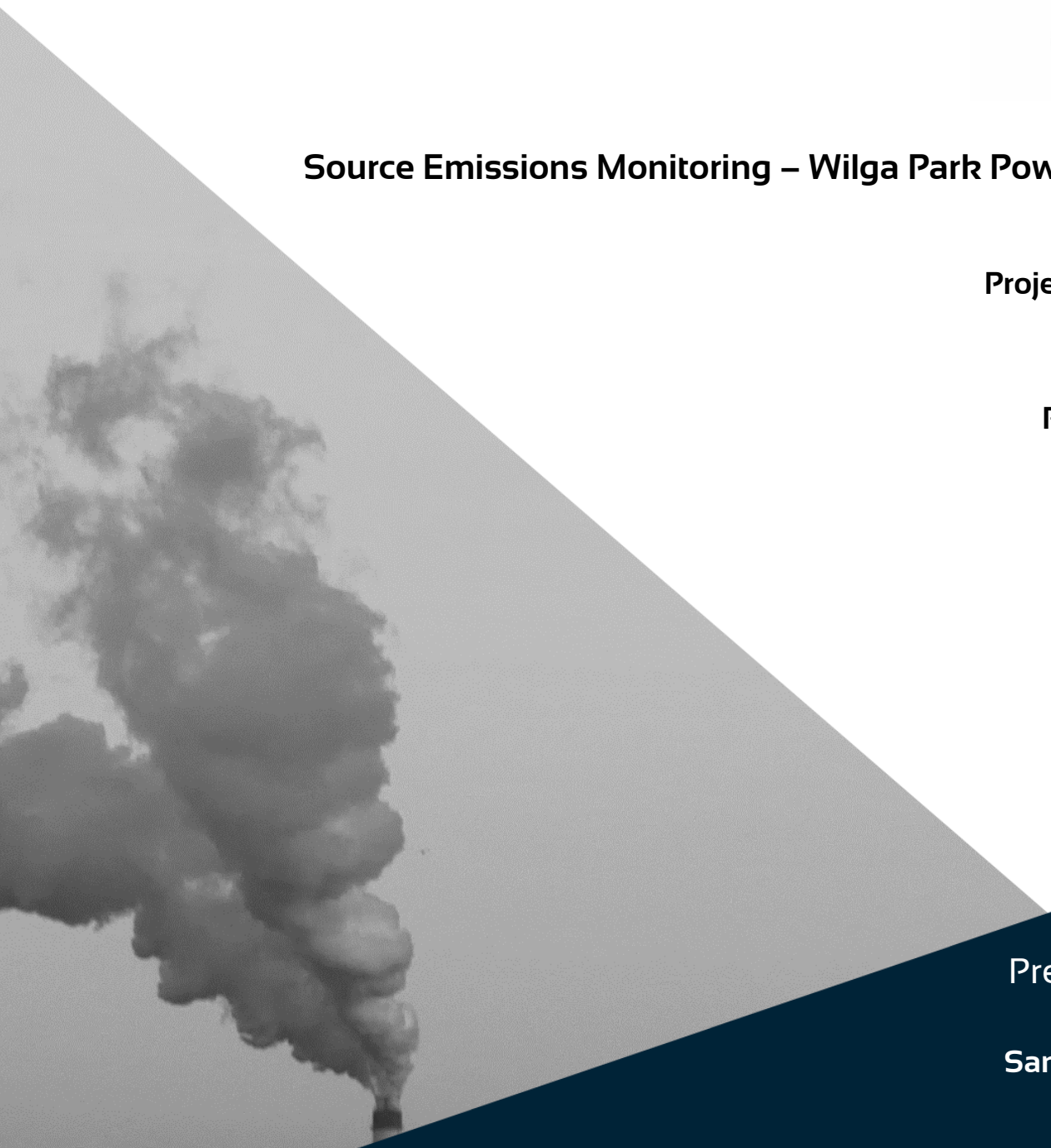

Source Emissions Monitoring – Wilga Park Power Station

Project ID: 17273

8/12/2025

Release: R_1

Prepared For:

Santos Limited

Assured Environmental

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Table 1: History of Revisions

Revision	Date	Issued to	Changes
R_1	8/12/2025	A. Kahi	Formal report release
R_0	28/11/2025	A. Kahi	Initial report release

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Accredited for compliance to ISO/IEC 17025

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Accreditation number: 19703

EXECUTIVE SUMMARY

Assured Environmental conducted emissions monitoring from the eleven operational generator stack release points at the Wilga Park Power Station (WPPS) outside Narrabri, New South Wales. Sampling was performed on each source for a period of at least 60 minutes.

The monitoring points included;

- 6 x 3 MW Generators
- 5 x 1 MW Generators

The table below provides the monitoring schedule performed during this emissions testing project.

Results are reported at dry, 273.15 °K and 101.325 kPa (STP), unless otherwise indicated. Results are also presented at 7 % oxygen correction.

Table 2: Summary of test schedule

3MW Units	Testing Completed
G01A	Yes
G02A	Yes
G03B	Yes
G04B	Yes
G05B	Yes
G06B	Yes
1MW Units	
G03A	Yes
G04A	Yes
G05A	Yes
G06A	Yes
G07A	Yes

The emissions monitoring results and emission limit guidelines are summarised in the following tables.

Table 3: Summary of emissions – 3MW Generators 1A & 2A

Release Point Parameter	Unit of Measure	Emission Target	3MW G01A	3MW G02A
Date of testing	dd-mm-yyyy	-	6/11/2025	5/11/2025
Exhaust velocity	m/sec	-	36.8	35.7
Average stack temperature	°C	-	414	378
Moisture content	vol-%	-	8.0	8.9
Dry standard stack flow rate	Nm^3/sec	-	3.5	3.6
Carbon dioxide concentration	vol-%	-	5.5	5.3
Oxygen concentration	vol-%	-	10.8	11.3
Oxides of nitrogen (as NO_2)	mg/Nm^3	-	315	263
	mg/Nm^3 @ 7% O_2	450	433	382
- emission rate	g/sec	-	1.11	0.94
Solid particles (total)	mg/Nm^3	-	6.9	< 2.8
	mg/Nm^3 @ 7% O_2	-	9.5	< 4.0
- emission rate	g/sec	-	0.02	< 0.01
Sulfur trioxide (as SO_3)	mg/Nm^3	-	2.7	< 0.2
	mg/Nm^3 @ 7% O_2	-	3.7	< 0.3
- emission rate	g/sec	-	0.0094	< 0.0007
Load	kW	-	3,040	3,047
Engine Speed	rpm	-	1,500	1,500
Fuel used	-	-	Natural gas	Natural gas

