1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6

SVOC DATA PACKAGE

Client Project Information

Project ID: 1466-004 SEATTLE IRON & METALS
Project Description:
Contact: Amber Bailey

ALSE Project Information

Project ID: FAR100
Contact: Breanne Dusureault
Submission ID(s): L2541483

Final Package Review by: _____

Date Reviewed: 28-Jan-21

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SECTION 1: PROJECT NARRATIVE

ALSE Project Information

Project ID: FAR100
Contact: Breanne Dusureault
Submission ID(s): L2541483

Client Project Information

Project ID: 1466-004 SEATTLE IRON & METALS
Project Description:
Contact: Amber Bailey

Analytical Method: PCDD/F by EPA TO9A/8290

ALS Sample ID	Client Sample Descriptions	Matrix	Date Sampled	Date Received	Temp/degrees C. on receipt	Date Extracted	Date Analyzed
L2519524-1	L2497422-3-1	PUF	15-Oct-20	21-Oct-20	10.8	n/a	n/a
L2530845-1	L2497422-8-1	PUF	17-Nov-20	18-Nov-20	5.9	n/a	n/a
L2541477-1	L2527465-3-1	PUF	15-Dec-20	16-Dec-20	5.4	n/a	n/a
L2541483-1	**SITE 1 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	**PUF**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**22-Jan-21**
L2519524-2	L2497422-5-2	PUF	15-Oct-20	21-Oct-20	10.8	n/a	n/a
L2530845-2	L2516041-1-2	PUF	17-Nov-20	18-Nov-20	5.9	n/a	n/a
L2541477-2	L2527465-2-2	PUF	15-Dec-20	16-Dec-20	5.4	n/a	n/a
L2541483-2	**SITE 2 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	**PUF**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**22-Jan-21**
L2519524-3	L2497422-4-3	PUF	15-Oct-20	21-Oct-20	10.8	n/a	n/a
L2530845-3	L2497422-9-3	PUF	17-Nov-20	18-Nov-20	5.9	n/a	n/a
L2541477-3	L2527465-5-3	PUF	15-Dec-20	16-Dec-20	5.4	n/a	n/a
L2541483-3	**SITE 3 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	**PUF**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**27-Jan-21**
L2519524-4	L2497422-6-4	PUF	15-Oct-20	21-Oct-20	10.8	n/a	n/a
L2530845-4	L2497422-7-4	PUF	17-Nov-20	18-Nov-20	5.9	n/a	n/a
L2541477-4	L2527465-4-4	PUF	15-Dec-20	16-Dec-20	5.4	n/a	n/a
L2541483-4	**SITE 4 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	**PUF**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**27-Jan-21**
L2519524-5	L2497422-2-5	PUF	15-Oct-20	21-Oct-20	10.8	n/a	n/a
L2530845-5	L2497422-10-5	PUF	17-Nov-20	18-Nov-20	5.9	n/a	n/a
L2541477-5	L2527465-1-5	PUF	15-Dec-20	16-Dec-20	5.4	n/a	n/a
L2541483-5	**SITE 5 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	**PUF**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**22-Jan-21**
WG3463499-1	**Method Blank**	**MEDIA**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**27-Jan-21**
WG3463499-4	**Method Blank**	**REAGENT**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**27-Jan-21**
WG3463499-2	**Laboratory Control Sample**	**MEDIA**	**n/a**	**n/a**	**n/a**	**23-Dec-21**	**17-Jan-21**

Comments and Notes:
a) Sample Integrity:

The samples were received on 3 different dates as noted above. The three samples for each sites were extracted together for a total of 5 composites. Some of the samples were received at above the recommended transportation and storage temperature. However, the brief period at above the recommended temperature is not expected to have a negative impact on reported native target results.

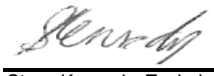
For the samples received 16-Dec-20, the samples were logged-in with identities supplied by the client, rather than the ones written on the chain-of-custody.

b) Instrumental Analysis:

The results for select samples have been reported from a reanalysis of the extract due to elevated instrument background.

No criteria failures or exceedances.

I certify that this data package is in compliance with the terms and condition of the contract , both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package (hardcopy and/or electronic version) has been authorized by the Laboratory Manager or his designee, as verified by the following signature.



Steve Kennedy, Technical Supervisor

28-Jan-21
Date

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SECTION 2: DATA SUMMARY REPORT

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Breanne Dusureault	**Client Name:**	Farallon Consulting, L.L.C.
ALS Project ID:	FAR100	**Client Address:**	975 5th Avenue Northwest
ALS WO#:	L2541483		Issaquah, WA 98027
Date of Report	29-Jan-21		USA
Date of Sample Receipt	16-Dec-20	**Client Contact:**	Amber Bailey
		Client Project ID:	1466-004 SEATTLE IRON & METALS

COMMENTS: **PCDD/F by EPA TO9A/8290**

Certified by:

Steve Kennedy
Technical Supervisor

ALS Life Sciences

Sample Analysis Summary Report

Sample Name	SITE 1 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	SITE 2 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	SITE 3 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	SITE 4 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	SITE 5 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)
ALS Sample ID	L2541483-1	L2541483-2	L2541483-3	L2541483-4	L2541483-5
Sample Size	1	1	1	1	1
Sample size units	SAMPLE	SAMPLE	SAMPLE	SAMPLE	SAMPLE
Percent Moisture	n/a	n/a	n/a	n/a	n/a
Sample Matrix	PUF	PUF	PUF	PUF	PUF
Sampling Date	n/a	n/a	n/a	n/a	n/a
Extraction Date	23-Dec-21	23-Dec-21	23-Dec-21	23-Dec-21	23-Dec-21
Target Analytes	**pg**	**pg**	**pg**	**pg**	**pg**
2,3,7,8-TCDD	<2.1	<1.5	<3.1	<3.4	<1.5
1,2,3,7,8-PeCDD	6.81	<2.2	7.75	<6.2	8.13
1,2,3,4,7,8-HxCDD	<6.0	2.92	8.00	<4.9	<9.4
1,2,3,6,7,8-HxCDD	<9.0	<5.5	<6.5	6.78	12.5
1,2,3,7,8,9-HxCDD	<11	4.18	<6.7	<13	16.0
1,2,3,4,6,7,8-HpCDD	202	74.5	189	236	272
OCDD	1160	578	889	1040	1770
2,3,7,8-TCDF	<2.7	6.28	<4.1	<2.8	5.77
1,2,3,7,8-PeCDF	2.99	4.29	<4.6	<4.1	<3.1
2,3,4,7,8-PeCDF	3.73	6.80	5.85	<3.8	5.38
1,2,3,4,7,8-HxCDF	<3.1	<4.5	<3.4	<4.3	<5.0
1,2,3,6,7,8-HxCDF	2.23	4.02	<2.1	<4.1	<3.7
2,3,4,6,7,8-HxCDF	3.15	4.85	2.38	<4.5	<2.7
1,2,3,7,8,9-HxCDF	<2.4	<1.1	<2.2	<5.2	<1.7
1,2,3,4,6,7,8-HpCDF	17.6	22.7	<18	<28	27.5
1,2,3,4,7,8,9-HpCDF	3.87	<1.5	<2.4	<2.7	<3.3
OCDF	<24	27.2	<21	27.0	51.4
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	98	97	93	95	97
13C12-1,2,3,4,7,8-HxCDD	88	92	94	88	95
13C12-2,3,4,7,8-PeCDF	109	107	116	113	113
13C12-1,2,3,4,7,8-HxCDF	94	98	88	91	98
13C12-1,2,3,4,7,8,9-HpCDF	89	96	103	101	85
Extraction Standards					
13C12-2,3,7,8-TCDD	71	78	85	72	76
13C12-1,2,3,7,8-PeCDD	64	73	86	68	62
13C12-1,2,3,6,7,8-HxCDD	92	93	100	88	95
13C12-1,2,3,4,6,7,8-HpCDD	58	67	88	65	60
13C12-OCDD	49	63	101	63	45
13C12-2,3,7,8-TCDF	77	85	91	77	90
13C12-1,2,3,7,8-PeCDF	69	79	85	70	69
13C12-1,2,3,6,7,8-HxCDF	99	97	106	91	107
13C12-1,2,3,4,6,7,8-HpCDF	68	75	93	67	70
Cleanup Standard					
13C12-1,2,3,7,8,9-HxCDF	71	72	81	71	76
Homologue Group Totals	**pg**	**pg**	**pg**	**pg**	**pg**
Total-TCDD	13.4	14.5	<3.1	18.7	14.8
Total-PeCDD	41.0	8.78	23.4	12.4	69.7
Total-HxCDD	59.1	39.3	51.4	67.3	90.6
Total-HpCDD	521	159	474	557	672
Total-TCDF	39.4	126	15.2	14.9	142
Total-PeCDF	16.3	43.0	14.0	8.47	68.2
Total-HxCDF	5.38	23.8	15.7	<5.2	23.9
Total-HpCDF	21.4	22.7	10.7	<2.7	53.2
Toxic Equivalency - (WHO 2005)					
Lower Bound PCDD/F TEQ (WHO 2005)	11.1	5.55	12.7	3.36	16.7
Mid Point PCDD/F TEQ (WHO 2005)	15.4	9.57	16.7	14.8	19.8
Upper Bound PCDD/F TEQ (WHO 2005)	16.7	10.4	18.6	18.4	20.6

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Quality Control Summary Report

Sample Name	Method Blank	Method Blank	Laboratory Control Sample
ALS Sample ID	WG3463499-1	WG3463499-4	WG3463499-2
Sample Size	1	1	1
Sample size units	sample	sample	sample
Percent Moisture	n/a	n/a	n/a
Sample Matrix	MEDIA	REAGENT	MEDIA
Sampling Date	n/a	n/a	n/a
Extraction Date	23-Dec-21	23-Dec-21	23-Dec-21
Target Analytes	**pg**	**pg**	**% Rec**
2,3,7,8-TCDD	<2.9	<3.2	90
1,2,3,7,8-PeCDD	<1.7	<1.7	105
1,2,3,4,7,8-HxCDD	<1.0	<1.5	102
1,2,3,6,7,8-HxCDD	<0.90	<1.3	100
1,2,3,7,8,9-HxCDD	<0.98	<1.4	103
1,2,3,4,6,7,8-HpCDD	<2.5	<2.2	98
OCDD	30.6	<10	110
2,3,7,8-TCDF	<2.1	<2.3	91
1,2,3,7,8-PeCDF	<1.0	<1.0	90
2,3,4,7,8-PeCDF	<0.93	<0.94	82
1,2,3,4,7,8-HxCDF	<0.85	<0.93	90
1,2,3,6,7,8-HxCDF	<0.81	<0.89	95
2,3,4,6,7,8-HxCDF	<0.89	<0.98	86
1,2,3,7,8,9-HxCDF	<1.0	<1.1	86
1,2,3,4,6,7,8-HpCDF	<2.2	<0.85	89
1,2,3,4,7,8,9-HpCDF	<2.9	<1.1	92
OCDF	<3.0	<3.7	79
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	NS	NS	NS
13C12-1,2,3,4,7,8-HxCDD	NS	NS	NS
13C12-2,3,4,7,8-PeCDF	NS	NS	NS
13C12-1,2,3,4,7,8-HxCDF	NS	NS	NS
13C12-1,2,3,4,7,8,9-HpCDF	NS	NS	NS
Extraction Standards			
13C12-2,3,7,8-TCDD	68	53	52
13C12-1,2,3,7,8-PeCDD	69	67	53
13C12-1,2,3,6,7,8-HxCDD	68	67	56
13C12-1,2,3,4,6,7,8-HpCDD	73	72	54
13C12-OCDD	73	69	59
13C12-2,3,7,8-TCDF	70	60	56
13C12-1,2,3,7,8-PeCDF	72	63	50
13C12-1,2,3,6,7,8-HxCDF	72	71	56
13C12-1,2,3,4,6,7,8-HpCDF	77	78	53
Cleanup Standard			
13C12-1,2,3,7,8,9-HxCDF	70	61	54
Homologue Group Totals	**pg**	**pg**	
Total-TCDD	<2.9	<3.2	
Total-PeCDD	<1.7	<1.7	
Total-HxCDD	<1.0	<1.5	
Total-HpCDD	<2.5	<2.2	
Total-TCDF	<2.1	<2.3	
Total-PeCDF	<1.0	<1.0	
Total-HxCDF	<1.0	<1.1	
Total-HpCDF	<2.9	<1.1	
Toxic Equivalency - (WHO 2005)			
Lower Bound PCDD/F TEQ (WHO 2005)	0.00918	0.00	
Mid Point PCDD/F TEQ (WHO 2005)	2.93	3.15	
Upper Bound PCDD/F TEQ (WHO 2005)	5.85	6.30	

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Continuing Calibration Summary Report

Sample Name	CVS	CCV	CCV	CCV	CCV	CCV	CCV
ALS Sample ID	H7-20-RS1-1209	H7-21-CCV-	H7-21-CCV-	H7-21-CCV-	H7-21-CCV-	H7-21-CCV-	H7-21-CCV-
Sample Size	1	1	1	1	1	1	1
Sample size units	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	QC	QC	QC	QC	QC	QC	QC
Sampling Date	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Extraction Date	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Target Analytes	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
2,3,7,8-TCDD	90	94	102	101	103	100	98
1,2,3,7,8-PeCDD	106	103	105	109	110	104	106
1,2,3,4,7,8-HxCDD	101	100	110	103	93	103	105
1,2,3,6,7,8-HxCDD	94	97	99	118	104	109	113
1,2,3,7,8,9-HxCDD	102	102	106	120	103	116	112
1,2,3,4,6,7,8-HpCDD	98	100	104	111	112	107	105
OCDD	100	106	109	116	119	108	110
2,3,7,8-TCDF	100	100	102	105	108	118	106
1,2,3,7,8-PeCDF	106	89	91	98	97	95	99
2,3,4,7,8-PeCDF	98	90	91	94	96	96	96
1,2,3,4,7,8-HxCDF	100	89	94	96	96	101	102
1,2,3,6,7,8-HxCDF	101	90	91	101	102	103	105
2,3,4,6,7,8-HxCDF	100	90	94	101	102	107	107
1,2,3,7,8,9-HxCDF	109	93	92	95	90	106	107
1,2,3,4,6,7,8-HpCDF	101	93	98	107	108	104	103
1,2,3,4,7,8,9-HpCDF	108	99	99	103	102	111	111
OCDF	102	85	88	101	104	100	102
Field Spike Standards	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**	**% Rec**
37Cl4-2,3,7,8-TCDD	107	90	91	91	92	91	90
13C12-1,2,3,4,7,8-HxCDD	104	103	105	105	82	93	101
13C12-2,3,4,7,8-PeCDF	100	101	99	98	99	98	99
13C12-1,2,3,4,7,8-HxCDF	102	101	102	95	96	100	99
13C12-1,2,3,4,7,8,9-HpCDF	102	99	103	96	93	108	105
Extraction Standards							
13C12-2,3,7,8-TCDD	101	104	105	104	104	103	106
13C12-1,2,3,7,8-PeCDD	94	95	99	94	89	94	97
13C12-1,2,3,6,7,8-HxCDD	94	96	96	95	107	99	98
13C12-1,2,3,4,6,7,8-HpCDD	102	104	107	99	94	115	116
13C12-OCDD	105	127	120	109	101	165	150
13C12-2,3,7,8-TCDF	97	97	105	108	109	101	105
13C12-1,2,3,7,8-PeCDF	93	95	105	106	103	101	104
13C12-1,2,3,6,7,8-HxCDF	93	92	99	108	111	103	106
13C12-1,2,3,4,6,7,8-HpCDF	95	94	101	102	99	113	115
Cleanup Standard							
13C12-1,2,3,7,8,9-HxCDF	95	96	101	104	99	108	111

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Sample Analysis Report

Sample Name	**SITE 1 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	Sampling Date	n/a		Approved:
ALS Sample ID	L2541483-1	Extraction Date	23-Dec-21		*N Ashtari*
Analysis Method	TO9A	Sample Size	1	Sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		28-Jan-2021
Sample Matrix	PUF	Split Ratio	4		

Run Information	**Run 1**
Filename	7-210122A05
Run Date	22-Jan-21 12:43
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	27.66	<2.1	2.1	U	2.0	20
1,2,3,7,8-PeCDD	1	32.07	6.81	1.7	J		100
1,2,3,4,7,8-HxCDD	0.1	34.16	<6.0	4.2	M,J,R	6.0	100
1,2,3,6,7,8-HxCDD	0.1	34.22	<9.0	3.7	M,J,R	9.0	100
1,2,3,7,8,9-HxCDD	0.1	34.35	<11	4.0	M,J,R	11	100
1,2,3,4,6,7,8-HpCDD	0.01	35.81	202	2.3			100
OCDD	0.0003	37.26	1160	4.7			200
2,3,7,8-TCDF	0.1	26.68	<2.7	2.7	M,U	2.4	20
1,2,3,7,8-PeCDF	0.03	31.10	2.99	1.9	M,J		100
2,3,4,7,8-PeCDF	0.3	31.76	3.73	1.8	M,J		100
1,2,3,4,7,8-HxCDF	0.1	33.67	<3.1	2.0	M,J,R	3.1	100
1,2,3,6,7,8-HxCDF	0.1	33.73	2.23	1.9	J		100
2,3,4,6,7,8-HxCDF	0.1	34.07	3.15	2.1	J		100
1,2,3,7,8,9-HxCDF	0.1	34.49	<2.4	2.4	M,U	0.89	100
1,2,3,4,6,7,8-HpCDF	0.01	35.25	17.6	0.90	J		100
1,2,3,4,7,8,9-HpCDF	0.01	36.05	3.87	1.2	J		100
OCDF	0.0003	37.36	<24	4.2	J,R	24	200

