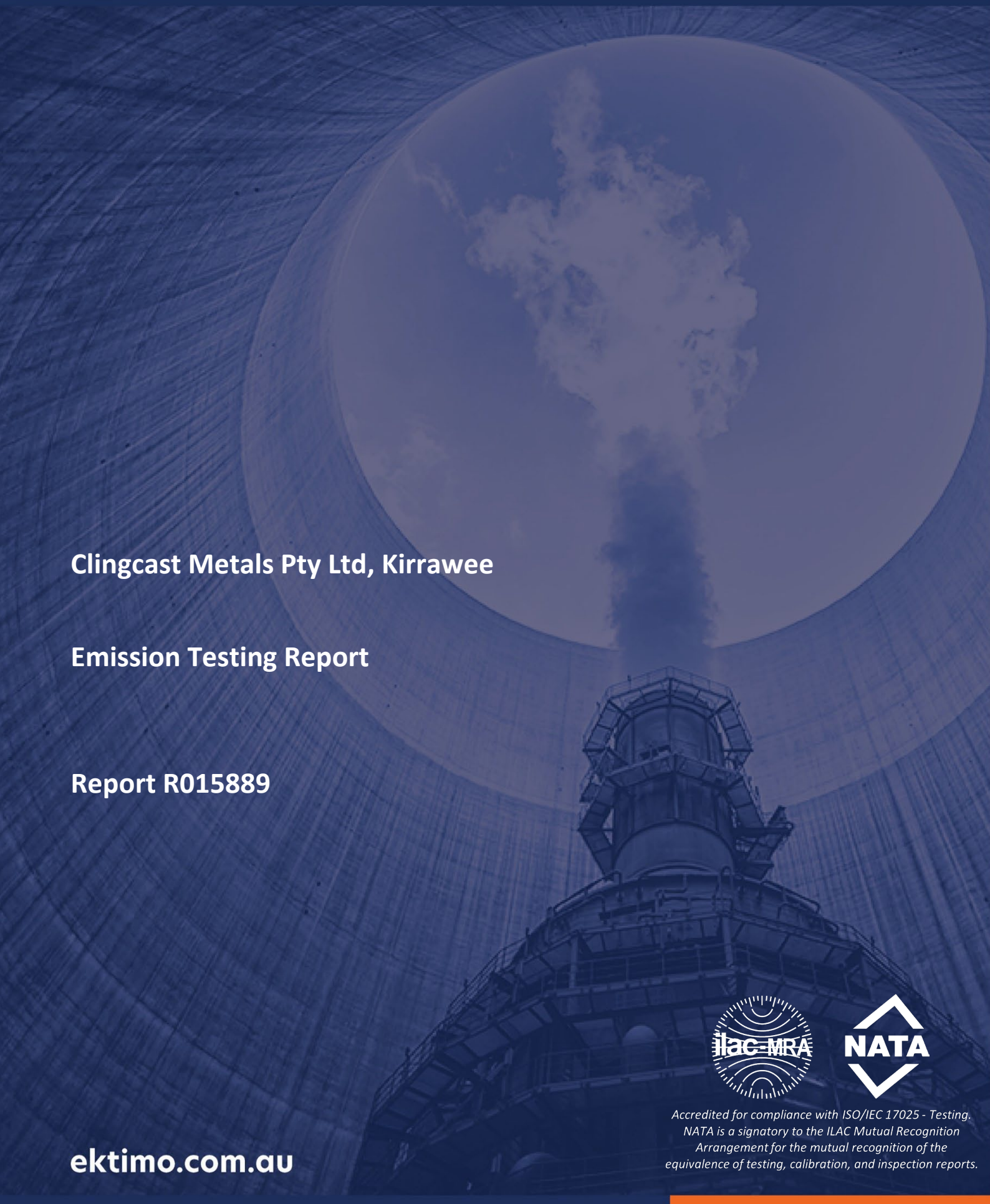
Ektimo



Clingcast Metals Pty Ltd, Kirrawee

Emission Testing Report

Report R015889

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

ektimo.com.au

Document Information

Client Name:	Clingcast Metals Pty Ltd
Report Number:	R015889
Date of Issue:	15 January 2024
Attention:	Megan Miller
Address:	98 Bath Rd Kirrawee NSW 2232
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

Aaron Davis
Operations Manager

NATA Accredited Laboratory
No. 14601

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to Test Methods section for full details of testing covered by NATA accreditation.

