WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXG 22F0061

Native Perfluoroalkyl Ether Carboxylic Acids and Sulfonate Solution/Mixture

PRODUCT CODE:	PFAC-MXG
LOT NUMBER:	PFACMXG0222
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	02/07/2022
LAST TESTED: (mm/dd/yyyy)	02/22/2022
EXPIRY DATE: (mm/dd/yyyy)	02/22/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components 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)

ADDITIONAL INFORMATION:

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

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

INTENDED USE:

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

HANDLING:

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:

Our products are synthesized using single-product unambiguous routes whenever possible. 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, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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

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

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

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

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

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. 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; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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

Table A: **PFAC-MXG; Components and Concentrations (ng/mL; ± 5% in methanol/water (<1%))**

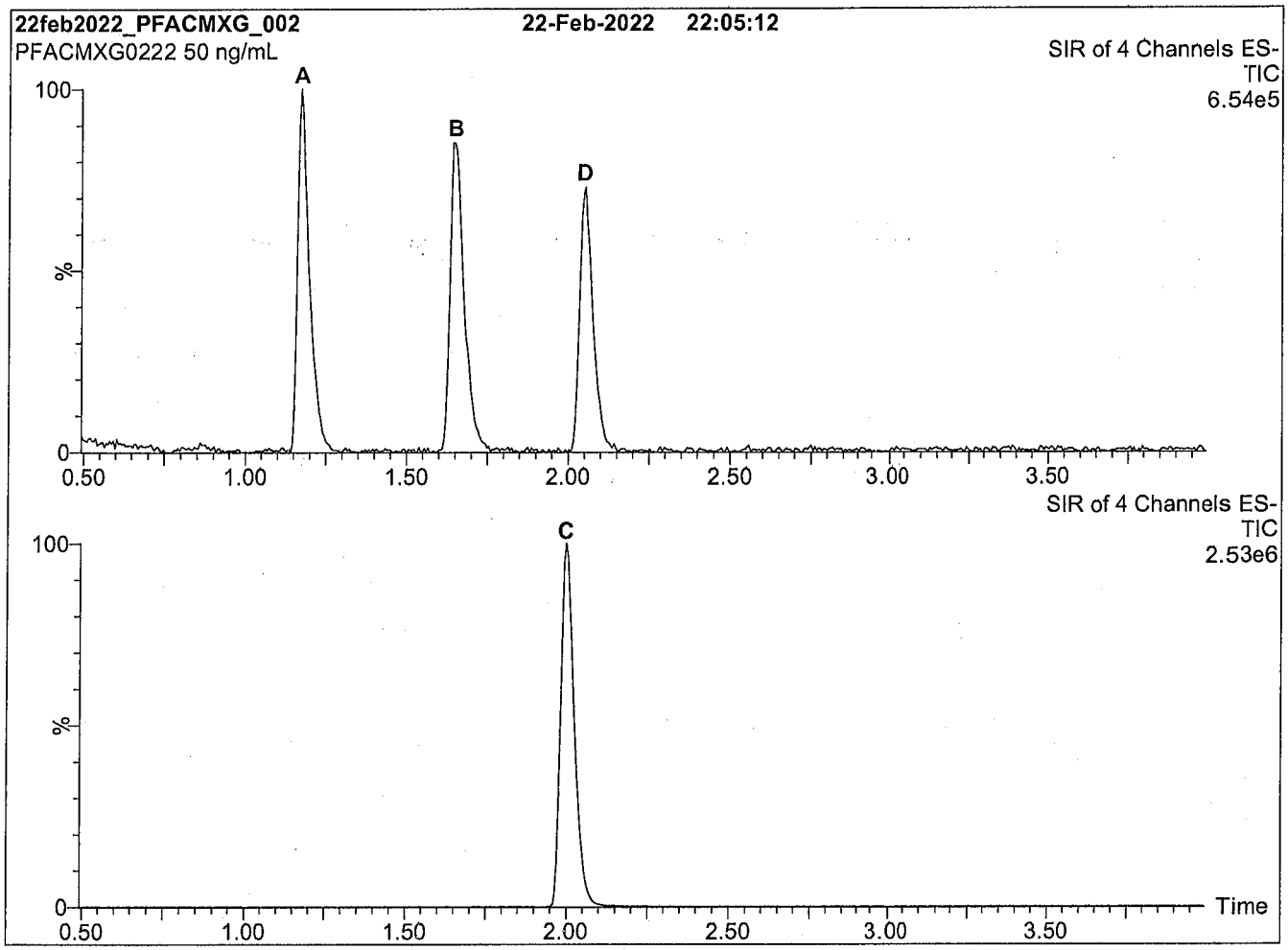
Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	**Acronym**	**Concentration* (ng/mL)**		**Peak Assignment in Figure 1**
		as the salt	**as the acid**	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 03/03/2022
(mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: **PFAC-MXG; LC/MS Data (SIR)**



Conditions for Figure 1:

Waters Acquity Ultra Performance LC
Waters Xevo TQ-S micro MS

Chromatographic Conditions:

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

Mobile phase: Gradient
Start: 50% H_2O / 50% (80:20 MeOH:ACN)
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 2 min
before returning to initial conditions in 0.75 min.
Time: 12 min

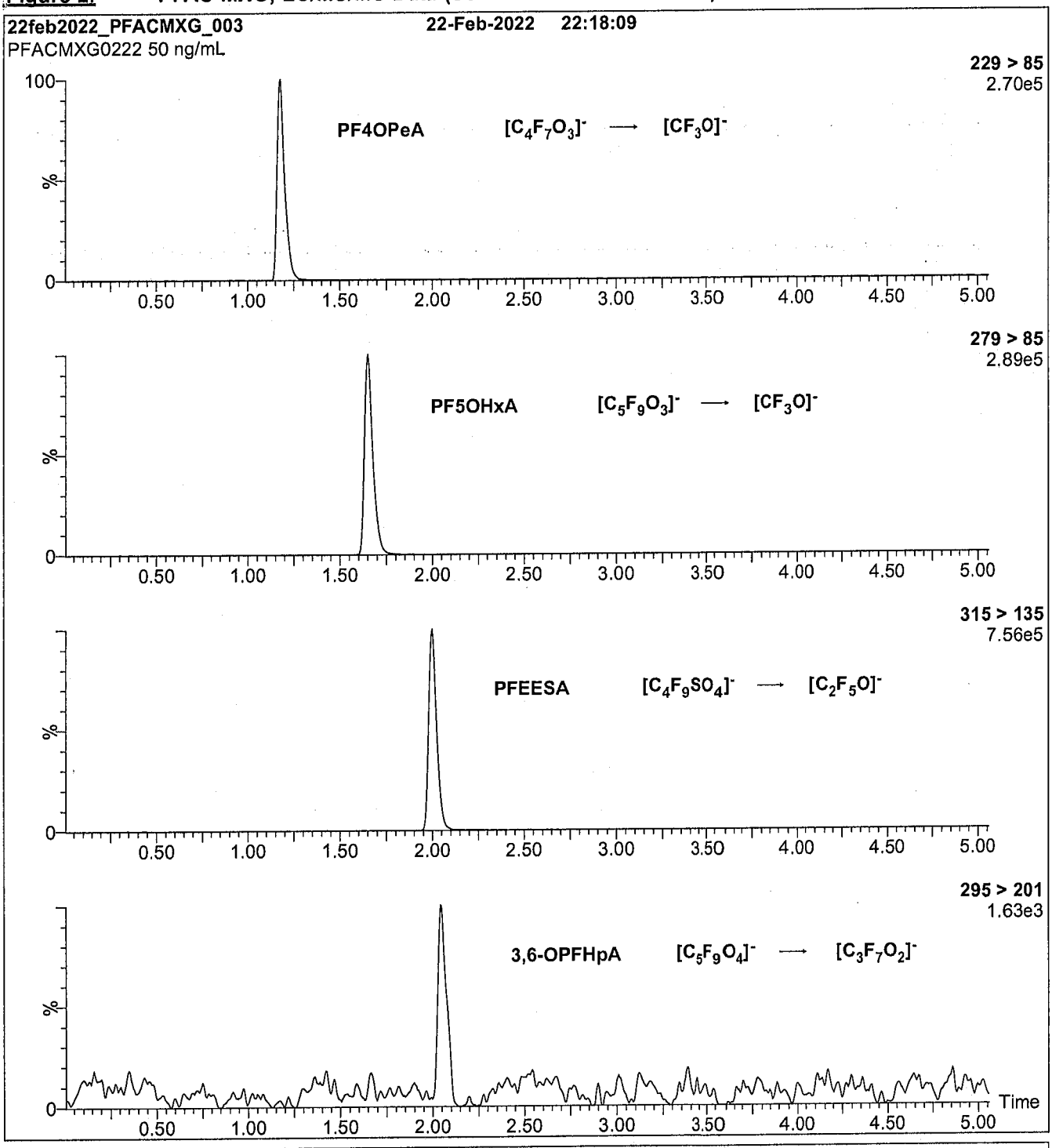
Flow: 300 µL/min

MS Parameters:

Experiment: SIR

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = variable (15-35)
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (L/hr) = 1000

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



Conditions for Figure 2:

Injection: On-column (PFAC-MXG)

