



2045 Mills Road West

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TOLL-FREE: 1-888-373-0881

SGS AXYS Client No.: 4066

Client Address: Tetra Tech, Inc. - Pacific Guardian Ctr.
737 Bishop St., Suite 2340, Mauka Tower
Honolulu, HI, US, 96813-3201

The SGS AXYS contact for these data is Dale Robinson.

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BATCH SUMMARY

Batch ID: WG88605	Date: 28-Feb-2024
Analysis Type: Perfluorinated Organic (Post)	Matrix Type: Aqueous
BATCH MAKEUP	
Contract: 4066 Samples: L40347-3 HNWWTP-EFFL-EB L40347-6 HNWWTP-EFFL L40347-9 HNWWTP-INFL-EB L40347-12 HNWWTP-INFL	Blank: WG88605-101
	Reference or Spike: WG88605-102
	Duplicate:
Comments: <ol style="list-style-type: none"> 1. Data are considered final. 2. Data are not blank corrected. Blank data should be taken into consideration when evaluating sample data. 3. Blank data should be evaluated against specifications using the same blank sample size as the size of the client samples. 4. In the continuing calibration verification (filename: FC4L_024 S:30, S:41, S:49) some surrogates are observed above the upper method control limit. As the result for the associated targets are observed within method specifications data is not considered impacted. 5. Percent recoveries of several surrogates in the client samples were observed to be outside the method limits and these surrogates have been flagged with a 'V' on the report forms. As the isotope dilution method of quantification produces data that are recovery corrected, the slight variance from the method acceptance criteria is deemed not to affect the quantification of these analytes. Percent surrogate recoveries are used as a general method performance indicator only. 	

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February 2017

CHAIN OF CUSTODY

2045 Mills Road West TEL: (250) 655-5800 TOLL FREE 1-888-373-0881
 Sidney, British Columbia, Canada V8L 5X2 FAX: (250) 655-5811

SGS AXYS CLIENT #: 4066

REPORT TO: Company <u>Hawaii DOH-HEER Office</u> Address <u>2385 Waimano Home Rd #100 Pearl City, HI 96782</u> Contact <u>Roger Brewer</u> Phone <u>808-586-4249</u> FAX E-mail <u>roger.brewer@doh.hawaii.gov</u>			INVOICE TO: Company <u>TetraTech</u> Address <u>737 Bishop St Ste 2340 Honolulu, HI 96813</u> Contact <u>Eric Jensen</u> Phone <u>808-225-7084</u> FAX E-mail <u>eric.jensen@tetratech.com</u>			ANALYSIS REQUESTED <div style="display: flex; justify-content: space-around; font-size: 2em; font-weight: bold;"> MLA-100 MLA-111 MLA-119 </div>									
Project Name/Number:			Sampler's Name:												
Signature:															
Client Sample Identification	Matrix	Sampling Date	Sampling Time	Container Type/No.	SGS AXYS Lab Sample ID (Lab use only)										
HVWWTP-EFFL	H ₂ O	9/19/23	7:54am	3 500ml	L 40347-6	X	X	X							
HVWWTP-INFL	"	9/19/23	7:37am	2 600ml	-12	X	X	X							
HVWWTP-EFFL-EB	"	9/18/23	7:10am	"	-3	X	X	X							
HVWWTP-INFL-EB	"	9/18/23	7:30am	"	-9	X	X	X							
Relinquished by (Signature) <u>Proger B</u>			Date <u>10/3/23</u> Time <u>9:00am</u>			Received by (Signature) <u>AJS</u>		Date <u>Oct-2023</u> Time <u>09:20</u>		Courier	Waybill No.				
Relinquished by (Signature)			Date			Time			Received by (Signature)						
Date			Time			Date			Time						
Remarks <u>* Filter water samples prior to analysis (0.45um)</u>						Sample Receipt									
						Temp °C					Cooler				
						Custody Seal #									
						Seal Intact Y / N									
Sample Tags					Y / N										

SGS AXYS METHOD MLA-111 Rev 03

Form 1A

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORTCLIENT SAMPLE NO.
HNWWTP-EFFL-EB
Sample Collection:
18-Sep-2023 07:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-3

Matrix: AQUEOUS

Sample Size:

0.0608 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 21:50:27

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 37

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 30

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RATIO	RRT
PFBA	U		13.2 (Q)		
PFPeA	U		6.58 (Q)		
PFHxA	J	7.39	3.29 (Q)	4.20	1.000
PFHpA	U		3.29 (Q)		
PFOA	J	5.04	3.29 (Q)	2.33	
PFNA	U		3.29 (Q)		
PFDA	U		3.29 (Q)		
PFUnA	U		3.29 (Q)		
PFDaA	U		2.63 (Q)		
PFTTrDA	U		3.29 (Q)		
PFTeDA	U		3.29 (Q)		
PFBS	U		3.29 (Q)		
PFPeS	U		3.31 (Q)		
PFHxS	U		3.29 (Q)		
PFHpS	U		3.29 (Q)		
PFOS	U		3.29 (Q)		
PFNS	U		3.29 (Q)		
PFDS	U		3.29 (Q)		
PFDoS	U		3.29 (Q)		
4:2 FTS	U		13.2 (Q)		
6:2 FTS	U		11.9 (Q)		
8:2 FTS	U		11.2 (Q)		
PFOSA	U		3.29 (Q)		
N-MeFOSA	U		3.29 (Q)		
N-EtFOSA	U		9.21 (Q)		
MeFOSAA	U		3.29 (Q)		
EtFOSAA	U		3.29 (Q)		
N-MeFOSE	U		32.9 (Q)		
N-EtFOSE	U		32.9 (Q)		
3:3 FTCA	U		13.2 (Q)		
5:3 FTCA	U		82.2 (Q)		
7:3 FTCA	U		82.2 (Q)		

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 2

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORT

CLIENT SAMPLE NO.

