0
13C2 PFUnA	Ave	117250	116265		49.6	50.0	-0.8	50.0
13C2 PFDOA	Ave	110957	105818		47.7	50.0	-4.6	50.0
13C2 PFDOA 13C2-PFTeDA	Ave	227387	214066		47.1	50.0	-5.9	50.0
			118207		47.4	50.0	-5.1	50.0
13C2-PFHxDA	Ave	124568	11820/		4/.4	] 30.0	9.1	50.0

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d

Lims ID: ICV

Client ID:

Sample Type: ICV

Inject. Date: 15-Dec-2016 13:21:44 ALS Bottle#: 44 Worklist Smp#: 11

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: ICV_b

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist:

Method: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 14:41:15 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 15-Dec-2016 13:56:27

THE ECVENTION OF CHANGE OF CHANGE				Date.	<u> </u>	0 DCC 2010 10.00.2	,			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.534	-0.001		16764776	48.2		96.4	106845	7
1 Perfluorobuty	yric acid									
212.90 > 169.00	1.541	1.535	0.006	1.000	14214515	49.7			107570	
D 413C5-PFPe	Α									
267.90 > 223.00	1.810	1.810	0.0		12585925	47.3		94.6	118615	0
3 Perfluoropen										
262.90 > 219.00		1.810	0.0	1.000	12149802	48.9			115067	
5 Perfluorobuta				1 000	00054044	44.0				
298.90 > 80.00 298.90 > 99.00		1.848 1.848	0.0	1.000 1.000	20951066 9653760	46.2	2.17(0.00-0.00)			
7 Perfluorohex			0.0	1.000	9053700		2.17(0.00-0.00)			
313.00 > 269.00		2.096	0.004	1.000	10971106	49.1			243419	
D 6 13C2 PFHx		2.070	0.001	1.000	10771100				210117	
315.00 > 270.00		2.097	0.003		12025693	49.1		98.1	480449	
D 11 13C4-PFH	οΑ									
367.00 > 322.00		2.426	-0.001		10772772	47.6		95.2	728689	
12 Perfluorohe	otanoic a	acid								
363.00 > 319.00	2.433	2.428	0.005	1.000	10426957	49.4			97176	
9 Perfluorohex	anesulfo	onic acid								
399.00 > 80.00	2.449	2.431	0.018	1.000	14462013	43.8				
D 10 1802 PFH										
403.00 > 84.00	2.449	2.446	0.003		15149334	46.3		98.0	878432	
D 14 13C4 PFO										
417.00 > 372.00	2.785	2.783	0.002		10974392	47.6		95.3	756643	

Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d								_		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
15 Perfluorooct	tanoic ac	cid								
413.00 > 369.00		2.783	0.002	1.000	10976634	49.9			90975	
413.00 > 169.00	2.793	2.783	0.010	1.003	6473539		1.70(0.90-1.10)		241007	
13 Perfluorohe	•									
449.00 > 80.00		2.790	0.003	1.000	13497259	50.1				
18 Perfluorooct				1 000	4055/047	40.4			0.4.0000	
499.00 > 80.00 499.00 > 99.00		3.118 3.118	0.044 0.036	1.000 0.997	10556247 2582918	43.4	4.09(0.90-1.10)		368282 118191	
D 17 13C4 PFO		5.110	0.030	0.777	2502710		4.07(0.70-1.10)		110171	
503.00 > 80.00		3.151	0.011		11689450	47.0		98.3	325285	
D 19 13C5 PFN										
468.00 > 423.00		3.153	0.009		8573219	48.2		96.5	485749	
20 Perfluorono	nanoic a	cid								
463.00 > 419.00	3.162	3.155	0.007	1.000	8024621	49.2			123355	
D 21 13C8 FOS										
506.00 > 78.00		3.488	0.007		19057117	49.6		99.2	610709	
22 Perfluorooct				1 000	4740000	40.0			0005/0	
498.00 > 78.00		3.491	0.004	1.000	17498900	49.2			383568	
24 Perfluorode 513.00 > 469.00		3.510	0.010	1.000	6894043	48.3			189508	
D 23 13C2 PFD		3.310	0.010	1.000	0074043	40.5			107500	
515.00 > 470.00		3.513	0.007		7568491	48.1		96.2	377092	
26 Perfluorode										
599.00 > 80.00		3.822	0.008	1.000	6986242	48.9				
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00	3.848	3.839	0.009	1.000	5397748	48.5			115044	
D 27 13C2 PFU										
565.00 > 520.00	3.848	3.842	0.006		5813248	49.6		99.2	413801	
D 30 13C2 PFD										
615.00 > 570.00		4.132	0.007		5290885	47.7		95.4	272661	
29 Perfluorodo			0.002	1.000	4720775	40.0			00007	
613.00 > 569.00		4.136	0.003	1.000	4739775	48.8			99907	
31 Perfluorotric 663.00 > 619.00		4.400	0.011	1.000	4861713	50.7			113110	
D 32 13C2-PFT		1.100	0.011	1.000	1001710	00.7			110110	
715.00 > 670.00		4.641	0.001		10703301	47.1		94.1	614243	
33 Perfluoroteti	radecan	oic acid								
712.50 > 668.90		4.642	0.010	1.000	8229099	49.1			142471	
713.00 > 169.00	4.642	4.642	0.0	0.998	1339943		6.14(0.00-0.00)		99778	
D 34 13C2-PFH										
815.00 > 770.00	5.058	5.057	0.001		5910325	47.4		94.9	128290	
35 Perfluorohe										
813.00 > 769.00		5.059	-0.001	1.000	4925242	48.2			4012	
36 Perfluorooct			0.007	1 000	4500407	44 -			4 4 4 0	
913.00 > 869.00	5.421	5.414	0.007	1.000	4522136	41.5			4448	

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents: LCPFCIC_00020

LCPFCIC_00020 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 14:41:15 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: \ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d **Injection Date:** 15-Dec-2016 13:21:44 Instrument ID: A8_N Lims ID: **ICV** Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 44 Worklist Smp#: 11 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid D 413C5-PFPeA Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 267.90 > 223.00 649 00042 642 636 642 636 <del>∑</del>35 ×30- $\times_{30}$ ≻28 **≻**24 21 18 18 12 12 1.5 1.8 1.9 0.9 1.2 2.1 0.7 1.0 1.3 1.6 1.2 1.5 1.8 2.1 5 Perfluorobutanesulfonic acid 3 Perfluoropentanoic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 262.90 > 219.00 Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 80 642 000 36 036-036-×₂₄ ×30 ×50 ≻₄₀-18 18 30 12 20 12 10 2.0 1.5 1.8 2.1 2.4 1.7 2.3 1.8 2.1 1.5 1.2 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 (35⁻ (0030-(30-(35⁻ (35⁻ (35 42 (35<del>-</del> X1000001 30-×25 <u>~</u>20 **≻**20 18 15 15 12 10 10 1.8 2.1 1.8 2.1 2.7 2.0 2.6 2.4 2.7 1.5 2.4 1.4 3.2 1.5 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 49 (49⁻ 0042⁻ ×35⁻ 000042 00001 X <del>_</del>28− <del>_</del>20 ≻28 21 15 21 14 10 14 0 03.0 1.8 2.1 2.4 2.7 3.0 1.8 2.1 2.4 2.7 3.0 1.8 2.1 Page 5**%**5 of 678

2.4

3.0

3.6

4.2

2.7

3.0

3.3

3.6

3.9

4.2

2.9

3.2

3.5

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4.7

5.0

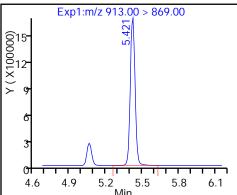
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4.7

Report Date: 16-Dec-2016 14:41:16 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:  $\ChromNa\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_011.d$ 

### 36 Perfluorooctadecanoic acid



### FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142571/4 Calibration Date: 12/16/2016 10:23

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016A_002.d Conc. Units: ng/mL

	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.8622		1.01	1.00	1.0	50.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.049		1.06	1.00	6.3	50.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.423		0.888	0.884	0.5	50.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9078		0.977	1.00	-2.3	50.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9636		0.984	1.00	-1.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.116		0.986	0.910	8.4	50.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.053		0.909	0.952	-4.5	50.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.073		1.07	1.00	7.0	50.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9456		0.994	1.00	-0.6	50.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	0.9280		0.866	0.928	-6.7	50.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9465		1.01	1.00	1.5	50.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9040		0.958	1.00	-4.2	50.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6119		1.01	0.964	4.8	50.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9903		1.04	1.00	3.6	50.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.8819		0.961	1.00	-3.9	50.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.7992		0.881	1.00	-11.9	50.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.924		1.21	1.00	21.4	50.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		1.721		1.20	1.00	20.3	50.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	1.124		1.09	1.00	9.1	50.0
13C4 PFBA	Ave	347743	351306		50.5	50.0	1.0	50.0
13C5-PFPeA	Ave	266072	280609		52.7	50.0	5.5	50.0
13C2 PFHxA	Ave	245110	256291		52.3	50.0	4.6	50.0
13C4-PFHpA	Ave	226344	231480		51.1	50.0	2.3	50.0
1802 PFHxS	Ave	326976	312827		45.3	47.3	-4.3	50.0
13C4 PFOA	Ave	230362	240945		52.3	50.0	4.6	50.0
13C4 PFOS	Ave	248847	245399		47.1	47.8	-1.4	50.0
13C5 PFNA	Ave	177687	174548		49.1	50.0	-1.8	50.0
13C8 FOSA	Ave	384141	416037		54.2	50.0	8.3	50.0
13C2 PFDA	Ave	157302	168574		53.6	50.0	7.2	50.0
13C2 PFUnA	Ave	117250	124386		53.0	50.0	6.1	50.0
13C2 PFDoA	Ave	110957	116679		52.6	50.0	5.2	50.0
13C2-PFTeDA	Ave	227387	254344		55.9	50.0	11.9	50.0
13C2-PFHxDA	Ave	124568	149310		59.9	50.0	19.9	50.0

Report Date: 16-Dec-2016 15:49:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d

Lims ID: CCV L2

Client ID:

Sample Type: CCVL

Inject. Date: 16-Dec-2016 10:23:18 ALS Bottle#: 38 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L2

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 16-Dec-2016 15:49:37 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK007

First Level Reviewer: chandrasenas Date: 16-Dec-2016 14:29:50

First Level Revie	wer: cha	ındrasen	as		Date:	1	6-Dec-2016 14:29:5	۰0		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1 Perfluorobut 212.90 > 169.00	,	1.606	0.001	1.000	302902	1.01		101	2474	
D 213C4 PFBA 217.00 > 172.00	١		-0.007		17565315	50.5		101	866076	
3 Perfluoroper 262.90 > 219.00	ntanoic a		0.0	1.000	294297	1.06		106	2755	
D 4 13C5-PFPe 267.90 > 223.00	eΑ	1.897	-0.009		14030435	52.7		105	1255780	)
5 Perfluorobut			-0.009	1.000	393624	0.8880		100	. 2007 0	
	1.926	1.935	-0.009	1.000	165281	0.0000	2.38(0.00-0.00)	100		
315.00 > 270.00 7 Perfluorohex	2.195	2.198	-0.003		12814553	52.3		105	782638	
313.00 > 269.00 9 Perfluorohex	2.195	2.198	-0.003	1.000	232669	0.9774		97.7	8322	
399.00 > 80.00	2.559	2.483	0.076	1.000	317736	0.9861		108		
D 11 13C4-PFH 367.00 > 322.00	2.536	2.541	-0.004		11574024	51.1		102	991176	
12 Perfluorohe 363.00 > 319.00	2.544	2.541	0.004	1.000	223051	0.9844		98.4	3086	
D 10 18O2 PFH 403.00 > 84.00	2.559	2.556	0.003		14796729	45.3		95.7	2677196	5
15 Perfluorooci 413.00 > 369.00 413.00 > 169.00	2.918	2.908 2.908	0.010 0.002	1.000 0.997	258512 154761	1.07	1.67(0.90-1.10)	107	1784 8352	
D 14 13C4 PFO	A			U.771		E2 2	1.07(0.70-1.10)	105		=
417.00 > 372.00	2.910	2.908	0.002		12047249 Page 580 of 6	678 ^{52.3}		105	142875	0

Data File:	\\Chr	omNa\S	acramen	to\Chrom	Data\A8_N\201	61216-3793	2.b\16DEC2016A_0	002.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ptanesu	Ifonic Ac	id							
449.00 > 80.00	•		-0.006	1.000	245887	0.9093		95.5		
D 17 13C4 PFO	S									
503.00 > 80.00	3.283	3.280	0.002		11730050	47.1		98.6	501134	
18 Perfluorooc	tane sulf	onic aci	d							M
499.00 > 80.00		3.280	0.010	1.000	211342	0.8660		93.3	18713	M
499.00 > 99.00		3.280	0.002	0.998	49645		4.26(0.90-1.10)		3734	M
D 19 13C5 PFN										
468.00 > 423.00		3.288	0.002		8727391	49.1		98.2	599988	
20 Perfluorono				1 000	1/5050	0.00		00.4	0/10	
463.00 > 419.00			0.002	1.000	165059	0.99		99.4	3619	
22 Perfluorooc				1 000	2027/4	1.01		101	25222	
498.00 > 78.00		3.598	0.001	1.000	393764	1.01		101	35223	
D 21 13C8 FOS		2.500	0.007		20001041	E4.0		100	471/50	
506.00 > 78.00			-0.007		20801841	54.2		108	471659	
24 Perfluorode 513.00 > 469.00			0.007	1.000	152391	0.9578		95.8	5207	
		3.040	-0.007	1.000	132391	0.9376		93.0	3207	
D 23 13C2 PFD. 515.00 > 470.00		3.648	0.002		8428699	53.6		107	260747	
26 Perfluorode					0420077	55.0		107	200747	
599.00 > 80.00		3.951	0.004	1.000	144764	1.01		105		
28 Perfluoroun			0.001	1.000	111701	1.01		100		
563.00 > 519.00		3.969	0.004	1.000	123173	1.04		104	2615	
D 27 13C2 PFU		0.707	0.00.		0.70				20.0	
565.00 > 520.00		3.978	-0.005		6219308	53.0		106	243473	
29 Perfluorodo										
613.00 > 569.00		4.271	0.0	1.000	102894	0.9606		96.1	1129	
D 30 13C2 PFD	οA									
615.00 > 570.00		4.262	0.009		5833967	52.6		105	216296	
31 Perfluorotrio	decanoic	acid								
663.00 > 619.00		4.530	0.006	1.000	93253	0.8813		88.1	130	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90	4.780	4.768	0.012	1.000	224469	1.21		121	110	
713.00 > 169.00	4.780	4.768	0.012	1.000	39049		5.75(0.00-0.00)		7170	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.780	4.768	0.012		12717194	55.9		112	786052	
35 Perfluorohe	xadecan	oic acid								
813.00 > 769.00	5.209	5.191	0.018	1.000	200813	1.20		120	323	
D 34 13C2-PFH	xDA									
815.00 > 770.00	5.198	5.191	0.007		7465499	59.9		120	169315	
36 Perfluorooc	tadecan	oic acid								
913.00 > 869.00	5.576	5.561	0.015	1.000	131139	1.09		109	338	

Report Date: 16-Dec-2016 15:49:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22

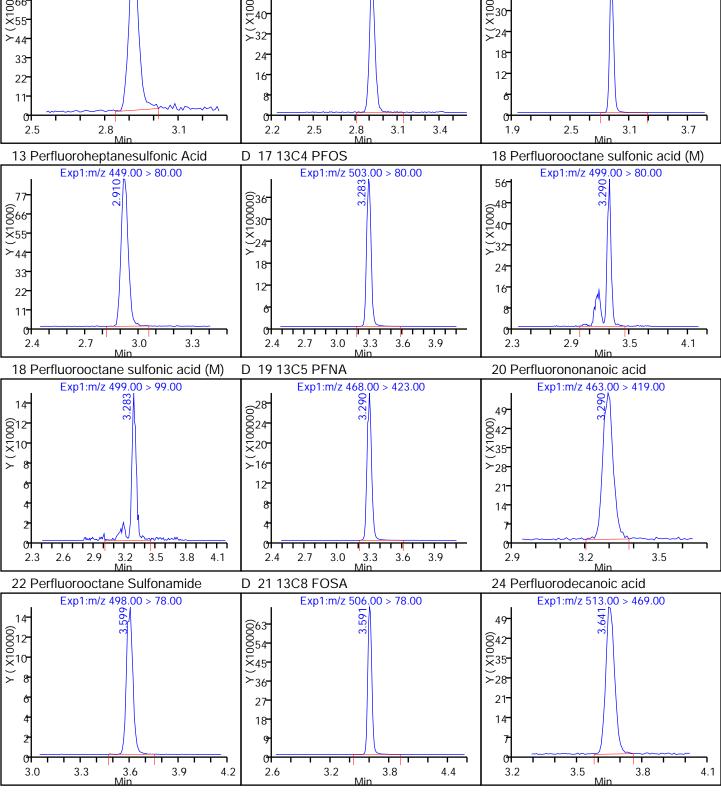
QC Flag Legend Review Flags

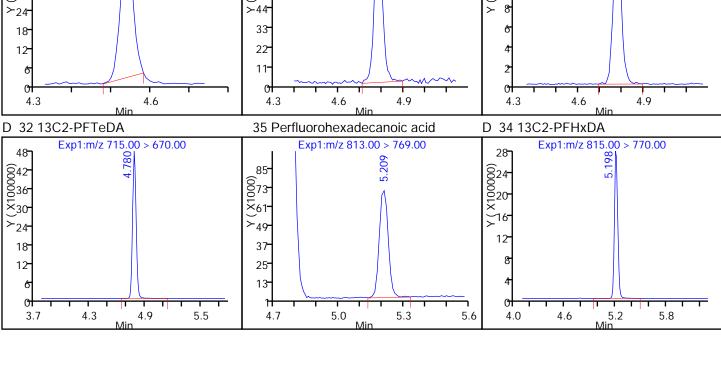
M - Manually Integrated

Reagents:

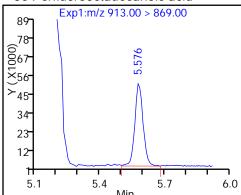
LCPFC-L2_00023 Amount Added: 1.00 Units: mL

Report Date: 16-Dec-2016 15:49:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 10:23:18 Instrument ID: A8_N Lims ID: CCV L2 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ 1 Perfluorobutyric acid D 213C4 PFBA 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 217.00 > 172.00 Exp1:m/z 262.90 > 219.00 (00042-200001 (00042-35-7 (X10000) ©72 <del>∑</del>60 <del>_</del>28<del>-</del> **≻**48 21 36 24 14 12 1.9 2.0 1.2 1.5 1.8 2.1 1.0 1.3 1.6 1.4 1.7 2.3 4 13C5-PFPeA D 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00(15⁻ (×) × 9 63 00042 35 654° <del>-</del>45 ∑28<del>-</del> **≻**36 21 27 14 18 1.9 2.2 2.5 2.8 2.0 2.0 1.3 1.6 1.7 1.7 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 Y (X10000) 84 042 0036 672-×60 ×30-**≻**48 36 18 12 24 12 2.0 2.3 2.6 2.9 2.1 1.9 2.2 2.5 1.7 2.4 2.8 3.1 1.8 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 40 ()49 ()000 42 ()49 77-035 030 30 <del>-</del>55<del>-</del> ×35 ×25 ×28 **≻44 ≻**20 33 21 15 22 14 11 0 0 1.9 2.2 2.5 2.8 2.2 2.8 2.0 2.6 3.2 3.1 1.4 1.6 Page 58% of 678





#### 36 Perfluorooctadecanoic acid



Report Date: 16-Dec-2016 15:49:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d

Injection Date: 16-Dec-2016 10:23:18 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

Column: Detector EXP1

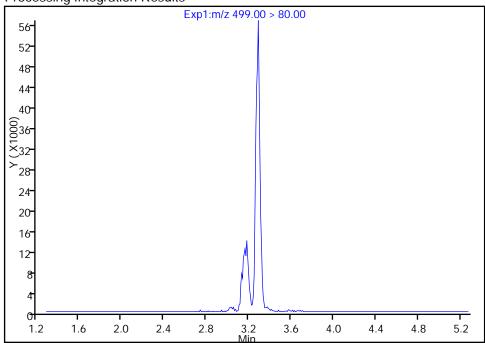
#### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

Signal: 1

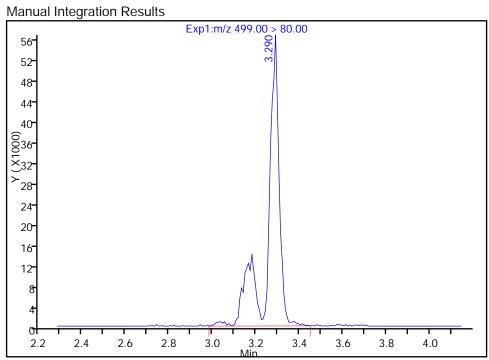
Not Detected

Expected RT: 3.28

**Processing Integration Results** 



RT: 3.29
Area: 211342
Amount: 0.866023
Amount Units: ng/ml



Reviewer: chandrasenas, 16-Dec-2016 14:29:50

Audit Action: Manually Integrated

Audit Reason: Assign Peak

Page 587 of 678

Report Date: 16-Dec-2016 15:49:37 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Manual Integration/User Assign Peak Report

TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161216-37932.b\16DEC2016A_002.d

Injection Date: 16-Dec-2016 10:23:18 Instrument ID: A8_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8 ALS Bottle#: 38 Worklist Smp#: 4

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Method: A8_N Limit Group: LC PFC_DOD ICAL