Table 4: Summary of emissions – 3MW Generators 3B & 4B

Release Point Parameter	Unit of Measure	Emission Target	3MW G03B	3MW G04B
Date of testing	dd-mm-yyyy	-	6/11/2025	5/11/2025
Exhaust velocity	m/sec	-	37.3	36.7
Average stack temperature	°C	-	392	395
Moisture content	vol-%	-	8.1	8.6
Dry standard stack flow rate	Nm^3/sec	-	3.7	3.6
Carbon dioxide concentration	vol-%	-	5.4	5.6
Oxygen concentration	vol-%	-	11.0	10.8
Oxides of nitrogen (as NO_2)	mg/Nm^3	-	307	325
	mg/Nm^3 @ 7% O_2	450	430	448
- emission rate	g/sec	-	1.14	1.18
Solid particles (total)	mg/Nm^3	-	2.6	4.5
	mg/Nm^3 @ 7% O_2	-	3.6	6.2
- emission rate	g/sec	-	0.01	0.02
Sulfur trioxide (as SO_3)	mg/Nm^3	-	1.7	1.0
	mg/Nm^3 @ 37% O_2	-	2.4	1.3
- emission rate	g/sec	-	0.0063	0.0035
Load	kW	-	3,000	3,000
Engine Speed	rpm	-	1,500	1,500
Fuel used	-	-	Natural gas	Natural gas

Table 5: Summary of permit limits – 3MW Generators 5B & 6B

Release Point Parameter	Unit of Measure	Emission Target		3MW G05B	3MW G06B
Date of testing	dd-mm-yyyy	-		6/11/2025	5/11/2025
Exhaust velocity	m/sec	-		37.6	36.2
Average stack temperature	°C	-		374	368
Moisture content	vol-%	-		8.8	8.1
Dry standard stack flow rate	Nm^3/sec	-		3.8	3.7
Carbon dioxide concentration	vol-%	-		5.1	5.2
Oxygen concentration	vol-%	-		11.4	11.5
Oxides of nitrogen (as NO_2)	mg/Nm^3	-		307	270
	mg/Nm^3 @ 7% O_2	450		447	399
- emission rate	g/sec	-		1.17	1.01
Solid particles (total)	mg/Nm^3	-	<	2.5	3.7
	mg/Nm^3 @ 7% O_2	-	<	3.6	5.5
- emission rate	g/sec	-	<	0.01	0.01
Sulfur trioxide (as SO_3)	mg/Nm^3	-		0.6	0.5
	mg/Nm^3 @ 7% O_2	-		0.9	0.7
- emission rate	g/sec	-		0.0023	0.0017
Load	kW	-		3,030	3,040
Engine Speed	rpm	-		1,500	1,500
Fuel used	-	-		Natural gas	Natural gas

Table 6: Summary of emissions – 1MW Generators 3A & 4A

Release Point Parameter	Unit of Measure	Emission Target		1MW G03A	1MW G04A
Date of testing	dd-mm-yyyy			4/11/2025	4/11/2025
Exhaust velocity	m/sec			43.5	37.4
Average stack temperature	°C			502	475
Moisture content	vol-%			9.1	8.7
Dry standard stack flow rate	Nm^3/sec			1.1	1.0
Carbon dioxide concentration	vol-%			6.7	6.5
Oxygen concentration	vol-%			9.3	9.5
Oxides of nitrogen (as NO_2)	mg/Nm^3	-		299	321
	mg/Nm^3 @ 7% O_2	450		359	390
- emission rate	g/sec	-		0.33	0.31
Solid particles (total)	mg/Nm^3	-	<	2.4	3.5
	mg/Nm^3 @ 7% O_2	-	<	2.8	4.3
- emission rate	g/sec	-	<	0.003	0.003
Sulfur trioxide (as SO_3)	mg/Nm^3	-		1.6	0.4
	mg/Nm^3 @ 7% O_2	-		1.9	0.5
- emission rate	g/sec	-		0.0018	0.0004
Load	MW			850	850
Engine Speed	rpm			1,500	1,500
Fuel used	-			Natural gas	Natural gas

Table 7: Summary of emissions – 1MW Generators 5A & 6A

Release Point Parameter	Unit of Measure	Emission Target	1MW G05A	1MW G06A
Date of testing	dd-mm-yyyy		4/11/2025	6/11/2025
Exhaust velocity	m/sec		44.8	44.2
Average stack temperature	°C		506	490
Moisture content	vol-%		9.3	8.6
Dry standard stack flow rate	Nm^3/sec		1.1	1.1
Carbon dioxide concentration	vol-%		6.7	6.3
Oxygen concentration	vol-%		9.4	9.4
Oxides of nitrogen (as NO_2)	mg/Nm^3	-	285	346
	mg/Nm^3 @ 7% O_2	450	344	417
- emission rate	g/sec	-	0.32	0.39
Solid particles (total)	mg/Nm^3	-	< 2.4	< 2.3
	mg/Nm^3 @ 7% O_2	-	< 2.9	< 2.8
- emission rate	g/sec	-	< 0.003	< 0.003
Sulfur trioxide (as SO_3)	mg/Nm^3	-	2.4	1.0
	mg/Nm^3 @ 7% O_2	-	2.9	1.2
- emission rate	g/sec	-	0.0027	0.0012
Load	MW		850	850
Engine Speed	rpm		1,500	1,500
Fuel used	-		Natural gas	Natural gas

Table 8: Summary of emissions – 1MW Generator 7A

Release Point Parameter	Unit of Measure	Emission Target	1MW G07A
Date of testing	dd-mm-yyyy		4/11/2025
Exhaust velocity	m/sec		35.8
Average stack temperature	°C		457
Moisture content	vol-%		8.7
Dry standard stack flow rate	Nm^3/sec		1.1
Carbon dioxide concentration	vol-%		6.7
Oxygen concentration	vol-%		9.3
Oxides of nitrogen (as NO_2)	mg/Nm^3	-	373
	mg/Nm^3 @ 7% O_2	450	445
- emission rate	g/sec	-	0.41
Solid particles (total)	mg/Nm^3	-	< 2.7
	mg/Nm^3 @ 7% O_2	-	< 3.2
- emission rate	g/sec	-	< 0.003
Sulfur trioxide (as SO_3)	mg/Nm^3	-	1.2
	mg/Nm^3 @ 7% O_2	-	1.4
- emission rate	g/sec	-	0.0013
Load	MW		850
Engine Speed	rpm		1,500
Fuel used	-		Natural gas

It is understood that there are no emissions limits defined under the NSW EPA Environment Protection Licence, in this case reference is made to the development approval conditions (NSW POEO – Stationary reciprocating internal combustion engine – Group 6). In comparison to these guidelines, oxides of nitrogen emissions fell below the target values[a].

[a] The measurement uncertainty associated with the test has not been considered when determining compliance or non-compliance.

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1 INTRODUCTION

Assured Environmental Pty Ltd (AE) was appointed by Santos to sample and analyse source emissions at the Wilga Park Power Station facility located outside Narrabri in Central New South Wales. Sampling was conducted by Assured Environmental from 4th to 6th November 2025.

Assured Environmental was responsible for the collection and analysis of samples unless otherwise indicated.

This test program was conducted as per the scope of works issued by Santos, which included sampling from 11 release points at the facility.

- During this emissions sampling program all Oxides of Nitrogen (as NO_2) results were found to be within the development approval standard concentration limit of 450 mg/Nm^3 corrected to 7 % O_2[b].

Monitoring of each unit was performed with close communication between site operations and the test team to ensure that the process was operating at stable, uninterrupted load.