HNWWTP-EFFL-EB

Sample Collection:

18-Sep-2023 07:10

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-3

Matrix: AQUEOUS

Sample Size:

0.0608 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 21:50:27

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 37

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 30

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RATIO	RRT
13C4-PFBA		40.0	27.5	68.7		0.997
13C5-PFPeA		20.0	17.7	88.6		0.854
13C5-PFHxA		10.0	7.91	79.1	11.7	1.000
13C4-PFHpA		10.0	7.59	75.9		0.878
13C8-PFOA		10.0	7.51	75.1		1.000
13C9-PFNA		5.00	4.43	88.6		1.000
13C6-PFDA		5.00	4.08	81.6		1.000
13C7-PFUnA		5.00	3.62	72.4		1.041
13C2-PFDoA		5.00	3.13	62.7		1.078
13C2-PFTeDA	V	5.00	2.01	40.1		1.174
13C3-PFBS		10.0	9.36	93.5	2.63	0.770
13C3-PFHxS		10.0	9.70	96.8	2.41	1.001
13C8-PFOS		10.1	9.82	97.6	2.18	1.000
13C2-4:2 FTS		20.2	18.2	90.2	1.91	0.810
13C2-6:2 FTS		20.0	18.7	93.4	2.04	1.002
13C2-8:2 FTS		20.0	18.4	91.7	3.36	1.261
13C8-PFOA	V	10.0	18.8	188		1.157
D3-N-MeFOSA		10.0	11.3	113		1.340
D5-N-EtFOSA		10.0	10.3	103		1.374
D3-MeFOSAA		20.0	25.7	128		1.298
D5-EtFOSAA		20.0	25.3	126		1.321
d7-NMe-FOSE		100	145	145		1.324
d9-NEt-FOSE		100	136	135		1.359

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 1A

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORTCLIENT SAMPLE NO.
HNWWTP-EFFL
Sample Collection:
19-Sep-2023 07:54

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-6

Matrix: EFFLUENT FINAL

Sample Size:

0.0641 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 22:30:55

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 40

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 30

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RATIO	RRT
PFBA	J	16.3	12.5 (Q)		1.003
PFPeA	J	16.5	6.24 (Q)		1.001
PFHxA	J	9.68	3.12 (Q)	3.95	1.000
PFHpA	U		3.12 (Q)		
PFOA	J	4.54	3.12 (Q)	2.10	
PFNA	U		3.12 (Q)		
PFDA	U		3.12 (Q)		
PFUnA	U		3.12 (Q)		
PFDoA	U		2.50 (Q)		
PFTTrDA	U		3.12 (Q)		
PFTeDA	U		3.12 (Q)		
PFBS	U		3.12 (Q)		
PFPeS	U		3.14 (Q)		
PFHxS	U		3.12 (Q)		
PFHpS	U		3.12 (Q)		
PFOS	U		3.12 (Q)		
PFNS	U		3.12 (Q)		
PFDS	U		3.12 (Q)		
PFDoS	U		3.12 (Q)		
4:2 FTS	U		12.5 (Q)		
6:2 FTS	U		11.3 (Q)		
8:2 FTS	U		10.6 (Q)		
PFOSA	U		3.12 (Q)		
N-MeFOSA	U		3.12 (Q)		
N-EtFOSA	U		8.74 (Q)		
MeFOSAA	U		3.12 (Q)		
EtFOSAA	U		3.12 (Q)		
N-MeFOSE	U		31.2 (Q)		
N-EtFOSE	U		31.2 (Q)		
3:3 FTCA	U		12.5 (Q)		
5:3 FTCA	U		78.1 (Q)		
7:3 FTCA	U		78.1 (Q)		

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 2

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORT

CLIENT SAMPLE NO.

HNWWTP-EFFL

Sample Collection:
19-Sep-2023 07:54

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-6

Matrix: EFFLUENT FINAL

Sample Size:

0.0641 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 22:30:55

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 40

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 30

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RATIO	RRT
13C4-PFBA		40.0	23.4	58.6		1.000
13C5-PFPeA		20.0	17.0	85.1		0.855
13C5-PFHxA		10.0	7.67	76.7	13.2	1.000
13C4-PFHpA		10.0	7.88	78.8		0.879
13C8-PFOA		10.0	7.94	79.4		1.001
13C9-PFNA		5.00	4.25	85.0		1.000
13C6-PFDA		5.00	4.48	89.7		1.000
13C7-PFUnA		5.00	3.95	79.0		1.041
13C2-PFDoA		5.00	3.11	62.3		1.077
13C2-PFTeDA	V	5.00	1.81	36.2		1.173
13C3-PFBS		10.0	9.76	97.4	2.72	0.770
13C3-PFHxS		10.0	9.73	97.2	2.38	1.000
13C8-PFOS		10.1	10.1	100	2.14	1.000
13C2-4:2 FTS		20.2	18.7	92.7	1.89	0.810
13C2-6:2 FTS		20.0	19.6	98.3	2.19	1.002
13C2-8:2 FTS		20.0	18.7	93.3	3.34	1.261
13C8-PFOSA	V	10.0	18.8	188		1.157
D3-N-MeFOSA		10.0	11.4	114		1.340
D5-N-EtFOSA		10.0	10.4	104		1.374
D3-MeFOSAA		20.0	27.6	138		1.298
D5-EtFOSAA		20.0	26.5	132		1.321
d7-NMe-FOSE		100	146	145		1.324
d9-NEt-FOSE		100	139	139		1.359

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 1A

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORTCLIENT SAMPLE NO.
HNWWTP-INFL-EB
Sample Collection:
18-Sep-2023 07:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-9

Matrix: AQUEOUS

Sample Size:

0.0625 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 23:38:46

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 45

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 41

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
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COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RATIO	RRT
PFBA	U		12.8 (Q)		
PFPeA	U		6.40 (Q)		
PFHxA	U		3.20 (Q)		
PFHpA	U		3.20 (Q)		
PFOA	U		3.20 (Q)		
PFNA	U		3.20 (Q)		
PFDA	U		3.20 (Q)		
PFUnA	U		3.20 (Q)		
PFDaA	U		2.56 (Q)		
PFTTrDA	U		3.20 (Q)		
PFTeDA	U		3.20 (Q)		
PFBS	U		3.20 (Q)		
PFPeS	U		3.22 (Q)		
PFHxS	U		3.20 (Q)		
PFHpS	U		3.20 (Q)		
PFOS	U		3.20 (Q)		
PFNS	U		3.20 (Q)		
PFDS	U		3.20 (Q)		
PFDoS	U		3.20 (Q)		
4:2 FTS	U		12.8 (Q)		
6:2 FTS	U		11.5 (Q)		
8:2 FTS	U		10.9 (Q)		
PFOSA	U		3.20 (Q)		
N-MeFOSA	U		3.20 (Q)		
N-EtFOSA	U		8.96 (Q)		
MeFOSAA	U		3.20 (Q)		
EtFOSAA	U		3.20 (Q)		
N-MeFOSE	U		32.0 (Q)		
N-EtFOSE	U		32.0 (Q)		
3:3 FTCA	U		12.8 (Q)		
5:3 FTCA	U		80.0 (Q)		
7:3 FTCA	U		80.0 (Q)		