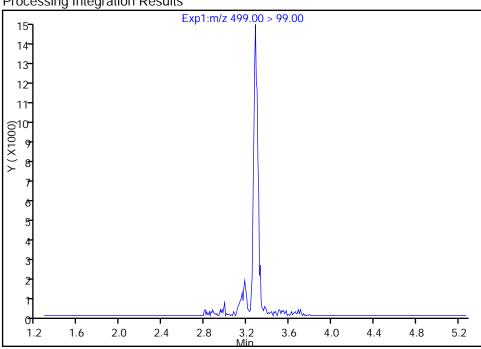
Column: Detector EXP1

#### 18 Perfluorooctane sulfonic acid, CAS: 1763-23-1

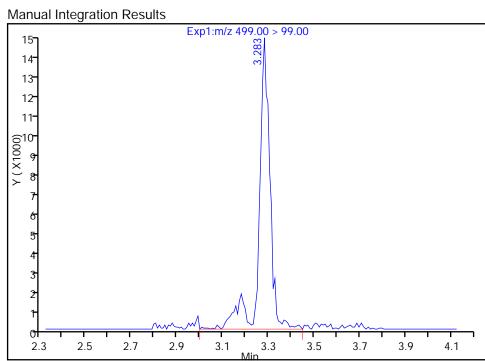
Signal: 2

Not Detected Expected RT: 3.28

**Processing Integration Results** 



RT: 3.28
Area: 49645
Amount: 0.866023
Amount Units: ng/ml



Reviewer: chandrasenas, 16-Dec-2016 14:29:50

Audit Action: Manually Integrated

Audit Reason: Assign Peak

Page 588 of 678

# FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142751/2 Calibration Date: 12/16/2016 18:07

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016C_002.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.8537	0.9085		53.2	50.0	6.4	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.002		50.8	50.0	1.5	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.614		50.4	44.2	13.9	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9228		49.7	50.0	-0.6	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.053		46.5	45.5	2.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9427		48.2	50.0	-3.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.015		50.6	50.0	1.2	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.203		52.0	47.6	9.2	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.043		48.7	46.4	4.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9759		51.3	50.0	2.5	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9190		49.3	50.0	-1.5	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9278		49.2	50.0	-1.7	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6212		51.3	48.2	6.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9668		50.6	50.0	1.1	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9702		52.8	50.0	5.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.8942		49.3	50.0	-1.4	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.686		53.2	50.0	6.4	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9292		48.1	50.0	-3.9	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8924		43.3	50.0	-13.4	25.0
13C4 PFBA	Ave	347743	324815		46.7	50.0	-6.6	50.0
13C5-PFPeA	Ave	266072	250452		47.1	50.0	-5.9	50.0
13C2 PFHxA	Ave	245110	230926		47.1	50.0	-5.8	50.0
13C4-PFHpA	Ave	226344	204941		45.3	50.0	-9.5	50.0
1802 PFHxS	Ave	326976	295951		42.8	47.3	-9.5	50.0
13C4 PFOA	Ave	230362	205127		44.5	50.0	-11.0	50.0
13C4 PFOS	Ave	248847	231691		44.5	47.8	-6.9	50.0
13C5 PFNA	Ave	177687	154726		43.5	50.0	-12.9	50.0
13C8 FOSA	Ave	384141	371623		48.4	50.0	-3.3	50.0
13C2 PFDA	Ave	157302	140694		44.7	50.0	-10.6	50.0
13C2 PFUnA	Ave	117250	105626		45.0	50.0	-9.9	50.0
13C2 PFDoA	Ave	110957	101100		45.6	50.0	-8.9	50.0
13C2-PFTeDA	Ave	227387	197360		43.4	50.0	-13.2	50.0
1002 111021	1			I				

Report Date: 18-Dec-2016 17:57:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_002.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 16-Dec-2016 18:07:45 ALS Bottle#: 41 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:57:38 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:27:02

First Level Revie	wer: cha	ındrasen	ias		Date:	1	8-Dec-2016 17:27:0	)2		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	٨									
217.00 > 172.00	1.582	1.582	0.0		16240726	46.7		93.4	824263	
1 Perfluorobut	,									
212.90 > 169.00		1.582	0.0	1.000	14754745	53.2		106	110916	
3 Perfluoroper 262.90 > 219.00		cid 1.858	0.0	1.000	12545897	50.8		102	106094	
D 4 13C5-PFP6		1.000	0.0	1.000	12545697	50.6		102	100094	
267.90 > 223.00		1.858	0.0		12522619	47.1		94.1	902879	
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.896	0.0	1.000	21116511	50.4		114		
298.90 > 99.00		1.896	0.0	1.000	9675442		2.18(0.00-0.00)			
D 613C2 PFHx		2 1 5 5	0.0		1154/207	47.1		04.2	/0//50	
315.00 > 270.00 7 Perfluorohex		2.155	0.0		11546297	47.1		94.2	686659	
313.00 > 269.00		2.164	0.0	1.000	10655163	49.7		99.4	371119	
D 11 13C4-PFH										
367.00 > 322.00	•	2.494	0.0		10247037	45.3		90.5	943509	
12 Perfluorohe	ptanoic a	acid								
363.00 > 319.00		2.502	0.0	1.000	9660067	48.2		96.3	108131	
D 10 1802 PFH		0.540	0.0		12000402	40.0		00.5	1/5001/	2
403.00 > 84.00		2.510			13998483	42.8		90.5	1658012	2
9 Perfluorohex 399.00 > 80.00		2.433	0.0	1.000	14185189	46.5		102		
15 Perfluorooc			0.0	1.000	14103107	40.5		102		
413.00 > 369.00		2.858	0.0	1.000	10409558	50.6		101	88116	
413.00 > 169.00	2.858	2.858	0.0	1.000	6531849		1.59(0.90-1.10)		276851	
D 14 13C4 PFO										
417.00 > 372.00	2.858	2.858	0.0		10256344 Page 590 of 6	78 ^{44.5}		89.0	506698	

**EXP** DLT REL **Amount** Signal **RT** RT RT RT Response ng/ml Ratio(Limits) %Rec S/N Flags 13 Perfluoroheptanesulfonic Acid 449.00 > 80.00 2.866 1.000 109 2.866 0.0 52.0 13265190 18 Perfluorooctane sulfonic acid 1.000 499.00 > 80.00 3.115 3.115 0.0 48.7 105 115970 11216848 499.00 > 99.00 3.123 3.115 1.003 4.70(0.90-1.10) 32026 0.008 2387102 D 19 13C5 PFNA 468.00 > 423.00 3.230 3.230 0.0 7736293 43.5 87.1 369229 D 17 13C4 PFOS 503.00 > 80.00 3.230 3.230 0.0 11074827 44.5 93.1 278664 20 Perfluorononanoic acid 463.00 > 419.00 3.239 51.3 117198 3.239 0.0 1.000 7549557 103 D 21 13C8 FOSA 506.00 > 78.00 3.561 3.561 0.0 48.4 96.7 538663 18581143 22 Perfluorooctane Sulfonamide 498.00 > 78.00 3.561 49.3 3.561 1.000 17075700 98.5 665756 24 Perfluorodecanoic acid 513.00 > 469.00 3.586 49.2 3.586 0.0 1.000 6526565 98.3 246564 D 23 13C2 PFDA 515.00 > 470.00 3.595 7034714 44.7 89.4 174967 3.595 0.0 26 Perfluorodecane Sulfonic acid 599.00 > 80.00 3.899 3.899 0.0 1.000 6936847 51.3 106 28 Perfluoroundecanoic acid 563.00 > 519.00 3.916 3.916 0.0 1.000 5106006 50.6 101 105918 D 27 13C2 PFUnA 565.00 > 520.00 3.907 279901 3.907 0.0 5281284 45.0 90.1 D 30 13C2 PFDoA 615.00 > 570.00 4.203 4.203 0.0 5055012 45.6 91.1 129750 29 Perfluorododecanoic acid 613.00 > 569.00 4.203 4.203 0.0 1.000 4904575 52.8 106 80208 31 Perfluorotridecanoic acid 663.00 > 619.00 4.467 49.3 4.467 0.0 1.000 4520371 98.6 92825 D 32 13C2-PFTeDA 715.00 > 670.00 4.711 4.711 0.0 9868020 43.4 86.8 901399 33 Perfluorotetradecanoic acid 712.50 > 668.90 4.711 4.711 0.0 1.000 8525230 53.2 106 6408 713.00 > 169.00 4.702 4.711 6.23(0.00-0.00) -0.009 0.998 1367702 167536 35 Perfluorohexadecanoic acid 813.00 > 769.00 5.112 5.112 0.0 1.000 4696863 48.1 96.1 5864 D 34 13C2-PFHxDA 815.00 > 770.00 5.123 5.123 0.0 5354260 43.0 86.0 108597 36 Perfluorooctadecanoic acid 913.00 > 869.00 5.471 5.471 0.0 1.000 4510902 43.3 86.6 7951 Reagents: LCPFC-L5_00022 Amount Added: 1.00 Units: mL

Report Date: 18-Dec-2016 17:57:39 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 18:07:45 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262,90 > 219.00 (42⁻ (0036⁻ (30⁻ 642 0036 ×30 000042 X <u></u> ≥28-<del>-</del>24 21 18 18 12 12 1.7 2.0 1.9 1.1 1.4 2.3 1.0 1.3 1.6 1.5 2.1 2.4 Mir 5 Perfluorobutanesulfonic acid 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0080 (0000 36-30-635<del>-</del> ×25 ×50 ≻24 ≻₄₀-**≻20** 18 30 15 20 10 10 1.8 2.1 1.8 2.1 2.4 2.1 1.2 1.5 1.8 2.7 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 313.00 > 269.00Exp1:m/z 315.00 > 270.00 Exp1:m/z 367.00 > 322.00 42 155 (35-0030-125-(35-0030-1×25-836 <u>§</u>30 ∑₂₄->20 ≻20 18 15 15 12 10 10 2.1 1.7 2.0 2.3 2.9 1.8 2.4 2.7 2.6 2.1 2.7 3.3 1.5 1.4 12 Perfluoroheptanoic acid D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 363.00 > 319.00 Exp1:m/z 403.00 > 84.00 Exp1:m/z 399.00 > 80.00 35<del>-</del> 42 49 510 000001 25 (000001 30-30-(00042<del>-</del> 000015-00042-∑₂₀ <u></u>28− 15 21 18 10 12 14 0 0 2.0 2.3 2.6 2.9 1.5 3.3 1.9 2.2 2.5 2.8 3.1 2.1 Page 592h of 678 1.6

3.5

3.8

4.1

2.9

3.2

3.8

4.1

16<del>-</del>

2.6

2.9

3.2

3.0

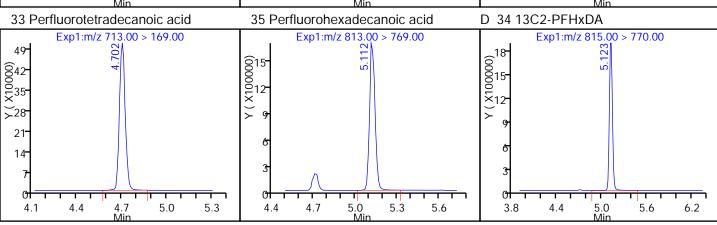
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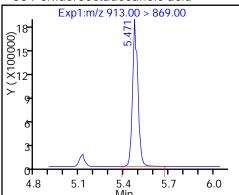
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4.2

4.5



36 Perfluorooctadecanoic acid



# FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142751/16 Calibration Date: 12/16/2016 19:52

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016C_016.d Conc. Units: ng/mL

7 N 7 T V 10 T 1	CHDVE	ATTE DDE	RRF	MIN RRF	CALC	SPIKE	%D	MAX
ANALYTE	CURVE TYPE	AVE RRF	KKF	MIN KKE	AMOUNT	AMOUNT	0.0	%D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9548		22.4	20.0	11.8	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.073		21.7	20.0	8.7	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.776		22.2	17.7	25.4*	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9731		21.0	20.0	4.8	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.019		20.8	20.0	4.1	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.089		19.2	18.2	5.7	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.082		21.6	20.0	7.9	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.190		20.6	19.0	8.0	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.056		19.7	18.6	6.2	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9911		20.8	20.0	4.1	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	1.016		21.8	20.0	9.0	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9656		20.5	20.0	2.3	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6357		21.0	19.3	8.9	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9822		20.5	20.0	2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9649		21.0	20.0	5.1	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9016		19.9	20.0	-0.6	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.621		20.5	20.0	2.3	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9609		19.5	20.0	-2.3	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8947		17.4	20.0	-13.2	25.0
13C4 PFBA	Ave	347743	360400		51.8	50.0	3.6	50.0
13C5-PFPeA	Ave	266072	283229		53.2	50.0	6.4	50.0
13C2 PFHxA	Ave	245110	246990		50.4	50.0	0.8	50.0
13C4-PFHpA	Ave	226344	221132		48.8	50.0	-2.3	50.0
1802 PFHxS	Ave	326976	320169		46.3	47.3	-2.1	50.0
13C4 PFOA	Ave	230362	234925		51.0	50.0	2.0	50.0
13C4 PFOS	Ave	248847	253815		48.8	47.8	2.0	50.0
13C5 PFNA	Ave	177687	177532		50.0	50.0	-0.0	50.0
13C8 FOSA	Ave	384141	400610		52.1	50.0	4.3	50.0
13C2 PFDA	Ave	157302	161562		51.4	50.0	2.7	50.0
		117250	122223		52.1	50.0	4.2	50.0
13C2 PFUnA	Ave	11/250	117459		52.9	50.0	5.9	50.0
13C2 PFDoA	Ave				48.0	50.0	-4.1	50.0
13C2-PFTeDA	Ave	227387	218087					
13C2-PFHxDA	Ave	124568	122332		49.1	50.0	-1.8	50.0

Report Date: 18-Dec-2016 17:59:49 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_016.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 16-Dec-2016 19:52:44 ALS Bottle#: 40 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:59:48 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

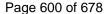
First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:41:53

First Level Revie	wer: cha	ndrasen	as		Date:	1	8-Dec-2016 17:41:5	3		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA 217.00 > 172.00		1.582	0.0		18019986	51.8		104	108814	6
1 Perfluorobut 212.90 > 169.00	,	1.582	0.0	1.000	6882219	22.4		112	50376	
3 Perfluoroper 262.90 > 219.00	1.858	cid 1.858	0.0	1.000	6076718	21.7		109	56110	
D 4 13C5-PFP6 267.90 > 223.00 5 Perfluorobut	1.858	1.858	0.0		14161437	53.2		106	886419	
298.90 > 80.00	1.896 1.896	1.896 1.896	0.0	1.000 1.000	10054296 4252000	22.2	2.36(0.00-0.00)	125		
D 6 13C2 PFHx 315.00 > 270.00		2.153	0.0		12349497	50.4		101	114481;	3
7 Perfluorohex 313.00 > 269.00	2.153	2.153	0.0	1.000	4807048	21.0		105	162675	
D 11 13C4-PFH 367.00 > 322.00	2.500	2.500	0.0		11056609	48.8		97.7	627047	
12 Perfluorohe 363.00 > 319.00 9 Perfluorohe	2.492	2.492		1.000	4506482	20.8		104	50900	
399.00 > 80.00 D 10 1802 PFH	2.515	2.515		1.000	6342778	19.2		106		
	2.508	2.508	0.0		15143997	46.3		97.9	139262	4
413.00 > 369.00 413.00 > 169.00	2.847	2.847 2.847	0.0	1.000 1.000	5085458 3057250	21.6	1.66(0.90-1.10)	108	44457 150757	
D 14 13C4 PFO 417.00 > 372.00		2.855	0.0		11746274 Page 597 of 6	578 ^{51.0}		102	671824	

Report Date: 18-Dec-2016 17:59:49 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_016.d

Data File:	NChr	JiiiNa\5	acrameni	lo/Chrom	Data\A8_N\201	01218-3797	2.D(16DEC2016C_C	)16.u		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
J				101	rtosponso	119/1111	rtano(zmmo)	701100	Ont	1 lago
13 Perfluorohe 449.00 > 80.00	•	tonic Ac 2.855		1.000	5750999	20.6		108		
18 Perfluorooc				1.000	3730777	20.0		100		
499.00 > 80.00	3.120	3.120		1.000	4973857	19.7		106	49208	
499.00 > 99.00	3.227	3.120	0.107	1.034	1062375		4.68(0.90-1.10)		65572	
D 19 13C5 PFN	A									
468.00 > 423.00	3.227	3.227	0.0		8876620	50.0		99.9	997107	
D 17 13C4 PFO										
503.00 > 80.00		3.227	0.0		12132354	48.8		102	423026	
20 Perfluorono			0.0	1.000	2510105	20.8		104	60854	
463.00 > 419.00		3.227	0.0	1.000	3519195	20.8		104	00834	
D 21 13C8 FOS 506.00 > 78.00		3.558	0.0		20030484	52.1		104	695501	
22 Perfluorooc					20030404	32.1		104	073301	
498.00 > 78.00		3.558		1.000	8143123	21.8		109	298280	
24 Perfluorode		cid								
513.00 > 469.00		3.583	0.0	1.000	3120158	20.5		102	93913	
D 23 13C2 PFD	A									
515.00 > 470.00	3.583	3.583	0.0		8078109	51.4		103	240628	
26 Perfluorode		lfonic ac	id							
599.00 > 80.00	3.893	3.893	0.0	1.000	3110617	21.0		109		
28 Perfluoroun										
563.00 > 519.00		3.911	0.0	1.000	2401012	20.5		103	56175	
D 27 13C2 PFU 565.00 > 520.00		3.902	0.0		41111E2	52.1		104	252504	
		3.902	0.0		6111153	52.1		104	353504	
D 30 13C2 PFD 615.00 > 570.00		4.198	0.0		5872931	52.9		106	223924	
29 Perfluorodo			0.0		3072731	52.7		100	223724	
613.00 > 569.00			0.0	1.000	2266617	21.0		105	49272	
31 Perfluorotrio										
663.00 > 619.00		4.459	0.0	1.000	2117899	19.9		99.4	33142	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.693	4.693	0.0		10904346	48.0		95.9	403485	
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90		4.702	0.0	1.000	3807671	20.5		102	2604	
713.00 > 169.00		4.702	-0.009	0.998	610917		6.23(0.00-0.00)		112709	
35 Perfluorohe			0.0	1 000	2257222	10.5		07.7	04.40	
813.00 > 769.00		5.110	0.0	1.000	2257383	19.5		97.7	2143	
D 34 13C2-PFH 815.00 > 770.00		5.110	0.0		6116579	49.1		98.2	116276	
			0.0		0110379	47. I		70.Z	1102/0	
36 Perfluorooc 913.00 > 869.00		5.467	0.0	1.000	2101776	17.4		86.8	3271	
Reagents:	J.7U <i>1</i>	J. TU /	0.0	1.000	2101110	17.4		50.0	JZ / I	
LCPFC-L4_0002	24		Δ	mount A	dded: 1.00	Units	a: mL			
	•		,			Orinto	····-			

Report Date: 18-Dec-2016 17:59:49 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 19:52:44 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 049 0042 ©21• 00 00 018• ×35 ≻₂₈ 21 14 0.9 1.2 1.8 2.1 8.0 1.1 1.4 1.7 2.0 1.1 1.4 1.7 2.0 2.3 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid 5 Perfluorobutanesulfonic acid D Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 18 (35<del>-</del> 0030-1×25-(049 00042 ×35 (00005 X12 2 3 4 9 --20 ≻28 15 21 10 1.8 1.8 2.1 2.4 2.1 2.1 1.2 1.5 1.8 2.7 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 18 153 (000001 36-30-(35 (00030 (25 (35) (X100000) (X100000) **≻**24 ≻20 18 15 12 10 2.1 1.8 2.7 1.9 2.2 2.5 2.8 3.1 1.8 2.4 2.7 1.5 2.1 2.4 1.5 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 56<del>-</del> (18 (0000015 X12 049 042 ×35 ≻28 21 0 0 2.0 2.3 2.6 2.9 2.9 3.2 2.1 2.7 3.3 1.7 1.5 Min



2.6

3.2

3.8

4.4

2.7

3.0

3.3

3.6

3.9

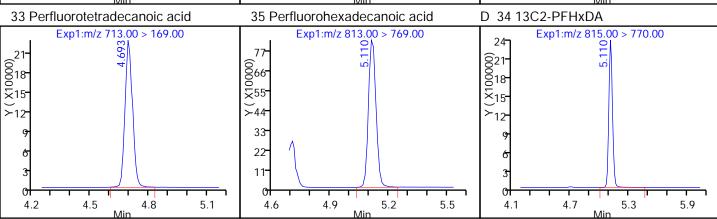
4.2

3.0

3.3

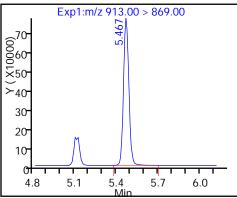
3.6 Min 3.9

4.2



Report Date: 18-Dec-2016 17:59:49 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:  $\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_016.d$ 

### 36 Perfluorooctadecanoic acid



# FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-142751/30 Calibration Date: 12/16/2016 21:37

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 16DEC2016C_030.d Conc. Units: ng/mL