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1800	27.66	98	70-130
13C12-1,2,3,4,7,8-HxCDD	18000	34.15	88	70-130
13C12-2,3,4,7,8-PeCDF	18000	31.84	109	70-130
13C12-1,2,3,4,7,8-HxCDF	18000	33.66	94	70-130
13C12-1,2,3,4,7,8,9-HpCDF	18000	36.05	89	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	4000	27.64	71	40-130
13C12-1,2,3,7,8-PeCDD	4000	32.06	64	40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.21	92	40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.80	58	25-130
13C12-OCDD	8000	37.26	49	25-130
13C12-2,3,7,8-TCDF	4000	26.72	77	40-130
13C12-1,2,3,7,8-PeCDF	4000	31.07	69	40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.72	99	40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.25	68	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	4000	34.48	71	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	3	13.4	2.1	20
Total-PeCDD	5	41.0	1.7	100
Total-HxCDD	2	59.1	4.2	100
Total-HpCDD	2	521	2.3	100
Total-TCDF	6	39.4	2.7	20
Total-PeCDF	4	16.3	1.9	100
Total-HxCDF	2	5.38	2.4	100
Total-HpCDF	2	21.4	1.2	100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	11.1
Mid Point PCDD/F TEQ (WHO 2005)	15.4
Upper Bound PCDD/F TEQ (WHO 2005)	16.7

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	**SITE 2 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	Sampling Date	n/a		
ALS Sample ID	L2541483-2	Extraction Date	23-Dec-21		Approved:
Analysis Method	TO9A	Sample Size	1	Sample	*N Ashtari*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	PUF	Split Ratio	4		28-Jan-2021

Run Information	**Run 1**
Filename	7-210122A06
Run Date	22-Jan-21 13:25
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<1.5	1.5	U		20
1,2,3,7,8-PeCDD	1	32.09	<2.2	0.93	M,J,R	2.2	100
1,2,3,4,7,8-HxCDD	0.1	34.16	2.92	2.3	J		100
1,2,3,6,7,8-HxCDD	0.1	34.23	<5.5	2.0	J,R	5.5	100
1,2,3,7,8,9-HxCDD	0.1	34.36	4.18	2.2	J		100
1,2,3,4,6,7,8-HpCDD	0.01	35.82	74.5	1.3	J		100
OCDD	0.0003	37.28	578	2.5			200
2,3,7,8-TCDF	0.1	26.77	6.28	1.8	M,J		20
1,2,3,7,8-PeCDF	0.03	31.11	4.29	1.9	M,J		100
2,3,4,7,8-PeCDF	0.3	31.85	6.80	1.7	J		100
1,2,3,4,7,8-HxCDF	0.1	33.68	<4.5	0.93	J,R	4.5	100
1,2,3,6,7,8-HxCDF	0.1	33.74	4.02	0.89	J		100
2,3,4,6,7,8-HxCDF	0.1	34.08	4.85	0.98	J		100
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<1.1	1.1	U		100
1,2,3,4,6,7,8-HpCDF	0.01	35.26	22.7	1.0	J		100
1,2,3,4,7,8,9-HpCDF	0.01	36.06	<1.5	1.3	M,J,R	1.5	100
OCDF	0.0003	37.36	27.2	1.7	J		200
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	1800	27.67	97	70-130			
13C12-1,2,3,4,7,8-HxCDD	18000	34.16	92	70-130			
13C12-2,3,4,7,8-PeCDF	18000	31.85	107	70-130			
13C12-1,2,3,4,7,8-HxCDF	18000	33.67	98	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	18000	36.05	96	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	4000	27.64	78	40-130			
13C12-1,2,3,7,8-PeCDD	4000	32.07	73	40-130			
13C12-1,2,3,6,7,8-HxCDD	4000	34.22	93	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.81	67	25-130			
13C12-OCDD	8000	37.27	63	25-130			
13C12-2,3,7,8-TCDF	4000	26.74	85	40-130			
13C12-1,2,3,7,8-PeCDF	4000	31.09	79	40-130			
13C12-1,2,3,6,7,8-HxCDF	4000	33.73	97	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.26	75	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	4000	34.49	72	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	2	14.5	1.5	20
Total-PeCDD	2	8.78	0.93	100
Total-HxCDD	5	39.3	2.3	100
Total-HpCDD	2	159	1.3	100
Total-TCDF	10	126	1.8	20
Total-PeCDF	6	43.0	1.9	100
Total-HxCDF	3	23.8	1.1	100
Total-HpCDF	1	22.7	1.3	100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	5.55
Mid Point PCDD/F TEQ (WHO 2005)	9.57
Upper Bound PCDD/F TEQ (WHO 2005)	10.4

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**SITE 3 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	Sampling Date	n/a		
ALS Sample ID	L2541483-3	Extraction Date	23-Dec-21		Approved:
Analysis Method	TO9A	Sample Size	1	Sample	*N Ashtari*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	PUF	Split Ratio	4		28-Jan-2021

Run Information	**Run 1**
Filename	7-210127A09
Run Date	27-Jan-21 22:40
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.1	3.1	U		20
1,2,3,7,8-PeCDD	1	32.06	7.75	2.4	J		100
1,2,3,4,7,8-HxCDD	0.1	34.15	8.00	2.2	M,J		100
1,2,3,6,7,8-HxCDD	0.1	34.20	<6.5	1.9	M,J,R	6.5	100
1,2,3,7,8,9-HxCDD	0.1	34.32	<6.7	2.1	M,J,R	6.7	100
1,2,3,4,6,7,8-HpCDD	0.01	35.79	189	4.2			100
OCDD	0.0003	37.24	889	5.7			200
2,3,7,8-TCDF	0.1	26.75	<4.1	4.1	M,U	2.2	20
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.6	4.6	U		100
2,3,4,7,8-PeCDF	0.3	31.75	5.85	4.2	J		100
1,2,3,4,7,8-HxCDF	0.1	33.66	<3.4	1.8	M,J,R	3.4	100
1,2,3,6,7,8-HxCDF	0.1	33.72	<2.1	1.8	M,J,R	2.1	100
2,3,4,6,7,8-HxCDF	0.1	34.06	2.38	1.9	M,J		100
1,2,3,7,8,9-HxCDF	0.1	34.47	<2.2	2.2	M,U		100
1,2,3,4,6,7,8-HpCDF	0.01	35.24	<18	1.8	M,J,R	18	100
1,2,3,4,7,8,9-HpCDF	0.01	36.04	<2.4	2.4	M,U	2.2	100
OCDF	0.0003	37.32	<21	1.7	M,J,R	21	200
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	1800	27.66	93	70-130			
13C12-1,2,3,4,7,8-HxCDD	18000	34.14	94	70-130			
13C12-2,3,4,7,8-PeCDF	18000	31.83	116	70-130			
13C12-1,2,3,4,7,8-HxCDF	18000	33.65	88	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	18000	36.03	103	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	4000	27.63	85	40-130			
13C12-1,2,3,7,8-PeCDD	4000	32.05	86	40-130			
13C12-1,2,3,6,7,8-HxCDD	4000	34.20	100	40-130	R		
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.79	88	25-130			
13C12-OCDD	8000	37.24	101	25-130			
13C12-2,3,7,8-TCDF	4000	26.72	91	40-130			
13C12-1,2,3,7,8-PeCDF	4000	31.07	85	40-130			
13C12-1,2,3,6,7,8-HxCDF	4000	33.72	106	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.23	93	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	4000	34.47	81	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<3.1	3.1	U	20
Total-PeCDD	3	23.4	2.4		100
Total-HxCDD	2	51.4	2.2		100
Total-HpCDD	2	474	4.2		100
Total-TCDF	3	15.2	4.1		20
Total-PeCDF	3	14.0	4.6		100
Total-HxCDF	3	15.7	2.2		100
Total-HpCDF	1	10.7	2.4		100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	12.7
Mid Point PCDD/F TEQ (WHO 2005)	16.7
Upper Bound PCDD/F TEQ (WHO 2005)	18.6

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**SITE 4 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	Sampling Date	n/a		
ALS Sample ID	L2541483-4	Extraction Date	23-Dec-21		Approved:
Analysis Method	TO9A	Sample Size	1	Sample	*N Ashtari*
Analysis Type	Sample	Percent Moisture	n/a		--e-signature--
Sample Matrix	PUF	Split Ratio	4		28-Jan-2021

Run Information	**Run 1**
Filename	7-210127A10
Run Date	27-Jan-21 23:22
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.4	3.4	U		20
1,2,3,7,8-PeCDD	1	32.07	<6.2	3.1	M,J,R	6.2	100
1,2,3,4,7,8-HxCDD	0.1	34.15	<4.9	4.9	M,U	3.8	100
1,2,3,6,7,8-HxCDD	0.1	34.20	6.78	4.3	M,J		100
1,2,3,7,8,9-HxCDD	0.1	34.33	<13	4.7	M,J,R	13	100
1,2,3,4,6,7,8-HpCDD	0.01	35.79	236	7.5			100
OCDD	0.0003	37.24	1040	8.1			200
2,3,7,8-TCDF	0.1	NotFnd	<2.8	2.8	U		20
1,2,3,7,8-PeCDF	0.03	NotFnd	<4.1	4.1	U		100
2,3,4,7,8-PeCDF	0.3	31.84	<3.8	3.8	M,U	2.7	100
1,2,3,4,7,8-HxCDF	0.1	33.66	<4.3	4.3	M,U	2.6	100
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<4.1	4.1	U		100
2,3,4,6,7,8-HxCDF	0.1	34.06	<4.5	4.5	M,U	4.4	100
1,2,3,7,8,9-HxCDF	0.1	34.49	<5.2	5.2	M,U	1.1	100
1,2,3,4,6,7,8-HpCDF	0.01	35.24	<28	2.1	J,R	28	100
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.7	2.7	U		100
OCDF	0.0003	37.33	27.0	14	J		200
Field Spike Standards	**pg**		**% Rec**	**Limits**			
37Cl4-2,3,7,8-TCDD	1800	27.66	95	70-130			
13C12-1,2,3,4,7,8-HxCDD	18000	34.14	88	70-130			
13C12-2,3,4,7,8-PeCDF	18000	31.83	113	70-130			
13C12-1,2,3,4,7,8-HxCDF	18000	33.65	91	70-130			
13C12-1,2,3,4,7,8,9-HpCDF	18000	36.03	101	70-130			
Extraction Standards							
13C12-2,3,7,8-TCDD	4000	27.63	72	40-130			
13C12-1,2,3,7,8-PeCDD	4000	32.05	68	40-130			
13C12-1,2,3,6,7,8-HxCDD	4000	34.20	88	40-130			
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.79	65	25-130			
13C12-OCDD	8000	37.23	63	25-130			
13C12-2,3,7,8-TCDF	4000	26.72	77	40-130			
13C12-1,2,3,7,8-PeCDF	4000	31.06	70	40-130			
13C12-1,2,3,6,7,8-HxCDF	4000	33.71	91	40-130			
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.23	67	25-130			
Cleanup Standard	**pg**						
13C12-1,2,3,7,8,9-HxCDF	4000	34.47	71	40-130			

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		**LQL**
Total-TCDD	3	18.7	3.4		20
Total-PeCDD	1	12.4	3.1		100
Total-HxCDD	2	67.3	4.9		100
Total-HpCDD	2	557	7.5		100
Total-TCDF	4	14.9	2.8		20
Total-PeCDF	2	8.47	4.1		100
Total-HxCDF	0	<5.2	5.2	U	100
Total-HpCDF	0	<2.7	2.7	U	100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	3.36
Mid Point PCDD/F TEQ (WHO 2005)	14.8
Upper Bound PCDD/F TEQ (WHO 2005)	18.4

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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Sample Analysis Report

Sample Name	**SITE 5 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)**	Sampling Date	n/a		Approved:
ALS Sample ID	L2541483-5	Extraction Date	23-Dec-21		*N Ashtari*
Analysis Method	TO9A	Sample Size	1	Sample	--e-signature--
Analysis Type	Sample	Percent Moisture	n/a		28-Jan-2021
Sample Matrix	PUF	Split Ratio	4		

Run Information	**Run 1**
Filename	7-210122A07
Run Date	22-Jan-21 14:07
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<1.5	1.5	U		20
1,2,3,7,8-PeCDD	1	32.08	8.13	1.2	J		100
1,2,3,4,7,8-HxCDD	0.1	34.18	<9.4	2.8	M,J,R	9.4	100
1,2,3,6,7,8-HxCDD	0.1	34.23	12.5	2.5	M,J		100
1,2,3,7,8,9-HxCDD	0.1	34.35	16.0	2.7	M,J		100
1,2,3,4,6,7,8-HpCDD	0.01	35.82	272	2.6			100
OCDD	0.0003	37.27	1770	7.0			200
2,3,7,8-TCDF	0.1	26.75	5.77	1.1	M,J		20
1,2,3,7,8-PeCDF	0.03	31.11	<3.1	2.7	M,J,R	3.1	100
2,3,4,7,8-PeCDF	0.3	31.85	5.38	2.5	M,J		100
1,2,3,4,7,8-HxCDF	0.1	33.68	<5.0	1.4	M,J,R	5.0	100
1,2,3,6,7,8-HxCDF	0.1	33.74	<3.7	1.3	J,R	3.7	100
2,3,4,6,7,8-HxCDF	0.1	34.08	<2.7	1.5	J,R	2.7	100
1,2,3,7,8,9-HxCDF	0.1	34.50	<1.7	1.7	M,U	1.5	100
1,2,3,4,6,7,8-HpCDF	0.01	35.26	27.5	1.1	J		100
1,2,3,4,7,8,9-HpCDF	0.01	36.08	<3.3	1.4	M,J,R	3.3	100
OCDF	0.0003	37.36	51.4	2.2	J		200

Field Spike Standards	**pg**		**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	1800	27.67	97	70-130
13C12-1,2,3,4,7,8-HxCDD	18000	34.16	95	70-130
13C12-2,3,4,7,8-PeCDF	18000	31.85	113	70-130
13C12-1,2,3,4,7,8-HxCDF	18000	33.67	98	70-130
13C12-1,2,3,4,7,8,9-HpCDF	18000	36.05	85	70-130
Extraction Standards				
13C12-2,3,7,8-TCDD	4000	27.64	76	40-130
13C12-1,2,3,7,8-PeCDD	4000	32.07	62	40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.22	95	40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.81	60	25-130
13C12-OCDD	8000	37.27	45	25-130
13C12-2,3,7,8-TCDF	4000	26.74	90	40-130
13C12-1,2,3,7,8-PeCDF	4000	31.09	69	40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.73	107	40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.25	70	25-130
Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	4000	34.49	76	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**	
Total-TCDD	3	14.8	1.5	20
Total-PeCDD	6	69.7	1.2	100
Total-HxCDD	4	90.6	2.8	100
Total-HpCDD	2	672	2.6	100
Total-TCDF	12	142	1.1	20
Total-PeCDF	8	68.2	2.7	100
Total-HxCDF	2	23.9	1.7	100
Total-HpCDF	2	53.2	1.4	100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	16.7
Mid Point PCDD/F TEQ (WHO 2005)	19.8
Upper Bound PCDD/F TEQ (WHO 2005)	20.6

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure

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SVOC DATA PACKAGE

SECTION 3: METHOD SUMMARY

PCDD/F METHOD SUMMARY
Methods 23/0023A/1613B/8290/TO-9A

Introduction:

This summary is to provide ALSE Burlington PCDD/F method details in order to provide persons reviewing or validating this data package sufficient information to re-construct the sample calculation, data verification and review. It incorporates the analysis of PCDD/F via the following reference methods:

US EPA Office of Water, Method 1613B
US EPA Office of Solid Waste, SW846 Methods 8290A and 0023/8290A
US EPA Office of Research & Development Method TO-9A.
US EPA Office of Air Quality Planning & Standards Method 23.

Any deviations to what is listed herein would be listed in the project narrative.

To avoid the confusion and conflicting nomenclature within the methods, we have defined the labeled standards in terms relating to the time of addition to the sample or extract. Therefore;

The Field or Sampling Standards are added prior to field sampling
The Extraction Standards are added prior to extraction
The Clean-up Standards are added prior to extract clean-up
The Injection Standards are added prior to extract injection.

Calibration Standard Levels:

Six levels of standard are available for calibration as listed in Table 1. The low point (the CS0) is below method requirements and therefore is optional.