Table of Contents

1 Executive Summary

1.1 Background

Ektimo was engaged by Clingcast Metals Pty Ltd to perform emission testing at their Kirrawee plant in accordance with Environmental Licence 21514. Testing was performed at the commencement of the casting process.

1.2 Project Objective & Overview

The objective of the project was to conduct a monitoring programme to quantify emissions from one (1) discharge point to determine compliance with Clingcast Metals Pty Ltd's Environmental Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
Baghouse Stack	6 December 2023	Solid particles Carbon dioxide, oxygen Metals Type 1 & 2 substances (Sb, As, Cd, Pb, Be, Cr, Co, Mn, Ni, Se, Sn, V) Specialised volatile organic compounds (VOCs) Odour and character

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

All results are reported on a dry basis at STP (except odour wet – STP).

Plant operating conditions have been noted in this report.

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 21514 (last amended on 5 May 2021).

Location Description	Pollutant	Units	Licence Limit	Detected Values
Baghouse Stack	Total solid particles	mg/m^3 at STP dry	5	**4.5**
	Type 1 & 2 substances in aggregate	mg/m^3 at STP dry	0.1	**≤0.035**
	Volatile organic compounds (as n-propane)	mg/m^3 at STP dry	5	**3.9**

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 *Baghouse Stack*

Date	6/12/2023	**Client**	Clingcast Metals
Report	R015889	**Stack ID**	Baghouse Stack
Licence No.	21514	**Location**	Kirrawee
Ektimo Staff	Aaron Davis / James Cullen	**State**	NSW
Process Conditions	Cast Iron Furnace 1200kg cast		*231129*

Stack Parameters		
Moisture content, %v/v	1	
Gas molecular weight, g/g mole	28.9 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.29 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.15	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1435 & 1605	
Temperature, °C	33	
Temperature, K	306	
Velocity at sampling plane, m/s	12	
Volumetric flow rate, actual, m³/s	17	
Volumetric flow rate (wet STP), m³/s	15	
Volumetric flow rate (dry STP), m³/s	15	
Mass flow rate (wet basis), kg/h	71000	

Gas Analyser Results	Average	Minimum	Maximum
Sampling time	1440 - 1602	1440 - 1602	1440 - 1602
	Concentration % v/v	Concentration % v/v	Concentration % v/v
Carbon dioxide	<0.4	<0.4	<0.4
Oxygen	20.9	20.7	20.9

Odour	Results	
Sampling time	1440 - 1455	
	Concentration ou	Odourant Flow Rate ou.m³/min
Results	270	250000
Lower uncertainty limit	270	
Upper uncertainty limit	270	
Odour character	musty, water	
Analysis date & time	07/12/23, 1046	
Holding time	19 hours	
Dilution factor	1	
Bag material	Nalophan	
Butanol threshold (ppb)	44.8	
Laboratory temp (°C)	22	

Ektimo

Date	6/12/2023	**Client**	Clingcast Metals
Report	R015889	**Stack ID**	Baghouse Stack
Licence No.	21514	**Location**	Kirrawee
Ektimo Staff	Aaron Davis / James Cullen	**State**	NSW
Process Conditions	Cast Iron Furnace 1200kg cast		*231129*

Isokinetic Results	Results	
Sampling time	1440-1602	
	Concentration mg/m³	Mass Rate g/min
Solid Particles	4.5	4.1
Antimony	<0.005	<0.005
Arsenic	<0.002	<0.002
Beryllium	<0.0006	<0.0006
Cadmium	<0.0005	<0.0005
Chromium	<0.0008	<0.0007
Cobalt	<0.0007	<0.0006
Lead	0.013	0.011
Manganese	<0.002	<0.002
Mercury	<0.0004	<0.0004
Nickel	<0.001	<0.001
Selenium	<0.005	<0.005
Tin	<0.002	<0.002
Vanadium	<0.001	<0.001
Type 1 & 2 Substances		
Upper Bound		
Total Type 1 Substances	≤0.021	≤0.019
Total Type 2 Substances	<0.01	<0.01
Total Type 1 & 2 Substances	≤0.035	≤0.032
Isokinetic Sampling Parameters		
Sampling time, min	80	
Isokinetic rate, %	98	
Gravimetric analysis date (total particulate)	11-12-2023	