Perfusion   Section   Se	ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ferrituro continue   AveID   0.9868   1.021   51.7   50.0   3.4   2		AveID	0.8537	0.9032		52.9	50.0	5.8	25.0
Perfluorobetanesulfonic acid   AveID   0.9288   0.9342   50.3   50.0   0.6   2	Perfluoropentanoic acid	AveID	0.9868	1.021		51.7	50.0	3.4	25.0
Perfluorohexanolc acid   AveID   0.9288   0.9342   50.3   50.0   0.6   2	Perfluorobutanesulfonic acid	AveID	1.417	1.664		51.9	44.2	17.4	25.0
Perfluoroheptanoic acid   AveID   0.9788   0.9850   50.3   50.0   0.6   2	Perfluorohexanoic acid	AveID	0.9288	0.9342		50.3	50.0	0.6	25.0
Perfluorochexanesulfonic acid   AveID   1.030   1.043   46.1   45.5   1.2   2	Perfluoroheptanoic acid	AveID	0.9788	0.9850		50.3	50.0	0.6	25.0
Perfluorocotanoic scid   AveID   1.003   1.025   51.1   50.0   2.1   2	Perfluorohexanesulfonic acid	AveID	1.030	1.043		46.1	45.5	1.2	25.0
Perfluoroheptanesulfonic   AveID   1.102   1.153   49.8   47.6   4.6   2   2   2   2   2   2   2   2   2	Perfluorooctanoic acid	AveID	1.003	1.025		51.1	50.0	2.1	25.0
Perfluorocctanesulfonic acid   AveID   0.9945   1.019   47.5   46.4   2.5   2	Perfluoroheptanesulfonic	AveID	1.102	1.153		49.8	47.6	4.6	25.0
Perfluction	Perfluorooctanesulfonic acid	AveID	0.9945	1.019		47.5	46.4	2.5	25.0
Perfluoroctane Sulfonamide   AveID   0.9327   0.9315   49.9   50.0   -0.1   2   2   2   2   2   2   2   2   2	Perfluorononanoic acid	AveID	0.9518	0.9610		50.5	50.0	1.0	25.0
Perfluorodecanoic acid   AveID   0.9438   0.9404   49.8   50.0   -0.4   2	Perfluorooctane Sulfonamide	AveID	0.9327	0.9315		49.9	50.0	-0.1	25.0
Perfluorodecanesulfonic acid   AveID   0.5840   0.6134   50.6   48.2   5.0   2   2   2   2   2   2   2   2   2	Perfluorodecanoic acid	AveID	0.9438	0.9404		49.8	50.0	-0.4	25.0
Perfluoroundecanoic acid   AveID   0.9563   0.9631   50.4   50.0   0.7   2	Perfluorodecanesulfonic acid	AveID	0.5840	0.6134		50.6	48.2	5.0	25.0
Perfluorododecanoic acid (PFDDA)	Perfluoroundecanoic acid	AveID	0.9563	0.9631		50.4	50.0	0.7	25.0
Perfluorotridecanoic Acid   AveID   0.9069   0.8916   49.2   50.0   -1.7   2	Perfluorododecanoic acid	AveID	0.9180	0.9374		51.1	50.0	2.1	25.0
Perfluorotetradecanoic acid   AveID   1.585   1.626   51.3   50.0   2.6   2   2   2   2   2   2   2   2   2	Perfluorotridecanoic Acid	AveID	0.9069	0.8916		49.2	50.0	-1.7	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	Perfluorotetradecanoic acid	AveID	1.585	1.626		51.3	50.0	2.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)   1.030   0.8905   43.2   50.0   -13.6   2   2   2   2   2   2   2   2   2	Perfluoro-n-hexadecanoic	L1ID		0.9217		47.7	50.0	-4.7	25.0
13C4 PFBA     Ave     347743     318215     45.8     50.0     -8.5     5       13C5-PFPeA     Ave     266072     247913     46.6     50.0     -6.8     5       13C2 PFHxA     Ave     245110     216743     44.2     50.0     -11.6     5       13C4-PFHpA     Ave     226344     195615     43.2     50.0     -13.6     5       1802 PFHxS     Ave     326976     288302     41.7     47.3     -11.8     5       13C4 PFOA     Ave     230362     206361     44.8     50.0     -10.4     5       13C4 PFOS     Ave     248847     231237     44.4     47.8     -7.1     5       13C5 PFNA     Ave     177687     159201     44.8     50.0     -10.4     5       13C8 FOSA     Ave     384141     357609     46.5     50.0     -6.9     5       13C2 PFDA     Ave     157302     137232     43.6     50.0     -7.6     5       13C2 PFDAA     Ave     110957     108324     46.2     50.0     -7.6     5       13C2-PFTeDA     Ave     227387     200272     44.0     50.0     -11.9     5	Perfluoro-n-octadecanoic	AveID	1.030	0.8905		43.2	50.0	-13.6	25.0
13C2 PFHxA         Ave         245110         216743         44.2         50.0         -11.6         5           13C4-PFHpA         Ave         226344         195615         43.2         50.0         -13.6         5           1802 PFHxS         Ave         326976         288302         41.7         47.3         -11.8         5           13C4 PFOA         Ave         230362         206361         44.8         50.0         -10.4         5           13C4 PFOS         Ave         248847         231237         44.4         47.8         -7.1         5           13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -7.6         5           13C2 PFDOA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5		Ave	347743	318215		45.8	50.0	-8.5	50.0
13C4 - PFHAR         Ave         226344         195615         43.2         50.0         -13.6         5           1802 PFHxS         Ave         326976         288302         41.7         47.3         -11.8         5           13C4 PFOA         Ave         230362         206361         44.8         50.0         -10.4         5           13C4 PFOS         Ave         248847         231237         44.4         47.8         -7.1         5           13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -7.6         5           13C2 PFDAA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5	13C5-PFPeA	Ave	266072	247913		46.6	50.0	-6.8	50.0
1802 PFHxS         Ave         326976         288302         41.7         47.3         -11.8         5           13C4 PFOA         Ave         230362         206361         44.8         50.0         -10.4         5           13C4 PFOS         Ave         248847         231237         44.4         47.8         -7.1         5           13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -12.8         5           13C2 PFUNA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5	13C2 PFHxA	Ave	245110	216743		44.2	50.0	-11.6	50.0
1802 PFHxS         Ave         326976         288302         41.7         47.3         -11.8         5           13C4 PFOA         Ave         230362         206361         44.8         50.0         -10.4         5           13C4 PFOS         Ave         248847         231237         44.4         47.8         -7.1         5           13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -12.8         5           13C2 PFUnA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5	13C4-PFHpA	Ave	226344	195615		43.2	50.0	-13.6	50.0
13C4 PFOA         Ave         230362         206361         44.8         50.0         -10.4         5           13C4 PFOS         Ave         248847         231237         44.4         47.8         -7.1         5           13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -12.8         5           13C2 PFUnA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5	•	Ave	326976	288302		41.7	47.3	-11.8	50.0
13C4 PFOS         Ave         248847         231237         44.4         47.8         -7.1         5           13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -12.8         5           13C2 PFUnA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5			230362	206361		44.8	50.0	-10.4	50.0
13C5 PFNA         Ave         177687         159201         44.8         50.0         -10.4         5           13C8 FOSA         Ave         384141         357609         46.5         50.0         -6.9         5           13C2 PFDA         Ave         157302         137232         43.6         50.0         -12.8         5           13C2 PFUnA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5			248847	231237		44.4	47.8	-7.1	50.0
13C8 FOSA     Ave     384141     357609     46.5     50.0     -6.9     5       13C2 PFDA     Ave     157302     137232     43.6     50.0     -12.8     5       13C2 PFUnA     Ave     117250     108324     46.2     50.0     -7.6     5       13C2 PFDOA     Ave     110957     103195     46.5     50.0     -7.0     5       13C2-PFTeDA     Ave     227387     200272     44.0     50.0     -11.9     5						44.8	50.0	-10.4	50.0
13C2 PFDA         Ave         157302         137232         43.6         50.0         -12.8         5           13C2 PFUnA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDoA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5								-6.9	50.0
13C2 PFUnA         Ave         117250         108324         46.2         50.0         -7.6         5           13C2 PFDoA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5									50.0
13C2 PFDOA         Ave         110957         103195         46.5         50.0         -7.0         5           13C2-PFTeDA         Ave         227387         200272         44.0         50.0         -11.9         5									50.0
13C2-PFTeDA Ave 227387 200272 44.0 50.0 -11.9 5									50.0
1002 111051									50.0
13C2-PFHxDA   Ave   124568   107048   43.0   50.0   -14.1   5			124568	107048		43.0	50.0	-14.1	50.0

Report Date: 18-Dec-2016 18:04:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_030.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 16-Dec-2016 21:37:42 ALS Bottle#: 41 Worklist Smp#: 30

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 18:04:11 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:57:11

First Level Revie	wer: cha	ndrasen	ias		Date:	1	8-Dec-2016 17:57:1	1		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA		4 5 / /	0.0		15010770	45.0		01.5	01.45.40	
217.00 > 172.00 1 Perfluorobut		1.566	0.0		15910772	45.8		91.5	814543	
212.90 > 169.00	•	1.574	0.0	1.000	14370412	52.9		106	97607	
3 Perfluoroper 262.90 > 219.00		cid 1.849	0.0	1.000	12653910	51.7		103	108460	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.849	1.849	0.0		12395627	46.6		93.2	1594868	3
5 Perfluorobut 298.90 > 80.00	anesulfo 1.887	nic acid 1.887	0.0	1.000	21204838	51.9		117		
	1.887	1.887	0.0	1.000	9872913	0,	2.15(0.00-0.00)			
D 613C2 PFHx										
315.00 > 270.00		2.151	0.0		10837135	44.2		88.4	967241	
7 Perfluorohex 313.00 > 269.00		id 2.151	0.0	1.000	10123731	50.3		101	299407	
D 11 13C4-PFH	•									
367.00 > 322.00		2.475	0.0		9780756	43.2		86.4	869057	
12 Perfluorohe 363.00 > 319.00	•	2.483	0.0	1.000	9634294	50.3		101	90313	
D 10 1802 PFH										
403.00 > 84.00			0.0		13636691	41.7		88.2	835242	
9 Perfluorohex 399.00 > 80.00			0.0	1.000	13675234	46.1		101		
15 Perfluorooc										
413.00 > 369.00	2.837	2.837	0.0	1.000	10572389	51.1		102	101495	
413.00 > 169.00		2.837	0.008	1.003	6511708		1.62(0.90-1.10)		266840	
D 14 13C4 PFO. 417.00 > 372.00		2.845	0.0		10318036 Page 604 of 678	44.8		89.6	699122	
					rage 004 01 676	o O				

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61218-3797	2.b\16DEC2016C_(	)30.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ntanocul	Ifonic Ac	·id	-						
449.00 > 80.00	-	2.845		1.000	12692330	49.8		105		
				1.000	12072330	47.0		103		
18 Perfluorooc 499.00 > 80.00		3.093		1.000	10933220	47.5		102	63686	
499.00 > 99.00		3.093	0.113	1.000	2379112	47.5	4.60(0.90-1.10)	102	122478	
D 19 13C5 PFN		0.070	0.110	1.007	2077112		1.00(0.70 1.10)		122170	
468.00 > 423.00		3.215	0.0		7960030	44.8		89.6	873300	
D 17 13C4 PFO		5.215	0.0		7700030	44.0		07.0	073300	
503.00 > 80.00		3.215	0.0		11053115	44.4		92.9	223559	
			0.0		11033113	44.4		12.1	223337	
20 Perfluorono 463.00 > 419.00		3.215	0.0	1.000	7649196	50.5		101	141580	
		3.213	0.0	1.000	7049190	30.3		101	141360	
D 21 13C8 FOS		2 5 4 7	0.0		17000474	47 5		00.1	700407	
506.00 > 78.00		3.546			17880474	46.5		93.1	700486	
22 Perfluorooc				1 000	1//51/05	40.0		00.0	000/40	
498.00 > 78.00	3.546	3.546	0.0	1.000	16654695	49.9		99.9	388619	
24 Perfluorode										
513.00 > 469.00	3.563	3.563	0.0	1.000	6452680	49.8		99.6	184331	
D 23 13C2 PFD										
515.00 > 470.00	3.571	3.571	0.0		6861617	43.6		87.2	238400	
26 Perfluorode	cane Su	Ifonic ac	id							
599.00 > 80.00	3.878	3.878	0.0	1.000	6836829	50.6		105		
28 Perfluoroun	decanoi	c acid								
563.00 > 519.00	3.887	3.887	0.0	1.000	5216144	50.4		101	105648	
D 27 13C2 PFU	nA									
565.00 > 520.00	3.895	3.895	0.0		5416222	46.2		92.4	315280	
D 30 13C2 PFD	οΑ									
615.00 > 570.00		4.177	0.0		5159766	46.5		93.0	227299	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00			0.0	1.000	4836845	51.1		102	115903	
31 Perfluorotrio										
663.00 > 619.00		4.450	0.0	1.000	4600585	49.2		98.3	95754	
D 32 13C2-PFT		1.100	0.0	1.000	100000	17.2		70.0	70701	
715.00 > 670.00		4.690	0.0		10013595	44.0		88.1	508011	
			0.0		10013373	44.0		00.1	300011	
33 Perfluorotet			0.0	1 000	020011/	F1 2		100	20500	
712.50 > 668.90 713.00 > 169.00		4.690 4.690	-0.009	1.000 0.998	8390116 1353019	51.3	6.20(0.00-0.00)	103	38509 128567	
				0.990	1333019		0.20(0.00-0.00)		120307	
35 Perfluorohe				1 000	4755707	47.7		05.0	F ( 40	
813.00 > 769.00		5.102	0.0	1.000	4755736	47.7		95.3	5640	
D 34 13C2-PFH										
815.00 > 770.00	5.102	5.102	0.0		5352377	43.0		85.9	99891	
36 Perfluorooc	tadecand	oic acid								
913.00 > 869.00	5.452	5.452	0.0	1.000	4595000	43.2		86.4	7368	
Reagents:										
LCPFC-L5_0002	22		Д	Amount A	dded: 1.00	Units	:: mL			

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Report Date: 18-Dec-2016 18:04:12 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 21:37:42 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 30 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 836<del>-</del> 0035<u>-</u> ×)28<u>-</u> × × 30-21 21 18 12 1.9 2.0 1.0 1.3 1.6 0.9 1.8 1.4 1.7 2.3 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0048 42 (77<del>-</del> (00066-(55-042 036 00001 00030-×30 -24<del>-</del>44 18 33 18 22 12 11 1.8 1.8 2.0 2.6 2.1 2.1 8.0 1.4 1.5 1.5 D 6 13C2 PFHxA 7 Perfluorohexanoic acid D 11 13C4-PFHpA Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 367.00 > 322.00 35 35 5 635 635 630 ©30-025-<u>8</u>30 8 25 × ×25 Ç₂₀ **≻**20 15<del>-</del> 15 15 10 10 10 2.1 1.7 2.0 2.3 2.9 2.0 1.8 2.4 2.7 2.6 3.2 1.5 1.4 2.6 9 Perfluorohexanesulfonic acid 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 399.00 > 80.00 Exp1:m/z 403.00 > 84.00 42 49 030 025 000042 00001 X (000001 30-30- $\stackrel{\sim}{\Sigma}_{20}$ <del>_</del>28− 18 21 10 12 14 0 0 1.9 2.2 2.5 2.8 Page 606 of 678 1.9 2.2 2.5 2.8 3.1 2.0 2.3 2.6 2.9 3.2 1.6 3.1 1.7

3.4

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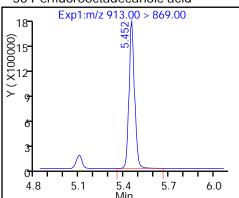
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5.1

4.4

4.7

36 Perfluorooctadecanoic acid



# FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-143259/2 Calibration Date: 12/20/2016 17:37

GC Column: Acquity ID: 2.10 (mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 20DEC2016C_002.d Conc. Units: ng/mL

7 N 7 N M 1	CHDVE	AVE DDE	DDE	MIN RRF	CALC	SPIKE	%D	MAX
ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN KKE	AMOUNT	AMOUNT	*•D	%D
Perfluorobutanoic acid (PFBA)	AveID	0.8537	0.9097		53.3	50.0	6.6	25.0
Perfluoropentanoic acid (PFPeA)	AveID	0.9868	1.004		50.9	50.0	1.8	25.0
Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.618		50.5	44.2	14.2	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9314		50.1	50.0	0.3	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	0.9642		49.3	50.0	-1.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.058		46.8	45.5	2.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.026		51.1	50.0	2.3	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.174		50.7	47.6	6.5	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.041		48.6	46.4	4.7	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9644		50.7	50.0	1.3	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9498		50.9	50.0	1.8	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9730		51.5	50.0	3.1	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6216		51.3	48.2	6.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9409		49.2	50.0	-1.6	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9518		51.8	50.0	3.7	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9067		50.0	50.0	-0.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.651		52.1	50.0	4.2	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.8939		46.2	50.0	-7.6	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8921		43.3	50.0	-13.4	25.0
13C4 PFBA	Ave	347743	320397		46.1	50.0	-7.9	50.0
13C5-PFPeA	Ave	266072	242203		45.5	50.0	-9.0	50.0
13C2 PFHxA	Ave	245110	214945		43.8	50.0	-12.3	50.0
13C4-PFHpA	Ave	226344	194545		43.0	50.0	-14.0	50.0
1802 PFHxS	Ave	326976	288898		41.8	47.3	-11.6	50.0
13C4 PFOA	Ave	230362	202169		43.9	50.0	-12.2	50.0
13C4 PFOS	Ave	248847	226278		43.5	47.8	-9.1	50.0
13C5 PFNA	Ave	177687	155059		43.6	50.0	-12.7	50.0
13C8 FOSA	Ave	384141	355226		46.2	50.0	-7.5	50.0
13C2 PFDA	Ave	157302	135820		43.2	50.0	-13.7	50.0
13C2 PFUnA	Ave	117250	100704		42.9	50.0	-14.1	50.0
13C2 PFDoA	Ave	110957	96448		43.5	50.0	-13.1	50.0
13C2-PFTeDA	Ave	227387	189221		41.6	50.0	-16.8	50.0
13C2-PFHxDA	Ave	124568	99464		39.9	50.0	-20.2	50.0

Report Date: 21-Dec-2016 10:21:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_002.d

Lims ID: CCV L5

Client ID:

Sample Type: CCV

Inject. Date: 20-Dec-2016 17:37:14 ALS Bottle#: 41 Worklist Smp#: 2

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L5

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:21:00 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

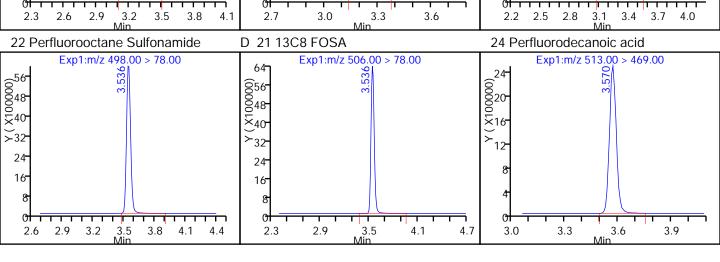
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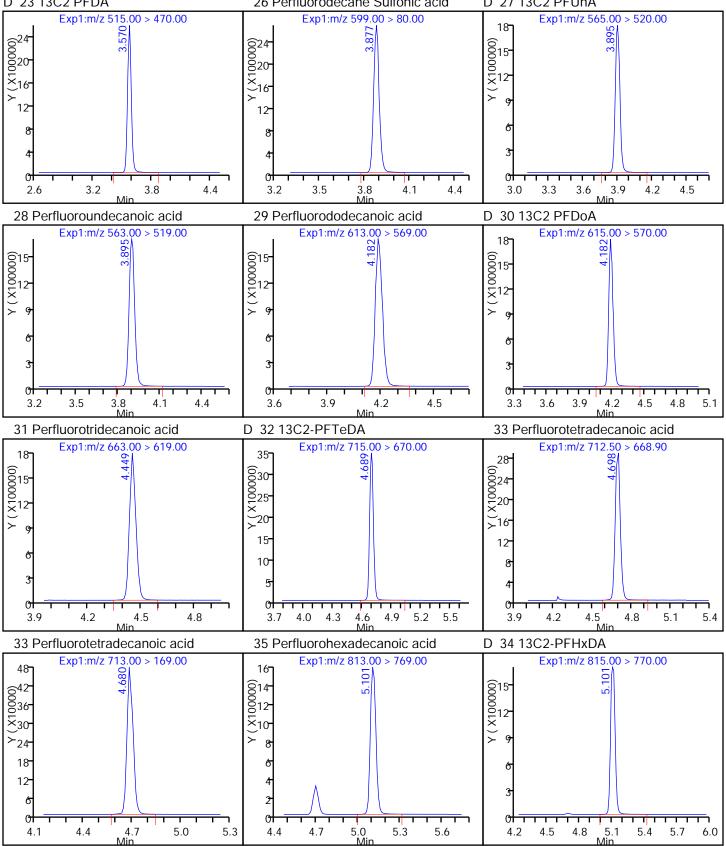
First Level Revie	wer: cha	ındrasen	nas		Date:	2	21-Dec-2016 09:16:4	<u> 1</u>		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	\									
217.00 > 172.00	1.558	1.558	0.0		16019833	46.1		92.1	131201	2
1 Perfluorobut	•			1 000	4.570.67	50.0		407	0.4.000	
212.90 > 169.00		1.566	0.0	1.000	14572607	53.3		107	86389	
3 Perfluoroper 262.90 > 219.00		cia 1.839	0.0	1.000	12162418	50.9		102	148465	
D 4 13C5-PFPe		1.007	0.0	1.000	12102110	00.7		102	110100	
267.90 > 223.00		1.839	0.0		12110147	45.5		91.0	115775	3
5 Perfluorobut										
	1.878	1.878	0.0	1.000	20656060	50.5	2.1/(2.00.0.00)	114		
	1.878	1.878	0.0	1.000	9551416		2.16(0.00-0.00)			
7 Perfluorohex 313.00 > 269.00		2.135	0.0	1.000	10009932	50.1		100	281851	
D 613C2 PFHx										
315.00 > 270.00	2.135	2.135	0.0		10747252	43.8		87.7	800299	
12 Perfluorohe	•									
363.00 > 319.00		2.472	0.0	1.000	9378580	49.3		98.5	117620	
D 11 13C4-PFH 367.00 > 322.00	•	2.480	0.0		9727255	43.0		86.0	692787	
D 10 1802 PFH		2.400	0.0		9727233	43.0		00.0	092707	
403.00 > 84.00		2.487	0.0		13664873	41.8		88.4	498358	9
9 Perfluorohex	canesulfo	onic acid								
399.00 > 80.00	2.495	2.495	0.0	1.000	13911971	46.8		103		
15 Perfluorooc										
413.00 > 369.00 413.00 > 169.00		2.835 2.835	0.0	1.000 1.000	10369198 6365207	51.1	1.63(0.90-1.10)	102	99492 320824	
D 14 13C4 PFO		2.033	U.U	1.000	0303207		1.03(0.70-1.10)		320024	
417.00 > 372.00		2.835	0.0		10108464 Page 611 of 6	43.9		87.8	510500	
					rage of 1 of 6	010				

