DATE OF REPORT: 7TH APRIL 2025

David Rivett
Health, Safety and Environment Leader
Ben Furney Flour Mills
101-105 Brisbane Street
Dubbo NSW 2830

TEST REPORT NO. FEB25013.1

MONITORING OF EMISSIONS FROM THE TVP BOILER STACK (EPA NO.1) AND THE GRAIN MILL BOILER STACK (EPA NO.2) AT BEN FURNEY FLOUR MILLS IN DUBBO NSW.

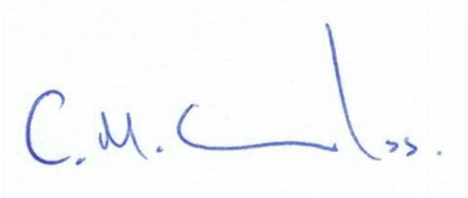
DATE OF TESTS: 19TH MARCH 2025

ACCREDITATION:

This laboratory is accredited by the National Association of Testing Authorities (NATA).
NATA Accredited Laboratory No. 15463.
Accredited for compliance with ISO/IEC 17025 – Testing.

AUTHORISATION:

Mr. P.A. Collins BSc.
QUALITY MANAGER



Dr. C.M. Clunies-Ross *PhD(Chem.Eng.)*
LABORATORY MANAGER

EXECUTIVE SUMMARY

Airlabs Environmental Pty Ltd was commissioned by Ben Furney Flour Mills to conduct air emissions monitoring of the TVP Boiler (EPA No.1) and Grain Mill Boiler (EPA No.2) at their Dubbo facility, NSW, to ensure compliance with the facility's NSW EPA Environmental Protection Licence requirements (Licence No. 4979, 17 May 2021). Testing of the TVP Boiler Stack (EPA No.1) and the Grain Mill Boiler Stack (EPA No.2) was performed on the 19th of March 2025. The results are provided in Table 1 below.

Table 1: Results summary for the TVP (EPA No.1) and Grain Mill (EPA No.2) boiler stacks.

Test Parameter	Concentration (g/Nm^3)	Mass Emission Rate (g/min)
TVP Boiler Stack (EPA No.1)		
Total Particulate Matter[a]	< 0.000009	< 0.00004
Oxides of Nitrogen (NO & NO_2 as NO_2)	0.065	0.32
Grain Mill Boiler Stack (EPA No.2)		
Total Particulate Matter[b]	< 0.00001	< 0.00007
Oxides of Nitrogen (NO & NO_2 as NO_2)	0.051	0.37

It must be noted that all results were correct at the time of sampling. These results are a snapshot of site conditions at the time of testing and may not accurately reflect long term trends. Variations in plant maintenance and operating conditions, fuels and other factors may influence emissions at other times.

[a] The pollutant measured by AS 4323.2 and the other methods referred to in NSW EPA TM-15 is 'Total Particulate Matter'. The facility's NSW EPA Licence incorrectly refers to the pollutant to be monitored by this method as 'Total Solid Particles'.
[b] The pollutant measured by AS 4323.2 and the other methods referred to in NSW EPA TM-15 is 'Total Particulate Matter'. The facility's NSW EPA Licence incorrectly refers to the pollutant to be monitored by this method as 'Total Solid Particles'.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Airlabs Environmental Pty Ltd was commissioned by Ben Furney Flour Mills to conduct air emissions monitoring of the TVP Boiler (EPA No.1) and Grain Mill Boiler (EPA No.2) at their Dubbo facility, NSW, to ensure compliance with the facility's NSW EPA Environmental Protection Licence requirements (Licence No. 4979, 17 May 2021). The following parameters were monitored under normal operating conditions:

- Gas velocity and volume flow rate
- Temperature
- Moisture concentration
- Concentration of oxygen (O_2) and carbon dioxide (CO_2)
- Dry gas density & molecular weight of gases
- Concentration and mass emission rate of:
  - Total particulate matter
  - Nitrogen oxides (NO_x) (NO & NO_2 as NO_2)

Combustion gases (O_2, CO_2 and NO_x) were monitored continuously during each test run. Ranges for combustion gases have been reported when the difference between high and low values was considered significant, with the average value logged over the monitoring period given in parentheses. Otherwise, only the average value has been reported.

