
Appendix A3

Raw Chemical Data

**Brominated Diphenylether (PBDE)
Analysis Report**

BROMINATED DIPHENYLETHER CONGENER ANALYSIS REPORT

AXYS ANALYTICAL SERVICES

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

Contract No.: 2607

Project No.

POP1406

Lab Sample I.D.:

L11830-15 R

Matrix: SEDIMENT

Sample Size:

4.36 g (dry)

Sample Receipt Date: 07-Oct-2008

Initial Calibration Date:

04-Dec-2008

Extraction Date: 26-Nov-2008

Instrument ID:

HR GC/MS

Analysis Date: 16-Dec-2008 Time: 20:00:06

GC Column ID:

DB5HT

Extract Volume (uL): 50

Sample Data Filename:

BE81_385 S: 7

Injection Volume (uL): 1.0

Blank Data Filename:

BE81_385 S: 5

Dilution Factor: N/A

Cal. Ver. Data Filename:

BE81_385 S: 1

Concentration Units: pg/g (dry weight basis)

% Moisture:

61.8

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT	ION ABUND. RATIO	RRT
2,4-DiBDE	7			0.295	0.230	0.46	0.929
2,4'-DiBDE	8	8 + 11	C	4.04	0.230	0.52	0.958
2,6-DiBDE	10		ND		0.230		
3,3'-DiBDE	11	8 + 11	C8				
3,4-DiBDE	12	12 + 13	C NDR	18.5	0.230	1.20	0.974
3,4'-DiBDE	13	12 + 13	C12				
4,4'-DiBDE	15			4.39	0.230	0.45	1.001
2,2',4-TriBDE	17	17 + 25	C	8.30	0.387	1.04	0.973
2,3',4-TriBDE	25	17 + 25	C17				
2,4,4'-TriBDE	28	28 + 33	C	4.09	0.300	1.12	1.000
2,4,6-TriBDE	30		ND		0.424		
2,4',6-TriBDE	32			5.34	0.331	1.14	0.955
2',3,4-TriBDE	33	28 + 33	C28				
3,3',4-TriBDE	35		NDR	0.673	0.261	0.86	1.018
3,4,4'-TriBDE	37		ND		0.242		
2,2',4,4'-TeBDE	47			45.9	0.230	0.68	1.000
2,2',4,5'-TeBDE	49			26.3	0.230	0.64	0.976
2,2',4,6'-TeBDE	51			3.53	0.230	0.61	0.967
2,3',4,4'-TeBDE	66			2.93	0.230	0.65	1.022
2,3',4',6-TeBDE	71		NDR	2.05	0.230	1.05	0.980
2,4,4',6-TeBDE	75		NDR	0.361	0.230	1.08	0.962
3,3',4,4'-TeBDE	77		NDR	0.251	0.230	0.93	1.000
3,3',4,5'-TeBDE	79		ND		0.330		
2,2',3,4,4'-PeBDE	85		NDR	2.10	0.742	1.21	0.992
2,2',4,4',5-PeBDE	99			36.4	0.591	1.05	1.000
2,2',4,4',6-PeBDE	100			9.84	0.425	1.12	1.000
2,3,3',4,4'-PeBDE	105		ND		0.930		



COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT	ION ABUND. RATIO	RRT
2,3,4,5,6-PeBDE	116		ND		1.25		
2,3',4,4',6-PeBDE	119	119 + 120	C ND		0.920		
2,3',4,5,5'-PeBDE	120	119 + 120	C119				
3,3',4,4',5-PeBDE	126		ND		0.461		
2,2',3,3',4,4'-HxBDE	128		ND		3.70		
2,2',3,4,4',5'-HxBDE	138	138 + 166	C ND		2.47		
2,2',3,4,4',6'-HxBDE	140		NDR	1.78	0.230	1.22	1.021
2,2',4,4',5,5'-HxBDE	153			11.9	0.230	0.79	1.000
2,2',4,4',5,6'-HxBDE	154			12.9	0.230	0.81	1.000
2,2',4,4',6,6'-HxBDE	155			7.30	0.230	0.66	0.981
2,3,4,4',5,6-HxBDE	166	138 + 166	C138				
2,2',3,4,4',5,6-HpBDE	181		ND		4.91		
2,2',3,4,4',5',6-HpBDE	183			62.5	2.64	1.09	1.000
2,3,3',4,4',5,6-HpBDE	190		ND		9.80		
2,2',3,4,4',5,5',6-OcBDE	203			144	19.9	0.76	1.012
2,2',3,3',4,4',5,5',6-NoBDE	206			477	7.08	0.99	1.114
2,2',3,3',4,4',5,6,6'-NoBDE	207			1180	6.98	1.04	1.098
2,2',3,3',4,5,5',6,6'-NoBDE	208			669	9.60	0.97	1.091
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			9090	48.5	0.85	1.000

(1) Where applicable, custom lab flags have been used on this report; ND = not detected; NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration; C = co-eluting congener.

Approved by: _____ Jason MacKenzie _____ QA/QC Chemist

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These pages are part of a larger report that may contain information necessary for full data evaluation. Results reported relate only to the sample tested. Results are compliant with NELAP where specific accreditation is held.