Table 1: Calibration Standards

		CS0	CS1	CS2	CS3	CS4	CS5
Natives	2,3,7,8-TCDD	0.1	0.5	2	10	40	200
	2,3,7,8-TCDF	0.1	0.5	2	10	40	200
	1,2,3,7,8-PeCDD	0.5	2.5	10	50	200	1000
	1,2,3,7,8-PeCDF	0.5	2.5	10	50	200	1000
	2,3,4,7,8-PeCDF	0.5	2.5	10	50	200	1000
	1,2,3,4,7,8-HxCDD	0.5	2.5	10	50	200	1000
	1,2,3,6,7,8-HxCDD	0.5	2.5	10	50	200	1000
	1,2,3,7,8,9-HxCDD	0.5	2.5	10	50	200	1000
	1,2,3,4,7,8-HxCDF	0.5	2.5	10	50	200	1000
	1,2,3,6,7,8-HxCDF	0.5	2.5	10	50	200	1000
	1,2,3,7,8,9-HxCDF	0.5	2.5	10	50	200	1000
	2,3,4,6,7,8-HxCDF	0.5	2.5	10	50	200	1000
	1,2,3,4,6,7,8-HpCDD	0.5	2.5	10	50	200	1000
	1,2,3,4,6,7,8-HpCDF	0.5	2.5	10	50	200	1000
	1,2,3,4,7,8,9-HpCDF	0.5	2.5	10	50	200	1000
	OCDD	1	5	20	100	400	2000
	OCDF	1	5	20	100	400	2000
Labeled	2,3,7,8-TCDD-$^{13}C_{12}$	100	100	100	100	100	100
	2,3,7,8-TCDF-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,7,8-PeCDD-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,7,8-PeCDF-$^{13}C_{12}$	100	100	100	100	100	100
	2,3,4,7,8-PeCDF-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	100	100	100	100	100	100
	2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	100	100	100	100	100	100
	OCDD-$^{13}C_{12}$	200	200	200	200	200	200
	2,3,7,8-TCDD-$^{37}Cl_4$	0.1	0.5	2	10	40	200
Injection	1,2,3,4-TCDD-$^{13}C_{12}$	100	100	100	100	100	100
	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	100	100	100	100	100	100

Calibration Control Limits

The initial and continuing calibration control limits for all methods are presented in Table 2 below. For the initial calibration CS1 and for each calibration verification CS3, the signal to noise ratio for each quantification ion for labelled and non-labelled analytes must be greater than or equal to 10:1

Table 2: Calibration Control Limits

	1613B		M23 & TO-9A		8290A	
	Initial Cal.	Cal. Ver.	Initial Cal.	Cal. Ver.	Initial Cal.	Cal. Ver.
	%RSD	ng/mL	%RSD	% Diff	%RSD	% Diff
Natives						
2,3,7,8-TCDD	20	7.8-12.9	25	25	20	20*
2,3,7,8-TCDF	20	8.4-12.0	25	25	20	20*
1,2,3,7,8-PeCDD	20	39-65	25	25	20	20*
1,2,3,7,8-PeCDF	20	41-60	25	25	20	20*
2,3,4,7,8-PeCDF	20	41-61	25	25	20	20*
1,2,3,4,7,8-HxCDD	20	39-64	25	25	20	20*
1,2,3,6,7,8-HxCDD	20	39-64	25	25	20	20*
1,2,3,7,8,9-HxCDD	35	41-61	25	25	20	20*
1,2,3,4,7,8-HxCDF	20	45-56	25	25	20	20*
1,2,3,6,7,8-HxCDF	20	44-57	25	25	20	20*
1,2,3,7,8,9-HxCDF	20	45-56	25	25	20	20*
2,3,4,6,7,8-HxCDF	20	44-57	25	25	20	20*
1,2,3,4,6,7,8-HpCDD	20	43-58	25	25	20	20*
1,2,3,4,6,7,8-HpCDF	20	45-55	25	25	20	20*
1,2,3,4,7,8,9-HpCDF	20	43-58	25	25	20	20*
OCDD	20	79-126	25	25	20	20*
OCDF	35	63-159	30	30	20	20*
Labels						
2,3,7,8-TCDD-$^{13}C_{12}$	35	82-121	25	25	30	30**
2,3,7,8-TCDF-$^{13}C_{12}$	35	71-140	30	30	30	30**
1,2,3,7,8-PeCDD-$^{13}C_{12}$	35	62-160	30	30	30	30**
1,2,3,7,8-PeCDF-$^{13}C_{12}$	35	76-130	30	30	30	30**
2,3,4,7,8-PeCDF-$^{13}C_{12}$	35	77-130	25	25	30	30**
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	35	85-117	25	25	30	30**
1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	35	85-118	25	25	30	30**
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	35	76-131	25	25	30	30**
1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	35	70-143	30	30	30	30**
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	35	74-135	-	-	-	-
2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	35	73-137	30	30	30	30**
1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	35	72-138	30	30	30	30**
1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	35	78-129	30	30	30	30**
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	35	77-129	25	25	30	30**
OCDD-$^{13}C_{12}$	35	96-415	30	30	30	30**
2,3,7,8-TCDD-$^{37}Cl_4$	35	7.9-12.7	25	25	30	30**

* 25% is allowed for a post-run verification but when the value is above 20%, then the analyte quantification must be as per 8290A Section 8.3.2.4 and corrective action is required before more samples can be analyzed.
**35% is allowed for a post-run verification but when the value is above 30%, then the analyte quantification must be as per 8290A Section 8.3.2.4 and corrective action is required before more samples can be analyzed.

LCS Criteria:

The laboratory control sample (LCS) or the On-Going Precision and Accuracy (OPR) recovery criteria are listed in Table 3

Table 3: Acceptance Criteria for IPR and OPR[a]

	Test Conc.	IPR		OPR
		s[b]	X[c]	
	ng/L	ng/L	ng/L	ng/L
Natives				
2,3,7,8-TCDD	10	2.8	8.3-12.9	6.7-15.8
2,3,7,8-TCDF	10	2	8.7-13.7	7.5-15.8
1,2,3,7,8-PeCDD	50	7.5	38-66	35-71
1,2,3,7,8-PeCDF	50	7.5	43-62	40-67
2,3,4,7,8-PeCDF	50	8.6	36-75	34-80
1,2,3,4,7,8-HxCDD	50	9.4	39-76	35-82
1,2,3,6,7,8-HxCDD	50	7.7	42-62	38-67
1,2,3,7,8,9-HxCDD	50	11.1	37-71	32-81
1,2,3,4,7,8-HxCDF	50	8.7	41-59	36-67
1,2,3,6,7,8-HxCDF	50	6.7	46-60	42-65
1,2,3,7,8,9-HxCDF	50	6.4	42-61	39-65
2,3,4,6,7,8-HxCDF	50	7.4	37-74	35-78
1,2,3,4,6,7,8-HpCDD	50	7.7	38-65	35-70
1,2,3,4,6,7,8-HpCDF	50	6.3	45-56	41-61
1,2,3,4,7,8,9-HpCDF	50	8.1	43-63	39-69
OCDD	100	19	89-127	78-144
OCDF	100	27	74-146	63-170
Labels				
2,3,7,8-TCDD-$^{13}C_{12}$	100	37	28-134	20-175
2,3,7,8-TCDF-$^{13}C_{12}$	100	35	31-113	22-152
1,2,3,7,8-PeCDD-$^{13}C_{12}$	100	39	27-184	21-227
1,2,3,7,8-PeCDF-$^{13}C_{12}$	100	34	27-156	21-192
2,3,4,7,8-PeCDF-$^{13}C_{12}$	100	38	16-297	13-328
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	100	41	29-147	21-193
1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	100	38	34-122	25-163
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	100	43	27-152	19-202
1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	100	35	30-122	21-159
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	100	40	24-157	17-205
2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	100	37	29-136	22-176
1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	100	35	34-129	26-166
1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	100	41	32-110	21-158
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	100	40	28-141	20-186
OCDD-$^{13}C_{12}$	200	95	41-276	26-397
2,3,7,8-TCDD-$^{37}Cl_4$	10	3.6	3.9-15.4	3.1-19.1

[a] Assuming a final volume of 20uL
[b] s = standard deviation
[c] X = Average Concentration

Extraction/Clean-up & Sampling Standard Recovery Limts:

Table 4: Extraction, Clean-up, Injection & Sampling Standard Recovery Limits

	1613B or 8290A (non Stack)		M23 or 0023A/8290A or TO-9A	
	(% Rec.)	Ref.	(% Rec.)	Ref.
Extraction Standard				
2,3,7,8-TCDD-$^{13}C_{12}$	25-164	a	40-130	b
2,3,7,8-TCDF-$^{13}C_{12}$	24-169	a	40-130	b
1,2,3,7,8-PeCDD-$^{13}C_{12}$	25-181	a	40-130	b
1,2,3,7,8-PeCDF-$^{13}C_{12}$	24-185	a	40-130	b
2,3,4,7,8-PeCDF-$^{13}C_{12}$	21-178	a	-	
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	32-141	a	-	
1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	28-130	a	40-130	b
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	26-152	a	-	
1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	26-123	a	40-130	b
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	29-147	a	-	
2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	28-136	a	40-130	c,d
1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	23-140	a	25-130	b
1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	28-143	a	25-130	b
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	26-138	a	-	
OCDD-$^{13}C_{12}$	17-157	a	25-130	b
Clean-up Standard				
2,3,7,8-TCDD-$^{37}Cl_4$	35-197	a	-	
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	-		40-130	b
Injection Standard				
1,2,3,4-TCDD-$^{13}C_{12}$	30-300	d	30-300	d
1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	30-300	d	30-300	d
Sampling Standard				
2,3,7,8-TCDD-$^{37}Cl_4$	-		70-130	b
2,3,4,7,8-PeCDF-$^{13}C_{12}$	-		70-130	b
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	-		70-130	b
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	-		70-130	b
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	-		70-130	b

References & Notes

[a] from OW method 1613B

[b] from OAQPS method 23

[c] this extraction standard is not required in methods 23 and 0023A/8290A

[d] ALS In-house criteria

Reporting Limits:

Unless indicated in the otherwise, the PCDD/F data is reported down to 2.5:1 signal to noise for each isomer grouping for each extract injection. This is consistent to SW846 8290 defined protocols (i.e. EDL or Estimated Detection Limit) and is commonly applied throughout the industry to all the HRMS PCDD/F methods applicable to this method summary.

Method Blank:

The method blank levels must be below the response to the low calibration standard, CS0 or CS1, whichever low calibration point is being applied to the project.

MS/MSD:

The % relative difference between the MS and MSD spike recoveries should be less than or equal to 20%.

Instrument/Run Performance Criteria:

1. Elution windows must be defined by a 'Window Performance Mix' at the beginning of each 12-hour run sequence
2. GC performance criteria of 25% maximum valley between 2,3,7,8-TCDD and it's neared eluting isomers (DB5) or 2,3,7,8-TCDF and it's nearest eluting isomers (DB225).
3. At the beginning of and just following the end of each 12 hour run sequence, the instrument must be checked to demonstrate a resolution of 10,000 for each quantification window.
4. For method 1613B, the relative retention times (RRT) of the compounds in the daily CS3 calibration verification must fall into the ranges presented in Table 4.
5. For all calibrations, QC samples and field samples, the absolute retention time (RT) for 1,2,3,4-TCDD-13C12 must be >25.0 min on a DB5 column and >15.0 min on a DB225 column.
6. The RT in the daily CS3 verification standards must be within 15 seconds of the CS3 in the initial calibration run.
7. The maximum time between scans within a descriptor is 1 second.
8. Lock mass deviations to the average response must be less than or equal 20%.

Laboratory Duplicates:

The % relative difference between duplicates should be less than or equal to 25% but only where the response is greater than the low calibration standard.

Analyte Identification Criteria:

1. Ion ratio must be within 15% of theoretical or within 10% of the most recent CS3.
2. The retention time (RT) of the peak maxima for each pair of quantification ions must be no more than 2 seconds (i.e. 2 scans) difference.
3. The retention time (RT) of the peak maxima of all 2,3,7,8- substituted native analytes must be within -1 to +3 seconds of the RT of corresponding $^{13}C_{12}$-labelled isomer of that injection run.
4. For those native analytes without a corresponding labelled isomer, the relative retention time (RRT) must be within 0.005 of the relative retention time observed in the daily CS3 run.
5. When there is a significant PCDPE interference observed, then a peak in the PCDF channel is not confirmed to be PCDF. [Significant PCDPE interference is identified when there is a PCDPE parent ion peak 10% or more of the response of a peak at the same RT (i.e. within 2 seconds) in the corresponding PCDF channel.]
6. For any peak to be identified as a positive PCDD/F response, that peak must be within the retention time windows defined by the daily analysis of Window Performance Mixture.

Table 4: Quantitation References and Method 1613B RT References and RRT

Analyte	Stack/Ambient Quantitation Reference	Method 1613B RT Reference Solids/ Waters Quantitation Reference	Method 1613B RRT
Compounds using 1,2,3,4-TCDD-$^{13}C_{12}$ as injection standard			
2,3,7,8-TCDF	2,3,7,8-TCDF-$^{13}C_{12}$	2,3,7,8-TCDF-$^{13}C_{12}$	0.999-1.003
2,3,7,8-TCDD	2,3,7,8-TCDD-$^{13}C_{12}$	2,3,7,8-TCDD-$^{13}C_{12}$	0.999-1.002
1,2,3,7,8-PeCDF	1,2,3,7,8-PeCDF-$^{13}C_{12}$	1,2,3,7,8-PeCDF-$^{13}C_{12}$	0.999-1.002
2,3,4,7,8-PeCDF	1,2,3,7,8-PeCDF-$^{13}C_{12}$	2,3,4,7,8-PeCDF-$^{13}C_{12}$	0.999-1.002
1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDD-$^{13}C_{12}$	1,2,3,7,8-PeCDD-$^{13}C_{12}$	0.999-1.002
2,3,7,8-TCDF-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	0.923-1.103
2,3,7,8-TCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	0.976-1.043
2,3,7,8-TCDD-$^{37}Cl_4$	2,3,7,8-TCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	0.989-1.052
1,2,3,7,8-PeCDF-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1.000-1.425
2,3,4,7,8-PeCDF-$^{13}C_{12}$	1,2,3,7,8-PeCDF-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1.011-1.526
1,2,3,7,8-PeCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1,2,3,4-TCDD-$^{13}C_{12}$	1.000-1.567
Compounds using 1,2,3,7,8,9-HxCDD-$^{13}C_{12}$ as injection standard			
1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	0.999-1.001
1,2,3,6,7,8-HxCDF	1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	0.997-1.005
1,2,3,7,8,9-HxCDF	1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	0.999-1.001
2,3,4,6,7,8-HxCDF	2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	0.999-1.001
1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	0.999-1.001
1,2,3,6,7,8-HxCDD	1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	0.998-1.004
1,2,3,7,8,9-HxCDD[a]	1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	[a]	1.000-1.019
1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	0.999-1.001
1,2,3,4,7,8,9-HpCDF	1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	0.999-1.001
1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	0.999-1.001
OCDF	OCDD-$^{13}C_{12}$	OCDD-$^{13}C_{12}$	0.999-1.008
OCDD	OCDD-$^{13}C_{12}$	OCDD-$^{13}C_{12}$	0.999-1.001
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	0.944-0.970
1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	0.949-0.975
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	0.977-1.047
2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	0.959-1.021
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	0.977-1.000
1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	0.981-1.003
1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1.043-1.085
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1.057-1.151
1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1.086-1.110
OCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	1.032-1.311

[a] For solids/waters via 1612B, 1,2,3,7,8,9-HXCDD is quantified against the average responses of 1,2,3,4,7,8-HxCDD-$^{13}C_{12}$ and 1,2,3,6,7,8-HxCDD-$^{13}C_{12}$ while 1,2,3,6,7,8-HxCDD-$^{13}C_{12}$ is the RT reference.

