

01 April 2026

To	John Studdert	Contact No.	john.studdert@manildra.com.au
Copy to	Gavin Dostal	Email	evan.smith@ghd.com
From	Simon Chen; Evan Smith	Project No.	12673476
Project Name	Boiler 6 verification report to address Development Consent 06_0228 Condition 9CA		
Subject	Boiler 6 verification report		

Dear John

1. Introduction

GHD was engaged by Shoalhaven Starches Pty Ltd (Manildra) to generate a verification report in relation to the proposed modification to the approved Shoalhaven Starches Expansion Project (SSEP) (Modification 23) (MOD23). The results of the MOD23 assessment are summarised in Manildra Group Air Quality Assessment Mod 23 (GHD, 2022).

Subsequent to the approval of the modification, the Department of Planning, Housing and Infrastructure (DPHI) and the Environmental Protection Agency (EPA) require the following in the Shoalhaven Starches Development Consent 06_228 from Shoalhaven Starches (NSW EPA, 2025):

9CA. Within six months of commissioning the fuel change to the boilers, as described in MOD 23, the Applicant shall submit a written report to the Planning Secretary and the EPA detailing the results of post-commissioning monitoring. The report shall:

- a) compare the results of monitoring undertaken in accordance with the EPL, with:*
 - i. the emission limits in the EPL;*
 - ii. the prescribed limits in the Protection of the Environment Operations (Clean Air Regulation) 2021¹;*
 - iii. the emission rates in the Air Quality Assessment dated 19 January 2022, prepared by GHD;*

2. Scope

The report has been prepared by GHD to outline results of the emission verification sampling undertaken to satisfy requirements outlined above for the conversion of Boiler 6 (also known as EPA identification no. 35) to operate on gas fuel. This report should be read in conjunction with the MOD 23 air quality assessment.

3. Limitations

This report: has been prepared by GHD for Shoalhaven Starches Pty Ltd and may only be used and relied on by Shoalhaven Starches Pty Ltd for the purpose agreed between GHD and Shoalhaven Starches Pty Ltd as set out in this report.

GHD otherwise disclaims responsibility to any person other than Shoalhaven Starches Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

¹ It is noted that the 2021 Clean Air Regulation was replaced by the 2022 Regulation and the 2022 version has been used for this verification report.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

GHD has prepared this report on the basis of information provided by Shoalhaven Starches Pty Ltd and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

4. Condition 9CA

As part of MOD23, Manildra sought approval to transition Boiler 6 fuel source from a mixture of coal and woodchip to biogas and natural gas. Verification of the performance of Boiler 6 includes stack emissions sampling to verify whether operation of Boiler 6 complies with the site EPL No. 883, Protection of the Environment Operations (Clean Air) Regulation (POEO) requirements and comparison of Boiler 6 emissions against those assumed in the MOD23 air quality assessment.

Emission sampling of Boiler 6 was undertaken over one event by Ektimo on 17 December 2025. Results of the sampling are discussed below, and the Ektimo sampling reports are provided in Appendix A. The sampling plane used for sampling of Boiler 6 was deemed to be conforming to AS 4323.1 *Stationary source emissions: Method 1, Selection of sampling positions and measurement of velocity in stacks*, but was not ideal.

It is noted that EPA ID no. 35 refers to the combined stack for Boiler 5 and Boiler 6. Boiler 5 is currently not operational, therefore sampling of Boiler 6 is representative of sampling from EPA ID no. 35.

4.1 Comparison of results against EPL data (i)

Manildra's EPL 883 imposes emission concentration limits on Point 35, which is described as the combined boiler stack for Boiler 5 and Boiler 6. Emission sampling of Boiler 6 was conducted at Point 35 by Ektimo on 17 December 2025, with Boiler 6 operating in isolation during the sampling period as Boiler 5 is currently not operational.

The EPL 883 concentration limits for Point 35 are provided in Table 1 for reference.

Table 1 Comparison against EPL 883 (Point 35)

Pollutants (at 7% O ₂)	Boiler 6 sampling data (SV ²)	EPL limits for Point 35 (Boiler 5 and Boiler 6)	Averaging period	SV/EPL limits
Total Solid Particles (TSP), mg/m ³	3.8	30	1 hour	12.7%
Sulphur dioxide, mg/m ³	<7	600	1 hour block	<1.2%
Nitrogen dioxide, mg/m ³	<2	500	1 hour block	<0.4%

² SV refers to Sampling Value

Pollutants (at 7% O ₂)	Boiler 6 sampling data (SV ²)	EPL limits for Point 35 (Boiler 5 and Boiler 6)	Averaging period	SV/EPL limits
VOCs (as n-propane), mg/m ³	0.084	40	1 hour rolling	0.21%
Cadmium (Cd), mg/m ³	<0.00005	0.2	1 hour	<0.025%
Mercury (Hg), mg/m ³	0.00016	0.2	1 hour	0.08%
Type 1 & Type 2 in aggregate, mg/m ³	≤0.022	1	1 hour	≤2.2%

4.2 Comparison of results against POEO limits (ii)

Comparison of sampling data against POEO limits for General activities and plant is summarised in Table 2. Measured Boiler 6 concentrations complied with POEO limits for all pollutants with a significant margin of compliance.

Table 2 Comparison of sampling data for Boiler 6 (EPA 35) against POEO Emission Limits

Pollutants (at 7% O ₂)	Boiler 6 sampling data (SV)	POEO Limit (PV ³)	SV/PV (%)
Total Solid Particles (TSP), mg/m ³	3.8	50	7.6%
PM ₁₀ , mg/m ³	<6	NA	-
PM _{2.5} , mg/m ³	<3	NA	-
Sulphur dioxide (SO ₂), mg/m ³	<7	NA	-
Nitrogen dioxide, mg/m ³	<2	NA	-
Nitrogen oxides (as NO ₂), mg/m ³	51	350	14.6%
Carbon monoxide (CO), mg/m ³	<3	125 ⁴	<2.4%
VOCs, mg/m ³	0.084	40	0.21%
PAHs ⁵ , mg/m ³	0.021	NA	-
Antimony (Sb) Type I, mg/m ³	<0.0007	NA	-
Arsenic (As) Type I, mg/m ³	0.0026	NA	-
Beryllium (Be) Type II, mg/m ³	<0.00007	NA	-
Cadmium (Cd) Type I, mg/m ³	<0.00005	0.2	<0.025%
Chromium (Cr) Type II, mg/m ³	0.0026	NA	-
Cobalt (Co) Type II, mg/m ³	<0.00005	NA	-
Lead (Pb) Type I, mg/m ³	0.0026	NA	-
Manganese (Mn) Type II, mg/m ³	0.0021	NA	-
Mercury (Hg) Type I, mg/m ³	0.00016	0.2	0.08%
Nickel (Ni) Type II, mg/m ³	0.0087	NA	-
Selenium (Se) Type II, mg/m ³	0.0012	NA	-
Tin (Sn) Type II, mg/m ³	<0.0007	NA	-
Vanadium (V) Type II, mg/m ³	0.00018	NA	-
Total Type I and Type II, mg/m ³	≤0.022	1	≤2.2%

³ PV refers to POEO limits Values

⁴ CO 125 mg/m³ is an alternative standard to VOC 40 mg/m³ under POEO 2022 (requirement is met if either is satisfied)

⁵ PAH 0.021 mg/m³ is dominated by naphthalene (~0.020 mg/m³). No POEO limit applies.