Mobile phase: Same as Figure 1

Flow: 300 µL/min

MS Parameters:
Collision Gas (mbar) = 3.33e-3
Collision Energy (eV) = 8-48 (variable)

Analytical Standard Record

22F0 610

Description:s	PFAS - MIX MXG 2ug/mL	Expires:s	02/22/2027
Standard Type:s	Others	Prepared:s	02/07/2022
Solvent:s	MeOHs	Prepared By:s	Lizbeth Andres
Final Volume (mls):s	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/15/2022 09:34 by DAGs
Comments:n	contains NFHDA PFMBA PFMPA PFEESA @ 2ug/mLn		

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NFDHA		151772-58-6	2s	ug/mLs
PFEESAs		113507-82-7	1.78	ug/mLs
PFMBAs		863090-89-5s	2s	ug/mLs
PFMPAs		377-73-1	2s	ug/mLs

Reviewed By

Date

Analytical Standard Record0

22I01530

Description:s	PFAS - MIX 1633 200ng/mL	Expires:s	01/11/2025s
Standard Type:s	Analyte Spikes	Prepared:s	09/13/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	6s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/15/2022 09:34 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NMeFOSE	22C0307	24448-09-7	0.8s	ug/mLs
3:3FTCAs	22C0308s	113507-82-7	0.8s	ug/mLs
5:3FTCAs	22C0309s	914637-49-3	0.8s	ug/mLs
NEtFOSE	22C0310s	1691-99-2s	0.8s	ug/mLs
7:3FTCA	22C0311s	812-70-4	0.8s	ug/mLs
NMeFOSA	22C0312s	31506-32-8s	0.8s	ug/mLs
NEtFOSA	22C0313s	4151-50-2s	0.8s	ug/mLs
11CL-PF3OUDS	22F0058s	763051-92-9	0.378	ug/mLs
9CL-PF3ONS	22F0058s	756426-58-1	0.374	ug/mLs
ADONA	22F0058s	919005-14-4s	0.378	ug/mLs
HFPO-DAs	22F0058s	13252-13-6s	0.4s	ug/mLs
4:2FTSs	22F0059s	757124-72-4	0.75	ug/mLs
6:2FTSs	22F0059s	27619-97-2	0.76	ug/mLs
8:2FTSs	22F0059s	39108-34-4s	0.768	ug/mLs
NEtFOSAA	22F0059s	2991-50-6s	0.2s	ug/mLs
NMeFOSAA	22F0059s	2355-31-9s	0.2s	ug/mLs
PFBAs	22F0059s	375-22-4	0.8s	ug/mLs
PFBSs	22F0059s	375-73-5	0.177	ug/mLs
PFDAs	22F0059s	335-76-2	0.2s	ug/mLs
PFDOAs	22F0059s	307-55-1	0.2s	ug/mLs
PFDOSs	22F0059s	79780-39-5	0.194s	ug/mLs
PFDSs	22F0059s	335-77-3	0.193s	ug/mLs
PFHPAs	22F0059s	375-85-9	0.2s	ug/mLs
PFHPSs	22F0059s	375-92-8	0.191s	ug/mLs
PFHXA	22F0059s	307-24-4	0.2s	ug/mLs
PFHXS	22F0059s	355-46-4s	0.183s	ug/mLs
PFNA	22F0059s	375-95-1	0.2s	ug/mLs
PFNS	22F0059s	68259-12-1s	0.192s	ug/mLs
PFOAs	22F0059s	335-67-1	0.2s	ug/mLs
PFOSs	22F0059s	1763-23-1	0.186s	ug/mLs
PFOSAs	22F0059s	754-91-6	0.2s	ug/mLs
PFPEAs	22F0059s	2706-90-3	0.4s	ug/mLs
PFPESs	22F0059s	630402-22-1s	0.188s	ug/mLs
PFTEDAs	22F0059s	376-06-7	0.2s	ug/mLs
PFTRDA	22F0059s	72629-94-8	0.2s	ug/mLs
PFUnA	22F0059s	2058-94-8s	0.2s	ug/mLs
NFDHA	22F0061s	151772-58-6	0.4s	ug/mLs
PFEESAs	22F0061s	113507-82-7	0.356s	ug/mLs
PFMBAs	22F0061s	863090-89-5s	0.4s	ug/mLs
PFMPAs	22F0061s	377-73-1	0.4s	ug/mLs

Reviewed By

Date

Analytical Standard Record0

22I0153 0

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22C0307	PFAS - SAS N-MeFOSE 50ug/mLs	03/15/2022s	Wellington Laboratories	NMeFOSE0921M	09/23/2026s	03/15/2022 15:59s	by DAGs	0.096s
22C0308s	PFAS - SAS FPrPA 50ug/mLs	03/15/2022s	Wellington Laboratories	FPrPA0122s	02/03/2027	03/15/2022 15:59s	by DAGs	0.096s
22C0309s	PFAS - SAS FPePA 50ug/mLs	03/15/2022s	Wellington Laboratories	FPePA1221s	01/05/2027	03/15/2022 15:59s	by DAGs	0.096s
22C0310s	PFAS - SAS NEtFOSE 50ug/mLs	03/15/2022s	Wellington Laboratories	NEtFOSE0921M	09/23/2026s	03/15/2022 15:59s	by DAGs	0.096s
22C0311s	PFAS - SAS FHpPA 50ug/mLs	03/15/2022s	Wellington Laboratories	HHpPA1020s	11/12/2025s	03/15/2022 16:00s	by DAGs	0.096s
22C0312s	PFAS - SAS NMeFOSA 50ug/mLs	03/15/2022s	Wellington Laboratories	NMeFOSA0721M	08/03/2026s	03/15/2022 16:00s	by DAGs	0.096s
22C0313s	PFAS - SAS NEtFOSA 50ug/mLs	03/15/2022s	Wellington Laboratories	NEtFOSA0821M	08/12/2026s	08/17/2022 10:49	by LYA	0.096s
22F0058s	PFAS - MIX MXF 2ug/mL	01/10/2022s	Wellington Laboratories	PFACMXF0122	01/11/2025s	09/15/2022 09:32s	by DAGs	1.2s
22F0059s	PFAS - MIX MXH 2ug/mL	09/09/2021s	Wellington Laboratories	PFACMXH0921	09/14/2026s	09/15/2022 09:33s	by DAGs	1.2s
22F0061s	PFAS - MIX MXG 2ug/mL	02/07/2022	Wellington Laboratories	PFACMXG0222	02/22/2027	09/15/2022 09:34s	by DAGs	1.2s

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CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXG

Native Perfluoroalkyl Ether Carboxylic Acids and Sulfonate Solution/Mixture

PRODUCT CODE:	PFAC-MXG
LOT NUMBER:	PFACMXG0222
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	02/07/2022
LAST TESTED: (mm/dd/yyyy)	02/22/2022
EXPIRY DATE: (mm/dd/yyyy)	02/22/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXG is a solution/mixture of three native perfluoroalkyl ether carboxylic acids and a native perfluoroalkyl ether sulfonate. The components and their concentrations are given in Table A.

The individual components 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)

ADDITIONAL INFORMATION:

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

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Table A: **PFAC-MXG; Components and Concentrations (ng/mL; ± 5% in methanol/water (<1%))**

Compound	Acronym	Concentration (ng/mL)		Peak Assignment in Figure 1
Perfluoro-4-oxapentanoic acid	PF4OPeA	2000		A
Perfluoro-5-oxahexanoic acid	PF5OHxA	2000		B
Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	2000		D
Compound	**Acronym**	**Concentration* (ng/mL)**		**Peak Assignment in Figure 1**
		as the salt	**as the acid**	
Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	2000	1780	C

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 03/03/2022
(mm/dd/yyyy)
B.G. Chittim, General Manager

Analytical Standard Record

22I03420

Description:s	PFAS - MIX MXG 2ug/mL	Expires:s	02/22/2027
Standard Type:s	Others	Prepared:s	02/07/2022
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:55 by DAGs
Comments:n	contains NFHDA PFMBA PFMPA PFEESA @ 2ug/mLn		

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
NFDHA		151772-58-6	2s	ug/mLs
PFEESAs		113507-82-7	1.78	ug/mLs
PFMBAs		863090-89-5s	2s	ug/mLs
PFMPAs		377-73-1	2s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22I03430

Description:s	PFAS - MIX MXF 2ug/mL	Expires:s	01/11/2025s
Standard Type:s	Others	Prepared:s	09/26/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:47 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS		763051-92-9	1.89s	ug/mLs
9CL-PF3ONS		756426-58-1	1.87	ug/mLs
ADONA		919005-14-4s	1.89s	ug/mLs
HFPO-DAs		13252-13-6s	2s	ug/mLs

Reviewed By

Date

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PFAC-MXF

Native Replacement PFAS Solution/Mixture

PRODUCT CODE:	PFAC-MXF
LOT NUMBER:	PFACMXF0122
SOLVENT(S):	Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2022
LAST TESTED: (mm/dd/yyyy)	01/11/2022
EXPIRY DATE: (mm/dd/yyyy)	01/11/2025
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

PFAC-MXF is a solution/mixture of sodium dodecafluoro-3H-4,8-dioxanonanoate (NaDONA), the major and minor components of F-53B (9Cl-PF3ONS and 11Cl-PF3OUdS), and GenX (HFPO-DA). The components and their concentrations are given in Table A.