Table 5: HRMS Instrumental Descriptor Parameters

Descriptor	Exact M/Z	M/Z Type	Elemental Composition	Substance	Type	Theoretical Ion Ratio	Ion Ratio QC Limits Upper	Lower
1	303.9016	M	$^{12}C_{12}\ ^{1}H_4\ ^{35}Cl_4\ ^{16}O$	TCDF	Native	0.77	0.65	0.89
	305.8987	M+2	$^{12}C_{12}\ ^{1}H_4\ ^{35}Cl_3\ ^{37}Cl\ ^{16}O$	TCDF	Native			
	315.9419	M	$^{13}C_{12}\ ^{1}H_4\ ^{35}Cl_4\ ^{16}O$	TCDF	^{13}C	0.77	0.65	0.89
	317.9389	M+2	$^{13}C_{12}\ ^{1}H_4\ ^{35}Cl_3\ ^{37}Cl\ ^{16}O$	TCDF	^{13}C			
	316.9824	Lock	$^{12}C_9\ ^{19}F_{11}$	PFK	Lock			
	319.8965	M	$^{12}C_{12}\ ^{1}H_4\ ^{35}Cl_4\ ^{16}O_2$	TCDD	Native	0.77	0.65	0.89
	321.8936	M+2	$^{12}C_{12}\ ^{1}H_4\ ^{35}Cl_3\ ^{37}Cl\ ^{16}O_2$	TCDD	Native			
	327.8847	M+8	$^{12}C_{12}\ ^{1}H_4\ ^{37}Cl_4\ ^{16}O_2$	TCDD	^{37}Cl			
	331.9368	M	$^{13}C_{12}\ ^{1}H_4\ ^{35}Cl_4\ ^{16}O_2$	TCDD	^{13}C	0.77	0.65	0.89
	333.9339	M+2	$^{13}C_{12}\ ^{1}H_4\ ^{35}Cl_3\ ^{37}Cl\ ^{16}O_2$	TCDD	^{13}C			
	339.8597	M+2	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_4\ ^{37}Cl\ ^{16}O$	PeCDF	Native	1.55	1.32	1.78
	341.8568	M+4	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_3\ ^{37}Cl_2\ ^{16}O$	PeCDF	Native			
	351.9	M+2	$^{13}C_{12}\ ^{1}H_3\ ^{35}Cl_4\ ^{37}Cl\ ^{16}O$	PeCDF	^{13}C	1.55	1.32	1.78
	353.897	M+4	$^{13}C_{12}\ ^{1}H_3\ ^{35}Cl_3\ ^{37}Cl_2\ ^{16}O$	PeCDF	^{13}C			
	375.8364	M+2	$^{12}C_{12}\ ^{1}H_4\ ^{35}Cl_5\ ^{37}Cl\ ^{16}O$	HxCDPE	Cl-DPE			
	409.7974	M+2	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_6\ ^{37}Cl\ ^{16}O$	HpCDPE	Cl-DPE			
2	339.8597	M+2	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_4\ ^{37}Cl\ ^{16}O$	PeCDF	Native	1.55	1.32	1.78
	341.8568	M+4	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_3\ ^{37}Cl_2\ ^{16}O$	PeCDF	Native			
	351.9	M+2	$^{13}C_{12}\ ^{1}H_3\ ^{35}Cl_4\ ^{37}Cl\ ^{16}O$	PeCDF	^{13}C	1.55	1.32	1.78
	353.897	M+4	$^{13}C_{12}\ ^{1}H_3\ ^{35}Cl_3\ ^{37}Cl_2\ ^{16}O$	PeCDF	^{13}C			
	353.8576	M	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_5\ ^{16}O_2$	PeCDD	Native	0.63	0.54	0.72
	355.8546	M+2	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_4\ ^{37}Cl\ ^{16}O_2$	PeCDD	Native			
	366.9792	Lock	$^{12}C_{10}\ ^{19}F_{13}$	PFK	Lock			
	365.8978	M	$^{13}C_{12}\ ^{1}H_3\ ^{35}Cl_5\ ^{16}O_2$	PeCDD	^{13}C	0.63	0.54	0.72
	367.8949	M+2	$^{13}C_{12}\ ^{1}H_3\ ^{35}Cl_4\ ^{37}\ Cl\ ^{16}O_2$	PeCDD	^{13}C			
	409.7974	M+2	$^{12}C_{12}\ ^{1}H_3\ ^{35}Cl_6\ ^{37}Cl\ ^{16}O$	HpCDPE	Cl-DPE			
3	373.8207	M+2	$^{12}C_{12}\ ^{1}H_2\ ^{35}Cl_5\ ^{37}Cl\ ^{16}O$	HxCDF	Native	1.24	1.05	1.43
	375.8178	M+4	$^{12}C_{12}\ ^{1}H_2\ ^{35}Cl_4\ ^{37}Cl_2\ ^{16}O$	HxCDF	Native			
	380.976	Lock	$^{12}C_8\ ^{19}F_5$	PFK	Lock			
	383.8639	M	$^{13}C_{12}\ ^{1}H_2\ ^{35}Cl_6\ ^{16}O$	HxCDF	^{13}C	0.51	0.43	0.59
	385.861	M+2	$^{13}C_{12}\ ^{1}H_2\ ^{35}Cl_5\ ^{37}Cl\ ^{16}O$	HxCDF	^{13}C			
	389.8156	M+2	$^{12}C_{12}\ ^{1}H_2\ ^{35}Cl_5\ ^{37}Cl\ ^{16}O_2$	HxCDD	Native	1.24	1.05	1.43
	391.8127	M+4	$^{12}C_{12}\ ^{1}H_2\ ^{35}Cl_4\ ^{37}Cl_2\ ^{16}O_2$	HxCDD	Native			
	401.8559	M+2	$^{13}C_{12}\ ^{1}H_2\ ^{35}Cl_5\ ^{37}Cl\ ^{16}O_2$	HxCDD	^{13}C	1.24	1.05	1.43
	403.853	M+4	$^{13}C_{12}\ ^{1}H_2\ ^{35}Cl_4\ ^{37}Cl_2\ ^{16}O_2$	HxCDD	^{13}C			
	445.7555	M+4	$^{12}C_{12}\ ^{1}H_2\ ^{35}Cl_6\ ^{37}Cl_2\ ^{16}O$	OCDPE	Cl-DPE			
4	409.7789	M+4	$^{12}C_{12}\ ^{1}H\ ^{35}Cl_5\ ^{37}Cl_2\ ^{16}O$	HpCDF	Native	1.88	1.60	2.16
	411.7759	M+6	$^{12}C_{12}\ ^{1}H\ ^{35}Cl_4\ ^{37}Cl_3\ ^{16}O$	HpCDF	Native			
	417.8253	M	$^{13}C_{12}\ ^{1}H\ ^{35}Cl_7\ ^{16}O$	HpCDF	^{13}C	0.44	0.37	0.51
	419.822	M+2	$^{13}C_{12}\ ^{1}H\ ^{35}Cl_6\ ^{37}Cl\ ^{16}O$	HpCDF	^{13}C			
	423.7767	M+2	$^{12}C_{12}\ ^{1}H\ ^{35}Cl_6\ ^{37}Cl\ ^{16}O_2$	HpCDD	Native	1.04	0.88	1.20
	425.7737	M+4	$^{12}C_{12}\ ^{1}H\ ^{35}Cl_5\ ^{37}Cl_2\ ^{16}O_2$	HpCDD	Native			
	430.9728	Lock	$^{12}C_9\ ^{19}F_{17}$	PFK	Lock			
	435.8169	M+2	$^{13}C_{12}\ ^{1}H\ ^{35}Cl_6\ ^{37}Cl\ ^{16}O_2$	HpCDD	^{13}C	1.04	0.88	1.20
	437.814	M+4	$^{13}C_{12}\ ^{1}H\ ^{35}Cl_5\ ^{37}Cl_2\ ^{16}O_2$	HpCDD	^{13}C			
	479.7165	M+4	$^{12}C_{12}\ ^{1}H\ ^{35}Cl_7\ ^{37}Cl_2\ ^{16}O$	NCDPE	Cl-DPE			
5	441.7428	M+2	$^{12}C_{12}\ ^{35}Cl_7\ ^{37}Cl\ ^{16}O$	OCDF	Native	0.89	0.76	1.02
	443.7399	M+4	$^{12}C_{12}\ ^{35}Cl_6\ ^{37}Cl2\ ^{16}O$	OCDF	Native			
	454.9728	Lock	$^{12}C_{11}\ ^{19}F_{17}$	PFK	Lock			
	457.7377	M+2	$^{12}C_{12}\ ^{35}Cl_7\ ^{37}Cl\ ^{16}O_2$	OCDD	Native	0.89	0.76	1.02
	459.7348	M+4	$^{12}C_{12}\ ^{35}Cl_6\ ^{37}Cl_2\ ^{16}O_2$	OCDD	Native			
	469.778	M+2	$^{13}C_{12}\ ^{35}Cl_7\ ^{37}Cl\ ^{16}O_2$	OCDD	^{13}C	0.89	0.76	1.02
	471.775	M+4	$^{13}C_{12}\ ^{35}Cl_6\ ^{37}Cl_2\ ^{16}O_2$	OCDD	^{13}C			
	513.6775	M+4	$^{12}C_{12}\ ^{35}Cl_8\ ^{37}Cl_2\ ^{16}O$	DCDPE	Cl-DPE			

Data Calculations:

a) Analyte Concentrations:

The relative response factor of each target relative to the standard against which it is to be calculated is determined using the area responses of both quantification ions via equation 9.1.
In cases where a native target is calculated against an exact labelled analogue, the quantification will be considered to be by isotope dilution. In other cases, the quantification will be considered to be by internal standard.

$$RRF = \frac{(A1_t + A2_t)\ C_s}{(A1_s + A2_s)\ C_t} \qquad \text{Equ. 9.1}$$

Where,
$A1_t + A2_t$ = The areas of the two quantification ions for the target analyte
$A1_s + A2_s$ = The areas of the two quantification ions for the labelled compound against which the target analyte will be calculated.
C_t = The concentration in the calibration standard of the target analyte.
C_s = The concentration in the calibration standard of the labelled compound against which the target will be calculated.

For all analytes to be quantified and from the initial calibration series of standard injections, a table of RRFs is prepared. The relative standard deviation (%RSD, or the coefficient of variance) is checked to confirm that the appropriate method criteria has been met as listed in Table 3. The average of the five or six levels of standard for each analyte, RRF_{av} is applied for quantification of samples according to Equations 9.2 and 9.3 below.

$$\text{Amount in sample (pg)} = \frac{(A1_n + A2_n)\ Q_l}{(A1_l + A2_l)\ (RRF_{av})} \qquad \text{Equ. 9.2}$$

$$\text{Concentration in sample (pg/g or pg/l)} = \frac{(A1_n + A2_n)\ Q_l}{(A1_l + A2_l)\ (RRF_{av})\ (W_s)} \qquad \text{Equ. 9.3}$$

Where,

Q_l = The amount (pg) of labelled compound added to the sample

W_s = The weight (g) or volume (l) of sample

b) Extraction, Clean-up, and Sampling Standard Recovery Calculation:

The extraction, clean-up, and sampling standard recoveries are determined by Equation 9.4 below.

% Recovery = (Amount in sample)/(Amount added to sample) X 100 Equ. 9.4

c) Estimated Detection Limit

$$EDL = \frac{2.5 \times H_x \times Q_{es}}{H_{es} \times W \times RFF_{av}} \qquad \text{Equ. 9.5}$$

Where,

EDL = estimated detection limit for homologous 2,3,7,8-Substituted PCDD/Fs

H_x = sum of the height of the noise level for each quantification ions for the unlabelled PCDD/Fs.

H_{es} = Sum of the heights of responses of both quantification ions for the labelled extraction standard.

W = weight of volume of sample

RRF_{av} = average relative response factor

Q_{es} = Amount of extraction standard added

Chromatogram Annotation Codes

All manually integrated peaks are expanded and reprinted with the following annotations:

* Analyst Initials	AA
* Date	YYMMDD
* integration code	CC

The Syntax is:	Example:
AAYYMMDDCC	SK111220MB

Code	Mnemonic	Description
MB	Manual Baseline	The peak was manually integrated because the initial baseline was determined incorrectly by the software
MS	Manual Split	The peak was manually integrated because the peak was incorrectly or not split by the software
MJ/MC	Manual Join/Manual Combine	The peak was manually integrated because the peak was split by the software and the peak should be integrated as a single peak
MA	Manual Add	The peak was manually integrated because the signal:noise ratio was judged to be >2.5
MD	Manual Delete	The peak was excluded because the signal:noise ratio was judged to be <2.5
MX	Manual Exclude	The peak was excluded due to an interference
NH	Noise Height	The noise height for detection limit calculation was manually defined, over-riding the software chosen value
MT	Manual Time	The peak retention time was manually chosen

The following explanatory annotation codes may appear on the chromatograms of peaks that have been reviewed:

Code	Mnemonic	Description
+	Detected Peak	A peak was detected at this mass and retention time that was above 2.5:1 signal to noise
<	Below Detection Limit	The signal at this mass and retention time was below 2.5:1 signal to noise
EMPC	Estimated Maximum Possible Concentration	The signal at this mass and retention time is an interference such that the target compound could not be confirmed
X-RT	Not Detected due to Retention Time non-conformance	The signal at this retention time could not be used to positively identify the target compound because of retention time non-conformance (apex of quantification and confirmation ions do not maximize within the same two seconds, or the retention time of the peak does not fall within the expected range with respect to its labeled analogue)
X-LOC	Not Detected due to interference from a higher level of chlorination	The signal at this retention time is attributable to a fragment from a co-eluting compound at a higher level of chlorination, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)
X-DPE	Not Detected due to diphenyl ether interference	The signal at this retention time is attributable to interference from a chlorinated diphenyl ether, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)
X-IF	Not Detected due to interference	The signal at this retention time is attributable to a co-eluting interference, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)

Deviations from the Primary Reference Methods:

The following changes and clarifications apply:

application of one standard calibration series to all of these methods is within the scope of each and every one of the methods. The calibration standard set CS1 through CS5 is consistent with the standards concentration listing in method 1613B Table 4. The CS0 extends the calibration range below what is required by all of the methods. Table 4 defines the use of each of the labelled standards relative to each of the methods.

a. Method 1613B lists a larger suite of labelled extraction standards than does method 8290A. Additional labelled extraction standards have been added into the 8290A analysis to enhance the method and the data quality. These additions to the method constitute performance based enhancements and are within the scope of SW846 Method 8290A.

b. The levels presented in the calibration table of method 8290A are recommended values only. Changes to these concentrations, especially to expand the range, are within the scope of the method. Therefore application of the 1613B calibration standards to method 8290A is compliant with the scope of the method.

c. TO-9A is also a performance based method. It specifically states that different extraction standards and different concentrations of standards from those listed in TO-9A Table 3 is acceptable (see Section 6.8 of reference method).

d. Although OAQPS reference method 23 is not a performance based method, application of the 1613B standards has been defined as within the scope of the method. (see Appendix B)

2) Chlorinated Diphenyl Ether interferences: Both methods 1613B and 8290A indicate that any instrumental response showing the presence of a chlorinated diphenyl ether response and that coelutes with a PCDF represents an interference on that analyte (see Sections 18.3 and 7.8.4.4 respectively). This apparent zero tolerance does not take into account that the response in the diphenyl ether channel may be trivial relative to the corresponding PCDF. For this 'Standard Method', we have defined a chlorinated diphenyl ether interference as the presence of a **significant** response within the chlorinated diphenyl ether channel (rather than zero response) and defined significant as a response equal to or greater than 10% of the peak response in the PCDF channel.

3) When the primary analysis is performed using a DB5MS GC column, 2,3,7,8-TCDF can be resolved to a valley height of 60% from the closest-eluting isomers for this column, providing good quantification of this target without further confirmation. Confirmation of 2,3,7,8-TCDF concentrations above the level of the lowest calibration standard are performed on a second column on a contract basis when requested. Confirmation of additional 2,3,7,8-subtituted PCDD/F isomers is also available when

4) Although not categorically stated in all associated PCDD/F methods, we maintain that each and every individual clean-up procedure is, by definition, performance-based and optional. There is not an expectation within the industry to follow exactly the descriptions of clean-ups in reference methods. Adaptations which meet or exceed the required performance criteria are therefore acceptable within the scope of each reference method. The reference method descriptions are intended as guidelines or templates available to help the laboratory to define effective in-house clean-up methods. The objective within the laboratory is to provide quality clean extracts to the instrument for analysis. Each individual clean-up is part of the laboratory's 'arsenal' in order to

5) There are differences within the individual reference methods as to the precise spiking protocols for adding extraction standards and native spikes (for LCS, MS and MSD). To ensure consistency within the laboratory between PCDD/F and related methods, the PCDD/F preparative 'Specific Method' requires solids (including stack and ambient sorbants/filters) to be spiked in the soxhlet thimble from a nonane solution and waters are spiked before filtering from an acetone solution. This is consistent with the 8290A

6) Sub-sampling of solids and pre-extraction processing is done in a manner that minimizes potential for cross-contamination. These processes are designed around SW846 protocols rather than 1613B protocols. Solids are sub-sampled directly from the bottle as submitted to the laboratory wherever practical. If the sample is submitted such that homogenization in the bottle is impractical (eg. the bottle is too full or lumps cannot be broken down), then transferring the sample to a tray or another bottle

7) The concentrations of labelled and native spiking solutions are not consistent with those listed in all of the reference methods. These concentrations are prepared at levels convenient and expedient for accurate laboratory processing.

the inter-laboratory performance limits defined in method 1613B rather than the relatively arbitrary limits of 35-140% suggested in Section 8.4 of method 8290A.