4.3 Comparison of results against Air Quality Assessment Prediction (iii)

In the MOD23 air quality assessment, Boilers 5 and 6 were modelled as a combined emission source (model ID: BOILR5, EPA ID: 35) sharing a single combined stack. Emission rates were not estimated for Boiler 6 individually. Accordingly, a direct comparison of Boiler 6 sampling data against the individual MOD23 predicted emission rates for Boiler 6 alone could not be undertaken. However, comparison against the overall predicted emission rates for the combined stack has been undertaken and summarised in Table 3.

It is noted that the measured Boiler 6 mass emission rates for TSP, NO_x, arsenic, beryllium, chromium, manganese, nickel, lead, selenium and PAH were higher than the corresponding BOILR5 typical operations emission rates estimated in MOD23.

Table 3 Comparison of Boiler 6 sampling data against MOD23 Air Quality Assessment emission rate (Boiler 5/6 combined source)

Pollutants (at 7% O ₂)	Boiler 6 sampling mass rate (g/s) ⁶ (at 7% O ₂) (SV)	MOD23 BOILR5 typical operations emission rate (g/s) ⁷	SV/BOILR5 typical operations emission rate
TSP	0.050	0.00097	5154.6%
PM ₁₀	<0.083	0.00097	<9587.6%
PM _{2.5}	<0.033	0.00097	<3402.1%
CO	<0.033	1.1	<3.0%
SO ₂	<0.083	0.014	<592.9%
NO _x (as NO ₂)	0.733	0.65	112.8%
VOC	0.0011	0.22	0.5%
Arsenic (As), Type I	3.3×10 ⁻⁵	2.6×10 ⁻⁶	1269.2%
Cadmium (Cd), Type I	<6.7×10 ⁻⁷	1.4×10 ⁻⁵	<4.8%
Lead (Pb), Type I	3.3×10 ⁻⁵	6.5×10 ⁻⁶	507.7%
Mercury (Hg), Type I	2.0×10 ⁻⁶	3.4×10 ⁻⁶	58.8%
Beryllium (Be), Type II	<8.3×10 ⁻⁷	1.6×10 ⁻⁸	<5187.5%
Chromium (Cr), Type II	3.3×10 ⁻⁵	1.8×10 ⁻⁵	183.3%
Cobalt (Co), Type II	<6.7×10 ⁻⁷	1.1×10 ⁻⁶	<60.9%
Manganese (Mn), Type II	2.7×10 ⁻⁵	5.0×10 ⁻⁶	540.0%
Nickel (Ni), Type II	1.1×10 ⁻⁴	2.7×10 ⁻⁵	407.4%
Selenium (Se), Type II	1.6×10 ⁻⁵	3.1×10 ⁻⁷	5161.3%
PAH	2.8×10 ⁻⁴	8.3×10 ⁻⁶	3373.5%

⁶ Boiler 6 mass rates converted from g/min to g/s. Boiler 6 was operating at 85% firing rate (50 T/hr steam) and co-firing biogas during sampling.

⁷ BOILR5 represents the combined Boiler 5/6 source (EPA ID: 35) under typical operations as modelled in the MOD23 AQIA.

4.3.1 Updated dispersion modelling

As some measured pollutants have higher concentrations than assumed in the MOD23 assessment, additional dispersion modelling and assessment was undertaken to confirm predicted ground level concentrations comply with the criteria.

Updated modelling results using the measured Boiler 6 emission rates in place of the MOD23 BOILR5 emission rates and results are presented in Appendix B. The revised modelling results demonstrate that predicted concentrations for all pollutants remain below the relevant assessment criteria at all sensitive receptors, and therefore operation of Boiler 6 is not predicted to result in any exceedance of air quality standards.

5. Conclusion

A post-commissioning verification report for Boiler 6 operating on natural gas and biogas has been prepared by GHD. The verification report provided a comparison of Boiler 6 sampling data against the requirements of approval consents.

The operation of Boiler 6 was found to comply with POEO emission concentration limits for all pollutants. The sampled Boiler 6 concentrations were also well below the EPL 883 concentration limits for Point 35 for all pollutants.

A comparison of Boiler 6 sampling data against the BOILR5 combined predicted emission rates from the MOD23 assessment was also undertaken. Where measured emission rates exceeded the MOD23 predicted rates (TSP, NO_x, arsenic, beryllium, chromium, manganese, nickel, lead, selenium and PAH), an updated air quality assessment with dispersion modelling was undertaken using the measured Boiler 6 emission rates (Appendix B). The updated assessment confirmed that predicted ground-level concentrations remain below the relevant assessment criteria at all sensitive receptors.

Therefore, operation of Boiler 6 is considered to comply with Development Consent Condition 9CA.

6. References

GHD. (2022). *Shoalhaven Starches Modification 23 Air Quality Impact Assessment*.
NSW EPA. (2025). *Environmental Protection Licence No.883*.

Appendix A

**Emission Testing Report: EPA ID 35 –
Boiler 6 (17 December 2025)**



Experts in air quality, odour and emission monitoring.

Emission Testing Report

EPA ID 35 - Boiler 6

Report: R019674-1 r

Manildra Group, Shoalhaven Starches Pty Ltd, Bomaderry



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.

Document Information

Client Name: Manildra Group
Report Number: R019674-1r
Date of Issue: 16 February 2026
Attention: Gavin Dostal
Address: 160 Bolong Rd
Bomaderry NSW 2541
Testing Laboratory: Ektimo Pty Ltd, ABN 86 600 381 413

Original Document Number	Initiator	Original Report Date	Sections	Reason for reissue
R019674	Client	11 February 2026	1 Executive Summary 2 Results 3 Sample Plane Compliance 4 Plant Operating Conditions Appendix A: Site Images	Removed mentions of Boiler 5. Adjustment to license table to include POEO limits. Added SCADA images of gas flows.

Report Authorisation



Zoe Parker
Senior Air Monitoring
Consultant



NATA Accredited Laboratory
No. 14601

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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.

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1 Executive Summary

1.1 Background

Ektimo was engaged by Manildra Group to perform emission testing at their Bomaderry plant.

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 Protection of the Environment Operations (Clean Air) Regulation 2022 (POEO).

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA ID 35 - Boiler 6	17 December 2025	Total solid particles, fine particulate matter <10µm (PM ₁₀), fine particulate matter <2.5µm (PM _{2.5}) Nitrogen oxides (as NO ₂), oxygen (O ₂), carbon dioxide (CO ₂), carbon monoxide (CO), sulfur dioxide (SO ₂) Volatile organic compounds (VOCs) Type 1 & 2 substances in aggregate (Sb, As, Cd, Pb, Hg, Be, Cr, Co, Mn, Ni, Se, Sn, V) Polycyclic aromatic hydrocarbons (PAHs)

* 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.

1.3 Results Summary

The following results summary table includes licence limits corresponding to Schedule 2 - Standards of Concentrations for Scheduled Premises - General Activities and Plant, Group 6 and Schedule 3 - Test methods, averaging periods and reference conditions - Reference Conditions for Scheduled Premises, Group 5 or 6 in the *Protection of the Environment Operations (Clean Air) Regulation, 2022*.

EPA No.	Pollutant	Units	Licence Limit	Detected values	Detected values (corrected to 7% O ₂)
EPA ID 35 - Boiler 6	Total solid particles	mg/m ³ at STP dry	50	3.2	3.8
	Sulfur dioxide	mg/m ³ at STP dry	NA	<6	<7
	Nitrogen dioxide	mg/m ³ at STP dry	NA	<2	<2
	Nitrogen oxides (as NO ₂)	mg/m ³ at STP dry	350	45	51
	Oxygen	%	NA	8.6	-
	Volatile organic compounds (as n-propane equivalent)	mg/m ³ at STP dry	40	0.071	0.084
	Cadmium	mg/m ³ at STP dry	0.2	<0.00004	<0.00005
	Mercury	mg/m ³ at STP dry	0.2	0.00013	0.00016
	Type 1 & 2 substances in aggregate	mg/m ³ at STP dry	1	≤0.018	≤0.022

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 ID 35 - Boiler 6

Date	17/12/2025	Client	Manildra Group
Report	R019674	Stack ID	EPA ID 35 - Boiler 6
Licence No.	883	Location	Bomaderry
Ektimo Staff	Aaron Davis, Sahad Musthafa, Drew Davidson	State	NSW
Process Conditions	Please refer to client records.		