The individual native components of this mixture 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)

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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Table A: **PFAC-MXF; Components and Concentrations (ng/mL; ± 5% in Methanol/Water (<1%))**

Compound	Acronym	Concentration* (ng/ml)		Peak Assignment in Figure 1
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid	HFPO-DA	2000		A
Compound	**Acronym**	**Concentration* (ng/mL)**		**Peak Assignment in Figure 1**
		as the salt	**as the acid**	
Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	2000	1890	B
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	2000	1870	C
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	2000	1890	D

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 01/12/2022
(mm/dd/yyyy)
B.G. Chittim, General Manager

Analytical Standard Record

22I03430

Description:s	PFAS - MIX MXF 2ug/mL	Expires:s	01/11/2025s
Standard Type:s	Others	Prepared:s	01/10/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:54 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS		763051-92-9	1.89s	ug/mLs
9CL-PF3ONS		756426-58-1	1.87	ug/mLs
ADONA		919005-14-4s	1.89s	ug/mLs
HFPO-DAs		13252-13-6s	2s	ug/mLs

Reviewed By

Date

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

APPL ID:22I0334

PFAC-MXH

Native PFAS
Solution/Mixture

PRODUCT CODE:	PFAC-MXH
LOT NUMBER:	PFACMXH0822
SOLVENT(S):	Methanol/Isopropanol (2%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	08/05/2022
LAST TESTED: (mm/dd/yyyy)	08/08/2022
EXPIRY DATE: (mm/dd/yyyy)	08/08/2027
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

PFAC-MXH is a solution/mixture of 11 native linear perfluoroalkylcarboxylic acids (C_4-C_{14}), eight native perfluoroalkanesulfonates (C_4, C_5, C_7, C_9, C_{10} and C_{12} linear; C_6 and C_8 linear and branched), three native fluorotelomer sulfonates (4:2, 6:2, and 8:2), two native linear and branched perfluorooctanesulfonamidoacetic acids, and perfluoro-1-octanesulfonamide (FOSA). The components and their concentrations are given in Table A.

The individual components of this mixture all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: Isomeric Components and Percent Composition of N-MeFOSAA
Table C: Isomeric Components and Percent Composition of N-EtFOSAA
Table D: Isomeric Components and Percent Composition of PFHxSK
Table E: Isomeric Components and Percent Composition of PFOSK
Figure 1: LC/MS Data (SIR)
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 acids to their respective methyl esters.

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Table A: **PFAC-MXH; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (2%)/water (<1%))**

Compound	Acronym	Concentration* (ng/mL)	Peak Assignment in Figure 1
Perfluoro-n-butanoic acid	PFBA	4000	1
Perfluoro-n-pentanoic acid	PFPeA	2000	2
Perfluoro-n-hexanoic acid	PFHxA	1000	5
Perfluoro-n-heptanoic acid	PFHpA	1000	7
Perfluoro-n-octanoic acid	PFOA	1000	11
Perfluoro-n-nonanoic acid	PFNA	1000	14
Perfluoro-n-decanoic acid	PFDA	1000	18
Perfluoro-n-undecanoic acid	PFUdA	1000	24
Perfluoro-n-dodecanoic acid	PFDoA	1000	26
Perfluoro-n-tridecanoic acid	PFTrDA	1000	27
Perfluoro-n-tetradecanoic acid	PFTeDA	1000	29
Perfluoro-1-octanesulfonamide	FOSA	1000	23
N-methylperfluorooctanesulfonamidoacetic acid [a]	N-MeFOSAA: linear isomer	760	20
	N-MeFOSAA: ∑ branched isomers	240	17
N-ethylperfluorooctanesulfonamidoacetic acid [b]	N-EtFOSAA: linear isomer	775	22
	N-EtFOSAA: ∑ branched isomers	225	21

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Potassium perfluoro-1-butanesulfonate	L-PFBS	1000	887	3
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	1000	941	6
Potassium perfluorohexanesulfonate [c]	PFHxSK: linear isomer	811	741	9
	PFHxSK: ∑ branched isomers	189	173	8
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	1000	953	12
Potassium perfluorooctanesulfonate [d]	PFOSK: linear isomer	788	732	15
	PFOSK: ∑ branched isomers	211	196	13
Sodium perfluoro-1-nonanesulfonate	L-PFNS	1000	962	19
Sodium perfluoro-1-decanesulfonate	L-PFDS	1000	965	25
Sodium perfluoro-1-dodecanesulfonate	L-PFDoS	1000	970	28
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	4000	3750	4
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	4000	3800	10
Sodium 1H,1H,2H,2H-perfluorodecanesulfonate	8:2FTS	4000	3840	16

[a] See Table B for percent composition of linear and branched N-MeFOSAA isomers.
[b] See Table C for percent composition of linear and branched N-EtFOSAA isomers.
[c] See Table D for percent composition of linear and branched PFHxSK isomers.
[d] See Table E for percent composition of linear and branched PFOSK isomers.

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 08/09/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Analytical Standard Record

22I03440

Description:s	PFAS - MIX MXH 1-4ug/mL	Expires:s	08/08/2027
Standard Type:s	Others	Prepared:s	08/05/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	09/26/2022 09:59 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
4:2FTSs		757124-72-4	3.75	ug/mLs
6:2FTSs		27619-97-2	3.8s	ug/mLs
8:2FTSs		39108-34-4s	3.84s	ug/mLs
NEtFOSAA		2991-50-6s	1s	ug/mLs
NMeFOSAA		2355-31-9s	1s	ug/mLs
PFBAs		375-22-4	4s	ug/mLs
PFBSs		375-73-5	0.887	ug/mLs
PFDAs		335-76-2	1s	ug/mLs
PFDOAs		307-55-1	1s	ug/mLs
PFDOSs		79780-39-5	0.97	ug/mLs
PFDSs		335-77-3	0.965s	ug/mLs
PFHPAs		375-85-9	1s	ug/mLs
PFHPSs		375-92-8	0.953s	ug/mLs
PFHXA		307-24-4	1s	ug/mLs
PFHXS		355-46-4s	0.914s	ug/mLs
PFNA		375-95-1	1s	ug/mLs
PFNS		68259-12-1s	0.962s	ug/mLs
PFOAs		335-67-1	1s	ug/mLs
PFOSs		1763-23-1	0.928s	ug/mLs
PFOSAs		754-91-6	1s	ug/mLs
PFPEAs		2706-90-3	2s	ug/mLs
PFPESs		630402-22-1s	0.941s	ug/mLs
PFTEDAs		376-06-7	1s	ug/mLs
PFTRDA		72629-94-8	1s	ug/mLs
PFUnA		2058-94-8s	1s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22J04480

Description:s	PFAS - MIX 1633 20ng/mL	Expires:s	04/25/2023s
Standard Type:s	Analyte Spikes	Prepared:s	10/27/2022
Solvent:s	MeOHs	Prepared By:s	Dipti Gokals
Final Volume (mls):s	10s	Department:s	PFASs
Vials:s	1s	Last Edit:s	10/27/2022 08:51 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS	22I0153s	763051-92-9	0.0378	ug/mLs
3:3FTCAs	22I0153s	113507-82-7	0.08s	ug/mLs
4:2FTSs	22I0153s	757124-72-4	0.075	ug/mLs
5:3FTCAs	22I0153s	914637-49-3	0.08s	ug/mLs
6:2FTSs	22I0153s	27619-97-2	0.076	ug/mLs
7:3FTCA	22I0153s	812-70-4	0.08s	ug/mLs
8:2FTSs	22I0153s	39108-34-4s	0.0768	ug/mLs
9CL-PF3ONS	22I0153s	756426-58-1	0.0374	ug/mLs
ADONA	22I0153s	919005-14-4s	0.0378	ug/mLs
HFPO-DAs	22I0153s	13252-13-6s	0.04s	ug/mLs
NEtFOSA	22I0153s	4151-50-2s	0.08s	ug/mLs
NEtFOSAA	22I0153s	2991-50-6s	0.02s	ug/mLs
NEtFOSE	22I0153s	1691-99-2s	0.08s	ug/mLs
NFDHA	22I0153s	151772-58-6	0.04s	ug/mLs
NMeFOSA	22I0153s	31506-32-8s	0.08s	ug/mLs
NMeFOSAA	22I0153s	2355-31-9s	0.02s	ug/mLs
NMeFOSE	22I0153s	24448-09-7	0.08s	ug/mLs
PFBAs	22I0153s	375-22-4	0.08s	ug/mLs
PFBSs	22I0153s	375-73-5	0.0177	ug/mLs
PFDAs	22I0153s	335-76-2	0.02s	ug/mLs
PFDOAs	22I0153s	307-55-1	0.02s	ug/mLs
PFDOSs	22I0153s	79780-39-5	0.0194s	ug/mLs
PFDSs	22I0153s	335-77-3	0.0193s	ug/mLs
PFEESAs	22I0153s	113507-82-7	0.0356s	ug/mLs
PFHPAs	22I0153s	375-85-9	0.02s	ug/mLs
PFHPSs	22I0153s	375-92-8	0.0191s	ug/mLs
PFHXA	22I0153s	307-24-4	0.02s	ug/mLs
PFHXS	22I0153s	355-46-4s	0.0183s	ug/mLs
PFMBAs	22I0153s	863090-89-5s	0.04s	ug/mLs
PFMPAs	22I0153s	377-73-1	0.04s	ug/mLs
PFNA	22I0153s	375-95-1	0.02s	ug/mLs
PFNS	22I0153s	68259-12-1s	0.0192s	ug/mLs
PFOAs	22I0153s	335-67-1	0.02s	ug/mLs
PFOSs	22I0153s	1763-23-1	0.0186s	ug/mLs
PFOSAs	22I0153s	754-91-6	0.02s	ug/mLs
PFPEAs	22I0153s	2706-90-3	0.04s	ug/mLs
PFPESs	22I0153s	630402-22-1s	0.0188s	ug/mLs
PFTEDAs	22I0153s	376-06-7	0.02s	ug/mLs
PFTRDA	22I0153s	72629-94-8	0.02s	ug/mLs
PFUnA	22I0153s	2058-94-8s	0.02s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22J0448 0