[b] The measurement uncertainty is not considered in this statement. This value is taken from the *NSW Protection of the Environment Operations (Clean Air) Regulation 2022 (POEO) – Schedule 2*, general standards of concentration for Stationary reciprocating internal combustion engines as a Group 6 activity. Further, *Schedule 3, Part 3 – Reference Conditions* requires a Group 5 or 6 activity using gas or liquid fuel to correct concentrations to 7 % Oxygen.

2 PROCESS DESCRIPTION & RELEASE POINTS

2.1 Process Description

The Wilga Park Power Station is a natural gas fired power station supplying electricity into the grid. The generators are comprised of six 3MW Jenbacher Gas Engines and five 1MW Jenbacher Gas Engines.

Figure 1: 3MW Generator Stack Release Points

Figure 2: 1MW Generator Stack Release Points

2.2 Sample locations

The tables below outline the details of each sample location in relation to the requirements of AS4323.1. A summary of the requirements of the Standard are:

- **Ideal sample location** – An ideal sample location shall conform to the requirements of Table 1 in Clause 4.2.2 of the standard and items 'a' through 'e'

Table 1 — Criteria for selection of sampling planes

Type of flow disturbance	Minimum distance upstream from disturbance, diameters (*D*)	Minimum distance downstream from disturbance, diameters (*D*)
Bend, connection, junction, direction change, stack silencer, flow straightener, stack exit	> 2	> 6
Louvre, butterfly damper (partially closed or closed)	> 3	> 6
Axial fan	> 3	> 8[a]
Centrifugal fan	> 3	> 6

[a] The plane should be selected as far as practicable from an axial fan. Flow straighteners may still be required to ensure that the selected position meets the criteria listed in Items (a) to (e) below.

  - a. The gas flow shall be in the same direction at all points along each sampling traverse,
  - b. The gas flow profile at the sampling plane shall be steady, evenly distributed and not have a cyclonic or swirl component which exceeds an angle of 15 ° to the duct axis, when measured near the periphery of circular sampling plane,
  - c. The temperature difference between adjacent points of the survey along each sampling traverse shall be less than 10 % of the absolute temperature in Kelvin, with the temperature at any point differing by less than 10 % from the mean.
  - d. The ratio of the highest to lowest pitot tube differential pressure across the sampling plane shall not exceed 9:1. The ration of the highest to lowest gas velocities shall also not exceed 3:1. For isokinetic testing with the use of impingers, the gas velocity ration across the sampling plane should not exceed 1.6:1,
  - e. The differential pressure at all sampling points shall be greater than or equal to 5 Pa. Sampling planes with differential pressures less than 5 Pa do not conform with this document.
- **Non-ideal sampling plane** – A non-ideal sampling plane does not conform to the separation distances listed in Table 1 of the Standard but is located greater than or equal to one duct diameter upstream of a flow disturbance and greater than or equal to two duct diameters downstream of a flow disturbance; or conforms with Table 1 separation distances but not with the criteria contained in Clause 4.2.2 (a) to (d).
  The number of sampling points shall be based on the maximum sampling point factor specified by Clause 4.2.3.
- **Non-conforming sampling plane** – A non-conforming sampling point does not conform with the criterion contained in Clause 4.2.2 (e); or is located less than one duct diameter upstream of a flow disturbance or less than two duct diameters downstream of a flow disturbance; or in Items (c)(i) and (ii), the requirements of Clause 4.2.4 apply.

The details of each sample location are provided in the tables below with reference to Australian Standard AS4323.l.

Table 9: Sample location details

AS4323.1	Sample location	1MW GO3A-GO6A	1 MW GO7A
	Stack Shape	Circular	Circular
	Ideal Sampling Plane Assessment		
	Equivalent Diameter (m)	0.32	0.35
	Stack Cross Section Area (m^2)	0.08	0.09
	Distance to upstream disturbance (m) (from disturbance)	0.2	0.6
	Upstream Diameters (D)	0.6	1.7
	Distance to downstream disturbance (m) (from disturbance)	0.4	1.5
	Downstream diameters (D)	1.3	4.3
4.2.2 Table 1	Meets Requirements AS4323.1 Table 1	No	No
	Non-ideal Sampling Plane Assessment		
	Assessment required?	No	No
	Total traverse point factors	1.3	1.1
	Non-conforming Sampling Plane Assessment		
4.2.2(a)	Gas flow in same direction	Yes	Yes
4.2.2(b)	Gas flow steady & evenly distributed (cyclonic or swirl <15º)	Yes	Yes
4.2.2(c)	Temperature difference between points <10%, and each point <10% of average	Yes	Yes
4.2.2(d)	Ratio of highest to lowest differential pressure & ratio highest to lowest velocity	1.8 – 4.8	1.1
		1.3 – 2.2	1.1
4.2.2(e)	Minimum differential pressure	13 - 28	29
	Gas temperature above dewpoint	Yes	Yes
	Sampling Plane Type		
4.2.2, 4.2.3, 4.2.4	Sampling plane type	Non-conforming[c]	Non-ideal[d]
	Alternative sampling plane available?	No	No
	Number of Sample Points Adopted		
	Port size (mm)	-	-
	Port Thread Type	Flange	Flange
	Number of traverses	2	2
	Number of points per traverse	4	4
	Total number of traverse points	8	8
	Flow & temperature compliance check	Yes	Yes

[c] Testing at this sample plane is unavoidable, all efforts have been made to collect a representative sample.

[d] Testing at this sample plane is unavoidable, all efforts have been made to collect a representative sample.

Table 10: Sample location details

AS4323.1	Sample location	3MW
	Stack Shape	Circular
	Ideal Sampling Plane Assessment	
	Equivalent Diameter (m)	0.59
	Stack Cross Section Area (m^2)	0.27
	Distance to upstream disturbance (m) (from disturbance)	2.3
	Upstream Diameters (D)	3.9
	Distance to downstream disturbance (m) (from disturbance)	1.8
	Downstream diameters (D)	3.1
4.2.2 Table 1	Meets Requirements AS4323.1 Table 1	No
	Non-ideal Sampling Plane Assessment	
	Assessment required?	No
	Total traverse point factors	1.1
	Non-conforming Sampling Plane Assessment	
4.2.2(a)	Gas flow in same direction	Yes
4.2.2(b)	Gas flow steady & evenly distributed (cyclonic or swirl <15º)	Yes
4.2.2(c)	Temperature difference between points <10%, and each point <10% of average	Yes
4.2.2(d)	Ratio of highest to lowest differential pressure & ratio highest to lowest velocity	1.1 – 1.3 1.1 – 1.3
4.2.2(e)	Minimum differential pressure	42 – 48
	Gas temperature above dewpoint	Yes
	Sampling Plane Type	
4.2.2, 4.2.3, 4.2.4	Sampling plane type	Non-ideal[e]
	Alternative sampling plane available?	No
	Number of Sample Points Adopted	
	Port size (mm)	75
	Port Thread Type	Flange
	Number of traverses	2
	Number of points per traverse	6
	Total number of traverse points	12
	Flow & temperature compliance check	Yes

[e] Testing at this sample plane is unavoidable, all efforts have been made to collect a representative sample.