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Aaron Kyle_____

SGS AXYS METHOD MLA-111 Rev 03

Form 2

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORTCLIENT SAMPLE NO.
HNWWTP-INFL-EB
Sample Collection:
18-Sep-2023 07:30

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-9

Matrix: AQUEOUS

Sample Size:

0.0625 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 23:38:46

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 45

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 41

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RATIO	RRT
13C4-PFBA	V	40.0	14.4	36.0		0.997
13C5-PFPeA		20.0	17.5	87.7		0.855
13C5-PFHxA		10.0	7.84	78.4	12.2	1.000
13C4-PFHpA		10.0	8.01	80.1		0.878
13C8-PFOA		10.0	8.09	80.9		0.999
13C9-PFNA		5.00	4.69	93.8		1.000
13C6-PFDA		5.00	4.11	82.2		1.000
13C7-PFUnA		5.00	3.79	75.9		1.042
13C2-PFDoA		5.00	3.36	67.2		1.077
13C2-PFTeDA	V	5.00	2.17	43.4		1.174
13C3-PFBS		10.0	9.44	94.2	2.61	0.770
13C3-PFHxS		10.0	9.82	98.0	2.35	1.000
13C8-PFOS		10.1	10.0	99.8	2.30	1.000
13C2-4:2 FTS		20.2	18.5	92.0	2.02	0.810
13C2-6:2 FTS		20.0	19.1	95.4	2.16	1.002
13C2-8:2 FTS		20.0	19.0	94.6	3.62	1.261
13C8-PFOA	V	10.0	18.4	184		1.158
D3-N-MeFOSA		10.0	11.0	110		1.340
D5-N-EtFOSA		10.0	9.67	96.7		1.375
D3-MeFOSAA		20.0	25.2	126		1.298
D5-EtFOSAA		20.0	26.0	130		1.320
d7-NMe-FOSE		100	145	145		1.324
d9-NEt-FOSE		100	135	135		1.360

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 1A

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORT

CLIENT SAMPLE NO.

HNWWTP-INFL

Sample Collection:

19-Sep-2023 07:37

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOLULI WWTP

Lab Sample I.D.:

L40347-12

Matrix: INFLUENT

Sample Size: 0.0656 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date: 01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID: LCMS/MS

Analysis Date: 01-Feb-2024 Time: 00:19:14

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC4L_024 S: 48

Injection Volume (uL): 2

Blank Data Filename: FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename: FC4L_024 S: 41

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RATIO	RRT
PFBA	U		12.2 (Q)		
PFPeA	J	8.29	6.10 (Q)		1.001
PFHxA	J	6.58	3.05 (Q)	6.07	1.000
PFHpA	U		3.05 (Q)		
PFOA	J	3.20	3.05 (Q)	2.62	
PFNA	U		3.05 (Q)		
PFDA	U		3.05 (Q)		
PFUnA	U		3.05 (Q)		
PFDoA	U		2.44 (Q)		
PFTTrDA	U		3.05 (Q)		
PFTeDA	U		3.05 (Q)		
PFBS	U		3.05 (Q)		
PFPeS	U		3.06 (Q)		
PFHxS	U		3.05 (Q)		
PFHpS	U		3.05 (Q)		
PFOS	J	3.20	3.05 (Q)	2.30	
PFNS	U		3.05 (Q)		
PFDS	U		3.05 (Q)		
PFDoS	U		3.05 (Q)		
4:2 FTS	U		12.2 (Q)		
6:2 FTS	U		11.0 (Q)		
8:2 FTS	U		10.4 (Q)		
PFOSA	U		3.05 (Q)		
N-MeFOSA	U		3.05 (Q)		
N-EtFOSA	U		8.53 (Q)		
MeFOSAA	U		3.05 (Q)		
EtFOSAA	U		3.05 (Q)		
N-MeFOSE	U		30.5 (Q)		
N-EtFOSE	U		30.5 (Q)		
3:3 FTCA	U		12.2 (Q)		
5:3 FTCA	U		76.2 (Q)		
7:3 FTCA	U		76.2 (Q)		

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; J = concentration less than limit of quantification.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 2

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORT

CLIENT SAMPLE NO.

HNWWTP-INFL

Sample Collection:
19-Sep-2023 07:37

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.: 4066

Project No.

HONOULIULI WWTP

Lab Sample I.D.:

L40347-12

Matrix: INFLUENT

Sample Size: 0.0656 L

Sample Receipt Date: 06-Oct-2023

Initial Calibration Date: 01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID: LCMS/MS

Analysis Date: 01-Feb-2024 Time: 00:19:14

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC4L_024 S: 48

Injection Volume (uL): 2

Blank Data Filename: FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename: FC4L_024 S: 41

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RATIO	RRT
13C4-PFBA		40.0	28.5	71.2		0.997
13C5-PFPeA		20.0	17.1	85.4		0.855
13C5-PFHxA		10.0	7.49	74.9	11.2	1.000
13C4-PFHpA		10.0	7.74	77.4		0.879
13C8-PFOA		10.0	7.81	78.1		1.000
13C9-PFNA		5.00	4.66	93.1		1.000
13C6-PFDA		5.00	4.20	84.0		0.999
13C7-PFUnA		5.00	4.07	81.4		1.041
13C2-PFDoA		5.00	3.68	73.5		1.077
13C2-PFTeDA		5.00	2.51	50.2		1.173
13C3-PFBS		10.0	9.43	94.1	2.63	0.770
13C3-PFHxS		10.0	9.66	96.4	2.26	1.000
13C8-PFOS		10.1	10.3	103	2.22	1.000
13C2-4:2 FTS		20.2	18.7	92.8	1.93	0.810
13C2-6:2 FTS		20.0	19.2	96.1	2.20	1.002
13C2-8:2 FTS		20.0	19.1	95.1	3.60	1.261
13C8-PFOA	V	10.0	19.3	193		1.158
D3-N-MeFOSA		10.0	11.5	115		1.340
D5-N-EtFOSA		10.0	10.6	106		1.375
D3-MeFOSAA		20.0	25.1	125		1.298
D5-EtFOSAA		20.0	25.9	129		1.320
d7-NMe-FOSE	V	100	151	151		1.324
d9-NEt-FOSE		100	141	141		1.360

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 1A

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORT

CLIENT SAMPLE NO.

Lab Blank

Sample Collection:

N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Project No.

