

Appendix C
Dioxin Laboratory Reports (First Round)



CERTIFICATE OF ANALYSIS # DAU05_188

Client	URS Australia Pty Ltd Level 3, 116 Miller Street North Sydney NSW 2060	Job No.	URS04/051006
Contact	Jati Teoh	Sampled by Date Sampled Date Received	Client not specified 6-Oct-05

The results apply specifically to the sample(s) received.

Method | AUTL_02 | **Date Reported** | 3-Nov-05

Details

The method is for determination of tetra- through octa-chlorinated dibenzo-p-dioxins (PCDDs) & dibenzofurans (PCDFs), plus "dioxin-like" PCBs in ambient air samples by high resolution gas chromatography/high resolution mass spectrometry (HRGC/HRMS). This method provides data on all toxic 2,3,7,8-PCDD (seven) and PCDF (ten) isomers as well as the "dioxin-like" PCBs (twelve). PCDD and PCDF totals for each homologue group (tetra to octa) are also reported. The dioxin toxicity equivalent ($WHO_{98}\text{-TEQ}_{DF} / \text{TEQ}_P$) in each sample is calculated using World Health Organization toxic equivalency factors ($WHO_{98}\text{-TEFs}$). All results are corrected for labelled surrogate recoveries.

After sampling the filters, PUF & resin are spiked with a range of isotopically labelled surrogate standards and exhaustively extracted. Clean up is effected by partitioning with sulphuric acid then distilled water. Further purification is performed using column chromatography on acid and base modified silica gels, basic alumina and carbon dispersed on celite.

Immediately prior to injection, internal standards are added to each extract, and an aliquot of the extract is injected into the GC. The analytes are separated by the GC and detected by a high-resolution (>10,000) mass spectrometer.

Authorisation

Nino Piro
Senior Chemist
Dioxin Analysis Unit

Gavin Stevenson
Senior Chemist
Dioxin Analysis Unit

Accreditation



NATA Accredited Laboratory Number : 198
This laboratory is accredited by the National Association of Testing Authorities, Australia.

The tests reported herein have been performed in accordance with its scope of accreditation.
This document shall not be reproduced, except in full.

Sample Details : Job No. URS04/051006			
Laboratory Reg. No.	Client Sample Ref.	Matrix	Description
N05/030473	Botany Council Depot	Ambient Air	XAD Resin + Filter + PUF

Project Details	
Project Name	Not specified
Project Number	43217288

Key			
Analytes			
TCDD	Tetrachlorodibenzo-p-dioxin	TCDF	Tetrachlorodibenzofuran
PeCDD	Pentachlorodibenzo-p-dioxin	PeCDF	Pentachlorodibenzofuran
HxCDD	Hexachlorodibenzo-p-dioxin	HxCDF	Hexachlorodibenzofuran
HpCDD	Heptachlorodibenzo-p-dioxin	HpCDF	Heptachlorodibenzofuran
OCDD	Octachlorodibenzo-p-dioxin	OCDF	Octachlorodibenzofuran
PCB 77	3,3',4,4'-Tetrachlorobiphenyl	PCB 126	3,3',4,4',5-Pentachlorobiphenyl
PCB 81	3,4,4',5-Tetrachlorobiphenyl	PCB 156	2,3,3',4,4',5-Hexachlorobiphenyl
PCB 105	2,3,3',4,4'-Pentachlorobiphenyl	PCB 157	2,3,3',4,4',5'-Hexachlorobiphenyl
PCB 114	2,3,4,4',5-Pentachlorobiphenyl	PCB 167	2,3',4,4',5,5'-Hexachlorobiphenyl
PCB 118	2,3',4,4',5-Pentachlorobiphenyl	PCB 169	3,3',4,4',5,5'-Hexachlorobiphenyl
PCB 123	2',3,4,4',5-Pentachlorobiphenyl	PCB 189	2,3,3',4,4',5,5'-Heptachlorobiphenyl
Units & Abbreviations			
pg	picograms		
<	level less than limit of detection (LOD)		
WHO ₉₈ -TEF [†]	World Health Organization toxic equivalency factor		
WHO ₉₈ -TEQ _{DF} [†]	World Health Organization toxic equivalents (Dioxins & Furans)		
WHO ₉₈ -TEQ _P [†]	World Health Organization toxic equivalents (PCBs)		
WHO ₉₈ -TEQ _{DFP} [†]	World Health Organization toxic equivalents (Dioxins, Furans and PCBs)		
[†] as defined by Van den Berg et al., <i>Environ. Health Perspect.</i> 106 (12) pp. 775-792 (1998).			
TEQs are calculated by multiplying the quantified level for each individual congener by corresponding TEF and summing result.			
Surrogate Recovery	percentage recovery for ¹³ C ₁₂ labelled surrogate standard		
Ⓜ	Laboratory surrogate recovery outside normal acceptance criteria:		
	Ambient Air : 50-120% [Tet/Pen/Hx PCDD/Fs] - 40-120% [Hep/Oct PCDD/Fs]		
	40-120% for PCB congeners		
Ⓜ	Dioxin/Furan field surrogate recovery outside normal acceptance criteria (70-130%)		
	PCB field surrogate recovery outside normal acceptance criteria (60-140%)		