Total VOCs (as n-Propane)	Results	
	Concentration mg/m³	Mass Rate g/min
Total	3.9	3.5

VOC (speciated)	Results	
Sampling time	1440-1540	
	Concentration mg/m³	Mass Rate g/min
Detection limit[1]	<0.2	<0.2
Benzene	4.6	4.2
Toluene	1.9	1.7
m + p-Xylene	0.41	0.37
Nonane	0.22	0.2
1,3,5-Trimethylbenzene	0.26	0.23

(1) Unless otherwise reported, the following target compounds were found to be below detection:
Ethanol, Acetone, Isopropanol, Pentane, 1,1-Dichloroethene, Acrylonitrile, Dichloromethane, trans-1,2-Dichloroethene, Methyl ethyl ketone, n-Hexane, cis-1,2-Dichloroethene, Ethyl acetate, Chloroform, 1,1,1-Trichloroethane,1,2-Dichloroethane, Cyclohexane, Carbon tetrachloride, Butanol, Isopropyl acetate, 2-Methylhexane, 2,3-Dimethylpentane, 1-Methoxy-2-propanol, 3-Methylhexane, Heptane, Ethyl acrylate, Trichloroethylene, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl Isobutyl Ketone, 1,1,2-Trichloroethane, 2-Hexanone, Octane, Tetrachloroethene, Butyl acetate, Chlorobenzene, Ethylbenzene, 1-Methoxy-2-propyl acetate, Styrene, o-Xylene, Butyl acrylate, 2-Butoxyethanol, Cellosolve acetate, 1,1,2,2-Tetrachloroethane,Isopropylbenzene, alpha-Pinene, Propylbenzene, beta-Pinene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, Decane, 3-Carene, 1,2,3-Trimethylbenzene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane, Residuals as Toluene

3 Sample Plane Compliance

3.1 Baghouse Stack

Sampling Plane Details	
Pollution control equipment	Filter baghouse
Sampling plane dimensions	1355 mm
Sampling plane area	1.44 m²
Sampling port size, number	4" Flange (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Centrifugal fan 8 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 downstream disturbance but is greater than or equal to 1D

4 Plant Operating Conditions

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

6 December 2023

Cast Iron Furnace operating normally (casting 1200kg)

Copper Furnace not operating.

See Clingcast Metals Pty Ltd records for complete process conditions.

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	NATA accredited 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%	✓	✓
Oxygen	NSW EPA TM-25 (USEPA Method 3A)	NSW EPA TM-25 (USEPA Method 3A)	13%	✓	✓
Speciated volatile organic compounds (VOCs)	NSW EPA TM-34[d] (USEPA Method 18)	Ektimo 344	19%	✓	✓[†]
Solid particles (total)	NSW EPA TM-15 (AS 4323.2)	NSW EPA TM-15 (AS 4323.2)	3%	✓	✓[††]
Total (gaseous & particulate) metals & metallic compounds	NSW EPA TM-12, NSW EPA TM-13, NSW EPA TM-14 (USEPA Method 29)	Envirolab in-house methods Metals-020/021/022	15%	✓	✓[‡]
Type 1 substances (As, Cd, Hg, Pb, Sb)	NSW EPA TM-12 (USEPA Method 29)	Envirolab in-house methods Metals-020/021/022	15%	✓	✓[‡]
Type 2 substances (Be, Cr, Co, Mn, Ni, Se, Sn, V)	NSW EPA TM-13 (USEPA Method 29)	Envirolab in-house methods Metals-020/021/022	15%	✓	✓[‡]
Odour	NSW EPA OM-7 (AS 4323.3)	The Odour Unit (AS 4323.3)	refer to results	✓	✓[¶]
Odour characterisation	NA	direct observation	NA	NA	×

270923

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

[¶] Odour analysis conducted at The Odour Unit NSW EPA laboratory by forced choice olfactometry. Results were reported to Ektimo on 21 December 2023 in report 20231208_088.

[†] Analysis performed by Ektimo. Results were reported to Ektimo on 21 December 2023 in report LV-005297.

[††] Gravimetric analysis conducted at the Ektimo NSW laboratory.

[‡] Analysis performed by Envirolab, NATA accreditation number 2901. Results were reported to Ektimo on 3 January 2024 in report 340530.

[d] Excludes recovery study as specified in section 8.4.3 of USEPA Test Method 18.

