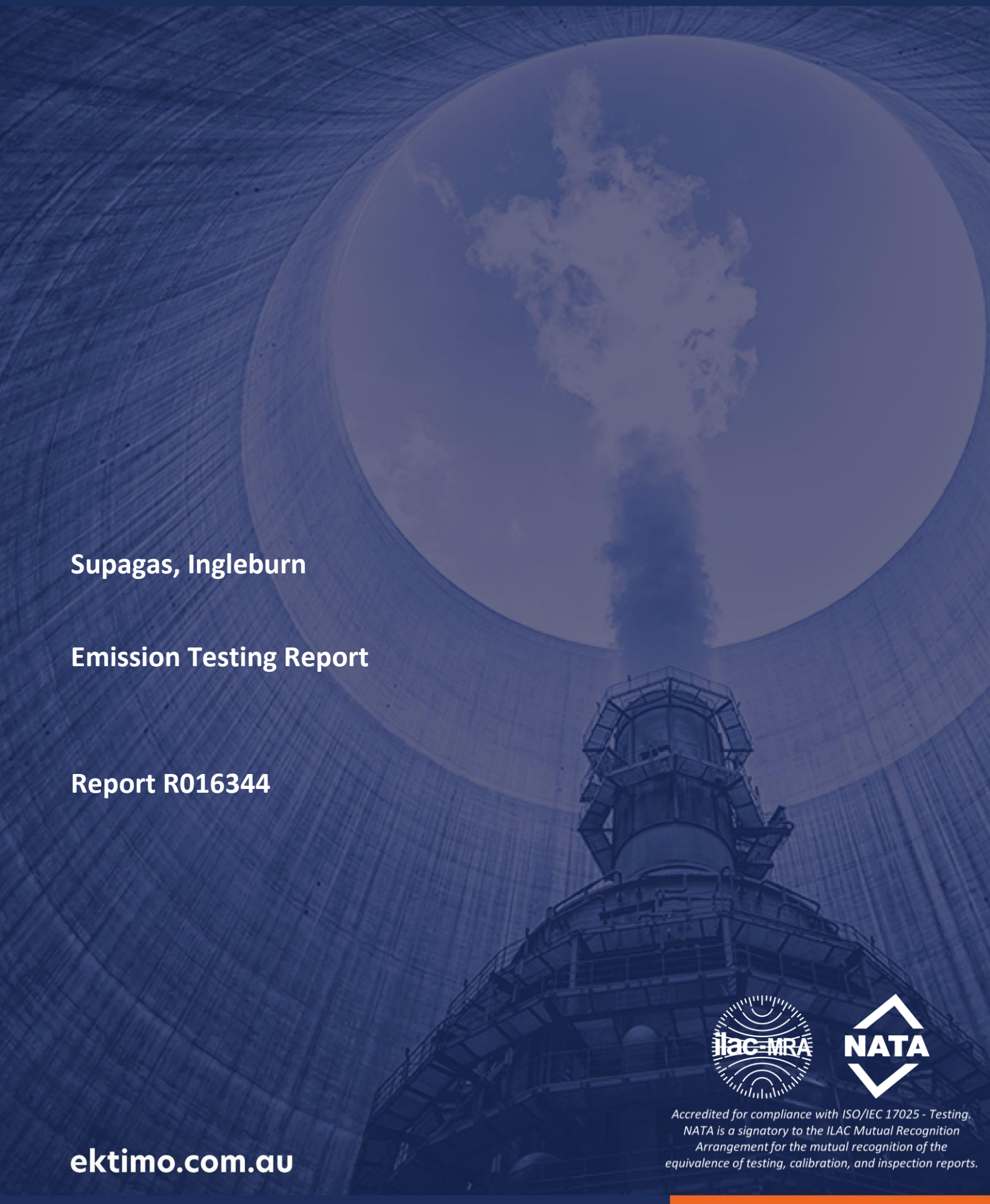
Ektimo



# Supagas, Ingleburn

## Emission Testing Report

## Report R016344

Ektimo

## Document Information

| | |
|---|---|
| Client Name: | Supagas |
| Report Number: | R016344 |
| Date of Issue: | 27 March 2024 |
| Attention: | Ben Woodbridge |
| Address: | 5 Benson Road<br>Ingleburn NSW 2565 |
| Testing Laboratory: | Ektimo Pty Ltd, ABN 86 600 381 413 |

## Report Authorisation

**Steven Cooper**
**Senior Air Monitoring Consultant**

NATA Accredited Laboratory
No. 14601



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

## Table of Contents

# 1 Executive Summary

## *1.1 Background*

Ektimo was engaged by Supagas to perform annual emission testing at their Ingleburn site pursuant to their Environment Protection Licence, 20022.

## *1.2 Project Objective & Overview*

The objective of the project was to quantify emissions from (one) 1 discharge point to determine compliance with Supagas' Environmental Licence.