3 MONITORING METHODOLOGY

3.1 Sampling Methodology

All sampling and analysis were carried out in accordance with the listed requirements in Table 11. Any sampling specific comments about the sampling and analysis have been documented where required.

Table 11: Test Methods

Parameter	Reference Test Method	NSW Test Method	NATA accreditation	Analysis by	Notes
Sample plane criteria	AS4323.1	TM-1	yes	1	nil
Gas velocity & volume flow rate	USEPA Method 2	TM-2	yes	1	nil
Temperature	USEPA Method 2	TM-2	yes	1	nil
Stack gas density	USEPA Method 3	TM-23	yes	1	nil
Oxygen	USEPA Method 3A	TM-25	yes	1	nil
Carbon dioxide	USEPA Method 3A	TM-24	yes	1	nil
Moisture	USEPA Method 4	TM-22	yes	1	nil
Solid particles – total	AS4323.2	TM-15	yes	1	nil
Oxides of nitrogen	USEPA Method 7E	TM-11	yes	1	nil
Carbon monoxide	USEPA Method 10	TM-32	yes	1	nil
Sulfuric acid mist (SO_3)	USEPA Method 8	TM-3	yes	1	nil
Sulfur dioxide	USEPA Method 8	TM-4	yes	1	nil

Table 12: Analysis Performed By

Note	Company	Work Performed	NATA ID	Report Number
1	Assured Environmental	Sampling & analysis	19703	17273

3.2 Test equipment

The sampling equipment was transported to site and setup at the base of the sample location. An elevated work platform was used to access the sample access point on the stack, with sample tubing connecting the probes to the sample equipment at the base.

All equipment used during the testing meets all relevant performance standards as required by the relevant jurisdiction. Combustion gases were monitored using a Testo and Horiba combustion gas analyser.

Figure 3: Testo 350 multi gas analyser

Table 13: Combustion gas analyser specifications

Compound	Range	Lower Detection Limit	Linearity
O_2	0 to 25 %	0.01 %	+/- 1% selected range
CO	0 to 200 ppm	1 ppm	+/- 2% selected range
CO_2	0 to 20 %	500 ppm	+/- 2% selected range
NO (Testo)	0 to 3,000ppm	1 ppm	+/- 2% selected range
NOx (Horiba)	0 to 50 ppm	0.1 ppm	+/- 2% selected range
NO_2 (Testo)	0 to 500ppm	0.5 ppm	+/- 2% selected range
Lower Detection Limit	2X Noise at 60sec averaging		
Precision (% of point)	+/- 0.1%, measured with single gases at the span concentration		
Flow Rate	~ 0.5 liters per minute		
Accuracy	2% of span		
Span Drift	Less than 2% per week		
Zero Noise	0.5 ppm RMS (60sec averaging time)		
Response Time	60 seconds		

Table 14: Test equipment identification

Equipment	Equipment make/model	Equipment ID	Last calibration date	Calibration information
Sampling console	Apex XC572	SN173	13/08/2025	Y = 0.95 ΔH@ = 52.23
Manometer	Apex XC572	SN173	13/08/2025	Correction factor = 1
Thermocouple indicator	Apex XC572	SN173	13/08/2025	Correction factor = 1
L-type pitot	APEX PT05	SN956	4/03/2025	Dimension check as per USEPA M2 Visual inspection on site OK
S-type pitot	Apex	PN111	26/07/2024	
Combustion gas analyser	Testo 350	SN935	daily zero and single point onsite	Multipoint pre and post sample campaign
Nozzle	Isokinetic Nozzle Set (stainless)	SN286	26/06/2025	-

4 TECHNICAL COMMENTS

4.1 AS4323.1 – Sample point location

- In the case where the sample location is considered non-ideal (less than 6 diameters downstream from a disturbance and/or less than 2 diameters upstream from a disturbance), an increased number of sample traverse points is sampled to maintain compliance to AS4323.1.
- Where the sample location is considered non-conforming (less than 2 diameters downstream from a disturbance and/or less than 1 diameter upstream from a disturbance), the number of sample points is increased. In this case there is no alternative sample location available.
- In each case the gas flow profile conforms to the standard.
- The release points of the 1MW generators are contained within the generator enclosure and therefore do not contain a true 'stack'. All efforts were made to perform representative sampling from these release points.

4.2 USEPA Method 2 – Exhaust gas volume flow rate

- The total traverse points at each sample location is calculated using the factors listed in AS4323.1 At each stack sample location, each traverse was sampled and measurements of differential pressure and temperature is recorded.
- The stack gas velocity result reported is the average of the individual measurements at each traverse point for each stack.
- The average velocity measurement is then multiplied by the stack cross sectional area to calculate the volume flow of stack flue gas.

4.3 USEPA Method 7E – Combustion gas measurement

- Combustion gases were measured using multi-gas analysers.
- Analyser calibration checks were performed both on and off-site. Direct three-point linearity checks were performed in the laboratory before and at completion of the site work, while zero and single point span checks were performed at the beginning and end of each day of sampling. Direct analyser calibration checks were performed directly to the analyser. The single point system bias check is performed by sending the gas to the beginning of the sampling system, in this case, the sampling probe, to determine any possible bias introduced by the sampling system. All calibration checks were within Method 7E tolerances.
- Combustion gas results are presented as hourly averages over the sampling period representing 1-minute data points.
- The results of the stratification testing are presented below.
- The calibration gases used are listed in the table below along with the reference certificate identification.

Table 15: Calibration Gas Details

Parameter	Zero cylinder	Span cylinder 1	Span cylinder 2
Contents	Nitrogen (UHP)	Carbon dioxide	Nitrogen dioxide
	-	8.04 %	40.5 ppm
	-	Nitric oxide	Oxygen
	-	491 ppm	18.9 %
	-	Carbon monoxide	-
	-	501 ppm	-
Certificate number	na	QCSPC038919	456981
Expiry date	na	19/05/2028	25/01/2027

4.3.1 Stratification determination

Stratification testing was performed on each source following the requirements of USEPA Method 7E, specifically the following points are considered;

- Definition of stratification;
  - If the concentration at each traverse point differs from the mean concentration for all traverse points by no more than: (a) ±5 % of the mean concentration; or (b) ±0.5 ppm (whichever is less restrictive), the gas stream is considered unstratified, and samples may be collected from a single point that most closely matches the mean.
  - If the 5 % or 0.5 ppm criterion is not met, but the concentration at each traverse point differs from the mean concentration for all traverse points by no more than: (a) ±10 % of the mean concentration; or (b) ±1 ppm (whichever is less restrictive), the gas stream is considered to be minimally stratified and you may take samples from 3 points.
  - If the gas stream is found to be stratified because the 10 % or 1 ppm criterion is not met, locate 12 traverse points for the test in accordance with USEPA Method 1 (AS4323.1 in Australia).
- In this case the NOx and O_2 concentration was measured at three traverse points on each release point. No significant stratification was observed.