N/A

Contract No.: 4066

Lab Sample I.D.:

WG88605-101

Matrix: AQUEOUS

Sample Size:

0.0600 L

Sample Receipt Date: N/A

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 21:09:43

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 34

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 30

Concentration Units: ng/L

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

COMPOUND	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	RATIO	RRT
PFBA	U		13.3 (Q)		
PFPeA	U		6.67 (Q)		
PFHxA	U		3.33 (Q)		
PFHpA	U		3.33 (Q)		
PFOA	U		3.33 (Q)		
PFNA	U		3.33 (Q)		
PFDA	U		3.33 (Q)		
PFUnA	U		3.33 (Q)		
PFDaA	U		2.67 (Q)		
PFTTrDA	U		3.33 (Q)		
PFTeDA	U		3.33 (Q)		
PFBS	U		3.33 (Q)		
PFPeS	U		3.35 (Q)		
PFHxS	U		3.33 (Q)		
PFHpS	U		3.33 (Q)		
PFOS	U		3.33 (Q)		
PFNS	U		3.33 (Q)		
PFDS	U		3.33 (Q)		
PFDoS	U		3.33 (Q)		
4:2 FTS	U		13.3 (Q)		
6:2 FTS	U		12.0 (Q)		
8:2 FTS	U		11.3 (Q)		
PFOSA	U		3.33 (Q)		
N-MeFOSA	U		3.33 (Q)		
N-EtFOSA	U		9.33 (Q)		
MeFOSAA	U		3.33 (Q)		
EtFOSAA	U		3.33 (Q)		
N-MeFOSE	U		33.3 (Q)		
N-EtFOSE	U		33.3 (Q)		
3:3 FTCA	U		13.3 (Q)		
5:3 FTCA	U		83.3 (Q)		
7:3 FTCA	U		83.3 (Q)		

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

(2) Reporting Limit (Code): S = sample detection limit; M = method detection limit; L = lowest calibration level equivalent; Q = minimum reporting level.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Aaron Kyle_____

SGS AXYS METHOD MLA-111 Rev 03

Form 2

TOTAL OXIDIZABLE PRECURSOR - POSTOXIDATION ANALYSIS
REPORT

CLIENT SAMPLE NO.

Lab Blank

Sample Collection:

N/A

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Project No.

N/A

Contract No.: 4066

Lab Sample I.D.:

WG88605-101

Matrix: AQUEOUS

Sample Size:

0.0600 L

Sample Receipt Date: N/A

Initial Calibration Date:

01-Mar-2023

Extraction Date: 29-Jan-2024

Instrument ID:

LCMS/MS

Analysis Date: 31-Jan-2024 Time: 21:09:43

Column ID:

C18

Extract Volume (uL): 4000

Sample Data Filename:

FC4L_024 S: 34

Injection Volume (uL): 2

Blank Data Filename:

FC4L_024 S: 34

Dilution Factor: N/A

Cal. Ver. Data Filename:

FC4L_024 S: 30

Concentration Units: ng absolute

This page is part of a total report that contains information necessary for accreditation compliance.
This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RATIO	RRT
13C4-PFBA	V	40.0	15.1	37.8		1.000
13C5-PFPeA		20.0	16.7	83.4		0.855
13C5-PFHxA		10.0	7.60	76.0	12.4	1.000
13C4-PFHpA		10.0	7.92	79.2		0.879
13C8-PFOA		10.0	8.18	81.8		1.000
13C9-PFNA		5.00	4.53	90.5		1.000
13C6-PFDA		5.00	4.32	86.4		1.000
13C7-PFUnA		5.00	4.10	81.9		1.041
13C2-PFDoA		5.00	3.86	77.2		1.077
13C2-PFTeDA		5.00	2.87	57.5		1.174
13C3-PFBS		10.0	9.34	93.2	2.47	0.770
13C3-PFHxS		10.0	9.91	99.0	2.43	1.000
13C8-PFOS		10.1	10.2	101	2.23	0.999
13C2-4:2 FTS		20.2	18.6	92.1	1.96	0.810
13C2-6:2 FTS		20.0	18.9	94.5	2.22	1.002
13C2-8:2 FTS		20.0	17.5	87.1	3.52	1.261
13C8-PFOA	V	10.0	18.5	185		1.157
D3-N-MeFOSA		10.0	11.2	112		1.340
D5-N-EtFOSA		10.0	10.0	100		1.374
D3-MeFOSAA		20.0	25.5	128		1.298
D5-EtFOSAA		20.0	25.1	126		1.320
d7-NMe-FOSE		100	142	142		1.324
d9-NEt-FOSE		100	133	132		1.359

(1) Where applicable, custom lab flags have been used on this report; V = surrogate recovery is not within method/contract control limits.

(2) R(%) = percent recovery.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG88605-102
Matrix:	AQUEOUS	Initial Calibration Date:	01-Mar-2023
Extraction Date:	29-Jan-2024	Instrument ID:	LCMS/MS
Analysis Date:	31-Jan-2024 Time: 20:42:20	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC4L_024 S: 32
Injection Volume (uL):	2	Blank Data Filename:	FC4L_024 S: 34
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC4L_024 S: 30

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

COMPOUND	LAB FLAG ¹	RATIO	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RRT
PFBA			45.2	52.4	116	1.003
PFPeA			33.3	33.8	102	1.000
PFHxA		4.50	32.1	29.9	93.2	1.000
PFHpA		2.11	28.8	24.8	86.0	1.000
PFOA		2.07	100	114	113	
PFNA		2.60	7.88	7.41	94.1	
PFDA		2.90	5.00	4.73	94.7	1.000
PFUnA		4.12	5.00	5.30	106	1.000
PFDoA		8.35	5.00	4.51	90.3	0.999
PFTTrDA		3.09	5.00	5.51	110	0.956
PFTTeDA		2.58	5.00	4.95	99.0	1.000
PFBS		2.62	5.00	5.25	105	1.000
PFPeS		2.15	4.98	4.99	100	0.868
PFHxS		2.40	5.00	4.89	97.7	
PFHpS		2.03	5.01	5.61	112	0.938
PFOS		2.63	5.42	5.46	101	
PFNS		2.38	5.00	4.61	92.1	1.041
PFDS		2.41	5.00	4.87	97.4	1.079
PFDoS		2.29	5.00	4.07	81.5	1.182
4:2 FTS	U		100		0	
6:2 FTS	U		100		0	
8:2 FTS	U		100		0	
MeFOSAA	U		70.0		0	
EtFOSAA	U		70.0		0	

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-111 Rev 03

Form 8B

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Contract No.:	4066	Lab Sample I.D.:	WG88605-102
Matrix:	AQUEOUS	Initial Calibration Date:	01-Mar-2023
Extraction Date:	29-Jan-2024	Instrument ID:	LCMS/MS
Analysis Date:	31-Jan-2024 Time: 20:42:20	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC4L_024 S: 32
Injection Volume (uL):	2	Blank Data Filename:	FC4L_024 S: 34
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC4L_024 S: 30

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT, BASED ON A 1 mL EXTRACT VOLUME.