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22I0153s	PFAS - MIX 1633 200ng/mLs	09/13/2022s	In house	xs	01/11/2025s	09/15/2022 09:34s	by DAGs	1s

Analytical Standard Record0

22J05520

Description:s	PFAS - MIX 1633 200ng/mL	Expires:s	01/11/2025s
Standard Type:s	Analyte Spikes	Prepared:s	10/31/2022s
Solvent:s	MeOH 62244s	Prepared By:s	Dipti Gokals
Final Volume (mls):s	6s	Department:s	PFASs
Vials:s	1s	Last Edit:s	10/31/2022 14:57 by DAG

Analyte0	Parent0	CAS Number	Concentration 0	Units0
NEtFOSA	21J0007	4151-50-2s	0.8s	ug/mLs
NMeFOSE	21J0014	24448-09-7	0.8s	ug/mLs
3:3FTCAs	21L0004s	113507-82-7	0.8s	ug/mLs
5:3FTCAs	21L0005s	914637-49-3	0.8s	ug/mLs
NEtFOSE	21L0006s	1691-99-2s	0.8s	ug/mLs
7:3FTCA	21L0007	812-70-4	0.8s	ug/mLs
NMeFOSA	21L0008s	31506-32-8s	0.8s	ug/mLs
NFDHA	22I0342s	151772-58-6	0.4s	ug/mLs
PFEESAs	22I0342s	113507-82-7	0.356s	ug/mLs
PFMBAs	22I0342s	863090-89-5s	0.4s	ug/mLs
PFMPAs	22I0342s	377-73-1	0.4s	ug/mLs
11CL-PF3OUDS	22I0343s	763051-92-9	0.378	ug/mLs
9CL-PF3ONS	22I0343s	756426-58-1	0.374	ug/mLs
ADONA	22I0343s	919005-14-4s	0.378	ug/mLs
HFPO-DAs	22I0343s	13252-13-6s	0.4s	ug/mLs
4:2FTSs	22I0344s	757124-72-4	0.75	ug/mLs
6:2FTSs	22I0344s	27619-97-2	0.76	ug/mLs
8:2FTSs	22I0344s	39108-34-4s	0.768	ug/mLs
NEtFOSAA	22I0344s	2991-50-6s	0.2s	ug/mLs
NMeFOSAA	22I0344s	2355-31-9s	0.2s	ug/mLs
PFBAs	22I0344s	375-22-4	0.8s	ug/mLs
PFBSs	22I0344s	375-73-5	0.177	ug/mLs
PFDAs	22I0344s	335-76-2	0.2s	ug/mLs
PFDOAs	22I0344s	307-55-1	0.2s	ug/mLs
PFDOSs	22I0344s	79780-39-5	0.194s	ug/mLs
PFDSs	22I0344s	335-77-3	0.193s	ug/mLs
PFHPAs	22I0344s	375-85-9	0.2s	ug/mLs
PFHPSs	22I0344s	375-92-8	0.191s	ug/mLs
PFHXA	22I0344s	307-24-4	0.2s	ug/mLs
PFHXS	22I0344s	355-46-4s	0.183s	ug/mLs
PFNA	22I0344s	375-95-1	0.2s	ug/mLs
PFNS	22I0344s	68259-12-1s	0.192s	ug/mLs
PFOAs	22I0344s	335-67-1	0.2s	ug/mLs
PFOSs	22I0344s	1763-23-1	0.186s	ug/mLs
PFOSAs	22I0344s	754-91-6	0.2s	ug/mLs
PFPEAs	22I0344s	2706-90-3	0.4s	ug/mLs
PFPESs	22I0344s	630402-22-1s	0.188s	ug/mLs
PFTEDAs	22I0344s	376-06-7	0.2s	ug/mLs
PFTRDA	22I0344s	72629-94-8	0.2s	ug/mLs
PFUnA	22I0344s	2058-94-8s	0.2s	ug/mLs

Analytical Standard Record0

22J0552 0

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0		(mls)0
21J0007	PFAS - SAS N-EtFOSA 50ug/mLs	08/12/2021s	Wellington Laboratories	NEtFOSA0821M	08/12/2026s	10/31/2022 14:36s	by DAGs	0.096s
21J0014	PFAS - SAS N-MeFOSE 50ug/mLs	09/22/2021s	Wellington Laboratories	NMeFOSE0921M	09/23/2026s	10/31/2022 14:35s	by DAGs	0.096s
21L0004s	PFAS - SAS 3:3FTA 50ug/mLs	12/07/2021	Wellington Laboratories	FPrPA1020s	11/12/2025s	10/31/2022 14:39s	by DAGs	0.096s
21L0005s	PFAS - SAS 5:3FTA 50ug/mLs	12/07/2021	Wellington Laboratories	FPePA1120s	11/11/2025s	10/31/2022 14:41s	by DAGs	0.096s
21L0006s	PFAS - SAS EtFOSE 50ug/mLs	12/07/2021	Wellington Laboratories	FPePA1120s	09/23/2026s	10/31/2022 14:41s	by DAGs	0.096s
21L0007	PFAS - SAS 7:3FTA 50ug/mLs	12/07/2021	Wellington Laboratories	FHpPA1020s	11/12/2025s	10/31/2022 14:42s	by DAGs	0.096s
21L0008s	PFAS - SAS N-MeFOSA 50ug/mLs	12/07/2021	Wellington Laboratories	NMeFOSA0721M	08/03/2026s	10/31/2022 14:42s	by DAGs	0.096s
22I0342s	PFAS - MIX MXG 2ug/mL	02/07/2022	Wellington Laboratories	PFACMXG0222	02/22/2027	10/31/2022 14:48s	by DAGs	1.2s
22I0343s	PFAS - MIX MXF 2ug/mL	01/10/2022s	Wellington Laboratories	PFACMXF0122	01/11/2025s	10/31/2022 14:55s	by DAGs	1.2s
22I0344s	PFAS - MIX MXH 1-4ug/mLs	08/05/2022s	Wellington Laboratories	PFACMXH0822	08/08/2027	10/31/2022 14:56s	by DAGs	1.2s

Analytical Standard Record

22K0039 0

Description:s	PFAS - MIX 1633 10ng/mL	Expires:s	05/01/2023 s
Standard Type:s	Analyte Spikes	Prepared:s	11/02/2022 s
Solvent:s	MeOHs	Prepared By: s	Andonios Karas
Final Volume (mls):s	10s	Department:s	PFAS s
Vials:s	1s	Last Edit: s	11/02/2022 12:56 by ABK

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS	22J0552	763051-92-9	0.0189s	ug/mLs
3:3FTCAs	22J0552	113507-82-7	0.04s	ug/mLs
4:2FTSs	22J0552	757124-72-4	0.0375	ug/mLs
5:3FTCAs	22J0552	914637-49-3	0.04s	ug/mLs
6:2FTSs	22J0552	27619-97-2	0.038s	ug/mLs
7:3FTCA	22J0552	812-70-4	0.04s	ug/mLs
8:2FTSs	22J0552	39108-34-4s	0.0384s	ug/mLs
9CL-PF3ONS	22J0552	756426-58-1	0.0187	ug/mLs
ADONA	22J0552	919005-14-4s	0.0189s	ug/mLs
HFPO-DAs	22J0552	13252-13-6s	0.02s	ug/mLs
NEtFOSA	22J0552	4151-50-2s	0.04s	ug/mLs
NEtFOSAA	22J0552	2991-50-6s	0.01s	ug/mLs
NEtFOSE	22J0552	1691-99-2s	0.04s	ug/mLs
NFDHA	22J0552	151772-58-6	0.02s	ug/mLs
NMeFOSA	22J0552	31506-32-8s	0.04s	ug/mLs
NMeFOSAA	22J0552	2355-31-9s	0.01s	ug/mLs
NMeFOSE	22J0552	24448-09-7	0.04s	ug/mLs
PFBAs	22J0552	375-22-4	0.04s	ug/mLs
PFBSs	22J0552	375-73-5	0.00885s	ug/mLs
PFDAs	22J0552	335-76-2	0.01s	ug/mLs
PFDOAs	22J0552	307-55-1	0.01s	ug/mLs
PFDOSs	22J0552	79780-39-5	0.0097	ug/mLs
PFDSs	22J0552	335-77-3	0.00965s	ug/mLs
PFEESAs	22J0552	113507-82-7	0.0178	ug/mLs
PFHPAs	22J0552	375-85-9	0.01s	ug/mLs
PFHPSs	22J0552	375-92-8	0.00955s	ug/mLs
PFHXA	22J0552	307-24-4	0.01s	ug/mLs
PFHXS	22J0552	355-46-4s	0.00915s	ug/mLs
PFMBAs	22J0552	863090-89-5s	0.02s	ug/mLs
PFMPAs	22J0552	377-73-1	0.02s	ug/mLs
PFNA	22J0552	375-95-1	0.01s	ug/mLs
PFNS	22J0552	68259-12-1s	0.0096s	ug/mLs
PFOAs	22J0552	335-67-1	0.01s	ug/mLs
PFOSs	22J0552	1763-23-1	0.0093s	ug/mLs
PFOSAs	22J0552	754-91-6	0.01s	ug/mLs
PFPEAs	22J0552	2706-90-3	0.02s	ug/mLs
PFPESs	22J0552	630402-22-1s	0.0094s	ug/mLs
PFTEDAs	22J0552	376-06-7	0.01s	ug/mLs
PFTRDA	22J0552	72629-94-8	0.01s	ug/mLs
PFUnA	22J0552	2058-94-8s	0.01s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22K0039 0