6 Deviations to Test Methods

TM-34 VOLATILE ORGANIC COMPOUNDS

Ektimo notes that the sampling and analysis of Volatile Organic Compounds (VOCs), per USEPA Method 18 has excluded the recovery study as specified in Section 8.4.3. Performing the recovery study described in Section 8.4.3 of USEPA Method 18 for analytes present at low levels is problematic. Given this, Ektimo applies a threshold of 50µg as a lower-bound mass, below which the 'spiking' of specific volatile organic compounds is not performed. For the purposes of this round of monitoring, the following compounds were present above the detection limit (0.1 µg) but were below 50µg (unless **bolded**). Therefore, recovery studies for the following analytes were not performed:

- **Benzene (50 µg)**
- Toluene (21 µg)
- m + p-Xylene (4.4 µg)
- Nonane (2.4 µg)
- 1,3,5-Trimethylbenzene (2.8 µg)

NIOSH 1501 – Hydrocarbons, Aromatic (Benzene)

Benzene is specifically referred as a compound to be sampled under this method, and the recommended adsorbent media for sampling is 'Solid Sorbent Tube, coconut shell charcoal'. Ektimo used this recommended sampling media (SKC brand 226-01).

7 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.

8 Definitions

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

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
APHA	American Public Health Association, Standard Methods for the Examination of Water and Waste Water
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
OU	Odour unit. One OU is that concentration of odorant(s) at standard conditions that elicits a physiological response from a panel equivalent to that elicited by one Reference Odour Mass (ROM), evaporated in one cubic metre of neutral gas at standard conditions.
PM_{10}	Particulate matter having an equivalent aerodynamic diameter less than or equal to 10 microns (µm).
$PM_{2.5}$	Particulate matter having an equivalent aerodynamic diameter less than or equal to 2.5 microns (µm).
PSA	Particle size analysis. PSA provides a distribution of geometric diameters, for a given sample, determined using laser diffraction.
RATA	Relative accuracy test audit
Semi-quantified VOCs	Unknown VOCs (those for which an analytical standard is not available), are identified by matching the mass spectrum of the chromatographic peak to the NIST Standard Reference Database (version 14.0), with a match quality exceeding 70%. An estimated concentration is determined by matching the area of the peak with the nearest suitable compound in the analytical calibration standard mixture.
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.

9 Appendices

Appendix A: Site Image

Image 1. Baghouse Stack

Appendix B: Chain(s) of Custody

Ektimo

Checked at Ektimo Dispatch by: _____ Sign/Date 11/12/23

Samples received in good o

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes
~~N 21392~~	R015889	VOCs	ug/sample	Ektimo		Aaron Davis	Blank Tube
~~N 21393~~	R015889	VOCs	ug/sample	Ektimo		Aaron Davis	Tube A

logged A/co 13/12

Ektimo

Checked at Ektimo Dispatch by: Sam 11/12 Sign/Date

Samples received in good order: _____ Sign/Date

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 21394	R015889	Metals - Type 1 & 2 substances (Sb, As, Cd, Pb, Hg, Ba, Cr, Co, Mn, Ni, Se, V, Sn)	ug/sample	Envirolab	W012815	Aaron Davis	Blank Filter	
N 21395	R015889	Metals - Type 1 & 2 substances (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V, Sn)	ug/sample	Envirolab	W012815	Aaron Davis	Filter A (NF4637)	
N 21396	R015889	Metals - Type 1 & 2 substances (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V, Sn)	ug/litre	Envirolab	W012815	Aaron Davis	Blank Solution	
N 21397	R015889	Metals - Type 1 & 2 substances (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V, Sn)	ug/litre	Envirolab	W012815	Aaron Davis	Imp A+B	
N 21398	R015889	Hg	ug/litre	Envirolab	W012815	Aaron Davis	Blank Solution	
N 21399	R015889	Hg	ug/litre	Envirolab	W012815	Aaron Davis	Imp A+B	
N 21400	R015889	Hg	ug/litre	Envirolab	W012815	Aaron Davis	Blank Solution HCL Rinse	
N 21401	R015889	Hg	ug/litre	Envirolab	W012815	Aaron Davis	HCL Rinse	
N 21402	R015889	Metals - Type 1 & 2 substances (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, V, Sn)	ug/litre	Envirolab	W012815	Aaron Davis	Probe wash	