LABELLED COMPOUND	LAB FLAG ¹	RATIO	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RRT
13C4-PFBA			40.0	28.4	71.0	1.000
13C5-PFPeA			20.0	16.9	84.7	0.854
13C5-PFHxA		12.2	10.0	7.51	75.1	1.000
13C4-PFHpA			10.0	7.85	78.5	0.879
13C8-PFOA			10.0	7.69	76.9	1.000
13C9-PFNA			5.00	4.70	94.0	1.000
13C6-PFDA			5.00	4.45	89.0	1.000
13C7-PFUnA			5.00	4.13	82.5	1.042
13C2-PFDoA			5.00	4.07	81.3	1.078
13C2-PFTeDA			5.00	3.13	62.6	1.173
13C3-PFBS		2.74	10.0	9.43	94.1	0.770
13C3-PFHxS		2.46	10.0	9.88	98.7	1.000
13C8-PFOS		2.09	10.1	9.99	99.2	1.000
13C2-4:2 FTS		1.80	20.2	18.7	92.9	0.810
13C2-6:2 FTS		2.17	20.0	18.8	93.9	1.002
13C2-8:2 FTS		3.32	20.0	17.7	88.3	1.262
D3-MeFOSAA			20.0	25.2	126	1.299
D5-EtFOSAA			20.0	24.3	122	1.321

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____Aaron Kyle_____

These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested.

SGS AXYS METHOD MLA-111 Rev 03

Form 3A

INITIAL CALIBRATION RELATIVE RESPONSES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC3L_107 S: 16
CS2 Data Filename: FC3L_107 S: 17
CS3 Data Filename: FC3L_107 S: 18
CS4 Data Filename: FC3L_107 S: 19
CS5 Data Filename: FC3L_107 S: 20
CS6 Data Filename: FC3L_107 S: 21
CS7 Data Filename: FC3L_107 S: 22
CS8 Data Filename: FC3L_107 S: 23

COMPOUND	LAB FLAG ¹	RELATIVE RESPONSE (RR)								MEAN RR	CV (%RSD) ²
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7		
PFBA		0.86	0.83	0.85	0.81	0.85	0.82	0.82	0.82	0.83	2.14
PFPeA		1.14	1.11	1.07	0.98	1.07	1.04	1.00	1.00	1.05	5.39
PFHxA		1.33	1.23	1.13	1.03	1.04	1.00	1.01	1.05	1.10	11.0
PFHpA		1.15	1.24	1.20	1.13	1.16	1.11	1.13	1.13	1.16	3.70
PFOA		1.47	1.32	1.34	1.34	1.26	1.29	1.28	1.27	1.32	5.22
PFNA		1.08	1.00	0.99	1.04	0.99	0.99	0.98	0.97	1.01	3.77
PFDA		0.83	0.74	0.70	0.66	0.74	0.67	0.70	0.68	0.71	7.38
PFUnA		0.78	0.76	0.77	0.70	0.75	0.71	0.70	0.70	0.73	4.69
PFDoA		1.18	1.14	1.11	1.12	1.17	1.09	1.07	1.02	1.11	4.78
PFTrDA		0.98	0.92	0.84	0.81	0.83	0.80	0.80	0.75	0.84	8.87
PFTeDA		0.87	0.83	0.77	0.75	0.78	0.76	0.74	0.68	0.77	7.62
PFBS		1.14	1.01	1.05	1.05	1.08	1.04	1.06	1.04	1.06	3.67
PFPeS		1.00	0.92	0.99	0.95	1.01	0.94	0.96	0.91	0.96	3.99
PFHxS		1.37	1.28	1.26	1.14	1.26	1.16	1.19	1.20	1.23	6.14
PFHpS		1.11	1.09	1.00	0.97	1.02	0.99	1.00	0.93	1.01	5.99
PFOS		1.25	1.14	1.12	1.02	1.11	1.17	1.10	1.06	1.12	6.16
PFNS		1.05	1.00	1.02	0.97	1.01	0.96	0.99	0.97	0.99	2.96
PFDS		0.93	0.97	0.92	0.89	0.94	0.93	0.95	0.94	0.94	2.43
PFDoS		0.84	0.82	0.86	0.79	0.86	0.84	0.87	0.87	0.85	3.31
4:2 FTS		0.53	0.50	0.49	0.45	0.49	0.47	0.45	0.42	0.47	7.27
6:2 FTS		0.51	0.46	0.48	0.43	0.46	0.44	0.43	0.40	0.45	7.25
8:2 FTS		0.35	0.30	0.32	0.30	0.32	0.30	0.30	0.25	0.31	9.70
PFOSA		0.97	0.96	0.93	0.89	0.92	0.90	0.90	0.91	0.92	3.33
N-MeFOSA		0.90	1.05	0.93	0.93	0.92	0.96	0.95	0.90	0.94	4.82
N-EtFOSA		1.15	1.14	1.08	1.10	1.18	1.10	1.18	1.13	1.13	3.25
MeFOSAA		0.87	0.93	1.00	0.91	0.94	0.88	0.86		0.91	5.56
EtFOSAA		0.77	0.75	0.68	0.75	0.78	0.73	0.74		0.74	4.16
N-MeFOSE		0.81	0.78	0.77	0.74	0.77	0.76	0.74	0.73	0.76	3.65
N-EtFOSE		1.08	1.03	1.03	0.99	1.04	1.02	1.01	0.98	1.02	3.19
3:3 FTCA		0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.07	8.61
5:3 FTCA		0.18	0.16	0.17	0.17	0.17	0.17	0.18	0.21	0.18	7.83
7:3 FTCA		0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.12	0.10	7.99

(1) Where applicable, custom lab flags have been used on this report.