Testing of the TVP Boiler Stack (EPA No.1) and the Grain Mill Boiler Stack (EPA No.2) was performed on the 19th of March 2025.

QUALITY STATEMENT

Airlabs Environmental is committed to providing the highest quality data to all our clients, as reflected in our ISO 17025 (NATA) accreditation. This requires strict adherence to, and continuous improvement of, all our processes and test work. Our goal is to exceed the QA/QC requirements as set by our clients and appropriate governmental entities and to ensure that all data generated is scientifically valid and defensible.

Airlabs Environmental is NATA accredited for all sampling and analysis undertaken for this project in accordance with our scope of accreditation.

DEFINITIONS

Table 2: Terms and definitions.

NSW EPA	New South Wales Environment Protection Authority.
US EPA	United States Environmental Protection Agency.
AS	Australian Standard.
STP	Standard temperature and pressure (0°C and 101.325 kPa).
EPA No.	NSW EPA nominated monitoring/discharge point number.
m	Metres.
m^3	Actual gas volume in cubic metres as measured.
m^3/min	Actual gas flow rate in cubic metres per minute at stack conditions.
Nm^3	Gas volume in dry cubic metres at STP.
Nm^3/min	Normalised gas flow rate in dry cubic metres per minute at STP.
s	Seconds.
m/s	Metres per second.
mg	Milligrams (10^{-3} grams).
g	Grams.
mg/Nm^3	Concentration of test parameter in milligrams per cubic metre of dry gas at STP.
g/Nm^3	Concentration of test parameter in grams per cubic metre of dry gas at STP.
g/min	Mass emission rate of test parameter in grams per minute.
K	Absolute temperature in Kelvin (°C + 273).
<	Less than. The value stated is the limit of detection. Where a range of parameter concentrations is reported, half the limit of detection is used when calculating the average concentration or mass emission rate.
N/A	Not applicable.

TEST METHODS

Sampling and analysis were performed by Airlabs unless otherwise specified. Specific details of the methods used are available upon request.

Table 3: Summary of test methods.

Parameter	Test Method	Method Detection Limit	Estimated Measurement Uncertainty	NATA Accredited	
				Sampling	Analysis
Sample plane criteria	AS 4323.1	N/A	N/A	✓	N/A
Gas velocity and volume flow rate	ISO 10780	3 m/s	± 13%	N/A	✓
Temperature	US EPA 2	273K	± 2.6%	N/A	✓
Oxygen	US EPA 3A	0.1%	± 6.0%	✓	✓
Carbon dioxide	US EPA 3A	0.1%	± 13%	✓	✓
Dry gas density & molecular weight of gases	US EPA 3	N/A	± 13%	✓	✓
Moisture content	US EPA 4	0.4%	± 8.4%	✓	✓
Total particulate matter	AS 4323.2	0.0001 g/m^3	± 15%	✓	✓
Nitrogen oxides (as NO_2)	US EPA 7E	0.002 g/m^3	± 13%	✓	✓

DEVIATIONS & INFLUENCING FACTORS

There were no deviations in the sampling or analytical methods.

Both boilers produce steam as required by the associated processes. As this demand fluctuates, and the boilers produce more steam than required at any one time, the boilers were observed to run on cycles of RUN and STANDBY. These cycles resulted in regular fluctuations in pollutant concentrations and emission rates during the testing periods. As this is considered 'normal operation' for the boilers, the results in this report are the averages for each entire testing period.

Table 4: TVP and Grain Mill boiler operating cycles.

Boiler	RUN (mins)	STANDBY (mins)
TVP Boiler	8	5
Grain Mill Boiler	4	3 - 5

It must be noted that all results were correct at the time of sampling. These results are a snapshot of site conditions at the time of testing and may not accurately reflect long term trends. Variations in plant maintenance and operating conditions, fuels and other factors may influence emissions at other times.

DECISION RULE

As the site's NSW EPA licence stipulates that monitoring must be undertaken at both monitoring/discharge points to determine the concentration of Nitrogen Oxides and Total Solid Particles but does not specify any concentration limits, a decision rule is not required.