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Stack Parameters			
Moisture content, %v/v	14		
Gas molecular weight, g/g mole	28.1 (wet)	29.8 (dry)	
Gas density at STP, kg/m ³	1.25 (wet)	1.33 (dry)	
Gas density at discharge conditions, kg/m ³	0.87		
% Oxygen correction & Factor	7 %	1.18	
Gas Flow Parameters			
Flow measurement time(s) (hhmm)	1240 & 1430		
Temperature, °C	121		
Temperature, K	394		
Ambient pressure, kPa	102		
Stack pressure, kPa	102		
Velocity at sampling plane, m/s	8.3		
Volumetric flow rate, actual, m ³ /s	26		
Volumetric flow rate (wet STP), m ³ /s	18		
Volumetric flow rate (dry STP), m ³ /s	15		
Mass flow rate (wet basis), kg/h	81000		

Gas Analyser Results		Average	Minimum	Maximum
	Sampling time	1244 - 1423	1244 - 1423	1244 - 1423
		Concentration	Concentration	Concentration
		%v/v	%v/v	%v/v
Carbon dioxide		8	7.7	8.4
Oxygen		9.1	8.5	9.7

Isokinetic Results		Results		
	Sampling time	1243-1424	1243-1424 (PM10&2.5)	
		Corrected to		
		Concentration	7% O ₂	Mass Rate
		mg/m ³	mg/m ³	g/min
Solid Particles		3.2	3.8	3
Fine particulates (PM10)		<5	<6	<5
Fine particulates (PM2.5)		<2	<3	<2
Antimony		<0.0006	<0.0007	<0.0005
Arsenic		0.0022	0.0026	0.002
Beryllium		<0.00006	<0.00007	<0.00005
Cadmium		<0.00004	<0.00005	<0.00004
Chromium		0.0022	0.0026	0.002
Cobalt		<0.00004	<0.00005	<0.00004
Lead		0.0022	0.0026	0.002
Manganese		0.0018	0.0021	0.0016
Mercury		0.00013	0.00016	0.00012
Nickel		0.0074	0.0087	0.0068
Selenium		0.001	0.0012	0.00096
Tin		<0.0006	<0.0007	<0.0005
Vanadium		0.00015	0.00018	0.00014
Type 1 & 2 Substances				
Upper Bound				
Total Type 1 Substances		≤0.0052	≤0.0061	≤0.0048
Total Type 2 Substances		≤0.013	≤0.016	≤0.012
Total Type 1 & 2 Substances		≤0.018	≤0.022	≤0.017
Isokinetic Sampling Parameters				
Sampling time, min		Isokinetic		PM 10&2.5
Isokinetic rate, %		100		99
Gravimetric analysis date (total particulate)		110		91
Gravimetric analysis date (PM ₁₀ /PM _{2.5})			22-12-2025	
			22-12-2025	

Date	17/12/2025	Client	Manildra Group
Report	R019674	Stack ID	EPA ID 35 - Boiler 6
Licence No.	883	Location	Bomaderry
Ektimo Staff	Aaron Davis, Sahad Musthafa, Drew Davidson	State	NSW
Process Conditions	Please refer to client records.		

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Total VOCs (as n-Propane)	Results		
	Corrected to		
	Concentration mg/m ³	7% O ₂ mg/m ³	Mass Rate g/min
Total	0.071	0.084	0.065

VOC (speciated)	Sampling time	Results		
		1251-1351		
		Concentration mg/m ³	7% O ₂ mg/m ³	Mass Rate g/min
Detection limit ⁽¹⁾		<0.09	<0.1	<0.08
Toluene		0.15	0.17	0.14

(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, Benzene, Carbon tetrachloride, Butanol, Isopropyl acetate, 2-Methylhexane, 2,3-Dimethylpentane, 1-Methoxy-2-propanol, 3-Methylhexane, Heptane, Trichloroethylene, Ethyl acrylate, Methyl methacrylate, Propyl acetate, Methylcyclohexane, Methyl isobutyl ketone, 1,1,2-Trichloroethane, 2-Hexanone, Octane, Tetrachloroethene, Butyl acetate, Chlorobenzene, Ethylbenzene, m + p-Xylene, 1-Methoxy-2-propyl acetate, Styrene, o-Xylene, Butyl acrylate, Nonane, 2-Butoxyethanol, Cellosolve acetate, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, alpha-Pinene, Propylbenzene, 1,3,5-Trimethylbenzene, beta-Pinene, tert-Butylbenzene, 1,2,4-Trimethylbenzene, Decane, 3-Carene, 1,2,3-Trimethylbenzene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane, Residuals as Toluene

Date	17/12/2025	Client	Manildra Group
Report	R019674	Stack ID	EPA ID 35 - Boiler 6
Licence No.	883	Location	Bomaderry
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Process Conditions	Please refer to client records.		

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Stack Parameters			
Moisture content, %v/v	12		
Gas molecular weight, g/g mole	28.3 (wet)	29.7 (dry)	
Gas density at STP, kg/m ³	1.26 (wet)	1.33 (dry)	
Gas density at discharge conditions, kg/m ³	0.87		
% Oxygen correction & Factor	7 %	1.13	
Gas Flow Parameters			
Flow measurement time(s) (hhmm)	1430 & 1645		
Temperature, °C	123		
Temperature, K	396		
Ambient pressure, kPa	102		
Stack pressure, kPa	102		
Velocity at sampling plane, m/s	8.3		
Volumetric flow rate, actual, m ³ /s	26		
Volumetric flow rate (wet STP), m ³ /s	18		
Volumetric flow rate (dry STP), m ³ /s	16		
Mass flow rate (wet basis), kg/h	81000		

Gas Analyser Results	Sampling time	Average 1502 - 1642			Minimum 1502 - 1642			Maximum 1502 - 1642		
		Corrected to			Corrected to			Corrected to		
		Concentration mg/m³	7% O2 mg/m³	Mass Rate g/min	Concentration mg/m³	7% O2 mg/m³	Mass Rate g/min	Concentration mg/m³	7% O2 mg/m³	Mass Rate g/min
		Combustion Gases								
		Nitrogen dioxide (as NO₂)	<2	<2	<2	<2	<2	<2	<2	<2
Nitrogen oxides (as NO₂)	45	51	42	39	44	36	47	53	44	
Sulfur dioxide	<6	<7	<5	<6	<7	<5	<6	<7	<5	
Carbon monoxide	<3	<3	<2	<3	<3	<2	<3	<3	<2	
		Concentration % v/v		Concentration % v/v		Concentration % v/v				
Carbon dioxide		7.8		7.6		8.2				
Oxygen		8.6		8.3		9				

Date	17/12/2025	Client	Manildra Group
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Licence No.	883	Location	Bomaderry
Ektimo Staff	Aaron Davis, Sahad Musthafa, Drew Davidson	State	NSW
Process Conditions	Please refer to client records.		