Data File:	\\Chr	omNa\Sa	acramen	to\Chrom	Data\A8_N\201	61221-3807	8.b\20DEC2016C_(	J02.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ntanosu	Ifonic Ac	·id							
449.00 > 80.00	•	2.844		1.000	12641244	50.7		107		
18 Perfluorooc				1.000	12011211	00.7		107		
499.00 > 80.00		3.099		1.000	10932752	48.6		105	72911	
499.00 > 99.00		3.099	0.105	1.034	2363705	10.0	4.63(0.90-1.10)		123612	
D 17 13C4 PFO	S						,			
503.00 > 80.00		3.204	0.0		10816069	43.5		90.9	249392	
20 Perfluorono	nanoic a	icid								
463.00 > 419.00		3.213	0.0	1.000	7476816	50.7		101	101920	
D 19 13C5 PFN	Α									
468.00 > 423.00		3.213	0.0		7752959	43.6		87.3	645115	
22 Perfluorooc										
498.00 > 78.00		3.536		1.000	16869344	50.9		102	543058	
D 21 13C8 FOS										
506.00 > 78.00		3.536	0.0		17761277	46.2		92.5	705579	
24 Perfluorode										
513.00 > 469.00		3.570	0.0	1.000	6607325	51.5		103	186040	
D 23 13C2 PFD										
515.00 > 470.00		3.570	0.0		6791017	43.2		86.3	209346	
26 Perfluorode										
599.00 > 80.00		3.877		1.000	6779011	51.3		106		
D 27 13C2 PFU										
565.00 > 520.00		3.895	0.0		5035175	42.9		85.9	252762	
28 Perfluoroun										
563.00 > 519.00		3.895	0.0	1.000	4737634	49.2		98.4	128396	
29 Perfluorodo			0.0		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			70	.20070	
613.00 > 569.00		4.182	0.0	1.000	4589867	51.8		104	90422	
D 30 13C2 PFD			0.0		.007007	00			70.22	
615.00 > 570.00		4 182	0.0		4822423	43.5		86.9	171975	
31 Perfluorotrio			0.0		1022 120	10.0		00.7	.,,,,	
663.00 > 619.00		4.449	0.0	1.000	4372668	50.0		100.0	81518	
D 32 13C2-PFT		7.777	0.0	1.000	4372000	30.0		100.0	01010	
715.00 > 670.00		4.689	0.0		9461025	41.6		83.2	689768	
33 Perfluorotet			0.0		7401023	41.0		03.2	007700	
712.50 > 668.90		4.698	0.0	1.000	7964194	52.1		104	22813	
712.30 > 008.90		4.698		0.996	1257863	JZ. I	6.33(0.00-0.00)	104	158469	
35 Perfluorohe				0.770	1207000		0.00(0.00 0.00)		100107	
813.00 > 769.00		5.101		1.000	4310935	46.2		92.4	3498	
		5.101	0.0	1.000	4310733	40.2		72.4	3470	
D 34 13C2-PFH 815.00 > 770.00		5.101	0.0		4973204	39.9		79.8	72071	
			0.0		4773204	37.7		17.0	12011	
36 Perfluorooc			0.0	1.000	4302040	43.3		86.6	4682	
913.00 > 869.00	0.459	J.43 <del>9</del>	0.0	1.000	4302060	43.3		00.0	408∠	
Reagents:	10				ddod. 100	119				
LCPFC-L5_0002	<u>′</u> ∠		F	amount A	dded: 1.00	Units	: mL			

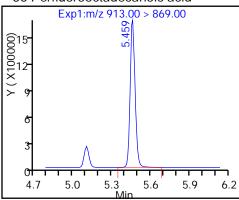
Page 612 of 678

Report Date: 21-Dec-2016 10:21:01 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 20-Dec-2016 17:37:14 Instrument ID: A8_N Lims ID: CCV L5 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 41 Worklist Smp#: 2 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 (00001 200001 35 <del>∑</del>30 ≻28 18 21 18 12 1.8 2.2 1.3 1.9 2.2 0.9 1.2 1.5 2.1 0.4 1.0 1.6 1.6 5 Perfluorobutanesulfonic acid 4 13C5-PFPeA D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0080 642 000 36 970<del>-</del> 036-036-×30 ×50 ≻₄₀-18 18 30 12 20 12 10 2.0 1.8 2.1 2.4 1.7 2.3 1.8 2.1 1.2 1.5 2.7 1.5 1.4 7 Perfluorohexanoic acid D 6 13C2 PFHxA 12 Perfluoroheptanoic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 363.00 > 319.00 Exp1:m/z 313.00 > 269.00 (000001X) × 20 35 0036 0030 0030 25-X ×₂₄- $\mathcal{L}_{20}$ 18 15 15 12 10 10 1.8 2.1 2.7 1.8 2.1 2.2 1.5 2.4 1.5 2.4 2.7 2.5 2.8 1.2 D 11 13C4-PFHpA D 10 1802 PFHxS 9 Perfluorohexanesulfonic acid Exp1:m/z 399.00 > 80.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 35<del>-</del> 42 49 187 (000001 30-30-00042 0005 35 ∑₂₀ ^{_28} 18 15 21 10 12 14 00 2.1 2.7 3.3 1.2 1.8 Page 61% of 678 3.6 2.0 2.3 2.6 2.9 3.2 1.5 1.7





36 Perfluorooctadecanoic acid



## FORM VII LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Lab Sample ID: CCV 320-143259/16 Calibration Date: 12/20/2016 19:22

Instrument ID: A8_N Calib Start Date: 12/15/2016 12:29

GC Column: Acquity ID: 2.10(mm) Calib End Date: 12/15/2016 14:18

Lab File ID: 20DEC2016C_016.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanoic acid	AveID	0.8537	0.9590		22.5	20.0	12.3	25.0
(PFBA) Perfluoropentanoic acid	AveID	0.9868	1.068		21.6	20.0	8.2	25.0
(PFPeA) Perfluorobutanesulfonic acid (PFBS)	AveID	1.417	1.724		21.5	17.7	21.6	25.0
Perfluorohexanoic acid (PFHxA)	AveID	0.9288	0.9571		20.6	20.0	3.0	25.0
Perfluoroheptanoic acid (PFHpA)	AveID	0.9788	1.004		20.5	20.0	2.5	25.0
Perfluorohexanesulfonic acid (PFHxS)	AveID	1.030	1.090		19.3	18.2	5.8	25.0
Perfluorooctanoic acid (PFOA)	AveID	1.003	1.087		21.7	20.0	8.4	25.0
Perfluoroheptanesulfonic Acid (PFHpS)	AveID	1.102	1.227		21.2	19.0	11.4	25.0
Perfluorooctanesulfonic acid (PFOS)	AveID	0.9945	1.054		19.7	18.6	5.9	25.0
Perfluorononanoic acid (PFNA)	AveID	0.9518	0.9827		20.6	20.0	3.2	25.0
Perfluorooctane Sulfonamide (FOSA)	AveID	0.9327	0.9851		21.1	20.0	5.6	25.0
Perfluorodecanoic acid (PFDA)	AveID	0.9438	0.9234		19.6	20.0	-2.2	25.0
Perfluorodecanesulfonic acid (PFDS)	AveID	0.5840	0.6330		20.9	19.3	8.4	25.0
Perfluoroundecanoic acid (PFUnA)	AveID	0.9563	0.9824		20.5	20.0	2.7	25.0
Perfluorododecanoic acid (PFDoA)	AveID	0.9180	0.9503		20.7	20.0	3.5	25.0
Perfluorotridecanoic Acid (PFTriA)	AveID	0.9069	0.9342		20.6	20.0	3.0	25.0
Perfluorotetradecanoic acid (PFTeA)	AveID	1.585	1.681		21.2	20.0	6.1	25.0
Perfluoro-n-hexadecanoic acid (PFHxDA)	L1ID		0.9342		19.0	20.0	-5.1	25.0
Perfluoro-n-octadecanoic acid (PFODA)	AveID	1.030	0.8734		17.0	20.0	-15.2	25.0
13C4 PFBA	Ave	347743	344175		49.5	50.0	-1.0	50.0
13C5-PFPeA	Ave	266072	262067		49.2	50.0	-1.5	50.0
13C2 PFHxA	Ave	245110	231525		47.2	50.0	-5.5	50.0
13C4-PFHpA	Ave	226344	216174		47.8	50.0	-4.5	50.0
1802 PFHxS	Ave	326976	312022		45.1	47.3	-4.6	50.0
13C4 PFOA	Ave	230362	221448		48.1	50.0	-3.9	50.0
13C4 PFOS	Ave	248847	243480		46.8	47.8	-2.2	50.
13C5 PFNA	Ave	177687	174025		49.0	50.0	-2.1	50.0
13C8 FOSA	Ave	384141	373456		48.6	50.0	-2.8	50.
13C2 PFDA	Ave	157302	156863		49.9	50.0	-0.3	50.
13C2 PFUnA	Ave	117250	114936		49.0	50.0	-2.0	50.
13C2 PFDOA	Ave	110957	104629		47.1	50.0	-5.7	50.0
	Ave	227387	205290		45.1	50.0	-9.7	50.0
13C2-PFTeDA 13C2-PFHxDA	Ave	124568	106704		42.8	50.0	-14.3	50.

Report Date: 21-Dec-2016 10:24:07 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\20DEC2016C_016.d

Lims ID: CCV L4

Client ID:

Sample Type: CCV

Inject. Date: 20-Dec-2016 19:22:25 ALS Bottle#: 40 Worklist Smp#: 16

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: CCV L4

Misc. Info.: Plate: 1 Rack: 1

Operator ID: A8-PC\A8 Instrument ID: A8_N

Sublist: chrom-A8_N*sub5

Method: \ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 21-Dec-2016 10:24:07 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK025

First Level Reviewer: chandrasenas Date: 21-Dec-2016 10:20:21

THIST ECVOLATIONS	WCI. CIIG	marasci	ius		Date.		1 DCC 2010 10.20.2			
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA	1									
217.00 > 172.00		1.550	0.0		17208744	49.5		99.0	112025	8
1 Perfluorobut	yric acid									
212.90 > 169.00	1.558	1.558	0.0	1.000	6601262	22.5		112	39345	
3 Perfluoroper										
262.90 > 219.00		1.840	0.0	1.000	5596154	21.6		108	54379	
D 4 13C5-PFP6		4 0 4 0	0.0		1010000	40.0		00.5	4/4400	•
267.90 > 223.00		1.840			13103338	49.2		98.5	161193	2
5 Perfluorobut 298.90 > 80.00		nic acid 1.868	0.0	1.000	9508652	21.5		122		
298.90 > 99.00		1.868	0.0	1.000	4144281	21.5	2.29(0.00-0.00)	122		
7 Perfluorohex			0.0				2.27(0.00 0.00)			
313.00 > 269.00			0.0	1.000	4431756	20.6		103	139263	
D 6 13C2 PFHx	κA									
315.00 > 270.00	2.129	2.129	0.0		11576262	47.2		94.5	920045	
9 Perfluorohex	canesulfo	onic acid	i							
399.00 > 80.00	2.485	2.485	0.0	1.000	6188691	19.3		106		
12 Perfluorohe	•									
363.00 > 319.00		2.470	0.0	1.000	4338838	20.5		103	52179	
D 11 13C4-PFH 367.00 > 322.00	•	2 470	0.0		10000405	47.0		OF F	010005	
		2.470	0.0		10808685	47.8		95.5	818025	
D 10 18O2 PFH 403.00 > 84.00		2.485	0.0		14758638	45.1		95.4	678779	
D 14 13C4 PFO		2,403	0.0		14730030	43.1		70.4	0/0//7	
417.00 > 372.00		2.831	0.0		11072395	48.1		96.1	958315	
		501	0.0							

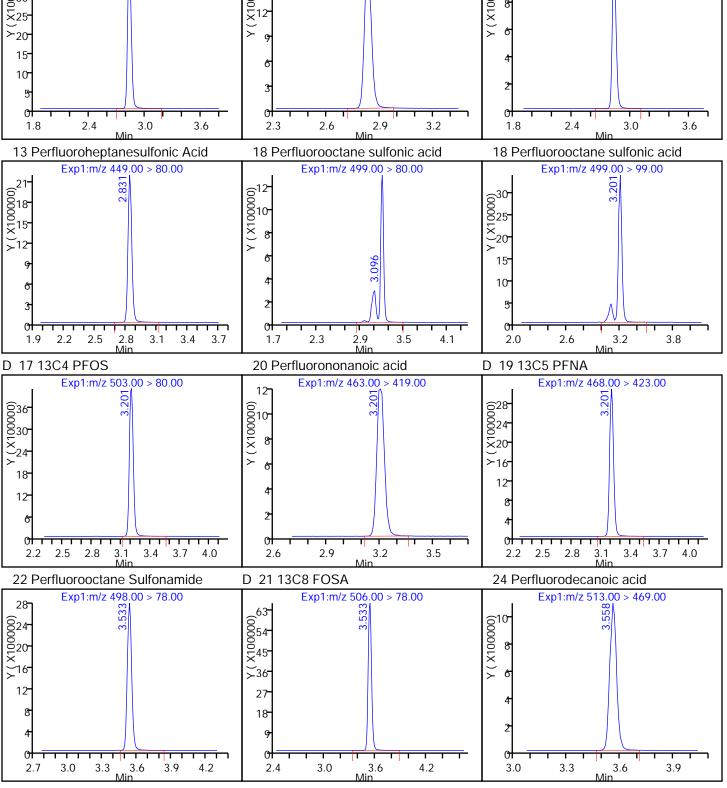
Data File:	\\Chr	omNa\S	acrament	io\Chrom	Data\A8_N\201	61221-3807	8.b\20DEC2016C_0	)16.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
1E Dorfluorocat	tonolo oc	old.	•	•						
15 Perfluorooct 413.00 > 369.00		2.823	0.0	1.000	4814977	21.7		108	41267	
413.00 > 369.00		2.823	0.008	1.003	2946005	21.7	1.63(0.90-1.10)	100	130443	
13 Perfluorohe				1.000	2710000		1.00(0.70 1.10)		100110	
449.00 > 80.00	-	2.831		1.000	5689759	21.2		111		
18 Perfluorooct				1.000	0007707	21.2				
499.00 > 80.00		3.096		1.000	4760814	19.7		106	54636	
499.00 > 99.00		3.096	0.105	1.034	1042526	17.7	4.57(0.90-1.10)	100	55600	
D 17 13C4 PFO		0.070	000		.0.2020		(0.70)			
503.00 > 80.00		3.201	0.0		11638340	46.8		97.8	403343	
20 Perfluorono			0.0		11030340	40.0		77.0	100010	
463.00 > 419.00		3.201	0.0	1.000	3420211	20.6		103	55807	
		3.201	0.0	1.000	3420211	20.0		103	33007	
D 19 13C5 PFN/ 468.00 > 423.00		3.201	0.0		8701261	49.0		07.0	602525	
					8701201	49.0		97.9	002323	
22 Perfluorooct				1 000	7257704	01.1		107	200407	
498.00 > 78.00		3.533	0.0	1.000	7357794	21.1		106	389487	
D 21 13C8 FOS		0.500			40/70707	40.7		07.0	7000//	
506.00 > 78.00		3.533	0.0		18672787	48.6		97.2	732866	
24 Perfluorode										
513.00 > 469.00	3.558	3.558	0.0	1.000	2896888	19.6		97.8	106380	
D 23 13C2 PFD/										
515.00 > 470.00	3.558	3.558	0.0		7843132	49.9		99.7	225832	
26 Perfluorode		lfonic ac	id							
599.00 > 80.00	3.863	3.863	0.0	1.000	2971680	20.9		108		
28 Perfluoround	decanoid	c acid								
563.00 > 519.00	3.889	3.889	0.0	1.000	2258155	20.5		103	66565	
D 27 13C2 PFUr	nA									
565.00 > 520.00	3.881	3.881	0.0		5746794	49.0		98.0	416320	
29 Perfluorodo	decanoio	c acid								
613.00 > 569.00	4.176	4.176	0.0	1.000	1988602	20.7		104	43342	
D 30 13C2 PFD	ρA									
615.00 > 570.00		4.176	0.0		5231462	47.1		94.3	215052	
31 Perfluorotrio										
663.00 > 619.00		4.441	0.0	1.000	1954950	20.6		103	34185	
33 Perfluoroteti										
712.50 > 668.90		4.688	0.0	1.000	3517788	21.2		106	17111	
713.00 > 169.00			-0.017	0.996	568250	21.2	6.19(0.00-0.00)	100	65678	
D 32 13C2-PFT		1.000	0.017	0.770	000200		0.17(0.00 0.00)		00070	
715.00 > 670.00		4.679	0.0		10264494	45.1		90.3	124797	2
					10204474	43.1		70.3	124/7/	2
35 Perfluorohe				1 000	1054017	10.0		04.0	1505	
813.00 > 769.00		5.101	U.U	1.000	1954816	19.0		94.9	1525	
D 34 13C2-PFH		E 404	0.0		5005010	40.0		05.7	704 / 1	
815.00 > 770.00		5.101	0.0		5335210	42.8		85.7	79161	
36 Perfluorooct										
913.00 > 869.00	5.452	5.452	0.0	1.000	1827580	17.0		84.8	1996	

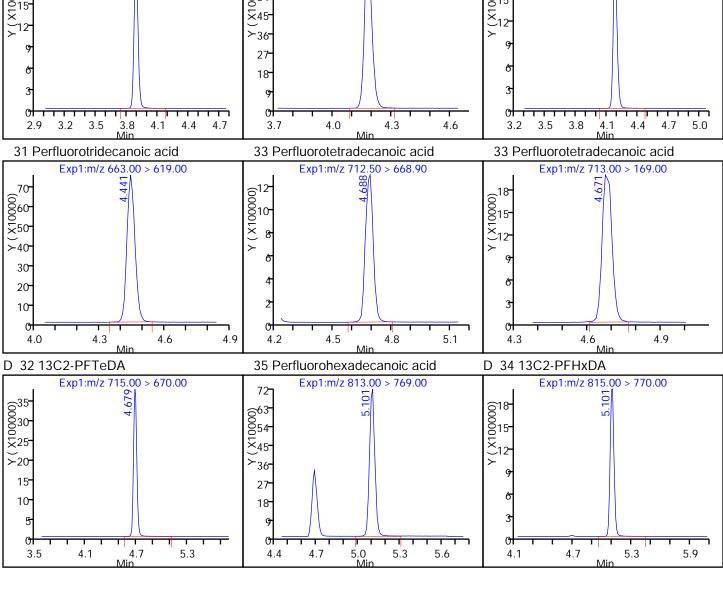
Report Date: 21-Dec-2016 10:24:07 Chrom Revision: 2.2 05-Dec-2016 12:37:22

Reagents:

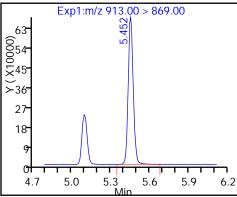
LCPFC-L4_00024 Amount Added: 1.00 Units: mL

Report Date: 21-Dec-2016 10:24:07 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 20-Dec-2016 19:22:25 Instrument ID: A8_N Lims ID: CCV L4 Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 40 Worklist Smp#: 16 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 56**-**(000018-15-<u>8</u>48 00 × 24 16 1.9 1.0 1.9 1.9 1.0 1.3 1.6 0.7 1.3 1.6 1.3 1.6 2.2 5 Perfluorobutanesulfonic acid 4 13C5-PFPeA D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.0018 (35<del>-</del> 0030-1×25-(000015 X1000012 X) 042 000 035 ∑₂₈ --20 21 15 10 1.8 1.8 1.9 2.2 2.5 2.1 2.1 1.0 1.3 1.6 1.5 1.5 7 Perfluorohexanoic acid D 6 13C2 PFHxA 9 Perfluorohexanesulfonic acid Exp1:m/z 313.00 > 269.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 399,00 > 80.00 (000015⁻ ×12· (0000012 (0000012) (0000012) 042 0036 ×30 18 12 1.9 2.2 1.8 2.1 2.0 2.6 2.9 3.2 2.5 1.5 2.4 2.7 1.7 2.3 1.6 12 Perfluoroheptanoic acid D 11 13C4-PFHpA D 10 1802 PFHxS Exp1:m/z 363,00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 049 0042 ©36-0036-×35 ≻28 18 21 12 0 0 2.0 2.3 2.6 2.9 Page 62/11nof 678 3.2 1.5 2.1 2.7 3.3 1.4





## 36 Perfluorooctadecanoic acid



# FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1						
SDG No.:							
Client Sample ID:	Lab Sample ID: MB 320-140536/1-A						
Matrix: Water	Lab File ID: 16DEC2016C_005.d						
Analysis Method: 537 (Modified)	Date Collected:						
Extraction Method: 3535	Date Extracted: 12/05/2016 08:31						
Sample wt/vol: 250(mL)	Date Analyzed: 12/16/2016 18:30						
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1						
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)						
% Moisture:	GPC Cleanup:(Y/N) N						
Analysis Batch No.: 142751	Units: ug/L						

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0010	Ū	0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0020	U	0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0020	U	0.0025	0.0020	0.00079
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
335-76-2	Perfluorodecanoic acid (PFDA)	0.0010	U	0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0020	U	0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0020	U	0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0020	U	0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.000656	J	0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0020	U	0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0020	U	0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0030	U	0.0040	0.0030	0.0013
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0030	U	0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0020	U	0.0025	0.0020	0.00064

### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1					
SDG No.:						
Client Sample ID:	Lab Sample ID: MB 320-140536/1-A					
Matrix: Water	Lab File ID: 16DEC2016C_005.d					
Analysis Method: 537 (Modified)	Date Collected:					
Extraction Method: 3535	Date Extracted: 12/05/2016 08:31					
Sample wt/vol: 250(mL)	Date Analyzed: 12/16/2016 18:30					
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)					
% Moisture:	GPC Cleanup: (Y/N) N					
Analysis Batch No.: 142751	Units: ug/L					

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	100		25-150
STL00992	13C4 PFBA	112		25-150
STL00993	13C2 PFHxA	109		25-150
STL00990	13C4 PFOA	116		25-150
STL00995	13C5 PFNA	109		25-150
STL00996	13C2 PFDA	111		25-150
STL00997	13C2 PFUnA	115		25-150
STL00998	13C2 PFDoA	111		25-150
STL00994	1802 PFHxS	105		25-150
STL00991	13C4 PFOS	102		25-150
STL01893	13C5-PFPeA	118		25-150
STL01892	13C4-PFHpA	112		25-150