Table 16: Stratification Testing

Source	Number of	Oxygen (vol-%)		Oxides of nitrogen (%)	
	traverse points sampled	Maximum difference from mean	criteria	Maximum difference from mean	criteria
G01A	3	0.1	< 0.3 vol-%	4.0	< 10 %
G02A	3	0.0	< 0.3 vol-%	3.2	< 10 %
G03B	3	0.2	< 0.3 vol-%	7.1	< 10 %
G04B	3	0.1	< 0.3 vol-%	7.7	< 10 %
G05B	3	0.0	< 0.3 vol-%	3.9	< 10 %
G06B	3	0.1	< 0.3 vol-%	8.4	< 10 %
G03A	3	0.0	< 0.3 vol-%	8.1	< 10 %
G04A	3	0.1	< 0.3 vol-%	5.1	< 10 %
G05A	3	0.1	< 0.3 vol-%	3.3	< 10 %
G06A	3	0.1	< 0.3 vol-%	2.5	< 10 %
G07A	3	0.1	< 0.3 vol-%	4.6	< 10 %

4.4 General Process Comments

- Monitoring was performed with close communication between the testing team and process operators to ensure the unit was operating at a stable load throughout the test period.
- It should be noted that the results presented in this report are representative of the operation of the compressor turbines at the time of sampling. As such, care should be taken in the application of these results where further mapping (tuning) of the generators was undertaken following completion of the monitoring.

5 MEASUREMENT UNCERTAINTY

There is an inherent uncertainty associated with any scientific measurement, including stack emissions monitoring. The measurement uncertainty can be controlled with strict adherence to the reference methodology along with utilising appropriate calibration standards with corresponding acceptable uncertainty reports.

Many source sampling methods do not outline exact procedures for establishing direct measurement uncertainty. In the absence of a defined procedure, the uncertainty budgets presented are based on estimations using ISO-GUM method.

Each individual source and test may have a unique associated uncertainty assigned, due to factors such as the stack sample location in relation to the positioning requirements of AS4323.1, stack temperature, water vapour content and sample analysis.

The table below outlines the estimated uncertainties associate with reports presented within this report.

Table 17: Sample Uncertainty

Parameter	Reference method	Uncertainty ± %	Coverage factor	Confidence coefficient %
Gas velocity & volume flow rate	USEPA Method 2	3	2	95
Temperature	USEPA Method 2	3	2	95
Oxygen	USEPA Method 3A	7	2	95
Carbon dioxide	USEPA Method 3A	7	2	95
Moisture	USEPA Method 4	4	2	95
Solid particles – total	AS4323.2	8	2	95
Oxides of nitrogen	USEPA Method 7E	7	2	95
Carbon monoxide	USEPA Method 10	7	2	95
Sulfuric acid mist (SO_3)	USEPA Method 8	31	2	95
Sulphur dioxide	USEPA Method 8	21	2	95

6 TEST RESULTS

Table 18: Test Information – GO1A

Site		Wilga Park Power Station
Sample Location		GO1A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		11
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	06/11/2025
Start Time	hh:mm	13:09
End Time	hh:mm	14:19
Average Stack Temperature	°C	414
Absolute Stack Pressure	mb	993
Moisture Content	% v/v	8.0
Oxygen	% v/v	10.8
Carbon dioxide	% v/v	5.5
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.3
Sample Volume (dry gas meter)	Nm^3	0.75
Stack Gas Velocity	m/sec	36.8
Actual Stack Flow Rate	m^3/sec	10
Dry Standard Stack Flow Rate	Nm^3/sec	3.5
Percent Isokinetic Rate	%	99

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	6.9	9.5	0.02
Oxides of Nitrogen (as NO_2)	315	433	1.11
Carbon Monoxide	391	538	1.38
Sulphur trioxide (as SO_3)	2.7	3.7	0.009
Sulphur dioxide	< 1.6	< 2.2	< 0.006

Table 19: Test Information – GO2A

Site		Wilga Park Power Station
Sample Location		GO2A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		6
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	05/11/2025
Start Time	hh:mm	9:15
End Time	hh:mm	10:27
Average Stack Temperature	°C	378
Absolute Stack Pressure	mb	993
Moisture Content	% v/v	8.9
Oxygen	% v/v	11.3
Carbon dioxide	% v/v	5.3
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.3
Sample Volume (dry gas meter)	Nm^3	0.72
Stack Gas Velocity	m/sec	35.7
Actual Stack Flow Rate	m^3/sec	10
Dry Standard Stack Flow Rate	Nm^3/sec	3.6
Percent Isokinetic Rate	%	94

Parameter		standard conditions Concentration mg/Nm^3		mg/Nm^3 & 7% O_2		Emission Rate g/sec
Solid Particles - total	<	2.8	<	4.0	<	0.01
Oxides of Nitrogen (as NO_2)		263		382		0.94
Carbon Monoxide		543		789		1.95
Sulphur trioxide (as SO_3)	<	0.2	<	0.3	<	0.001
Sulphur dioxide	<	1.8	<	2.5	<	0.006

Table 20: Test Information – GO3B

Site		Wilga Park Power Station
Sample Location		GO3B
Reference Method		USEPA M8 - ISOKINETIC
Run ID		10
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	06/11/2025
Start Time	hh:mm	11:08
End Time	hh:mm	12:14
Average Stack Temperature	°C	392
Absolute Stack Pressure	mb	995
Moisture Content	% v/v	8.1
Oxygen	% v/v	11.0
Carbon dioxide	% v/v	5.4
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.3
Sample Volume (dry gas meter)	Nm^3	0.80
Stack Gas Velocity	m/sec	37.3
Actual Stack Flow Rate	m^3/sec	10
Dry Standard Stack Flow Rate	Nm^3/sec	3.7
Percent Isokinetic Rate	%	100

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	2.6	3.6	0.01
Oxides of Nitrogen (as NO_2)	307	430	1.14
Carbon Monoxide	495	695	1.84
Sulphur trioxide (as SO_3)	1.7	2.4	0.01
Sulphur dioxide	< 1.3	< 1.9	< 0.01

Table 21: Test Information – GO4B

Site		Wilga Park Power Station
Sample Location		GO4B
Reference Method		USEPA M8 - ISOKINETIC
Run ID		7
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	05/11/2025
Start Time	hh:mm	11:25
End Time	hh:mm	12:30
Average Stack Temperature	°C	395
Absolute Stack Pressure	mb	994
Moisture Content	% v/v	8.6
Oxygen	% v/v	10.8
Carbon dioxide	% v/v	5.6
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.3
Sample Volume (dry gas meter)	Nm^3	0.74
Stack Gas Velocity	m/sec	36.7
Actual Stack Flow Rate	m^3/sec	10
Dry Standard Stack Flow Rate	Nm^3/sec	3.6
Percent Isokinetic Rate	%	95

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	4.5	6.2	0.02
Oxides of Nitrogen (as NO_2)	325	448	1.18
Carbon Monoxide	471	649	0.16
Sulphur trioxide (as SO_3)	1.0	1.3	0.003
Sulphur dioxide	< 1.6	< 2.2	< 0.006