ENVIROLAB Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 340530
Date Received: 19/12/23
Time Received: 1920
Received By:
Temp: Cool/Ambient 21°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Appendix C: Laboratory Results

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accounts@ektimo.com.au
ektimo.com.au

CERTIFICATE OF ANALYSIS

Testing Laboratory:	Ektimo 26 Redland Drive Mitcham, VIC 3132
Report Number:	LV-005297
Job Number:	R015889
Date of Issue:	21/12/2023
Attention:	Clingcast
Address:	98 Bath Rd Kirrawee, NSW 2232
Date samples received:	13/12/2023
Number of samples received:	2
Date samples analysed:	21/12/2023
No of samples analysed:	2
Test method(s) used:	Ektimo 344

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

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 231130

Matthew Cook
Laboratory Manager

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-005297

Job No. R015889

Client Name: Clingcast

Parameter	Units	N21392 R015889	N21393 R015889
	PQL	2.0	2.0
Ethanol	µg	<2	<2
Acetone	µg	<2	<2
Isopropanol	µg	<2	<2
Pentane	µg	<2	<2
1,1-Dichloroethene	µg	<2	<2
Acrylonitrile	µg	<2	<2
Dichloromethane	µg	<2	<2
trans-1,2-Dichloroethene	µg	<2	<2
Methyl ethyl ketone	µg	<2	<2
n-Hexane	µg	<2	<2
cis-1,2-Dichloroethene	µg	<2	<2
Ethyl acetate	µg	<2	<2
Chloroform	µg	<2	<2
1,1,1-Trichloroethane	µg	<2	<2
1,2-Dichloroethane	µg	<2	<2
Cyclohexane	µg	<2	<2
Benzene	µg	<2	50
Carbon tetrachloride	µg	<2	<2
Butanol	µg	<2	<2
Isopropyl acetate	µg	<2	<2
2-Methylhexane	µg	<2	<2
2,3-Dimethylpentane	µg	<2	<2
1-Methoxy-2-propanol	µg	<2	<2
3-Methylhexane	µg	<2	<2
Heptane	µg	<2	<2
Ethyl acrylate	µg	<2	<2
Trichloroethylene	µg	<2	<2
Methyl methacrylate	µg	<2	<2
Propyl acetate	µg	<2	<2
Methylcyclohexane	µg	<2	<2
Methyl Isobutyl Ketone	µg	<2	<2
Toluene	µg	<2	21
1,1,2-Trichloroethane	µg	<2	<2
2-Hexanone	µg	<2	<2
Octane	µg	<2	<2
Tetrachloroethene	µg	<2	<2
Butyl acetate	µg	<2	<2
Chlorobenzene	µg	<2	<2
Ethylbenzene	µg	<2	<2
m + p-Xylene	µg	<2	4.4
1-Methoxy-2-propyl acetate	µg	<2	<2
Styrene	µg	<2	<2
o-Xylene	µg	<2	<2
Butyl acrylate	µg	<2	<2
Nonane	µg	<2	2.4

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

NATA Accredited Laboratory 14601

Ektimo

Analytical Results

Report No. LV-005297

Job No. R015889

Client Name: Clingcast

Parameter	Units	N21392 R015889	N21393 R015889
	PQL	2.0	2.0
2-Butoxyethanol	µg	<2	<2
Cellosolve acetate	µg	<2	<2
1,1,2,2-Tetrachloroethane	µg	<2	<2
Isopropylbenzene	µg	<2	<2
alpha-Pinene	µg	<2	<2
Propylbenzene	µg	<2	<2
1,3,5-Trimethylbenzene	µg	<2	2.8
beta-Pinene	µg	<2	<2
tert-Butylbenzene	µg	<2	<2
1,2,4-Trimethylbenzene	µg	<2	<2
Decane	µg	<2	<2
3-Carene	µg	<2	<2
1,2,3-Trimethylbenzene	µg	<2	<2
D-Limonene	µg	<2	<2
Undecane	µg	<2	<2
Dodecane	µg	<2	<2
Tridecane	µg	<2	<2
Tetradecane	µg	<2	<2
Residuals as Toluene	µg	<2	<2

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

NATA Accredited Laboratory 14601

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 340530

Client Details

Client	Ektimo (Unanderra)
Attention	Aaron Davis
Address	1/251 Princes Hwy, Unanderra, NSW, 2526