9) With respect to ions monitored for P5CDD and H7CDF:

a. The 358 ion has a potential for interference from PCB (hexachlorobiphenyls) dependent upon levels of PCBs in the sample and the instrument tuning. Of particular concern is PCB-169 which on a DB5MS column elutes very close to 1,2,3,7,8-P5CDD and which is not removed for the PCDD/F extracts even by carbon clean-up. To eliminate the potential of such interferences from PCB on the 358 mass, we choose to monitor the alternate ion pair of 354 and 356.

b. Similarly, the 408 ion of native H7CDF is prone to problematic interferences arising from 13C12-labeled heptachlorinated biphenyls. To eliminate the potential of such interferences from PCB on the 358 mass, we choose to monitor the alternate ion pair

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SVOC DATA PACKAGE

SECTION 4: CALIBRATION DATA

Including:

for Multi-Point Calibration(s)

- Multi-Point Calibration Tables
- Individual Quantitation Reports

for Continuing Calibration(s)

- Individual Quantitation Reports

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Calibration Summary Report

Calibration Level	Filename	Run Date
CS-1	7-201001A03	01-Oct-2020 11:01
CS-2	7-201001A02	01-Oct-2020 10:19
CS-3	7-201001A01	01-Oct-2020 09:38
CS-4	7-201001A07	01-Oct-2020 13:51
CS-5	7-201001A06	01-Oct-2020 13:08

Approved: *N Ashtari*
--e-signature--
28-Jan-2021

Relative Response Factors

Target Analytes	CS-1	CS-2	CS-3	CS-4	CS-5	Mean	% RSD
2,3,7,8-TCDD	0.966	0.960	1.149	1.006	0.998	1.016	8%
1,2,3,7,8-PeCDD	0.861	0.913	0.899	0.926	0.902	0.900	3%
1,2,3,4,7,8-HxCDD	0.824	0.819	0.841	0.849	0.901	0.847	4%
1,2,3,6,7,8-HxCDD	0.988	0.942	0.959	0.967	0.947	0.961	2%
1,2,3,7,8,9-HxCDD	0.882	0.853	0.875	0.900	0.901	0.882	2%
1,2,3,4,6,7,8-HpCDD	0.893	0.878	0.952	0.947	0.925	0.919	4%
OCDD	1.008	0.968	0.923	0.994	0.924	0.963	4%
2,3,7,8-TCDF	0.873	0.873	0.916	0.934	0.933	0.906	3%
1,2,3,7,8-PeCDF	0.937	0.957	0.939	1.007	1.001	0.968	3%
2,3,4,7,8-PeCDF	1.001	1.019	1.042	1.071	1.063	1.039	3%
1,2,3,4,7,8-HxCDF	1.068	1.128	1.112	1.122	1.100	1.106	2%
1,2,3,6,7,8-HxCDF	1.133	1.140	1.188	1.172	1.150	1.157	2%
2,3,4,6,7,8-HxCDF	1.003	1.051	1.053	1.081	1.070	1.052	3%
1,2,3,7,8,9-HxCDF	0.874	0.910	0.928	0.942	0.928	0.916	3%
1,2,3,4,6,7,8-HpCDF	1.028	1.017	1.016	1.045	1.021	1.025	1%
1,2,3,4,7,8,9-HpCDF	0.790	0.800	0.783	0.833	0.802	0.802	2%
OCDF	1.246	1.299	1.233	1.351	1.215	1.269	4%
Field Spike Standards							
37Cl4-2,3,7,8-TCDD	0.964	1.033	1.337	0.992	1.028	1.071	14%
13C12-1,2,3,4,7,8-HxCDD	0.883	0.863	0.883	0.870	0.943	0.888	4%
13C12-2,3,4,7,8-PeCDF	0.958	0.957	1.000	0.965	0.968	0.970	2%
13C12-1,2,3,4,7,8-HxCDF	0.894	0.922	0.923	0.898	0.891	0.906	2%
13C12-1,2,3,4,7,8,9-HpCDF	0.786	0.758	0.823	0.768	0.750	0.777	4%
Extraction Standards							
13C12-2,3,7,8-TCDD	1.096	1.110	0.972	1.120	1.237	1.107	9%
13C12-1,2,3,7,8-PeCDD	0.719	0.730	0.787	0.769	0.918	0.785	10%
13C12-1,2,3,6,7,8-HxCDD	0.978	1.002	1.149	1.009	0.979	1.023	7%
13C12-1,2,3,4,6,7,8-HpCDD	0.690	0.700	0.736	0.695	0.713	0.707	3%
13C12-OCDD	0.392	0.404	0.452	0.444	0.493	0.437	9%
13C12-2,3,7,8-TCDF	1.365	1.390	1.529	1.396	1.468	1.430	5%
13C12-1,2,3,7,8-PeCDF	0.992	1.012	1.127	1.061	1.229	1.084	9%
13C12-1,2,3,6,7,8-HxCDF	1.195	1.203	1.402	1.199	1.189	1.238	7%
13C12-1,2,3,4,6,7,8-HpCDF	0.779	0.800	0.929	0.814	0.823	0.829	7%
Cleanup Standard							
13C12-1,2,3,7,8,9-HxCDF	0.924	0.937	1.102	0.925	0.937	0.965	8%

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Calibration Report

ALS Sample ID **H7-20-CS1-1209**
Analysis Method EPA M23
Analysis Type Calibration

Filename	Inst #	Column	Run Date	Approved:	*N Ashtari*
7-201001A03	HRMS-7	DB5MSUSR188441H	01-Oct-2020 11:01		--e-signature-- 28-Jan-2021

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
2,3,7,8-TCDD	27.85	0.81	0.50	1.02E+04	0.966
1,2,3,7,8-PeCDD	32.29	1.66	2.50	2.99E+04	0.861
1,2,3,4,7,8-HxCDD	34.38	1.22	2.50	2.71E+04	0.824
1,2,3,6,7,8-HxCDD	34.44	1.27	2.50	3.25E+04	0.988
1,2,3,7,8,9-HxCDD	34.56	1.22	2.50	2.90E+04	0.882
1,2,3,4,6,7,8-HpCDD	36	1.06	2.50	2.07E+04	0.893
OCDD	37.43	0.90	5.00	2.65E+04	1.008
2,3,7,8-TCDF	26.95	0.80	0.50	1.15E+04	0.873
1,2,3,7,8-PeCDF	31.29	1.54	2.50	4.49E+04	0.937
2,3,4,7,8-PeCDF	32.07	1.50	2.50	4.80E+04	1.001
1,2,3,4,7,8-HxCDF	33.88	1.26	2.50	4.28E+04	1.068
1,2,3,6,7,8-HxCDF	33.95	1.22	2.50	4.55E+04	1.133
2,3,4,6,7,8-HxCDF	34.29	1.25	2.50	4.02E+04	1.003
1,2,3,7,8,9-HxCDF	34.71	1.30	2.50	3.50E+04	0.874
1,2,3,4,6,7,8-HpCDF	35.47	2.03	2.50	2.69E+04	1.028
1,2,3,4,7,8,9-HpCDF	36.25	1.90	2.50	2.06E+04	0.790
OCDF	37.52	0.92	5.00	3.28E+04	1.246
Field Spike Standards					
37Cl4-2,3,7,8-TCDD	27.85	0.00	0.50	1.02E+04	0.964
13C12-1,2,3,4,7,8-HxCDD	34.38	1.28	100.00	1.16E+06	0.883
13C12-2,3,4,7,8-PeCDF	32.05	1.51	100.00	1.84E+06	0.958
13C12-1,2,3,4,7,8-HxCDF	33.87	0.53	100.00	1.44E+06	0.894
13C12-1,2,3,4,7,8,9-HpCDF	36.25	0.44	100.00	8.22E+05	0.786
Extraction Standards					
13C12-2,3,7,8-TCDD	27.82	0.784	100	2.12E+06	1.096
13C12-1,2,3,7,8-PeCDD	32.28	1.602	100	1.39E+06	0.719
13C12-1,2,3,6,7,8-HxCDD	34.43	1.3	100	1.31E+06	0.978
13C12-1,2,3,4,6,7,8-HpCDD	36	1.056	100	9.27E+05	0.69
13C12-OCDD	37.42	0.883	200	1.05E+06	0.392
13C12-2,3,7,8-TCDF	26.93	0.757	100	2.64E+06	1.365
13C12-1,2,3,7,8-PeCDF	31.28	1.563	100	1.92E+06	0.992
13C12-1,2,3,6,7,8-HxCDF	33.94	0.52	100	1.60E+06	1.195
13C12-1,2,3,4,6,7,8-HpCDF	35.46	0.464	100	1.05E+06	0.779
Cleanup Standard					
13C12-1,2,3,7,8,9-HxCDF	34.7	0.522	100	1.24E+06	0.924
Injection Standards					
13C12-1234-TCDD IS	27.13	0.792	100	1933155.7	19331.557
13C12-123789-HxCDD IS	34.56	1.26	100.00	1.34E+06	13434.236

ALS Life Sciences

Calibration Report

ALS Sample ID **H7-20-CS2-1209**
Analysis Method EPA M23
Analysis Type Calibration

Filename	Inst #	Column	Run Date	Approved:	*N Ashtari*
7-201001A02	HRMS-7	DB5MSUSR188441H	01-Oct-2020 10:19		--e-signature-- 28-Jan-2021

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
2,3,7,8-TCDD	27.83	0.79	2.00	3.80E+04	0.960
1,2,3,7,8-PeCDD	32.28	1.61	10.00	1.19E+05	0.913
1,2,3,4,7,8-HxCDD	34.37	1.27	10.00	1.01E+05	0.819
1,2,3,6,7,8-HxCDD	34.43	1.33	10.00	1.17E+05	0.942
1,2,3,7,8,9-HxCDD	34.55	1.30	10.00	1.06E+05	0.853
1,2,3,4,6,7,8-HpCDD	35.99	1.02	10.00	7.60E+04	0.878
OCDD	37.42	0.87	20.00	9.66E+04	0.968
2,3,7,8-TCDF	26.95	0.80	2.00	4.33E+04	0.873
1,2,3,7,8-PeCDF	31.28	1.62	10.00	1.73E+05	0.957
2,3,4,7,8-PeCDF	32.06	1.58	10.00	1.84E+05	1.019
1,2,3,4,7,8-HxCDF	33.86	1.17	10.00	1.68E+05	1.128
1,2,3,6,7,8-HxCDF	33.94	1.14	10.00	1.70E+05	1.140
2,3,4,6,7,8-HxCDF	34.28	1.18	10.00	1.56E+05	1.051
1,2,3,7,8,9-HxCDF	34.7	1.18	10.00	1.35E+05	0.910
1,2,3,4,6,7,8-HpCDF	35.45	2.01	10.00	1.01E+05	1.017
1,2,3,4,7,8,9-HpCDF	36.23	1.99	10.00	7.91E+04	0.800
OCDF	37.5	0.90	20.00	1.30E+05	1.299
Field Spike Standards					
37Cl4-2,3,7,8-TCDD	27.83	0.00	2.00	4.09E+04	1.033
13C12-1,2,3,4,7,8-HxCDD	34.36	1.24	100.00	1.07E+06	0.863
13C12-2,3,4,7,8-PeCDF	32.05	1.57	100.00	1.73E+06	0.957
13C12-1,2,3,4,7,8-HxCDF	33.86	0.53	100.00	1.37E+06	0.922
13C12-1,2,3,4,7,8,9-HpCDF	36.23	0.47	100.00	7.49E+05	0.758
Extraction Standards					
13C12-2,3,7,8-TCDD	27.81	0.781	100	1.98E+06	1.11
13C12-1,2,3,7,8-PeCDD	32.26	1.612	100	1.30E+06	0.73
13C12-1,2,3,6,7,8-HxCDD	34.42	1.245	100	1.24E+06	1.002
13C12-1,2,3,4,6,7,8-HpCDD	35.99	1.077	100	8.66E+05	0.7
13C12-OCDD	37.41	0.925	200	9.99E+05	0.404
13C12-2,3,7,8-TCDF	26.92	0.769	100	2.48E+06	1.39
13C12-1,2,3,7,8-PeCDF	31.27	1.564	100	1.80E+06	1.012
13C12-1,2,3,6,7,8-HxCDF	33.93	0.518	100	1.49E+06	1.203
13C12-1,2,3,4,6,7,8-HpCDF	35.45	0.452	100	9.89E+05	0.8
Cleanup Standard					
13C12-1,2,3,7,8,9-HxCDF	34.69	0.517	100	1.16E+06	0.937
Injection Standards					
13C12-1234-TCDD IS	27.11	0.788	100	1784134.8	17841.348
13C12-123789-HxCDD IS	34.54	1.24	100.00	1.24E+06	12368.686

ALS Life Sciences

Calibration Report

ALS Sample ID **H7-20-CCV-1209**
Analysis Method EPA M23
Analysis Type Calibration

Filename	Inst #	Column	Run Date	Approved:	*N Ashtari*
7-201001A01	HRMS-7	DB5MSUSR188441H	01-Oct-2020 09:38		--e-signature-- 28-Jan-2021

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
2,3,7,8-TCDD	27.87	0.77	10.00	1.68E+05	1.149
1,2,3,7,8-PeCDD	32.29	1.63	50.00	5.31E+05	0.899
1,2,3,4,7,8-HxCDD	34.38	1.23	50.00	4.59E+05	0.841
1,2,3,6,7,8-HxCDD	34.43	1.21	50.00	5.24E+05	0.959
1,2,3,7,8,9-HxCDD	34.55	1.21	50.00	4.77E+05	0.875
1,2,3,4,6,7,8-HpCDD	36	1.06	50.00	3.33E+05	0.952
OCDD	37.42	0.93	100.00	3.97E+05	0.923
2,3,7,8-TCDF	26.98	0.80	10.00	2.10E+05	0.916
1,2,3,7,8-PeCDF	31.29	1.59	50.00	7.95E+05	0.939
2,3,4,7,8-PeCDF	32.07	1.58	50.00	8.82E+05	1.042
1,2,3,4,7,8-HxCDF	33.88	1.21	50.00	7.41E+05	1.112
1,2,3,6,7,8-HxCDF	33.95	1.22	50.00	7.91E+05	1.188
2,3,4,6,7,8-HxCDF	34.28	1.20	50.00	7.02E+05	1.053
1,2,3,7,8,9-HxCDF	34.7	1.21	50.00	6.19E+05	0.928
1,2,3,4,6,7,8-HpCDF	35.46	1.97	50.00	4.49E+05	1.016
1,2,3,4,7,8,9-HpCDF	36.24	1.88	50.00	3.46E+05	0.783
OCDF	37.51	0.94	100.00	5.30E+05	1.233
Field Spike Standards					
37Cl4-2,3,7,8-TCDD	27.87	0.00	10.00	1.95E+05	1.337
13C12-1,2,3,4,7,8-HxCDD	34.37	1.25	100.00	9.64E+05	0.883
13C12-2,3,4,7,8-PeCDF	32.06	1.54	100.00	1.69E+06	1.000
13C12-1,2,3,4,7,8-HxCDF	33.87	0.52	100.00	1.23E+06	0.923
13C12-1,2,3,4,7,8,9-HpCDF	36.24	0.46	100.00	7.27E+05	0.823
Extraction Standards					
13C12-2,3,7,8-TCDD	27.84	0.799	100	1.46E+06	0.972
13C12-1,2,3,7,8-PeCDD	32.28	1.607	100	1.18E+06	0.787
13C12-1,2,3,6,7,8-HxCDD	34.43	1.257	100	1.09E+06	1.149
13C12-1,2,3,4,6,7,8-HpCDD	36	1.028	100	7.00E+05	0.736
13C12-OCDD	37.42	0.861	200	8.60E+05	0.452
13C12-2,3,7,8-TCDF	26.95	0.771	100	2.30E+06	1.529
13C12-1,2,3,7,8-PeCDF	31.28	1.551	100	1.69E+06	1.127
13C12-1,2,3,6,7,8-HxCDF	33.94	0.521	100	1.33E+06	1.402
13C12-1,2,3,4,6,7,8-HpCDF	35.46	0.451	100	8.83E+05	0.929
Cleanup Standard					
13C12-1,2,3,7,8,9-HxCDF	34.7	0.533	100	1.05E+06	1.102
Injection Standards					
13C12-1234-TCDD IS	27.16	0.786	100	1502322.7	15023.227
13C12-123789-HxCDD IS	34.55	1.31	100.00	9.51E+05	9505.725

ALS Life Sciences

Calibration Report

ALS Sample ID **H7-20-CS4-1209**
Analysis Method EPA M23
Analysis Type Calibration

Filename	Inst #	Column	Run Date	Approved:	*N Ashtari*
7-201001A07	HRMS-7	DB5MSUSR188441H	01-Oct-2020 13:51		--e-signature-- 28-Jan-2021