PLANT OPERATIONAL DATA

Each boiler was operating under normal production conditions during its respective testing period. Both boilers are fuelled by natural gas.

The above operating conditions are considered representative of typical plant conditions. It must be noted that all data regarding plant operating conditions was supplied by Ben Furney Flour Mills and cannot been verified by Airlabs Environmental.

SAMPLING PLANE LOCATION

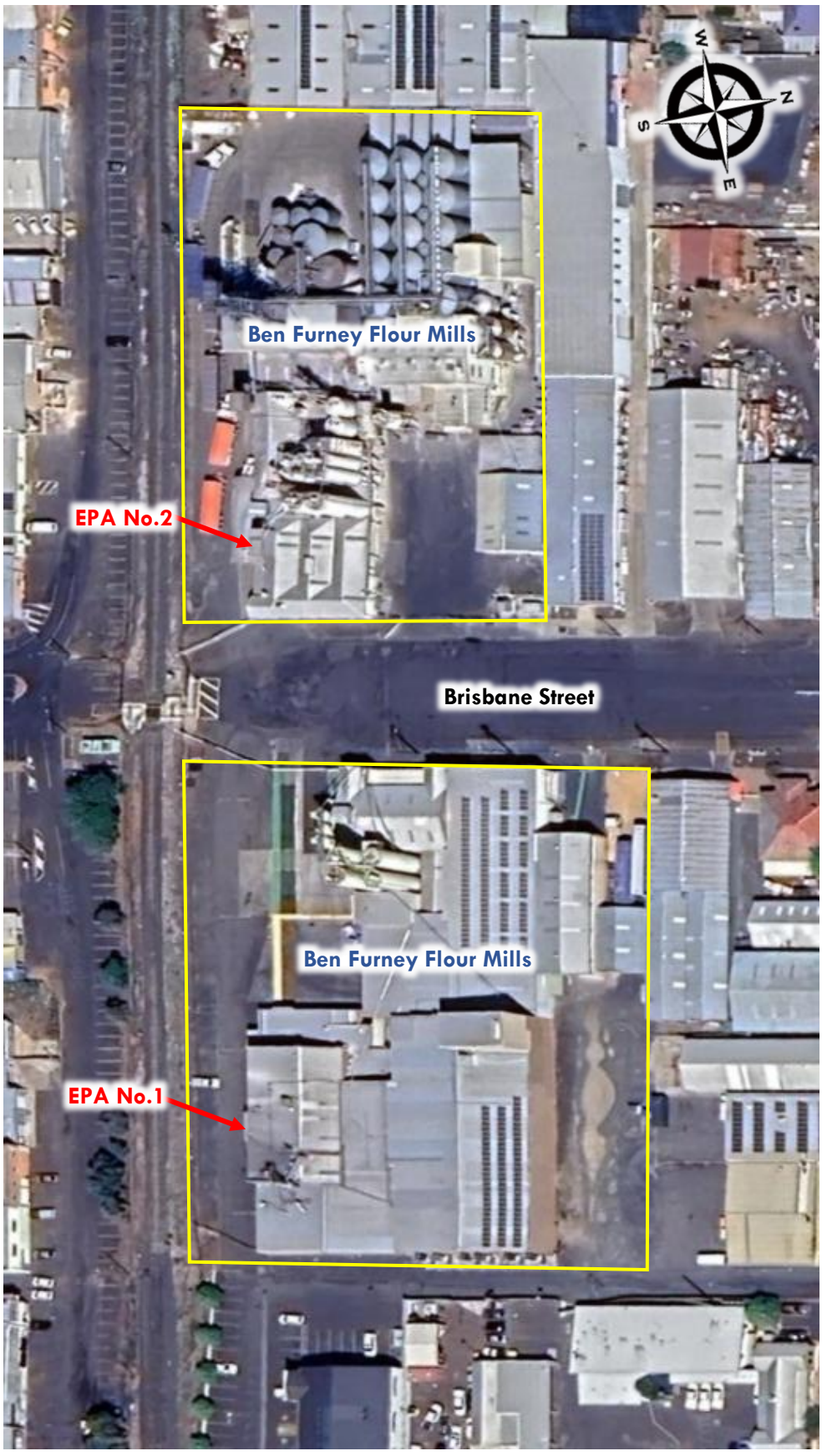


Figure 1: EPA No.1 & EPA No.2 stack locations at 101 -105 Brisbane Street, Dubbo NSW 2830.

