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Annual Compliance Emission Testing Report

Report: R018152

VIP Drum Reconditioners, Seven Hills



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Document Information

Client Name: VIP Drum Reconditioners
Report Number: R018152
Date of Issue: 15 July 2025
Attention: Arielle Comin
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Report Authorisation



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1 Executive Summary

1.1 Background

Ektimo was engaged by VIP Drum Reconditioners to perform emission testing at their Seven Hills plant. Testing was carried out in accordance with Environment Protection Licence 124.

1.2 Project Objective & Overview

The objective of the project was to conduct a monitoring programme to quantify emissions from the afterburner discharge stack and characteristic of the ingress flow at the cooling air vent as required by VIP Drum Reconditioners' Environmental Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 1 - Afterburner Discharge Stack	29 April 2025	Solid particles (total) Total fluoride Hydrochloric acid (as HCl), chlorine Metals - type 1 substances (Sb, As, Cd, Pb, Hg) Dioxins & furans Carbon dioxide, oxygen, carbon monoxide, nitrogen oxides (as NO ₂) Volatile organic compounds (total VOCs) Sulfuric acid mist & sulfur trioxide (as SO ₃) Dry gas density, molecular weight Hydrogen sulfide (H ₂ S)
EPA 2 - Cooling Air Vent		Dry gas density, molecular weight

* Flow rate, velocity, temperature, and moisture were also determined.

All results are reported on a dry basis at STP.

Plant operating conditions have been noted in this report.

The cooling air vent (EPA 2) consists of an open slot around the entire 4555mm circumference of the waste air duct stemming from the afterburner. The width of this slot is variable. Fresh ambient air is drawn through the slot under venturi. On the day of sampling the slot was open to a width of 148mm. Velocity measurements were taken with a pitot probe at four accessible locations around the circumference. All calculations assume that the cooling air vent flow into the afterburner waste air duct is consistent and uniform across the entire width and circumference of the slot.

1.3 Licence Comparison

The following licence comparison table shows that all analytes are within the licence limit set by the NSW EPA as per licence 124 (last amended on 17 May 2023).

EPA	Pollutant	Units	Licence limit	Detected values at STP	Detected values (Corrected to 11% O ₂)	Detected values (Corrected to 3% O ₂)	Detected values (Corrected to 12% CO ₂)
1 - Afterburner Discharge Stack	Dioxins and furans	ng/m ³	0.1	0.0021	0.013	-	-
	Hydrogen sulfide	mg/m ³	5	<0.09	-	<1	-
	Volatile organic compounds	mg/m ³	40	3.5	-	38	-
	Nitrogen oxides	mg/m ³	2000	21	-	210	-
	Mercury	mg/m ³	3	<0.0002	-	<0.002	-
	Chlorine	mg/m ³	200	<0.09	-	<0.8	-
	Cadmium	mg/m ³	3	<0.0005	-	<0.005	-
	Hydrochloric acid (HCl)	mg/m ³	400	<0.05	-	<0.4	-
	Total fluoride (as HF)	mg/m ³	50	1.4	-	12	-
	Solid particles	mg/m ³	250	1.8	-	-	40
	Sulfuric acid mist and sulfur trioxide (as SO ₃)	mg/m ³	100	0.067	-	0.67	-
	Type 1 substances	mg/m ³	10	≤0.037	-	≤0.33	-

Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.

2 Results

2.1 EPA 1 - Afterburner Discharge Stack

Date	29/04/2025	Client	VIP Drum Reconditioners
Report	R018152	Stack ID	EPA 1 - Afterburner Discharge Stack
Licence No.	124	Location	Seven Hills
Ektimo Staff	Steven Cooper & Adnan Latif	State	NSW
Process Conditions	Please refer to client records.		

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Stack Parameters			
Moisture content, %v/v	3.1		
Gas molecular weight, g/g mole	28.6 (wet)	29.0 (dry)	
Gas density at STP, kg/m ³	1.28 (wet)	1.29 (dry)	
Gas density at discharge conditions, kg/m ³	0.71		
% Oxygen correction & Factor	3 %	10.73	
% Oxygen correction & Factor	11 %	5.93	
Gas Flow Parameters			
Flow measurement time(s) (hhmm)	0836 & 1235		
Temperature, °C	219		
Temperature, K	492		
Ambient pressure, kPa	102		
Stack pressure, kPa	102		
Velocity at sampling plane, m/s	33		
Volumetric flow rate, actual, m ³ /s	28		
Volumetric flow rate (wet STP), m ³ /s	16		
Volumetric flow rate (dry STP), m ³ /s	15		
Mass flow rate (wet basis), kg/h	72000		

Gas Analyser Results		Average			Minimum			Maximum		
		1004 - 1108			1004 - 1108			1004 - 1108		
	Sampling time	Corrected to			Corrected to			Corrected to		
		Concentration	3% O ₂	Mass Rate	Concentration	3% O ₂	Mass Rate	Concentration	3% O ₂	Mass Rate
		mg/m ³	mg/m ³	g/min	mg/m ³	mg/m ³	g/min	mg/m ³	mg/m ³	g/min
Total Organic Compounds (TOC)										
TOC (as Propane)		3.5	38	3.2	<2	<20	<2	9.8	110	9

Hydrogen Sulfide		Results		
	Sampling time	0945-1245		
		Corrected to		
		Concentration	3% O ₂	Mass Rate
		mg/m ³	mg/m ³	g/min
Hydrogen sulfide		<0.09	<1	<0.08

Date	29/04/2025	Client	VIP Drum Reconditioners
Report	R018152	Stack ID	EPA 1 - Afterburner Discharge Stack
Licence No.	124	Location	Seven Hills
Ektimo Staff	Steven Cooper & Adnan Latif	State	NSW
Process Conditions	Please refer to client records.		