Report Date: 18-Dec-2016 17:57:44 Chrom Revision: 2.2 05-Dec-2016 12:37:22

> TestAmerica Sacramento **Target Compound Quantitation Report**

Data File:

Lims ID: MB 320-140536/1-A

Client ID:

Sample Type: MB

Inject. Date: 16-Dec-2016 18:30:12 ALS Bottle#: 25 Worklist Smp#: 5

Injection Vol: Dil. Factor: 2.0 ul 1.0000

Sample Info: mb 320-140536/1-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: 

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: **Initial Calibration** 

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

004/470707

First Level Reviewer: chandrasenas				Date:	18	8-Dec-2016 17:27:3	7		
Signal RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 213C4 PFBA									
217.00 > 172.00 1.574	1.582	-0.008		19559860	56.2		112	950919	
1 Perfluorobutyric acid									
	1.582	0.024	1.000	68726	0.2058			326	
3 Perfluoropentanoic a	cid								
262.90 > 219.00 1.859	1.858	0.001	1.000	32564	0.1055			198	
D 413C5-PFPeA									
267.90 > 223.00 1.859	1.858	0.001		15642661	58.8		118	826864	
D 613C2 PFHxA									
315.00 > 270.00 2.149	2.155	-0.006		13419469	54.7		109	535944	
7 Perfluorohexanoic ac									
313.00 > 269.00 2.157	2.164	-0.007	1.000	12414	0.0498			243	
D 11 13C4-PFHpA									
367.00 > 322.00 2.493	2.494	-0.002		12647763	55.9		112	149455	4
D 10 1802 PFHxS	0.540			1/01000	40.7		405	0.400.40	
403.00 > 84.00 2.508	2.510	-0.002		16212802	49.6		105	968948	
D 47 M2-6:2FTS	0.000	0.017		0405	0.0100		0.0		
429.00 > 409.00 2.839	2.822	0.017		2135	0.0183		0.0		
48 Sodium 1H,1H,2H,2 427.00 > 407.00 2.823	H-perflu 2.822		e 1.000	7921	NR				
	2.822	0.001	1.000	7921	IVK				
D 14 13C4 PFOA 417.00 > 372.00 2.856	2 050	-0.002		13332539	57.9		116	111889	4
	2.000	-0.002		13332339	37.9		110	111009	+
D 19 13C5 PFNA 468.00 > 423.00 3.227	3 230	-0.003		9698401	54.6		109	834170	
D 17 13C4 PFOS	3.230	-0.003		7070401	34.0		107	034170	
503.00 > 80.00 3.219	3 230	-0.011		12164460	48.9		102	692606	
D 21 13C8 FOSA	0.200	0.011		12104400	10.7		102	3,2000	
506.00 > 78.00 3.558	3.561	-0.003		19211223	50.0		100	565183	
				Page 627 of					

Report Date: 18-Dec-2016 17:57:44 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_005.d

Data File:	\\Chr	omNa\Sa	acrament	to\Chrom	Data\A8_N\201	61218-3797	2.b\16DEC2016C_0	)05.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
22 Perfluorooc	tane Sul	fonamide	е							
498.00 > 78.00			-0.003	1.000	24698	0.0689			2517	
43 Sodium 1H,	1H,2H,2	H-perflu	orooctan	е						
527.00 > 507.00	3.575	3.570	0.005	1.000	521	NR				
D 42 M2-8:2FTS										
529.00 > 509.00		3.570	0.005		2006	0.0187		0.0		
24 Perfluorode 513.00 > 469.00		3.586	0.006	1.000	6461	0.0392			184	
D 23 13C2 PFD										
515.00 > 470.00		3.595	-0.012		8722258	55.4		111	269787	
D 45 d3-NMeFC 573.00 > 419.00		2 721	0.009		15270	0.2020		0.0		
		3.731			15279	0.2028		0.0		
44 N-methyl pe 570.00 > 419.00			0.010	1.003	4104	NR				
26 Perfluorode										
599.00 > 80.00			-0.008	1.000	5244	0.0353				
D 46 d5-NEtFOS	SAA									
589.00 > 419.00	3.900	3.899	0.001		27779	0.3546		0.0		
D 27 13C2 PFU										
565.00 > 520.00		3.907	0.002		6741385	57.5		115	346546	
49 N-ethyl perf 584.00 > 419.00			onamid -0.008	1.000	7263	NR				
28 Perfluoroun			-0.006	1.000	7203	INK				
563.00 > 519.00			-0.007	1.000	19724	0.1530			578	
D 52 d-N-MeFO		0.7.0	0.007			01.000			0.0	
515.00 > 169.00		4.050	-0.007		3701	0.0389		0.0		
D 30 13C2 PFD	οA									
615.00 > 570.00	4.200	4.203	-0.003		6151519	55.4		111	157918	
29 Perfluorodo										
613.00 > 569.00		4.203	-0.010	1.000	12398	0.1098			280	
D 51 d-N-EtFOS		4 222	0.007		2407	0.040/		0.0		
531.00 > 169.00		4.233	0.006		3487	0.0406		0.0		
53 N-ethylperfl 526.00 > 169.00			0.005	1.000	546	NR				
31 Perfluorotrio			0.005	1.000	340	IVIX				
663.00 > 619.00		4.467	-0.007	1.000	15321	0.1373			187	
D 32 13C2-PFT	eDA									
715.00 > 670.00	4.702	4.711	-0.009		14912291	65.6		131	1362688	3
33 Perfluorotet	radecan	oic acid								
712.50 > 668.90		4.711	0.0	1.000	63957	0.3280			41.0	
713.00 > 169.00		4.711	-0.017	0.996	11085		5.77(0.00-0.00)		4654	
35 Perfluorohe			0.001	1 000	07570	0.1450			140	
813.00 > 769.00		5.112	-0.001	1.000	87579	0.1459			140	
D 34 13C2-PFH 815.00 > 770.00		5.123	-0.001		6560285	52.7		105	133381	
36 Perfluorooc			0.001		0000200	JZ.1		100	100001	
913.00 > 869.00			-0.002	1.000	8789	0.0693			11.7	
					Dogg COO of /					

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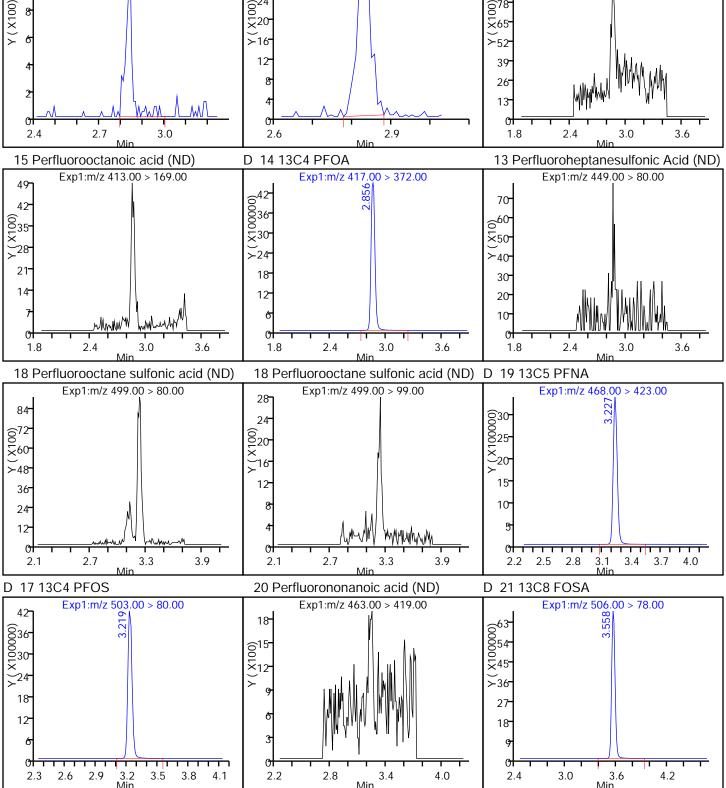
Chrom Revision: 2.2 05-Dec-2016 12:37:22

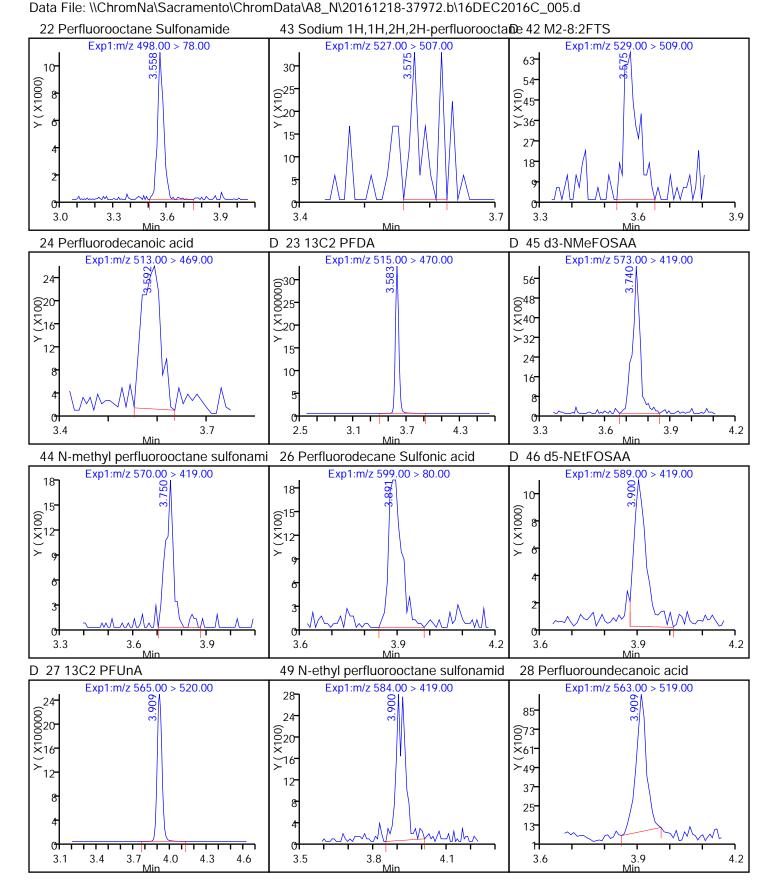
Report Date: 18-Dec-2016 17:57:44

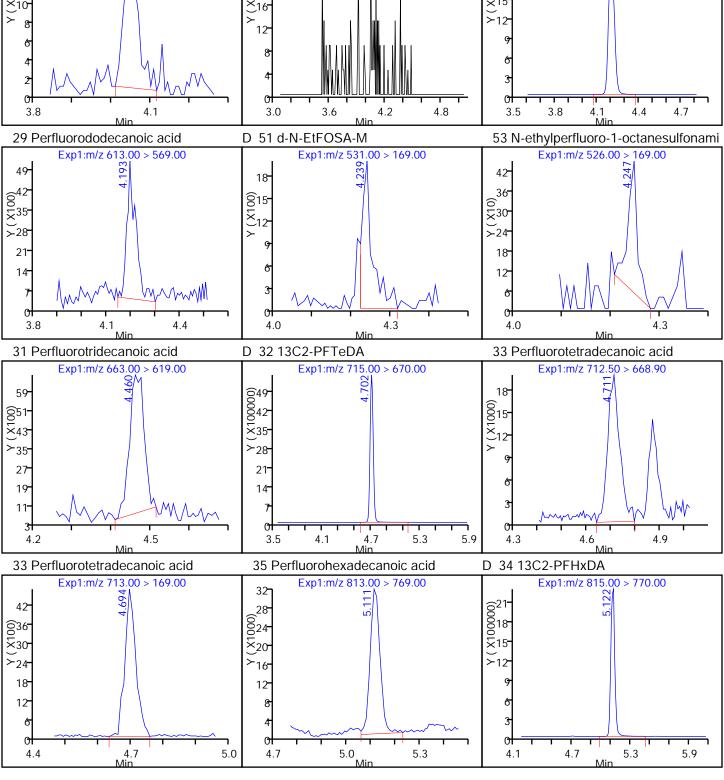
OC Flag Legend Processing Flags

NR - Missing Quant Standard

Report Date: 18-Dec-2016 17:57:44 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 18:30:12 Instrument ID: A8_N Lims ID: MB 320-140536/1-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 25 Worklist Smp#: 5 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 217.00 > 172.00 Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 18 56 000048 40 40 24 16 1.9 0.9 1.5 1.8 1.9 1.0 1.3 1.6 2.1 1.6 D 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid (ND) 5 Perfluorobutanesulfonic acid (ND) Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 56 24 10 (000048-0000140-(S₂₀ Y (X1000) ∑16<del>-</del> 24 16 1.9 2.2 2.5 0.8 1.4 2.0 2.6 2.0 2.6 1.0 1.3 1.6 8.0 1.4 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid (ND) Exp1:m/z 399.00 > 80.00 Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 49 51 18 842 0 2 15 <u>8</u>35 ∑₂₈-21 23 16 1.7 2.0 2.3 2.9 1.9 2.2 2.0 2.6 2.6 1.4 3.2 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid (ND) D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 56⁻ (00048⁻ (100001) (10001) (0000 36-1000 30-10 Y (X1000) <del>-</del>32 24 18 12 16 0 0 2.1 2.7 3.3 1.5 3.3 1.9 2.2 2.5 2.8 3.4 1.5 3.1 1.6 Páge 6800 of 678

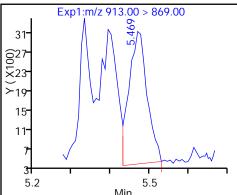






Report Date: 18-Dec-2016 17:57:45 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File:  $\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_005.d$ 

## 36 Perfluorooctadecanoic acid



### FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	JOD NO.: 32U-23931-1					
SDG No.:						
Client Sample ID:	Lab Sample ID: LCS 320-140536/2-A					
Matrix: Water	Lab File ID: 16DEC2016C_006.d					
Analysis Method: 537 (Modified)	Date Collected:					
Extraction Method: 3535	Date Extracted: 12/05/2016 08:31					
Sample wt/vol: 250(mL)	Date Analyzed: 12/16/2016 18:37					
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1					
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)					
% Moisture:	GPC Cleanup: (Y/N) N					
Analysis Batch No.: 142751	Units: ug/L					

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
375-22-4	Perfluorobutanoic acid (PFBA)	0.0446		0.0025	0.0010	0.00046
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.0431		0.0025	0.0020	0.00099
307-24-4	Perfluorohexanoic acid (PFHxA)	0.0427		0.0025	0.0020	0.00079
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.0443		0.0025	0.0020	0.00080
335-67-1	Perfluorooctanoic acid (PFOA)	0.0425		0.0025	0.0020	0.00075
375-95-1	Perfluorononanoic acid (PFNA)	0.0428		0.0025	0.0020	0.00065
335-76-2	Perfluorodecanoic acid (PFDA)	0.0420		0.0025	0.0010	0.00044
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.0410		0.0025	0.0020	0.00075
307-55-1	Perfluorododecanoic acid (PFDoA)	0.0422		0.0025	0.0020	0.00058
72629-94-8	Perfluorotridecanoic Acid (PFTriA)	0.0436		0.0025	0.0020	0.00055
376-06-7	Perfluorotetradecanoic acid (PFTeA)	0.0557		0.0025	0.0010	0.00040
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.0464		0.0025	0.0020	0.00092
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.0375		0.0025	0.0020	0.00087
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.0398		0.0040	0.0030	0.0013
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.0412		0.0040	0.0030	0.0012
754-91-6	Perfluorooctane Sulfonamide (FOSA)	0.0445		0.0025	0.0020	0.00064

# FORM I LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento	Job No.: <u>320-23931-1</u>				
SDG No.:					
Client Sample ID:	Lab Sample ID: LCS 320-140536/2-A				
Matrix: Water	Lab File ID: 16DEC2016C_006.d				
Analysis Method: 537 (Modified)	Date Collected:				
Extraction Method: 3535	Date Extracted: 12/05/2016 08:31				
Sample wt/vol: 250(mL)	Date Analyzed: 12/16/2016 18:37				
Con. Extract Vol.: 0.5(mL)	Dilution Factor: 1				
Injection Volume: 2(uL)	GC Column: Acquity ID: 2.1(mm)				
% Moisture:	GPC Cleanup: (Y/N) N				
Analysis Batch No.: 142751	Units: ug/L				

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01056	13C8 FOSA	90		25-150
STL00992	13C4 PFBA	106		25-150
STL00993	13C2 PFHxA	103		25-150
STL00990	13C4 PFOA	103		25-150
STL00995	13C5 PFNA	103		25-150
STL00996	13C2 PFDA	104		25-150
STL00997	13C2 PFUnA	104		25-150
STL00998	13C2 PFDoA	107		25-150
STL00994	1802 PFHxS	97		25-150
STL00991	13C4 PFOS	99		25-150
STL01893	13C5-PFPeA	109		25-150
STL01892	13C4-PFHpA	102		25-150

Report Date: 18-Dec-2016 17:57:46 Chrom Revision: 2.2 05-Dec-2016 12:37:22

TestAmerica Sacramento
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_006.d

Lims ID: LCS 320-140536/2-A

Client ID:

Sample Type: LCS

Inject. Date: 16-Dec-2016 18:37:42 ALS Bottle#: 26 Worklist Smp#: 6

Injection Vol: 2.0 ul Dil. Factor: 1.0000

Sample Info: lcs 320-140536/2-a Misc. Info.: Plate: 1 Rack: 2

Operator ID: A8-PC\A8 Instrument ID: A8_N

Method: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\A8_N.m

Limit Group: LC PFC_DOD ICAL

Last Update: 18-Dec-2016 17:57:40 Calib Date: 15-Dec-2016 14:18:33

Integrator: Picker

Quant Method: Isotopic Dilution Quant By: Initial Calibration

Last ICal File: \\ChromNA\Sacramento\ChromData\A8_N\20161215-37881.b\15DEC2016B_018.d

Column 1: Det: EXP1

Process Host: XAWRK028

First Level Reviewer: chandrasenas Date: 18-Dec-2016 17:27:56

First Level Revie	wer: cha	ndraser	nas		Date:	1	8-Dec-2016 17:27:5	6		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
D 2 13C4 PFBA										
217.00 > 172.00		1.582	0.0		18389320	52.9		106	917574	
1 Perfluorobut	yric acid									
212.90 > 169.00	,	1.582	0.0	1.000	7007122	22.3		112	55582	
3 Perfluoroper	ntanoic a	cid								
262.90 > 219.00	1.858	1.858	0.0	1.000	6199007	21.6		108	47966	
D 4 13C5-PFPe	eΑ									
267.90 > 223.00	1.868	1.858	0.010		14564444	54.7		109	167866	6
5 Perfluorobut	anesulfo	nic acid								
298.90 > 80.00		1.896	0.0	1.000	10425428	23.2		131		
298.90 > 99.00		1.896	0.0	1.000	4415290		2.36(0.00-0.00)			
D 6 13C2 PFHx										
315.00 > 270.00		2.155	0.0		12569897	51.3		103	888806	
7 Perfluorohex				4 000	100005/	04.4		407	4 400 40	
313.00 > 269.00		2.164		1.000	4990056	21.4		107	142842	
9 Perfluorohex				1 000	(100074	10.7		100		
399.00 > 80.00		2.433	0.073	1.000	6122274	18.7		103		
D 11 13C4-PFH 367.00 > 322.00		2.404	0.004		11541401	F1 O		100	025027	
		2.494	0.004		11541421	51.0		102	825827	
12 Perfluorohe 363.00 > 319.00	•	2.502	-0.004	1.000	F00F270	22.2		111	F00/1	
		2.502	-0.004	1.000	5005270	22.2		111	52361	
D 10 1802 PFH: 403.00 > 84.00		2.510	-0.004		15013039	45.9		97.1	137804	7
			-0.004		15015059	43.9		97.1	13/004	,
15 Perfluorooct 413.00 > 369.00		2.858	-0.004	1.000	5064631	21.2		106	46975	
413.00 > 369.00		2.858	-0.004	1.000	3129880	۷۱.۷	1.62(0.90-1.10)	100	154787	
D 14 13C4 PFO		2.500	0.00 1		0.27000				.0.707	
417.00 > 372.00		2.858	-0.004		11889539	51.6		103	201728	1
311121 31 <b>2.00</b>					Page 637 of 6					

Report Date: 18-Dec-2016 17:57:46 Chrom Revision: 2.2 05-Dec-2016 12:37:22 Data File: \ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b\16DEC2016C_006.d

Data File:	\\Chr	omNa\S	acrament	to\Chrom	Data\A8_N\201	61218-3797	2.b\16DEC2016C_(	006.d		
Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	%Rec	S/N	Flags
13 Perfluorohe	ntanesul	fonic Ac	·id							
449.00 > 80.00	-		-0.004	1.000	5607115	20.7		109		
18 Perfluorooc	tane sulf	onic aci	d							
499.00 > 80.00		3.115	0.003	1.000	4865808	19.9		107	57594	
499.00 > 99.00		3.115	0.110	1.034	1032370		4.71(0.90-1.10)		103992	
D 19 13C5 PFN.		2 220	0.005		0100/10	F1 0		102	7/2/0/	
468.00 > 423.00 D 17 13C4 PFO		3.230	-0.005		9122612	51.3		103	762484	
503.00 > 80.00		3 230	-0.005		11750191	47.2		98.8	463895	
20 Perfluorono			0.000		11700171	17.2		70.0	100070	
463.00 > 419.00			-0.014	1.000	3719381	21.4		107	73124	
D 21 13C8 FOS	Α									
506.00 > 78.00	3.565	3.561	0.004		17278317	45.0		90.0	503834	
22 Perfluorooc		fonamid	е							
498.00 > 78.00	3.556	3.561	-0.005	1.000	7178236	22.3		111	187210	
24 Perfluorode										
513.00 > 469.00		3.586	-0.005	1.000	3237951	21.0		105	102755	
D 23 13C2 PFD		2 505	0.014		0174272	52.0		104	284307	
515.00 > 470.00			-0.014		8174372	52.0		104	284307	
26 Perfluorode 599.00 > 80.00			-0.008	1.000	2955627	20.6		107		
D 27 13C2 PFU		0.077	0.000	1.000	2700027	20.0				
565.00 > 520.00		3.907	0.010		6116801	52.2		104	414310	
28 Perfluoroun	decanoio	c acid								
563.00 > 519.00	3.917	3.916	0.001	1.000	2398461	20.5		103	49616	
D 30 13C2 PFD	οΑ									
615.00 > 570.00	4.202	4.203	-0.001		5924429	53.4		107	215870	
29 Perfluorodo										
613.00 > 569.00			-0.001	1.000	2292380	21.1		105	54764	
31 Perfluorotrio			0.004	1 000	2242702	21.0		100	20025	
663.00 > 619.00		4.467	0.004	1.000	2343702	21.8		109	39835	
D 32 13C2-PFT6 715.00 > 670.00		4.711	-0.013		14686506	64.6		129	722298	
33 Perfluorotet			0.013		14000300	04.0		127	122270	
712.50 > 668.90		4.711	-0.013	1.000	5225598	27.8		139	6130	
713.00 > 169.00		4.711	-0.013	1.000	885252		5.90(0.00-0.00)		112861	
35 Perfluorohe	xadecan	oic acid								
813.00 > 769.00	5.114	5.112	0.002	1.000	2115780	18.1		90.5	4622	
D 34 13C2-PFH										
815.00 > 770.00	5.114	5.123	-0.009		5582988	44.8		89.6	172368	
36 Perfluorooc				4.0	0476117	4		00.5		
913.00 > 869.00	5.471	5.471	0.0	1.000	2173117	17.8		89.0	4270	