Sample Details

Your Reference	**R015889**
Number of Samples	2 Filter, 5 Water, 2 Liquid
Date samples received	19/12/2023
Date completed instructions received	19/12/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	03/01/2024
Date of Issue	03/01/2024

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Hannah Nguyen, Metals Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

Metals on filters			
Our Reference		340530-1	340530-2
Your Reference	UNITS	N21394	N21395
Type of sample		Filter	Filter
Date prepared	-	22/12/2023	22/12/2023
Date analysed	-	28/12/2023	28/12/2023
Antimony	µg/filter	<5	<5
Arsenic	µg/filter	<2	<2
Cadmium	µg/filter	<0.5	<0.5
Lead	µg/filter	<1	12
Mercury	µg/filter	<0.2	<0.2
Beryllium	µg/filter	<0.5	<0.5
Chromium	µg/filter	<0.5	0.6
Cobalt	µg/filter	<0.5	<0.5
Manganese	µg/filter	<0.5	1
Nickel	µg/filter	<1	<1
Selenium	µg/filter	<5	<5
Vanadium	µg/filter	<1	<1
Tin	µg/filter	<2	<2

Metals in water - mass units						
Our Reference		340530-3	340530-4	340530-5	340530-6	340530-7
Your Reference	UNITS	N21396	N21397	N21398	N21399	N21400
Type of sample		Water	Water	Liquid	Liquid	Water
Volume	mL	205	196	202	179	244
Antimony	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Arsenic	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Cadmium	µg	0.1	0.2	[NA]	[NA]	[NA]
Lead	µg	<0.5	0.7	[NA]	[NA]	[NA]
Mercury	µg	<10	<10	<1	<1	<0.5
Beryllium	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Chromium	µg	<0.5	0.7	[NA]	[NA]	[NA]
Cobalt	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Manganese	µg	<3	<3	[NA]	[NA]	[NA]
Nickel	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Selenium	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Vanadium	µg	<0.5	<0.5	[NA]	[NA]	[NA]
Tin	µg	0.6	0.5	[NA]	[NA]	[NA]
Date prepared	-	02/01/2024	02/01/2024	02/01/2024	02/01/2024	02/01/2024
Date analysed	-	02/01/2024	02/01/2024	02/01/2024	02/01/2024	02/01/2024
Antimony-Dissolved	µg/L	<1	<1	[NA]	[NA]	[NA]
Arsenic-Dissolved	µg/L	<1	<1	[NA]	[NA]	[NA]
Cadmium-Dissolved	µg/L	0.7	0.8	[NA]	[NA]	[NA]
Lead-Dissolved	µg/L	2	4	[NA]	[NA]	[NA]
Mercury-Dissolved	µg/L	<1	<1	<0.1	0.1	<0.05
Beryllium-Dissolved	µg/L	<0.5	<0.5	[NA]	[NA]	[NA]
Chromium-Dissolved	µg/L	2	3	[NA]	[NA]	[NA]
Cobalt-Dissolved	µg/L	<1	<1	[NA]	[NA]	[NA]
Manganese-Dissolved	µg/L	<5	<5	[NA]	[NA]	[NA]
Nickel-Dissolved	µg/L	<1	1	[NA]	[NA]	[NA]
Selenium-Dissolved	µg/L	<1	<1	[NA]	[NA]	[NA]
Vanadium-Dissolved	µg/L	<1	<1	[NA]	[NA]	[NA]
Tin-Dissolved	µg/L	3	3	[NA]	[NA]	[NA]