Form 2
BROMINATED DIPHENYLETHER ANALYSIS REPORT

CLIENT SAMPLE NO.
08THA019A
Sample Collection:
N/A

AXYS ANALYTICAL SERVICES

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

Contract No.: 2607
Matrix: SEDIMENT
Sample Receipt Date: 07-Oct-2008
Extraction Date: 26-Nov-2008
Analysis Date: 16-Dec-2008 Time: 20:00:06
Extract Volume (uL): 50
Injection Volume (uL): 1.0
Dilution Factor: N/A
Concentration Units: pg absolute

Project No. POP1406
Lab Sample I.D.: L11830-15 R
Sample Size: 4.36 g (dry)
Initial Calibration Date: 04-Dec-2008
Instrument ID: HR GC/MS
GC Column ID: DB5HT
Sample Data Filename: BE81_385 S: 7
Blank Data Filename: BE81_385 S: 5
Cal. Ver. Data Filename: BE81_385 S: 1
% Moisture: 61.8

LABELLED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	SPIKE CONC.	CONC. FOUND	R(%) ³	ION ABUND. RATIO	RRT
13C12-4,4'-DiBDE	15L			2000	1380	69.0	0.52	0.667
13C12-2,4,4'-TriBDE	28L			2000	1140	56.9	1.02	0.832
13C12-2,2',4,4'-TeBDE	47L			2160	1500	69.2	1.52	0.988
13C12-3,3',4,4'-TeBDE	77L			1860	1380	74.3	1.53	1.041
13C12-2,2',4,4',5-PeBDE	99L			2140	1650	77.2	1.06	1.133
13C12-2,2',4,4',6-PeBDE	100L			2160	1510	70.0	1.06	1.101
13C12-3,3',4,4',5-PeBDE	126L			2000	1610	80.4	1.04	1.198
13C12-2,2',4,4',5,5'-HxBDE	153L			2060	1070	51.7	1.29	0.881
13C12-2,2',4,4',5,6'-HxBDE	154L			2000	993	49.7	1.28	0.851
13C12-2,2',3,4,4',5,6'-HpBDE	183L			2000	1190	59.4	1.04	0.966
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			2000	1420	70.9	0.78	1.063
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			20400	14900	73.0	1.18	1.081
CLEANUP STANDARD								
13C12-2,2',3,4,4',6-HxBDE	139L			2000	987	49.3	1.36	1.013

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

Approved by: _____ Jason MacKenzie _____ QA/QC Chemist

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BROMINATED DIPHENYLETHER CONGENER ANALYSIS REPORT

AXYS ANALYTICAL SERVICES

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

Contract No.: 2607

Project No.

N/A

Lab Sample I.D.:

WG27201-101

Matrix: SOLID

Sample Size:

5.00 g

Sample Receipt Date: N/A

Initial Calibration Date:

04-Dec-2008

Extraction Date: 26-Nov-2008

Instrument ID:

HR GC/MS

Analysis Date: 16-Dec-2008 Time: 18:07:42

GC Column ID:

DB5HT

Extract Volume (uL): 50

Sample Data Filename:

BE81_385 S: 5

Injection Volume (uL): 1.0

Blank Data Filename:

BE81_385 S: 5

Dilution Factor: N/A

Cal. Ver. Data Filename:

BE81_385 S: 1

Concentration Units: pg/g

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT	ION ABUND. RATIO	RRT
2,4-DiBDE	7		ND		0.200		
2,4'-DiBDE	8	8 + 11	C ND		0.200		
2,6-DiBDE	10		ND		0.200		
3,3'-DiBDE	11	8 + 11	C8				
3,4-DiBDE	12	12 + 13	C ND		0.200		
3,4'-DiBDE	13	12 + 13	C12				
4,4'-DiBDE	15		ND		0.200		
2,2',4-TriBDE	17	17 + 25	C ND		0.208		
2,3',4-TriBDE	25	17 + 25	C17				
2,4,4'-TriBDE	28	28 + 33	C NDR	0.523	0.200	1.31	1.001
2,4,6-TriBDE	30		ND		0.228		
2,4',6-TriBDE	32		ND		0.200		
2',3,4-TriBDE	33	28 + 33	C28				
3,3',4-TriBDE	35		ND		0.200		
3,4,4'-TriBDE	37		ND		0.200		
2,2',4,4'-TeBDE	47			12.6	0.200	0.69	1.001
2,2',4,5'-TeBDE	49		NDR	0.435	0.200	1.48	0.976
2,2',4,6'-TeBDE	51		ND		0.200		
2,3',4,4'-TeBDE	66		NDR	0.355	0.200	0.84	1.021
2,3',4',6-TeBDE	71		ND		0.200		
2,4,4',6-TeBDE	75		ND		0.200		
3,3',4,4'-TeBDE	77		ND		0.200		
3,3',4,5'-TeBDE	79		ND		0.200		
2,2',3,4,4'-PeBDE	85		NDR	0.630	0.200	1.50	0.992
2,2',4,4',5-PeBDE	99			14.3	0.200	0.95	1.001
2,2',4,4',6-PeBDE	100			2.64	0.200	1.11	1.000
2,3,3',4,4'-PeBDE	105		ND		0.200		



COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	CONC. FOUND	REPORTING LIMIT	ION ABUND. RATIO	RRT
2,3,4,5,6-PeBDE	116		ND		0.200		
2,3',4,4',6-PeBDE	119	119 + 120	C ND		0.200		
2,3',4,5,5'-PeBDE	120	119 + 120	C119				
3,3',4,4',5-PeBDE	126		ND		0.200		
2,2',3,3',4,4'-HxBDE	128		ND		0.386		
2,2',3,4,4',5'-HxBDE	138	138 + 166	C	0.588	0.200	0.87	1.044
2,2',3,4,4',6'-HxBDE	140		ND		0.200		
2,2',4,4',5,5'-HxBDE	153		NDR	2.65	0.200	0.62	1.000
2,2',4,4',5,6'-HxBDE	154			1.25	0.200	0.76	1.001
2,2',4,4',6,6'-HxBDE	155		NDR	0.200	0.200	0.58	0.982
2,3,4,4',5,6-HxBDE	166	138 + 166	C138				
2,2',3,4,4',5,6-HpBDE	181		ND		0.483		
2,2',3,4,4',5',6-HpBDE	183		NDR	1.06	0.200	1.66	1.000
2,3,3',4,4',5,6-HpBDE	190		ND		0.330		
2,2',3,4,4',5,5',6-OcBDE	203		NDR	4.66	1.14	1.19	1.012
2,2',3,3',4,4',5,5',6-NoBDE	206		NDR	19.8	1.61	1.30	1.114
2,2',3,3',4,4',5,6,6'-NoBDE	207			36.7	1.59	0.88	1.098
2,2',3,3',4,5,5',6,6'-NoBDE	208		NDR	24.4	2.18	0.79	1.090
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			319	40.1	0.83	1.000