Results : Job No. URS04/051006

Laboratory Reg. No. N05/030473

Date Extracted 25-Oct-05

Client Sample Ref. Botany Council Depot
 Matrix Ambient Air
 Description XAD Resin + Filter + PUF

DB5 Analysis 01-Nov-05
 DB-Dioxin Analysis 31-Oct-05
 PCB Analysis 01-Nov-05

PCDD/F Congeners	Level pg	WHO ₉₈ -TEF	WHO ₉₈ -TEQ _{DF} contribution	Labelled Surrogate recovery
2,3,7,8-TCDF	40	0.1	4.0	90
2,3,7,8-TCDD	<3	1	1.5	85
1,2,3,7,8-PeCDF	25	0.05	1.2	82
2,3,4,7,8-PeCDF	45	0.5	23	85
1,2,3,7,8-PeCDD	8.5	1	8.5	79
1,2,3,4,7,8-HxCDF	29	0.1	2.9	103
1,2,3,6,7,8-HxCDF	26	0.1	2.6	86
2,3,4,6,7,8-HxCDF	29	0.1	2.9	
1,2,3,7,8,9-HxCDF	2.3	0.1	0.23	
1,2,3,4,7,8-HxCDD	9.1	0.1	0.91	98
1,2,3,6,7,8-HxCDD	17	0.1	1.7	77
1,2,3,7,8,9-HxCDD	13	0.1	1.3	
1,2,3,4,6,7,8-HpCDF	76	0.01	0.76	71
1,2,3,4,7,8,9-HpCDF	8.4	0.01	0.084	72
1,2,3,4,6,7,8-HpCDD	190	0.01	1.9	64
OCDF	<100	0.0001	0.005	
OCDD	2580	0.0001	0.26	59

PCB Congeners	Level pg	WHO ₉₈ -TEF	WHO ₉₈ -TEQ _P contribution	Labelled Surrogate recovery
Non-Ortho PCBs				
PCB 77	2960	0.0001	0.30	82
PCB 81	140	0.0001	0.014	78
PCB 126	150	0.1	15	89
PCB 169	<6	0.01	0.03	88
Mono-Ortho PCBs				
PCB 105	16800	0.0001	1.7	105
PCB 114	1100	0.0005	0.55	105
PCB 118	42700	0.0001	4.3	103
PCB 123	4120	0.0001	0.41	102
PCB 156	2340	0.0005	1.2	102
PCB 157	550	0.0005	0.28	94
PCB 167	1070	0.00001	0.011	85
PCB 189	68	0.0001	0.0068	108

PCDD/F Homologue Groups	Level pg
Total TCDF isomers	1170
Total TCDD isomers	210
Total PeCDF isomers	490
Total PeCDD isomers	150
Total HxCDF isomers	270
Total HxCDD isomers	270
Total HpCDF isomers	120
Total HpCDD isomers	380

Summary Results			
Sum of PCDD and PCDF congeners			
Excluding LOD values		5640	pg
WHO₉₈-TEQ_{DFP}			
Lower Bound [excluding LOD values]		76	pg
Middle Bound [including half LOD values]		78	pg