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
2,3,7,8-TCDD	27.84	0.78	40.00	7.02E+05	1.006
1,2,3,7,8-PeCDD	32.28	1.63	200.00	2.22E+06	0.926
1,2,3,4,7,8-HxCDD	34.37	1.22	200.00	2.01E+06	0.849
1,2,3,6,7,8-HxCDD	34.43	1.23	200.00	2.29E+06	0.967
1,2,3,7,8,9-HxCDD	34.55	1.23	200.00	2.13E+06	0.900
1,2,3,4,6,7,8-HpCDD	36	1.05	200.00	1.55E+06	0.947
OCDD	37.42	0.89	400.00	2.07E+06	0.994
2,3,7,8-TCDF	26.95	0.78	40.00	8.12E+05	0.934
1,2,3,7,8-PeCDF	31.28	1.59	200.00	3.33E+06	1.007
2,3,4,7,8-PeCDF	32.06	1.57	200.00	3.54E+06	1.071
1,2,3,4,7,8-HxCDF	33.87	1.21	200.00	3.16E+06	1.122
1,2,3,6,7,8-HxCDF	33.94	1.21	200.00	3.30E+06	1.172
2,3,4,6,7,8-HxCDF	34.28	1.19	200.00	3.04E+06	1.081
1,2,3,7,8,9-HxCDF	34.7	1.22	200.00	2.65E+06	0.942
1,2,3,4,6,7,8-HpCDF	35.46	1.87	200.00	2.00E+06	1.045
1,2,3,4,7,8,9-HpCDF	36.24	1.90	200.00	1.59E+06	0.833
OCDF	37.51	0.91	400.00	2.82E+06	1.351
Field Spike Standards					
37Cl4-2,3,7,8-TCDD	27.84	0.00	40.00	6.92E+05	0.992
13C12-1,2,3,4,7,8-HxCDD	34.37	1.25	100.00	1.03E+06	0.870
13C12-2,3,4,7,8-PeCDF	32.05	1.54	100.00	1.60E+06	0.965
13C12-1,2,3,4,7,8-HxCDF	33.86	0.53	100.00	1.26E+06	0.898
13C12-1,2,3,4,7,8,9-HpCDF	36.23	0.44	100.00	7.35E+05	0.768
Extraction Standards					
13C12-2,3,7,8-TCDD	27.81	0.77	100	1.74E+06	1.12
13C12-1,2,3,7,8-PeCDD	32.27	1.59	100	1.20E+06	0.769
13C12-1,2,3,6,7,8-HxCDD	34.43	1.23	100	1.18E+06	1.009
13C12-1,2,3,4,6,7,8-HpCDD	35.99	1.046	100	8.16E+05	0.695
13C12-OCDD	37.41	0.86	200	1.04E+06	0.444
13C12-2,3,7,8-TCDF	26.92	0.771	100	2.17E+06	1.396
13C12-1,2,3,7,8-PeCDF	31.27	1.564	100	1.65E+06	1.061
13C12-1,2,3,6,7,8-HxCDF	33.93	0.524	100	1.41E+06	1.199
13C12-1,2,3,4,6,7,8-HpCDF	35.44	0.444	100	9.56E+05	0.814
Cleanup Standard					
13C12-1,2,3,7,8,9-HxCDF	34.69	0.534	100	1.09E+06	0.925
Injection Standards					
13C12-1234-TCDD IS	27.13	0.772	100	1557536.4	15575.364
13C12-123789-HxCDD IS	34.55	1.23	100.00	1.17E+06	11743.281

ALS Life Sciences

Calibration Report

ALS Sample ID **H7-20-CS5-1209**
Analysis Method EPA M23
Analysis Type Calibration

Filename	Inst #	Column	Run Date	Approved:	*N Ashtari*
7-201001A06	HRMS-7	DB5MSUSR188441H	01-Oct-2020 13:08		--e-signature-- 28-Jan-2021

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
2,3,7,8-TCDD	27.84	0.78	200.00	4.45E+06	0.998
1,2,3,7,8-PeCDD	32.28	1.63	1000.00	1.49E+07	0.902
1,2,3,4,7,8-HxCDD	34.37	1.23	1000.00	1.42E+07	0.901
1,2,3,6,7,8-HxCDD	34.43	1.23	1000.00	1.49E+07	0.947
1,2,3,7,8,9-HxCDD	34.55	1.24	1000.00	1.42E+07	0.901
1,2,3,4,6,7,8-HpCDD	36	1.06	1000.00	1.06E+07	0.925
OCDD	37.43	0.89	2000.00	1.47E+07	0.924
2,3,7,8-TCDF	26.93	0.78	200.00	4.94E+06	0.933
1,2,3,7,8-PeCDF	31.29	1.58	1000.00	2.22E+07	1.001
2,3,4,7,8-PeCDF	32.06	1.57	1000.00	2.35E+07	1.063
1,2,3,4,7,8-HxCDF	33.88	1.21	1000.00	2.11E+07	1.100
1,2,3,6,7,8-HxCDF	33.95	1.22	1000.00	2.20E+07	1.150
2,3,4,6,7,8-HxCDF	34.28	1.20	1000.00	2.05E+07	1.070
1,2,3,7,8,9-HxCDF	34.7	1.22	1000.00	1.78E+07	0.928
1,2,3,4,6,7,8-HpCDF	35.46	1.89	1000.00	1.35E+07	1.021
1,2,3,4,7,8,9-HpCDF	36.24	1.90	1000.00	1.06E+07	0.802
OCDF	37.51	0.92	2000.00	1.93E+07	1.215
Field Spike Standards					
37Cl4-2,3,7,8-TCDD	27.83	0.00	200.00	4.58E+06	1.028
13C12-1,2,3,4,7,8-HxCDD	34.37	1.25	100.00	1.49E+06	0.943
13C12-2,3,4,7,8-PeCDF	32.05	1.54	100.00	2.14E+06	0.968
13C12-1,2,3,4,7,8-HxCDF	33.86	0.52	100.00	1.71E+06	0.891
13C12-1,2,3,4,7,8,9-HpCDF	36.23	0.46	100.00	9.93E+05	0.750
Extraction Standards					
13C12-2,3,7,8-TCDD	27.81	0.788	100	2.23E+06	1.237
13C12-1,2,3,7,8-PeCDD	32.27	1.617	100	1.65E+06	0.918
13C12-1,2,3,6,7,8-HxCDD	34.43	1.254	100	1.58E+06	0.979
13C12-1,2,3,4,6,7,8-HpCDD	35.99	1.048	100	1.15E+06	0.713
13C12-OCDD	37.42	0.886	200	1.59E+06	0.493
13C12-2,3,7,8-TCDF	26.92	0.772	100	2.64E+06	1.468
13C12-1,2,3,7,8-PeCDF	31.28	1.553	100	2.21E+06	1.229
13C12-1,2,3,6,7,8-HxCDF	33.93	0.533	100	1.92E+06	1.189
13C12-1,2,3,4,6,7,8-HpCDF	35.46	0.458	100	1.32E+06	0.823
Cleanup Standard					
13C12-1,2,3,7,8,9-HxCDF	34.7	0.538	100	1.51E+06	0.937
Injection Standards					
13C12-1234-TCDD IS	27.13	0.791	100	1801426.6	18014.266
13C12-123789-HxCDD IS	34.55	1.23	100.00	1.61E+06	16108.986

ALS Life Sciences

Second Source Calibration Verification Report

Sample Name	**CVS**	Sampling Date	n/a		
ALS Sample ID	H7-20-RS1-1209	Extraction Date	n/a		Approved:
Analysis Method	EPA M23	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		25-Jan-2021

Run Information	**Run 1**
Filename	7-201001A08
Run Date	01-Oct-20 14:33
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUSR188441H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.84	90	75-125	
1,2,3,7,8-PeCDD	50	32.29	106	75-125	
1,2,3,4,7,8-HxCDD	50	34.39	101	75-125	
1,2,3,6,7,8-HxCDD	50	34.44	94	75-125	
1,2,3,7,8,9-HxCDD	50	34.56	102	75-125	
1,2,3,4,6,7,8-HpCDD	50	36.01	98	75-125	
OCDD	100	37.43	100	75-125	
2,3,7,8-TCDF	10	26.95	100	75-125	
1,2,3,7,8-PeCDF	50	31.29	106	75-125	
2,3,4,7,8-PeCDF	50	32.07	98	75-125	M
1,2,3,4,7,8-HxCDF	50	33.88	100	75-125	
1,2,3,6,7,8-HxCDF	50	33.95	101	75-125	
2,3,4,6,7,8-HxCDF	50	34.29	100	75-125	
1,2,3,7,8,9-HxCDF	50	34.71	109	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.47	101	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.25	108	75-125	
OCDF	100	37.52	102	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.84	107	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.37	104	75-125	
13C12-2,3,4,7,8-PeCDF	100	32.06	100	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.87	102	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.24	102	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.81	101	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.28	94	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.43	94	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	36.00	102	70-130	
13C12-OCDD	200	37.42	105	70-130	
13C12-2,3,7,8-TCDF	100	26.92	97	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.28	93	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.94	93	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.46	95	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.70	95	40-130	

M Indicates that a peak has been manually integrated.

Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H7-21-CCV-0030	Extraction Date	n/a		Approved:
Analysis Method	TO9A	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Jan-2021

Run Information	**Run 1**
Filename	7-210117A32
Run Date	18-Jan-21 05:21
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.69	94	75-125	
1,2,3,7,8-PeCDD	50	32.08	103	75-125	
1,2,3,4,7,8-HxCDD	50	34.17	100	75-125	
1,2,3,6,7,8-HxCDD	50	34.23	97	75-125	
1,2,3,7,8,9-HxCDD	50	34.35	102	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.81	100	75-125	
OCDD	100	37.27	106	75-125	
2,3,7,8-TCDF	10	26.77	100	75-125	
1,2,3,7,8-PeCDF	50	31.10	89	75-125	
2,3,4,7,8-PeCDF	50	31.86	90	75-125	
1,2,3,4,7,8-HxCDF	50	33.67	89	75-125	
1,2,3,6,7,8-HxCDF	50	33.74	90	75-125	
2,3,4,6,7,8-HxCDF	50	34.08	90	75-125	
1,2,3,7,8,9-HxCDF	50	34.50	93	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.26	93	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.06	99	75-125	
OCDF	100	37.36	85	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.69	90	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.17	103	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.86	101	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.66	101	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.05	99	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.66	104	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.07	95	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.22	96	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.81	104	70-130	
13C12-OCDD	200	37.26	127	70-130	
13C12-2,3,7,8-TCDF	100	26.75	97	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.09	95	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.73	92	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.25	94	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.49	96	40-130	

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Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H7-21-CCV-0029	Extraction Date	n/a		Approved:
Analysis Method	TO9A	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Jan-2021

Run Information	**Run 1**
Filename	7-210117A15
Run Date	17-Jan-21 17:18
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.69	102	75-125	
1,2,3,7,8-PeCDD	50	32.09	105	75-125	
1,2,3,4,7,8-HxCDD	50	34.18	110	75-125	
1,2,3,6,7,8-HxCDD	50	34.23	99	75-125	
1,2,3,7,8,9-HxCDD	50	34.35	106	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.82	104	75-125	
OCDD	100	37.27	109	75-125	
2,3,7,8-TCDF	10	26.78	102	75-125	
1,2,3,7,8-PeCDF	50	31.12	91	75-125	
2,3,4,7,8-PeCDF	50	31.87	91	75-125	
1,2,3,4,7,8-HxCDF	50	33.68	94	75-125	
1,2,3,6,7,8-HxCDF	50	33.75	91	75-125	
2,3,4,6,7,8-HxCDF	50	34.08	94	75-125	
1,2,3,7,8,9-HxCDF	50	34.50	92	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.26	98	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.06	99	75-125	
OCDF	100	37.36	88	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.71	91	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.17	105	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.86	99	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.67	102	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.06	103	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.68	105	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.08	99	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.23	96	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.81	107	70-130	
13C12-OCDD	200	37.27	120	70-130	
13C12-2,3,7,8-TCDF	100	26.77	105	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.10	105	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.74	99	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.26	101	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.49	101	40-130	

Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H7-21-CCV-0041	Extraction Date	n/a		Approved:
Analysis Method	TO9A	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Jan-2021

Run Information	**Run 1**
Filename	7-210122A01
Run Date	22-Jan-21 09:56
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.67	101	75-125	
1,2,3,7,8-PeCDD	50	32.08	109	75-125	
1,2,3,4,7,8-HxCDD	50	34.16	103	75-125	
1,2,3,6,7,8-HxCDD	50	34.22	118	75-125	
1,2,3,7,8,9-HxCDD	50	34.35	120	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.81	111	75-125	
OCDD	100	37.26	116	75-125	
2,3,7,8-TCDF	10	26.77	105	75-125	
1,2,3,7,8-PeCDF	50	31.10	98	75-125	
2,3,4,7,8-PeCDF	50	31.85	94	75-125	
1,2,3,4,7,8-HxCDF	50	33.67	96	75-125	
1,2,3,6,7,8-HxCDF	50	33.74	101	75-125	
2,3,4,6,7,8-HxCDF	50	34.07	101	75-125	
1,2,3,7,8,9-HxCDF	50	34.49	95	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.25	107	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.05	103	75-125	
OCDF	100	37.35	101	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.67	91	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.15	105	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.84	98	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.66	95	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.04	96	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.66	104	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.06	94	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.21	95	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.80	99	70-130	
13C12-OCDD	200	37.26	109	70-130	
13C12-2,3,7,8-TCDF	100	26.74	108	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.09	106	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.73	108	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.25	102	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.48	104	40-130	

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Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H7-21-CCV-0042	Extraction Date	n/a		Approved:
Analysis Method	TO9A	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Jan-2021

Run Information	**Run 1**
Filename	7-210122A16
Run Date	22-Jan-21 20:25
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.67	103	75-125	
1,2,3,7,8-PeCDD	50	32.08	110	75-125	
1,2,3,4,7,8-HxCDD	50	34.18	93	75-125	
1,2,3,6,7,8-HxCDD	50	34.23	104	75-125	
1,2,3,7,8,9-HxCDD	50	34.36	103	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.82	112	75-125	
OCDD	100	37.28	119	75-125	
2,3,7,8-TCDF	10	26.75	108	75-125	
1,2,3,7,8-PeCDF	50	31.10	97	75-125	
2,3,4,7,8-PeCDF	50	31.86	96	75-125	
1,2,3,4,7,8-HxCDF	50	33.68	96	75-125	
1,2,3,6,7,8-HxCDF	50	33.74	102	75-125	
2,3,4,6,7,8-HxCDF	50	34.08	102	75-125	
1,2,3,7,8,9-HxCDF	50	34.50	90	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.26	108	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.06	102	75-125	
OCDF	100	37.36	104	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.67	92	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.16	82	75-125	M
13C12-2,3,4,7,8-PeCDF	100	31.85	99	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.67	96	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.06	93	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.64	104	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.07	89	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.22	107	75-125	M
13C12-1,2,3,4,6,7,8-HpCDD	100	35.81	94	70-130	
13C12-OCDD	200	37.27	101	70-130	
13C12-2,3,7,8-TCDF	100	26.74	109	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.09	103	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.73	111	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.26	99	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.49	99	40-130	

M Indicates that a peak has been manually integrated.

Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H7-21-CCV-0457	Extraction Date	n/a		Approved:
Analysis Method	TO9A	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Jan-2021

Run Information	**Run 1**
Filename	7-210127A11
Run Date	28-Jan-21 00:04
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.66	100	75-125	
1,2,3,7,8-PeCDD	50	32.07	104	75-125	
1,2,3,4,7,8-HxCDD	50	34.16	103	75-125	
1,2,3,6,7,8-HxCDD	50	34.22	109	75-125	
1,2,3,7,8,9-HxCDD	50	34.33	116	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.80	107	75-125	
OCDD	100	37.24	108	75-125	
2,3,7,8-TCDF	10	26.75	118	75-125	
1,2,3,7,8-PeCDF	50	31.09	95	75-125	
2,3,4,7,8-PeCDF	50	31.85	96	75-125	
1,2,3,4,7,8-HxCDF	50	33.67	101	75-125	
1,2,3,6,7,8-HxCDF	50	33.73	103	75-125	
2,3,4,6,7,8-HxCDF	50	34.07	107	75-125	
1,2,3,7,8,9-HxCDF	50	34.48	106	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.25	104	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.04	111	75-125	
OCDF	100	37.33	100	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.66	91	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.15	93	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.84	98	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.66	100	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.04	108	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.63	103	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.06	94	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.21	99	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.79	115	70-130	
13C12-OCDD	200	37.24	165	70-130	
13C12-2,3,7,8-TCDF	100	26.72	101	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.07	101	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.72	103	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.24	113	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.47	108	40-130	

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Continuing Calibration Report

Sample Name	**CCV**	Sampling Date	n/a		
ALS Sample ID	H7-21-CCV-0456	Extraction Date	n/a		Approved:
Analysis Method	TO9A	Sample Size	1	n/a	*N Ashtari*
Analysis Type	CCV	Percent Moisture	n/a		--e-signature--
Sample Matrix	QC	Split Ratio	1		28-Jan-2021