Report Date: 18-Dec-2016 17:57:46 Chrom Revision: 2.2 05-Dec-2016 12:37:22 TestAmerica Sacramento Data File: **Injection Date:** 16-Dec-2016 18:37:42 Instrument ID: A8_N Lims ID: LCS 320-140536/2-A Client ID: Operator ID: A8-PC\A8 ALS Bottle#: 26 Worklist Smp#: 6 Injection Vol: 2.0 ul Dil. Factor: 1.0000 Method: Limit Group: LC PFC_DOD ICAL  $A8_N$ D 213C4 PFBA 1 Perfluorobutyric acid 3 Perfluoropentanoic acid Exp1:m/z 212.90 > 169.00 Exp1:m/z 262.90 > 219.00 Exp1:m/z 217.00 > 172.00 56 049 042  $\times_{35}$ ≻₂₈-21 1.5 1.8 1.2 1.5 1.8 0.9 2.1 8.0 1.1 1.4 1.7 2.0 2.1 2.4 4 13C5-PFPeA 5 Perfluorobutanesulfonic acid D 5 Perfluorobutanesulfonic acid Exp1:m/z 298.90 > 80.00 Exp1:m/z 298.90 > 99.00 Exp1:m/z 267.90 > 223.00 42 (518 (500015 (512 (518) (100000) 00042 35 ∑28<del>-</del> 18 21 12 2.4 1.8 1.9 1.2 1.8 3.0 1.5 2.1 2.2 0.6 1.6 D 6 13C2 PFHxA 7 Perfluorohexanoic acid 9 Perfluorohexanesulfonic acid Exp1:m/z 315.00 > 270.00 Exp1:m/z 313.00 > 269.00 Exp1:m/z 399.00 > 80.00 155 (00036⁻ ) 30⁻ (000015 X)12 18 12 1.8 2.1 2.4 1.9 2.2 2.7 1.5 1.8 2.1 2.4 2.7 2.5 2.8 3.1 1.5 1.6 D 11 13C4-PFHpA 12 Perfluoroheptanoic acid D 10 1802 PFHxS Exp1:m/z 363.00 > 319.00 Exp1:m/z 367.00 > 322.00 Exp1:m/z 403.00 > 84.00 42 18 56<del>-</del> (0015-12-12-(00001×) ×) 24 049 042 ×35 ≻28 18 21 12 0 0 2.9 2.1 2.7 3.3 2.0 Page 689hof 678 1.5 2.1 2.7 3.3 1.5

3.0

2.7

3.3

3.6

3.9

4.2

2.7

3.0

3.3

3.6

3.9

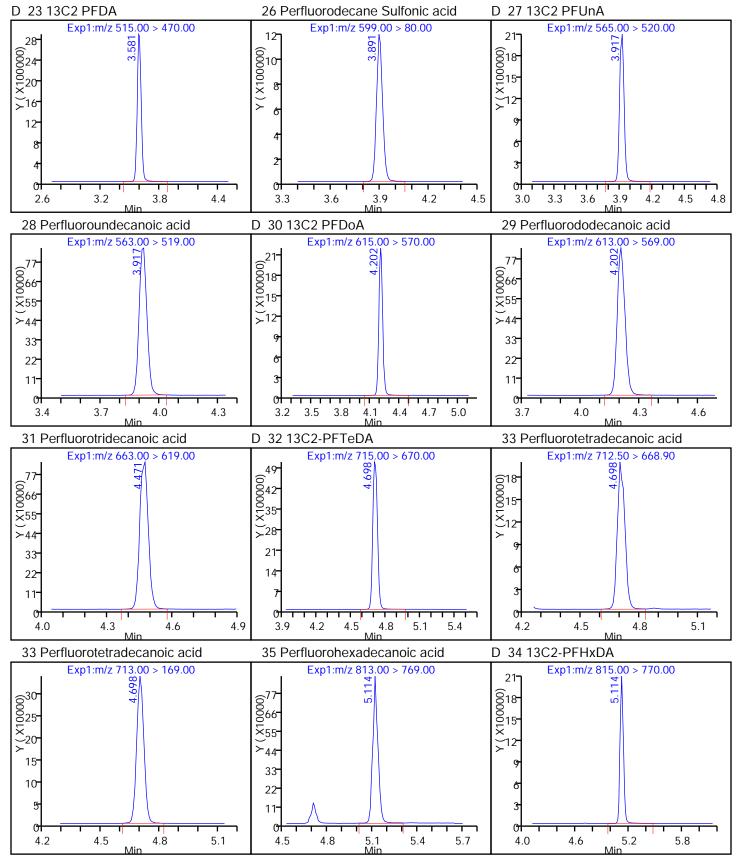
4.2

3.0

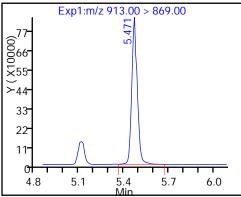
3.3

3.6 Min 3.9

4.2



## 36 Perfluorooctadecanoic acid



Lab Name:	TestAmerica Sacramento	Job No.:	320-23931-1
SDG No.:			

Instrument ID: <u>A8_N</u> Start Date: <u>12/15/2016</u> 12:06

Analysis Batch Number: 142379 End Date: 12/15/2016 19:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142379/1 CCB		12/15/2016 12:06	1		Acquity 2.1(mm)
RB 320-142379/2 CCB		12/15/2016 12:14	1		Acquity 2.1(mm)
RB 320-142379/3 CCB		12/15/2016 12:21	1		Acquity 2.1(mm)
IC 320-142379/4		12/15/2016 12:29	1	15DEC2016B_004.	Acquity 2.1 (mm)
IC 320-142379/5		12/15/2016 12:36	1	15DEC2016B_005.	Acquity 2.1 (mm)
IC 320-142379/6		12/15/2016 12:44	1	15DEC2016B_006.	Acquity 2.1 (mm)
IC 320-142379/7		12/15/2016 12:51	1	15DEC2016B_007.	Acquity 2.1 (mm)
IC 320-142379/8		12/15/2016 12:59	1	15DEC2016B_008.	Acquity 2.1 (mm)
IC 320-142379/9		12/15/2016 13:06	1	15DEC2016B_009.	Acquity 2.1 (mm)
ICB 320-142379/10		12/15/2016 13:14	1	~	Acquity 2.1(mm)
ICV 320-142379/11		12/15/2016 13:21	1	15DEC2016B_011.	Acquity 2.1 (mm)
IC 320-142379/13		12/15/2016 13:41	1	15DEC2016BB_013	Acquity 2.1 (mm)
IC 320-142379/14		12/15/2016 13:48	1	15DEC2016B_014.	Acquity 2.1 (mm)
IC 320-142379/15		12/15/2016 13:56	1	15DEC2016B_015.	Acquity 2.1 (mm)
IC 320-142379/16		12/15/2016 14:03	1	15DEC2016B_016.	Acquity 2.1 (mm)
IC 320-142379/17		12/15/2016 14:11	1	15DEC2016B_017.	Acquity 2.1 (mm)
IC 320-142379/18		12/15/2016 14:18	1	15DEC2016B_018.	Acquity 2.1 (mm)
ICB 320-142379/19		12/15/2016 14:26	1		Acquity 2.1(mm)
ICV 320-142379/20		12/15/2016 14:33	1		Acquity 2.1(mm)
RB 320-142379/21 CCB		12/15/2016 14:41	1		Acquity 2.1 (mm)
CCV 320-142379/24		12/15/2016 15:46	1		Acquity 2.1(mm)
RB 320-142379/25 CCB		12/15/2016 15:54	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:01	1		Acquity 2.1(mm)
CCV 320-142379/27		12/15/2016 16:09	1		Acquity 2.1(mm)
RB 320-142379/28 CCB		12/15/2016 16:16	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:24	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:31	1		Acquity 2.1(mm)
ZZZZZ		12/15/2016 16:39	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 16:46	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 16:54	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:01	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:09	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:16	1		Acquity 2.1 (mm)
ZZZZZ		12/15/2016 17:24	1		Acquity 2.1 (mm)
RB 320-142379/44 CCB		12/15/2016 19:47	1		Acquity 2.1 (mm)
CCV 320-142379/42		12/15/2016 19:54	1		Acquity 2.1(mm)

Lab Name: TestAmerica Sacramento	Job No.: <u>320-23931-1</u>
SDG No.:	
Instrument ID: A8_N	Start Date: 12/16/2016 10:15
Analysis Batch Number: 142571	End Date: 12/16/2016 10:30

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION	LAB FILE ID	COLUMN ID
			FACTOR		
			_		
RB 320-142571/3 CCB		12/16/2016 10:15	1		Acquity 2.1 (mm)
CCV 320-142571/4		12/16/2016 10:23	1	16DEC2016A 002.	Acquity 2.1 (mm)
CCVL				d	1 1 1
CCV 320-142571/5		12/16/2016 10:30	1		Acquity 2.1 (mm)
CCVL					

Lab Name:	TestAmerica Sacramento	JOD NO.: 320-23931-1
SDG No.:		
Instrument	ID: A8 N	Start Date: 12/16/2016 18:00

Analysis Batch Number: 142751 End Date: 12/16/2016 21:52

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-142751/1 CCB		12/16/2016 18:00	1		Acquity 2.1 (mm)
CCV 320-142751/2		12/16/2016 18:07	1	16DEC2016C_002.	Acquity 2.1 (mm)
CCV 320-142751/3		12/16/2016 18:15	1		Acquity 2.1 (mm)
RB 320-142751/4 CCB		12/16/2016 18:22	1		Acquity 2.1 (mm)
MB 320-140536/1-A		12/16/2016 18:30	1	16DEC2016C_005.	Acquity 2.1 (mm)
LCS 320-140536/2-A		12/16/2016 18:37	1	16DEC2016C_006.	Acquity 2.1 (mm)
ZZZZZ		12/16/2016 18:45	1	-	Acquity 2.1 (mm)
ZZZZZ		12/16/2016 18:52	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 19:00	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 19:07	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 19:15	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 19:22	1		Acquity 2.1 (mm)
320-23931-1		12/16/2016 19:30	1	16DEC2016C_013.	Acquity 2.1 (mm)
320-23931-2		12/16/2016 19:37	1	16DEC2016C_014.	Acquity 2.1 (mm)
RB 320-142751/15 CCB		12/16/2016 19:45	1		Acquity 2.1 (mm)
CCV 320-142751/16		12/16/2016 19:52	1	16DEC2016C_016.	Acquity 2.1 (mm)
CCV 320-142751/17		12/16/2016 20:00	1	u u	Acquity 2.1 (mm)
RB 320-142751/18 CCB		12/16/2016 20:07	1		Acquity 2.1 (mm)
320-23931-3		12/16/2016 20:15	1	16DEC2016C_019.	Acquity 2.1 (mm)
320-23931-4		12/16/2016 20:22	1	16DEC2016C_020.	Acquity 2.1 (mm)
320-23931-5		12/16/2016 20:30	1	16DEC2016C_021.	Acquity 2.1 (mm)
320-23931-6		12/16/2016 20:37	1	16DEC2016C_022.	Acquity 2.1 (mm)
ZZZZZ		12/16/2016 20:45	1	u u	Acquity 2.1 (mm)
ZZZZZ		12/16/2016 20:52	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 21:00	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 21:07	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 21:15	1		Acquity 2.1 (mm)
ZZZZZ		12/16/2016 21:22	1		Acquity 2.1 (mm)
RB 320-142751/29 CCB		12/16/2016 21:30	1		Acquity 2.1 (mm)
CCV 320-142751/30		12/16/2016 21:37	1	16DEC2016C_030.	Acquity 2.1 (mm)
CCV 320-142751/31		12/16/2016 21:45	1	<u>~</u>	Acquity 2.1 (mm)
RB 320-142751/32 CCB		12/16/2016 21:52	1		Acquity 2.1 (mm)

Lab Name: TestAmerica Sacramento	Job No.: 320-23931-1
SDG No.:	
Instrument ID: A8_N	Start Date: 12/20/2016 17:29

Analysis Batch Number: 143259 End Date: 12/20/2016 20:29

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
RB 320-143259/1 CCB		12/20/2016 17:29	1		Acquity 2.1 (mm)
CCV 320-143259/2		12/20/2016 17:37	1	20DEC2016C_002.	Acquity 2.1 (mm)
CCV 320-143259/3		12/20/2016 17:44	1		Acquity 2.1 (mm)
RB 320-143259/4 CCB		12/20/2016 17:52	1		Acquity 2.1 (mm)
ZZZZZ		12/20/2016 17:59	1		Acquity 2.1 (mm)
ZZZZZ		12/20/2016 18:07	1		Acquity 2.1 (mm)
ZZZZZ		12/20/2016 18:14	100		Acquity 2.1 (mm)
320-23931-2 DL		12/20/2016 18:22	100	20DEC2016C_008. d	Acquity 2.1 (mm)
ZZZZZ		12/20/2016 18:29	100		Acquity 2.1(mm)
320-23931-1 DL		12/20/2016 18:37	50	20DEC2016C_010. d	Acquity 2.1 (mm)
ZZZZZ		12/20/2016 18:44	1		Acquity 2.1(mm)
320-23931-3 RA		12/20/2016 18:52	1	20DEC2016C_012. d	Acquity 2.1 (mm)
320-23931-4 RA		12/20/2016 18:59	1	20DEC2016C_013. d	Acquity 2.1 (mm)
320-23931-5 RA		12/20/2016 19:07	1	20DEC2016C_014.	Acquity 2.1 (mm)
RB 320-143259/15 CCB		12/20/2016 19:14	1		Acquity 2.1 (mm)
CCV 320-143259/16		12/20/2016 19:22	1	20DEC2016C_016. d	Acquity 2.1 (mm)
CCV 320-143259/17		12/20/2016 19:29	1		Acquity 2.1 (mm)
RB 320-143259/18 CCB		12/20/2016 19:37	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 19:44	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 19:52	1		Acquity 2.1(mm)
ZZZZZ		12/20/2016 19:59	1		Acquity 2.1 (mm)
RB 320-143259/22 CCB		12/20/2016 20:07	1		Acquity 2.1 (mm)
CCV 320-143259/23		12/20/2016 20:14	1		Acquity 2.1 (mm)
CCV 320-143259/24		12/20/2016 20:22	1		Acquity 2.1 (mm)
RB 320-143259/25 CCB		12/20/2016 20:29	1		Acquity 2.1 (mm)

#### LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Batch Number: 140536 Batch Start Date: 12/05/16 08:28 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 12/06/16 14:30

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	LCMPFCSU 00046	LCPFCSP 00070
MB 320-140536/1		3535, 537				250 mL	0.5 mL	25 uL	
		(Modified)							
LCS		3535 <b>,</b> 537				250 mL	0.5 mL	25 uL	20 uL
320-140536/2		(Modified)							
320-23931-B-1	608D132MW-LF-111	3535, 537	Т	291.44 q	26.94 g	264.5 mL	0.5 mL	25 uL	
	6	(Modified)		, and the second					
320-23931-A-2	608D33MW-LF-1116	3535, 537	T	287.40 g	27.19 g	260.2 mL	0.5 mL	25 uL	
		(Modified)		_	_				
320-23931-A-3	61301MW-LF-1116	3535, 537	Т	292.42 q	26.95 g	265.5 mL	0.5 mL	25 uL	
		(Modified)							
320-23931-A-4	613D41MW-LF-1116	3535, 537	Т	292.31 q	26.61 g	265.7 mL	0.5 mL	25 uL	
		(Modified)		3					
320-23931-A-5	613D39MW-LF-1116	3535, 537	Т	304.37 g	26.73 g	277.6 mL	0.5 mL	25 uL	
		(Modified)		2					
320-23931-A-6	FB113016	3535, 537	Т	307.13 g	26.94 q	280.2 mL	0.5 mL	25 uL	
		(Modified)		. ,					

Batch Notes						
QA-070						
0.1N NAOH/H2O 758321						
12-05-16						
0000146278						
5, 6						
789822						
MD05306						
НЈА						
НЈА						
NSH						
794501						
0.3% NH4OH/MeOH						
WS-LC-0025						
WAX 500mg						
002836112A						

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.

#### LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-23931-1

SDG No.:

Batch Number: 140536 Batch Start Date: 12/05/16 08:28 Batch Analyst: Arauz, Horacio J

Batch Method: 3535 Batch End Date: 12/06/16 14:30

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.



#### West Sacramento

#### HPLC/LCMS Data Review Checklist

	781	1/16	- A) (A
. Calibration/Instrument Run QC	1 st Level	2 nd Level	N/A
ICAL locked in Chrom and TALS? ICAL Batch# /42379; /42380	\ <u>\</u>		
ICAL, CCV Frequency & Criteria met.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		
RF _{average} criteria appropriate for the method.	- V		
<ul> <li>Linear Regression criteria appropriate if required (r ≥ 0.995).</li> </ul>	V		
<ul> <li>Quadratic fit criteria appropriate if required (r² ≥ 0.990).</li> </ul>			V
<ul> <li>For Linear Regression and Quadratic fit – Does the y-intercept support</li> <li>½ the reporting limit as described in CA-Q-S-005?</li> </ul>	/		
All curve points show calculated concentrations.			
Peaks correctly ID'd by data system.	<b>/</b>		
Tune check frequency & criteria met and Tune check report attached.	<b>V</b>	V	
QA/QC			
Are all QC samples properly linked in TALS?	<b>/</b>		
Method blank, LCS/LCSD and MS/SD frequencies met.	<b>/</b>		
LCS/LCSD and MB data are within control limits. If not, NCM is present.			
Are MS/MSD recoveries and RPD within control limits?	<b>/</b>		
Holding Times were met for prep and analytical.	<b>V</b>		
IS/Surrogate recoveries meet criteria or properly noted.	/	/	
Sample Analysis			
Was correct analysis performed and were project instructions followed?	<u> </u>		
If required, are compounds within RT windows?	~		
If required, are positive hits confirmed and >40% RPD flagged?			<u> </u>
Manual Integrations reviewed and appropriate.	~		
All analytes correctly reported. (Primary, secondary, acceptable status)	V		
Correct reporting limits used. (based on client request, prep factors, and			
utions)	<b>V</b>	V	
Documentation			
Are all non-conformances documented/attached? NCM#	/		
Do results make sense (e.g. dilutions, etc.)?	<b>V</b>	/	
Have all flags been reviewed for appropriateness?			
For level 3 and 4 reports, have forms and raw data been reviewed?		/	
Was QC Checker run for this job?	<b>/</b>		

21212016

q:\forms\checklists\qa-570_lcms_review ns 2012-09-25.doc

73571

QA-570 Revised NS 9/25/2012

Report Date: 18-Dec-2016 16:04:38

Page: 1

#### TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

16DEC2016D_PFC

Worklist Number: 37972

Instrument Name: A8_N Data Directory:

Chrom Method: A8_N

\\ChromNa\Sacramento\ChromData\A8_N\20161218-37972.b

QC Batching:

Disabled

Limit Group Batching: Enabled

QC Batch: 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
	Raw Batch: 142751	Raw Batch: 142752	Raw Batch 142753
# 1 RB	#1 RB	#1 RB	#1 RB
# 2 CCV L5	# 2 CCV L5	#2 CCV L5	# 2 CCV L5
#3 CCV L5 Add-on	#3 CCV L5 Add-on	#3 CCV L5 Add-on	#3 CCV L5 Add-on
#4 RB		#4 RB	#4 RB [
# 5 MB 320-140536/1-A	# 5 MB 320-140536/1-A		1
# 6 LCS 320-140536/2-A	# 6 LCS 320-140536/2-A		
# 7 320-23884-A-1-A	# 7 320-23884-A-1-A	1	
# 8 320-23884-A-2-A	# 8 320-23884-A-2-A 100x	K. RA PI all	10000
# 9 320-23884-A-3-A	#9 320-23884-A-3-A 100x,10		i cev migh
#10 320-23884-A-3-B MS	#10 320-23884-A-3-B MS	that are not	(CV high Samples ND NCM 73518
#11 320-23884-A-3-C MSD	#11 320-23884-A-3-C MSD	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	20 510
#12 320-23884-A-4-A	#12 320-23884-A-4-A	ND PPBS	ND NEW 70010
	#13 320-23931-B-1-A <i>50</i> ×	f	
#14 320-23931-A-2-A	#14 320-23931-A-2-A 100x,10	X	
#15 RB	#15 DD	1#15 DD \	#15 RB
#16 CCV L4	#16 CCV L4		#16 CCV L4
#17 CCV L4 Add-on			#17 CCV L4 Add-on
#18 RB		#18 RB	#18 RB
#19 320-23931-A-3-A	#19 320-23931-A-3-A	[	Eflag NCM 73522
#20 320-23931-A-4-A	#20 320-23931-A-4-A	i	1
#21 320-23931-A-5-A	#21 320-23931-A-5-A	מא	MS/MSD inconsistency
#22 320-23931-A-6-A	#22 320-23931-A-6-A NO RI	(	· · · · · · · ·
#23 320-23996 <b>-</b> A-1-A	#23 320-23996-A-1-A	1	inconsisting
#24 320-23996-A-2-A	#24 320-23996-A-2-A NOKI	ואס	NCM 73519
	#25 320-23996-A-3-A		1000 7051
#26 320-23996-A-4-A	#26 320-23996-A-4-A 100x,10	PX [	120 NOM 73 52
	#27 320-23996-A-5-A	<u>_</u>	( Dr. 100 Marc 19 3-1
#28 320-23996-A-6-A	#28 320-23996-A-6-A NORI	שא	
#29 RB	#29 RB	#29 RB	#29 RB
#30 CCV L5			#30 CCV L5
#31 CCV L5 Add-on			#31 CCV L5 Add-on
#32 RB	#32 RB	#32 RB	#32 RB