Metals in water - mass units			
Our Reference		340530-8	340530-9
Your Reference	UNITS	N21401	N21402
Type of sample		Water	Water
Volume	mL	239	25
Antimony	µg	[NA]	<0.5
Arsenic	µg	[NA]	<0.5
Cadmium	µg	[NA]	1.3
Lead	µg	[NA]	4
Mercury	µg	<0.5	<10
Beryllium	µg	[NA]	<0.5
Chromium	µg	[NA]	<0.5
Cobalt	µg	[NA]	<0.5
Manganese	µg	[NA]	<3
Nickel	µg	[NA]	<0.5
Selenium	µg	[NA]	<0.5
Vanadium	µg	[NA]	<0.5
Tin	µg	[NA]	<0.5
Date prepared	-	02/01/2024	02/01/2024
Date analysed	-	02/01/2024	02/01/2024
Antimony-Dissolved	µg/L	[NA]	<1
Arsenic-Dissolved	µg/L	[NA]	7
Cadmium-Dissolved	µg/L	[NA]	52
Lead-Dissolved	µg/L	[NA]	170
Mercury-Dissolved	µg/L	<0.05	<1
Beryllium-Dissolved	µg/L	[NA]	<0.5
Chromium-Dissolved	µg/L	[NA]	20
Cobalt-Dissolved	µg/L	[NA]	<1
Manganese-Dissolved	µg/L	[NA]	85
Nickel-Dissolved	µg/L	[NA]	11
Selenium-Dissolved	µg/L	[NA]	<1
Vanadium-Dissolved	µg/L	[NA]	<1
Tin-Dissolved	µg/L	[NA]	5

Method ID	Methodology Summary
Metals-020/021/022	Determination of various metals on filters by ICP-AES/MS and or CV/AAS. Note - air volume measurements are not covered by Envirolab's NATA accreditation.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.

QUALITY CONTROL: Metals on filters					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			22/12/2023	[NT]	[NT]	[NT]	[NT]	22/12/2023	[NT]
Date analysed	-			28/12/2023	[NT]	[NT]	[NT]	[NT]	28/12/2023	[NT]
Antimony	µg/filter	5	Metals-020/021/022	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Arsenic	µg/filter	2	Metals-020/021/022	<2	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium	µg/filter	0.5	Metals-020/021/022	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Lead	µg/filter	1	Metals-020/021/022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Mercury	µg/filter	0.2	Metals-020/021/022	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Beryllium	µg/filter	0.5	Metals-020/021/022	<0.5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Chromium	µg/filter	0.5	Metals-020/021/022	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cobalt	µg/filter	0.5	Metals-020/021/022	<0.5	[NT]	[NT]	[NT]	[NT]	95	[NT]
Manganese	µg/filter	0.5	Metals-020/021/022	<0.5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel	µg/filter	1	Metals-020/021/022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Selenium	µg/filter	5	Metals-020/021/022	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Vanadium	µg/filter	1	Metals-020/021/022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Tin	µg/filter	2	Metals-020/021/022	<2	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: Metals in water - mass units					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Antimony	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Arsenic	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cadmium	µg	0.05	Metals-022	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Lead	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mercury	µg	0.5	Metals-021	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Beryllium	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chromium	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cobalt	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Manganese	µg	3	Metals-022	<3	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Nickel	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Selenium	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vanadium	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tin	µg	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Date prepared	-			02/01/2024	[NT]	[NT]	[NT]	[NT]	02/01/2024	[NT]
Date analysed	-			02/01/2024	[NT]	[NT]	[NT]	[NT]	02/01/2024	[NT]
Antimony-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	91	[NT]
Beryllium-Dissolved	µg/L	0.5	Metals-022	<0.5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Cobalt-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Manganese-Dissolved	µg/L	5	Metals-022	<5	[NT]	[NT]	[NT]	[NT]	108	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
Selenium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Vanadium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Tin-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Metals in water - mass units - The PQL for Hg has been raised due to the sample matrix requiring dilution.

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Odour Concentration Measurement Report

Sampling and Laboratory Information

Organisation	Ektimo	Telephone	+61 417 386 242
Contact	G. Edwards	Email	graham.edwards@ektimo.com.au
Sampling Site	Not disclosed	Sampling Personnel	Ektimo
Sampling Method	Not disclosed	Laboratory Location	Mascot NSW

Order and Project Information

Order requested by	G. Edwards	Order accepted by	A. Schulz
Date of order	07/12/2023	TOU Project #	N2017
Order number	W012911	Project Manager	A. Schulz
Signed by	G. Edwards	Panel Operator	A. Schulz