(1) Where applicable, custom lab flags have been used on this report; ND = not detected; NDR = peak detected but did not meet quantification criteria, result reported represents the estimated maximum possible concentration; C = co-eluting congener.

Approved by: _____ Jason MacKenzie _____ QA/QC Chemist

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Form 2
BROMINATED DIPHENYLETHER ANALYSIS REPORT

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

AXYS ANALYTICAL SERVICES

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

Contract No.: 2607
Matrix: SOLID
Sample Receipt Date: N/A
Extraction Date: 26-Nov-2008
Analysis Date: 16-Dec-2008 Time: 18:07:42
Extract Volume (uL): 50
Injection Volume (uL): 1.0
Dilution Factor: N/A
Concentration Units: pg absolute

Project No. N/A
Lab Sample I.D.: WG27201-101
Sample Size: 5.00 g
Initial Calibration Date: 04-Dec-2008
Instrument ID: HR GC/MS
GC Column ID: DB5HT
Sample Data Filename: BE81_385 S: 5
Blank Data Filename: BE81_385 S: 5
Cal. Ver. Data Filename: BE81_385 S: 1

LABELLED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	SPIKE CONC.	CONC. FOUND	R(%) ³	ION ABUND. RATIO	RRT
13C12-4,4'-DiBDE	15L			2000	1640	82.2	0.52	0.668
13C12-2,4,4'-TriBDE	28L			2000	1300	65.0	1.04	0.832
13C12-2,2',4,4'-TeBDE	47L			2160	1620	75.0	1.54	0.988
13C12-3,3',4,4'-TeBDE	77L			1860	1520	82.0	1.58	1.041
13C12-2,2',4,4',5-PeBDE	99L			2140	1930	90.2	1.04	1.132
13C12-2,2',4,4',6-PeBDE	100L			2160	1770	82.1	1.06	1.101
13C12-3,3',4,4',5-PeBDE	126L			2000	1990	99.4	1.03	1.197
13C12-2,2',4,4',5,5'-HxBDE	153L			2060	1060	51.4	1.37	0.881
13C12-2,2',4,4',5,6'-HxBDE	154L			2000	968	48.4	1.38	0.851
13C12-2,2',3,4,4',5,6'-HpBDE	183L			2000	1240	61.8	1.03	0.966
13C12-2,2',3,3',4,4',6,6'-OcBDE	197L			2000	1450	72.7	0.79	1.063
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			20400	10500	51.4	1.22	1.081
CLEANUP STANDARD								
13C12-2,2',3,4,4',6-HxBDE	139L			2000	1010	50.3	1.40	1.012

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

Approved by: _____ Jason MacKenzie _____ QA/QC Chemist

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BROMINATED DIPHENYLETHER ONGOING PRECISION AND RECOVERY (OPR)

AXYS ANALYTICAL SERVICES

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

Contract No.:	2607	Lab Sample I.D.:	WG27201-103
Matrix:	SOLID	Initial Calibration Date:	04-Dec-2008
Extraction Date:	26-Nov-2008	Instrument ID:	HR GC/MS
Analysis Date:	16-Dec-2008 Time: 15:19:06	GC Column ID:	DB5HT
Extract Volume (uL):	50	OPR Data Filename:	BE81_385 S: 2
Injection Volume (uL):	1.0	Blank Data Filename:	BE81_385 S: 5
Dilution Factor:	N/A	Cal. Ver. Data Filename:	BE81_385 S: 1

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

COMPOUND	IUPAC NO.	CO-ELUTIONS	LAB FLAG ¹	ION ABUND. RATIO	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	OPR CONC. LIMITS ² (ng/mL)	% RECOVERY
2,4,4'-TriBDE	28	28 + 33	C	1.02	83.0	83.4	41.5 - 125	100
2',3,4-TriBDE	33	28 + 33	C28					
2,2',4,4'-TeBDE	47			0.69	50.0	54.1	25.0 - 75.0	108
2,2',4,4',5-PeBDE	99			1.04	50.0	52.4	25.0 - 75.0	105
2,2',4,4',6-PeBDE	100			1.00	50.0	49.5	25.0 - 75.0	99.1
2,2',4,4',5,5'-HxBDE	153			0.76	50.0	47.8	25.0 - 75.0	95.6
2,2',4,4',5,6'-HxBDE	154			0.77	50.0	47.8	25.0 - 75.0	95.7
2,2',3,4,4',5',6-HpBDE	183			1.03	50.0	47.9	25.0 - 75.0	95.8
2,2',3,3',4,4',5,5',6,6'-DeBDE	209			0.83	500	578	200 - 1000	116

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

Approved by: _____ Jason MacKenzie _____ QA/QC Chemist



BROMINATED DIPHENYLETHER ONGOING PRECISION AND RECOVERY (OPR)

