

SGS

AXYS

2045 Mills Road West

TEL: (250) 655-5800

Sidney, BC, Canada V8L5X2

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:	WG88061	Date:	13-Dec-2023
Analysis Type:	Polybrominated Diphenylether	Matrix Type:	Solid
BATCH MAKEUP			
Contract:	4066	Blank:	WG88061-101
Samples:			
L40286-1	KULA ASH #1	Reference or Spike:	WG88061-102
		Duplicate:	
Comments: 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. The temperature of the sample upon receipt was 6°C, exceeding the method requirement of ≤4°C. This is judged not to significantly impact the data accuracy and the analysis was allowed to proceed.			

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February 2017

FQA-006 Rev. 4. 20-Sep-2013

SGS-AXYS LABORATORY CHAIN-OF-CUSTODY RECORD

Client Name/Account #: TetraTech, Inc.

Address: 737 Bishop St., Suite 2000

City/State/Zip: Honolulu, HI 96813

Project Manager: Eric Jensen (eric.jensen@tetrattech.com)

Telephone Number: 808.225.7084

Fax No.: NA

Sampler Name: (Print) Roger Brewer, DOH

Sampler Signature: Roger Brewer, DOH



TETRA TECH

4066

Report To: Eric Jensen

Invoice To: Eric Jensen

Project ID: DOH Maui Wildfire Ash Sample - KULA

Project #: 103S864023138

[illegible]

SGS AXYS METHOD MLA-033 Rev 06

Form 1A

BROMINATED DIPHENYLETHER CONGENER ANALYSIS REPORT

CLIENT SAMPLE NO.

KULA ASH #1

Sample Collection:

21-Sep-2023 17:00

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.

DOH MAUI WILDFIRE - KULA
ASH

Lab Sample I.D.:

L40286-1 i

Matrix: SOLID

Sample Size:

9.70 g (dry)

Sample Receipt Date: 29-Sep-2023

Initial Calibration Date:

09-Aug-2023

Extraction Date: 07-Dec-2023

Instrument ID:

HR GC/MS

Analysis Date: 13-Dec-2023 Time: 00:27:58

GC Column ID:

DB5HT

Extract Volume (uL): 50

Sample Data Filename:

BE31_198 S: 6

Injection Volume (uL): 1.0

Blank Data Filename:

BE31_197 S: 5

Dilution Factor: N/A

Cal. Ver. Data Filename:

BE31_198 S: 1

Concentration Units: pg/g (dry weight basis)

% Moisture:

3.24

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	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	ION ABUND. RATIO	RRT
2,4-DiBDE	7			54.6	0.103 (Q)	0.53	0.936
2,4'-DiBDE	8	8 + 11		114	0.103 (Q)	0.52	0.961
2,6-DiBDE	10		J	3.57	0.103 (Q)	0.55	0.877
3,3'-DiBDE	11	8 + 11					
3,4-DiBDE	12	12 + 13		114	0.103 (Q)	0.52	0.980
3,4'-DiBDE	13	12 + 13					
4,4'-DiBDE	15			44.6	0.103 (Q)	0.53	1.001
2,2',4-TriBDE	17	17 + 25		305	0.967 (S)	0.97	0.975
2,3',4-TriBDE	25	17 + 25					
2,4,4'-TriBDE	28	28 + 33		229	0.805 (S)	1.01	1.001
2,4,6-TriBDE	30		J	3.74	1.09 (S)	1.04	0.905
2,4',6-TriBDE	32			32.3	0.836 (S)	1.00	0.958
2',3,4-TriBDE	33	28 + 33					
3,3',4-TriBDE	35			77.5	0.602 (S)	1.05	1.016
3,4,4'-TriBDE	37			65.8	0.550 (S)	1.01	1.035
2,2',4,4'-TeBDE	47			602	0.103 (Q)	0.69	1.001
2,2',4,5'-TeBDE	49			582	0.103 (Q)	0.69	0.977
2,2',4,6'-TeBDE	51			308	0.103 (Q)	0.68	0.971
2,3',4,4'-TeBDE	66			382	0.103 (Q)	0.70	1.020
2,3',4',6-TeBDE	71			212	0.103 (Q)	0.70	0.982
2,4,4',6-TeBDE	75			83.5	0.103 (Q)	0.68	0.966
3,3',4,4'-TeBDE	77			51.1	0.103 (Q)	0.72	1.001
3,3',4,5'-TeBDE	79			70.0	0.103 (Q)	0.62	1.012
2,2',3,4,4'-PeBDE	85			157	0.390 (S)	1.02	0.993
2,2',4,4',5-PeBDE	99			963	0.306 (S)	1.04	1.001
2,2',4,4',6-PeBDE	100			638	0.218 (S)	1.03	1.001
2,3,3',4,4'-PeBDE	105			103	0.495 (S)	1.06	1.008

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COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	ION ABUND. RATIO	RRT
2,3,4,5,6-PeBDE	116			73.6	0.771 (S)	1.01	1.009
2,3',4,4',6-PeBDE	119	119 + 120		460	0.446 (S)	1.05	1.010
2,3',4,5,5'-PeBDE	120	119 + 120					
3,3',4,4',5-PeBDE	126			41.4	0.246 (S)	1.03	1.000
2,2',3,3',4,4'-HxBDE	128		R	403	4.68 (S)	0.86	1.085
2,2',3,4,4',5'-HxBDE	138	138 + 166	G	337	40.0 (S)	0.78	1.042
2,2',3,4,4',6'-HxBDE	140			628	24.3 (S)	0.76	1.021
2,2',4,4',5,5'-HxBDE	153			786	27.5 (S)	0.77	1.000
2,2',4,4',5,6'-HxBDE	154			1580	19.2 (S)	0.69	1.000
2,2',4,4',6,6'-HxBDE	155			436	17.6 (S)	0.76	0.983
2,3,4,4',5,6-HxBDE	166	138 + 166					
2,2',3,4,4',5,6-HpBDE	181		U		2.91 (S)		
2,2',3,4,4',5,6-HpBDE	183			4260	1.65 (S)	1.02	1.000
2,3,3',4,4',5,6-HpBDE	190		U		5.28 (S)		
2,2',3,4,4',5,5',6-ObBDE	203			3380	4.70 (S)	0.82	1.011
2,2',3,3',4,4',5,5',6-NoBDE	206		MAX	4780	5.41 (S)	1.04	1.109
2,2',3,3',4,4',5,6,6'-NoBDE	207		MAX	17800	7.67 (S)	1.02	1.094
2,2',3,3',4,5,5',6,6'-NoBDE	208		MAX	10000	7.89 (S)	1.03	1.087
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			112000	6.97 (S)	0.85	1.000

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; R = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration; J = concentration less than limit of quantification; G = lock mass interference present; MAX = concentration is an estimated maximum value.

(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: _____ Jason MacKenzie _____

For Axys Internal Use Only [XSL Template: Form16141A.xsl; Created: 13-Dec-2023 14:22:14; Application: XMLTransformer-1.18.46; Report Filename: 1614_PBDPE_1614LS_L40286-1_Form1A_BE31_198S6_SJ3357750.html; Workgroup: WG88061; Design ID: 5275]

BROMINATED DIPHENYLETHER ANALYSIS REPORT

SGS AXYS ANALYTICAL SERVICES

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

Contract No.: 4066
Matrix: SOLID
Sample Receipt Date: 29-Sep-2023
Extraction Date: 07-Dec-2023
Analysis Date: 13-Dec-2023 Time: 00:27:58
Extract Volume (uL): 50
Injection Volume (uL): 1.0
Dilution Factor: N/A
Concentration Units: pg absolute

Project No. DOH MAUI WILDFIRE - KULA ASH
Lab Sample I.D.: L40286-1 i
Sample Size: 9.70 g (dry)
Initial Calibration Date: 09-Aug-2023
Instrument ID: HR GC/MS
GC Column ID: DB5HT
Sample Data Filename: BE31_198 S: 6
Blank Data Filename: BE31_197 S: 5
Cal. Ver. Data Filename: BE31_198 S: 1
% Moisture: 3.24

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This test is not NELAP accredited. Sample results relate only to the sample tested.