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Dioxins & Furans	Results
Sampling time	0859 - 1108
	Corrected to
	Concentration 11% O ₂ Mass Rate
	ng/m ³ ng/m ³ ng/min
Dioxins & Furans (PCDDs & PCDFs)	
OCDF	0.0016 0.0098 1.5
OCDD	0.0048 0.028 4.3
Total TCDF isomers	0.055 0.33 50
Total TCDD isomers	0.035 0.21 32
Total PeCDF isomers	0.026 0.15 24
Total PeCDD isomers	0.011 0.067 10
Total HxCDF isomers	0.016 0.098 15
Total HxCDD isomers	0.0092 0.054 8.3
Total HpCDF isomers	0.011 0.063 9.7
Total HpCDD isomers	0.0059 0.035 5.3
Total PCDDs + PCDFs	0.18 1 160
Specified Toxic Dioxins & Furans - TEQs[‡]	
2,3,7,8-TCDF	0.00015 0.00089 0.14
2,3,7,8-TCDD	<0.0004 <0.002 <0.3
1,2,3,7,8-PeCDF	0.000029 0.00017 0.026
2,3,4,7,8-PeCDF	0.00041 0.0024 0.37
1,2,3,7,8-PeCDD	<0.0004 <0.002 <0.3
1,2,3,4,7,8-HxCDF	0.00021 0.0012 0.19
1,2,3,6,7,8-HxCDF	0.00019 0.0011 0.17
2,3,4,6,7,8-HxCDF	0.00016 0.00098 0.15
1,2,3,7,8,9-HxCDF	<0.00004 <0.0002 <0.03
1,2,3,4,7,8-HxCDD	0.00004 0.00024 0.037
1,2,3,6,7,8-HxCDD	0.000044 0.00026 0.04
1,2,3,7,8,9-HxCDD	<0.00003 <0.0002 <0.03
1,2,3,4,6,7,8-HpCDF	0.000081 0.00048 0.073
1,2,3,4,7,8,9-HpCDF	0.0000034 0.00002 0.0031
1,2,3,4,6,7,8-HpCDD	0.00003 0.00018 0.027
OCDF	0.00000049 0.0000029 0.00045
OCDD	0.0000014 0.0000085 0.0013
Total Specified Toxic Dioxins & Furans - TEQs [‡]	
Lower Bound	0.0013 0.008 1.2
Middle Bound	0.0017 0.01 1.6
Upper Bound	0.0021 0.013 2

Abbreviations and definitions

[‡] WHO05-TEQ: TEQs calculated using the 2005 World Health Organisation TEFs for specified toxic dioxins and furans.

TEQs (Toxic Equivalents)	Calculated by multiplying the quantified result for each toxic compound by its corresponding toxic equivalency factor (TEF).
Lower Bound	Defines values reported below detection as equal to zero.
Middle Bound	Defines values reported below detection are equal to half the detection limit.
Upper Bound	Defines values reported below detection are equal to the detection limit.

Isokinetic Sampling Parameters	Results
Dioxins & Furans	
Sampling time, min	128
Isokinetic rate, %	99

Date	29/04/2025	Client	VIP Drum Reconditioners
Report	R018152	Stack ID	EPA 1 - Afterburner Discharge Stack
Licence No.	124	Location	Seven Hills
Ektimo Staff	Steven Cooper & Adnan Latif	State	NSW
Process Conditions	Please refer to client records.		

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Stack Parameters

Moisture content, %v/v	3.1	
Gas molecular weight, g/g mole	28.6 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	0.71	
% Oxygen correction & Factor	3 %	10.01

Gas Flow Parameters

Flow measurement time(s) (hhmm)	0836 & 1235
Temperature, °C	219
Temperature, K	492
Ambient pressure, kPa	101
Stack pressure, kPa	102
Velocity at sampling plane, m/s	33
Volumetric flow rate, actual, m ³ /s	28
Volumetric flow rate (wet STP), m ³ /s	16
Volumetric flow rate (dry STP), m ³ /s	15
Mass flow rate (wet basis), kg/h	72000

Gas Analyser Results	Sampling time	Average 1030 - 1151			Minimum 1030 - 1151			Maximum 1030 - 1151		
		Corrected to			Corrected to			Corrected to		
		Concentration mg/m³	3% O2 mg/m³	Mass Rate g/min	Concentration mg/m³	3% O2 mg/m³	Mass Rate g/min	Concentration mg/m³	3% O2 mg/m³	Mass Rate g/min
		Combustion Gases								
		Nitrogen oxides (as NO₂)			3.3	33	3	30	300	28
		Carbon monoxide			<1	<10	<1	3.7	38	3.4
		Concentration ppm	3% O2 ppm	Mass Rate g/min	Concentration ppm	3% O2 ppm	Mass Rate g/min	Concentration ppm	3% O2 ppm	Mass Rate g/min
		Carbon monoxide			<1	<10	<1	3	30	3.4
		Concentration % v/v			Concentration % v/v			Concentration % v/v		
		Carbon dioxide			0.1			0.6		
		Oxygen			18.9			20.3		

