



## Dioxins, Furans and Dioxin-like PCBs

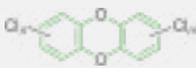
### Dioxins in the Environment

Dioxins are a group of related persistent environmental pollutants (POPs). They arise as by-products of industrial processes including the bleaching of paper pulp, waste incineration and herbicide synthesis. Dioxins are also formed during the open burning of waste, and can result from naturally occurring fires and volcanic eruptions.

There are 210 different dioxins and furans, as well as a group of PCBs. They have similar structures, and all contain chlorine, but have differing levels of toxicity.

#### Dioxins

Polychlorinated dibenzo-p-dioxins (Dioxins / PCDDs)



- 75 PCDD Congeners
- 7 of which are toxic
- 2,3,7,8-TCDD considered most toxic

Polychlorinated dibenzofurans (Furans / PCDFs)



- 135 PCDF Isomers
- 10 have dioxin-like properties

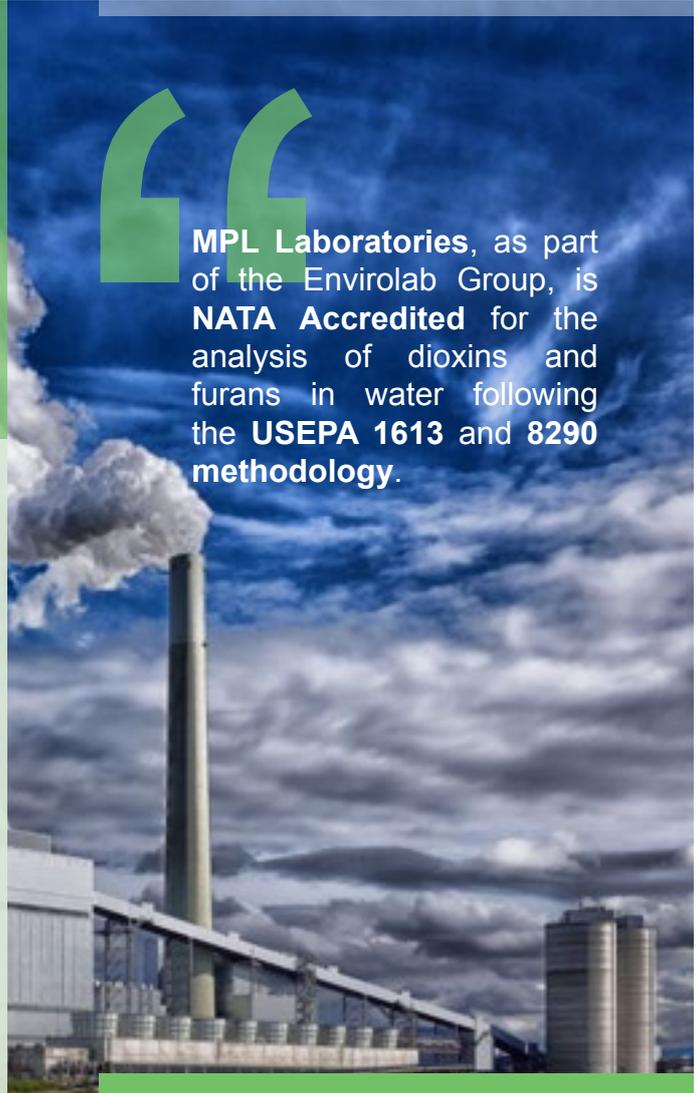
Dioxin-like Polychlorinated Biphenyls (dl-PCBs)



- 12 dioxin-like PCBs
- May form PCDDs or PCDFs through partial oxidation



**MPL Laboratories**, as part of the Envirolab Group, is **NATA Accredited** for the analysis of dioxins and furans in water following the **USEPA 1613** and **8290 methodology**.



## NATA Accredited for Dioxins and Furans in Water



Accreditation Number 2901

The National Association of Testing Authorities (NATA) is the authority that provides independent assurance of technical competence through a proven network of best practice industry experts for customers who require confidence in the delivery of their products and services.