LABELLED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	SPIKE CONC.	CONC. FOUND	R(%) ³	ION ABUND. RATIO	RRT
13C12-4,4'-DiBDE	15L			2000	1550	77.5	0.52	0.690
13C12-2,4,4'-TriBDE	28L			2000	1830	91.5	1.01	0.844
13C12-2,2',4,4'-TeBDE	47L			2000	1600	80.0	1.53	0.989
13C12-3,3',4,4'-TeBDE	77L			2000	1800	90.2	1.57	1.039
13C12-2,2',4,4',5-PeBDE	99L			2000	2350	117	1.07	1.123
13C12-2,2',4,4',6-PeBDE	100L			2000	2200	110	1.06	1.094
13C12-3,3',4,4',5-PeBDE	126L			2000	1630	81.6	1.04	1.184
13C12-2,2',4,4',5,5'-HxBDE	153L			2000	1200	59.8	1.38	0.886
13C12-2,2',4,4',5,6'-HxBDE	154L			2000	1190	59.5	1.39	0.858
13C12-2,2',3,4,4',5,6'-HpBDE	183L			2000	1120	55.8	0.99	0.968
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			2000	1890	94.5	0.85	1.060
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			20000	20500	102	1.30	1.080

CLEANUP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			2000	1160	58.1	1.38	1.012
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- (1) Suffix "L" indicates labeled compound.
(2) Where applicable, custom lab flags have been used on this report.
(3) R% = percent recovery of labeled compounds.

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

Signed: _____Jason MacKenzie_____

SGS AXYS METHOD MLA-033 Rev 06

Form 1A

CLIENT SAMPLE NO.
Lab Blank
Sample Collection:
N/A

BROMINATED DIPHENYLETHER CONGENER ANALYSIS REPORT

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. N/A

Lab Sample I.D.: WG88061-101

Matrix: SOLID

Sample Size: 10.0 g

Sample Receipt Date: N/A

Initial Calibration Date: 09-Aug-2023

Extraction Date: 07-Dec-2023

Instrument ID: HR GC/MS

Analysis Date: 11-Dec-2023 Time: 13:26:13

GC Column ID: DB5HT

Extract Volume (uL): 50

Sample Data Filename: BE31_197 S: 5

Injection Volume (uL): 1.0

Blank Data Filename: BE31_197 S: 5

Dilution Factor: N/A

Cal. Ver. Data Filename: BE31_197 S: 1

Concentration Units: pg/g

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COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	ION ABUND. RATIO	RRT
2,4-DiBDE	7		U		0.100 (Q)		
2,4'-DiBDE	8	8 + 11	U		0.100 (Q)		
2,6-DiBDE	10		U		0.100 (Q)		
3,3'-DiBDE	11	8 + 11					
3,4-DiBDE	12	12 + 13	U		0.100 (Q)		
3,4'-DiBDE	13	12 + 13					
4,4'-DiBDE	15		U		0.100 (Q)		
2,2',4-TriBDE	17	17 + 25	J	0.105	0.100 (Q)	1.10	0.975
2,3',4-TriBDE	25	17 + 25					
2,4,4'-TriBDE	28	28 + 33	U		0.100 (Q)		
2,4,6-TriBDE	30		U		0.111 (S)		
2,4',6-TriBDE	32		U		0.100 (Q)		
2',3,4-TriBDE	33	28 + 33					
3,3',4-TriBDE	35		U		0.100 (Q)		
3,4,4'-TriBDE	37		U		0.100 (Q)		
2,2',4,4'-TeBDE	47		J	1.20	0.100 (Q)	0.65	1.001
2,2',4,5'-TeBDE	49		J	0.160	0.100 (Q)	0.71	0.977
2,2',4,6'-TeBDE	51		U		0.100 (Q)		
2,3',4,4'-TeBDE	66		R J	0.123	0.100 (Q)	0.31	1.019
2,3',4',6-TeBDE	71		U		0.100 (Q)		
2,4,4',6-TeBDE	75		U		0.100 (Q)		
3,3',4,4'-TeBDE	77		U		0.100 (Q)		
3,3',4,5'-TeBDE	79		U		0.100 (Q)		
2,2',3,4,4'-PeBDE	85		U		0.100 (Q)		
2,2',4,4',5-PeBDE	99		J	0.601	0.100 (Q)	0.99	1.000
2,2',4,4',6-PeBDE	100		R J	0.143	0.100 (Q)	1.33	1.001
2,3,3',4,4'-PeBDE	105		U		0.100 (Q)		

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	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT (RL) ²	ION ABUND. RATIO	RRT
2,3,4,5,6-PeBDE	116		U		0.100 (Q)		
2,3',4,4',6-PeBDE	119	119 + 120	U		0.100 (Q)		
2,3',4,5,5'-PeBDE	120	119 + 120					
3,3',4,4',5-PeBDE	126		U		0.100 (Q)		
2,2',3,3',4,4'-HxBDE	128		U		0.216 (S)		
2,2',3,4,4',5'-HxBDE	138	138 + 166	U		0.135 (S)		
2,2',3,4,4',6'-HxBDE	140		U		0.100 (Q)		
2,2',4,4',5,5'-HxBDE	153		R J	0.105	0.101 (S)	0.36	1.000
2,2',4,4',5,6'-HxBDE	154		U		0.100 (Q)		
2,2',4,4',6,6'-HxBDE	155		U		0.100 (Q)		
2,3,4,4',5,6-HxBDE	166	138 + 166					
2,2',3,4,4',5,6-HpBDE	181		U		0.260 (S)		
2,2',3,4,4',5',6-HpBDE	183		U		0.148 (S)		
2,3,3',4,4',5,6-HpBDE	190		U		0.419 (S)		
2,2',3,4,4',5,5',6-OcBDE	203		U		0.263 (S)		
2,2',3,3',4,4',5,5',6-NoBDE	206		U		1.51 (S)		
2,2',3,3',4,4',5,6,6'-NoBDE	207		U		1.20 (S)		
2,2',3,3',4,5,5',6,6'-NoBDE	208		U		2.70 (S)		
2,2',3,3',4,4',5,5',6,6'-DeBDE	209		U		15.0 (S)		

(1) Where applicable, custom lab flags have been used on this report; U = not detected at RL; R = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration; 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: _____ Jason MacKenzie _____

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BROMINATED DIPHENYLETHER ANALYSIS REPORT

SGS AXYS ANALYTICAL SERVICES

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

Contract No.: 4066
Matrix: SOLID
Sample Receipt Date: N/A
Extraction Date: 07-Dec-2023
Analysis Date: 11-Dec-2023 Time: 13:26:13
Extract Volume (uL): 50
Injection Volume (uL): 1.0
Dilution Factor: N/A
Concentration Units: pg absolute

Project No. N/A
Lab Sample I.D.: WG88061-101
Sample Size: 10.0 g
Initial Calibration Date: 09-Aug-2023
Instrument ID: HR GC/MS
GC Column ID: DB5HT
Sample Data Filename: BE31_197 S: 5
Blank Data Filename: BE31_197 S: 5
Cal. Ver. Data Filename: BE31_197 S: 1

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.

LABELLED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	SPIKE CONC.	CONC. FOUND	R(%) ³	ION ABUND. RATIO	RRT
13C12-4,4'-DiBDE	15L			2000	1620	80.8	0.50	0.690
13C12-2,4,4'-TriBDE	28L			2000	1660	83.1	0.97	0.844
13C12-2,2',4,4'-TeBDE	47L			2000	1500	75.0	1.53	0.989
13C12-3,3',4,4'-TeBDE	77L			2000	1660	83.1	1.54	1.038
13C12-2,2',4,4',5-PeBDE	99L			2000	2330	116	1.06	1.123
13C12-2,2',4,4',6-PeBDE	100L			2000	2210	110	1.05	1.093
13C12-3,3',4,4',5-PeBDE	126L			2000	1790	89.5	1.03	1.184
13C12-2,2',4,4',5,5'-HxBDE	153L			2000	1500	75.2	1.45	0.887
13C12-2,2',4,4',5,6'-HxBDE	154L			2000	1390	69.7	1.37	0.859
13C12-2,2',3,4,4',5,6'-HpBDE	183L			2000	1240	62.0	1.05	0.968
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			2000	1940	97.2	0.84	1.061
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			20000	14600	73.1	1.28	1.080
CLEANUP STANDARD								
13C12-2,2',3,4,4',6-HxBDE	139L			2000	1380	69.1	1.41	1.012

- (1) Suffix "L" indicates labeled compound.
- (2) Where applicable, custom lab flags have been used on this report.
- (3) R% = percent recovery of labeled compounds.