Isokinetic Results	Sampling time	Results		
		1030-1151		
		Corrected to		
		Concentration	3% O2	Mass Rate
		mg/m³	mg/m³	g/min
Sulfur trioxide and/or Sulfuric acid (as SO3)		0.067	0.67	0.061
Isokinetic Sampling Parameters				
Sampling time, min		80		
Isokinetic rate, %		97		
Gravimetric analysis date (total particulate)		01-05-2025		

Date	29/04/2025	Client	VIP Drum Reconditioners
Report	R018152	Stack ID	EPA 1 - Afterburner Discharge Stack
Licence No.	124	Location	Seven Hills
Ektimo Staff	Steven Cooper & Adnan Latif	State	NSW
Process Conditions	Please refer to client records.		

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Stack Parameters

Moisture content, %v/v	3.1	
Gas molecular weight, g/g mole	28.6 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.28 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	0.70	
% Oxygen correction & Factor	3 %	9.06
% Carbon dioxide correction & Factor	12 %	22.87

Gas Flow Parameters

Flow measurement time(s) (hhmm)	1235 & 1428
Temperature, °C	225
Temperature, K	498
Ambient pressure, kPa	101
Stack pressure, kPa	102
Velocity at sampling plane, m/s	32
Volumetric flow rate, actual, m ³ /s	27
Volumetric flow rate (wet STP), m ³ /s	15
Volumetric flow rate (dry STP), m ³ /s	15
Mass flow rate (wet basis), kg/h	69000

Halides & Halogens e.g HCl, Cl₂, HF

Sampling time	Results		
	1304-1404		
	Corrected to		
	Concentration mg/m ³	3% O ₂ mg/m ³	Mass Rate g/min
	Chloride (as HCl)	<0.05	<0.4
Chlorine	<0.09	<0.8	<0.04

Isokinetic Results

Sampling time	Results		
	1250-1411		
	Corrected to		
	Concentration mg/m ³	12% CO ₂ mg/m ³	Mass Rate g/min
	Solid Particles	1.8	40
Total fluoride (as HF)	Corrected to		
	Concentration mg/m ³	3% O ₂ mg/m ³	Mass Rate g/min
	1.4	12	1.5

Isokinetic Sampling Parameters

Sampling time, min	80
Isokinetic rate, %	100
Gravimetric analysis date (total particulate)	01-05-2025

Date	29/04/2025	Client	VIP Drum Reconditioners
Report	R018152	Stack ID	EPA 1 - Afterburner Discharge Stack
Licence No.	124	Location	Seven Hills
Ektimo Staff	Steven Cooper & Adnan Latif	State	NSW
Process Conditions	Please refer to client records.		

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Stack Parameters			
Moisture content, %v/v	3.1		
Gas molecular weight, g/g mole	28.6 (wet)	29.0 (dry)	
Gas density at STP, kg/m ³	1.28 (wet)	1.29 (dry)	
Gas density at discharge conditions, kg/m ³	0.70		
% Oxygen correction & Factor	3 %	9.11	
Gas Flow Parameters			
Flow measurement time(s) (hhmm)	1235 & 1428		
Temperature, °C	225		
Temperature, K	498		
Ambient pressure, kPa	101		
Stack pressure, kPa	102		
Velocity at sampling plane, m/s	32		
Volumetric flow rate, actual, m ³ /s	27		
Volumetric flow rate (wet STP), m ³ /s	15		
Volumetric flow rate (dry STP), m ³ /s	15		
Mass flow rate (wet basis), kg/h	69000		

Isokinetic Results		Results		
	Sampling time	1302-1423		
		Corrected to		
		Concentration	3% O ₂	Mass Rate
		mg/m ³	mg/m ³	g/min
Antimony		0.0052	0.047	0.0045
Arsenic		<0.0005	<0.005	<0.0005
Cadmium		<0.0005	<0.005	<0.0005
Lead		0.03	0.28	0.026
Mercury		<0.0002	<0.002	<0.0001
Total Type 1 Substances		≤0.037	≤0.33	≤0.032
Isokinetic Sampling Parameters				
Sampling time, min			80	
Isokinetic rate, %			99	

2.2 EPA 2 - Cooling Air Vent

Date	29/04/2025	Client	VIP Drum Reconditioners
Report	R018152	Stack ID	EPA 2 - Cooling Air Vent
Licence No.	124	Location	Seven Hills
Ektimo Staff	Steven Cooper & Adnan Latif	State	NSW
Process Conditions	Please refer to client records.		