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22J0552	PFAS - MIX 1633 200ng/mLs	10/31/2022s	In house	xs	01/11/2025s	10/31/2022 15:40s	by DAGs	0.5s

Analytical Standard Record

22K0054 0

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025s
Standard Type:s	Others	Prepared:s	11/02/2022s
Solvent:s	meoh	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/02/2022 15:37 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSE		D9-NETFOSE	5s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22K0 540

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025s
Standard Type:s	Others	Prepared:s	07/20/2022
Solvent:s	meoh	Prepared By:s	Wellington Laboratories (Lot#: MPFACHIFES0822)s
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/04/2022 10:46 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSE		D9-NETFOSE	5s	ug/mLs

Reviewed By

Date

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

PRODUCT CODE:	MPFAC-HIF-ES
LOT NUMBER:	MPFACHIFES0822
SOLVENT(S):	Methanol/Isopropanol (1%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	07/20/2022
LAST TESTED: (mm/dd/yyyy)	08/02/2022
EXPIRY DATE: (mm/dd/yyyy)	08/02/2025
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4-C_{12}, C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4, C_6, and C_8), three mass-labelled (one ^{13}C and two ^{2}H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^{2}H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^{2}H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled components all have chemical purities >98% and isotopic purities of ≥99%. The individual ^{2}H-labelled components all have chemical purities >98% and isotopic 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)

ADDITIONAL INFORMATION:

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

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Table A: **MPFAC-HIF-ES; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))**

Compound	Acronym	Concentration (ng/mL)	Peak Assignment in Figure 1
Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	2000	1
Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	1000	2
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	500	5
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	500	7
Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	500	10
Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	250	11
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	250	14
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	250	17
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	250	19
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	250	23
Perfluoro-1-($^{13}C_8$)octanesulfonamide	M8FOSA	500	18
N-methyl-d_3-perfluoro-1-octanesulfonamide	d-N-MeFOSA	500	21
N-ethyl-d_5-perfluoro-1-octanesulfonamide	d-N-EtFOSA	500	24
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000	15
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000	16
2-(N-methyl-d_3-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d7-N-MeFOSE	5000	20
2-(N-ethyl-d_5-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d9-N-EtFOSE	5000	22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	2000	6

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 08/02/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Analytical Standard Record

22K0055 0

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025s
Standard Type:s	Others	Prepared:s	11/02/2022s
Solvent:s	meoh	Prepared By:s	Dipti Gokals
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/02/2022 15:37 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSE		D9-NETFOSE	5s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22K0 550

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025s
Standard Type:s	Others	Prepared:s	07/20/2022
Solvent:s	meoh	Prepared By:s	Wellington Laboratories (Lot#: MPFACHIFES0822)s
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/04/2022 10:46 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSE		D9-NETFOSE	5s	ug/mLs

Reviewed By

Date

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

PRODUCT CODE:	MPFAC-HIF-ES
LOT NUMBER:	MPFACHIFES0822
SOLVENT(S):	Methanol/Isopropanol (1%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	07/20/2022
LAST TESTED: (mm/dd/yyyy)	08/02/2022
EXPIRY DATE: (mm/dd/yyyy)	08/02/2025
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4-C_{12}, C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4, C_6, and C_8), three mass-labelled (one ^{13}C and two ^{2}H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^{2}H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^{2}H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled components all have chemical purities >98% and isotopic purities of ≥99%. The individual ^{2}H-labelled components all have chemical purities >98% and isotopic 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)

ADDITIONAL INFORMATION:

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

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Table A: **MPFAC-HIF-ES; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))**

Compound	Acronym	Concentration (ng/mL)	Peak Assignment in Figure 1
Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	2000	1
Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	1000	2
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	500	5
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	500	7
Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	500	10
Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	250	11
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	250	14
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	250	17
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	250	19
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	250	23
Perfluoro-1-($^{13}C_8$)octanesulfonamide	M8FOSA	500	18
N-methyl-d_3-perfluoro-1-octanesulfonamide	d-N-MeFOSA	500	21
N-ethyl-d_5-perfluoro-1-octanesulfonamide	d-N-EtFOSA	500	24
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000	15
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000	16
2-(N-methyl-d_3-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d7-N-MeFOSE	5000	20
2-(N-ethyl-d_5-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d9-N-EtFOSE	5000	22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	2000	6

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 08/02/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

PRODUCT CODE:	MPFAC-HIF-ES
LOT NUMBER:	MPFACHIFES0822
SOLVENT(S):	Methanol/Isopropanol (1%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	07/20/2022
LAST TESTED: (mm/dd/yyyy)	08/02/2022
EXPIRY DATE: (mm/dd/yyyy)	08/02/2025
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4-C_{12}, C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4, C_6, and C_8), three mass-labelled (one ^{13}C and two ^{2}H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^{2}H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^{2}H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled components all have chemical purities >98% and isotopic purities of ≥99%. The individual ^{2}H-labelled components all have chemical purities >98% and isotopic 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)

ADDITIONAL INFORMATION:

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

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Table A: **MPFAC-HIF-ES; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))**

Compound	Acronym	Concentration (ng/mL)	Peak Assignment in Figure 1
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Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	250	23
Perfluoro-1-($^{13}C_8$)octanesulfonamide	M8FOSA	500	18
N-methyl-d_3-perfluoro-1-octanesulfonamide	d-N-MeFOSA	500	21
N-ethyl-d_5-perfluoro-1-octanesulfonamide	d-N-EtFOSA	500	24
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000	15
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000	16
2-(N-methyl-d_3-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d7-N-MeFOSE	5000	20
2-(N-ethyl-d_5-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d9-N-EtFOSE	5000	22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	2000	6

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
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Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 08/02/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

PRODUCT CODE:	MPFAC-HIF-ES
LOT NUMBER:	MPFACHIFES0822
SOLVENT(S):	Methanol/Isopropanol (1%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	07/20/2022
LAST TESTED: (mm/dd/yyyy)	08/02/2022
EXPIRY DATE: (mm/dd/yyyy)	08/02/2025
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4-C_{12}, C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4, C_6, and C_8), three mass-labelled (one ^{13}C and two ^{2}H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^{2}H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^{2}H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled components all have chemical purities >98% and isotopic purities of ≥99%. The individual ^{2}H-labelled components all have chemical purities >98% and isotopic 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)

ADDITIONAL INFORMATION:

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

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Table A: **MPFAC-HIF-ES; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))**

Compound	Acronym	Concentration (ng/mL)	Peak Assignment in Figure 1
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Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	250	17
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	250	19
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	250	23
Perfluoro-1-($^{13}C_8$)octanesulfonamide	M8FOSA	500	18
N-methyl-d_3-perfluoro-1-octanesulfonamide	d-N-MeFOSA	500	21
N-ethyl-d_5-perfluoro-1-octanesulfonamide	d-N-EtFOSA	500	24
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000	15
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000	16
2-(N-methyl-d_3-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d7-N-MeFOSE	5000	20
2-(N-ethyl-d_5-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d9-N-EtFOSE	5000	22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	2000	6

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
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Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 08/02/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Analytical Standard Record