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

Signed: _____Jason MacKenzie_____

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Report Filename: 1614_PBDPE_1614LS_WG88061-101_Form2_BE31_197S5_SJ3357211.html; Workgroup: WG88061; Design ID: 5275]

BROMINATED DIPHENYLETHER 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.:	WG88061-102
Matrix:	SOLID	Initial Calibration Date:	09-Aug-2023
Extraction Date:	07-Dec-2023	Instrument ID:	HR GC/MS
Analysis Date:	11-Dec-2023 Time: 10:30:17	GC Column ID:	DB5HT
Extract Volume (uL):	50	OPR Data Filename:	BE31_197 S: 2
Injection Volume (uL):	1.0	Blank Data Filename:	BE31_197 S: 5
Dilution Factor:	N/A	Cal. Ver. Data Filename:	BE31_197 S: 1

CONCENTRATIONS REPORTED ARE CONCENTRATIONS IN EXTRACT, BASED ON A 20 uL EXTRACT VOLUME.

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	ION ABUND. RATIO	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	OPR CONC. LIMITS ² (ng/mL)	% RECOVERY
2,4,4'-TriBDE	28	28 + 33		1.05	97.4	91.4	48.7 - 146	93.9
2',3,4'-TriBDE	33	28 + 33						
2,2',4,4'-TeBDE	47			0.70	50.0	53.5	25.0 - 75.0	107
2,2',4,4',5-PeBDE	99			1.05	50.0	52.4	25.0 - 75.0	105
2,2',4,4',6-PeBDE	100			1.05	50.0	50.8	25.0 - 75.0	102
2,2',4,4',5,5'-HxBDE	153			0.76	50.0	51.7	25.0 - 75.0	103
2,2',4,4',5,6'-HxBDE	154			0.75	50.0	50.5	25.0 - 75.0	101
2,2',3,4,4',5,6'-HpBDE	183			1.00	50.0	48.8	25.0 - 75.0	97.5
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			0.90	500	505	250 - 750	101

(1) Where applicable, custom lab flags have been used on this report.
(2) Contract-required limits for OPR as specified in Table 6, Method 1614.

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

Signed: _____Jason MacKenzie_____

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.

BROMINATED DIPHENYLETHER 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.:	WG88061-102
Matrix:	SOLID	Initial Calibration Date:	09-Aug-2023
Extraction Date:	07-Dec-2023	Instrument ID:	HR GC/MS
Analysis Date:	11-Dec-2023 Time: 10:30:17	GC Column ID:	DB5HT
Extract Volume (uL):	50	OPR Data Filename:	BE31_197 S: 2
Injection Volume (uL):	1.0	Blank Data Filename:	BE31_197 S: 5
Dilution Factor:	N/A	Cal. Ver. Data Filename:	BE31_197 S: 1

CONCENTRATIONS REPORTED ARE CONCENTRATIONS IN EXTRACT, BASED ON A 20 uL EXTRACT VOLUME.

LABELLED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	ION ABUND. RATIO	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	OPR CONC. LIMITS ³ (ng/mL)	% RECOVERY
13C12-4,4'-DiBDE	15L			0.51	100	77.9	30.0 - 200	77.9
13C12-2,4,4'-TriBDE	28L			0.99	100	81.7	30.0 - 200	81.7
13C12-2,2',4,4'-TeBDE	47L			1.51	100	74.7	30.0 - 200	74.7
13C12-3,3',4,4'-TeBDE	77L			1.54	100	85.6	30.0 - 200	85.6
13C12-2,2',4,4',5-PeBDE	99L			1.02	100	114	30.0 - 200	114
13C12-2,2',4,4',6-PeBDE	100L			1.06	100	107	30.0 - 200	107
13C12-3,3',4,4',5-PeBDE	126L			1.04	100	92.9	30.0 - 200	92.9
13C12-2,2',4,4',5,5'-HxBDE	153L			1.35	100	65.0	30.0 - 200	65.0
13C12-2,2',4,4',5,6'-HxBDE	154L			1.37	100	61.5	30.0 - 200	61.5
13C12-2,2',3,4,4',5,6-HpBDE	183L			1.05	100	56.1	30.0 - 200	56.1
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			0.90	100	138	30.0 - 200	138
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			1.31	1000	859	100 - 2000	85.9

CLEANUP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			1.36	100	58.4	30.0 - 200	58.4
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(1) Suffix "L" indicates labeled compound.
(2) Where applicable, custom lab flags have been used on this report.
(3) Contract-required limits for OPR as specified in Table 6, Method 1614.

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

Signed: _____Jason MacKenzie_____

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.

BROMINATED DIPHENYLETHER 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: 09-Aug-2023

Instrument ID: HR GC/MS

GC Column ID: DB5HT

CS0 Data Filename: N/A
CS1 Data Filename: BE31_161E S: 4
CS2 Data Filename: BE31_161E S: 3
CS3 Data Filename: BE31_161E S: 2
CS4 Data Filename: BE31_161E S: 6
CS5 Data Filename: BE31_161E S: 5
CS6 Data Filename: N/A

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	RELATIVE RESPONSE (RR)							MEAN RR	CV ² (%RSD)
				CS0	CS1	CS2	CS3	CS4	CS5	CS6		
2,4,4'-TriBDE	28	28 + 33			0.99	1.00	1.00	1.02	0.86		0.98	6.79
2',3,4-TriBDE	33	28 + 33										
2,2',4,4'-TeBDE	47				1.03	1.04	1.03	1.09	1.01		1.04	2.65
2,2',4,4',5-PeBDE	99				1.08	1.05	1.04	1.08	1.06		1.06	1.69
2,2',4,4',6-PeBDE	100				1.13	1.10	1.07	1.11	1.04		1.09	3.41
2,2',4,4',5,5'-HxBDE	153				0.94	0.94	1.01	1.01	0.98		0.98	3.70
2,2',4,4',5,6'-HxBDE	154				0.99	0.97	0.97	1.00	0.99		0.98	1.46
2,2',3,4,4',5',6-HpBDE	183				0.54	0.47	0.47	0.51	0.50		0.50	6.28
2,2',3,3',4,4',5,5',6,6'-DeBDE	209				1.23	1.25	1.20	1.26	1.03		1.20	7.88

(1) Where applicable, custom lab flags have been used on this report.
(2) For contract CV specifications, see Section 10.4.4, Method 1614.

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

Signed: _____Leanne Henley_____

BROMINATED DIPHENYLETHER 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: 09-Aug-2023

Instrument ID: HR GC/MS

GC Column ID: DB5HT

CS0 Data Filename: N/A
CS1 Data Filename: BE31_161E S: 4
CS2 Data Filename: BE31_161E S: 3
CS3 Data Filename: BE31_161E S: 2
CS4 Data Filename: BE31_161E S: 6
CS5 Data Filename: BE31_161E S: 5
CS6 Data Filename: N/A

				RELATIVE RESPONSE (RR)								
				CS0	CS1	CS2	CS3	CS4	CS5	CS6	MEAN RR	CV ³ (%RSD)
COMPOUND	IUPAC NO. ¹	CO- ELUTIONS	LAB FLAG ²									
13C12-2,4,4'-TriBDE	28L				1.19	1.13	1.06	1.30	1.45		1.23	12.4
13C12-2,2',4,4'-TeBDE	47L				0.95	0.91	0.86	1.05	1.12		0.98	10.8
13C12-2,2',4,4',5-PeBDE	99L				0.59	0.56	0.55	0.67	0.83		0.64	18.2
13C12-2,2',4,4',6-PeBDE	100L				0.86	0.81	0.79	0.95	1.12		0.91	14.6
13C12-2,2',4,4',5,5'-HxBDE	153L				2.39	2.41	2.40	2.76	3.27		2.65	14.4
13C12-2,2',4,4',5,6'-HxBDE	154L				3.75	3.74	3.85	4.12	4.54		4.00	8.51
13C12-2,2',3,4,4',5',6-HpBDE	183L				1.98	2.10	2.14	2.54	3.19		2.39	20.8
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L				0.45	0.42	0.56	1.42	1.44		0.86	61.0
CLEAN-UP STANDARD												
13C12-2,2',3,4,4',6-HxBDE	139L				1.69	1.75	1.72	1.72	1.61		1.70	3.24

(1) Suffix "L" indicates labeled compound.
(2) Where applicable, custom lab flags have been used on this report.
(3) For contract CV specifications, see Section 10.5.6, Method 1614.