CCVL2 142571 1CV 142379 Tune NCM 73213

38078

#### TestAmerica Laboratories Worklist QC Batch Report

Worklist Name:

20DEC2016C_PFC

Worklist Number:

Instrument Name: A8_N

**A8_N** Chrom Method:

\\ChromNa\Sacramento\ChromData\A8_N\20161221-38078.b

Data Directory: QC Batching:

Disabled

Limit Group Batching: Enabled

QC Batch 1	LC PFC_DOD ICAL	LC PFC ICAL	LC PFAS ICAL
	Raw Batch: 143259	Raw Batch: 143260	Raw Batch: 143261
#1 RB			#1 RB
#2 CCV L5			# 2 CCV L5
#3 CCV L5 Add-on		#3 CCV L5 Add-on	#3 CCV L5 Add-on
#4 RB		#4 RB	#4 RB
# 5 MB 320-140536/1-A	# 5 MB 320-140536/1-A	FOSA IDA LOW NOM 225	25
# 6 LCS 320-140536/2-A	# 6 LCS 320-140536/2-A	#4 RB FOSA IDA LOW NOM 735 IDA high NCM 7352	[2
# 7 320-23884-A-2-A	# 7 320-23884-A-2-A	IDA high NCM 7352	F
#8 320-23931-A-2-A	# 8 320-23931-A-2-A		
# 9 320-23996-A-4-A	# 9 320-23996-A-4-A	RL NCM 73527	
#10 320-23931-B-1-A	#10 320-23931-B-1-A	RE 10011 1330	
	#11 320-23884-A-1-A	looxeflog NCM 93	-35
#12 320-23931-A-3-A			<b>/</b>
#13 320-23931-A-4-A			
#14 320-23931-A-5-A			
	1		#15 RB
			#16 CCV L4
r .			#17 CCV L4 Add-on
		#18 RB	#18 RB
	#19 320-23996-A-1-A		
	#20 320-23996-A-3-A		
	#21 320-23996-A-5-A		
			#22 RB
	,		#23 CCV L5
			#24 CCV L5 Add-on
#25 RB	#25 RB	#25 RB	#25 RB

CCV L2 143143 1CV 142379

#### TestAmerica Laboratories Worklist QC Batch Report

Worklist Name: 20DEC2016B_PFC

Worklist Number: 38075

Instrument Name: A8_N

Chrom Method: **A8 N** 

Data Directory: QC Batching:

Disabled

\\ChromNa\Sacramento\ChromData\A8_N\20161221-38075.b Limit Group Batching: Enabled

QC Batch: 1 LC PFC_DOD ICAL LC PFC ICAL LC PFAS ICAL Raw Batch: 143248 Raw Batch: 143249 Raw Batch: 143250 #1 RB #1 RB #1 RB #1 RB # 2 CCV L5 # 2 CCV L5 #2 CCV L5 #2 CCV L5 #3 CCV L5 Add-on #3 CCV L5 Add-on #3 CCV L5 Add-on #3 CCV L5 Add-on #4 RB #4 RB #4 RB #4 RB # 5 320-23990-A-1-A # 5 320-23990-A-1-A # 5 320-23990-A-1-A # 6 320-23990-A-2-A # 6 320-23990-A-2-A # 6 320-23990-A-2-A # 7 320-23990-A-4-A # 7 320-23990-A-4-A # 7 320-23990-A-4-A # 8 320-23990-A-5-A # 8 320-23990-A-5-A # 8 320-23990-A-5-A # 9 320-23990-A-6-A # 9 320-23990-A-6-A # 9 320-23990-A-6-A #10 320-23990-A-7-A #10 320-23990-A-7-A #10 320-23990-A-7-A #11 320-23990-A-8-A #11 320-23990-A-8-A #11 320-23990-A-8-A #12 320-23990-A-9-A #12 320-23990-A-9-A #12 320-23990-A-9-A #13 320-23990-A-13-A #13 320-23990-A-13**-**A #13 320-23990-A-13-A #14 320-23990-A-15-A #14 320-23990-A-15-A #14 320-23990-A-15-A #15 RB #15 RB #15 RB #15 RB #16 CCV L4 #16 CCV L4 #16 CCV L4 #16 CCV L4 #17 CCV L4 Add-on #17 CCV L4 Add-on #17 CCV L4 Add-on #17 CCV L4 Add-on #18 RB #18 RB #18 RB #18 RB #19 320-23990-A-16-A #19 320-23990-A-16-A #19 320-23990-A**-**16-A #20 320-23990-A-3-A #20 320-23990-A-3-A #20 320-23990-A-3-A #21 320-23990-A-14-A #21 320-23990-A-14-A l#21 320-23990-A-14-A #22 320-23990-A-3-A #22 320-23990-A-3-A #22 320-23990-A-3-A #23 RB #23 RB #23 RB #23 RB #24 320-23990-A-5-A #24 320-23990-A-5-A #24 320-23990-A-5-A #25 RB #25 RB #25 RB #25 RB #26 320-23990-A-9-A #26 320-23990-A-9-A #26 320-23990-A-9**-**A #27 RB #27 RB #27 RB #27 RB MS/MSD 1.P My #28 320-23990-A-10-A #28 320-23990-A-10-A l#28 320-23990**-**A-10-A #29 320-23990-A-14**-**A #29 320-23990-A-14-A #29 320-23990-A-14-A #30 RB #30 RB #30 RB l#30 RB #31 CCV L4 #31 CCV L4 #31 CCV L4 #31 CCV L4 #32 RB #32 RB #32 RB #32 RB #33 MB 320-142964/1-A #33 MB 320-142964/1-A 1DA high NCM 73531 #34 LCS 320-142964/2-A #34 LCS 320-142964/2-A #35 320-23884-B-3-A #35 320-23884-B-3-A #36 320-23884-B-3-B MS #36 320-23884-B-3-B MS #37 320-23884-B-3-C MSD #37 320-23884-B-3-C MSD #38 RB #38 RB #38 RB #38 RB #39 CCV L5 #39 CCV L5 #39 CCV L5 #39 CCV L5 #40 RB #40 RB #40 RB #40 RB

CCV L2 143143

143144 142380

ICV 142379

FOSA IDA LOW NCM 73524



Batch Number: 320-140536

Method Code: 320-3535_IVWT-320

# **Aqueous Extraction Analysis Sheet**

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

DL 12/20/16

Batch Open: 12/5/2016 8:28:00AM

Batch End: 12/6/2016 2:30:00PM

Solid-Phase Extraction (SPE)

142751

PK

A9 12/13/16 12/15/16

	Input Sample Lab ID (Analytical Method)	SDG (Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-140536/1 N/A	N/A		250 mL				N/A	N/A	N/A	RI CCV PFBS	
	LCS~320-140536/2	N/A		0.5 mL		<b></b>						
2	N/A	N/A		250 mL				N/A	N/A	N/A	PI	
				0.5 mL								
3	320-23884-A-1 (PFC_IDA_DOD5)	N/A (320-23884-1)	293.79 g	267.1 mL				12/6/16	12_Days	4 .	FI	
			26.65 g	0.5 mL								
Patje (	320-23884-A-2 (PFC_IDA_DOD5)	N/A (320-23884-1)	300.27 g	273.4 mL				12/6/16	12_Days	4	See NCM, unsual color.	Marata iu un in
553			26.89 g	0.5 mL							100x	
653 01 678	320-23884-A-3 (PFC_IDA_DOD5)	N/A (320-23884-1)	304.67 g	277.8 mL				12/6/16	12_Days	4	100x,10x, R	
78			26.86 g	0.5 mL	1	i						
6	320-23884-A-3~MS (PFC_IDA_DOD5)	N/A (320-23884-1)	303.71 g	276.2 mL				12/6/16	12_Days	4	See NCM, unsual color.	
			27.47 g	0.5 mL	1					l		
7	320-23884-A-3~MSD (PFC_IDA_DOD5)	N/A (320-23884-1)	298.35 g	271.2 mL				12/6/16	12_Days	4		
			27.11 g	0.5 mL	1					1		
8	320-23884-A-4 (PFC_IDA_DOD5)	N/A (320-23884-1)	320.76 g	294.1 mL				12/6/16	12_Days	4		
			26.63 g	0.5 mL	1	i	1	]	1	1	Ì	
9	320-23931-B-1 (PFC_IDA_DOD5)	N/A (320-23931-1)	291.44 g	264.5 mL				12/7/16	12_Days	4	50×	
			26.94 g	0.5 mL	1		1					5 Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z
10	320-23931-A-2 (PFC_IDA_DOD5)	N/A (320-23931-1)	287.40 g	260.2 mL				12/7/16	12_Days	4	100x, 10x	
	·		27.19 g	0.5 mL								
				H								

(To Accompany Samples to Instruments)

Batch Number: 320-140536

Analyst: Arauz, Horacio J

Method Code: 320-3535_IVWT-320

Batch Open: 12/5/2016 8:28:00AM

Batch End: 12/6/2016 2:30:00PM

11	320-23931-A-3 (PFC_IDA_DOD5)	N/A (320-23931-1)	292.42 g	265.5 mL			12/7/16	12_Days	4	pt ppBs	
- 1	(* 1 03.01 (2000)	(020 2000 ; 7)	26.95 g	0.5 mL		1 1				1	110 3 2 0 - 2 3 9 3 1 - A - 3 - A 110
12	320-23931-A-4 (PFC_IDA_DOD5)	N/A (320-23931-1)	292.31 g	265.7 mL			12/7/16	12_Days	4		
ĺ			26.61 g	0.5 mL							
13	320-23931-A-5 (PFC_IDA_DOD5)	N/A (320-23931-1)	304.37 g	277.6 mL			12/7/16	12_Days	4		
			26.73 g	0.5 mL							
14	320-23931-A-6 (PFC_IDA_DOD5)	N/A (320-23931-1)	307.13 g	280.2 mL			12/7/16	12_Days	4	MORI	AN A
1			26.94 g	0.5 mL							
15	320-23996-A-1 (PFC_IDA_DOD5)	N/A (320-23996-1)	283.78 g	257.2 mL			12/8/16	12_Days	4		
[			26.62 g	0.5 mL							
Pæge	320-23996-A-2 (PFC_IDA_DOD5)	N/A (320-23996-1)	292.01 g	265.2 mL			12/8/16	12_Days	4	NORE	
65 F			26.77 g	0.5 mL		_					
654 <b>Q</b> f 6	320-23996-A-3 (PFC_IDA_DOD5)	N/A (320-23996-1)	302.98 g	276.2 mL			12/8/16	12_Days	4		
678			26.82 g	0.5 mL							
18	320-23996-A-4 (PFC_IDA_DOD5)	N/A (320-23996-1)	299.19 g	272.4 mL			12/8/16	12_Days	4	100x,10x	AN AN THE WAY
ĺ			26.82 g	0.5 mL						1	
19	320-23996-A-5 (PFC_IDA_DOD5)	N/A (320-23996-1)	298.09 g	271.3 mL			12/8/16	12_Days	4		
		<u>.                                    </u>	26.83 g	0.5 mL							
20	320-23996-A-6 (PFC_IDA_DOD5)	N/A (320-23996-1)	281.55 g	254.2 mL	·		12/8/16	12_Days	4	NOPI	
	<del> </del>		27.39 g	0.5 mL							

Batch Number: 320-140536

**Aqueous Extraction Analysis Sheet** 

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Open: 12/5/2016 8:28:00AM

Batch End:

Method Code: 320-3535_IVWT-320

	Batch Notes
Manifold ID 5	5, 6
Methanol ID 7	789822
Hexane ID 0	0000146278
Sodium Hypochlorite ID N	NA
First Start time N	NA .
First End time	NA .
Balance ID C	QA-070
SPE Cartridge Type V	WAX 500mg
Solid Phase Extraction Disk ID 0	002836112A
H2O ID 1	12-05-16
Pipette ID N	MD05306
Solvent Name 0	0.3% NH4OH/MeOH
Solvent Lot # 7	794501
Analyst ID - Reagent Drop	HJA
Analyst ID - SU Reagent Drop	HJA
Analyst ID - SU Reagent Drop N Witness -	NSH
Acid Name N	NA
Acid ID N	NA
Reagent ID	NA .
Reagent Lot Number N	NA .
NaCI ID N	NA

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# ⁵age 656 of 678

# **Aqueous Extraction Analysis Sheet**

(To Accompany Samples to Instruments)

Analyst: Arauz, Horacio J

Batch Open: 12/5/2016 8:28:00AM

Batch End:

SOP Number WS-LC-0025

Batch Comment 0.1N NAOH/H2O 758321

Printed: 12/5/2016

Batch Number: 320-140536

Method Code: 320-3535_IVWT-320

Page 4 of 7

## (To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: Arauz, Horacio J

Method Code: 320-3535_IVWT-320

Batch Open: 12/5/2016 8:28:00AM

Batch End:

		Comments
320-23884-A-1	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-2	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-3	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-3~MS	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-3~MSD	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23884-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-B-1	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-2 320-23931-A-3 320-23931-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-3	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-5	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23931-A-6	Method Comments:	
320-23996-A-1	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-2	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-3	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-4	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-5	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.
320-23996-A-6	Method Comments:	Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.

Printed: 12/5/2016

(To Accompany Samples to Instruments)

Batch Number: 320-140536 Analyst: A

Method Code: 320-3535_IVWT-320

Analyst: Arauz, Horacio J

Batch Open: 12/5/2016 8:28:00AM

Batch End:

#### **Reagent Additions Worksheet**

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
MB 320-140536/1	LCMPFCSU_00046	25 uL	0.5 mL	HJA 12-5.16	NSH 12-5-16
LCS 320-140536/2	LCMPFCSU_00046	25 uL	0.5 mL		/
LCS 320-140536/2	LCPFCSP_00070	20 uL	0.5 mL		
320-23884-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3 MS	LCPFCSP_00070	20 uL	0.5 mL		
320-23884-A-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-A-3 MSD	LCPFCSP_00070	20 uL	0.5 mL		
320-23884-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-B-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23931-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-1	LCMPFCSU_00046	25 uL	0.5 mL	4	V

f 678

Printed: 12/5/2016

(To Accompany Samples to Instruments)

Batch Number: 320-140536

Analyst: Arauz, Horacio J

Batch Open: 12/5/2016 8:28:00AM

Method Code: 320-3535_IVWT-320

Batch End:

320-23996-A-2	LCMPFCSU_00046	25 uL	0.5 mL	HZA 12-5-16	NSH 12-5-16
320-23996-A-3	LCMPFCSU_00046	25 uL	0.5 mL	(	
320-23996-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-5	LCMPFCSU_00046	25 uL	0.5 mL		
320-23996-A-6	LCMPFCSU_00046	25 uL	0.5 mL	1	V

	Other Reagents:	
Reagent	Amount/Units	Lot#:

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# Sacramento Preparation Data Review Checklist

Preparation Batch Number(s):320-140536 Test: P1C-L		
Earliest Holding Time: 12-13-16		
Samula Liet Tah	1 st Level	2 nd Level
Sample List Tab Samples identified to the correct method	Reviewer	Reviewer
	6 NB V	1-/-
Method/sample/login/QAS checked and correct	V 3010 0	<del> </del>
The treated and to the original to the origina		
Morton back Tab	1 st Level	2 nd Level
Worksheet Tab All samples properly preserved	Reviewer	Reviewer
Weights in anticipated range and not targeted	NV	IVI
All additional test requirements performed, documented, and uploaded to TALS		1
correctly (e.g. final amount, initial amount, turbidity, and Cl Check)		
The pH is transcribed correctly in TALS	VK	NA
All additional information transcribed into TALS is correct and raw data is	/	
attached		//
Comments are transcribed correctly in TALS		
	1st Level	2 nd Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS		//
All spike amounts correct and added to necessary samples and QC		
	1 st Level	2 nd Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly		//
All necessary 'batch information' complete and entered into TALS correctly		
181 and Davison HTA	16	
1 st Level Reviewer: HSA Date: 12-b 2 nd Level Reviewer: Date:	10/0/0	1110
2 nd Level Reviewer: Date:	12/00/	10_
Comments:	,	



## Test America - Sacramento

# Sample Dilution Record

Method ID PFC-TOA-DOD 5	Job#	2393	31; 23884	; 23996
Analyst (Print Name) Shyhora Chandraseno	Analyst	Initials _	880	
Date 12/20/16				

Sample#	Original F.V.	Aliquot (uL)	Dilution F.V.	<b>Dilution Factor</b>
	(uL)		(uL)	
23884-2	500	40	400	LOX
23931-1		200	1000	50x
-2		40	400	10x -
-2		100	1000	(00x 4
23996-4		40	400	10x ·
-4	+	100	1000	100× 4
23884-2	<b>V</b>	100	1000	100x
			,	
	<i>¥</i>			
		-		
				-

Comments:	÷	

32 PX

Batch Number: 320-142964

Method Code: 320-3535_PFC-320

# **Aqueous Extraction Analysis Sheet**

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

A 8 12/20/16

Batch Open: 12/19/2016 2:29:00PM

Batch End: 12/20/14 14:03

## Solid-Phase Extraction (SPE)

	Input Sample Lab ID (Analytical Method)	SDG (Job #)		InitAmnt FinAmnt	PHs Adj1	Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-142964/1 N/A	N/A		250 mL			N/A	N/A	N/A	<u></u>	
				0.5 mL							
2	LCS~320-142964/2 N/A	N/A		250 mL			N/A	N/A	N/A		
				0.5 mL							
3	320-23884-B-3 (PFC_IDA_DOD5)	N/A (320-23884-1)	307.60 g	280.8 mL			12/6/16	12_Days	4		
_			26.78 g	0.5 mL		·			]		
Patge	320-23884-B-3~MS (PFC_IDA_DOD5)	N/A (320-23884-1)	300.14 g	270 mL			12/6/16	12_Days	4		73 2 6 · 2 3 8 8 4 · B · 3 · B · M S
662			30.13 g	0.5 mL							
<u>9</u> 5 i	320-23884-B-3~MSD (PFC_IDA_DOD5)	N/A (320-23884-1)	304.86 g	277.9 mL			12/6/16	12_Days	4		
678			26.92 g	0.5 mL							

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Method Code: 320-3535_PFC-320

Batch Number: 320-142964

Batch Open: 12/19/2016 2:29:00PM

Batch End:

Batch Notes						
Manifold ID	9					
Methanol ID	798085					
Hexane ID	0000135581					
Sodium Hydroxide ID	NA					
First Start time	NA NA					
First End time	NA					
SPE Cartridge Type	WAX 150mg					
Solid Phase Extraction Disk ID	002836112A					
Balance ID	QA-070					
H2O ID	12/15/16					
Pipette ID	MD05306					
Solvent Name	0.3% NH4OH/MeOH					
Solvent Lot #	800649					
Analyst ID - Reagent Drop	VPM					
Analyst ID - SU Reagent Drop	VPM					
Analyst ID - SU Reagent Drop Witness	OM					
Acid Name						
Acid ID	NA NA					
Reagent ID	NA NA					
Reagent Lot Number	NA NA					
SOP Number	WS-LC-0025					

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(To Accompany Samples to Instruments)

Batch Number: 320-142964

Method Code: 320-3535_PFC-320

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:29:00PM

Batch End:

Comments							
320-23884-B-3		Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted. MS/MSD did not match the parent					
320-23884-B-3~MS		Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted. MS/MSD did not match the parent					
020 2000+15-0 141015		Caution AFFF DOD site-Screen, Follow QSM strictly. NO Variances accepted.  MS/MSD did not match the parent					

Page 664 of 678

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:29:00PM

Batch End:

# **Reagent Additions Worksheet**

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
MB 320-142964/1	LCMPFCSU_00046	25 uL	1.0mt 0!	VPM12/9/16	OM 12/19/16
LCS 320-142964/2	LCMPFCSU_00046	25 uL	1		
LCS 320-142964/2	LCPFCSP_00073	20 uL			
320-23884-B-3	LCMPFCSU_00046	25 uL			
320-23884-B-3 MS	LCMPFCSU_00046	25 uL			
320-23884-B-3 MS	LCPFCSP_00073	20 uL			
320-23884-B-3 MSD	LCMPFCSU_00046	25 uL			
320-23884-B-3 MSD	LCPFCSP_00073	20 uL	Ż	Ŭ .	