SUITABILITY OF SAMPLING PLANE

Section 4.2.1 of AS 4323.1:2021 'Stationary source emissions. Selection of sampling positions and measurement of velocity in stacks' states that, in the absence of cyclonic flow activity, ideal sampling plane conditions are found to exist at the positions given in Table 5 below.

Table 5: Criteria for the 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	>2D	>6D
Louvre, butterfly damper (partially closed or closed)	>3D	>6D
Axial fan	>3D	>8D (see Note)
Centrifugal fan	>3D	>6D
NOTE: 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 still meets the criteria listed in Items (a) to (e) below.		

Section 4.2.2 of AS 4323.1:2021 states that an ideal sampling plane shall meet criteria contained in items (a) to (e) as follows:

(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 a 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 ratio of highest to lowest gas velocities shall not exceed 3:1. For isokinetic testing with the use of impingers, the gas velocity ratio 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.

In addition, the gas temperature at the sampling plane should be above the dewpoint.

The sampling locations for the TVP Boiler Stack (EPA No.1) and Grain Mill Boiler Stack (EPA No.2) did not satisfy the requirements of AS 4323.1:2021 Section 4.2.1 due to insufficient distance between the sampling planes and the upstream and/or downstream disturbances and are therefore considered non-ideal. The gas characteristics for both stacks satisfied the requirements of AS 4323.1:2021 Section 4.2.2 (a)-(e). The sampling plane details and required number of sampling points are given in Tables 6 and 7 below.

SUITABILITY OF SAMPLING PLANE continued

Table 6: TVP Boiler Stack (EPA No.1) sampling plane details.

Parameters	
Stack shape	Circular
Stack diameter (m) at sampling plane	0.250
Direction of discharge to air	Vertical
Stack diameter (m) at stack exit	0.250
Stack exit height (m) above ground level	6.33
Type of flow disturbance	Bend
Sampling plane distance downstream from disturbance	**4.8D (< 6D)**
Type of flow disturbance	Stack Exit
Sampling plane distance upstream from disturbance	**1.3D (< 2D)**
Compliance with AS 4232.1 Section 4.2.1 Criteria for Selection of Sampling Planes	**No**
Required No. and orientation of access holes	2 at 90°
Available No. and orientation of access holes	1
Compliance with AS 4323.1 Section 6 '*Sampling access holes*'	**No**
Standard No. of sampling points per traverse	2
Number of traverses	2
Correction factor	1.27
Corrected No. of sampling points per traverse	4
Total No. of sampling points	8
Gas flow direction is consistent at all points	Yes
Stratified gas flow	No
Cyclonic or swirling gas flow	No (<15°)
Absolute temperature difference between adjacent sampling points (K)	<1 (<10%)
Ratio of the highest to lowest pitot differential pressure across sampling plane	1.0:1 (<9:1)
Ratio of the highest to lowest gas velocity across sampling plane (isokinetic)	1.0:1 (<1.6:1)
Minimum differential pressure at any sample point ≥ 5 Pa	5 (≥ 5 Pa)
Gas temperature above dewpoint	Yes
Sampling location compliant with AS 4323.1 Section 4.2.2 (a)-(e)	**Yes**

Figure 2: Sampling plane location for the TVP Boiler Stack (EPA No.1).

SUITABILITY OF SAMPLING PLANE continued

Table 7: Grain Mill Boiler Stack (EPA No.2) sampling plane details.