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

BROMINATED DIPHENYLETHER INITIAL CALIBRATION ION ABUNDANCE 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: 09-Aug-2023

Instrument ID: HR GC/MS

GC Column ID: DB5HT

CS0 Data Filename: N/A
CS1 Data Filename: BE31_161E S: 4
CS2 Data Filename: BE31_161E S: 3
CS3 Data Filename: BE31_161E S: 2
CS4 Data Filename: BE31_161E S: 6
CS5 Data Filename: BE31_161E S: 5
CS6 Data Filename: N/A

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	M/Z's FORMING RATIO ²	ION ABUNDANCE RATIO							QC LIMITS ²
					CS0	CS1	CS2	CS3	CS4	CS5	CS6	
2,4,4'-TriBDE	28	28 + 33		M+2/M+4		1.04	0.99	1.00	1.01	1.00		0.88-1.18
2',3,4-TriBDE	33	28 + 33										
2,2',4,4'-TeBDE	47			M+2/M+4	0.74	0.67	0.69	0.69	0.77			0.60-0.81
2,2',4,4',5-PeBDE	99			M+4/M+6	0.92	1.12	1.08	1.03	1.03			0.88-1.18
2,2',4,4',6-PeBDE	100			M+4/M+6	1.04	1.02	1.04	1.03	1.03			0.88-1.18
2,2',4,4',5,5'-HxBDE	153			M+4/M+6	0.67	0.73	0.77	0.77	0.76			0.65-0.89
2,2',4,4',5,6'-HxBDE	154			M+4/M+6	0.74	0.77	0.77	0.76	0.76			0.65-0.89
2,2',3,4,4',5',6'-HpBDE	183			M+6/M+8	1.01	1.02	1.01	1.04	1.02			0.88-1.18
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			M+8/M+10	0.79	0.80	0.86	0.86	0.80			0.73-0.99

(1) Where applicable, custom lab flags have been used on this report.
(2) See Table 8 Method 1614 for m/z specifications and ion abundance ratio control limits; QC Limits apply to CS2 to CS5 only.

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

BROMINATED DIPHENYLETHER INITIAL CALIBRATION ION ABUNDANCE 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: 09-Aug-2023

Instrument ID: HR GC/MS

GC Column ID: DB5HT

CS0 Data Filename: N/A
CS1 Data Filename: BE31_161E S: 4
CS2 Data Filename: BE31_161E S: 3
CS3 Data Filename: BE31_161E S: 2
CS4 Data Filename: BE31_161E S: 6
CS5 Data Filename: BE31_161E S: 5
CS6 Data Filename: N/A

LABELED COMPOUND	IUPAC NO. ¹	CO- ELUTIONS	LAB FLAG ²	M/Z's FORMING RATIO ³	ION ABUNDANCE RATIO							QC LIMITS ³
					CS0	CS1	CS2	CS3	CS4	CS5	CS6	
13C12-2,4,4'-TriBDE	28L			M+2/M+4	1.03	1.00	1.00	1.02	1.04			0.88-1.18
13C12-2,2',4,4'-TeBDE	47L			M+4/M+6	1.56	1.52	1.51	1.53	1.54			1.31-1.77
13C12-2,2',4,4',5-PeBDE	99L			M+4/M+6	1.07	1.03	1.07	1.07	1.08			0.88-1.18
13C12-2,2',4,4',6-PeBDE	100L			M+4/M+6	1.07	1.05	1.06	1.05	1.08			0.88-1.18
13C12-2,2',4,4',5,5'-HxBDE	153L			M+6/M+8	1.39	1.38	1.41	1.38	1.39			1.16-1.58
13C12-2,2',4,4',5,6'-HxBDE	154L			M+6/M+8	1.40	1.37	1.39	1.39	1.41			1.16-1.58
13C12-2,2',3,4,4',5,6-HpBDE	183L			M+6/M+8	1.06	1.02	1.01	1.04	1.06			0.88-1.18
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			M+10/M+12	1.22	1.19	1.24	1.25	1.23			1.05-1.41
CLEAN-UP STANDARD												
13C12-2,2',3,4,4',6-HxBDE	139L			M+6/M+8	1.39	1.39	1.39	1.39	1.37			1.16-1.58

(1) Suffix "L" indicates labeled compound.
(2) Where applicable, custom lab flags have been used on this report.
(3) See Table 8 Method 1614 for m/z specifications and ion abundance ratio control limits.

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

BROMINATED DIPHENYLETHER 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:

09-Aug-2023

VER Data Filename:

BE31_197 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

11-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

07:56:42

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	MZ's FORMING RATIO ²	ION ABUND. RATIO	QC LIMITS ³	CONC. FOUND (ng/mL)	CONC. RANGE ⁴ (ng/mL)
2,4,4'-TriBDE	28	28 + 33		M+2/M+4	1.02	0.88-1.18	91.5	68.2 - 127
2',3,4-TriBDE	33	28 + 33						
2,2',4,4'-TeBDE	47			M+2/M+4	0.69	0.60-0.81	54.0	35.0 - 65.0
2,2',4,4',5-PeBDE	99			M+4/M+6	1.03	0.88-1.18	51.8	35.0 - 65.0
2,2',4,4',6-PeBDE	100			M+4/M+6	1.03	0.88-1.18	53.4	35.0 - 65.0
2,2',4,4',5,5'-HxBDE	153			M+4/M+6	0.77	0.65-0.89	51.2	35.0 - 65.0
2,2',4,4',5,6'-HxBDE	154			M+4/M+6	0.75	0.65-0.89	52.1	35.0 - 65.0
2,2',3,4,4',5',6-HpBDE	183			M+6/M+8	1.04	0.88-1.18	55.0	35.0 - 65.0
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			M+8/M+10	0.82	0.73-0.99	446	350 - 650

(1) Where applicable, custom lab flags have been used on this report.
(2) See Table 8, Method 1614, for m/z specifications.
(3) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.
(4) Contract-required concentration range as specified in Table 6, Method 1614, under VER.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER 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:

09-Aug-2023

VER Data Filename:

BE31_197 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

11-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

07:56:42

LABELED COMPOUND	IUPAC NO. ¹	CO- ELUTIONS	LAB FLAG ²	MZ's FORMING RATIO ³	ION ABUND. RATIO	QC LIMITS ⁴	CONC. FOUND (ng/mL)	CONC. RANGE ⁵ (ng/mL)
13C12-2,4,4'-TriBDE	28L			M+2/M+4	1.00	0.88-1.18	98.7	50.0 - 150
13C12-2,2',4,4'-TeBDE	47L			M+4/M+6	1.57	1.31-1.77	90.4	50.0 - 150
13C12-2,2',4,4',5-PeBDE	99L			M+4/M+6	1.05	0.88-1.18	141	50.0 - 150
13C12-2,2',4,4',6-PeBDE	100L			M+4/M+6	1.07	0.88-1.18	125	50.0 - 150
13C12-2,2',4,4',5,5'-HxBDE	153L			M+6/M+8	1.36	1.16-1.58	69.1	50.0 - 150
13C12-2,2',4,4',5,6'-HxBDE	154L			M+6/M+8	1.38	1.16-1.58	64.5	50.0 - 150
13C12-2,2',3,4,4',5',6-HpBDE	183L			M+6/M+8	1.04	0.88-1.18	63.8	50.0 - 150

CLEAN-UP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			M+6/M+8	1.38	1.16-1.58	66.5	50.0 - 150
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- (1) Suffix "L" indicates labeled compound.
- (2) Where applicable, custom lab flags have been used on this report.
- (3) See Table 8, Method 1614, for m/z specifications.
- (4) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.
- (5) Contract-required concentration range as specified in Table 6, Method 1614, under VER.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER RELATIVE RETENTION TIMES

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

Initial Calibration Date:

09-Aug-2023

VER Data Filename:

BE31_197 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

11-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

07:56:42

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	RETENTION TIME REFERENCE	IUPAC NO. ²	RRT	RRT QC LIMITS ³
2,4,4'-TriBDE	28	28 + 33		13C12-2,4,4'-TriBDE	28L	1.0000	0.9986-1.0021
2',3,4-TriBDE	33	28 + 33					
2,2',4,4'-TeBDE	47			13C12-2,2',4,4'-TeBDE	47L	1.0007	0.9988-1.0018
2,2',4,4',5-PeBDE	99			13C12-2,2',4,4',5-PeBDE	99L	1.0005	0.9990-1.0016
2,2',4,4',6-PeBDE	100			13C12-2,2',4,4',6-PeBDE	100L	1.0005	0.9989-1.0016
2,2',4,4',5,5'-HxBDE	153			13C12-2,2',4,4',5,5'-HxBDE	153L	1.0005	0.9991-1.0014
2,2',4,4',5,6'-HxBDE	154			13C12-2,2',4,4',5,6'-HxBDE	154L	1.0005	0.9990-1.0015
2,2',3,4,4',5,6'-HpBDE	183			13C12-2,2',3,4,4',5,6'-HpBDE	183L	1.0004	0.9991-1.0013
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L	1.0004	0.9993-1.0010