(2) For contract CV specifications, see SGS AXYS METHOD MLA-111 Rev 03

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-111 Rev 03

Form 3B
INITIAL CALIBRATION RELATIVE RESPONSES

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC3L_107 S: 16
CS2 Data Filename: FC3L_107 S: 17
CS3 Data Filename: FC3L_107 S: 18
CS4 Data Filename: FC3L_107 S: 19
CS5 Data Filename: FC3L_107 S: 20
CS6 Data Filename: FC3L_107 S: 21
CS7 Data Filename: FC3L_107 S: 22
CS8 Data Filename: FC3L_107 S: 23

Labeled Compound	LAB FLAG ¹	RELATIVE RESPONSE (RR)								MEAN RR	CV (%RSD) ²	
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7			CS8
13C4-PFBA			1.07	1.11	1.08	1.05	1.08	1.09	1.09	1.07	1.08	1.60
13C5-PFPeA			0.93	0.95	0.93	0.92	0.94	0.93	0.95	0.90	0.93	1.71
13C5-PFHxA			0.65	0.70	0.66	0.64	0.69	0.66	0.66	0.63	0.66	3.33
13C4-PFHpA			3.41	3.65	3.45	3.36	3.21	3.53	3.36	3.31	3.41	3.96
13C8-PFOA			3.71	3.92	3.85	3.61	3.62	3.81	3.68	3.81	3.75	3.04
13C9-PFNA			1.02	1.04	1.03	1.05	1.06	1.05	1.04	1.02	1.04	1.56
13C6-PFDA			0.99	1.10	1.05	1.02	1.02	1.04	1.00	1.01	1.03	3.30
13C7-PFUnA			1.07	1.14	1.11	1.07	1.10	1.09	1.06	1.04	1.08	3.02
13C2-PFDoA			0.88	0.94	0.91	0.85	0.87	0.90	0.88	0.95	0.90	3.90
13C2-PFTeDA			0.92	0.98	0.98	0.94	0.98	0.96	0.96	1.06	0.97	4.24
13C3-PFBS			1.31	1.40	1.31	1.24	1.37	1.30	1.25	1.08	1.28	7.48
13C3-PFHxS			1.10	1.15	1.12	1.07	1.12	1.11	1.12	1.10	1.11	2.19
13C8-PFOS			1.04	1.03	1.05	1.06	1.05	1.04	0.99	1.05	1.04	1.93
13C2-4:2 FTS			1.22	1.17	1.10	1.15	1.11	1.01	0.95	0.92	1.08	9.94
13C2-6:2 FTS			1.00	1.00	0.94	0.97	0.98	0.93	0.97	1.01	0.98	2.97
13C2-8:2 FTS			1.49	1.45	1.42	1.44	1.43	1.34	1.33	1.40	1.41	3.76
13C8-PFOA			1.72	1.76	1.77	1.72	1.77	1.75	1.73	1.93	1.77	3.87
D3-N-MeFOA			0.24	0.26	0.27	0.26	0.27	0.25	0.25	0.28	0.26	5.17
D5-N-EtFOA			0.25	0.26	0.26	0.25	0.25	0.26	0.24	0.26	0.25	3.36
D3-MeFOA			0.45	0.45	0.46	0.42	0.47	0.50	0.62		0.48	13.6
D5-EtFOA			0.40	0.40	0.39	0.39	0.42	0.43	0.52		0.42	10.7
d7-NMe-FOSE			2.21	2.19	2.26	2.22	2.24	2.17	2.19	2.37	2.23	2.77
d9-Net-FOSE			1.85	1.84	1.90	1.88	1.88	1.83	1.80	1.95	1.87	2.49

(1) Where applicable, custom lab flags have been used on this report.

(2) For contract CV specifications, see SGS AXYS METHOD MLA-111 Rev 03.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

Form 3C
LC MS/MS INITIAL CALIBRATION RATIOS

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC3L_107 S: 16
CS2 Data Filename: FC3L_107 S: 17
CS3 Data Filename: FC3L_107 S: 18
CS4 Data Filename: FC3L_107 S: 19
CS5 Data Filename: FC3L_107 S: 20
CS6 Data Filename: FC3L_107 S: 21
CS7 Data Filename: FC3L_107 S: 22
CS8 Data Filename: FC3L_107 S: 23

COMPOUND	LAB FLAG ¹	RATIOS								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
PFBA										
PFPeA										
PFHxA			5.24	5.95	5.71	5.10	5.29	5.21	5.37	5.23
PFHpA			2.11	2.24	2.38	2.36	2.23	2.23	2.23	2.21
PFOA			2.14	1.90	2.05	2.03	1.95	1.99	2.00	1.99
PFNA			2.97	2.71	2.79	2.82	2.69	2.84	2.83	2.78
PFDA			3.28	3.99	2.90	3.07	3.10	2.98	3.12	3.01
PFUnA			5.66	5.27	4.47	4.61	4.63	4.60	4.49	4.49
PFDoA			7.35	7.43	7.38	7.72	7.38	7.27	7.30	7.39
PFTTrDA			3.39	3.56	3.13	3.19	3.16	3.16	3.17	3.20
PFTeDA			2.56	2.87	2.55	2.81	2.83	2.83	2.78	2.79
PFBS			2.64	2.75	2.72	2.70	2.75	2.74	2.76	2.72
PFPeS			2.35	2.06	2.47	2.30	2.27	2.33	2.37	2.34
PFHxS			2.33	2.29	2.49	2.42	2.61	2.44	2.50	2.45
PFHpS			2.38	2.02	2.09	2.03	2.15	2.08	2.09	2.07
PFOS			2.07	2.49	2.62	2.63	2.60	2.67	2.61	2.60
PFNS			2.39	2.19	2.34	2.41	2.27	2.28	2.24	2.30
PFDS			2.05	2.40	2.30	2.33	2.30	2.30	2.31	2.30
PFDoS			1.86	2.05	2.15	2.13	2.14	2.23	2.18	2.21
4:2 FTS			0.45	0.45	0.45	0.43	0.45	0.45	0.44	0.45
6:2 FTS			0.44	0.42	0.43	0.40	0.41	0.41	0.41	0.42
8:2 FTS			0.55	0.48	0.51	0.53	0.52	0.53	0.53	0.54
PFOSA										
N-MeFOSA			0.48	0.60	0.52	0.53	0.53	0.53	0.54	0.53
N-EtFOSA			0.49	0.53	0.49	0.51	0.52	0.53	0.54	0.53
MeFOSAA			1.36	2.00	2.51	2.02	1.92	1.89	1.91	
EtFOSAA			1.43	1.05	1.05	1.25	1.14	1.12	1.15	
N-MeFOSE										
N-EtFOSE										
3:3 FTCA			1.60	1.42	1.60	1.50	1.59	1.60	1.57	1.60
5:3 FTCA			1.37	1.31	1.40	1.40	1.39	1.40	1.41	1.41
7:3 FTCA			0.62	0.67	0.65	0.68	0.66	0.64	0.66	0.66