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Comments

Slot width is 148mm this year
The number of points sampled is less than the requirement
The discharge is assumed to be composed of dry air and moisture

Stack Parameters

Moisture content, %v/v	1.1	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m ³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m ³	1.07	

Gas Flow Parameters

Flow measurement time(s) (hhmm)	1349
Temperature, °C	55
Temperature, K	328
Ambient pressure, kPa	101
Stack pressure, kPa	101
Velocity at sampling plane, m/s	21
Volumetric flow rate, actual, m ³ /s	14
Volumetric flow rate (wet STP), m ³ /s	12
Volumetric flow rate (dry STP), m ³ /s	12
Mass flow rate (wet basis), kg/h	55000

3 Sample Plane Compliance

3.1 EPA 1 - Afterburner Discharge Stack

Sampling Plane Details	
Source tested	Exhaust vent
Pollution control equipment	Thermal oxidiser
Sampling plane dimensions	1035 mm
Sampling plane area	0.841 m ²
Sampling port size, number & depth	4" BSP (x2), 80 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 7 D
Upstream disturbance	Change in diameter 3 D
No. traverses & points sampled	2 16
Sample plane conformance to AS 4323.1	Conforming but non-ideal
The sampling plane is deemed to be non-ideal due to the following reasons:	
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D	

3.2 EPA 2 - Cooling Air Vent

Sampling Plane Details	
Source tested	Fresh air ingress
Pollution control equipment	Thermal oxidiser
Sampling plane dimensions	4555 x 148 mm
Sampling plane area	0.674 m ²
Sampling port size, number & depth	NA, 0 mm
Duct orientation & shape	Horizontal Rectangular
Downstream disturbance	Change in diameter 0 D
Upstream disturbance	Change in diameter 0 D
No. traverses & points sampled	4 4
Sample plane conformance to AS 4323.1	Non-conforming
The sampling plane is deemed to be non-conforming due to the following reasons:	
The downstream disturbance is <1D from the sampling plane	
The upstream disturbance is <2D from the sampling plane	

4 Plant Operating Conditions

See VIP Drum Reconditioners records for complete process conditions.

Based on information received from VIP Drum Reconditioners' personnel, it is our understanding that samples were collected during typical plant operations.

5 Test Methods

All sampling and analysis were performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited	
				Sampling	Analysis
Sampling points - Selection	NSW EPA TM-1 (AS 4323.1)	NA	NA	✓	NA
Flow rate, temperature & velocity	NSW EPA TM-2 (USEPA Method 2)	NSW EPA TM-2 (USEPA Method 2)	8%, 2%, 7%	NA	✓
Moisture content	NSW EPA TM-22 (USEPA Method 4)	NSW EPA TM-22 (USEPA Method 4)	8%	✓	✓
Molecular weight	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Dry gas density	NA	NSW EPA TM-23 (USEPA Method 3)	not specified	NA	✓
Carbon dioxide	NSW EPA TM-24 (USEPA Method 3A)	NSW EPA TM-24 (USEPA Method 3A)	13%	✓	✓
Carbon monoxide	NSW EPA TM-32 (USEPA Method 10)	NSW EPA TM-32 (USEPA Method 10)	12%	✓	✓
Nitrogen oxides	NSW EPA TM-11 (USEPA Method 7E)	NSW EPA TM-11 (USEPA Method 7E)	12%	✓	✓
Oxygen	NSW EPA TM-25 (USEPA Method 3A)	NSW EPA TM-25 (USEPA Method 3A)	13%	✓	✓
Total gaseous organic compounds	NSW EPA TM-34 (USEPA Method 25B)	NSW EPA TM-34 (USEPA Method 25B)	not specified	✓	✓
Hydrogen sulfide	NSW EPA TM-5 (USEPA Method 11)	NSW EPA TM-5	not specified	✓	✓ [†]
Solid particles (total)	NSW EPA TM-15 (AS 4323.2)	NSW EPA TM-15 (AS 4323.2)	3%	✓	✓ ^{††}
Type 1 substances (As, Cd, Hg, Pb, Sb)	NSW EPA TM-12 (USEPA Method 29)	Ektimo 666	not specified	✓	✓ [†]
Dioxins & furans (PCDDs & PCDFs)	NSW EPA TM-18 (USEPA Method 23)	NMI in-house method AUTL_MET_02	16%	✓	✓ [¶]
Fluorine & fluorine compounds ¹	NSW EPA TM-9 (USEPA Method 13B)	Ektimo 235	25%	✓	✓ [†]
Hydrogen chloride	NSW EPA TM-8 (USEPA Method 26A)	Ektimo 235	14%	✓	✓ ^{†i}
Chlorine	NSW EPA TM-7 (USEPA Method 26A)	Ektimo 235	14%	✓	✓ ^{†i}
Sulfuric acid mist and/or sulfur trioxide	NSW EPA TM-3 (USEPA Method 8)	Ektimo 235	16%	✓	✓ ^{†m}

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* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

[¶] Analysis performed by Australian Government National Measurement Institute, NATA accreditation number 198. Results were reported to Ektimo on 30 May 2025 in report RN1465955.

[†] Analysis performed by Ektimo. Results were reported to Ektimo on.

- 16 May 2025 in report LV-007198 (Metals).
- 19 May 2025 in report LV-007205 (H₂S).
- 19 May 2025 in report LV-007217 (Halides & Halogens).
- 19 May 2025 in report LV-007225 (SO₃).

^{††} Gravimetric analysis conducted at the Ektimo NSW laboratory.

¹ Sampling follows USEPA Method 13B and analysis follows Ektimo 235 (ion chromatography which uses the same principle as the NSW EPA approved alternative analysis method USEPA SW-846 Method 9056A).

ⁱ Includes analysis of chlorine/chloride by Ektimo 235 which uses the same principle as USEPA Method 26/26A.

^m Includes analysis of SO₃/H₂SO₄ by Ektimo 235 which uses the same principle as USEPA SW-846 Method 9056A which is an approved alternative to the analytical procedure of USEPA Method 8.

6 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

Unless specifically noted, all samples were collected and handled in accordance with Ektimo's QA/QC standards.