AXYS ANALYTICAL SERVICES

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

Contract No.:	2607	Lab Sample I.D.:	WG27201-103
Matrix:	SOLID	Initial Calibration Date:	04-Dec-2008
Extraction Date:	26-Nov-2008	Instrument ID:	HR GC/MS
Analysis Date:	16-Dec-2008 Time: 15:19:06	GC Column ID:	DB5HT
Extract Volume (uL):	50	OPR Data Filename:	BE81_385 S: 2
Injection Volume (uL):	1.0	Blank Data Filename:	BE81_385 S: 5
Dilution Factor:	N/A	Cal. Ver. Data Filename:	BE81_385 S: 1

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

LABELLED COMPOUND	IUPAC NO. ¹	CO-ELUTIONS	LAB FLAG ²	ION ABUND. RATIO	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	OPR CONC. LIMITS ³ (ng/mL)	% RECOVERY
13C12-2,4,4'-TriBDE	28L			1.01	100	67.6	30.0 - 140	67.6
13C12-2,2',4,4'-TeBDE	47L			1.53	108	78.0	32.5 - 151	72.1
13C12-2,2',4,4',5-PeBDE	99L			1.01	107	94.7	32.0 - 150	88.7
13C12-2,2',4,4',6-PeBDE	100L			1.04	108	84.4	32.4 - 151	78.2
13C12-2,2',4,4',5,5'-HxBDE	153L			1.37	103	49.7	31.0 - 144	48.2
13C12-2,2',4,4',5,6'-HxBDE	154L			1.37	100	41.4	30.0 - 140	41.4
13C12-2,2',3,4,4',5',6-HpBDE	183L			1.05	100	62.4	30.0 - 140	62.4
13C12-2,2',3,3',4,4',5,5',6,6'-DeBDE	209L			1.23	20400	12800	4080 - 40800	62.6

CLEANUP STANDARD

13C12-2,2',3,4,4',6-HxBDE	139L			1.36	100	51.1	40.0 - 125	51.1
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- (1) Suffix "L" indicates labeled compound.
- (2) Where applicable, custom lab flags have been used on this report.
- (3) Contract-required limits for OPR as specified in Table 6, Method 1614.

Approved by: _____ Jason MacKenzie _____ QA/QC Chemist

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**Perfluorinated Organics (PFC)
Analysis Report**

Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
08THA019A
Sample Collection:
N/A

AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 2607

Project No. POP1406
Lab Sample I.D.: L11830-15
Sample Size: 1.67 g (dry)
Initial Calibration Date: 29-Oct-2008
Instrument ID: LC MS/MS
Column ID: C18
Sample Data Filename: FC8G_357 S: 25
Blank Data Filename: FC8G_357 S: 23
Cal. Ver. Data Filename: FC8G_357 S: 17
% Moisture: 59.4

Matrix: SEDIMENT
Sample Receipt Date: 07-Oct-2008
Extraction Date: 24-Oct-2008
Analysis Date: 29-Oct-2008 Time: 07:10:29
Extract Volume (uL): 4000
Injection Volume (uL): 15
Dilution Factor: N/A
Concentration Units: ng/g (dry weight basis)

COMPOUND	LAB FLAG ¹	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	ND		0.299	
PFPeA	ND		0.299	
PFHxA	ND		0.299	
PFHpA	ND		0.299	
PFOA	ND		0.299	
PFNA	ND		0.299	
PFDA	ND		0.299	
PFUnA		0.366	0.299	8:39
PFDoA	ND		0.299	
PFBS	ND		0.598	
PFHxS	ND		0.598	
PFOS		1.68	0.628	8:24
PFOSA	ND		0.299	

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

Approved by: _____ Matthew Ou _____ QA/QC Chemist

For Axy's Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 20-Nov-2008 16:04:13; Application: XMLTransformer-1.9.15; Report Filename: PFC_FC_LC_PFOA_L11830-15_Form1A_FC8G_357S25_SJ932749.html; Workgroup: WG26821; Design ID: 986]

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



Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

CLIENT SAMPLE NO.
08THA019A
Sample Collection:
N/A

AXYS ANALYTICAL SERVICES

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

Contract No.: 2607

Project No. POP1406

Lab Sample I.D.: L11830-15

Matrix: SEDIMENT

Sample Size: 1.67 g (dry)

Sample Receipt Date: 07-Oct-2008

Initial Calibration Date: 29-Oct-2008

Extraction Date: 24-Oct-2008

Instrument ID: LC MS/MS

Analysis Date: 29-Oct-2008 Time: 07:10:29

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8G_357 S: 25

Injection Volume (uL): 15

Blank Data Filename: FC8G_357 S: 23

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8G_357 S: 17

Concentration Units: ng absolute

% Moisture: 59.4

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		12.0	8.92	74.4	5:23
13C2-PFHxA		12.0	8.28	69.0	6:31
13C2-PFOA		25.2	15.5	61.6	7:15
13C5-PFNA		12.0	6.27	52.3	7:36
13C2-PFDA	V	12.0	3.95	33.0	8:07
13C2-PFDoA		12.0	8.43	70.3	9:15
13C4-PFOS (80)		18.0	9.55	53.1	8:23

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

Approved by: _____ Matthew Ou _____ QA/QC Chemist



Form 1A
PERFLUORINATED ORGANICS ANALYSIS REPORT

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

AXYS ANALYTICAL SERVICES

2045 MILLS RD., SIDNEY, B.C., CANADA
V8L 5X2 TEL (250) 655-5800 FAX (250) 655-5811
Contract No.: 2607

Project No. N/A
Lab Sample I.D.: WG26821-101

Matrix:	AQUEOUS	Sample Size:	1.00 g
Sample Receipt Date:	N/A	Initial Calibration Date:	29-Oct-2008
Extraction Date:	24-Oct-2008	Instrument ID:	LC MS/MS
Analysis Date:	29-Oct-2008 Time: 06:32:18	Column ID:	C18
Extract Volume (uL):	4000	Sample Data Filename:	FC8G_357 S: 23
Injection Volume (uL):	15	Blank Data Filename:	FC8G_357 S: 23
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8G_357 S: 17
Concentration Units:	ng/g		