Run Information	**Run 1**
Filename	7-210127A01
Run Date	27-Jan-21 17:05
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg/uL**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	10	27.66	98	75-125	
1,2,3,7,8-PeCDD	50	32.06	106	75-125	
1,2,3,4,7,8-HxCDD	50	34.15	105	75-125	
1,2,3,6,7,8-HxCDD	50	34.21	113	75-125	
1,2,3,7,8,9-HxCDD	50	34.33	112	75-125	
1,2,3,4,6,7,8-HpCDD	50	35.79	105	75-125	
OCDD	100	37.24	110	75-125	
2,3,7,8-TCDF	10	26.75	106	75-125	
1,2,3,7,8-PeCDF	50	31.09	99	75-125	
2,3,4,7,8-PeCDF	50	31.84	96	75-125	
1,2,3,4,7,8-HxCDF	50	33.66	102	75-125	
1,2,3,6,7,8-HxCDF	50	33.72	105	75-125	
2,3,4,6,7,8-HxCDF	50	34.06	107	75-125	
1,2,3,7,8,9-HxCDF	50	34.48	107	75-125	
1,2,3,4,6,7,8-HpCDF	50	35.24	103	75-125	
1,2,3,4,7,8,9-HpCDF	50	36.03	111	75-125	
OCDF	100	37.33	102	70-130	
Field Spike Standards	**pg/uL**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	10	27.66	90	75-125	
13C12-1,2,3,4,7,8-HxCDD	100	34.14	101	75-125	
13C12-2,3,4,7,8-PeCDF	100	31.83	99	75-125	
13C12-1,2,3,4,7,8-HxCDF	100	33.65	99	75-125	
13C12-1,2,3,4,7,8,9-HpCDF	100	36.03	105	75-125	
Extraction Standards					
13C12-2,3,7,8-TCDD	100	27.63	106	75-125	
13C12-1,2,3,7,8-PeCDD	100	32.05	97	70-130	
13C12-1,2,3,6,7,8-HxCDD	100	34.20	98	75-125	
13C12-1,2,3,4,6,7,8-HpCDD	100	35.79	116	70-130	
13C12-OCDD	200	37.23	150	70-130	
13C12-2,3,7,8-TCDF	100	26.72	105	70-130	
13C12-1,2,3,7,8-PeCDF	100	31.07	104	70-130	
13C12-1,2,3,6,7,8-HxCDF	100	33.72	106	70-130	
13C12-1,2,3,4,6,7,8-HpCDF	100	35.23	115	70-130	
Cleanup Standard	**pg/uL**				
13C12-1,2,3,7,8,9-HxCDF	100	34.47	111	40-130	

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SVOC DATA PACKAGE

SECTION 5: QC SAMPLE DATA

Including:

- Laboratory Method Blank Analysis Reports
- Laboratory Control Sample Analysis Reports
- Matrix Spike Analysis Reports
- Other QC Sample Analysis Reports (where applicable)

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Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG3463499-1	Extraction Date	23-Dec-21		Approved:
Analysis Method	TO9A	Sample Size	1	Sample	*N Ashtari*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	MEDIA	Split Ratio	4		28-Jan-2021

Run Information	**Run 1**
Filename	7-210127A07
Run Date	27-Jan-21 21:16
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<2.9	2.9	U		20
1,2,3,7,8-PeCDD	1	NotFnd	<1.7	1.7	U		100
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<1.0	1.0	U		100
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<0.90	0.90	U		100
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<0.98	0.98	U		100
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<2.5	2.5	U		100
OCDD	0.0003	37.24	30.6	4.3	M,J		200
2,3,7,8-TCDF	0.1	NotFnd	<2.1	2.1	U		20
1,2,3,7,8-PeCDF	0.03	NotFnd	<1.0	1.0	U		100
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.93	0.93	U		100
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<0.85	0.85	U		100
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<0.81	0.81	U		100
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<0.89	0.89	U		100
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<1.0	1.0	U		100
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<2.2	2.2	U		100
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<2.9	2.9	U		100
OCDF	0.0003	NotFnd	<3.0	3.0	U		200

Field Spike Standards	**pg**	**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	0	NS	
13C12-1,2,3,4,7,8-HxCDD	0	NS	
13C12-2,3,4,7,8-PeCDF	0	NS	
13C12-1,2,3,4,7,8-HxCDF	0	NS	
13C12-1,2,3,4,7,8,9-HpCDF	0	NS	

Extraction Standards				
13C12-2,3,7,8-TCDD	4000	27.63	68	40-130
13C12-1,2,3,7,8-PeCDD	4000	32.05	69	40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.20	68	40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.79	73	25-130
13C12-OCDD	8000	37.23	73	25-130
13C12-2,3,7,8-TCDF	4000	26.72	70	40-130
13C12-1,2,3,7,8-PeCDF	4000	31.06	72	40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.71	72	40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.23	77	25-130

Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	4000	34.47	70	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<2.9	2.9	U	20
Total-PeCDD	0	<1.7	1.7	U	100
Total-HxCDD	0	<1.0	1.0	U	100
Total-HpCDD	0	<2.5	2.5	U	100
Total-TCDF	0	<2.1	2.1	U	20
Total-PeCDF	0	<1.0	1.0	U	100
Total-HxCDF	0	<1.0	1.0	U	100
Total-HpCDF	0	<2.9	2.9	U	100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.00918
Mid Point PCDD/F TEQ (WHO 2005)	2.93
Upper Bound PCDD/F TEQ (WHO 2005)	5.85

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
NS	Indicates that this standards has not been added.

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name	**Method Blank**	Sampling Date	n/a		
ALS Sample ID	WG3463499-4	Extraction Date	23-Dec-21		Approved:
Analysis Method	TO9A	Sample Size	1	Sample	*N Ashtari*
Analysis Type	Blank	Percent Moisture	n/a		--e-signature--
Sample Matrix	REAGENT	Split Ratio	4		28-Jan-2021

Run Information	**Run 1**
Filename	7-210127A08
Run Date	27-Jan-21 21:58
Final Volume	10 uL
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**TEF (WHO 2005)**	**Ret. Time**	**Conc. pg**	**EDL pg**	**Flags**	**EMPC pg**	**LQL**
2,3,7,8-TCDD	1	NotFnd	<3.2	3.2	U		20
1,2,3,7,8-PeCDD	1	NotFnd	<1.7	1.7	U		100
1,2,3,4,7,8-HxCDD	0.1	NotFnd	<1.5	1.5	U		100
1,2,3,6,7,8-HxCDD	0.1	NotFnd	<1.3	1.3	U		100
1,2,3,7,8,9-HxCDD	0.1	NotFnd	<1.4	1.4	U		100
1,2,3,4,6,7,8-HpCDD	0.01	NotFnd	<2.2	2.2	U		100
OCDD	0.0003	37.25	<10	4.2	M,J,R	10	200
2,3,7,8-TCDF	0.1	NotFnd	<2.3	2.3	U		20
1,2,3,7,8-PeCDF	0.03	NotFnd	<1.0	1.0	U		100
2,3,4,7,8-PeCDF	0.3	NotFnd	<0.94	0.94	U		100
1,2,3,4,7,8-HxCDF	0.1	NotFnd	<0.93	0.93	U		100
1,2,3,6,7,8-HxCDF	0.1	NotFnd	<0.89	0.89	U		100
2,3,4,6,7,8-HxCDF	0.1	NotFnd	<0.98	0.98	U		100
1,2,3,7,8,9-HxCDF	0.1	NotFnd	<1.1	1.1	U		100
1,2,3,4,6,7,8-HpCDF	0.01	NotFnd	<0.85	0.85	U		100
1,2,3,4,7,8,9-HpCDF	0.01	NotFnd	<1.1	1.1	U		100
OCDF	0.0003	NotFnd	<3.7	3.7	U		200

Field Spike Standards	**pg**	**% Rec**	**Limits**
37Cl4-2,3,7,8-TCDD	0	NS	
13C12-1,2,3,4,7,8-HxCDD	0	NS	
13C12-2,3,4,7,8-PeCDF	0	NS	
13C12-1,2,3,4,7,8-HxCDF	0	NS	
13C12-1,2,3,4,7,8,9-HpCDF	0	NS	

Extraction Standards				
13C12-2,3,7,8-TCDD	4000	27.63	53	40-130
13C12-1,2,3,7,8-PeCDD	4000	32.05	67	40-130
13C12-1,2,3,6,7,8-HxCDD	4000	34.21	67	40-130
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.79	72	25-130
13C12-OCDD	8000	37.24	69	25-130
13C12-2,3,7,8-TCDF	4000	26.72	60	40-130
13C12-1,2,3,7,8-PeCDF	4000	31.07	63	40-130
13C12-1,2,3,6,7,8-HxCDF	4000	33.72	71	40-130
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.24	78	25-130

Cleanup Standard	**pg**			
13C12-1,2,3,7,8,9-HxCDF	4000	34.47	61	40-130

Homologue Group Totals	**# peaks**	**Conc. pg**	**EDL pg**		
Total-TCDD	0	<3.2	3.2	U	20
Total-PeCDD	0	<1.7	1.7	U	100
Total-HxCDD	0	<1.5	1.5	U	100
Total-HpCDD	0	<2.2	2.2	U	100
Total-TCDF	0	<2.3	2.3	U	20
Total-PeCDF	0	<1.0	1.0	U	100
Total-HxCDF	0	<1.1	1.1	U	100
Total-HpCDF	0	<1.1	1.1	U	100

Toxic Equivalency - (WHO 2005)	**pg**
Lower Bound PCDD/F TEQ (WHO 2005)	0.00
Mid Point PCDD/F TEQ (WHO 2005)	3.15
Upper Bound PCDD/F TEQ (WHO 2005)	6.30

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
TEQ	Indicates the Toxic Equivalency
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that a target analyte was detected below the calibrated range.
R	Indicates that the ion abundance ratio for this compound did not meet the acceptance criterion.
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
EMPC	Estimated Maximum Possible Concentration – elevated detection limit due to interference or positive id criterion failure
NS	Indicates that this standards has not been added.

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	**Laboratory Control Sample**	Sampling Date	n/a		
ALS Sample ID	WG3463499-2	Extraction Date	23-Dec-21		Approved:
Analysis Method	TO9A	Sample Size	1	Sample	*N Ashtari*
Analysis Type	LCS	Percent Moisture	n/a		--e-signature--
Sample Matrix	MEDIA	Split Ratio	4		28-Jan-2021

Run Information	**Run 1**
Filename	7-210117A16
Run Date	17-Jan-21 18:09
Final Volume	10 uL
Dilution Factor	1
Analysis Units	%
Instrument - Column	HRMS-7 DB5MSUS0710421H

Target Analytes	**pg**	**Ret. Time**	**% Rec**	**Limits**	**Flags**
2,3,7,8-TCDD	400	27.71	90	70-130	
1,2,3,7,8-PeCDD	2000	32.09	105	70-130	
1,2,3,4,7,8-HxCDD	2000	34.17	102	70-130	
1,2,3,6,7,8-HxCDD	2000	34.23	100	70-130	
1,2,3,7,8,9-HxCDD	2000	34.35	103	70-130	
1,2,3,4,6,7,8-HpCDD	2000	35.82	98	70-130	
OCDD	4000	37.27	110	70-130	
2,3,7,8-TCDF	400	26.80	91	70-130	
1,2,3,7,8-PeCDF	2000	31.12	90	70-130	
2,3,4,7,8-PeCDF	2000	31.87	82	70-130	
1,2,3,4,7,8-HxCDF	2000	33.68	90	70-130	
1,2,3,6,7,8-HxCDF	2000	33.75	95	70-130	
2,3,4,6,7,8-HxCDF	2000	34.08	86	70-130	
1,2,3,7,8,9-HxCDF	2000	34.50	86	70-130	
1,2,3,4,6,7,8-HpCDF	2000	35.26	89	70-130	
1,2,3,4,7,8,9-HpCDF	2000	36.06	92	70-130	
OCDF	4000	37.36	79	70-130	
Field Spike Standards	**pg**		**% Rec**	**Limits**	
37Cl4-2,3,7,8-TCDD	0		NS		
13C12-1,2,3,4,7,8-HxCDD	0		NS		
13C12-2,3,4,7,8-PeCDF	0		NS		
13C12-1,2,3,4,7,8-HxCDF	0		NS		
13C12-1,2,3,4,7,8,9-HpCDF	0		NS		
Extraction Standards					
13C12-2,3,7,8-TCDD	4000	27.68	52	40-130	
13C12-1,2,3,7,8-PeCDD	4000	32.08	53	40-130	
13C12-1,2,3,6,7,8-HxCDD	4000	34.22	56	40-130	
13C12-1,2,3,4,6,7,8-HpCDD	4000	35.81	54	25-130	
13C12-OCDD	8000	37.27	59	25-130	
13C12-2,3,7,8-TCDF	4000	26.77	56	40-130	
13C12-1,2,3,7,8-PeCDF	4000	31.10	50	40-130	
13C12-1,2,3,6,7,8-HxCDF	4000	33.73	56	40-130	
13C12-1,2,3,4,6,7,8-HpCDF	4000	35.25	53	25-130	
Cleanup Standard	**pg**				
13C12-1,2,3,7,8,9-HxCDF	4000	34.49	54	40-130	

NS Indicates that this standards has not been added.

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6

SVOC DATA PACKAGE

SECTION 6: INTERNAL RECORDS

Including:

- Prep Logs
- Independent calculation checks
- Others as listed below:

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Extraction Workup Sheet

Batch ID:	WG3463499	Analysis:	PUFS - M23/1668A (HR)

WG3463499

Prep Procedure: BU-TM-1110 Overall HR Prep, BU-TP-1101 8270D Prep, BU-TP-2100 PAH Prep Method

Analyst:	Saurin Ketu	Date:	23-Dec-20

SUBSAMPLING

Sample I.D.	Client I.D.	Media Prep L#
WG3463499-1	Method Blank	L2497422-16
WG3463499-2	Laboratory Control Sample	L2497422-17
WG3463499-3	Extraction and Injection STD.	—
WG3463499-4	Method Blank(Reagent)	glassware TS-S
L2541483-1	SITE 1 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	L2497422-3, L2527465-3, L2497422-8
L2541483-2	SITE 2 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	L2527465-2, L2516041-5, L2497422-5
L2541483-3	SITE 3 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	L2497422-9, L2527465-6, L2497422-4
L2541483-4	SITE 4 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	L2497422-10, L2527465-4, L2497422-7
L2541483-5	SITE 5 - COMPOSITE 4 (WET SEASON - OCT, NOV, DEC)	L2497422-1, L2527465-1, L2497422-10
	Composite PUFS to be combined as 1 sample	

BATCH TRACKING

	Date/Time/Initials
Client Labels Checked:	SP
Media transfer to soxhlet:	SP
Rotovap Rinses:	—
liquid/liquid extraction:	N/A —
Soxhlet Start Time:	2:30pm SP 23-Dec-20 SP
Soxhlets Reflux Properly:	SP
Soxhlet End Time:	MM 24-Dec-2020 12:40pm.
	-
	-
	-
	-
Rotovap Reduction + verify temp:	28-Dec-20 AR
Extract split:	28-Dec-20 AR
Acid Silica Column:	28-Dec-20 BM/SS
Solvent exchange:	4-Jan-21 NB
Alumina Column:	4-Jan-21 NB
Split	4-Jan-21 NB
	—
Micro/Robo Vial: PCB DX	4-Jan-21 NB 5-Jan-21 KS
Update to LIMS:	5-Jan-21 KS

DXPCB STACK PREP
3-OCt-18 / MSM RS
Page 1 of 11

Batch ID:	WG3463499

DX Extraction Standard:

Sample I.D.	Volume (ul)	(Checkmark) Spiked
WG3463499-1	40	✓
WG3463499-2	40	✓
WG3463499-3	40	✓
WG3463499-4	40	✓
L2541483-1	40	✓
L2541483-2	40	✓
L2541483-3	40	✓
L2541483-4	40	✓
L2541483-5	40	✓
	40	
	40	
	40	

Syringe ID: 320

Standard: M23-ES#2- 043I

Spike Date: 23-Dec-20

Spike Witnessing

Chemist's Initials

Chemist: SP

Witness's Initials

Witness: AM

Witness's Initials

Correct Syringe Obtained: AM

Witness's Initials

Correct Standard Obtained: AM

Witness's Initials

Correct Technique Followed: AM

PCB Extraction Standard:

Sample I.D.	Volume (ul)	(Checkmark) Spiked
WG3463499-1	40	✓
WG3463499-2	40	✓
WG3463499-3	40	✓
WG3463499-4	40	✓
L2541483-1	40	✓
L2541483-2	40	✓
L2541483-3	40	✓
L2541483-4	40	✓
L2541483-5	40	✓
	40	
	40	

Syringe ID: 382

Standard: 1668A-ES#2- 069F

Spike Date: 23-Dec-20 SP

Spike Witnessing

Chemist's Initials

Chemist: SP

Witness's Initials

Witness: AM

Witness's Initials

Correct Syringe Obtained: AM

Witness's Initials

Correct Standard Obtained: AM

Witness's Initials

Correct Technique Followed: AM

Batch ID:	WG3463499

Batch ID:	WG3463499

DX Native Standard:

Sample I.D.	Volume (ul)	(Checkmark) Spiked
WG3463499-2	40	✓
WG3463499-3	40	✓

Syringe ID: 322
Standard: 1613B-NS#3-030B
Date & Initials: 23-Dec-20 SS

PCB Native Standard:

Sample I.D.	Volume (ul)	(Checkmark) Spiked
WG3463499-2	40	✓
WG3463499-3	40	✓

Syringe ID: 394
Standard: 1668A-NS#1-040D
Date & Initials: 23-Dec-20 SS

DX Cleanup Standard:

Sample I.D.	Volume (ul)	(Checkmark) Spiked
WG3463499-1	20	✓
WG3463499-2	20	✓
WG3463499-3	N/A	N/A
WG3463499-4	20	✓
L2541483-1	20	✓
L2541483-2	20	✓
L2541483-3	20	✓
L2541483-4	20	✓
L2541483-5	20	✓
	20	
	20	