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Polycyclic Aromatic Hydrocarbons (PAHs)	Sampling time	Results		
		1500 - 1642		
		Corrected to		
		Concentration ng/m ³	7% O ₂ ng/m ³	Mass Rate ng/min
Naphthalene		17000	20000	16000000
2-Methylnaphthalene		610	690	570000
Acenaphthylene		<40	<50	<40000
Acenaphthene		<10	<20	<10000
Fluorene		<10	<20	<10000
Phenanthrene		180	200	170000
Anthracene		<10	<20	<10000
Fluoranthene		130	140	120000
Pyrene		51	57	47000
Benz(a)anthracene		38	43	35000
Chrysene		49	56	46000
Benzo(b)fluoranthene		<10	<20	<10000
Benzo(k)fluoranthene		<10	<20	<10000
Benzo(e)pyrene		<10	<20	<10000
Benzo(a)pyrene		<10	<20	<10000
Perylene		<10	<20	<10000
Indeno(1,2,3-cd)pyrene		<10	<20	<10000
Dibenz(ah)anthracene		<10	<20	<10000
Benzo(ghi)perylene		<10	<20	<10000
Total 16 PAHs		18000	20000	17000000
Total 19 PAHs		18000	21000	17000000
Total Specified Toxic PAHs - TEQs [†]				
Lower Bound		4.3	4.8	4000
Middle Bound		16	18	15000
Upper Bound		27	30	25000

Abbreviations and definitions

[†] BaP-TEQ: TEQs calculated using the CARB/OEHHA TEFs as specified in "Benzo(a)pyrene as a Toxic Air Contaminant" 1994.

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
PAHs	
Sampling time, min	100
Isokinetic rate, %	103

3 Sample Plane Compliance

3.1 EPA ID 35 - Boiler 6

Sampling Plane Details

Source tested	Boiler
Sampling plane dimensions	1985 mm
Sampling plane area	3.09 m ²
Sampling port size, number & depth	4" BSP (x4), 100 mm
Access & height of ports	Stairs & ladders 40 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit >6 D
Upstream disturbance	Junction 4 D
No. traverses & points sampled	2 20
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 highest to lowest gas velocity ratio exceeds 1.6:1

The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

4 Plant Operating Conditions

The below plant operating conditions have been supplied by Manildra Group personnel. See Manildra Group records for complete process conditions.

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

EPA No.	Date	Firing Rate (%)	Steam Output (T/hr)	Biogas (On/Off)	Odour (On/Off)
EPA ID 35 - Boiler 6	17 December 2025	85	50	On	On

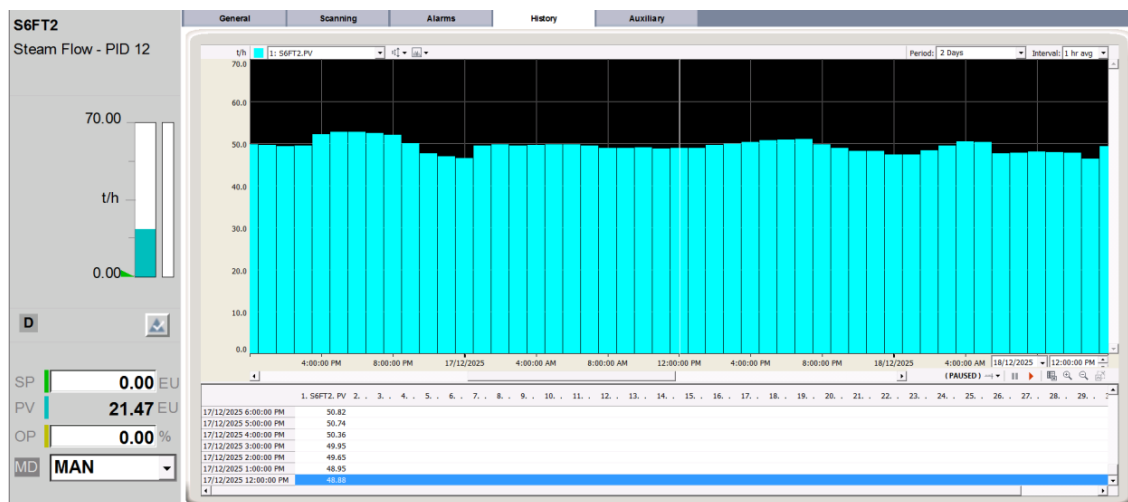


Figure 1: Plant Operating Conditions - EPA ID 35 - Boiler 6 Steam Flow (17/12/2025)

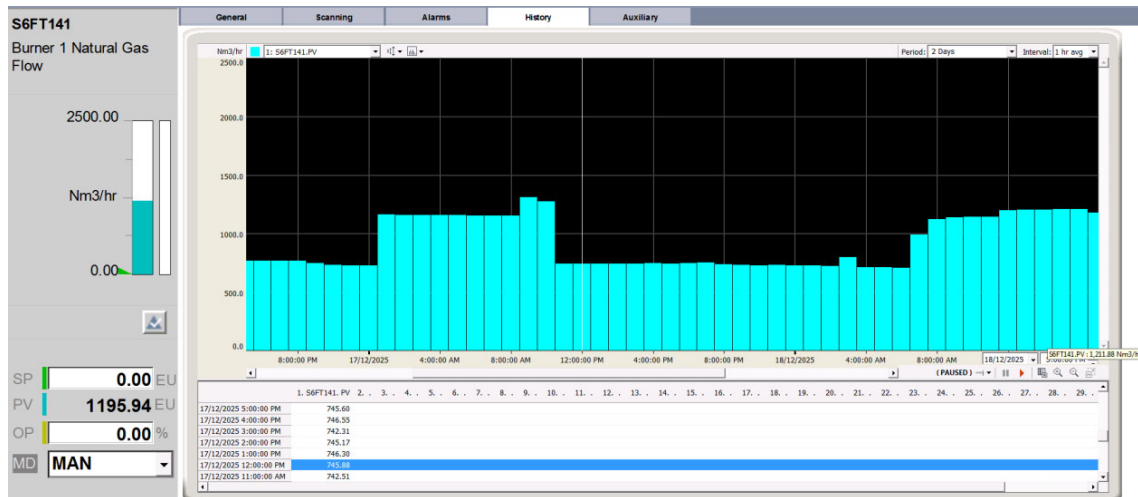


Figure 2: Plant Operating Conditions - EPA ID 35 - Boiler 6 Burner 1 Natural Gas Flow (17/12/2025)



Figure 3: Plant Operating Conditions - EPA ID 35 - Boiler 6 Burner 1 Biogas Flow (17/12/2025)

5 Test Methods

All sampling and analysis is 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%	✓	✓
Sulfur dioxide	NSW EPA TM-4 (USEPA Method 6C)	NSW EPA TM-4 (USEPA Method 6C)	12%	✓	✓
Speciated volatile organic compounds (VOCs)	NSW EPA TM-34 ^d (USEPA Method 18)	Ektimo 344	19%	✓	✓ [†]
Particulate matter (PM ₁₀ & PM _{2.5})	NSW EPA OM-5 (USEPA Method 201A)	NSW EPA OM-5 (USEPA Method 201A)	6%	✓	✓ ^{††}
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)	Ektimo 666	not specified	✓	✓ [†]
Type 1 substances (As, Cd, Hg, Pb, Sb)	NSW EPA TM-12 (USEPA Method 29)	Ektimo 666	not specified	✓	✓ [†]
Type 2 substances (Be, Cr, Co, Mn, Ni, Se, Sn, V)	NSW EPA TM-13 (USEPA Method 29)	Ektimo 666	not specified	✓	✓ [†]
Polycyclic aromatic hydrocarbons (PAHs)	NSW EPA OM-6	NMI in-house method NGCMS 11.27	21%	✓	✓ [†]

080126

* 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 6 February 2026 in report RN1488129.

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

- 16 January 2026 in report LV-008341.
- 20 January 2026 in report LV-008350.