Table 22: Test Information – GO5B

Site		Wilga Park Power Station
Sample Location		GO5B
Reference Method		USEPA M8 - ISOKINETIC
Run ID		9
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	06/11/2025
Start Time	hh:mm	9:06
End Time	hh:mm	10:16
Average Stack Temperature	°C	374
Absolute Stack Pressure	mb	995
Moisture Content	% v/v	8.8
Oxygen	% v/v	11.4
Carbon dioxide	% v/v	5.1
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.3
Sample Volume (dry gas meter)	Nm^3	0.80
Stack Gas Velocity	m/sec	37.6
Actual Stack Flow Rate	m^3/sec	10.1
Dry Standard Stack Flow Rate	Nm^3/sec	3.8
Percent Isokinetic Rate	%	98

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	2.5	3.6	0.01
Oxides of Nitrogen (as NO_2)	307	447	1.17
Carbon Monoxide	443	646	1.69
Sulphur trioxide (as SO_3)	0.6	0.9	0.002
Sulphur dioxide	< 1.5	< 2.2	< 0.006

Table 23: Test Information – GO6B

Site		Wilga Park Power Station
Sample Location		GO6B
Reference Method		USEPA M8 - ISOKINETIC
Run ID		8
Test Parameter		USEPA M8 - ISOKINETIC
Test Date	dd/mm/yyyy	05/11/2025
Start Time	hh:mm	14:00
End Time	hh:mm	15:07
Average Stack Temperature	°C	368
Absolute Stack Pressure	mb	993
Moisture Content	% v/v	8.1
Oxygen	% v/v	11.5
Carbon dioxide	% v/v	5.2
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.3
Sample Volume (dry gas meter)	Nm^3	0.82
Stack Gas Velocity	m/sec	36.2
Actual Stack Flow Rate	m^3/sec	10
Dry Standard Stack Flow Rate	Nm^3/sec	3.7
Percent Isokinetic Rate	%	102

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	3.7	5.5	0.01
Oxides of Nitrogen (as NO_2)	270	399	1.01
Carbon Monoxide	432	637	1.61
Sulphur trioxide (as SO_3)	0.5	0.7	0.002
Sulphur dioxide	< 1.2	< 1.8	< 0.005

Table 24: Test Information – GO3A

Site		Wilga Park Power Station
Sample Location		GO3A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		2
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	04/11/2025
Start Time	hh:mm	11:00
End Time	hh:mm	12:04
Average Stack Temperature	°C	502
Absolute Stack Pressure	mb	989
Moisture Content	% v/v	9.1
Oxygen	% v/v	9.3
Carbon dioxide	% v/v	6.7
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.4
Sample Volume (dry gas meter)	Nm^3	0.85
Stack Gas Velocity	m/sec	43.5
Actual Stack Flow Rate	m^3/sec	3.5
Dry Standard Stack Flow Rate	Nm^3/sec	1.1
Percent Isokinetic Rate	%	102

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	2.4	2.8	0.003
Oxides of Nitrogen (as NO_2)	299	359	0.33
Carbon Monoxide	589	706	0.64
Sulphur trioxide (as SO_3)	1.6	1.9	0.002
Sulphur dioxide	< 1.4	< 1.7	< 0.002

Table 25: Test Information – GO4A

Site		Wilga Park Power Station
Sample Location		GO4A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		1
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	04/11/2025
Start Time	hh:mm	9:21
End Time	hh:mm	10:25
Average Stack Temperature	°C	475
Absolute Stack Pressure	mb	988
Moisture Content	% v/v	8.7
Oxygen	% v/v	9.5
Carbon dioxide	% v/v	6.5
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.4
Sample Volume (dry gas meter)	Nm^3	0.75
Stack Gas Velocity	m/sec	37.4
Actual Stack Flow Rate	m^3/sec	3.0
Dry Standard Stack Flow Rate	Nm^3/sec	1.0
Percent Isokinetic Rate	%	100

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	3.5	4.3	0.003
Oxides of Nitrogen (as NO_2)	321	390	0.31
Carbon Monoxide	471	573	0.46
Sulphur trioxide (as SO_3)	0.4	0.5	0.0004
Sulphur dioxide	< 1.5	< 1.9	< 0.002

Table 26: Test Information – GO5A

Site		Wilga Park Power Station
Sample Location		GO5A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		3
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	04/11/2025
Start Time	hh:mm	12:58
End Time	hh:mm	14:02
Average Stack Temperature	°C	506
Absolute Stack Pressure	mb	989
Moisture Content	% v/v	9.3
Oxygen	% v/v	9.4
Carbon dioxide	% v/v	6.7
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.4
Sample Volume (dry gas meter)	Nm^3	0.84
Stack Gas Velocity	m/sec	44.8
Actual Stack Flow Rate	m^3/sec	3.6
Dry Standard Stack Flow Rate	Nm^3/sec	1.1
Percent Isokinetic Rate	%	98

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	< 2.4	< 2.9	< 0.003
Oxides of Nitrogen (as NO_2)	285	344	0.32
Carbon Monoxide	582	701	0.65
Sulphur trioxide (as SO_3)	2.4	2.9	0.003
Sulphur dioxide	< 1.3	< 1.6	< 0.001

Table 27: Test Information – GO6A

Site		Wilga Park Power Station
Sample Location		GO6A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		5
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	06/11/2025
Start Time	hh:mm	16:04
End Time	hh:mm	17:08
Average Stack Temperature	°C	490
Absolute Stack Pressure	mb	988
Moisture Content	% v/v	8.6
Oxygen	% v/v	9.4
Carbon dioxide	% v/v	6.3
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.4
Sample Volume (dry gas meter)	Nm^3	0.86
Stack Gas Velocity	m/sec	44.2
Actual Stack Flow Rate	m^3/sec	3.6
Dry Standard Stack Flow Rate	Nm^3/sec	1.1
Percent Isokinetic Rate	%	99

Parameter		standard conditions Concentration			Emission Rate
		mg/Nm^3		mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	<	2.3	<	2.8	< 0.003
Oxides of Nitrogen (as NO_2)		346		417	0.39
Carbon Monoxide		440		530	0.50
Sulphur trioxide (as SO_3)		1.0		1.2	0.001
Sulphur dioxide	<	1.3	<	1.6	< 0.002

Table 28: Test Information – GO7A

Site		Wilga Park Power Station
Sample Location		GO7A
Reference Method		USEPA M8 - ISOKINETIC
Run ID		4
Test Parameter		PM & SOx
Test Date	dd/mm/yyyy	04/11/2025
Start Time	hh:mm	16:14
End Time	hh:mm	17:18
Average Stack Temperature	°C	457
Absolute Stack Pressure	mb	988
Moisture Content	% v/v	8.7
Oxygen	% v/v	9.3
Carbon dioxide	% v/v	6.7
Dry Gas Density	kg/Nm^3	1.31
Dry Gas Molecular Weight	g/g-mole	29.4
Sample Volume (dry gas meter)	Nm^3	0.75
Stack Gas Velocity	m/sec	35.8
Actual Stack Flow Rate	m^3/sec	3.3
Dry Standard Stack Flow Rate	Nm^3/sec	1.1
Percent Isokinetic Rate	%	102

Parameter	standard conditions Concentration		Emission Rate
	mg/Nm^3	mg/Nm^3 & 7% O_2	g/sec
Solid Particles - total	< 2.7	< 3.2	< 0.003
Oxides of Nitrogen (as NO_2)	373	445	0.41
Carbon Monoxide	374	446	0.42
Sulphur trioxide (as SO_3)	1.2	1.4	0.001
Sulphur dioxide	< 1.6	< 2.0	< 0.002

7 QUALITY ASSURANCE & QUALITY CONTROL (QA/QC)

Assured Environmental operates within a quality system based upon the requirements of ISO17025.Our quality system defines specific procedures and methodologies to ensure any project undertaken by Assured Environmental is conducted with the highest level of quality given the specific confines of each project. The overall objective of our QA/QC procedures is to representatively sample and accurately analyse components in the gas streams and therefore report valid measurements of emission concentrations.