7 Definitions

The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
BaP-TEQ	Benzo(a)pyrene toxic equivalents
BSP	British standard pipe
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
D ₅₀	'Cut size' of a cyclone is defined as the particle diameter at which the cyclone achieves a 50% collection efficiency i.e. half of the particles are retained by the cyclone and half pass through it. The D ₅₀ method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D ₅₀ of that cyclone and less than the D ₅₀ of the preceding cyclone.
DECC	Department of Environment & Climate Change (NSW)
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
DWER	Department of Water and Environmental Regulation (WA)
DEHP	Department of Environment and Heritage Protection (QLD)
EPA	Environment Protection Authority
FTIR	Fourier transform infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
I-TEQ	International toxic equivalents
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NIOSH	National Institute of Occupational Safety and Health
NT	Not tested or results not required
OM	Other approved method
RATA	Relative accuracy test audit
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
TOC	Total organic carbon. This is the sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
VOC	Volatile organic compound. A carbon-based chemical compound with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the given conditions of use. VOCs may contain oxygen, nitrogen and other elements. VOCs do not include carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
WHO05-TEQ	World Health Organisation toxic equivalents
XRD	X-ray diffractometry
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range

8 Appendices

Appendix A: Site Images



Image 1. EPA 1 - Afterburner Discharge Stack



Image 2. EPA 2 - Cooling Air Vent


Appendix B: Chain(s) of Custody

~~28/05~~ EKT101/250501
~~29/05~~ 2/5/21
 29/05


30-4-2025
 Checked at Ektimo Dispatch by: dd Sign/Date

Ektimo

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact
N 24563	R018152	Dioxins & Furans	ug/sample	NMI	W016093	Steven Cooper


N25/006989

JOB NUMBER R018152



Checked at Ektimo Dispatch by: 415/HO
02/05/20 Sign/Date

Samples received in good order: AKO S/S
 Sign/Date

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 24512	R018152	Metals on filter (Ektimo) (Sb, As, Cd, Pb, Hg)	ug/sample	Ektimo		Steven Cooper	EPA 1 Filter	
N 24513	R018152	Metals on filter (Ektimo) (Sb, As, Cd, Pb, Hg)	ug/sample	Ektimo		Steven Cooper	EPA 1 Blank Filter	
N 24514	R018152	Metals in Solution (Ektimo) (Sb, As, Cd, Pb, Hg)	ug/litre	Ektimo		Steven Cooper	EPA 1 Impingers	
N 24515	R018152	Metals in Solution (Ektimo) (Sb, As, Cd, Pb, Hg)	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank Impingers	
N 24516	R018152	Hg in Solution	ug/litre	Ektimo		Steven Cooper	EPA 1 Hg Impingers	
N 24517	R018152	Hg in Solution	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank Hg Impingers	
N 24518	R018152	Metals in Solution (Ektimo) (Sb, As, Cd, Pb, Hg)	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger Rinse	
N 24519	R018152	Metals in Solution (Ektimo) (Sb, As, Cd, Pb, Hg)	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank Impingers Rinse	
N 24520	R018152	Hg in Solution	ug/litre	Ektimo		Steven Cooper	EPA 1 Hg Impinger Rinse	
N 24521	R018152	Hg in Solution	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank Hg Impinger Blank	
N 24522	R018152	Total Fluoride	ug/sample	Ektimo		Steven Cooper	EPA 1 Filter	
N 24523	R018152	Total Fluoride	ug/sample	Ektimo		Steven Cooper	EPA 1 Blank Filter	
N 24524	R018152	HF	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger A + B	
N 24525	R018152	HF	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank HF Solution	
N 24526	R018152	SO3	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger A + B	
N 24527	R018152	SO3	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank SO3 Solution	
N 24528	R018152	H2S	ug/litre	Ektimo		Steven Cooper	EPA 1 Impingers A + B + C	
N 24529	R018152	H2S	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank H2S Solution	
N 24530	R018152	HCl	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger A	
N 24531	R018152	HCl	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger B	
N 24532	R018152	HCl	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank HCl Solution	
N 24533	R018152	Cl2	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger A	
N 24534	R018152	Cl2	ug/litre	Ektimo		Steven Cooper	EPA 1 Impinger B	
N 24535	R018152	Cl2	ug/litre	Ektimo		Steven Cooper	EPA 1 Blank Cl2 Solution	

Logged AKO S/S

Appendix C: Laboratory Results



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CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo
26 Redland Drive
Mitcham, VIC 3132

Report Number: LV-007225
Job Number: R018152
Date of Issue: 19/05/2025

Attention: VIP Drum Reconditioners
Address: 8 Maui Street, Pukete
Hamilton, NSW 3240

Date samples received: 5/05/2025
Number of samples received: 2
Date samples analysed: 16/05/2025
No of samples analysed: 2
Test method(s) used: Ektimo 235

Comments

QC Acceptance Criteria:	Parameter	Criteria	Pass/Fail
	Standard Curve	$R^2 > 0.99$	Pass
	Range	All samples <110% of highest standard	Pass
	Repeat samples	Between 80% - 120%	Pass
	Method Blanks	All method blanks < PQL	Pass
	QC sample	2 standard deviations of theoretical	Pass
	Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

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A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.