COMPOUND	LAB FLAG ¹	CONC. FOUND	DETECTION LIMIT	RETENTION TIME
PFBA	ND		0.500	
PFPeA	ND		0.500	
PFHxA	ND		0.500	
PFHpA	ND		0.500	
PFOA	ND		0.500	
PFNA	ND		0.500	
PFDA	ND		0.500	
PFUnA	ND		0.500	
PFDoA	ND		0.500	
PFBS	ND		1.00	
PFHxS	ND		1.00	
PFOS	ND		1.00	
PFOSA	ND		0.500	

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

Approved by: _____ Matthew Ou _____ QA/QC Chemist

For AxyS Internal Use Only [XSL Template: FC-Form1A.xsl; Created: 20-Nov-2008 16:04:13; Application: XMLTransformer-1.9.15; Report Filename: PFC_FC_LC_PFOA_WG26821-101_Form1A_FC8G_357S23_SJ932743.html; Workgroup: WG26821; Design ID: 986]

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



Form 2
PERFLUORINATED ORGANICS ANALYSIS REPORT

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

AXYS ANALYTICAL SERVICES

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

Contract No.: 2607

Project No. N/A

Lab Sample I.D.: WG26821-101

Matrix: AQUEOUS

Sample Size: 1.00 g

Sample Receipt Date: N/A

Initial Calibration Date: 29-Oct-2008

Extraction Date: 24-Oct-2008

Instrument ID: LC MS/MS

Analysis Date: 29-Oct-2008 Time: 06:32:18

Column ID: C18

Extract Volume (uL): 4000

Sample Data Filename: FC8G_357 S: 23

Injection Volume (uL): 15

Blank Data Filename: FC8G_357 S: 23

Dilution Factor: N/A

Cal. Ver. Data Filename: FC8G_357 S: 17

Concentration Units: ng absolute

LABELED COMPOUND	LAB FLAG ¹	SPIKE CONC.	CONC. FOUND	R(%) ²	RETENTION TIME
13C4-PFBA		12.0	10.0	83.7	5:19
13C2-PFHxA		12.0	10.7	89.3	6:27
13C2-PFOA		25.2	19.4	76.9	7:12
13C5-PFNA		12.0	8.85	73.7	7:36
13C2-PFDA		12.0	6.28	52.4	8:03
13C2-PFDoA		12.0	6.31	52.6	9:12
13C4-PFOS (80)		18.0	12.1	67.2	8:23

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

(2) R(%) = percent recovery.

Approved by: _____ Matthew Ou _____ QA/QC Chemist

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



Form 8A

PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

AXYS ANALYTICAL SERVICES

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

Contract No.:	2607	Lab Sample I.D.:	WG26821-102 i
Matrix:	SOLID	Initial Calibration Date:	29-Oct-2008
Extraction Date:	24-Oct-2008	Instrument ID:	LC MS/MS
Analysis Date:	29-Oct-2008 Time: 05:34:39	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC8G_357 S: 20
Injection Volume (uL):	15	Blank Data Filename:	FC8G_357 S: 23
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8G_357 S: 17

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

COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
PFBA		20.0	23.4	117	5:23
PFPeA		20.0	22.3	111	6:06
PFHxA		20.0	22.7	113	6:31
PFHpA		20.0	22.2	111	6:52
PFOA		20.0	19.9	99.4	7:15
PFNA		20.0	18.8	93.8	7:36
PFDA		20.0	21.7	108	8:07
PFUnA		20.0	15.6	78.1	8:39
PFDoA		20.0	21.6	108	9:12
PFBS		40.0	51.8	130	6:38
PFHxS		40.0	51.3	128	7:29
PFOS		40.0	36.2	90.4	8:23
PFOSA		20.0	18.1	90.3	10:01

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

Approved by: _____ Matthew Ou _____ QA/QC Chemist

For Axy's Internal Use Only [XSL Template: FC-Form8A.xsl; Created: 20-Nov-2008 16:04:13; Application: XMLTransformer-1.9.15; Report Filename: PFC_FC_LC_PFOA_WG26821-102_Form8A_SJ932738.html; Workgroup: WG26821; Design ID: 986]

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



PERFLUORINATED ORGANICS ONGOING PRECISION AND RECOVERY (OPR)

AXYS ANALYTICAL SERVICES

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

Contract No.:	2607	Lab Sample I.D.:	WG26821-102 i
Matrix:	SOLID	Initial Calibration Date:	29-Oct-2008
Extraction Date:	24-Oct-2008	Instrument ID:	LC MS/MS
Analysis Date:	29-Oct-2008 Time: 05:34:39	Column ID:	C18
Extract Volume (uL):	4000	OPR Data Filename:	FC8G_357 S: 20
Injection Volume (uL):	15	Blank Data Filename:	FC8G_357 S: 23
Dilution Factor:	N/A	Cal. Ver. Data Filename:	FC8G_357 S: 17

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

LABELLED COMPOUND	LAB FLAG ¹	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	% RECOVERY	RETENTION TIME
13C4-PFBA		12.0	10.0	83.5	5:22
13C2-PFHxA		12.0	9.26	77.2	6:31
13C2-PFOA		25.2	23.0	91.3	7:15
13C5-PFNA		12.0	8.66	72.2	7:40
13C2-PFDA		12.0	5.31	44.3	8:07
13C2-PFDoA		12.0	5.34	44.5	9:15
13C4-PFOS (80)		18.0	12.7	70.6	8:23

CLEANUP STANDARD

13C8-PFOA	7:15
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(1) Where applicable, custom lab flags have been used on this report.