22K0097 0

Description:s	MPFAC-HIF-ES-EISs	Expires:s	08/02/2025 s
Standard Type:s	Others	Prepared: s	07/20/2022
Solvent: s	meoh	Prepared By:s	Wellington Laboratories (Lot#: MPFACHIFES0822)s
Final Volume (mls):s	1.2s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/04/2022 10:47 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs		13C2-4:2FTSs	1s	ug/mLs
13C2-6:2FTSs		13C2-6:2FTSs	1s	ug/mLs
13C2-8:2FTSs		13C2-8:2FTSs	1s	ug/mLs
13C2-PFDOAs		13C2-PFDOAs	0.25s	ug/mLs
13C2-PFTEDAs		13C2-PFTEDAs	0.25s	ug/mLs
13C3-HFPO-DAs		13C3-HFPO-DAs	2s	ug/mLs
13C3-PFBSs		13C3-PFBSs	0.5s	ug/mLs
13C3-PFHXS		13C3-PFHXS	0.5s	ug/mLs
13C4-PFBAs		13C4-PFBAs	2s	ug/mLs
13C4-PFHPAs		13C4-PFHPAs	0.5s	ug/mLs
13C5-PFHXA		13C5-PFHXA	0.5s	ug/mLs
13C5-PFPEAs		13C5-PFPEAs	1s	ug/mLs
13C6-PFDAs		13C6-PFDAs	0.25s	ug/mLs
13C7-PFUnA		13C7-PFUDA	0.25s	ug/mLs
13C8-PFOAs		13C8-PFOAs	0.5s	ug/mLs
13C8-PFOSs		13C8-PFOSs	0.5s	ug/mLs
13C8-PFOSAs		13C8-PFOSAs	0.5s	ug/mLs
13C9-PFNA		13C9-PFNA	0.25s	ug/mLs
D3-NMEFOSA		D3-NMEFOSA	0.5s	ug/mLs
D3-NMEFOSAA		D3-NMEFOSAA	1s	ug/mLs
D5-NETFOSA		D5-NETFOSA	0.5s	ug/mLs
D5-NETFOSAA		D5-NETFOSAA	1s	ug/mLs
D7-NMEFOSE		D7-NMEFOSE	5s	ug/mLs
D9-NETFOSE		D9-NETFOSE	5s	ug/mLs

Reviewed By

Date

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

MPFAC-HIF-ES

Mass-Labelled PFAS Extraction Standard Solution/Mixture

PRODUCT CODE:	MPFAC-HIF-ES
LOT NUMBER:	MPFACHIFES0822
SOLVENT(S):	Methanol/Isopropanol (1%)/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	07/20/2022
LAST TESTED: (mm/dd/yyyy)	08/02/2022
EXPIRY DATE: (mm/dd/yyyy)	08/02/2025
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

MPFAC-HIF-ES is a solution/mixture of ten mass-labelled (^{13}C) perfluoroalkylcarboxylic acids (C_4-C_{12}, C_{14}), three mass-labelled (^{13}C) perfluoroalkanesulfonates (C_4, C_6, and C_8), three mass-labelled (one ^{13}C and two ^{2}H) perfluoro-1-octanesulfonamides, three mass-labelled (^{13}C) fluorotelomer sulfonates (4:2, 6:2, and 8:2), two mass-labelled (^{2}H) perfluorooctanesulfonamidoacetic acids, two mass-labelled (^{2}H) perfluorooctanesulfonamidoethanols, and mass-labelled (^{13}C) hexafluoropropylene oxide dimer acid (GenX, M3HFPO-DA). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled components all have chemical purities >98% and isotopic purities of ≥99%. The individual ^{2}H-labelled components all have chemical purities >98% and isotopic 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)

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

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

Table A: **MPFAC-HIF-ES; Components and Concentrations (ng/mL, ± 5% in methanol/isopropanol (1%)/water (<1%))**

Compound	Acronym	Concentration (ng/mL)	Peak Assignment in Figure 1
Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	2000	1
Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	1000	2
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	500	5
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	500	7
Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	500	10
Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	250	11
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	250	14
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	250	17
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	250	19
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	250	23
Perfluoro-1-($^{13}C_8$)octanesulfonamide	M8FOSA	500	18
N-methyl-d_3-perfluoro-1-octanesulfonamide	d-N-MeFOSA	500	21
N-ethyl-d_5-perfluoro-1-octanesulfonamide	d-N-EtFOSA	500	24
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000	15
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000	16
2-(N-methyl-d_3-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d7-N-MeFOSE	5000	20
2-(N-ethyl-d_5-perfluoro-1-octanesulfonamido)ethan-d_4-ol	d9-N-EtFOSE	5000	22
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	2000	6

Compound	Acronym	Concentration* (ng/mL)		Peak Assignment in Figure 1
		as the salt	as the acid	
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	500	466	3
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	500	474	8
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	500	479	12
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	1000	938	4
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	1000	951	9
Sodium 1H,1H,2H,2H-perfluoro-(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	1000	960	13

* Concentrations have been rounded to three significant figures.

Certified By: _____ **Date:** 08/02/2022 (mm/dd/yyyy)

B.G. Chittim, General Manager

Analytical Standard Record

22K04080

Description:s	MPFAC-HIF-ES 40.0ng/mLs	Expires:s	05/20/2023s
Standard Type:s	Surrogate Spikes	Prepared:s	11/21/2022s
Solvent:s	MeOH/62244s	Prepared By:s	Dipti Gokals
Final Volume (mls):s	15s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/21/2022 09:01 by DAGs

Analyte 0	Parent0	CAS Number0	Concentration 0	Units0
13C2-4:2FTSs	22K0054	13C2-4:2FTSs	0.08s	ug/mLs
13C2-6:2FTSs	22K0054	13C2-6:2FTSs	0.08s	ug/mLs
13C2-8:2FTSs	22K0054	13C2-8:2FTSs	0.08s	ug/mLs
13C2-PFDOAs	22K0054	13C2-PFDOAs	0.02s	ug/mLs
13C2-PFTEDAs	22K0054	13C2-PFTEDAs	0.02s	ug/mLs
13C3-HFPO-DAs	22K0054	13C3-HFPO-DAs	0.16s	ug/mLs
13C3-PFBSs	22K0054	13C3-PFBSs	0.04s	ug/mLs
13C3-PFHXS	22K0054	13C3-PFHXS	0.04s	ug/mLs
13C4-PFBAs	22K0054	13C4-PFBAs	0.16s	ug/mLs
13C4-PFHPAs	22K0054	13C4-PFHPAs	0.04s	ug/mLs
13C5-PFHXA	22K0054	13C5-PFHXA	0.04s	ug/mLs
13C5-PFPEAs	22K0054	13C5-PFPEAs	0.08s	ug/mLs
13C6-PFDAs	22K0054	13C6-PFDAs	0.02s	ug/mLs
13C7-PFUnA	22K0054	13C7-PFUDA	0.02s	ug/mLs
13C8-PFOAs	22K0054	13C8-PFOAs	0.04s	ug/mLs
13C8-PFOSs	22K0054	13C8-PFOSs	0.04s	ug/mLs
13C8-PFOSAs	22K0054	13C8-PFOSA s	0.04s	ug/mLs
13C9-PFNA	22K0054	13C9-PFNA	0.02s	ug/mLs
D3-NMEFOSA	22K0054	D3-NMEFOSA	0.04s	ug/mLs
D3-NMEFOSAA	22K0054	D3-NMEFOSAA	0.08s	ug/mLs
D5-NETFOSA	22K0054	D5-NETFOSA	0.04s	ug/mLs
D5-NETFOSAA	22K0054	D5-NETFOSAA	0.08s	ug/mLs
D7-NMEFOSE	22K0054	D7-NMEFOSE	0.4s	ug/mLs
D9-NETFOSE	22K0054	D9-NETFOSE	0.4s	ug/mLs
13C2-4:2FTSs	22K0055	13C2-4:2FTSs	0.08s	ug/mLs
13C2-6:2FTSs	22K0055	13C2-6:2FTSs	0.08s	ug/mLs
13C2-8:2FTSs	22K0055	13C2-8:2FTSs	0.08s	ug/mLs
13C2-PFDOAs	22K0055	13C2-PFDOAs	0.02s	ug/mLs
13C2-PFTEDAs	22K0055	13C2-PFTEDAs	0.02s	ug/mLs
13C3-HFPO-DAs	22K0055	13C3-HFPO-DAs	0.16s	ug/mLs
13C3-PFBSs	22K0055	13C3-PFBSs	0.04s	ug/mLs
13C3-PFHXS	22K0055	13C3-PFHXS	0.04s	ug/mLs
13C4-PFBAs	22K0055	13C4-PFBAs	0.16s	ug/mLs
13C4-PFHPAs	22K0055	13C4-PFHPAs	0.04s	ug/mLs
13C5-PFHXA	22K0055	13C5-PFHXA	0.04s	ug/mLs
13C5-PFPEAs	22K0055	13C5-PFPEAs	0.08s	ug/mLs
13C6-PFDAs	22K0055	13C6-PFDAs	0.02s	ug/mLs
13C7-PFUnA	22K0055	13C7-PFUDA	0.02s	ug/mLs
13C8-PFOAs	22K0055	13C8-PFOAs	0.04s	ug/mLs
13C8-PFOSs	22K0055	13C8-PFOSs	0.04s	ug/mLs
13C8-PFOSAs	22K0055	13C8-PFOSA s	0.04s	ug/mLs
13C9-PFNA	22K0055	13C9-PFNA	0.02s	ug/mLs
D3-NMEFOSA	22K0055	D3-NMEFOSA	0.04s	ug/mLs
D3-NMEFOSAA	22K0055	D3-NMEFOSAA	0.08s	ug/mLs
D5-NETFOSA	22K0055	D5-NETFOSA	0.04s	ug/mLs
D5-NETFOSAA	22K0055	D5-NETFOSAA	0.08s	ug/mLs
D7-NMEFOSE	22K0055	D7-NMEFOSE	0.4s	ug/mLs