REPORT AUTHORISATION

Version: 06/05/25



Annie Kolokithas
Laboratory Technician



Daniel Balaam
Senior Laboratory Chemist



NATA Accredited Laboratory 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Ektimo

Analytical Results

Report No. LV-007225

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24526 R018152	N 24527 R018152
Volume	1	mL	46	130
Sulfur trioxide (SO ₃) as SO ₂	0.2	mg/L	3.2	0.3

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



NATA Accredited Laboratory 14601

Results page 2 of 2

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo
26 Redland Drive
Mitcham, VIC 3132

Report Number: LV-007217
Job Number: R018152
Date of Issue: 19/05/2025

Attention: VIP Drum Reconditioners
Address: 8 Maui Street, Pukete
Hamilton, NSW 3240

Date samples received: 5/05/2025
Number of samples received: 10
Date samples analysed: 13/05/2025
No of samples analysed: 10
Test method(s) used: Ektimo 235

Comments

QC Acceptance Criteria:	Parameter	Criteria	Pass/Fail
	Standard Curve	$R^2 > 0.99$	Pass
	Range	All samples <110% of highest standard	Pass
	Repeat samples	Between 80% - 120%	Pass
	Method Blanks	All method blanks < PQL	Pass
	QC sample	2 standard deviations of theoretical	Pass
	Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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REPORT AUTHORISATION

Version: 060525

Annie Kolokithas
Laboratory TechnicianDaniel Balaam
Senior Laboratory Chemist

NATA Accredited Laboratory 14601

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Ektimo

Analytical Results

Report No. LV-007217

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24522 R018152	N 24523 R018152	N 24524 R018152	N 24525 R018152
Volume	1	mL			210	210
Hydrogen chloride (HCl) as Cl	0.1	mg/L				
Chlorine (Cl) as Cl	0.1	mg/L				
Hydrogen fluoride (HF) as F	0.1	mg/L			8.2	<0.1
Hydrogen chloride (HCl) as Cl (Total)	0.1	µg				
Chlorine (Cl) as Cl (Total)	0.1	µg				
Hydrogen fluoride (HF) as F (Total)	4	µg	31	<4		

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



NATA Accredited Laboratory 14601

Results page 2 of 4

Ektimo

Analytical Results

Report No. LV-007217

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24530 R018152	N 24531 R018152	N 24532 R018152	N 24533 R018152
Volume	1	mL	17	18	37	17
Hydrogen chloride (HCl) as Cl	0.1	mg/L	0.88	0.64	0.55	
Chlorine (Cl) as Cl	0.1	mg/L				<0.1
Hydrogen fluoride (HF) as F	0.1	mg/L				
Hydrogen chloride (HCl) as Cl (Total)	0.1	µg				
Chlorine (Cl) as Cl (Total)	0.1	µg				
Hydrogen fluoride (HF) as F (Total)	4	µg				

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



NATA Accredited Laboratory 14601

Results page 3 of 4

Ektimo

Analytical Results

Report No. LV-007217

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24534 R018152	N 24535 R018152
Volume	1	mL	17	41
Hydrogen chloride (HCl) as Cl	0.1	mg/L		
Chlorine (Cl) as Cl	0.1	mg/L	<0.1	<0.1
Hydrogen fluoride (HF) as F	0.1	mg/L		
Hydrogen chloride (HCl) as Cl (Total)	0.1	µg		
Chlorine (Cl) as Cl (Total)	0.1	µg		
Hydrogen fluoride (HF) as F (Total)	4	µg		

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



NATA Accredited Laboratory 14601

Results page 4 of 4

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo
26 Redland Drive
Mitcham, VIC 3132

Report Number: LV-007198
Job Number: R018152
Date of Issue: 16/05/2025

Attention: VIP Drum Reconditioners
Address: 8 Maui Street, Pukete
Hamilton, NSW 3240

Date samples received: 5/05/2025

Number of samples received: 10

Date samples analysed: 15/05/2025
No of samples analysed: 10

Test method(s) used: Ektimo 666

Comments

QC Acceptance Criteria:	Parameter	Criteria	Pass/Fail
	Standard Curve	$R^2 > 0.99$	Pass
	Range	All samples <110% of highest standard	Pass
	Repeat samples	Between 70% - 130%	Pass
	Method Blanks	All method blanks < PQL	Pass
	QC sample	2 standard deviations of theoretical	Pass
	Chemical Expiry	All chemicals within expiry date	Pass

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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REPORT AUTHORISATION

Version: 060525



Cappi Tuffery
Laboratory Chemist



Daniel Balaam
Senior Laboratory Chemist



NATA Accredited Laboratory 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Ektimo

Analytical Results

Report No. LV-007198

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24512 R018152	N 24513 R018152	N 24514 R018152	N 24515 R018152
Volume	1	mL			210	220
Antimony	1	µg/L			<1	<1
Arsenic	1	µg/L			<1	<1
Cadmium	1	µg/L			<1	<1
Lead	1	µg/L			7.3	<1
Mercury	0.2	µg/L			<0.2	<0.2
Antimony (Total)	0.31	µg	7.4	<0.31		
Arsenic (Total)	0.31	µg	<0.31	<0.31		
Cadmium (Total)	0.31	µg	<0.31	<0.31		
Lead (Total)	0.31	µg	42	<0.31		
Mercury (Total)	0.062	µg	<0.062	<0.062		