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-111 Rev 03

Form 3D
LC MS/MS INITIAL CALIBRATION RATIOS

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

Instrument ID: LC MS/MS

LC Column ID: C18

CS0 Data Filename: N/A
CS1 Data Filename: FC3L_107 S: 16
CS2 Data Filename: FC3L_107 S: 17
CS3 Data Filename: FC3L_107 S: 18
CS4 Data Filename: FC3L_107 S: 19
CS5 Data Filename: FC3L_107 S: 20
CS6 Data Filename: FC3L_107 S: 21
CS7 Data Filename: FC3L_107 S: 22
CS8 Data Filename: FC3L_107 S: 23

LABELED COMPOUND	LAB FLAG ¹	RATIOS								
		CS0	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8
13C4-PFBA										
13C5-PFPeA										
13C5-PFHxA			14.8	14.6	14.9	13.9	14.9	15.4	16.1	14.7
13C4-PFHpA										
13C8-PFOA										
13C9-PFNA										
13C6-PFDA										
13C7-PFUnA										
13C2-PFDoA										
13C2-PFTeDA										
13C3-PFBS			2.83	2.71	2.68	2.63	2.82	2.82	2.70	2.77
13C3-PFHxS			2.45	2.41	2.44	2.36	2.39	2.49	2.50	2.50
13C8-PFOS			2.24	2.18	2.09	2.25	2.16	2.28	2.19	2.17
13C2-4:2 FTS			1.85	1.81	1.78	1.77	1.74	1.51	1.22	0.55
13C2-6:2 FTS			2.22	2.19	2.07	2.13	2.03	1.83	1.52	0.74
13C2-8:2 FTS			3.37	3.31	3.31	3.25	3.06	2.99	2.34	1.27
13C8-PFOA										
D3-N-MeFOSA										
D5-N-EtFOSA										
D3-MeFOSAA										
D5-EtFOSAA										
d7-NMe-FOSE										
d9-NEt-FOSE										

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Jordan Berends _____

SGS AXYS METHOD MLA-111 Rev 03

Form 4A

LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

VER Data Filename: FC4L_024 S: 30

Instrument ID: LCMS/MS

Analysis Date: 31-Jan-2024

LC Column ID: C18

Analysis Time: 20:14:41

COMPOUND	LAB FLAG ¹	RRT	QUANT TRANSITION	RATIO	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1.003	213 > 169		20.0	21.2	106
PFPeA		1.000	263 > 219		10.0	9.99	99.9
PFHxA		1.000	313 > 269	4.33	5.00	5.08	102
PFHpA		1.000	363 > 319	2.11	5.00	5.51	110
PFOA		1.000	413 > 369	2.12	5.00	5.67	113
PFNA		1.000	463 > 419	2.80	5.00	5.35	107
PFDA		1.000	513 > 469	2.82	5.00	4.78	95.6
PFUnA		1.000	563 > 519	4.21	5.00	5.18	104
PFDoA		1.000	613 > 569	7.97	4.06	4.51	111
PFTTrDA		0.956	663 > 619	3.03	5.00	5.37	107
PFTTeDA		1.000	713 > 669	2.80	5.00	5.43	109
PFBS		1.000	299 > 80	2.58	5.00	4.81	96.2
PFPeS		0.868	349 > 80	2.31	5.00	5.58	112
PFHxS		1.000	399 > 80	2.38	5.00	4.96	99.3
PFHpS		0.938	449 > 80	2.04	5.00	5.41	108
PFOS		1.000	499 > 80	2.44	5.00	4.85	97.1
PFNS		1.040	549 > 80	2.42	5.00	4.83	96.7
PFDS		1.079	599 > 80	2.47	5.00	5.28	106
PFDoS		1.182	699 > 80	2.23	5.00	4.67	93.3
4:2 FTS		0.999	327 > 307	0.41	20.0	20.4	102
6:2 FTS		0.999	427 > 407	0.39	18.0	19.1	107
8:2 FTS		1.000	527 > 507	0.56	17.0	17.9	105
PFOSA		1.000	498 > 78		5.00	5.57	111
N-MeFOSA		1.000	512 > 219	0.53	5.00	5.67	113
N-EtFOSA		1.001	526 > 219	0.51	14.0	14.9	107
MeFOSAA		1.000	570 > 419	2.04	5.00	5.04	101
EtFOSAA		1.001	584 > 419	1.17	5.00	5.11	102
N-MeFOSE		1.002	616 > 59		50.0	53.2	106
N-EtFOSE		1.002	630 > 59		50.0	52.0	104
3:3 FTCA			241 > 177	1.55	20.0	17.5	87.5
5:3 FTCA		1.062	341 > 237	1.45	125	140	112
7:3 FTCA		1.399	441 > 317	0.64	125	121	97.0

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 4B

LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

VER Data Filename: FC4L_024 S: 30

Instrument ID: LCMS/MS

Analysis Date: 31-Jan-2024

LC Column ID: C18

Analysis Time: 20:14:41

LABELED COMPOUND	LAB FLAG ¹	RRT	QUANT TRANSITION	RATIO	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		1.000	217 > 172		40.0	37.8	94.6
13C5-PFPeA		0.856	268 > 223		20.0	21.0	105
13C5-PFHxA		1.000	318 > 273	11.8	10.0	8.95	89.5
13C4-PFHpA		0.878	367 > 322		10.0	9.92	99.2
13C8-PFOA		1.000	421 > 376		10.0	9.64	96.4
13C9-PFNA		1.000	472 > 427		5.00	5.22	104
13C6-PFDA		0.999	519 > 474		5.00	4.89	97.9
13C7-PFUnA		1.041	570 > 525		5.00	4.60	92.1
13C2-PFDoA		1.076	615 > 570		5.00	4.51	90.2
13C2-PFTeDA		1.172	715 > 670		5.00	3.84	76.8
13C3-PFBS		0.770	302 > 80	2.56	10.0	10.4	104
13C3-PFHxS		1.000	402 > 80	2.39	10.0	9.99	99.7
13C8-PFOS		1.000	507 > 80	2.15	10.1	10.9	108
13C2-4:2 FTS		0.811	329 > 81	1.83	20.2	21.1	104
13C2-6:2 FTS		1.002	429 > 81	2.15	20.0	20.3	101
13C2-8:2 FTS		1.262	529 > 81	3.41	20.0	19.4	96.6
13C8-PFOSA		1.157	506 > 78		10.0	16.9	169
D3-N-MeFOSA		1.340	515 > 219		10.0	9.97	99.7
D5-N-EtFOSA		1.374	531 > 219		10.0	9.14	91.4
D3-MeFOSAA		1.299	573 > 419		20.0	26.2	131
D5-EtFOSAA		1.321	589 > 419		20.0	27.2	136
d7-NMe-FOSE		1.324	623 > 59		100	120	119
d9-NEt-FOSE		1.359	639 > 59		100	107	107