Reviewed By

Date

Analytical Standard Record

22K04080

Description:s	MPFAC-HIF-ES 40.0ng/mLs	Expires:s	05/20/2023s
Standard Type:s	Surrogate Spikes	Prepared:s	11/21/2022s
Solvent:	MeOH/62244s	Prepared By:s	Dipti Gokals
Final Volume (mls):s	15s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/21/2022 09:01 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
D9-NETFOSE	22K0055	D9-NETFOSE	0.4s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22K0054	MPFAC-HIF-ES-EISs	07/20/2022	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:15s	by DAGs	0.8s
22K0055	MPFAC-HIF-ES-EISs	07/20/2022	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:15s	by DAGs	0.4s

Analytical Standard Record

22K05020

Description:s	PFAS IIS 7C 40ng/mL	Expires:s	01/20/2023s
Standard Type:s	Internal Standards	Prepared:s	11/28/2022s
Solvent:	MeOH/62286s	Prepared By:s	Dipti Gokals
Final Volume (mls):s	25s	Department:s	PFASs
Vials:s	1s	Last Edit:s	11/28/2022 15:10 by DAGs

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-PFDAs	22A0234s	13C2-PFDAs	0.04s	ug/mLs
13C2-PFHXA	22A0234s	13C2-PFHxAs	0.04s	ug/mLs
13C3-PFBAs	22A0234s	13C3-PFBAs	0.04s	ug/mLs
13C4-PFOAs	22A0234s	13C4-PFOAs	0.04s	ug/mLs
13C4-PFOSs	22A0234s	13C4-PFOSs	0.04s	ug/mLs
13C5-PFNA	22A0234s	13C5-PFNA	0.04s	ug/mLs
18O2-PFHXS	22A0234s	18O2-PFHXS	0.04s	ug/mLs

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22A0234s	PFAS IIS 7C 5ug/mL	01/20/2022s	In house	*	01/20/2023s	01/20/2022 15:49s	by HGHs	0.2s

Reviewed Bys

Date s

Analytical Standard Record

22K0503 0

Description:s	1633- IIS Static 1ng/mL	Expires:s	01/20/2023s
Standard Type:s	Internal Standards	Prepared:s	11/28/2022s
Solvent:s	MeOH/62286s	Prepared By:s	Dipti Gokal
Final Volume (mls):s	2s	Department:s	PFAS
Vials:s	1s	Last Edit:	11/28/2022 15:11 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
13C2-PFDAs	22K0502s	13C2-PFDAs	0.001s	ug/mL
13C2-PFHXAs	22K0502s	13C2-PFHxAs	0.001s	ug/mL
13C3-PFBAs	22K0502s	13C3-PFBAs	0.001s	ug/mL
13C4-PFOAs	22K0502s	13C4-PFOAs	0.001s	ug/mL
13C4-PFOS	22K0502s	13C4-PFOS	0.001s	ug/mL
13C5-PFNAs	22K0502s	13C5-PFNAs	0.001s	ug/mL
18O2-PFHXS	22K0502s	18O2-PFHXS	0.001s	ug/mL

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22K0502s	PFAS IIS 7C 40ng/mL	11/28/2022s	In houses	*s	01/20/2023s	11/28/2022 15:10s	by DAG	0.05s

Reviewed Bys

Date s

Analytical Standard Record

22L0117 L

Description:s	MPFAC-HIF-ES 20.0ng/mL	Expires:s	06/05/2023s
Standard Type:s	Surrogate Spike	Prepared:s	12/07/2022s
Solvent:s	MeOH/62244s	Prepared By:s	Dipti Gokal
Final Volume (mls):s	10s	Department:s	PFAS
Vials:s	3s	Last Edit:	12/07/2022 10:55 by DAG
Comments: l	Half the concentration of previous EIS solution used for 1633/B-15.l Double the spiking volume from 100 uL to 200 uLl		

Analyte L	ParentL	CAS NumberL	Concentration L	UnitsL
13C2-4:2FTS	22K0097	13C2-4:2FTS	0.04s	ug/mL
13C2-6:2FTS	22K0097	13C2-6:2FTS	0.04s	ug/mL
13C2-8:2FTS	22K0097	13C2-8:2FTS	0.04s	ug/mL
13C2-PFDOAs	22K0097	13C2-PFDOAs	0.01s	ug/mL
13C2-PFTEDAs	22K0097	13C2-PFTEDAs	0.01s	ug/mL
13C3-HFPO-DAs	22K0097	13C3-HFPO-DAs	0.08s	ug/mL
13C3-PFBS	22K0097	13C3-PFBS	0.02s	ug/mL
13C3-PFHXS	22K0097	13C3-PFHXS	0.02s	ug/mL
13C4-PFBAs	22K0097	13C4-PFBAs	0.08s	ug/mL
13C4-PFHPAs	22K0097	13C4-PFHPAs	0.02s	ug/mL
13C5-PFHXAs	22K0097	13C5-PFHXAs	0.02s	ug/mL
13C5-PFPEAs	22K0097	13C5-PFPEAs	0.04s	ug/mL
13C6-PFDAs	22K0097	13C6-PFDAs	0.01s	ug/mL
13C7-PFUnA	22K0097	13C7-PFUDA	0.01s	ug/mL
13C8-PFOAs	22K0097	13C8-PFOAs	0.02s	ug/mL
13C8-PFOS	22K0097	13C8-PFOS	0.02s	ug/mL
13C8-PFOSAs	22K0097	13C8-PFOSA s	0.02s	ug/mL
13C9-PFNA	22K0097	13C9-PFNA	0.01s	ug/mL
D3-NMEFOSAs	22K0097	D3-NMEFOSAs	0.02s	ug/mL
D3-NMEFOSAAs	22K0097	D3-NMEFOSAA s	0.04s	ug/mL
D5-NETFOSAs	22K0097	D5-NETFOSA s	0.02s	ug/mL
D5-NETFOSAAs	22K0097	D5-NETFOSAA s	0.04s	ug/mL
D7-NMEFOSEs	22K0097	D7-NMEFOSE s	0.2s	ug/mL
D9-NETFOSE	22K0097	D9-NETFOSE	0.2s	ug/mL

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22K0097	MPFAC-HIF-ES-EIS	07/20/2022s	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:17s	by DAG	0.4s

Reviewed By s

Date s

Analytical Standard Record

22L0269 0

Description:s	PFAS - MIX 1633 10ng/mL	Expires:s	06/12/2023s
Standard Type:s	Analyte Spike	Prepared:s	12/14/2022s
Solvent:s	MeOHs	Prepared By:s	Dipti Gokal
Final Volume (mls):s	10s	Department:s	PFAS
Vials:s	1s	Last Edit:	12/14/2022 12:00 by DAG

Analyte0	Parent0	CAS Number0	Concentration 0	Units0
11CL-PF3OUDS	22J0552	763051-92-9	0.0189	ug/mL
3:3FTCAs	22J0552	113507-82-7s	0.04s	ug/mL
4:2FTS	22J0552	757124-72-4s	0.0375s	ug/mL
5:3FTCAs	22J0552	914637-49-3	0.04s	ug/mL
6:2FTS	22J0552	27619-97-2	0.038s	ug/mL
7:3FTCAs	22J0552	812-70-4s	0.04s	ug/mL
8:2FTS	22J0552	39108-34-4	0.0384s	ug/mL
9CL-PF3ONS	22J0552	756426-58-1s	0.0187s	ug/mL
ADONAs	22J0552	919005-14-4	0.0189	ug/mL
HFPO-DAs	22J0552	13252-13-6s	0.02s	ug/mL
NEtFOSAs	22J0552	4151-50-2s	0.04s	ug/mL
NEtFOSAAs	22J0552	2991-50-6	0.01s	ug/mL
NEtFOSEs	22J0552	1691-99-2	0.04s	ug/mL
NFDHAs	22J0552	151772-58-6s	0.02s	ug/mL
NMeFOSAs	22J0552	31506-32-8s	0.04s	ug/mL
NMeFOSAAs	22J0552	2355-31-9	0.01s	ug/mL
NMeFOSEs	22J0552	24448-09-7	0.04s	ug/mL
PFBAs	22J0552	375-22-4s	0.04s	ug/mL
PFBS	22J0552	375-73-5s	0.00885s	ug/mL
PFDAs	22J0552	335-76-2s	0.01s	ug/mL
PFDOAs	22J0552	307-55-1s	0.01s	ug/mL
PFDOS	22J0552	79780-39-5	0.0097	ug/mL
PFDS	22J0552	335-77-3s	0.00965	ug/mL
PFEESAs	22J0552	113507-82-7s	0.0178s	ug/mL
PFHPAs	22J0552	375-85-9	0.01s	ug/mL
PFHPS	22J0552	375-92-8	0.00955	ug/mL
PFHXAs	22J0552	307-24-4s	0.01s	ug/mL
PFHXS	22J0552	355-46-4s	0.00915	ug/mL
PFMBAs	22J0552	863090-89-5	0.02s	ug/mL
PFMPAs	22J0552	377-73-1s	0.02s	ug/mL
PFNAs	22J0552	375-95-1	0.01s	ug/mL
PFNS	22J0552	68259-12-1	0.0096	ug/mL
PFOAs	22J0552	335-67-1s	0.01s	ug/mL
PFOS	22J0552	1763-23-1s	0.0093	ug/mL
PFOSAs	22J0552	754-91-6	0.01s	ug/mL
PFPEAs	22J0552	2706-90-3	0.02s	ug/mL
PFPES	22J0552	630402-22-1s	0.0094	ug/mL
PFTEDAs	22J0552	376-06-7s	0.01s	ug/mL
PFTRDAs	22J0552	72629-94-8	0.01s	ug/mL
PFUnA	22J0552	2058-94-8	0.01s	ug/mL