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

^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:

- Toluene (3.4 µg)

NIOSH 1501 - Hydrocarbons, Aromatic

Toluene is specifically referred a compound to be sampled under this method, and the recommended adsorbent media for sampling is 'Solid Sorbent Tube, coconut shell charcoal'; Ektimo used the recommended sampling media (SKC brand 226-01). Since the adsorbent media is deemed appropriate by NIOSH 1501, Ektimo opted not to perform the recovery study for this compound.

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 basis (except moisture)
~	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
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 Images



Image 1. EPA ID 35 - Boiler 6

Appendix B: Chains of Custody

Ektimo

Checked at Ektimo Dispatch by: Phu 5-1-26 Sign/Date

Please send all results and queries to: laboratory@ektimo.com.au
 Samples received in good order: Phu 6/1 Sign/Date

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 23927	R019674	VOCA	var/sample	Ektimo		Zoe Parker	Blank Tube	
N 23928	R019674	VOCA	var/sample	Ektimo		Zoe Parker	Tube A	
N 23929	R019674	Metals in Filter (Ektimo) (St. Ar. Ba. Cd. Cr. Cu. Pb. Mn. Hg. Ni. Se. Sn. V)	var/sample	Ektimo		Zoe Parker	Blank Filter	
N 23930	R019674	Metals in Filter (Ektimo) (St. Ar. Ba. Cd. Cr. Cu. Pb. Mn. Hg. Ni. Se. Sn. V)	var/sample	Ektimo		Zoe Parker	Filter	
N 23931	R019674	Metals in Solution (Ektimo) (St. Ar. Ba. Cd. Cr. Cu. Pb. Mn. Hg. Ni. Se. Sn. V)	var/sample	Ektimo		Zoe Parker	Blank Imp 1-4	
N 23932	R019674	Metals in Solution (Ektimo) (St. Ar. Ba. Cd. Cr. Cu. Pb. Mn. Hg. Ni. Se. Sn. V)	var/sample	Ektimo		Zoe Parker	Imp 1-4	
N 23933	R019674	Metals in Solution (Ektimo) (St. Ar. Ba. Cd. Cr. Cu. Pb. Mn. Hg. Ni. Se. Sn. V)	var/sample	Ektimo		Zoe Parker	Blank Metal Rinse	
N 23934	R019674	Metals in Solution (Ektimo) (St. Ar. Ba. Cd. Cr. Cu. Pb. Mn. Hg. Ni. Se. Sn. V)	var/sample	Ektimo		Zoe Parker	Metal Rinse	
N 23935	R019674	Metals in Solution (Ektimo) (H4)	var/sample	Ektimo		Zoe Parker	Blank Imp 1-5	
N 23936	R019674	Metals in Solution (Ektimo) (H4)	var/sample	Ektimo		Zoe Parker	Imp 1-5	
N 23937	R019674	Metals in Solution (Ektimo) (H4)	var/sample	Ektimo		Zoe Parker	Blank HCl Rinse	
N 23938	R019674	Metals in Solution (Ektimo) (H4)	var/sample	Ektimo		Zoe Parker	HCl Rinse	
N 23939	R019674	VOCA	var/sample	Ektimo		Zoe Parker	Tube A	
N 23940	R019674	VOCA	var/sample	Ektimo		Zoe Parker	Tube A	

logged

Ektimo

Checked at Ektimo Dispatch by: Phu 5-1-26 Sign/Date

Please send all results and queries to: laboratory@ektimo.com.au
 Samples received in good order: EKT101/260106/1 24 3/2 Sign/Date

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Required (days)
N 23940	R019674	PAH	var/sample	NMI	W017802	Zoe Parker	Filter, resin & rinse (AUT251212A)	

N26/000081

Cartridge: AUT251212A
 6/1 SH

6 JAN 2026 12:24
 SH
 6 JAN 2026 12:24

Appendix C: Laboratory Results



1300 364 005
+61 2 4003 3296
info@ektimo.com.au
ektimo.com.au
ABN 86 600 381 413

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektime
26 Redland Drive
Mitcham, VIC 3132

Report Number: LV-008350
Job Number: R019674
Date of Issue: 20/01/2026

Attention: Manildra Group
Address: 160 Bolong Road
Bomaderry NSW 2541

Date samples received: 6/1/2026
Number of samples received: 4
Date samples analysed: 13/01/2026
No of samples analysed: 4
Test method(s) used: Ektime 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.

Ektime 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 Ektime at NATA's website www.nata.com.au. Ektime is accredited by NATA (National Association of Testing Authorities) 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 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 Ektime 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: 291025



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.

Analytical Results

Report No. LV-008350

Job No. R019674

Client Name: Manildra Group

Parameter	Units	N23927 R019674	N23928 R019674	N23939 R019674	N23941 R019674
	PQL	1	1	2	1
Ethanol	µg	<1	<1	<2	<1
Acetone	µg	<1	<1	<2	<1
Isopropanol	µg	<1	<1	<2	<1
Pentane	µg	<1	<1	<2	<1
1,1-Dichloroethene	µg	<1	<1	<2	<1
Acrylonitrile	µg	<1	<1	<2	<1
Dichloromethane	µg	<1	<1	<2	<1
trans-1,2-Dichloroethene	µg	<1	<1	<2	<1
Methyl ethyl ketone	µg	<1	<1	<2	<1
n-Hexane	µg	<1	<1	<2	<1
cis-1,2-Dichloroethene	µg	<1	<1	<2	<1
Ethyl acetate	µg	<1	<1	<2	<1
Chloroform	µg	<1	<1	<2	<1
1,1,1-Trichloroethane	µg	<1	<1	<2	<1
1,2-Dichloroethane	µg	<1	<1	<2	<1
Cyclohexane	µg	<1	<1	<2	<1
Benzene	µg	<1	<1	<2	<1
Carbon tetrachloride	µg	<1	<1	<2	<1
Butanol	µg	<1	<1	<2	<1
Isopropyl acetate	µg	<1	<1	<2	<1
2-Methylhexane	µg	<1	<1	<2	<1
2,3-Dimethylpentane	µg	<1	<1	<2	<1
1-Methoxy-2-propanol	µg	<1	<1	<2	<1
3-Methylhexane	µg	<1	<1	<2	<1
Heptane	µg	<1	<1	<2	<1
Trichloroethylene	µg	<1	<1	<2	<1
Ethyl acrylate	µg	<1	<1	<2	<1
Methyl methacrylate	µg	<1	<1	<2	<1
Propyl acetate	µg	<1	<1	<2	<1
Methylcyclohexane	µg	<1	<1	<2	<1
Methyl Isobutyl Ketone	µg	<1	<1	<2	<1
Toluene	µg	<1	<1	3.4	<1
1,1,2-Trichloroethane	µg	<1	<1	<2	<1
2-Hexanone	µg	<1	<1	<2	<1
Octane	µg	<1	<1	<2	<1
Tetrachloroethene	µg	<1	<1	<2	<1
Butyl acetate	µg	<1	<1	<2	<1
Chlorobenzene	µg	<1	<1	<2	<1
Ethylbenzene	µg	<1	<1	<2	<1
m + p-Xylene	µg	<1	<1	<2	<1
1-Methoxy-2-propyl acetate	µg	<1	<1	<2	<1
Styrene	µg	<1	<1	<2	<1
o-Xylene	µg	<1	<1	<2	<1
Butyl acrylate	µg	<1	<1	<2	<1
Nonane	µg	<1	<1	<2	<1