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



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Results page 2 of 4

Ektimo

Analytical Results

Report No. LV-007198

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24516 R018152	N 24517 R018152	N 24518 R018152	N 24519 R018152
Volume	1	mL	270	210	230	230
Antimony	1	µg/L			<1	<1
Arsenic	1	µg/L			<1	<1
Cadmium	1	µg/L			<1	<1
Lead	1	µg/L			<1	<1
Mercury	0.2	µg/L	<0.2	<0.2	<0.2	<0.2
Antimony (Total)	0.31	µg				
Arsenic (Total)	0.31	µg				
Cadmium (Total)	0.31	µg				
Lead (Total)	0.31	µg				
Mercury (Total)	0.062	µg				

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



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Results page 3 of 4

Ektimo

Analytical Results

Report No. LV-007198

Job No. R018152

Client Name: VIP Drum Reconditioners

Parameter	PQL	Units	N 24520 R018152	N 24521 R018152
Volume	1	mL	210	220
Antimony	1	µg/L		
Arsenic	1	µg/L		
Cadmium	1	µg/L		
Lead	1	µg/L		
Mercury	0.2	µg/L	<0.2	<0.2
Antimony (Total)	0.31	µg		
Arsenic (Total)	0.31	µg		
Cadmium (Total)	0.31	µg		
Lead (Total)	0.31	µg		
Mercury (Total)	0.062	µg		

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



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Results page 4 of 4



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Version: 260624

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo
26 Redland Drive
Mitcham, VIC 3132

Client: VIP Drum Reconditioners
Report Number: LV-007205
Job Number: R018152
Date of Issue: 19/05/2025 15:40

Attention: VIP Drum Reconditioners
Address: 8 Maui Street, Pukete
Hamilton, NSW 3240

Date samples received: 5/05/2025
Number of samples received: 2
Date samples analysed: 19/05/2025
No of samples analysed: 2

Test method(s) used: USEPA Method 11

Comments

QC Acceptance Criteria:	Parameter	Criteria	Pass/Fail
	Standardisation	All titres within 0.05 mL.	PASS
	Storage	All samples refrigerated below 4 °C.	PASS
	Sample Integrity	All sample containers undamaged.	PASS
	Chemical expiry	All chemicals within expiry date.	PASS
	Holding time	All samples analysed within holding time.	PASS

This report supersedes any previous report(s) with this reference. Sample(s) have been analysed as received.

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REPORT AUTHORISATION



Annie Kolokithas
Laboratory Technician



Daniel Balaam
Senior Laboratory Chemist



NATA Accredited Laboratory 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Report No. LY-007205
 Job No. R018152
 Client Name: VIP Drum Reconditioners

Sample ID	Location	Sample name	Observations	As received sample volume (ml)	Volume analysed (ml)	H ₂ S mass in impinger solution (µg)
N24529	EPA 1	BLANK	Clear, Nil odour	42	42	< 21.3
N24528	EPA 1	Impingers A + B+ C	Clear, Nil odour	42	42	< 21.3

* Results marked with an asterisk are outside the acceptable calibration range of the instrument.



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Results page 2 of 2



Australian Government
Department of Industry,
Science and Resources

National
Measurement
Institute



REPORT OF ANALYSIS

Page: 1 of 3

Report No. RN1465955

Client :	EKTIMO PTY LTD 52 COOPER ROAD COCKBURN CENTRAL WA 6164	Job No. :	EKTIO1/250501
		Quote No. :	QT-02288
		Order No. :	WO16093
		Date Sampled :	
Attention :		Date Received :	01-MAY-2025
Project Name :		Sampled By :	CLIENT
For Follow up enquiries :	ASB@measurement.gov.au	Phone :	1300 722 845

Lab Reg No.	Sample Ref	Sample Description
N25/006989	N 24563	AUT250422P RESIN, RINSE AND FILTER TEST JOB NO. R018152

Lab Reg No.	Sample Reference	Units	N25/006989 N 24563	Method
Dioxin/Furan International Toxic Equivalency (iTEQ)				
	Lower bound iTEQDF	pg	4.5	AUT_MET002
	Middle bound iTEQDF	pg	5.3	AUT_MET002
	Upper bound iTEQDF	pg	6.2	AUT_MET002
Dioxin and Furan Toxic congeners				
	2378-TCDF (51207-31-9)	pg	4.1	AUT_MET002
	2378-TCDD (1746-01-6)	pg	< 1	AUT_MET002
	12378-PeCDF (57117-41-6)	pg	2.6	AUT_MET002
	23478-PeCDF (57117-31-4)	pg	3.7	AUT_MET002
	12378-PeCDD (40321-76-4)	pg	< 1	AUT_MET002
	123478-HxCDF (70648-26-9)	pg	5.7	AUT_MET002
	123678-HxCDF (57117-44-9)	pg	5.1	AUT_MET002
	234678-HxCDF (60851-34-5)	pg	4.5	AUT_MET002
	123789-HxCDF (72918-21-9)	pg	< 1	AUT_MET002
	123478-HxCDD (39227-28-6)	pg	1.1	AUT_MET002
	123678-HxCDD (57653-85-7)	pg	1.2	AUT_MET002
	123789-HxCDD (19408-74-3)	pg	< 0.8	AUT_MET002
	1234678-HpCDF (67562-39-4)	pg	22	AUT_MET002
	1234789-HpCDF (55673-89-7)	pg	0.93	AUT_MET002
	1234678-HpCDD (35822-46-9)	pg	8.1	AUT_MET002
	OCDF (39001-02-0)	pg	4.5	AUT_MET002
	OCDD (3268-87-9)	pg	13	AUT_MET002
Total homologue groups				
	Total TCDF isomers	pg	150	AUT_MET002
	Total TCDD isomers	pg	96	AUT_MET002
	Total PeCDF isomers	pg	71	AUT_MET002
	Total PeCDD isomers	pg	31	AUT_MET002
	Total HxCDF isomers	pg	45	AUT_MET002
	Total HxCDD isomers	pg	25	AUT_MET002
	Total HpCDF isomers	pg	29	AUT_MET002