Approved by: _____ Matthew Ou _____ QA/QC Chemist

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



**CALUX Analysis Report (PCDD/F and
Dioxin-like PCB TEQs)**

BIOMONITORING OF POPs AND POPs-LIKE CHEMICALS -
CAMBODIA, LAO PDR, MALAYSIA, AND THAILAND
TERMS OF REFERENCE

Final report
(Thai-Soil&Sediment)

The World Bank

2008.10.03
Hiyoshi Corporation

Final report (Soil & Sediment) – 1

Sample No.	Sample type		Sample volume(g)	CALUX Raw Data					WHO-TEF1998			WHO-TEF2006		
				PCDDs/Fs	DL-PCBs	DXNs	LOD	LOQ	PCDDs/Fs	DL-PCBs	DXNs	PCDDs/Fs	DL-PCBs	DXNs
				pgCALUX-TEQ/g					pg-TEQ _{(WHO1998)/g}			pg-TEQ _{(WHO2006)/g}		
1	08THA001B	Sediment	3.50	4.3	0	4.3	0.45	0.89	1.0	0	1.0	1.1	0	1.05
2	08THA002B	Sediment	3.50	4.1	(0.55)	4.7	0.45	0.89	0.93	(1.8)	2.7	1.0	(1.1)	2.1
3	08THA003B	Soil	3.50	5.2	0	5.2	0.45	0.89	1.2	0	1.2	1.1	0	1.1
4	08THA004B	Sediment	3.50	7.4	4.0	11	0.45	0.89	1.7	13	15	1.8	8	10
5	08THA005B	Soil	3.50	65	82	147	1.8	3.6	15	209	224	14	217	231
6	08THA006B	Soil	3.50	96	43	140	0.45	0.89	22	110	132	21	114	135
7	08THA007B	Soil	3.50	13	3.8	17	0.45	0.89	3.0	10	13	2.7	10.0	13
8	08THA008B	Soil	3.50	65	48	113	4.5	8.9	15	121	136	14	126	140
9	08THA009B	Soil	3.50	16	22	38	0.45	0.89	3.8	55	59	3.5	58	61
10	08THA010B	Soil	3.50	41	65	106	0.45	0.89	9.5	165	174	9	171	180
11	08THA011B	Soil	3.50	61	42	103	0.45	0.89	14	105	119	13	109	122
12	08THA012B	Soil	3.50	11	9.7	20	0.45	0.89	2.4	25	27	2.3	26	28
13	08THA013B	Soil	3.50	2.6	0	2.6	0.45	0.89	0.60	0	0.60	0.55	0	0.55
14	08THA014B	Soil	3.50	5.7	1.9	7.6	0.45	0.89	1.3	4.8	6.1	1.2	5.0	6.2
15	08THA015B	Sediment	3.50	13	1.3	14	0.45	0.89	2.9	4.1	7.0	3.1	2.6	5.7
16	08THA016B	Sediment	3.50	5.4	(0.75)	6.1	0.45	0.89	1.2	(2.4)	3.6	1.3	(1.5)	2.8
17	08THA017B	Soil	3.50	5.8	1.0	6.7	0.45	0.89	1.3	2.4	3.7	1.2	2.5	3.7
18	08THA018B	Sediment	3.50	6.0	(0.62)	6.6	0.45	0.89	1.4	(2.0)	3.4	1.5	(1.3)	2.8
19	08THA019B	Sediment	3.50	4.0	(0.74)	4.8	0.45	0.89	0.91	(2.4)	3.3	0.98	(1.5)	2.5
20	08THA020B	Sediment	3.50	4.0	1.4	5.4	0.45	0.89	0.91	4.4	5.3	0.98	2.8	3.8
21	08THA021B	Sediment	3.50	6.2	0.94	7.1	0.45	0.89	1.4	3.0	4.4	1.5	1.9	3.4
22	08THA022B	Sediment	3.50	4.4	(0.70)	5.1	0.45	0.89	1.0	(2.2)	3.2	1.07	(1.4)	2.5
23	08THA023B	Soil	3.50	9.8	4.2	14	0.45	0.89	2.3	11	13	2.1	11	13
24	08THA024B	Soil	3.50	5.9	1.7	7.6	0.45	0.89	1.4	4.3	5.7	1.3	4.5	5.7
25	08THA025B	Soil	3.50	7.3	1.7	8.9	0.45	0.89	1.7	4.2	5.9	1.6	4.3	5.9
26	08THA026B	Soil	3.50	3.4	2.1	5.4	0.45	0.89	0.78	5.2	6.0	0.72	5.4	6.1
27	08THA027B	Sediment	3.50	14	2.9	17	0.45	0.89	3.1	9.3	12	3.3	5.9	9.3
28	08THA028B	Sediment	3.50	4.2	(0.50)	4.7	0.45	0.89	0.9	(1.6)	2.5	1.02	(1.0)	2.0
29	08THA029B	Sediment	3.50	7.2	3.4	11	0.45	0.89	1.6	10.8	12	1.8	6.9	8.6
30	08THA030B	Soil	3.50	0	0	0	0.45	0.89	0	0	0	0	0	0