	Other Reagents:	
Reagent	Amount/Units	Lot#:

Printed: 12/19/2016

Batch Number: 320-142964

Page 665 of 678

Method Code: 320-3535_PFC-320

(To Accompany Samples to Instruments)

Analyst: Marchenko, Veronika P

Batch Open: 12/19/2016 2:29:00PM

Batch End:

## **Reagent Additions Worksheet**

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
MB 320-142964/1	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142964/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-142964/2	LCPFCSP_00073	20 uL	0.5 mL		
320-23884-B-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-B-3 MS	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-B-3 MS	LCPFCSP_00073	20 uL	0.5 mL		
320-23884-B-3 MSD	LCMPFCSU_00046	25 uL	0.5 mL		
320-23884-B-3 MSD	LCPFCSP_00073	20 uL	0.5 mL		

	Other Reagents:	
Reagent	Amount/Units	Lot#:

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Batch Number: 320-142964

Method Code: 320-3535_PFC-320

Printed: 12/19/2016



# Sacramento Preparation Data Review Checklist

THE LEADER IN ENVIRONMENTAL TESTING

Preparation Batch Number(s): 142904 Test: PFC-10	1A-00	105 [[
Earliest Holding Time: 12/06/14 13535-17WT)		/
	35-PF	7
18/19/14 33		<u></u>
Comple Liet Tele	1 st Level Reviewer	2 nd Level
Sample List Tab Samples identified to the correct method	Reviewer	Reviewer
All necessary NCMs filed (including holding time)	1//	<del>                                     </del>
Method/sample/login/QAS checked and correct	//	
	1 st Level	2 nd Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	INA	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	MA	NA
All additional information transcribed into TALS is correct and raw data is		
attached Comments are transmitted as reath in TALS	//	<del></del>
Comments are transcribed correctly in TALS	/	
	1 st Level	2 nd Level
Reagents Tab  All necessary reagents not expired and entered into TALS	Reviewer	Reviewer
All spike amounts correct and added to necessary samples and QC	//	<del></del>
All spike altibulits correct and added to necessary samples and do	/	
Detail Information	1 st Level	2 nd Levei
Batch Information  Date and time accurate and entered into TALS correctly	Reviewer	Reviewer
All necessary 'batch information' complete and entered into TALS correctly	//	<del></del>
water morniager complete and emotion into these company		
. 10.00	امدأم	110
St Level Reviewer: Date:	01201	ΙΨ
and Level Reviewer: ERW Date: 12/20	166	
Comments:		
gg ²		
W.		

Method Code: 320-3535_IVWT-320

# **Aqueous Extraction Analysis Sheet**

(To Accompany Samples to Instruments)

Batch Number: 320-140852 Analyst: Winchester, Ethan R

Batch Open: 12/6/2016 3:23:00PM

Batch End: 12'.00 12/-/14

A8 12/18/16

Solid-Phase Extraction (SPE)

Case 3 21-39 ase 31-28

DL AB 12/20/16

	Input Sample Lab ID (Analytical Method)	(Job #)	GrossWt TareWt	InitAmnt FinAmnt	Rcvd	PHs Adj1	Adj2	Due Date	Analytical TAT	Dlv Rank	Comments	Output Sample Lab ID
1	MB~320-140852/1 N/A	N/A		250 mL				N/A	N/A	N/A		M B 3 2 6 - 1 4 8 8 5 2 7 1 - A
				0.5 mL								
2	LCS~320-140852/2 N/A	N/A		250 mL				N/A	N/A	N/A		
				0.5 mL								
3	LCSD~320-140852/3 N/A	N/A		250 mL				N/A	N/A	N/A		
70				0.5 mL								
Page (	320-23990-A-1 (PFC_IDA)	N/A (320-23990-1)	312.46 g	285.1 mL				12/6/16	8_Days	4	100x PFOS	III A UN ÎN
668			27.35 g	0.5 mL								
o <del>þ</del> 678	320-23990-A-2 (PFC_IDA)	N/A (320-23990-1)	293.21 g	265.2 mL				12/6/16	8_Days	4	Observations	
00			28.06 g	0.5 mL			l				vemiaion 116	100x, 10x
6	320-23990-A-3 (PFC_IDA)	N/A (320-23990-1)	269.51 g	242.9 mL				12/6/16	8_Days	4	IOX PFOS	Militaniam in
			26.57 g	0.5 mL	] ;						RA	
7	320-23990-A-4 (PFC_IDA)	N/A (320-23990-1)	282.00 g	253.6 mL				12/6/16	8_Days	4	100x, 10x yellow	
			28.44 g	0.5 mL	]	ĺ	1				geore	
8	320-23990-A-5 (PFC_IDA)	N/A (320-23990-1)	281.36 g	254.9 mL				12/6/16	8_Days	4	100×,10× PA (PFNA)	Material ministriction in the second of the
			26.47 g	0.5 mL		L	<u></u>				KALLININ	
9	320-23990-A-6 (PFC_IDA)	N/A (320-23990-1)	278.20 g	250.2 mL				12/6/16	8_Days	4	idellen	
			28.00 g	0.5 mL	1	i	1				100x, 10x	
10	320-23990-A-7 (PFC_IDA)	N/A (320-23990-1)	286.51 g	258.9 mL				12/6/16	8_Days	4		
			27.66 g	0.5 mL							100x, 10x	
					ĺ						100x, 10x	

(To Accompany Samples to Instruments)

Batch Number: 320-140852

Analyst: Winchester, Ethan R

Batch Open: 12/6/2016 3:23:00PM

Batch End:

Method Cod	de: 320-3535 _.	_IVWT-320
------------	---------------------------	-----------

000 00000 4 0	4114								
320-23990-A-8 (PFC_IDA)	N/A (320-23990-1)	295.26 g	267.1 mL		12/6/16	8_Days	4	ע אלא א	
		28.12 g	0.5 mL					ye had how	× _y t0x
320-23990-A-9 (PFC_IDA)	N/A (320-23990-1)	296.37 g	269.2 mL		12/6/16	8_Days	4		HRININIA MININIA MIRINIA MININIA MININ
		27.15 g	0.5 mL	1				· •	
320-23990-A-10 (PFC_IDA)	N/A (320-23990-1)	284.61 g	258 mL		12/6/16	8_Days	4	RA	3 2 8 - 2 3 9 9 4 - A - 1 8 - A
		26.65 g	0.5 mL					'	
320-23990-A-11 (PFC_IDA)	N/A (320-23990-1)	296.92 g	270 mL		12/6/16	8_Days	4		
		26.92 g	0.5 mL				ļ		
320-23990-A-12 (PFC_IDA)	N/A (320-23990-1)	315.87 g	288.8 mL		12/6/16	8_Days	4		
		27.07 g	0.5 mL						
320-23990-A-13 (PFC_IDA)	N/A (320-23990-1)	292.66 g	266.2 mL		12/6/16	8_Days	4	100x,10x	
		26.43 g	0.5 mL	ľ					
320-23990-A-14 (PFC_IDA)	N/A (320-23990-1)	291.16 g	264.3 mL		12/6/16	8_Days	4	lox, RA	
		26.84 g	0.5 mL					<b>'</b>	
320-23990-A-15 (PFC_IDA)	N/A (320-23990-1)	272.66 g	245.5 mL		12/6/16	8_Days	4	100x,10x	
		27.16 g	0.5 mL						
320-23990-A-16 (PFC_IDA)	N/A (320-23990-1)	293.96 g	266.8 mL		12/6/16	8_Days	4	100x ,10x	
		27.17 g	0.5 mL						
	320-23990-A-9 (PFC_IDA)  320-23990-A-10 (PFC_IDA)  320-23990-A-11 (PFC_IDA)  320-23990-A-12 (PFC_IDA)  320-23990-A-13 (PFC_IDA)  320-23990-A-14 (PFC_IDA)  320-23990-A-15 (PFC_IDA)	(PFC_IDA) (320-23990-1)  320-23990-A-9 (PFC_IDA) (320-23990-1)  320-23990-A-10 (N/A (320-23990-1)  320-23990-A-11 (N/A (320-23990-1)  320-23990-A-12 (N/A (320-23990-1)  320-23990-A-13 (320-23990-1)  320-23990-A-14 (PFC_IDA) (320-23990-1)  320-23990-A-15 (PFC_IDA) (320-23990-1)  320-23990-A-15 (N/A (320-23990-1)	(PFC_IDA) (320-23990-1) 295.26 g  320-23990-A-9 (PFC_IDA) (320-23990-1) 296.37 g  320-23990-A-10 (PFC_IDA) (320-23990-1) 27.15 g  320-23990-A-11 (PFC_IDA) (320-23990-1) 26.65 g  320-23990-A-12 (PFC_IDA) (320-23990-1) 26.92 g  320-23990-A-12 (PFC_IDA) (320-23990-1) 27.07 g  320-23990-A-13 (PFC_IDA) (320-23990-1) 292.66 g  320-23990-A-14 (PFC_IDA) (320-23990-1) 26.84 g  320-23990-A-15 (PFC_IDA) (320-23990-1) 26.84 g  320-23990-A-16 (PFC_IDA) (320-23990-1) 272.66 g  271.16 g  320-23990-A-16 (PFC_IDA) (320-23990-1) 293.96 g	(PFC_IDA) (320-23990-1) 295.26 g 267.1 mL 28.12 g 0.5 mL 28.12 g 0.5 mL 296.37 g 269.2 mL 27.15 g 0.5 mL 27.15 g 0.5 mL 27.15 g 0.5 mL 27.15 g 0.5 mL 26.65 g 0.5 mL 26.92 g 0.5 mL 26.92 g 0.5 mL 26.92 g 0.5 mL 26.92 g 0.5 mL 27.07	(PFC_IDA) (320-23990-1) 295.26 g 267.1 mL 28.12 g 0.5 mL 28.12 g 0.5 mL 296.37 g 269.2 mL 27.15 g 0.5 mL 27.15 g 0.5 mL 27.15 g 0.5 mL 284.61 g 258 mL 26.65 g 0.5 mL 26.65 g 0.5 mL 26.65 g 0.5 mL 26.65 g 0.5 mL 26.92 g 270 mL 26.92 g 0.5 mL 26.92 g 0.5 mL 27.07 g 2	(PFC_IDA) (320-23990-1)	(PFC_IDA) (320-23990-1) 295.26 g 267.1 mL 28.12 g 0.5 mL 320-23990-A-9 (PFC_IDA) (320-23990-1) 296.37 g 269.2 mL 27.15 g 0.5 mL 320-23990-A-10 (320-23990-1) 26.55 g 0.5 mL 320-23990-A-11 (PFC_IDA) (320-23990-1) 26.92 g 0.5 mL 320-23990-A-12 (PFC_IDA) (320-23990-1) 26.92 g 0.5 mL 320-23990-A-12 (PFC_IDA) (320-23990-1) 27.07 g 0.5 mL 320-23990-A-13 (320-23990-1) 27.07 g 0.5 mL 320-23990-A-13 (320-23990-1) 26.43 g 0.5 mL 320-23990-A-14 (PFC_IDA) (320-23990-1) 26.43 g 0.5 mL 320-23990-A-15 (PFC_IDA) (320-23990-1) 26.84 g 0.5 mL 320-23990-A-15 (PFC_IDA) (320-23990-1) 26.84 g 0.5 mL 320-23990-A-16 (PFC_IDA) (320-23990-1) 26.84 g 0.5 mL 320-23990-A-16 (PFC_IDA) (320-23990-1) 27.16 g 0.5 mL 320-23990-A-16 (PFC_IDA) (320-23990-A-16 (PFC_IDA)	(PFC_IDA) (320-23990-1) 295.26 g 267.1 mL 28.12 g 0.5 mL 12/6/16 8_Days 4 28.12 g 0.5 mL 12/6/16 8_Days 4 27.15 g 0.5 mL 12/6/16 8_Days 4 284.61 g 258 mL 12/6/16 8_Days 4 26.65 g 0.5 mL 12/6/16 8_Days 4 26.92 g 0.5 mL 12/6/16 8_Days 4 27.07 g 0.5 mL 12/6/16 8_Days 4 284.8 g 0.5 mL 12/6/16 8_Days 4 285.8 g 0.5 mL 12/6/16 8_Days 4 285.2 mL 12/6/16 8_Days	Section   Sect

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# **Aqueous Extraction Analysis Sheet**

(To Accompany Samples to Instruments)

Analyst: Winchester, Ethan R

Batch Open: 12/6/2016 3:23:00PM

Batch End:

Batch Notes							
Manifold ID	5,6						
Methanol ID	789820						
Hexane ID	00001462						
Sodium Hypochlorite ID	NA NA						
First Start time	NA NA						
First End time	NA						
Balance ID	QA-070						
SPE Cartridge Type	WAX 500mg						
Solid Phase Extraction Disk ID	002836112						
H2O ID	12/05/16						
Pipette ID	MD05306						
Solvent Name	0.3% NH4OH/MeOH						
Solvent Lot #	794501						
Analyst ID - Reagent Drop	DEW DEW						
Analyst ID - SU Reagent Drop	ERW						
Analyst ID - SU Reagent Drop Witness	NSH						
Acid Name							
Acid ID	NA						
ReagentID	NA .						
Reagent Lot Number	NA						
NaCi ID	NA						

Batch Number: 320-140852

Method Code: 320-3535_IVWT-320

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Batch Number: 320-140852

Method Code: 320-3535_IVWT-320

# **Aqueous Extraction Analysis Sheet**

(To Accompany Samples to Instruments)

Analyst: Winchester, Ethan R

Batch Open: 12/6/2016 3:23:00PM

Batch End:

SOP Number	WS-LC-0025				
	<del></del>	 	 	 	

Batch Comment 0.1N NaOH/H2O: 794893

Comments

(To Accompany Samples to Instruments)

Analyst: Winchester, Ethan R

Batch Open: 12/6/2016 3:23:00PM

Batch End:

## **Reagent Additions Worksheet**

Lab ID	Reagent Code	Amount Added	Final Amount	Ву	Witness
MB 320-140852/1	LCMPFCSU_00046	25 uL	0.5 mL	ERW 12/4/16	NSH 12-6-16
LCS 320-140852/2	LCMPFCSU_00046	25 uL	0.5 mL		
LCS 320-140852/2	LCPFCSP_00070	20 uL	0.5 mL		
LCSD 320-140852/3	LCMPFCSU_00046	25 uL	0.5 mL		
LCSD 320-140852/3	LCPFCSP_00070	20 uL	0.5 mL		
320-23990-A-1	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-2	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-3	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-4	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-5	LCMPFCSU_00046	25 uL.	0.5 mL		
320-23990-A-6	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-7	LCMPFCSU_00046	25 uL.	0.5 mL		
320-23990-A-8	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-9	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-10	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-11	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-12	LCMPFCSU_00046	25 uL	0.5 mL		
320-23990-A-13	LCMPFCSU_00046	25 uL	0.5 mL		

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Printed: 12/6/2016

Batch Number: 320-140852

Method Code: 320-3535_IVWT-320

(To Accompany Samples to Instruments)

Batch Number: 320-140852

Method Code: 320-3535_IVWT-320

Analyst: Winchester, Ethan R

Batch Open: 12/6/2016 3:23:00PM

Batch End:

320-23990-A-14	LCMPFCSU_00046	25 uL	0.5 mL	ERU 12/6/16	NSH 12-6-16
320-23990-A-15	LCMPFCSU_00046	25 uL	0.5 mL		\
320-23990-A-16	LCMPFCSU_00046	25 uL	0.5 mL	7	

	Other Reagents:			
Reagent	Amount/Units	Lot#:		

Printed: 12/6/2016



# Sacramento Preparation Data Review Checklist

THE LEADER IN ENVIRONMENTAL TESTING

Preparation Batch Number(s): 140852 Test: PFC-IDA	(L)	
Earliest Holding Time; 2107114		
Edition Tolding Title,		
		ond
Sample List Tab	1 st Level Reviewer	2 nd Level Reviewer
Samples identified to the correct method	/	1.01.0.
All necessary NCMs filed (including holding time)	DOH/	
Method/sample/login/QAS checked and correct		
	1 st Level	2 nd Level
Worksheet Tab	Reviewer	Reviewer
All samples properly preserved	M	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)		1
The pH is transcribed correctly in TALS	M	NA
All additional information transcribed into TALS is correct and raw data is attached	/	
Comments are transcribed correctly in TALS		
	1 st Level	2 nd Level
Reagents Tab	Reviewer	Reviewer
All necessary reagents not expired and entered into TALS	TOVICATO	TOVICATOR
All spike amounts correct and added to necessary samples and QC		
	1 st Level	2 nd Level
Batch Information	Reviewer	Reviewer
Date and time accurate and entered into TALS correctly	The state of the s	1101101101
All necessary 'batch information' complete and entered into TALS correctly		
st	12-7-1	10
1 st Level Reviewer: Date:	10 -1	
2 nd Level Reviewer:	12-1-1	<u> </u>
Comments:		



# Test America - Sacramento

# Sample Dilution Record

Method ID PFC-IDA	Job#_	23990	
Analyst (Print Name) Shyhar a Chand 1280	Analyst l	nitials &BC	
Date 12/19/16			

Sample#	Original F.V.	Aliquot (uL)	Dilution F.V.	<b>Dilution Factor</b>	
	(uL)		(uL)		
1	500	100	1000	10x	7
2		100	1000	1	1
58K/16 3 4		100	1000		]
5		30	300		
		100	1000		
<i>b</i> 7		100	1000		
8		100	1000		
9		30	300		1 \
13		100	1000		,
15		100	1000		
16		100	1000	<b>*</b>	<u>ا</u>
1		100	1000	100X	1
2					/
5					
5					
6					7
7					
8					
9					
13	1				
15					
16		4	4	4	
3		30	300	10%	
14	4	30	300	10x	

Comments:

# Shipping and Receiving Documents

6		CHAIN OF C	EQUEST	RECOR	RD		COC No. EJBIJOILA Pa				Page		10	of \					
		Project Name: PFA Grandwitter Investigation											Proje	ct No.	333	1=1	Phase	FIFS	
PEGUI	HITTON	Site Location: NAS	4 051-51	34.15									(Enter number of containers for each test)						
	LUTION LTANTS	CTO No. JM79	العمطايل	\$			(3)→	*-											
CONSULTANTS CTO No. JAN 3 RC Project Manager: Town Sampler/Site Phone#										5								/MSD	
Lab Name	· Test 6	Janua Secum	e(specify): 21 - Dev			tainers	A S								for MS				
Lab ID	Sample ID (sys_samp_co		Location ID (sys_loc_code)	Date (mm/dd/yy)	Time (Military) (hhmm)	Matrix Code (1)	Sample Type (2)	Field Filtered (Y/N)	Total No. of Containers	456790								Extra Volume for MS/MSD	НОГР
	60871	32(46-4F-11)4	1,08D132 ma	distin	<b>उद्भ</b> ठ	24	N	N	2	X									
	602D3	3 MW - LF - 1114	LUSD3 > NW		1150	w 5	18	N	Z	X									
	61301 N	16 - LF - 11/4	6/30/MW		1245	w 6	14	N	2	X									
	61304	1 MW- LF - 1116	GI3DYIMU		1355	w G	N	N	2.	X									
	61303	9100-4-1116	612 D39MW	11/3/16	1520	46	18	16	2	X									
	FBII3	114		11/30/16	1535	200	FB	N	2	X									
			-								-	-					+	-	
					0						+	+						1	-
												1							3
						1						+	320-2	23931	Chain o	of Custo	dy		- 2
Field Comments:  TRRP Reportes  NO Drawer tive				Lab Con		7-0- 1-10 16					Sample Shipment and Delivery Detail  A Number of coolers in shipment:				l tails				
Relinquished by (signature)  Date  Time				Received by (signature)				Date Time (2)(1)(8 0950)					Samples Iced?(check) Yes No No Method of Shipment:						
. 0		1			2								Airbill No:						
					3									Date	Shippe	ed: [[	30	٠	

⁽¹⁾ AA=Ambient air, AQ=Air quality control, ASB=Asbestos, CK=Caulk, D5=Storm drain sediment, GS=Soil gas, IC=IDW Concrete, IDD=IDW Soild, IDS=IDW Water, LF=Free Product, MA=Mastic, PC=Paint Chips, SC=Cement/Concrete, SE=Sediment, SL=Sludge, SO=Soil, SQ=Soil/Solid quality control, SSD=Subsurface sediment, SU=Surface soil (<6 in), SW=Swab or wipe, TA=Animal tissue, TP=Plant tissue, TQ=Tissue quality control, WG=Ground water, WL=Leachate, WO=Ocean water, WP=Drinking water, WQ=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Water quality control, WR=Ground water effluent, WS=Surface water, WU=Storm water, WW=Water quality control, WR=Ground water, WS=Surface wat

⁽²⁾ Sample Type: AB=Ambient Blk, EB=Equipment Blk, FB=Field Blk, FD=Field Duplicate Sample, IDW=Investigative-Derived Waste, MIS=Incremental Sampling Methodology, N=Normal Environmental Sample, TB=Trip Blk

⁽³⁾ Preservative added: HA=Hydrochloric Acid, NI=Nitric Acid, SH=Sodium Hydroxide, SA=Sulfuric Acid, ME=Methanol, SB=sodium bisulfate, ST=Sodium Thiosulfate, If NO preservative added leave blank

# **Login Sample Receipt Checklist**

Client: EnSafe, Inc.

Job Number: 320-23931-1

Login Number: 23931 List Source: TestAmerica Sacramento

List Number: 1

**Creator: Turpen, Troy** 

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	ESS Seal
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	

DODCMD_ID INSTALLATION_I	D SDG SITE_NAME NORM_SITE_	NAME LOCATION_NAM	ME LOCATION_TYPE_DES	SC COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DES	C COLLECT_DAT	E ANALYTICAL_METHO	DD ANALYTICAL_METHOD_GRP_D	ESC RES_META_ID
SOUTHEAST DALLAS_NAS	320-23931-1 ASB 0ZONEA	61301MW	Monitoring well	2441386.359	6957584.543	N6247011D8013	JM37	RESOLUTION CONSULTANTS	61301MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS	320-23931-1 ASB 0ZONEA	608D33MW	Monitoring well	2441385.104	6957906.804	N6247011D8013	JM37	RESOLUTION CONSULTANTS	608D33MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS	320-23931-1 ASB 0ZONEA	613D41MW	Monitoring well	2441170.111	6957563.429	N6247011D8013	JM37	RESOLUTION CONSULTANTS	613D41MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS	320-23931-1 SWMU 00017 SWMU 00017	613D39MW	Monitoring well	2441054.157	6957529.367	N6247011D8013	JM37	RESOLUTION CONSULTANTS	613D39MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS	320-23931-1 SWMU 00021 SWMU 00021	608D132MW	Monitoring well	2441497.908	6957799.041	N6247011D8013	JM37	RESOLUTION CONSULTANTS	608D132MW-LF-1116	Ground water	Normal (Regular)	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00
SOUTHEAST DALLAS_NAS	320-23931-1					N6247011D8013	JM37	RESOLUTION CONSULTANTS	FB113016	Water for QC samples	QC Sample	30-Nov-16	537_MOD	Perfluoroalkyl Compounds	20170918061901.00