Accredited for compliance with ISO/IEC 17025 - Testing

105 Delhi Road, North Ryde NSW 2113 Tel: 1300 722 845 Web: industry.gov.au/measurement

National Measurement Institute

REPORT OF ANALYSIS

Page: 2 of 3
Report No. RN1465955

Lab Reg No.		N25/006989	
Sample Reference		N 24563	
	Units		Method
Total homologue groups			
Total HpCDD isomers	pg	16	AUT_MET002
Labelled Field Surrogate Recoveries			
23478-PeCDF (13C12) (116843-02-8)	%	140	AUT_MET002
123478-HxCDF (13C12) (114423-98-2)	%	137	AUT_MET002
123478-HxCDD (13C12) (109719-80-4)	%	137	AUT_MET002
1234789-HpCDF (13C12) (109719-94-0)	%	124	AUT_MET002
Labelled Internal Standard Recoveries			
2378-TCDF (13C12) (89059-46-1)	%	62	AUT_MET002
2378-TCDD (13C12) (76523-40-5)	%	75	AUT_MET002
12378-PeCDF (13C12) (109719-77-9)	%	62	AUT_MET002
12378-PeCDD (13C12) (109719-79-1)	%	72	AUT_MET002
123678-HxCDF (13C12) (116843-03-9)	%	74	AUT_MET002
123678-HxCDD (13C12) (109719-81-5)	%	82	AUT_MET002
1234678-HpCDF (13C12) (109719-84-8)	%	70	AUT_MET002
1234678-HpCDD (13C12) (109719-83-7)	%	76	AUT_MET002
OCDD (13C12) (114423-97-1)	%	76	AUT_MET002
Extraction			
Pressurised Solvent Extraction		21-MAY-2025	AUT_MET_01
Purification			
Automated column chromatography DF		26-MAY-2025	AUT_MET_01
Dioxin/Furan International Toxic Equivalency Factors (iTEF)			
iTEF 2378-TCDF		0.1	AUT_MET002
iTEF 2378-TCDD		1	AUT_MET002
iTEF 12378-PeCDF		0.05	AUT_MET002
iTEF 23478-PeCDF		0.5	AUT_MET002
iTEF 12378-PeCDD		0.5	AUT_MET002
iTEF 123478-HxCDF		0.1	AUT_MET002
iTEF 123678-HxCDF		0.1	AUT_MET002
iTEF 234678-HxCDF		0.1	AUT_MET002
iTEF 123789-HxCDF		0.1	AUT_MET002
iTEF 123478-HxCDD		0.1	AUT_MET002
iTEF 123678-HxCDD		0.1	AUT_MET002
iTEF 123789-HxCDD		0.1	AUT_MET002
iTEF 1234678-HpCDF		0.01	AUT_MET002
iTEF 1234789-HpCDF		0.01	AUT_MET002
iTEF 1234678-HpCDD		0.01	AUT_MET002
iTEF OCDF		0.001	AUT_MET002
iTEF OCDD		0.001	AUT_MET002
Analysis Dates			
Emission Extracted Dioxin		21-MAY-2025	AUT_MET002
Emission HRMS Dioxin analysis		28-MAY-2025	AUT_MET002
Emission Confirmation Dioxin analysis		29-MAY-2025	AUT_MET002

105 Delhi Road, North Ryde NSW 2113 Tel: 1300 722 845 Web: industry.gov.au/measurement

National Measurement Institute

REPORT OF ANALYSIS

Page: 3 of 3
Report No. RN1465955

Lab Reg No.		N25/006989	
Sample Reference		N 24563	
	Units		Method
Analysis Dates			
Emission Holding times		Extract/Analyse Met	AUT_MET002

N25/006989

Please note that we observed higher than normal calculated values for the field surrogate recoveries.

Since the reported results are corrected for labelled surrogate recovery, we are reasonably confident with the calculated values for individual congeners and the overall I-TEQ values.

All results are expressed on an as received weight basis. iTEF defined in USEPA publication EPA/625/3-89/016 (1989), WHO TEFs defined by Van den Berg et al., Toxicol. Sci. 93(2), pp. 223241 (2006).
Labelled surrogates acceptance criteria: 70-130% for field - 40-130% for Tetra/Penta/Hexa - 25-130% for Hepta/Octa - 40-120% for PCB congeners.



Robert Crough, Analyst
Australian Ultra Trace Laboratory
Accreditation No. 198

30-MAY-2025



WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

* Denotes the analyte or test method is not within our ISO/IEC 17025 scope of accreditation.

Measurement Uncertainty is available upon request.

The testing was undertaken at: 105 Delhi Road, North Ryde, NSW, 2113

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National Measurement Institute



Experts in air quality, odour and emission monitoring.

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