To ensure representativeness of field work, our quality procedures target:

1. Correct sampling locations
2. Sample time
3. Frequency of samples and
4. Method selection & adherence

To ensure representativeness of lab work, our quality procedures target:

1. Sample preservation
2. Chain of custody (COC)
3. Sample preparation and
4. Analytical techniques

Assured Environmental maintains strict quality assurance throughout all its sampling programs, covering on-site 'field work' and the analytical phase of our projects. Our QA program covers the calibration of all sampling and analytical apparatus where applicable and the use of spikes, replicate sample and reference standards. The test methodologies used for this project are outlined in the methods section of this document. Field test data has been recorded and calculated using direct entry into Microsoft Excel spreadsheets following the procedures of the appropriate test methods. Determination of emission concentrations has been performed using the same Microsoft Excel spreadsheets which are partially supplied as an attachment to this report. More detailed information can be supplied upon request.

QA/QC checks for this project will use validation techniques and criteria appropriate to the type of data and the purpose of the measurement to approve the test report. Records of all data will be maintained. Complete chain of custody (COC) procedures has been followed to document the entire custodial history of each sample. The COC forms also served as a laboratory sheet detailing sample ID and analysis requirements.

Table 29: Sampling Data QA/QC Checklist

Sampling Data QA/QC Checklist	Comment
Use of appropriate test methods	Yes
'Normal' operation of the process being tested	Yes – as instructed by client
Use of properly operating and calibrated test equipment	Yes
Use of high purity reagents	Yes
Performance of leak checks post sample (at least)	Yes

Table 30: Laboratory Data QA/QC Checklist

Laboratory Data QA/QC Checklist	Comment
Use of appropriate analytical methods	Yes
Use of properly operating and calibrated analytical equipment	Yes
Precision and accuracy comparable to that achieved in similar projects	Yes
Accurate reporting	Yes

8 GLOSSARY OF TERMS

The following terms and abbreviations may be used in this report:

Table 31: Definitions

Symbol	Definition
<	The analytes tested for was not detected; the value stated is the reportable limit of detection
Am^3	Gas volume in cubic metres at measured conditions
AS	Australian Standard
°C	Degrees Celsius
CO	Carbon monoxide
dscm	dry standard cubic meters
g	Grams
kg	Kilograms
m	Metres
m^3	actual gas volume in cubic metres as measured
mbar	Millibars
mg	Milligrams (10^{-3} grams)
min	Minute
ml	Millilitres
mmH_2O	Millimetres of water
Mole	SI unit that measures the amount of substance
N/A	Not applicable
Nm^3	Gas volume in dry cubic metres at standard temperature and pressure (0°C and 101.3 kPa)
NOx	Oxides of nitrogen expressed as NO_2 equivalent (nitric oxide (NO) + nitrogen dioxide (NO_2))
NR	Not required on this occasion
ppb	Parts per billion
ppm	Parts per million
sec	Second
Sm^3	Gas volume in dry cubic metres at standard temperature and pressure (0°C and 101.3 kPa) and corrected to a standardised value (e.g. 15% O_2)
STP	Standard temperature and pressure (0°C and 101.3 kPa)
SO_3	Sulfur trioxide
SO_2	Sulfur dioxide
TWA	Time weighted average
USEPA	United States Environmental Protection Authority

9 APPENDIX A - CALIBRATION CERTIFICATES

Doc number	File Name	Last modified	Authorised by	Version	QUALITY - CALIBRATION
F101.009.027	L-type Pitot Tube Dimension Check	27/09/2022	DL	1.2	

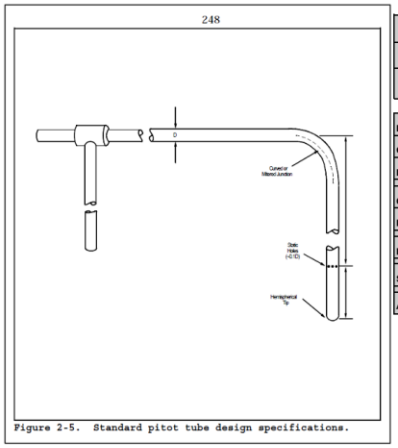


Figure 2-5. Standard pitot tube design specifications.

Pilot tube Serial Number	PT05	Reference Calliper Serial Number	SN438
Checked by :	LJ	Last Calibration Date	28/02/2025
Date Checked	4/03/2025	Next Calibration Due Date	4/03/2027

Parameter	Inspection result	Tollerance	Check
General condition	PASS	-	
Hemispherical Tip damaged	NO	NO	
Outer Diameter (mm)	8.03		
Distance - Tip to Static Holes (mm)	68.43	9 D	6 diameters (mininum)
Distance - Static Holes to Centerline External Tube (mm)	132	16 D	8 diameters (mininum)
Static pressure holes - of equal size, equally spaced (mm)	0.8	.10 D	approx 0.1 D
Angle of bend (°)	90		90°

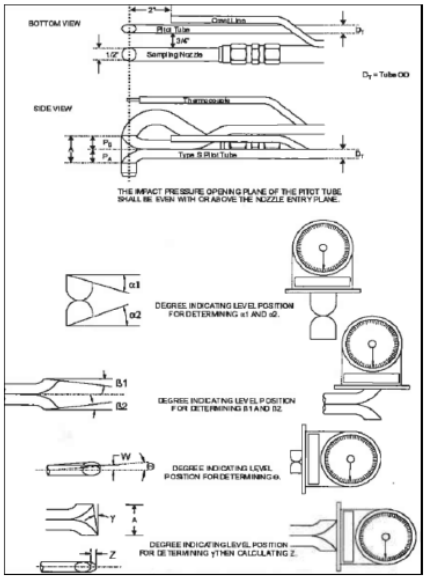
Note: If any of the check column result = NO, remove pilot from service and notify technical manager for action.