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



NATA Accredited Laboratory 14601

Results page 2 of 3

Analytical Results

Report No. LV-008350

Job No. R019674

Client Name: Manildra Group

Parameter	Units	N23927 R019674	N23928 R019674	N23939 R019674	N23941 R019674
	PQL	1	1	2	1
2-Butoxyethanol	µg	<1	<1	<2	<1
Cellosolve acetate	µg	<1	<1	<2	<1
1,1,2,2-Tetrachloroethane	µg	<1	<1	<2	<1
Isopropylbenzene	µg	<1	<1	<2	<1
alpha-Pinene	µg	<1	<1	<2	<1
Propylbenzene	µg	<1	<1	<2	<1
1,3,5-Trimethylbenzene	µg	<1	<1	<2	<1
beta-Pinene	µg	<1	<1	<2	<1
tert-Butylbenzene	µg	<1	<1	<2	<1
1,2,4-Trimethylbenzene	µg	<1	<1	<2	<1
Decane	µg	<1	<1	<2	<1
3-Carene	µg	<1	<1	<2	<1
1,2,3-Trimethylbenzene	µg	<1	<1	<2	<1
D-Limonene	µg	<1	<1	<2	<1
Undecane	µg	<1	<1	<2	<1
Dodecane	µg	<1	<1	<2	<1
Tridecane	µg	<1	<1	<2	<1
Tetradecane	µg	<1	<1	<2	<1
Residuals as Toluene	µg	<1	5.5	<2	7

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



NATA Accredited Laboratory 14601

Results page 3 of 3

CERTIFICATE OF ANALYSIS

Testing Laboratory: Ektimo
26 Redland Drive
Mitcham, VIC 3132

Report Number: LV-008341
Job Number: R019674
Date of Issue: 16/01/2026

Attention: Manildra Group
Address: 160 Bolong Road
Bomaderry NSW 2541

Date samples received: 06/01/2026
Number of samples received: 10
Date samples analysed: 15/01/2026
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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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: 291025


Cappi Tuffery
Laboratory Chemist


Daniel Balaam
Senior Laboratory Chemist



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.

Analytical Results

Report No. LV-008341

Job No. R019674

Client Name: Manildra Group

Parameter	PQL	Units	N 23929 R019674	N 23930 R019674	N 23931 R019674	N 23932 R019674
Volume	1	mL			185	380
Antimony	1	µg/L			<1	<1
Arsenic	1	µg/L			<1	<1
Beryllium	0.1	µg/L			<0.1	<0.1
Cadmium	0.1	µg/L			<0.1	0.12
Chromium	1	µg/L			1.7	6.3
Cobalt	0.1	µg/L			<0.1	<0.1
Lead	1	µg/L			<1	8.5
Manganese	1	µg/L			<1	5.9
Mercury	0.1	µg/L			0.69	0.56
Nickel	1	µg/L			<1	23
Selenium	0.1	µg/L			<0.1	2.5
Tin	1	µg/L			<1	<1
Vanadium	0.1	µg/L			<0.1	0.41
Antimony (Total)	0.031	µg	<0.31	<0.31		
Arsenic (Total)	0.031	µg	<0.31	3.5		
Beryllium (Total)	0.0031	µg	<0.031	<0.031		
Cadmium (Total)	0.0031	µg	0.097	0.086		
Chromium (Total)	0.031	µg	1.7	3.1		
Cobalt (Total)	0.0031	µg	0.85	0.85		
Lead (Total)	0.031	µg	2.6	2.1		
Manganese (Total)	0.031	µg	<0.31	0.55		
Mercury (Total)	0.0031	µg	0.041	<0.031		
Nickel (Total)	0.031	µg	0.58	1.6		
Selenium (Total)	0.0031	µg	<0.031	0.69		
Tin (Total)	0.031	µg	<0.31	<0.31		
Vanadium (Total)	0.0031	µg	<0.031	0.083		

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



NATA Accredited Laboratory 14601

Results page 2 of 4

Analytical Results

Report No. LV-008341

Job No. R019674

Client Name: Manildra Group

Parameter	PQL	Units	N 23933 R019674	N 23934 R019674	N 23935 R019674	N 23936 R019674
Volume	1	mL	190	190	164	365
Antimony	1	µg/L	<1	<1		
Arsenic	1	µg/L	<1	<1		
Beryllium	0.1	µg/L	<0.1	<0.1		
Cadmium	0.1	µg/L	<0.1	<0.1		
Chromium	1	µg/L	<1	<1		
Cobalt	0.1	µg/L	<0.1	<0.1		
Lead	1	µg/L	<1	1.4		
Manganese	1	µg/L	<1	<1		
Mercury	0.1	µg/L	0.51	0.48	0.72	0.66
Nickel	1	µg/L	<1	9.9		
Selenium	0.1	µg/L	<0.1	<0.1		
Tin	1	µg/L	<1	<1		
Vanadium	0.1	µg/L	<0.1	<0.1		
Antimony (Total)	0.031	µg				
Arsenic (Total)	0.031	µg				
Beryllium (Total)	0.0031	µg				
Cadmium (Total)	0.0031	µg				
Chromium (Total)	0.031	µg				
Cobalt (Total)	0.0031	µg				
Lead (Total)	0.031	µg				
Manganese (Total)	0.031	µg				
Mercury (Total)	0.0031	µg				
Nickel (Total)	0.031	µg				
Selenium (Total)	0.0031	µg				
Tin (Total)	0.031	µg				
Vanadium (Total)	0.0031	µg				

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



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Analytical Results

Report No. LV-008341

Job No. R019674

Client Name: Manildra Group

Parameter	PQL	Units	N 23937 R019674	N 23938 R019674
Volume	1	mL	232	198
Antimony	1	µg/L		
Arsenic	1	µg/L		
Beryllium	0.1	µg/L		
Cadmium	0.1	µg/L		
Chromium	1	µg/L		
Cobalt	0.1	µg/L		
Lead	1	µg/L		
Manganese	1	µg/L		
Mercury	0.1	µg/L	0.87	0.75
Nickel	1	µg/L		
Selenium	0.1	µg/L		
Tin	1	µg/L		
Vanadium	0.1	µg/L		
Antimony (Total)	0.031	µg		
Arsenic (Total)	0.031	µg		
Beryllium (Total)	0.0031	µg		
Cadmium (Total)	0.0031	µg		
Chromium (Total)	0.031	µg		
Cobalt (Total)	0.0031	µg		
Lead (Total)	0.031	µg		
Manganese (Total)	0.031	µg		
Mercury (Total)	0.0031	µg		
Nickel (Total)	0.031	µg		
Selenium (Total)	0.0031	µg		
Tin (Total)	0.031	µg		
Vanadium (Total)	0.0031	µg		

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



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Report No. RN1488129

Client	: EKTIMO PTY LTD 52 COOPER ROAD COCKBURN CENTRAL WA 6164	Job No.	: EKTIO1/260106/1
		Quote No.	: QT-02288
		Order No.	: W017802
		Date Sampled	:
Attention	:	Date Received	: 06-JAN-2026
Project Name	:	Sampled By	: CLIENT
For Follow up enquiries	: ASB@measurement.gov.au	Phone	: 1300 722 845

Lab Reg No.	Sample Ref	Sample Description
N26/000081	N 23940	FILTER RESIN RINSE AUT251212A JOB NO. R019674