(1) Where applicable, custom lab flags have been used on this report.
(2) Suffix "L" indicates labeled compound
(3) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1614.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER RELATIVE RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

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

Initial Calibration Date:

09-Aug-2023

VER Data Filename:

BE31_197 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

11-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

07:56:42

LABELLED COMPOUND	IUPAC NO. ¹	CO- ELUTIONS	LAB FLAG ²	RETENTION TIME REFERENCE	IUPAC NO. ¹	RRT	RRT QC LIMITS ³
13C12-2,4,4'-TriBDE	28L			13C12-3,3',4,5'-TeBDE	79L	0.8441	0.8351-0.8528
13C12-2,2',4,4'-TeBDE	47L			13C12-3,3',4,5'-TeBDE	79L	0.9885	0.9829-0.9947
13C12-2,2',4,4',5-PeBDE	99L			13C12-3,3',4,5'-TeBDE	79L	1.1231	1.1143-1.1319
13C12-2,2',4,4',6-PeBDE	100L			13C12-3,3',4,5'-TeBDE	79L	1.0934	1.0848-1.1025
13C12-2,2',4,4',5,5'-HxBDE	153L			13C12-2,2',3,4,4',5,5'-HpBDE	180L	0.8868	0.8804-0.8930
13C12-2,2',4,4',5,6'-HxBDE	154L			13C12-2,2',3,4,4',5,5'-HpBDE	180L	0.8585	0.8523-0.8649
13C12-2,2',3,4,4',5,6'-HpBDE	183L			13C12-2,2',3,4,4',5,5'-HpBDE	180L	0.9677	0.9635-0.9719

CLEANUP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			13C12-2,2',4,4',5,5'-HxBDE	153L	1.0122	1.0076-1.0170
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- (1) Suffix "L" indicates labeled compound
- (2) Where applicable, custom lab flags have been used on this report.
- (3) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1614.

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

Signed: _____Angela Schlak_____

For Axys Internal Use Only [XSL Template: Form16686B.xsl; Created: 13-Dec-2023 14:22:14; Application: XMLTransformer-1.18.46;
Report Filename: 1614_PBDPE_BE31_197S1__Form6B_SJ3357098.html; Workgroup: WG88061; Design ID: 5275]

SGS AXYS METHOD MLA-033 Rev 06

Form 3A

BROMINATED DIPHENYLETHER INITIAL CALIBRATION RELATIVE RESPONSES,
ION ABUNDANCE RATIOS, AND RELATIVE RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

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

Initial Calibration Date: 09-Aug-2023

CAL Data Filename: BE31_197 S: 1

Instrument ID: HR GC/MS

Analysis Date: 11-Dec-2023

GC Column ID: DB5HT

Analysis Time: 07:56:42

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	RRF	MZ's FORMING RATIO ²	ION ABUND. RATIO	RATIO QC LIMITS ³	RRT	RRT QC LIMITS
2,4-DiBDE	7			0.55	M/M+2	0.52	0.43-0.59	0.936	0.923 - 0.949
2,4'-DiBDE	8	8 + 11		0.73	M/M+2	0.52	0.43-0.59	0.960	0.952 - 0.969
2,6-DiBDE	10			0.44	M/M+2	0.52	0.43-0.59	0.878	0.861 - 0.895
3,3'-DiBDE	11	8 + 11							
3,4-DiBDE	12	12 + 13		0.83	M/M+2	0.52	0.43-0.59	0.978	0.969 - 0.986
3,4'-DiBDE	13	12 + 13							
4,4'-DiBDE	15			0.95	M/M+2	0.52	0.43-0.59	1.001	0.998 - 1.003
2,2',4-TriBDE	17	17 + 25		0.81	M+2/M+4	1.03	0.88-1.18	0.975	0.969 - 0.983
2,3',4-TriBDE	25	17 + 25							
2,4,6-TriBDE	30			0.70	M+2/M+4	1.00	0.88-1.18	0.904	0.890 - 0.918
2,4',6-TriBDE	32			0.90	M+2/M+4	1.03	0.88-1.18	0.958	0.951 - 0.965
3,3',4-TriBDE	35			1.32	M+2/M+4	1.02	0.88-1.18	1.016	1.009 - 1.023
3,4,4'-TriBDE	37			1.44	M+2/M+4	1.02	0.88-1.18	1.035	1.029 - 1.043
2,2',4,5'-TeBDE	49			0.71	M+2/M+4	0.70	0.60-0.81	0.977	0.971 - 0.983
2,2',4,6'-TeBDE	51			0.94	M+2/M+4	0.68	0.60-0.81	0.970	0.964 - 0.976
2,3',4,4'-TeBDE	66			0.66	M+2/M+4	0.69	0.60-0.81	1.020	1.014 - 1.026
2,3',4',6'-TeBDE	71			0.65	M+2/M+4	0.69	0.60-0.81	0.982	0.976 - 0.988
2,4,4',6'-TeBDE	75			0.87	M+2/M+4	0.68	0.60-0.81	0.965	0.959 - 0.971
3,3',4,4'-TeBDE	77			1.16	M+2/M+4	0.71	0.60-0.81	1.000	0.999 - 1.002
3,3',4,5'-TeBDE	79			1.05	M+2/M+4	0.68	0.60-0.81	1.012	1.006 - 1.018
2,2',3,4,4'-PeBDE	85			0.75	M+4/M+6	1.03	0.88-1.18	0.993	0.988 - 0.998
2,3,3',4,4'-PeBDE	105			0.59	M+4/M+6	1.01	0.88-1.18	1.008	1.003 - 1.013
2,3,4,5,6-PeBDE	116			0.38	M+4/M+6	1.04	0.88-1.18	1.009	1.004 - 1.015
2,3',4,4',6-PeBDE	119	119 + 120		0.61	M+4/M+6	1.03	0.88-1.18	1.010	1.005 - 1.016
2,3',4,5,5'-PeBDE	120	119 + 120							
3,3',4,4',5-PeBDE	126			1.13	M+4/M+6	1.03	0.88-1.18	1.000	0.999 - 1.001
2,2',3,3',4,4'-HxBDE	128			0.54	M+4/M+6	0.78	0.65-0.89	1.084	1.078 - 1.092
2,2',3,4,4',5'-HxBDE	138	138 + 166		0.58	M+4/M+6	0.76	0.65-0.89	1.042	1.037 - 1.047
2,2',3,4,4',6'-HxBDE	140			0.90	M+4/M+6	0.74	0.65-0.89	1.021	1.016 - 1.026
2,2',4,4',6,6'-HxBDE	155			1.16	M+4/M+6	0.76	0.65-0.89	0.983	0.978 - 0.988
2,3,4,4',5,6-HxBDE	166	138 + 166							
2,2',3,4,4',5,6-HpBDE	181			0.29	M+6/M+8	1.02	0.88-1.18	1.043	1.039 - 1.048
2,3,3',4,4',5,6-HpBDE	190			0.18	M+6/M+8	0.97	0.88-1.18	1.049	1.045 - 1.054
2,2',3,4,4',5,5',6-OcBDE	203			0.71	M+6/M+8	0.80	0.70-0.94	1.011	1.007 - 1.015
2,3,3',4,4',5,5',6-OcBDE	205			0.21	M+6/M+8	0.82	0.70-0.94	1.031	1.027 - 1.035
2,2',3,3',4,4',5,5',6-NoBDE	206			0.36	M+8/M+10	1.06	0.88-1.18	1.109	1.103 - 1.115
2,2',3,3',4,4',5,6,6'-NoBDE	207			0.45	M+8/M+10	1.05	0.88-1.18	1.094	1.088 - 1.100
2,2',3,3',4,5,5',6,6'-NoBDE	208			0.20	M+8/M+10	1.04	0.88-1.18	1.087	1.081 - 1.093

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

(2) See Table 8, Method 1614, for m/z specifications.