As a leading laboratory, we are fully accredited and qualified to perform testing for dioxins and furans in water according to national standards.

With **NATA Accreditation**, you have the confidence that you are partnering with a laboratory that will provide you with quality results. Contact us today to find out more.

Dioxins and furans have dispersed around the globe primarily through contamination in the air. They have been detected in distant regions far from polluting industries. Human exposure was previously most common within exposed workers, now increasingly as these compounds become more widespread they are coming through the food chain.

Due to their very stable chemical structure they are resistant to oxidative or microbiological degradation, however do break down slowly on exposure to UV light.

Dioxins and furans are lipophilic and bind to proteins in cells, causing a toxic response. With continued exposure they bio-accumulate in fatty tissue. **2,3,7,8-TCDD** is classified as Carcinogenic to humans and was present as a contaminant in Agent Orange.

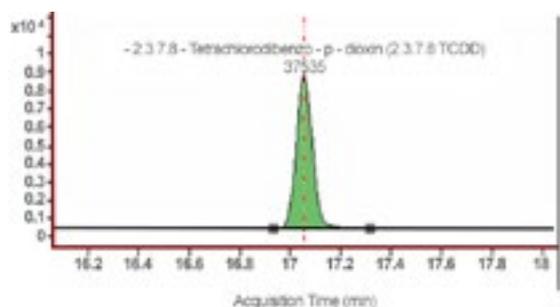


## Testing for Dioxins at Envirolab

**Table A: Testing Suites**

Suite	Analyte	PQL µg/L	
Dioxins and Furans Screen	2,3,7,8 - Tetrachlorodibenzofuran (2,3,7,8 TCDF)	10	
	2,3,7,8 - Tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD)	10	
	1,2,3,7,8 - Pentachlorodibenzofuran (1,2,3,7,8-PeCDF)	50	
	2,3,4,7,8-Pentachlorodibenzofuran (2,3,4,7,8-PeCDF)	50	
	1,2,3,7,8 - Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD)	50	
	1,2,3,4,7,8-Hexachlorodibenzofuran (1,2,3,4,7,8-HxCDF)	50	
	1,2,3,6,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF)	25	
	1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF)	25	
	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7,8-HxCDD)	50	
	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,6,7,8-HxCDD)	50	
	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD)	50	
	2,3,4,6,7,8-Hexachlorodibenzofuran (2,3,4,6,7,8-HxCDF)	25	
	1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	50	
	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (1,2,3,4,6,7,8-HpCDD)	50	
	1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	50	
	Octachlorodibenzo-p-dioxin (OCDD)	50	
	Octachlorodibenzofuran (OCDF)	100	
	PCBs – Dioxin Like (DL) Congeners	PCB C8	
		PCB C18	
		PCB C28	
PCB C44			
PCB C52			
PCB C66			
PCB C77			
PCB C81			
PCB C101			
PCB C105			
PCB C114			
PCB C118 & PCB C123 (coelution)			
PCB C126		<0.0005-0.002 µg/L	
PCB C128 & C167 (coelution)			
PCB C138			
PCB C153			
PCB C156			
PCB C157			
PCB C169			
PCB C170			
PCB C180			
PCB C187			
PCB C189			
PCB C195			
PCB C206			
PCB C209			

**Figure A: GC-MS/MS 2, 3, 7, 8 - Tetrachlorodibenzo - p - dioxin product ion**



**Table B: Preservation Requirements**

Matrix	Container / Item Description	Transport Temperature	RHT
Dioxins & Furans Screen	500mL Amber Glass Bottle. Teflon Liner	≤6°C	30 days
PCBs – Dioxin Like (DL) Congeners	500mL Amber Glass Bottle. Teflon Liner	≤6°C	7 days

MPL Laboratories analyses PCDDs and PCDFs by highly sensitive Gas Chromatography coupled with Tandem Mass Spectrometry (GC-MS/MS) in water samples.

These can be analysed in conjunction with, or separate to, the existing PCB Dioxin-like Congeners suite.

For further information contact our laboratories



envirolab.com.au



1300 424 344



lab@mpl.com.au

Great Science. Great Service.