Lab Reg No.	Sample Reference	Units	N26/000081 N 23940	Method
PAH				
	Naphthalene (91-20-3)	ng	26000	NGCMS_1127
	2-Methylnaphthalene (91-57-6)	ng	910	NGCMS_1127
	Acenaphthylene (208-96-8)	ng	< 60	NGCMS_1127
	Acenaphthene (83-32-9)	ng	< 20	NGCMS_1127
	Fluorene (86-73-7)	ng	< 20	NGCMS_1127
	Phenanthrene (85-01-8)	ng	270	NGCMS_1127
	Anthracene (120-12-7)	ng	< 20	NGCMS_1127
	Fluoranthene (206-44-0)	ng	190	NGCMS_1127
	Pyrene (129-00-0)	ng	76	NGCMS_1127
	Benz(a)anthracene (56-55-3)	ng	57	NGCMS_1127
	Chrysene (218-01-9)	ng	74	NGCMS_1127
	Benzo(b)fluoranthene (205-99-2)	ng	< 20	NGCMS_1127
	Benzo(k)fluoranthene (207-08-9)	ng	< 20	NGCMS_1127
	Benzo(e)pyrene (192-97-2)	ng	< 20	NGCMS_1127
	Benzo(a)pyrene (50-32-8)	ng	< 20	NGCMS_1127
	Perylene (198-55-0)	ng	< 20	NGCMS_1127
	Indeno(1,2,3-cd)pyrene (193-39-5)	ng	< 20	NGCMS_1127
	Dibenz(ah)anthracene (53-70-3)	ng	< 20	NGCMS_1127
	Benzo(ghi)perylene (50-32-8)	ng	< 20	NGCMS_1127
Field Surrogate				
	Surrogate: d14-Terphenyl	%	101	NGCMS_1127
Labelled Internal Recovery %				
	d8-Naphthalene	%	47	NGCMS_1127
	d8-Acenaphthylene	%	55	NGCMS_1127
	d10-Acenaphthene	%	54	NGCMS_1127
	d10-Fluorene	%	120	NGCMS_1127
	d10-Phenanthrene	%	95	NGCMS_1127
	d10-Fluoranthene	%	88	NGCMS_1127
	d12-Benz(a)anthracene	%	82	NGCMS_1127
	d12-Chrysene	%	90	NGCMS_1127

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National Measurement Institute

REPORT OF ANALYSIS

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Lab Reg No.		N26/000081		
Sample Reference		N 23940		
	Units			Method
Labelled Internal Recovery %				
d12-Benzo(b)fluoranthene	%	72		NGCMS_1127
d12-Benzo(k)fluoranthene	%	81		NGCMS_1127
d12-Benzo(a)pyrene	%	81		NGCMS_1127
d12-Indeno(1,2,3-c,d)pyrene	%	84		NGCMS_1127
d14-Dibenz(ah)anthracene	%	96		NGCMS_1127
d12-Benzo(ghi)perylene	%	84		NGCMS_1127
CARB - Benzo(a)pyrene Potency Equivalent Factors				
BaP-PEF Benz(a)anthracene		0.1		NGCMS_1127
BaP-PEF Chrysene		0.01		NGCMS_1127
BaP-PEF Benzo(b)fluoranthene		0.1		NGCMS_1127
BaP-PEF Benzo(k)fluoranthene		0.1		NGCMS_1127
BaP-PEF Benzo(a)pyrene		1		NGCMS_1127
BaP-PEF Indeno(1,2,3-cd)pyrene		0.1		NGCMS_1127
BaP-PEF Dibenz(ah)anthracene		0.4		NGCMS_1127
CARB - Benzo(a)pyrene Toxic Equivalent Summary				
BaP-TEQPAH Lower Bound [excl LOR]	ng	6.4		NGCMS_1127
BaP-TEQPAH Middle Bound [incl 1/2 LOR]	ng	23		NGCMS_1127
BaP-TEQPAH Upper Bound [incl LOR]	ng	40		NGCMS_1127
Dates				
Date extracted		13-JAN-2026		
Date analysed		16-JAN-2026		

N26/000081

The standard Reporting Level for this analysis is 20 ng.
Standard acceptable recovery range is 50 to 150%.

BaP-PEF Factors are as below:

BaP-PEF Benz(a)anthracene: 0.1

BaP-PEF Chrysene: 0.01

BaP-PEF Benzo(b)fluoranthene: 0.1

BaP-PEF Benzo(k)fluoranthene: 0.1

BaP-PEF Benzo(a)pyrene: 1

BaP-PEF Indeno(1,2,3-cd)pyrene: 0.1

BaP-PEF Dibenz(ah)anthracene: 0.4

The PAH-BaP toxicity factors is as defined in "Benzo(a)pyrene as a Toxic Air Contaminant",
CARB/OEHHA Executive Summary, July 1994.

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Lab Reg No.		N26/000081	
Sample Reference	Units	N 23940	Method



Gabriela Saveluc, Analyst
Organics - NSW
Accreditation No. 198

06-FEB-2026

Lab Reg No.		N26/000081	
Sample Reference	Units	N 23940	Method
Components			
Cartridge Preparation Charge		AUT251212A	AUTL_MET_002
Extraction			
Pressurised Solvent Extraction		12-JAN-2026	AUTL_MET_001



Alan Yates, Analyst
Australian Ultra Trace Laboratory
Accreditation No. 198

06-FEB-2026



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This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

NA - Test Not Required

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

Measurement Uncertainty is available upon request.

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

National Measurement Institute

REPORT OF ANALYSIS

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

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QLD 4170

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Appendix B

Revised MOD23 modelling results

As discussed in Section 4.3, the measured Boiler 6 mass emission rates for a number of pollutants exceeded the BOILR5 typical operations emission rates used in the MOD23 air quality assessment. To assess whether operation of Boiler 6 at the measured emission rates would result in any exceedance of air quality criteria, a supplementary assessment was undertaken using the measured emission rates in place of the MOD23 BOILR5 typical operations emission rates. All other model inputs, including meteorology, source parameters and background concentrations, were kept consistent with the MOD23 assessment.

SO₂, Metals and PAH

For SO₂, metals and PAH, a scaling factor approach was applied. For each pollutant where the ratio of the measured Boiler 6 mass emission rate to the MOD23 BOILR5 typical operations emission rate exceeds 1, the MOD23 predicted ground-level concentrations were scaled by that ratio. This is considered a conservative approach as it scales the total predicted concentrations rather than the BOILR5 contribution alone. The scaled results are presented in Table B1 (SO₂) and Table B2 (metals and PAH).

TSP

The measured Boiler 6 TSP mass emission rate was higher than the BOILR5 typical operations emission rate in MOD23. As TSP requires a cumulative assessment in accordance with the NSW Approved Methods for the Modelling and Assessment of Air Pollutants, dispersion modelling was re-run using the measured Boiler 6 TSP emission rate. The revised cumulative predicted TSP concentrations are presented in Table B3.

NO_x

The measured Boiler 6 NO_x mass emission rate was higher than the BOILR5 typical operations emission rate in MOD23. As the assessment of NO₂ requires application of the Ozone Limiting Method (OLM) in accordance with the NSW Approved Methods, dispersion modelling was re-run using the measured Boiler 6 NO_x emission rate. The revised predicted NO₂ concentrations are presented in Table B4.

The results across all pollutants demonstrate that predicted concentrations remain below the relevant assessment criteria at all sensitive receptors. Operation of Boiler 6 at the measured emission rates is therefore not predicted to result in any exceedance of air quality standards.