(3) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER INITIAL CALIBRATION RELATIVE RESPONSES,
ION ABUNDANCE RATIOS, AND RELATIVE RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

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

Initial Calibration Date:	09-Aug-2023	CAL Data Filename:	BE31_197 S: 1
Instrument ID:	HR GC/MS	Analysis Date:	11-Dec-2023
GC Column ID:	DB5HT	Analysis Time:	07:56:42

LABELED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	RRF	MZ's FORMING RATIO ³	ION ABUND. RATIO	RATIO QC LIMITS ⁴	RRT	RRT QC LIMITS
13C12-4,4'-DiBDE	15L			1.93	M/M+2	0.51	0.43-0.59	0.690	0.678 - 0.701
13C12-2,4,4'-TriBDE	28L			1.20	M+2/M+4	1.00	0.88-1.18	0.844	0.835 - 0.853
13C12-2,2',4,4'-TeBDE	47L			0.88	M+4/M+6	1.57	1.31-1.77	0.989	0.983 - 0.995
13C12-3,3',4,4'-TeBDE	77L			1.08	M+4/M+6	1.52	1.31-1.77	1.039	1.034 - 1.045
13C12-2,2',4,4',5-PeBDE	99L			0.89	M+4/M+6	1.05	0.88-1.18	1.123	1.114 - 1.132
13C12-2,2',4,4',6-PeBDE	100L			1.12	M+4/M+6	1.06	0.88-1.18	1.093	1.085 - 1.102
13C12-3,3',4,4',5-PeBDE	126L			1.07	M+4/M+6	1.05	0.88-1.18	1.184	1.175 - 1.193
13C12-2,2',4,4',5,5'-HxBDE	153L			1.82	M+6/M+8	1.37	1.16-1.58	0.887	0.880 - 0.893
13C12-2,2',4,4',5,6'-HxBDE	154L			2.58	M+6/M+8	1.38	1.16-1.58	0.858	0.852 - 0.865
13C12-2,2',3,4,4',5,6'-HpBDE	183L			1.52	M+6/M+8	1.04	0.88-1.18	0.968	0.963 - 0.972
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			0.88	M+6/M+8	0.82	0.70-0.94	1.060	1.054 - 1.067
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			0.19	M+10/M+12	1.27	1.05-1.41	1.080	1.075 - 1.085

ADDITIONAL STANDARD

13C12-2,2',3,4,4',5'-HxBDE	138L			0.37	M+6/M+8	1.38	1.16-1.58	1.041	1.037 - 1.046
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- (1) Suffix "L" indicates labeled compound
- (2) Where applicable, custom lab flags have been used on this report.
- (3) See Table 8, Method 1614, for m/z specifications.
- (4) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER 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:

09-Aug-2023

VER Data Filename:

BE31_198 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

12-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

19:35:57

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	MZ's FORMING RATIO ²	ION ABUND. RATIO	QC LIMITS ³	CONC. FOUND (ng/mL)	CONC. RANGE ⁴ (ng/mL)
2,4,4'-TriBDE	28	28 + 33		M+2/M+4	1.02	0.88-1.18	93.1	68.2 - 127
2',3,4-TriBDE	33	28 + 33						
2,2',4,4'-TeBDE	47			M+2/M+4	0.67	0.60-0.81	55.5	35.0 - 65.0
2,2',4,4',5-PeBDE	99			M+4/M+6	1.04	0.88-1.18	53.0	35.0 - 65.0
2,2',4,4',6-PeBDE	100			M+4/M+6	1.03	0.88-1.18	51.6	35.0 - 65.0
2,2',4,4',5,5'-HxBDE	153			M+4/M+6	0.75	0.65-0.89	52.8	35.0 - 65.0
2,2',4,4',5,6'-HxBDE	154			M+4/M+6	0.76	0.65-0.89	52.5	35.0 - 65.0
2,2',3,4,4',5',6-HpBDE	183			M+6/M+8	1.02	0.88-1.18	50.9	35.0 - 65.0
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			M+8/M+10	0.81	0.73-0.99	428	350 - 650

(1) Where applicable, custom lab flags have been used on this report.
(2) See Table 8, Method 1614, for m/z specifications.
(3) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.
(4) Contract-required concentration range as specified in Table 6, Method 1614, under VER.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER 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:	09-Aug-2023	VER Data Filename:	BE31_198 S: 1
Instrument ID:	HR GC/MS	Analysis Date:	12-Dec-2023
GC Column ID:	DB5HT	Analysis Time:	19:35:57

LABELED COMPOUND	IUPAC NO. ¹	CO- ELUTIONS	LAB FLAG ²	MZ's FORMING RATIO ³	ION ABUND. RATIO	QC LIMITS ⁴	CONC. FOUND (ng/mL)	CONC. RANGE ⁵ (ng/mL)
13C12-2,4,4'-TriBDE	28L			M+2/M+4	1.02	0.88-1.18	106	50.0 - 150
13C12-2,2',4,4'-TeBDE	47L			M+4/M+6	1.58	1.31-1.77	89.2	50.0 - 150
13C12-2,2',4,4',5-PeBDE	99L			M+4/M+6	1.07	0.88-1.18	137	50.0 - 150
13C12-2,2',4,4',6-PeBDE	100L			M+4/M+6	1.06	0.88-1.18	132	50.0 - 150
13C12-2,2',4,4',5,5'-HxBDE	153L			M+6/M+8	1.36	1.16-1.58	83.0	50.0 - 150
13C12-2,2',4,4',5,6'-HxBDE	154L			M+6/M+8	1.38	1.16-1.58	79.1	50.0 - 150
13C12-2,2',3,4,4',5,6-HpBDE	183L			M+6/M+8	1.01	0.88-1.18	68.1	50.0 - 150

CLEAN-UP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			M+6/M+8	1.36	1.16-1.58	79.0	50.0 - 150
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- (1) Suffix "L" indicates labeled compound.
- (2) Where applicable, custom lab flags have been used on this report.
- (3) See Table 8, Method 1614, for m/z specifications.
- (4) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.
- (5) Contract-required concentration range as specified in Table 6, Method 1614, under VER.

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

Signed: _____Angela Schlak_____

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Report Filename: 1614_PBDPE_BE31_198S1__Form4B_SJ3357704.html; Workgroup: WG88061; Design ID: 5275]

BROMINATED DIPHENYLETHER RELATIVE RETENTION TIMES

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

Initial Calibration Date:

09-Aug-2023

VER Data Filename:

BE31_198 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

12-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

19:35:57

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	RETENTION TIME REFERENCE	IUPAC NO. ²	RRT	RRT QC LIMITS ³
2,4,4'-TriBDE	28	28 + 33		13C12-2,4,4'-TriBDE	28L	1.0000	0.9986-1.0021
2',3,4-TriBDE	33	28 + 33					
2,2',4,4'-TeBDE	47			13C12-2,2',4,4'-TeBDE	47L	1.0007	0.9988-1.0018
2,2',4,4',5-PeBDE	99			13C12-2,2',4,4',5-PeBDE	99L	1.0000	0.9990-1.0016
2,2',4,4',6-PeBDE	100			13C12-2,2',4,4',6-PeBDE	100L	1.0000	0.9989-1.0016
2,2',4,4',5,5'-HxBDE	153			13C12-2,2',4,4',5,5'-HxBDE	153L	1.0005	0.9991-1.0014
2,2',4,4',5,6'-HxBDE	154			13C12-2,2',4,4',5,6'-HxBDE	154L	1.0005	0.9990-1.0015
2,2',3,4,4',5,6'-HpBDE	183			13C12-2,2',3,4,4',5,6'-HpBDE	183L	1.0000	0.9991-1.0013
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L	1.0004	0.9993-1.0010

(1) Where applicable, custom lab flags have been used on this report.
(2) Suffix "L" indicates labeled compound
(3) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1614.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER RELATIVE RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

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

Initial Calibration Date:

09-Aug-2023

VER Data Filename:

BE31_198 S: 1

Instrument ID:

HR GC/MS

Analysis Date:

12-Dec-2023

GC Column ID:

DB5HT

Analysis Time:

19:35:57

LABELLED COMPOUND	IUPAC NO. ¹	CO- ELUTIONS	LAB FLAG ²	RETENTION TIME REFERENCE	IUPAC NO. ¹	RRT	RRT QC LIMITS ³
13C12-2,4,4'-TriBDE	28L			13C12-3,3',4,5'-TeBDE	79L	0.8446	0.8355-0.8532
13C12-2,2',4,4'-TeBDE	47L			13C12-3,3',4,5'-TeBDE	79L	0.9892	0.9835-0.9953
13C12-2,2',4,4',5-PeBDE	99L			13C12-3,3',4,5'-TeBDE	79L	1.1241	1.1150-1.1327
13C12-2,2',4,4',6-PeBDE	100L			13C12-3,3',4,5'-TeBDE	79L	1.0943	1.0855-1.1032
13C12-2,2',4,4',5,5'-HxBDE	153L			13C12-2,2',3,4,4',5,5'-HpBDE	180L	0.8867	0.8807-0.8933
13C12-2,2',4,4',5,6'-HxBDE	154L			13C12-2,2',3,4,4',5,5'-HpBDE	180L	0.8584	0.8522-0.8648
13C12-2,2',3,4,4',5,6'-HpBDE	183L			13C12-2,2',3,4,4',5,5'-HpBDE	180L	0.9681	0.9639-0.9723

CLEANUP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			13C12-2,2',4,4',5,5'-HxBDE	153L	1.0122	1.0071-1.0166
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- (1) Suffix "L" indicates labeled compound
- (2) Where applicable, custom lab flags have been used on this report.
- (3) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1614.