		①PCDD/Fs	②DL-PCBs	③DXNs	④PCDD/Fs	⑤DL-PCBs	⑥DXNs
Soil	Conversion factor	0.231	2.53	①+②	0.214	2.63	④+⑤
Sediment	Conversion factor	0.226	3.21	①+②	0.244	2.04	④+⑤

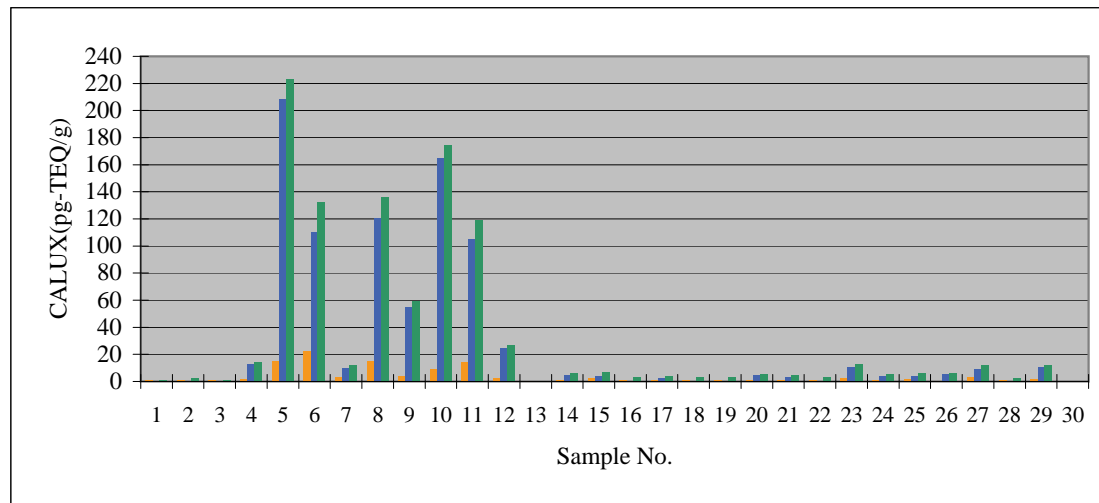
* "0" represent below detection limit (LOD)

** number in bracket represent the number below quantification limit and above detection limit which has been converted into DXNs

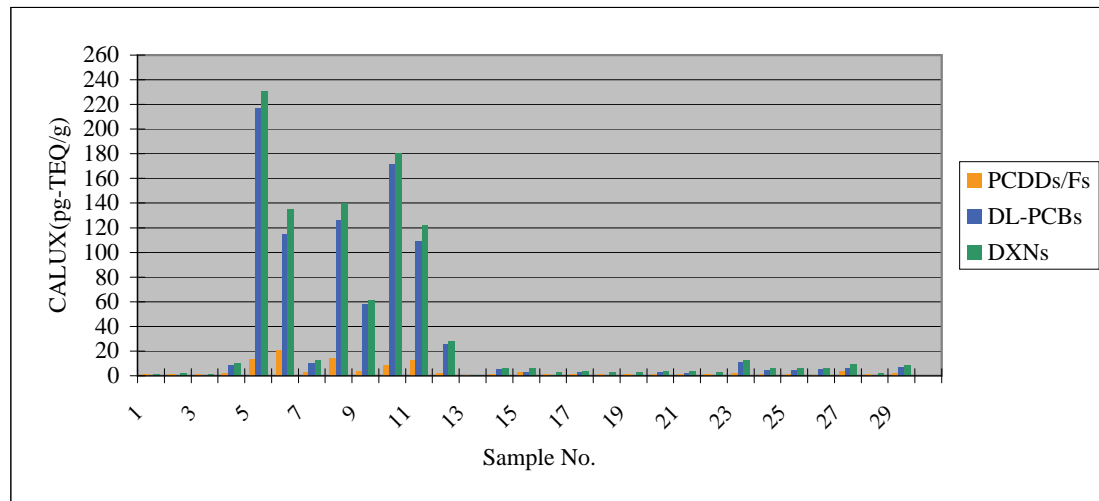
*** Average of quantified and measured toxic equivalent value and calculate standard deviation and coefficient of variation(CV) from standard curve obtained from 5 time measured adjusted standard for detection limit and create quality profile. Detection

**** Guideline for quality control of dioxin environmental measurement, March 3, 2006 by Ministry of the Environment, was used to set quantification limit and detection limit was

Final report (Soil&Sediment) – 2



WHO-TEF1998



WHO-TEF2006

Final report (Fish) – 1

Sample No.	Sample type	Sample volume(g)	CALUX Raw Date					WHO-TEF1998			WHO-TEF2006		
			PCDDs/Fs	DL-PCBs	DXNs	LOD	LOQ	PCDDs/Fs	DL-PCBs	DXNs	PCDDs/Fs	DL-PCBs	DXNs
			pgCALUX-TEQ/gwet					pg-TEQ _(WHO1998) /gwet			pg-TEQ _(WHO2006) /gwet		
1	08THA-033B ②	10.0637	(0.22)	0	(0.22)	0.16	0.31	(0.091)	0	(0.091)	(0.076)	0	(0.076)
2	08THA-036B ②	11.6612	1.2	0	1.2	0.13	0.27	0.49	0	0.49	0.41	0	0.41
3	08THA-037B ②	11.5502	0	0	0	0.14	0.27	0	0	0	0	0	0
4	08THA-038B ②	10.7622	0.74	0.62	1.4	0.15	0.29	0.31	2.0	2.3	0.25	1.6	1.8
5	08THA-039B ②	14.4120	0.68	0.25	0.93	0.11	0.22	0.28	0.78	1.07	0.23	0.63	0.86
6	08THA-040B ②	10.7872	0.53	0.58	1.1	0.14	0.29	0.22	1.8	2.0	0.18	1.5	1.6