Reviewed Bys

Date s

Analytical Standard Record

22L0269 0

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22J0552	PFAS - MIX 1633 s 200ng/mL	10/31/2022s	In houses	xs	01/11/2025s	10/31/2022 15:40s	by DAG	0.5s

Analytical Standard Record

22L0272 L

Description:s	MPFAC-HIF-ES 20.0ng/mL	Expires:s	06/12/2023s
Standard Type:s	Surrogate Spike	Prepared:s	12/14/2022s
Solvent:s	MeOH/62244s	Prepared By:s	Andonios Karas
Final Volume (mls):s	10s	Department:s	PFAS
Vials:s	3s	Last Edit:	12/14/2022 13:55 by ABKs
Comments:l	Half the concentration of previous EIS solution used for 1633/B-15.l Double the spiking volume from 100 uL to 200 uLl		

Analyte L	ParentL	CAS NumberL	Concentration L	UnitsL
13C2-4:2FTS	22K0095	13C2-4:2FTS	0.04s	ug/mL
13C2-6:2FTS	22K0095	13C2-6:2FTS	0.04s	ug/mL
13C2-8:2FTS	22K0095	13C2-8:2FTS	0.04s	ug/mL
13C2-PFDOAs	22K0095	13C2-PFDOAs	0.01s	ug/mL
13C2-PFTEDAs	22K0095	13C2-PFTEDAs	0.01s	ug/mL
13C3-HFPO-DAs	22K0095	13C3-HFPO-DAs	0.08s	ug/mL
13C3-PFBS	22K0095	13C3-PFBS	0.02s	ug/mL
13C3-PFHXS	22K0095	13C3-PFHXS	0.02s	ug/mL
13C4-PFBAs	22K0095	13C4-PFBAs	0.08s	ug/mL
13C4-PFHPAs	22K0095	13C4-PFHPAs	0.02s	ug/mL
13C5-PFHXAs	22K0095	13C5-PFHXAs	0.02s	ug/mL
13C5-PFPEAs	22K0095	13C5-PFPEAs	0.04s	ug/mL
13C6-PFDAs	22K0095	13C6-PFDAs	0.01s	ug/mL
13C7-PFUnA	22K0095	13C7-PFUDA	0.01s	ug/mL
13C8-PFOAs	22K0095	13C8-PFOAs	0.02s	ug/mL
13C8-PFOS	22K0095	13C8-PFOS	0.02s	ug/mL
13C8-PFOSAs	22K0095	13C8-PFOSA s	0.02s	ug/mL
13C9-PFNA	22K0095	13C9-PFNA	0.01s	ug/mL
D3-NMEFOSAs	22K0095	D3-NMEFOSAs	0.02s	ug/mL
D3-NMEFOSAAs	22K0095	D3-NMEFOSAA s	0.04s	ug/mL
D5-NETFOSAs	22K0095	D5-NETFOSA s	0.02s	ug/mL
D5-NETFOSAAs	22K0095	D5-NETFOSAA s	0.04s	ug/mL
D7-NMEFOSEs	22K0095	D7-NMEFOSE s	0.2s	ug/mL
D9-NETFOSE	22K0095	D9-NETFOSE	0.2s	ug/mL

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22K0095	MPFAC-HIF-ES-EIS	07/20/2022s	Wellington Laboratories	MPFACHIFES0822s	08/02/2025s	11/04/2022 12:16s	by DAG	0.4s

Reviewed By s

Date s

Analytical Standard Record0

22L0432 0

Description: s	PFAS IIS 7C 40ng/mL	Expires:s	01/20/2023 s
Standard Type:s	Internal Standards	Prepared: s	12/29/2022
Solvent:s	MeOH/62286s	Prepared By: s	Dipti Gokal
Final Volume (mls):s	25s	Department:s	PFAS
Vials:s	1 s	Last Edit:	12/29/2022 09:09 by DAG

Analyte0	Parent0	CAS Number	Concentration 0	Units0
13C2-PFDAs	22A0234s	13C2-PFDAs	0.04s	ug/mL
13C2-PFHXAs	22A0234s	13C2-PFHxAs	0.04s	ug/mL
13C3-PFBAs	22A0234s	13C3-PFBAs	0.04s	ug/mL
13C4-PFOAs	22A0234s	13C4-PFOAs	0.04s	ug/mL
13C4-PFOS	22A0234s	13C4-PFOS	0.04s	ug/mL
13C5-PFNAs	22A0234s	13C5-PFNAs	0.04s	ug/mL
18O2-PFHXS	22A0234s	18O2-PFHXS	0.04s	ug/mL

Parent Standards used: 0

Standard 0	Description0	Prepared0	Prepared By0	Lot Nbr	Expires0	Last Edit0		(mls)0
22A0234s	PFAS IIS 7C 5ug/mL	01/20/2022s	In houses	*s	01/20/2023s	01/20/2022 15:49	by HGH	0.2s

Reviewed Bys

Date s

Analytical Standard Record

22L0442 L

Description: s	PFAS - MIX 1633 10ng/mL	Expires:s	06/27/2023 s
Standard Type: s	Analyte Spike	Prepared: s	12/29/2022
Solvent:s	MeOHs	Prepared By: s	Dipti Gokal
Final Volume (mls):s	10s	Department:s	PFAS
Vials:s	1 s	Last Edit:	12/29/2022 09:41 by DAG

AnalyteL	ParentL	CAS NumberL	Concentration L	UnitsL
11CL-PF3OUDS	22J0552	763051-92-9	0.0189	ug/mL
3:3FTCAs	22J0552	113507-82-7s	0.04s	ug/mL
4:2FTS	22J0552	757124-72-4s	0.0375s	ug/mL
5:3FTCAs	22J0552	914637-49-3	0.04s	ug/mL
6:2FTS	22J0552	27619-97-2	0.038s	ug/mL
7:3FTCAs	22J0552	812-70-4s	0.04s	ug/mL
8:2FTS	22J0552	39108-34-4	0.0384s	ug/mL
9CL-PF3ONS	22J0552	756426-58-1s	0.0187s	ug/mL
ADONAs	22J0552	919005-14-4	0.0189	ug/mL
HFPO-DAs	22J0552	13252-13-6s	0.02s	ug/mL
NEtFOSAs	22J0552	4151-50-2s	0.04s	ug/mL
NEtFOSAAs	22J0552	2991-50-6	0.01s	ug/mL
NEtFOSEs	22J0552	1691-99-2	0.04s	ug/mL
NFDHAs	22J0552	151772-58-6s	0.02s	ug/mL
NMeFOSAs	22J0552	31506-32-8s	0.04s	ug/mL
NMeFOSAAs	22J0552	2355-31-9	0.01s	ug/mL
NMeFOSEs	22J0552	24448-09-7	0.04s	ug/mL
PFBAs	22J0552	375-22-4s	0.04s	ug/mL
PFBS	22J0552	375-73-5s	0.00885s	ug/mL
PFDAs	22J0552	335-76-2s	0.01s	ug/mL
PFDOAs	22J0552	307-55-1s	0.01s	ug/mL
PFDOS	22J0552	79780-39-5	0.0097	ug/mL
PFDS	22J0552	335-77-3s	0.00965	ug/mL
PFEESAs	22J0552	113507-82-7s	0.0178s	ug/mL
PFHPAs	22J0552	375-85-9	0.01s	ug/mL
PFHPS	22J0552	375-92-8	0.00955	ug/mL
PFHXAs	22J0552	307-24-4s	0.01s	ug/mL
PFHXS	22J0552	355-46-4s	0.00915	ug/mL
PFMBAs	22J0552	863090-89-5	0.02s	ug/mL
PFMPAs	22J0552	377-73-1s	0.02s	ug/mL
PFNAs	22J0552	375-95-1	0.01s	ug/mL
PFNS	22J0552	68259-12-1	0.0096	ug/mL
PFOAs	22J0552	335-67-1s	0.01s	ug/mL
PFOS	22J0552	1763-23-1s	0.0093	ug/mL
PFOSAs	22J0552	754-91-6	0.01s	ug/mL
PFPEAs	22J0552	2706-90-3	0.02s	ug/mL
PFPES	22J0552	630402-22-1s	0.0094	ug/mL
PFTEDAs	22J0552	376-06-7s	0.01s	ug/mL
PFTRDAs	22J0552	72629-94-8	0.01s	ug/mL
PFUnA	22J0552	2058-94-8	0.01s	ug/mL

Reviewed Bys

Date s

Analytical Standard Record

22L0442 L

Parent Standards used: 0

Standard 0	Description0	Prepared	Prepared By0	Lot Nbr0	Expires0	Last Edit0		(mls)0
22J0552	PFAS - MIX 1633 s 200ng/mL	10/31/2022s	In houses	xs	01/11/2025s	10/31/2022 15:40s	by DAG	0.5s