Parameters	
Stack shape	Circular
Stack diameter (m) at sampling plane	0.255
Direction of discharge to air	Horizontal
Stack diameter (m) at stack exit	0.250
Stack exit height (m) above ground level	6.55
Type of flow disturbance	Bend
Sampling plane distance downstream from disturbance	**12D (> 6D)**
Type of flow disturbance	Bend
Sampling plane distance upstream from disturbance	**1.2D (< 2D)**
Compliance with AS 4232.1 Section 4.2.1 Criteria for Selection of Sampling Planes	**No**
Required No. and orientation of access holes	2 at 90°
Available No. and orientation of access holes	1
Compliance with AS 4323.1 Section 6 '*Sampling access holes*'	**No**
Standard No. of sampling points per traverse	2
Number of traverses	2
Correction factor	1.1
Corrected No. of sampling points per traverse	4
Total No. of sampling points	8
Gas flow direction is consistent at all points	Yes
Stratified gas flow	No
Cyclonic or swirling gas flow	No (<15°)
Absolute temperature difference between adjacent sampling points (K)	<1 (<10%)
Ratio of the highest to lowest pitot differential pressure across sampling plane	1.0:1 (<9:1)
Ratio of the highest to lowest gas velocity across sampling plane (isokinetic)	1.0:1 (<1.6:1)
Minimum differential pressure at any sample point ≥ 5 Pa	9 (≥ 5 Pa)
Gas temperature above dewpoint	Yes
Sampling location compliant with AS 4323.1 Section 4.2.2 (a)-(e)	**Yes**

Figure 3: Sampling plane location for the Grain Mill Boiler Stack (EPA No.2).

RESULTS – TVP Boiler Stack (EPA No.1)

Company	Ben Furney Flour Mills
Site	101 -105 Brisbane Street, Dubbo NSW 2830
Source Tested	TVP Boiler Stack (EPA No.1)
Date of Test	19th of March 2025
Sampling Period	09:46 to 10:46 (60 minutes per test)
Testing Officer	P. Collins
Sampling Position	One 52mm hole in a circular metal stack

Table 8: TVP Boiler Stack (EPA No.1) – Gas flow conditions.

Gas Flow Parameters	
Stack diameter at sampling plane (m)	0.250
Average stack gas temperature (K)	517 (244°C)
Average barometric pressure (mB)	992.7
Average static pressure (mB)	+ 0.02
Average stack pressure (mB)	992.7
Average moisture content (%v/v)	7.66
Average oxygen concentration (%v/v)	12.8
Average carbon dioxide concentration (%v/v)	4.57
Dry molecular weight of stack gas (g/g mole)	29.26
Wet molecular weight of stack gas (g/g mole)	28.39
Dry gas density of stack gas (kg/m^3)	1.306
Average velocity at sampling plane (m/s)	3.48
Actual gas flow rate (m^3/min)	10.2
Gas flow rate at STP, dry (Nm^3/min)	4.89

Table 9: TVP Boiler Stack (EPA No.1) – Test results.

Test Parameter	**Concentration (g/Nm^3)**	**Mass Emission Rate (g/min)**
Total Particulate Matter[c]	< 0.000009	< 0.00004
Oxides of Nitrogen (NO_x) (NO & NO_2 as NO_2)	0.0021 – 0.11 (0.065)	0.0098 – 0.54 (0.32)

[c] The pollutant measured by AS 4323.2 and the other methods referred to in NSW EPA TM-15 is 'Total Particulate Matter'. The facility's NSW EPA Licence incorrectly refers to the pollutant to be monitored by this method as 'Total Solid Particles'.

RESULTS – Grain Mill Boiler Stack (EPA No.2)

Company	Ben Furney Flour Mills
Site	101 -105 Brisbane Street, Dubbo NSW 2830
Source Tested	Grain Mill Boiler Stack (EPA No.2)
Date of Test	19th of March 2025
Sampling Period	07:51 – 08:51 (60 minutes per test)
Testing Officer	P. Collins
Sampling Position	One 52mm hole in a circular metal stack

Table 10: Grain Mill Boiler Stack (EPA No.2) – Gas flow conditions.