Sample No.	Sample type	Sample volume(fat)	CALUX Raw Date					WHO-TEF1998			WHO-TEF2006		
			PCDDs/Fs	DL-PCBs	DXNs	LOD	LOQ	PCDDs/Fs	DL-PCBs	DXNs	PCDDs/Fs	DL-PCBs	DXNs
			pgCALUX-TEQ/fat					pg-TEQ _(WHO1998) /gfat			pg-TEQ _(WHO2006) /gfat		
1	08THA-033B ②	0.29	(76)	0	(76)	54	107	(31)	0	(31)	(26)	0	(26)
2	08THA-036B ②	0.25	474	0	474	53	107	196	0	196	163	0	163
3	08THA-037B ②	0.34	0	0	0	40	81	0	0	0	0	0	0
4	08THA-038B ②	0.48	153	129	282	30	60	63	407	470	53	324	377
5	08THA-039B ②	1.4	49	18	67	7.8	16	20	56	77	17	45	62
6	08THA-040B ②	0.56	94	102	196	26	51	39	322	361	32	257	289

	①PCDD/Fs	②DL-PCBs	③DXNs	④PCDD/Fs	⑤DL-PCBs	⑥DXNs
Conversion factor	0.414	3.16	①+②	0.344	2.52	④+⑤

* "0" represent below detection limit (LOD)

** number in bracket represent the number below quantification limit and above detection limit which has been converted into DXNs

*** Average of quantified and measured toxic equivalent value and calculate standard deviation and coefficient of variation(CV) from standard curve obtained from 5 time measured adjusted standard for detection limit and create quality profile. Detection

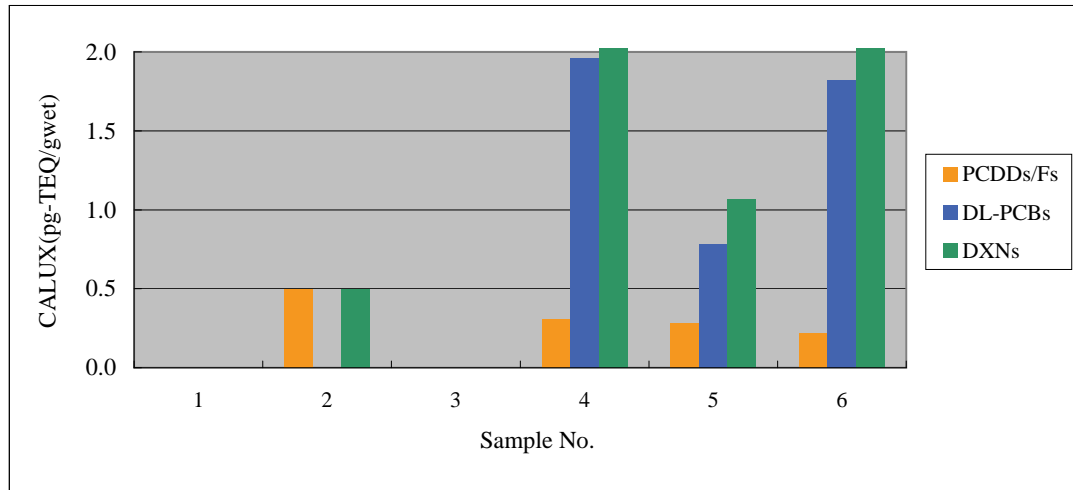
**** Guideline for quality control of dioxin environmental measurement, March 3, 2006 by Ministry of the Environment, was used to set quantification limit and detection limit was

①All sample were used and homogenized and applied for the analysis

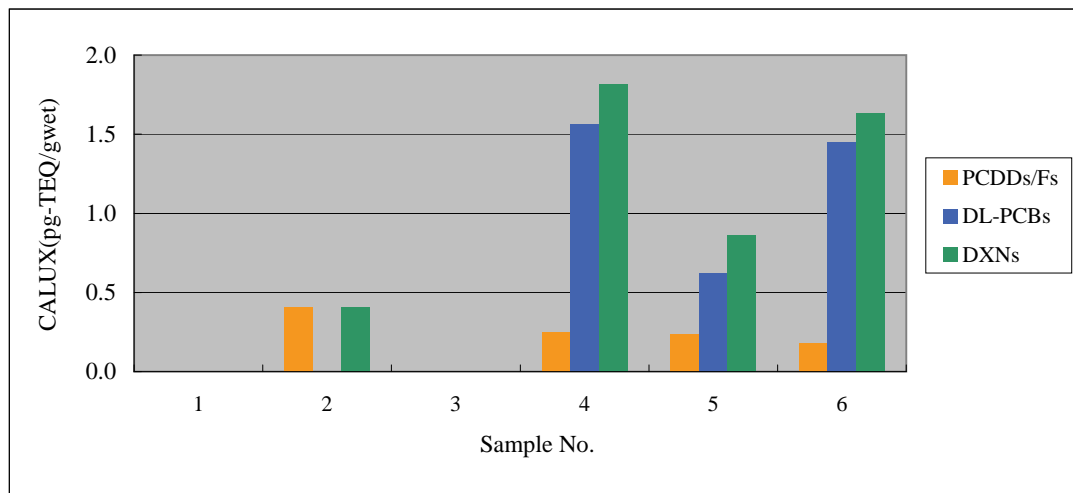
②All parts including shell were used and pestled in mortar and homogenized and total of less than 10g were used.

③Removed shell and homogenized all the meat, less than 10g

Final report (Fish) – 2



WHO-TEF1998



WHO-TEF2006