Table B1 Comparison of AQIA predicted SO₂ concentration (typical operation scenario) and scaled SO₂ concentration

Receptor	Total impact (Incremental plus background) (µg/m ³)							
	AQIA Predicted SO ₂ Concentration				Scaled Predicted SO ₂ Concentration			
Averaging Period	10 min	1 hour	24 hour	Annual	10 min	(1 hour)	(24 hour)	(Annual)
Background, µg/m ³	No data (assumed same as 1 hour)	57.6	15.7	1.6	No data (assumed same as 1 hour)	57.6	15.7	1.6
Criteria, µg/m ³	712	570	228	60	712	570	228	60
Bomaderry (R1)	61.2	60.1	16.1	1.7	78.9	72.4	18.1	2.2
North Nowra (R2)	59.5	58.9	15.9	1.6	68.9	65.3	16.9	1.6
Nowra (R3)	58.7	58.4	15.8	1.6	64.1	62.3	16.3	1.6
Terara (R4)	58.3	58.1	15.8	1.6	61.8	60.6	16.3	1.6
C1	60.2	59.4	16	1.6	73.0	68.3	17.5	1.6
C2	62.2	60.8	16.3	1.7	84.9	76.6	19.3	2.2
C3	62.2	60.8	16.4	1.7	84.9	76.6	19.9	2.2
C4	61.8	60.5	16.4	1.7	82.5	74.8	19.9	2.2
C5	62.8	61.2	16.3	1.7	88.4	78.9	19.3	2.2
C6	62.8	61.3	16.2	1.7	88.4	79.5	18.7	2.2
C7	63.4	61.6	16.2	1.7	92.0	81.3	18.7	2.2

Table B2 Comparison of AQIA predicted PAH and metals concentration (typical operation scenario) and scaled concentration

Receptor	AQIA Predicted Concentration (Incremental)							Scaled Predicted Concentration (Incremental)						
	PAH	Arsenic	Beryllium	Chromium	Manganese	Nickel	Lead	PAH	Arsenic	Beryllium	Chromium	Manganese	Nickel	Lead
Averaging period	1 hour, 99.9th percentile						Annual, 100th percentile	1 hour, 99.9th percentile						Annual, 100th percentile
Criteria	0.0004	9.00E-05	4.00E-06	9.00E-05	1.80E-02	1.80E-04	5.00E-04	0.0004	9.00E-05	4.00E-06	9.00E-05	1.80E-02	1.80E-04	5.00E-04
Bomaderry (R1)	2.00E-08	6.30E-09	3.80E-11	4.40E-08	1.20E-08	6.60E-08	5.80E-10	6.75E-07	8.00E-08	<1.97E-09	8.07E-08	6.48E-08	2.69E-07	2.94E-09
North Nowra (R2)	1.70E-08	5.20E-09	3.10E-11	3.60E-08	9.80E-09	5.40E-08	3.20E-10	5.73E-07	6.60E-08	<1.61E-09	6.60E-08	5.29E-08	2.20E-07	1.62E-09
Nowra (R3)	2.40E-08	7.50E-09	4.50E-11	5.20E-08	1.40E-08	7.80E-08	1.50E-10	8.10E-07	9.52E-08	<2.33E-09	9.53E-08	7.56E-08	3.18E-07	7.62E-10
Terara (R4)	1.30E-08	4.10E-09	2.50E-11	2.90E-08	7.80E-09	4.30E-08	7.30E-11	4.39E-07	5.20E-08	<1.30E-09	5.32E-08	4.21E-08	1.75E-07	3.71E-10
C1	7.30E-08	2.30E-08	1.40E-10	1.60E-07	4.30E-08	2.40E-07	1.30E-09	2.46E-06	2.92E-07	<7.26E-09	2.93E-07	2.32E-07	9.78E-07	6.60E-09
C2	4.40E-08	1.40E-08	8.30E-11	9.70E-08	2.60E-08	1.40E-07	9.80E-10	1.48E-06	1.78E-07	<4.31E-09	1.78E-07	1.40E-07	5.70E-07	4.98E-09
C3	4.10E-08	1.30E-08	7.80E-11	9.10E-08	2.50E-08	1.40E-07	9.50E-10	1.38E-06	1.65E-07	<4.05E-09	1.67E-07	1.35E-07	5.70E-07	4.82E-09
C4	3.50E-08	1.10E-08	6.60E-11	7.70E-08	2.10E-08	1.20E-07	9.00E-10	1.18E-06	1.40E-07	<3.42E-09	1.41E-07	1.13E-07	4.89E-07	4.57E-09
C5	3.10E-08	9.70E-09	5.80E-11	6.80E-08	1.80E-08	1.00E-07	8.70E-10	1.05E-06	1.23E-07	<3.01E-09	1.25E-07	9.72E-08	4.07E-07	4.42E-09
C6	4.20E-08	1.30E-08	8.00E-11	9.30E-08	2.50E-08	1.40E-07	9.80E-10	1.42E-06	1.65E-07	<4.15E-09	1.70E-07	1.35E-07	5.70E-07	4.98E-09
C7	3.40E-08	1.10E-08	6.40E-11	7.40E-08	2.00E-08	1.10E-07	9.60E-10	1.15E-06	1.40E-07	<3.32E-09	1.36E-07	1.08E-07	4.48E-07	4.87E-09
Maximum level (on site)	1.10E-07	3.30E-08	2.00E-10	2.30E-07	6.20E-08	3.40E-07	1.40E-09	3.71E-06	4.19E-07	<1.04E-08	4.22E-07	3.35E-07	1.39E-06	7.11E-09

Table B3 Comparison of MOD23 predicted and revised annual average TSP concentrations at sensitive receptors ($\mu\text{g}/\text{m}^3$)

Receptor	Predicted concentrations ($\mu\text{g}/\text{m}^3$)			
	MOD23 Predicted Incremental Annual Concentration	MOD23 Predicted Cumulative Annual Concentration	Revised Incremental Annual Concentration (Model Re-run)	Revised Cumulative Annual Concentration (Model Re-run)
Criteria	90			
R1	0.4	37.7	0.4	37.7
R2	0.2	37.5	0.2	37.5
R3	0.1	37.5	0.2	37.5
R4	0.2	37.5	0.2	37.5
C1	1.2	38.6	1.2	38.6
C2	1.5	38.8	1.5	38.8
C3	1.4	38.8	1.4	38.8
C4	1.2	38.5	1.2	38.5
C5	0.9	38.3	0.9	38.3
C6	1.6	38.9	1.6	38.9
C7	1.2	38.6	1.2	38.6

Table B4 Comparison of MOD23 predicted and revised NO_x (as NO₂) concentrations at sensitive receptors ($\mu\text{g}/\text{m}^3$)

Receptor	Total impact (Incremental plus background) ($\mu\text{g}/\text{m}^3$)					
	MOD23 Predicted Concentration			Revised Concentration (Model Re-run)		
Background	80.8	n/a	7.1	80.8	n/a	7.1
Criteria	246 (1 hour, Method 1)	246 (1 hour, Method 2)	62 (Annual)	246 (1 hour, Method 1)	246 (1 hour, Method 2)	62 (Annual)
Bomaderry (R1)	110.9	97.8	8.2	110.9	97.8	8.2
North Nowra (R2)	98.1	97.8	7.5	98.3	97.8	7.5
Nowra (R3)	99.6	97.8	7.4	99.6	97.8	7.4
Terara (R4)	95	102.9	7.5	95.0	103.0	7.5
C1	129.1	97.8	9.9	129.7	97.8	9.9
C2	131.3	97.8	9.8	132.0	97.8	9.8
C3	129.4	97.8	9.6	130.1	97.8	9.7
C4	130.6	97.8	9.4	131.2	97.8	9.4
C5	138.2	97.8	9.2	138.6	97.8	9.2
C6	127.8	97.8	9.7	127.9	97.8	9.7
C7	140.3	97.8	9.4	140.6	97.8	9.4

Project name		Boiler 6 verification report to address Development Consent 06_0228 Condition 9CA					
Document title		Boiler 6 verification report					
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S4	1	S Chen	J Potgieter		E Smith		01/04/26

GHD Pty Ltd | ABN 39 008 488 373

Contact: Simon Chen, Graduate Engineer | GHD

133 Castlereagh Street, Level 15

Sydney, New South Wales 2000, Australia

T +61 2 9239 7100 | **F** +61 2 9239 7199 | **E** sydmail@ghd.com | **ghd.com**

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