IF CHECKS ARE ALL OK, ASSIGN COEFFICIENT OF 0.99

Reviewed By:	TB	Date Reviewed:	6/03/2025

Figure 4: L-type Pitot Tube Dimension Check

Doc number	File Name	Last modified	Authorised by	Version	QUALITY - CALIBRATION
F101.009.008	S-type Pitot Tube Dimension Check	18/04/2023	JW	3.4	



Pitot tube Serial Number	PN111	Reference Calliper Serial Number	SN438
Checked by :	JH	Reference Calliper Last Calibration Date	14/02/2024
Date Checked	26/07/2024	Reference Calliper Calibration Due Date	14/02/2026
Date for next calibration check	26/07/2026		

Parameter	Inspection result	Tolerance	Check
General condition	PASS	PASS	OK
Openings damaged	NO	NO	OK
Df (mm)	9.39	4 to 10 AS 4323.1 4.8 - 9.5 USEPA M2	OK
A	23.04	2.1 Df ≤ A ≤ 3 Df	OK
A - Pa(mm)	11.52	Pa = Pb	OK
B - Pb (mm)	11.52		
P check		1.05 ≤ Pa/Df ≤ 1.5	OK
A - α1	1	-10° < α < +10°	OK
B - α2	1		
A - β1	2	-5° < β < +5°	OK
B - β2	2		
Z = A tan γ	0	Z ≤ 3.2	OK
W = A tan θ	0.0	W ≤ 0.8	OK

Note: If any of the check column result = NO, remove pitot from service and notify technical manager for action.

Reviewed By:	JW	Date Reviewed:	06/08/2024

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Figure 5: S-type Pitot Tube Dimension Check

Doc number	File Name	Last modified	Authorised by	Version	QUALITY - CALIBRATION
F101.009.002	Thermocouple Indicator Check	13/09/2022	DL	5.2	

Background Information	
Equipment Serial Number	SN173
Date Calibrated	13-Aug-25
Calibrated By	Nige
Reference Indicator Serial Number	SN459
Reference Indicator Calibration Date	05-Aug-25
Reference Indicator Calibration due date Date	05-Aug-27
% Error Tolerance	2

Data Input										Results				
		Indicator Response								% Error/Difference				
Channel ID	Channel Name (if applicable)	Zero		Span 1		Span 2		Span 3		Zero	Span 1	Span 2	Span 3	Response
Channel 1 Setpoint	AUX	0	°C	100	°C	250	°C	800	°C	0.0	1.0	0.4	0.0	OK
Channel 1 Response	AUX	0	°C	101	°C	251	°C	800	°C					
Channel 2 Setpoint	Stack	0	°C	100	°C	250	°C	800	°C	0.0	0.0	0.0	0.0	OK
Channel 2 Response	Stack	0	°C	100	°C	250	°C	800	°C					
Channel 3 Setpoint	Probe	0	°C	100	°C	250	°C	800	°C	1.0	1.0	0.4	0.1	OK
Channel 3 Response	Probe	-1	°C	99	°C	249	°C	799	°C					
Channel 4 Setpoint	Filter	0	°C	100	°C	250	°C	800	°C	0.0	0.0	0.0	0.0	OK
Channel 4 Response	filter	0	°C	100	°C	250	°C	800	°C					
Channel 5 Setpoint	Exit	0	°C	100	°C	250	°C	800	°C	0.0	0.0	0.0	0.0	OK
Channel 5 Response	Exit	0	°C	100	°C	250	°C	800	°C					

Reviewed By:	JW	Date Reviewed:	14/08/2025

Figure 6: Thermocouple Indicator Check

Doc number	File Name	Last modified	Authorised by	Version	QUALITY - CALIBRATION
F101.009.005	Working Manometer Calibration Check	7/03/2024	JW	7.4	

Background Information	
Manometer Serial Number	SN173
Date Calibrated:	13-Aug-25
Next Calibration Due Date:	13/01/2026
Calibrated By:	Nige
Reference Manometer Serial Number	SN119
Last Reference manaometer Calibration Date	17/04/2025
Next Reference manaometer Calibration Due Date:	17/04/2028
% Error Tolerance (Across Span)	2

Results				
DP side		ΔH side		
0.0	0.0	0.0	0.0	Average % Error
0.0	0.0	0.0	0.0	Maximum % Error
	NO		NO	Calibration Required?

*Zero manometers prior to beginning calibration checks

Input Data					Calibration Results			
Suggested	Reference set point	Channel 1 response	Channel 2 response	Reference Manometer	DP side		ΔH side	
		DP side	ΔH side					
mm H_2O	kPa	mm H_2O	mm H_2O	mm H_2O	% Error	% Error Accross Span	% Error	% Error Accross Span
*0 (Zero)	0	0	0	0	0	0	0	0
*180 (Span)	1.8	180	180	180	0.0	0.0	0.0	0.0
2	0.02	2	2	2.0	0.0	0.0	0.0	0.0
5	0.05	5	5	5.0	0.0	0.0	0.0	0.0
10	0.1	10	10	10	0.0	0.0	0.0	0.0
20	0.2	20	20	20	0.0	0.0	0.0	0.0
40	0.4	40	40	40	0.0	0.0	0.0	0.0
80	0.8	80	80	80	0.0	0.0	0.0	0.0
120	1.2	120	120	120	0.0	0.0	0.0	0.0

Reviewed By:	JW	Date Reviewed:	14/08/2025

Figure 7: Manometer Check

Gas analyser SN		SN935				
Calibration performed by:		GG TB				
		Carbon dioxide	Oxygen	Carbon monoxide	Nitric oxide	Nitrogen dioxide
Upscale gas cylinder reference number		QCSPC038919	456981	QCSPC038919	QCSPC038919	456981
Certificate expiry date	dd/mm/yyyy	19/05/2028	25/01/2027	19/05/2028	19/05/2028	25/01/2027
Upscale calibration gas value (Cma)	ppm / vol-%	8.04	18.9	501	491	40.5
Mid-point gas cylinder reference number		QCSPC038919	456981	QCSPC038919	QCSPC038919	456981
Certificate expiry date	dd.mm.yyyy	46892	46412.45833	46892	46892	46412.45833
Mid-point calibration gas value	ppm / vol-%	4.02	9.45	250.5	245.5	20.25
Date of pre-calibration	dd.mm.yyyy	3/11/2025				
Initial zero check response	ppm / vol-%	0	0	0	0	0
Zero point calibration error (initial)	%	0.0	0.0	0.0	0.0	0.0
Initial upscale calibration response	ppm / vol-%	8.03	18.94	501	491	39.8
Upscale calibration error (initial)	%	0.1	-0.2	0.0	0.0	1.7
Initial mid-point calibration response	ppm / vol-%	4.07	9.51	247	241	19.8
Mid-point calibration error (initial)	%	-0.6	-0.3	0.7	0.9	1.1
Date of post-calibration	dd/mm/yyyy	7/11/2025				
Post sampling zero check response	ppm / vol-%	0.03	0	0	0	0
Zero point calibration error (post sampling)	%	-0.4	0.0	0.0	0.0	0.0
Zero drift	%	0.4	0.0	0.0	0.0	0.0
Post sampling upscale calibration response	ppm / vol-%	8.06	18.96	507	497	40
Upscale calibration error (post sampling)	%	-0.2	-0.3	-1.2	-1.2	1.2
Upscale drift	%	0.4	0.1	1.2	1.2	0.5
Post sampling mid-point calibration response	ppm / vol-%	4.12	9.53	243	246	20.1
Mid-point calibration error (post sampling)	%	-1.2	-0.4	1.5	-0.1	0.4
Mid-point drift	%	0.6	0.1	0.8	1.0	0.7

Figure 8: Gas Analyser Calibration Check