Syringe ID: 357
Standard: M23-CL#1-037A
Date & Initials: 28-Dec-20 SS/BM

Chemist's Initials
Correct Syringe Obtained: SS/BM
Chemist's Initials
Correct Standard Obtained: SS/BM
Chemist's Initials
Correct Technique Followed: SS/BM

PCB Cleanup Standard:

Sample I.D.	Volume (ul)	(Checkmark) Spiked
WG3463499-1	20	✓
WG3463499-2	20	✓
WG3463499-3	N/A	N/A
WG3463499-4	20	✓
L2541483-1	20	✓
L2541483-2	20	✓
L2541483-3	20	✓
L2541483-4	20	✓
L2541483-5	20	✓
	20	
	20	

Syringe ID: 395
Standard: 1668A-CL#2-038I
Date & Initials: 28-Dec-20 SS/BM

Chemist's Initials
Correct Syringe Obtained: SS/BM
Chemist's Initials
Correct Standard Obtained: SS/BM
Chemist's Initials
Correct Technique Followed: SS/BM

Batch ID:	WG3463499

DX Injection Standard:

Sample I.D.	Volume (ul)	Spiked (Checkmark)
WG3463499-1	10	✓
WG3463499-2	10	✓
WG3463499-3	10	✓
WG3463499-4	10	✓
L2541483-1	10	✓
L2541483-2	10	✓
L2541483-3	10	✓
L2541483-4	10	✓
L2541483-5	10	✓
	10	
	10	
	10	
	10	
	10	
	10	
	10	

Syringe ID: 342

Standard: 1613B-IS#1- 087H

Date & Initials: 5-Jan-2020 KB

	Chemist's Initials
Correct Syringe Obtained:	KB
Correct Standard Obtained:	KB
Correct Technique Followed:	KB

PCB Injection Standard:

Sample I.D.	Volume (ul)	Spiked (Checkmark)
WG3463499-1	5	✓
WG3463499-2	5	✓
WG3463499-3	5	✓
WG3463499-4	5	✓
L2541483-1	5	✓
L2541483-2	5	✓
L2541483-3	5	✓
L2541483-4	5	✓
L2541483-5	5	✓
	5	
	5	
	5	
	5	
	5	
	5	
	5	

Syringe ID: 365

Standard: 1668A-IS#2-014B

Date & Initials: 4-Jan-2021 NB

	Chemist's Initials
Correct Syringe Obtained:	NB
Correct Standard Obtained:	NB
Correct Technique Followed:	NB

Batch ID:	WG3463499

Reagent Lot Numbers:

Reagent	Lot#	Manufacturer
Acetone	105642	
Hexane	105523	
DCM	105939	
Toluene	105795	
Nonane	ORG-WAKONON- 056	
1:1 DCM:HEX	ORG-DH2- 662	
Sodium Sulphate	ORG-SSU- 2462, 2461	
Acid Silica	ORG-ASI- 9524, 9525, 9526	
Neutral Silica	ORG-NSI- 2468	
Alumina	ORG-ALU- 491	
1% Deactivated Silica	ORG-2%DAS- –	
Chromacarb	ORG-CC- 255	

Corn oil 073

Batch ID:	WG3463499

Procedure:

This batchsheet is a guideline only. Please see test procedure for complete set of instructions.
Extraction:
- For MB and LCS you **must** use blank media - if not available see your Team Lead
XAD+Filter+Front Half Rinse
- Place a layer of pre-cleaned glasswool with 1cm of sodium sulphate or a preclened thimble into soxhlet
- Place the PUFS into the soxhlet body or precleaned thimble
- Spike with Extraction Standard (plus Native for LCS and ENI).
- Soxhlet extract in DCM for 16 hours (check with team lead or supervisor)
Rotovap:
- Rotovap and reduce to ~2mL.
- Transfer to a calibrated c-tube (marked at 1ml, 2ml) with 3x2ml hexane
- Mix well then quantitatively spilt the extract **1/2 DX/PCB 1/2 Archive**

Batch ID:	WG3463499
DX/PCB:	
- Perform Acid Silica column	
`- Solvent Exchange (reduce to **~50ul**, bulk back up to 1ml Hexane, vortex well.	
`- Perform Alumina Column:	
- Pre-elute the Alumina Column with 7ml Hexane	
- Place F1 c-tube under the column, then load the sample with 3x1ml Hexane rinses	
- F1 (Archive) 1mL Hexane	
- F2 (DX/PCB) 14mL 1:1 DCM:Hexane	
-Split Alumina F2 1/2 PCB 1/2 DX	
Micro-Vial:	
PCB:	
- Blow down to ~1/2ml	
- Vortex **very** well.	
- Transfer every last drop to a micro-vial (Marked at 20uL with nonane).	
- Blow down to the line	
- Spike PCB Injection Standard, cap and vortex. **FV=25ul**	

DX:
- Solvent Exchange to Hexane (Reduce to Just Dry then bulk back up to 1ml Hexane)
- ChromaCarb: - 4cm of well-packed chroma-carb.
- Pre-elute Carbon with 5ml Hexane
- Transfer with 3x1ml Hexane
- F1 = **10ml** 1:1 DCM:Hexane (Archive)
- After dripping has stopped Invert Column.
- F2 = 14ml Toluene (DX and PCB)
- After the column has stopped dripping reduce the **F2** portion down to ~1/2ml.
- Vortex well, then transfer to a micro-vial without rinses.
- Blow the micro-vial down to just-dry.
- Spike with Injection Standard, Cap the micro-vial, and Vortex. **FV=10ul**

Batch ID:	WG3463499

Comments:

NOTE: Label and Save All Columns including Acid Silica Columns

Approval of Deviation from Standard Method

(Batch Writer): _____

☐ Procedure does deviate from Standard Method. **Approved (Supervisor/Manager):** _____

WG3463499			Prep Analyst:		
PUFS - M23/1668A (HR)			Date:		
	Very Good	Meets Method Req	Some Outliers	Very Poor	Comments / Was spl/batch sent for rework? Why?
MB					
LCS					
DUP					
ES rec					

ALS Life Sciences

Sample Calculation Report

CS3 RRF Check

Approved: *N Ashtari* --e-signature-- 28-Jan-2021

RRF = (Response of 2,3,7,8-TCDD / Response of 13C12-2,3,7,8-TCDD) x (Concentration of 13C12-2,3,7,8-TCDD / Concentration of TCDD)

						Calculated Value	Value from TargetLynx	
RRF	**=**	**167775.70** / **1460254.80**	**x**	**100** / **10**	**=**	**1.149**	**1.149**	

Calculation of OCDD amount in L2541483-1

pg = (Response of OCDD / Response of 13C12-OCDD) x (pg of 13C12-OCDD spiked / Mean RRF * Sample Size)

pg	**=**	**47999.5** / **343802.4**	**x**	**8000** / **0.96**	*****	**1.00**	**=**	**1159**	**1159**	

Calculation of 13C12-2,3,7,8-TCDD Recovery in L2541483-1

% Recovery = (Response of 13C12-2,3,7,8-TCDD / Response of 13C12-1,2,3,4-TCDD) x (pg of 13C12-1,2,3,4-TCDD spiked * 100 / Mean RRF * Amount Spiked)

% Recovery	**=**	**1211291.2** / **1547309.8**	**x**	**4000** / **1.11**	*****	**100** / **4000**	**=**	**71**	**71**	**%**

1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6

SVOC DATA PACKAGE

SECTION 7: SHIPPING/RECEIVING DOCUMENTS

Including:

- Airbills
- Chain-of-Custody Records
- Sample Log-in Sheet(s) - where applicable
- Others as listed below:

Composite WO: L2541483

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2519524-COFC

COC Number: 17 - 792165

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution		Select Turnaround Time (TAT) Below - Contact your AM to confirm all E&P TATs (surcharges may apply)
Company:	Faralon Consulting	Select Report Format:	PDF ☒ EXCEL ☐ EDD (DIGITAL) ☐	Regular [R] ☒ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Amber Bailey	Quality Control (QC) Report with Report	YES ☐ NO ☐	PRIORITY (Business Days): 4 day [P4-20%] ☐ / 3 day [P3-25%] ☐ / 2 day [P2-50%] ☐
Phone:	206-735-6178	Compare Results to Criteria on Report - provide details below if box checked	☐	EMERGENCY: 1 Business day [E - 100%] ☐ / Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] ☐
	Company address below will appear on the final report	Select Distribution:	EMAIL ☒ MAIL ☐ FAX ☐	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
Street:	975 5th Ave. NW	Email 1 or Fax	abailey@faralonconsulting.com	For tests that can not be performed according to the service level selected, you will be contacted.
City/Province:	Issaquah, WA	Email 2		
Postal Code:	98059	Email 3		
Invoice To	Same as Report To YES ☒ NO ☐	**Invoice Distribution**		
	Copy of Invoice with Report YES ☒ NO ☐	Select Invoice Distribution:	EMAIL ☒ MAIL ☐ FAX ☐	
Company:		Email 1 or Fax	AP@faralonconsulting.com	
Contact:		Email 2	abailey@faralonconsulting.com	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:		Major/Minor Code	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PCBs EPA Method 1668	Dioxins EPA Method 8290A	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
1	L2497422-3-1	15-Oct-20	1010	Air	1	X	X		
2	L2497422-5-2	15-Oct-20	1037		1	X	X		
3	L2497422-4-3		1205		1	X	X		
4	L2497422-6-4		1216		1	X	X		
5	L2497422-2-5		1225		1	X	X		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? YES ☐ NO ☐	
Are samples for human consumption/ use? YES ☐ NO ☐	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐	SIF Observations	Yes ☐	No ☒
Ice Packs ☒ Ice Cubes ☒	Custody seal intact	Yes ☒	No ☐
Cooling Initiated ☒			

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
10.8°C							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	10/15/20	1400	ARRON BURTON	21-Oct-2020	11:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**

Composite WO: L2541483

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

~~Canada Toll Free: 1 800 668 9878~~

L2530845-COFC

COC Number: 17 - 792309

Page of

Report To	Contact and company name below will appear on the final report
Company:	Farallon Consulting
Contact:	Amber Bailey
Phone:	206 735-6178
	Company address below will appear on the final report
Street:	975 5th AVE NW
City/Province:	Issaquah WA
Postal Code:	98027
Invoice To	Same as Report To [X] YES [ ] NO
	Copy of Invoice with Report [X] YES [ ] NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	[X] PDF [X] EXCEL [X] EDD (DIGITAL)
Quality Control (QC) Report with Report	[ ] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	[X] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	abailey@farallonconsulting.com
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	[X] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	APe farallonconsulting.com
Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code.
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): | **ALS Contact:** | **Sampler:**

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] [ ] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ] | 3 day [P3-25%] [ ] | 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E - 100%] [ ] | Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] [ ]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PCBs EPA method 1668	Dioxins EPA method 8290A	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	L2497422-1	10/29/20	1305	Air	1				
1	L2497422-8-1	11/17/20	0946		1	X	X		
2	L2496041-1-2		1011		1	X	X		
3	L2497422-9-3		1046		1	X	X		
4	L2497422-7-4		1055		1	X	X		
5	L2497422-10-5		1106		1	X	X		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? [ ] YES [ ] NO	Do not analyze L2497422-1, Recycle/discard
Are samples for human consumption/ use? [ ] YES [ ] NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	[ ]	SIF Observations	Yes [ ] No [X]
Ice Packs [X] Ice Cubes [ ]		Custody seal intact	Yes [X] No [ ]
Cooling Initiated	[X]		

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
5.9°C							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
	11/17/20	1205	AARON BURTON	18-NOV-2020	11:45			

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Composite WO: L2541483

Chain of Custody (COC) / Analytical Request Form

L2541477-COFC

COC Number: 17 - 792310

ALS Environmental

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Canada Toll Free: 1 800 668 9878

Page of

Report To	Contact and company name below will appear on the final report
Company:	Faralion Consulting
Contact:	Amber Bailey
Phone:	206 735 6178
Company address below will appear on the final report	
Street:	975 5th Ave NW
City/Province:	Issaquah WA
Postal Code:	98027
Invoice To	Same as Report To [X] YES [ ] NO
	Copy of Invoice with Report [X] YES [ ] NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	[X] PDF [X] EXCEL [X] EDD (DIGITAL)
Quality Control (QC) Report with Report	[ ] YES [ ] NO
[ ] Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	[ ] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	abailey@faralionconsulting.com
Email 2	spatterson@faralionconsulting.com
Email 3	

Invoice Distribution	
Select Invoice Distribution:	[X] EMAIL [ ] MAIL [ ] FAX
Email 1 or Fax	AP@faralionconsulting.com
Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] [X] Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] [ ]; 3 day [P3-25%] [ ]; 2 day [P2-50%] [ ]

EMERGENCY: 1 Business day [E - 100%] [ ]; Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] [ ]

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	PCBs	EPA Method 1668B	EPA Method 8290A Dioxins	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
1	L2497422-8 - 1	12/15/20	1241	Air	1	X	X			
2	L2497422-1 - 2	"	1250	"	1	X	X			
3	L2497422-9 - 3	"	1324	"	1	X	X			
4	L2497422-7 - 4	"	1334	"	1	X	X			
5	L2497422-10 - 5	"	1343	"	1	X	X			

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? [ ] YES [ ] NO	Analyze samples - composite samples submitted on 10/15, 11/17, and 12/15.
Are samples for human consumption/ use? [ ] YES [ ] NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen [ ] SIF Observations Yes [ ] No [X]

Ice Packs [X] Ice Cubes [ ] Custody seal intact Yes [X] No [ ]

Cooling Initiated [X]

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
5.4°C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 12/15/20	Time: 1500	Received by: AARON BENTON	Date: 08-DEC-2020	Time: 13:10	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2015 FRONT

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Sample Receiving Log

Date/Time Received	Client ID	Number/Description of Containers	Temp. on Receipt*	Condition of Samples, Courier & Tracking Information	Receiver's Initials	Date/Time Login Completed	Submission ID	Sample ID Range
21-oct-2020 11:00	FARALLON	5 x PUFs	10.8°C	Good FedEx 7714 6810 5736	MJ	21-oct-2020 14:45	L2519524	-1-5

*Temperatures were recorded using :

☑ VWR Traceable dedicated I.R. gun (model 36934-178 SN 192108143)

☐ Other (specify): _____

Sample Receiving Log

Date/Time Received	Client ID	Number/Description of Containers	Temp. on Receipt*	Condition of Samples, Courier & Tracking Information	Receiver's Initials	Date/Time Login Completed	Submission ID	Sample ID Range
18-NOV-2020 11:45	FARALLON	6 x PUFS	5.9°C	Good FedEx 7726 6531 8900	MJ	18-NOV-2020 14:08	L2530845	-1-5

*Temperatures were recorded using :

☑ VWR Traceable dedicated I.R. gun (model 36934-178 SN 192108143)

☐ Other (specify): _____

Sample Receiving Log

Date/Time Received	Client ID	Number/Description of Containers	Temp. on Receipt*	Condition of Samples, Courier & Tracking Information	Receiver's Initials	Date/Time Login Completed	Submission ID	Sample ID Range
16-Dec2020 13:10	FARALLON	5 x PUFs	5.4°C	Good FedEx 7718 6371 7805	NJ	17-Dec2020 12:45	L2541477 L2541483	-1-5 -1-5

*Temperatures were recorded using :

☑ VWR Traceable dedicated I.R. gun (model 36934-178 SN 192108143)

☐ Other (specify): _____

From: Claire Kocharakkal
To: Amber Bailey; Breanne Dusureault
Subject: RE: [EXTERNAL] - COC from 12/15/20
Date: Friday, January 8, 2021 12:40:54 PM
Attachments: image003.png
image004.png
image005.png

Hello Amber,

We can certainly look into this! Breanne will be your account manager going forward and she will be happy to check in on this and respond.

Thank you!

Claire Kocharakkal
Account Manager, Environmental
Canada

T +1 905 331 3111 **D** +1 905 340 0819
F +1 905 331 4567
claire.kocharakkal@alsglobal.com
1435 Norjohn Court Unit 1
Burlington, ON Canada, L7L 0E6

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***EnviroMail 00** – Summary of all EnviroMails Canada*

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From: Amber Bailey [mailto:abailey@farallonconsulting.com]
Sent: Friday, January 08, 2021 12:37 PM
To: Claire Kocharakkal <claire.kocharakkal@ALSGlobal.com>
Subject: [EXTERNAL] - COC from 12/15/20
Importance: High

Claire,

Can you double check on something for me? I think I wrote the incorrect sample label IDs on the COC from the 12/15 sample submission.

If so please verify that the following samples were actually the ones submitted.

Site 1: L2527465-3
Site 2: L2527465- 2
Site 3: L2527465- 5
Site 4: L2527465- 4
Site 5: L2527465- 1

If these are correct please correct on the COC to:

L2527465-3-1
L2527465- 2- 2
L2527465- 5- 3
L2527465- 4- 4
L2527465- 1- 5

I apologize for the mix up.

Thank you,

Amber Bailey, Project Environmental Scientist
Farallon Consulting, L.L.C. | 975 5th Avenue Northwest | Issaquah, Washington 98027
abailey@farallonconsulting.com | Direct: (425) 295-0811 Cell: (206) 735-6178

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