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 4A

LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

VER Data Filename: FC4L_024 S: 41

Instrument ID: LCMS/MS

Analysis Date: 31-Jan-2024

LC Column ID: C18

Analysis Time: 22:44:25

COMPOUND	LAB FLAG ¹	RRT	QUANT TRANSITION	RATIO	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
PFBA		1.003	213 > 169		20.0	21.3	107
PFPeA		1.000	263 > 219		10.0	9.94	99.4
PFHxA		1.000	313 > 269	4.19	5.00	4.90	98.0
PFHpA		1.000	363 > 319	2.14	5.00	5.27	105
PFOA		1.000	413 > 369	2.06	5.00	5.48	110
PFNA		1.000	463 > 419	2.78	5.00	5.39	108
PFDA		1.000	513 > 469	2.88	5.00	5.33	107
PFUnA		1.001	563 > 519	4.14	5.00	5.19	104
PFDoA		1.000	613 > 569	8.12	4.06	4.41	109
PFTTrDA		0.955	663 > 619	2.90	5.00	5.21	104
PFTTeDA		1.000	713 > 669	2.55	5.00	5.03	101
PFBS		1.000	299 > 80	2.61	5.00	5.03	101
PFPeS		0.868	349 > 80	2.29	5.00	5.54	111
PFHxS		1.001	399 > 80	2.37	5.00	5.02	100
PFHpS		0.938	449 > 80	2.24	5.00	5.63	113
PFOS		1.000	499 > 80	2.65	5.00	5.05	101
PFNS		1.041	549 > 80	2.33	5.00	4.79	95.8
PFDS		1.079	599 > 80	2.30	5.00	4.98	99.6
PFDoS		1.183	699 > 80	2.22	5.00	4.51	90.1
4:2 FTS		1.000	327 > 307	0.43	20.0	21.0	105
6:2 FTS		1.001	427 > 407	0.39	18.0	18.8	105
8:2 FTS		1.000	527 > 507	0.55	17.0	18.3	108
PFOSA		1.001	498 > 78		5.00	5.63	113
N-MeFOSA		1.000	512 > 219	0.53	5.00	5.70	114
N-EtFOSA		1.001	526 > 219	0.51	14.0	15.5	110
MeFOSAA		1.000	570 > 419	1.90	5.00	4.58	91.6
EtFOSAA		1.001	584 > 419	1.16	5.00	4.99	99.8
N-MeFOSE		1.002	616 > 59		50.0	53.4	107
N-EtFOSE		1.002	630 > 59		50.0	53.7	107
3:3 FTCA			241 > 177	1.71	20.0	18.2	90.9
5:3 FTCA		1.063	341 > 237	1.45	125	139	111
7:3 FTCA		1.401	441 > 317	0.64	125	119	95.3

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

SGS AXYS METHOD MLA-111 Rev 03

Form 4B

LC MS/MS CALIBRATION VERIFICATION

SGS AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811

Initial Calibration Date: 01-Mar-2023

VER Data Filename: FC4L_024 S: 41

Instrument ID: LCMS/MS

Analysis Date: 31-Jan-2024

LC Column ID: C18

Analysis Time: 22:44:25

LABELED COMPOUND	LAB FLAG ¹	RRT	QUANT TRANSITION	RATIO	EXPECTED CONC. (ng)	CONC. FOUND (ng)	RECOVERY (%)
13C4-PFBA		0.997	217 > 172		40.0	37.7	94.2
13C5-PFPeA		0.856	268 > 223		20.0	20.7	104
13C5-PFHxA		1.000	318 > 273	11.5	10.0	9.20	92.0
13C4-PFHpA		0.878	367 > 322		10.0	10.0	100
13C8-PFOA		0.999	421 > 376		10.0	9.57	95.7
13C9-PFNA		1.000	472 > 427		5.00	5.30	106
13C6-PFDA		1.000	519 > 474		5.00	4.67	93.4
13C7-PFUnA		1.041	570 > 525		5.00	4.62	92.4
13C2-PFDoA		1.078	615 > 570		5.00	4.70	94.0
13C2-PFTeDA		1.174	715 > 670		5.00	4.01	80.2
13C3-PFBS		0.770	302 > 80	2.62	10.0	10.6	106
13C3-PFHxS		1.000	402 > 80	2.48	10.0	10.4	104
13C8-PFOS		1.000	507 > 80	2.23	10.1	10.6	106
13C2-4:2 FTS		0.810	329 > 81	1.72	20.2	20.2	100
13C2-6:2 FTS		1.001	429 > 81	2.07	20.0	21.0	105
13C2-8:2 FTS		1.261	529 > 81	3.25	20.0	19.5	97.3
13C8-PFOA		1.157	506 > 78		10.0	16.3	163
D3-N-MeFOSA		1.340	515 > 219		10.0	9.86	98.6
D5-N-EtFOSA		1.374	531 > 219		10.0	8.89	88.9
D3-MeFOSAA		1.298	573 > 419		20.0	28.6	143
D5-EtFOSAA		1.320	589 > 419		20.0	28.6	143
d7-NMe-FOSE		1.324	623 > 59		100	116	116
d9-NEt-FOSE		1.359	639 > 59		100	105	105

(1) Where applicable, custom lab flags have been used on this report.

These data are validated and reported as accurate and in accord with SGS AXYS Analytical Services Ltd. ISO17025 compliant quality assurance processes.

Signed: _____ Aaron Kyle _____

Accreditation Scope

SGS AXYS Analytical Services Ltd.
file ref.: ACC-103 Rev. 70

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum	Solids	Tissue and Tissue Flora	Urine	Water	Water, Non-Potable
				CALA	Alaska DEC ANAB DoD ** ANAB ISO 17025	ANAB DoD ** ANAB ISO 17025			
					CALA California WB Florida DOH Maine DOH Minnesota DOH New Jersey DEP New York DOH Virginia DGS Washington DE				
						ANAB DoD ** ANAB ISO 17025			
						CALA Florida DOH Minnesota DOH New Jersey DEP Virginia DGS			
				CALA			CALA		
								CALA	
								Alaska DEC ANAB DoD **	
								ANAB ISO 17025 California WB Florida DOH Maine DOH Minnesota DOH New Jersey DEP New York DOH Pennsylvania DEP Virginia DGS Washington DE *	
								ANAB DoD **	
								ANAB ISO 17025	AFFF

ANAB DoD ANSI National Accreditation Board, certificate ADE-1861, (US DoD QSM 5.3 and 5.4 Standard)



CALA Canadian Association for Laboratory Accreditation Inc., Lab ID A2637, (ISO/IEC 17025:2017 Standard)