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

Signed: _____Angela Schlak_____

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SGS AXYS METHOD MLA-033 Rev 06

Form 3A

BROMINATED DIPHENYLETHER INITIAL CALIBRATION RELATIVE RESPONSES,
ION ABUNDANCE RATIOS, AND RELATIVE RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

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

Initial Calibration Date: 09-Aug-2023

CAL Data Filename: BE31_198 S: 1

Instrument ID: HR GC/MS

Analysis Date: 12-Dec-2023

GC Column ID: DB5HT

Analysis Time: 19:35:57

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	RRF	MZ's FORMING RATIO ²	ION ABUND. RATIO	RATIO QC LIMITS ³	RRT	RRT QC LIMITS
2,4-DiBDE	7			0.54	M/M+2	0.52	0.43-0.59	0.936	0.923 - 0.949
2,4'-DiBDE	8	8 + 11		0.71	M/M+2	0.52	0.43-0.59	0.960	0.952 - 0.969
2,6-DiBDE	10			0.44	M/M+2	0.52	0.43-0.59	0.877	0.861 - 0.895
3,3'-DiBDE	11	8 + 11							
3,4-DiBDE	12	12 + 13		0.83	M/M+2	0.52	0.43-0.59	0.980	0.972 - 0.989
3,4'-DiBDE	13	12 + 13							
4,4'-DiBDE	15			0.99	M/M+2	0.52	0.43-0.59	1.001	0.998 - 1.003
2,2',4-TriBDE	17	17 + 25		0.81	M+2/M+4	1.02	0.88-1.18	0.975	0.969 - 0.983
2,3',4-TriBDE	25	17 + 25							
2,4,6-TriBDE	30			0.72	M+2/M+4	1.03	0.88-1.18	0.904	0.890 - 0.918
2,4',6-TriBDE	32			0.94	M+2/M+4	1.02	0.88-1.18	0.957	0.950 - 0.964
3,3',4-TriBDE	35			1.31	M+2/M+4	1.08	0.88-1.18	1.016	1.009 - 1.023
3,4,4'-TriBDE	37			1.43	M+2/M+4	1.08	0.88-1.18	1.034	1.028 - 1.042
2,2',4,5'-TeBDE	49			0.72	M+2/M+4	0.69	0.60-0.81	0.978	0.971 - 0.983
2,2',4,6'-TeBDE	51			1.02	M+2/M+4	0.70	0.60-0.81	0.970	0.964 - 0.976
2,3',4,4'-TeBDE	66			0.67	M+2/M+4	0.69	0.60-0.81	1.020	1.014 - 1.026
2,3',4',6'-TeBDE	71			0.71	M+2/M+4	0.70	0.60-0.81	0.982	0.976 - 0.988
2,4,4',6'-TeBDE	75			0.85	M+2/M+4	0.69	0.60-0.81	0.965	0.959 - 0.971
3,3',4,4'-TeBDE	77			1.16	M+2/M+4	0.69	0.60-0.81	1.001	0.999 - 1.002
3,3',4,5'-TeBDE	79			1.06	M+2/M+4	0.68	0.60-0.81	1.012	1.005 - 1.017
2,2',3,4,4'-PeBDE	85			0.71	M+4/M+6	1.04	0.88-1.18	0.993	0.988 - 0.998
2,3,3',4,4'-PeBDE	105			0.56	M+4/M+6	1.04	0.88-1.18	1.008	1.002 - 1.012
2,3,4,5,6-PeBDE	116			0.36	M+4/M+6	1.02	0.88-1.18	1.009	1.004 - 1.014
2,3',4,4',6'-PeBDE	119	119 + 120		0.62	M+4/M+6	1.01	0.88-1.18	1.010	1.004 - 1.015
2,3',4,5,5'-PeBDE	120	119 + 120							
3,3',4,4',5-PeBDE	126			1.14	M+4/M+6	1.03	0.88-1.18	1.000	0.999 - 1.001
2,2',3,3',4,4'-HxBDE	128			0.52	M+4/M+6	0.78	0.65-0.89	1.085	1.078 - 1.092
2,2',3,4,4',5'-HxBDE	138	138 + 166		0.55	M+4/M+6	0.75	0.65-0.89	1.042	1.037 - 1.046
2,2',3,4,4',6'-HxBDE	140			0.91	M+4/M+6	0.76	0.65-0.89	1.021	1.016 - 1.025
2,2',4,4',6,6'-HxBDE	155			1.25	M+4/M+6	0.76	0.65-0.89	0.984	0.978 - 0.988
2,3,4,4',5,6-HxBDE	166	138 + 166							
2,2',3,4,4',5,6-HpBDE	181			0.28	M+6/M+8	1.04	0.88-1.18	1.043	1.039 - 1.047
2,3,3',4,4',5,6-HpBDE	190			0.16	M+6/M+8	1.00	0.88-1.18	1.049	1.045 - 1.053
2,2',3,4,4',5,5',6-OcBDE	203			0.64	M+6/M+8	0.84	0.70-0.94	1.011	1.007 - 1.015
2,3,3',4,4',5,5',6-OcBDE	205			0.37	M+6/M+8	0.83	0.70-0.94	1.031	1.027 - 1.035
2,2',3,3',4,4',5,5',6-NoBDE	206			0.21	M+8/M+10	1.00	0.88-1.18	1.109	1.103 - 1.115
2,2',3,3',4,4',5,6,6'-NoBDE	207			0.15	M+8/M+10	1.02	0.88-1.18	1.094	1.088 - 1.100
2,2',3,3',4,5,5',6,6'-NoBDE	208			0.15	M+8/M+10	1.04	0.88-1.18	1.087	1.081 - 1.093

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

(2) See Table 8, Method 1614, for m/z specifications.

(3) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.

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

Signed: _____Angela Schlak_____

BROMINATED DIPHENYLETHER INITIAL CALIBRATION RELATIVE RESPONSES,
ION ABUNDANCE RATIOS, AND RELATIVE RETENTION TIMES

SGS AXYS ANALYTICAL SERVICES

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

Initial Calibration Date:	09-Aug-2023	CAL Data Filename:	BE31_198 S: 1
Instrument ID:	HR GC/MS	Analysis Date:	12-Dec-2023
GC Column ID:	DB5HT	Analysis Time:	19:35:57

LABELED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	RRF	MZ's FORMING RATIO ³	ION ABUND. RATIO	RATIO QC LIMITS ⁴	RRT	RRT QC LIMITS
13C12-4,4'-DiBDE	15L			2.19	M/M+2	0.52	0.43-0.59	0.690	0.678 - 0.702
13C12-2,4,4'-TriBDE	28L			1.30	M+2/M+4	1.02	0.88-1.18	0.845	0.835 - 0.853
13C12-2,2',4,4'-TeBDE	47L			0.86	M+4/M+6	1.58	1.31-1.77	0.989	0.983 - 0.995
13C12-3,3',4,4'-TeBDE	77L			1.04	M+4/M+6	1.56	1.31-1.77	1.039	1.033 - 1.045
13C12-2,2',4,4',5-PeBDE	99L			0.87	M+4/M+6	1.06	0.88-1.18	1.124	1.115 - 1.133
13C12-2,2',4,4',6-PeBDE	100L			1.18	M+4/M+6	1.06	0.88-1.18	1.094	1.085 - 1.103
13C12-3,3',4,4',5-PeBDE	126L			1.10	M+4/M+6	1.05	0.88-1.18	1.185	1.176 - 1.194
13C12-2,2',4,4',5,5'-HxBDE	153L			2.20	M+6/M+8	1.37	1.16-1.58	0.887	0.881 - 0.893
13C12-2,2',4,4',5,6'-HxBDE	154L			3.16	M+6/M+8	1.38	1.16-1.58	0.858	0.852 - 0.865
13C12-2,2',3,4,4',5,6'-HpBDE	183L			1.62	M+6/M+8	1.01	0.88-1.18	0.968	0.964 - 0.972
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			0.95	M+6/M+8	0.81	0.70-0.94	1.060	1.054 - 1.067
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			0.25	M+10/M+12	1.33	1.05-1.41	1.080	1.075 - 1.085

ADDITIONAL STANDARD

13C12-2,2',3,4,4',5'-HxBDE	138L			0.35	M+6/M+8	1.36	1.16-1.58	1.041	1.036 - 1.046
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- (1) Suffix "L" indicates labeled compound
(2) Where applicable, custom lab flags have been used on this report.
(3) See Table 8, Method 1614, for m/z specifications.
(4) Ion Abundance Ratio Control Limits as specified in Table 8, Method 1614.