Gas Flow Parameters	
Stack diameter at sampling plane (m)	0.255
Average stack gas temperature (K)	437 (164°C)
Average barometric pressure (mB)	992.6
Average static pressure (mB)	+ 0.03
Average stack pressure (mB)	992.6
Average moisture content (%v/v)	8.74
Average oxygen concentration (%v/v)	13.3
Average carbon dioxide concentration (%v/v)	4.29
Dry molecular weight of stack gas (g/g mole)	29.23
Wet molecular weight of stack gas (g/g mole)	28.25
Dry gas density of stack gas (kg/m^3)	1.305
Average velocity at sampling plane (m/s)	4.19
Actual gas flow rate (m^3/min)	12.8
Gas flow rate at STP, dry (Nm^3/min)	7.18

Table 11: Grain Mill Boiler Stack (EPA No.2) – Test results.

Test Parameter	**Concentration (g/Nm^3)**	**Mass Emission Rate (g/min)**
Total Particulate Matter[d]	< 0.00001	< 0.00007
Oxides of Nitrogen (NO_x) (NO & NO_2 as NO_2)	0.0021 – 0.11 (0.051)	0.015 – 0.79 (0.37)

[d] The pollutant measured by AS 4323.2 and the other methods referred to in NSW EPA TM-15 is 'Total Particulate Matter'. The facility's NSW EPA Licence incorrectly refers to the pollutant to be monitored by this method as 'Total Solid Particles'.

APPENDIX A – Gas Analyser QA/QC Data

Table 12: Gas Analyser QA/QC Table

Process or element	QA/QC specification	Acceptance criteria	Checking frequency	Result	Compliant with US EPA M 7E?
Analyzer Design	Analyzer resolution or sensitivity	<2.0% of full-scale range	Manufacturer design	0.1 ppm	YES
	Interference gas check	Sum of responses ≤2.5% of calibration span	Manufacturer design.	1.1 %	YES
Calibration Gases	Traceability protocol (G1, G2)	Valid certificate required Uncertainty ≤2.0% of tag value	NATA Certified Calibration Gas	Analysis Uncertainty = 2%	YES
	High-level gas	Equal to the calibration span	Each test.	Cert. No. 030000044711/1 808 ppm NO	YES
	Mid-level gas	40 to 60% of calibration span	Each test.	Cert. No. 030000044711/1 104 ppm NO	YES
	Low-level gas	<20% of calibration span	Each test.	Nitrogen UN 1066 (Pure 4.2 – 99.992%) 0 ppm NO	YES
Sample Extraction	Probe temperature	For dry-basis analysers, keep sample above the dew point by heating, prior to sample conditioning	Each run.	105^{0}C	YES
	Filter head temperature			123^{0}C	YES
	Sample line temperature			122^{0}C	YES
Analyzer & Calibration Gas Performance	Analyzer calibration error	Within ±2.0 percent of the calibration span of the analyser for the low-, mid-, and high-level calibration gases	Before initial run and after a failed system bias test or drift test.	-1.1 %	YES
System Performance	System bias	Within ±5.0% of the analyser calibration span for low-scale and upscale calibration gases	Before and after each run.	Initial 0.2 % (low scale) -0.1 % (upscale) Final 0.4 % (low scale) -0.2 % (upscale)	YES
System Performance	System response time	Determines minimum sampling time per point	During initial sampling system bias test.	35 seconds	YES
	Drift	≤3.0% of calibration span for low-level and mid- or high-level gases	After each test run.	0.2 % (low scale) -0.1 % (upscale)	YES
	NO2-NO conversion efficiency	≥90% of certified test gas concentration	Before or after each test.	N/A	N/A
	Purge time	≥2 times system response time	Before starting the first run and when probe is removed from and re-inserted into the stack	90 seconds	YES

Process or element	QA/QC specification	Acceptance criteria	Checking frequency	Result	Compliant with US EPA M 7E?
	Minimum sample time at each point	Two times the system response time	Each sample point	90 seconds	YES
	Stable sample flow rate (surrogate for maintaining system response time)	Within 10% of flow rate established during system response time check	Each run.	60 ±2 L/hr	YES
Sample Point Selection	Stratification test	All points within ±10% of mean for 3-point	Prior to first run.	2% of mean	YES
Data Recording	Frequency	≤1 minute average	During run.	1 minute	YES
Data Parameters	Average concentration for the run	Run average ≤calibration span	Each run.	58 ppm (≤104 ppm)	YES

END OF REPORT