Investigated Item	Odour concentration in odour units 'ou', determined by sensory odour concentration measurements, of an odour sample supplied in a sampling bag.
Identification	The odour sample bags were labelled individually. Each label recorded the testing laboratory, sample number, sampling location (or Identification), sampling date and time, dilution ratio (if dilution was used) and whether further chemical analysis was required.
Method	The odour concentration measurements were performed using dynamic olfactometry according to the Australian/New Zealand Standard: Stationary source emissions – *Part 3*: '*Determination of odour concentration by dynamic olfactometry* (AS/NZS 4323.3). The odour perception characteristics of the panel within the presentation series for the samples were analogous to that for butanol calibration. Any deviation from the Australian standard is recorded in the 'Comments' section of this report.
Measuring Range	The measuring range of the olfactometer is $2^2 \leq \chi \leq 2^{18}$ ou. If the measuring range was insufficient the odour samples will have been pre-diluted. The machine is not calibrated beyond dilution setting 2^{17}. This is specifically mentioned with the results.
Environment	The measurements were performed in an air- and odour-conditioned room. The room temperature is maintained at 22 °C ±3 °C.
Measuring Dates	The date of each measurement is specified with the results.
Instrument Used	The olfactometer used during this testing session was: TOU-OLF-VO4
Laboratory Precision	The precision of this laboratory (expressed as repeatability) for sensory quality must be $r \leq 0.477$ in accordance with the AS/NZS 4323.3. $r = 0.461$ Compliance – Yes
Laboratory Accuracy	The accuracy of this laboratory for sensory quality must be $A \leq 0.217$ in accordance with the AS/NZS 4323.3. $A = 0.216$ Compliance – Yes
Lower Detection Limit (LDL)	The LDL for the olfactometer has been determined to be 16 ou, which is 4 times the lowest dilution setting.
Traceability	The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. The assessors are individually selected to comply with fixed criteria and are monitored in time to keep within the limits of the standard. The results from the assessors are traceable to primary standards of n-butanol in nitrogen. Note Disclaimers on last page of this document.

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced, except in full.

Date: Thursday, 21 December 2023

Panel Roster Number: SYD20231207_087

A. Schulz
Authorised Signatory

THE ODOUR UNIT

Accreditation Number: 14974

Odour Sample Measurement Results
Panel Roster Number: SYD20231207_087

Sample ID / Location	Laboratory ID	Sampling Date & Time	Analysis Date & Time	Panel Size	Valid ITEs	Final Odour Concentration (ou)
Barrel #59 Baghouse (1 of 2)	SC23632	6/12/2023 1440 – 1455 hrs	7/12/2023 1046 hrs	5	10	274
Barrel #44 Baghouse (2 of 2)	SC23633	6/12/2023 1500 – 1515 hrs	7/12/2023 1122 hrs	5	10	97

Samples Received in Laboratory – From: Ektimo Date: 07/12/2023 Time: 0830 hrs

Note: The following are not covered by the NATA Accreditation issued to The Odour Unit:

1. The collection of samples by a method that is not prescribed by AS/NZS 4323.3.
2. Final results that have been modified by the dilution factors where parties other than The Odour Unit have performed the dilution of samples.

THE ODOUR UNIT

Accreditation Number: 14974

Odour Panel Calibration Results

Reference Odorant	Reference Odorant Panel Roster Number	Concentration of Reference gas (ppb)	Panel Target Range for n-butanol (ppb)	Measured Concentration (ou)	Measured Panel Threshold (ppb)	Does this panel calibration measurement comply with AS/NZS 4323.3 (Yes / No)
n-butanol	SYD20231207_087	44,800	$20 \leq \chi \leq 80$	832	54	Yes

Comments Odour characters (non-NATA accredited) as determined by odour laboratory panel:

SC23629 – musty, water
SC23630 – musty, water

Departures Clause 9.5.3 (d) – Cross-sectional distribution of airflow and concentration from port-openings are not checked due to impracticality of the requirement .

Disclaimers
1. Parties, other than The Odour Unit, responsible for collecting odour samples have advised that they have voluntarily furnished these odour samples, appropriately collected and labelled, to The Odour Unit for the purpose of odour testing.
2. The collection of odour samples by parties other than The Odour Unit relinquishes The Odour Unit from all responsibility for the sample collection and any effects or actions that the results from the test(s) may have.
3. Any comments included in, or attachments to, this Report are not covered by the NATA Accreditation issued to The Odour Unit.
4. This report shall not be reproduced, except in full, without written approval of The Odour Unit.

Report Status

Status	Version	Prepared by	Date	Checked by	Date	Change	Reason
Draft	0.1	AS	21/12/2023	MA	21/12/2023	--	--
Final	1.0	AS	21/12/2023	MA	21/12/2023	--	--
Revised	1.1	--	--	--	--	--	--

END OF DOCUMENT

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