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

Signed: _____Angela Schlak_____

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Accreditation Scope																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
SGS AXYS Analytical Services Ltd. file ref.: ACC-103 Rev. 70																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum	Tissue and Tissue Flora										Urine	Water	Water, Non-Potable										AFFF																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
				CALA	Alaska DEC	ANAB CoD **	ANAB ISO 17025	CALA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB CoD **	ANAB ISO 17025	CALA	Florida DOH	Minnesota DOH	New Jersey DEP	Virginia DGS	CALA	CALA	Alaska DEC	ANAB CoD **	ANAB ISO 17025	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB CoD **	ANAB ISO 17025																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
OC Pesticides	Alpha-HCH	SGS AXYS MLA-007	MLA-007																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</

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
				CALA Alaska DEC 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	Urine Water Water, Non-Potable 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
PFAS	N-Ethylperfluorooctanesulfonamide (N-EtFOSA)	EPA 1633 draft SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	N-Ethylperfluorooctanesulfonamidoethanol (N-EtFOSE)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	N-Methylperfluorooctanesulfonamide (N-MeFOSA)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	N-Methylperfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	N-Methylperfluorooctanesulfonamidoethanol (N-MeFOSE)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-060 SGS AXYS MLA-041 SGS AXYS MLA-043 SGS AXYS MLA-042 SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-060 MLA-041 MLA-043 MLA-042 MLA-110 MLA-110 MLA-110 MLA-110	Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluorobutanoate (PFBA)	SGS AXYS MLA-060 SGS AXYS MLA-041 SGS AXYS MLA-043 SGS AXYS MLA-042 SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-060 MLA-041 MLA-043 MLA-042 MLA-110 MLA-110 MLA-110 MLA-110	Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluorodecanoate (PFDA)	SGS AXYS MLA-060 SGS AXYS MLA-041 SGS AXYS MLA-043 SGS AXYS MLA-042 SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-060 MLA-041 MLA-043 MLA-042 MLA-110 MLA-110 MLA-110 MLA-110	Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluorododecanoate (PFDaO)	SGS AXYS MLA-060 SGS AXYS MLA-041 SGS AXYS MLA-043 SGS AXYS MLA-042 SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-060 MLA-041 MLA-043 MLA-042 MLA-110 MLA-110 MLA-110 MLA-110	Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y
PFAS	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-110 DoD QSM Version 5.3 DoD QSM Version 5.4 EPA 1633 draft	MLA-110 MLA-110 MLA-110 MLA-110	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y	Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y

Accreditation Scope

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

Accreditation Scope			
SGS AXYS Analytical Services Ltd. file ref.: ACC-103 Rev. 70			
Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID

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Accreditation Scope

SGS AXYS Analytical Services Ltd.

file ref.: ACC-103 Rev. 70

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	Serum	Tissue and Tissue Flora										Urine	Water	Water, Non-Potable	AFFF							
				Alaska DEC	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	New York DOH	Pennsylvania DEP	Virginia DGS
PPCP	Lincomycin	SGS AXYS MLA-075	MLA-075			Y										Y									
PPCP	Lomefloxacin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Meprobamate	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Metformin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Methylprednisolone	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Metoprolol	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Miconazole	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Minocycline	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Naproxen	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Norfloxacin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Norfluoxetine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Norgestimate	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Norverapamil	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Ofloxacin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Ormetoprim	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Oxacillin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Oxolinic acid	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Oxycodone	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Oxytetracycline (OTC)	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Paroxetine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Penicillin G	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Penicillin V	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Prednisolone	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Prednisone	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Promethazine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Propoxyphene	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Propranolol	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Ranitidine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Roxithromycin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sarafloxacin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sertraline	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Simvastatin	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfachloropyridazine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfadiazine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfadimethoxine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfamerazine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfamethazine	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfamethizole	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfamethoxazole	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfanilamide	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Sulfathiazole	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Tetracycline (TC)	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Theophylline	SGS AXYS MLA-075	MLA-075			Y			Y									Y							
PPCP	Thiabendazole	SGS AXYS MLA-075	MLA-075			Y			Y									Y							

Accreditation Scope

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

Compound Class	Compound	Accredited Method ID	SGS AXYS Method ID	CA	Alaska DEC	ANAB DoD **	ANAB ISO 17025	CA	California WB	Florida DOH	Maine DOH	Minnesota DOH	New Jersey DEP	New York DOH	Virginia DGS	Washington DE	ANAB DoD **	ANAB ISO 17025	CA	Florida DOH	Minnesota DOH	New Jersey DEP	New York DOH	Pennsylvania DEP	Virginia DGS	Washington DE *	ANAB DoD **	ANAB ISO 17025				
PPCP		SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Trenbolone	SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Trenbolone acetate	SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Triamterene	SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Triclocarban	EPA 1694	MLA-075								Y											Y										
PPCP		SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Triclosan	EPA 1694	MLA-075							Y													Y									
PPCP		SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Trimethoprim	EPA 1694	MLA-075							Y													Y									
PPCP		SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Tylosin	EPA 1694	MLA-075							Y														Y								
PPCP		SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Valsartan	SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Verapamil	SGS AXYS MLA-075	MLA-075					Y															Y									
PPCP	Virginiamycin	EPA 1694	MLA-075							Y														Y								
PPCP		SGS AXYS MLA-075	MLA-075					Y																								
PPCP	Warfarin	EPA 1694	MLA-075							Y																						
PPCP		SGS AXYS MLA-075	MLA-075					Y			Y													Y								
TOP	Perfluorobutanesulfonate (PFBS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorobutanoate (PFBA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorodecanesulfonate (PFDS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorodecanoate (PFDA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorododecanesulfonate (PFDoS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorododecanoate (PFDoA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluoroheptanesulfonate (PFHpS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluoroheptanoate (PFHpA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorohexanesulfonate (PFHxS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorohexanoate (PFHxA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorononanesulfonate (PFNS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorononanoate (PFNA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorooctanesulfonate (PFOS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorooctanoate (PFOA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluoropentanesulfonate (PFPeS)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluoropentanoate (PFPeA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorotetradecanoate (PFTeDA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluorotridecanoate (PFTrDA)	SGS AXYS MLA-111	MLA-111					Y																								
TOP	Perfluoroundecanoate (PFUnA)	SGS AXYS MLA-111	MLA-111					Y																								
Note *	Analysis of pesticides and PCBs in non-potable water samples by SGS AXYS method MLA-007, with the exception of NPDES or State permitted discharges and Stormwater applications, may fall within the scope of Washington State Department of Ecology solids matrix accreditation, subject to approval of the Ecology Project Manager.																															
Note **	PFAS by LC-MS/MS compliant with US DoD QSM 5.3 table B-15 and US DoD QSM 5.4 table B-24																															

Legend

Y	Accreditation scope
AFFF	Aqueous film forming foam
BFR	Brominated flame retardants (non-PBDPE)
BPA and mPE	Bisphenol A and mono-Phthalate Esters
OC Pesticides	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PBDPE	Polybrominated diphenylethers
PCB	Polychlorinated Biphenyls
PCDDF	Polychlorinated dibenzodioxins/furans
PFAS	Per- and Polyfluoroalkyl Substances
PPCP	Pharmaceutical and Personal Care Products
TOP	Total Oxidizable Precursors
California WB	California Water Boards, Lab ID 2911
Florida DOH	Florida Department of Health, Lab ID E871007, (NELAC Standard)
Pennsylvania DEP	Pennsylvania Department of Environmental Protection
Minnesota DOH	Minnesota Department of Health, Lab ID 232-999-430, (NELAC Standard)
New Jersey DEP	New Jersey Department of Environmental Protection, Lab ID CANA005, (NELAC Standard)
New York DOH	New York Department of Health, Lab ID 11674, (NELAC Standard)
Washington DE	Washington Department of Ecology, Lab ID C404
Virginia DGS	Virginia Department of General Services, Division of Consolidated Laboratory Services, Lab ID 460224, (NELAC Standard)
Alaska DEC	Alaska Department of Environmental Conservation, Contaminated Sites Laboratory Approval 17-014
Maine DOH	Maine Center for Disease Control and Prevention, Department of Health and Human Services, Lab ID CN00003

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	AFFF
				CALA	Alaska DEC 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	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

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)