Monitoring was performed as follows:

| Location | Test Date | Test Parameters* |
|---|---|---|
| EPA 1<br>$CO_2$ Production Plant Absorber Tower Stack | 17 January 2024 | Nitrogen oxides, carbon monoxide, carbon dioxide, oxygen |

* 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 Licence Comparison*

The following licence comparison table shows that the analyte below is within the licence limit set by the NSW EPA as per licence 20022 (last amended on 10 July 2014).

| Location ID | Location Description | Pollutant | Units | Licence limit | Detected values | Detected values (corrected to 3% $O_2$) |
|---|---|---|---|---|---|---|
| 1 | $CO_2$ Production Plant Absorber Tower Stack | Nitrogen Oxides | $mg/m^3$ | 230 | 140 | 150 |

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

Ektimo

# 2 Results

## 2.1 EPA 1 — $CO_2$ Production Plant Absorber Tower Stack

| | | | |
|---|---|---|---|
| **Date** | 17/01/2024 | **Client** | Supagas |
| **Report** | R016344 | **Stack ID** | CO2 Production Plant Absorber Tower Stack |
| **Licence No.** | 20022 | **Location** | Ingleburn |
| **Ektimo Staff** | Steven Cooper | **State** | NSW |
| **Process Conditions** | Please refer to client records. | | 231213 |

| | | |
|---|---|---|
| **Stack Parameters** | | |
| Moisture content, %v/v | 14 | |
| Gas molecular weight, g/g mole | 27.1 (wet) | 28.5 (dry) |
| Gas density at STP, kg/m³ | 1.21 (wet) | 1.27 (dry) |
| Gas density at discharge conditions, kg/m³ | 1.00 | |
| % Oxygen correction & Factor | 3 % | 1.04 |
| | | |
| **Gas Flow Parameters** | | |
| Flow measurement time(s) (hhmm) | 0946 | |
| Temperature, °C | 54 | |
| Temperature, K | 327 | |
| Velocity at sampling plane, m/s | <2 | |
| Volumetric flow rate, actual, m³/s | <2 | |
| Volumetric flow rate (wet STP), m³/s | <1 | |
| Volumetric flow rate (dry STP), m³/s | <1 | |
| Mass flow rate (wet basis), kg/h | <6000 | |

| **Gas Analyser Results** | Average | | | Minimum | | | Maximum | | |
|---|---|---|---|---|---|---|---|---|---|
| Sampling time | 0947 - 1047 | | | 0947 - 1047 | | | 0947 - 1047 | | |
| | Concentration mg/m³ | Corrected to 3% O2 mg/m³ | Mass Rate g/min | Concentration mg/m³ | Corrected to 3% O2 mg/m³ | Mass Rate g/min | Concentration mg/m³ | Corrected to 3% O2 mg/m³ | Mass Rate g/min |
| **Combustion Gases** | | | | | | | | | |
| Nitrogen oxides (as $NO_2$) | 140 | 150 | <10 | 110 | 120 | <8 | 160 | 160 | <10 |
| Carbon monoxide | 940 | 980 | <70 | 650 | 680 | <50 | 1200 | 1200 | <90 |
| | Concentration %v/v | | | Concentration %v/v | | | Concentration %v/v | | |
| Carbon dioxide | 1.4 | | | 1.1 | | | 1.7 | | |
| Oxygen | 3.7 | | | 2.4 | | | 6 | | |

# 3 Sample Plane Compliance

## *3.1 EPA 1 — $CO_2$ Production Plant Absorber Tower Stack*

| **Sampling Plane Details** | |
|---|---|
| Source tested | Boiler |
| Pollution control equipment | Wet scrubber |
| Sampling plane dimensions | 1140 mm |
| Sampling plane area | 1.02 m² |
| Duct orientation & shape | Vertical Circular |
| Downstream disturbance | Exit 0 D |
| Upstream disturbance | Exit 0 D |
| No. traverses & points sampled | 2 20 |
| Sample plane conformance to AS 4323.1 | Non-conforming |
| | |
| **The sampling plane is deemed to be non-conforming due to the following reasons:** | |
| The differential pressure at one or more sampling points is less than 5 Pa | |
| The downstream disturbance is <1D from the sampling plane | |
| The upstream disturbance is <2D from the sampling plane | |
| The stack or duct does not have the required number of access holes (ports) | |

# 4 Plant Operating Conditions

See Supagas records for complete process conditions.

Based on the information received from Supagas personnel, it is our understanding that sampling was undertaken during typical plant operations.

# 5 Test Methods

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

| Parameter | Sampling method | Analysis method | Uncertainty* | NATA accredited Sampling | NATA accredited Analysis |
|---|---|---|---|---|---|
| Sampling points - Selection | NSW EPA TM-1 (AS 4323.1) | NA | NA | ✓ | NA |
| Flow rate, temperature & velocity | NSW EPA TM-2 (USEPA Method 2) | NSW EPA TM-2 (USEPA Method 2) | 8%, 2%, 7% | NA | ✓ |
| Moisture (stacks <60°C) | Ektimo 050 | Ektimo 050 | not specified | ✓ | ✓[j] |
| 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% | ✓ | ✓ |

*271123*

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

[j] Includes analysis of moisture content by Ektimo 050 which uses the same principle as ASTM E337.

## 6 Quality Assurance/Quality Control Information

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

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

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

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

## 7 Definitions

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

| | |
|---|---|
| % v/v | Volume to volume ratio |
| ~ | Approximately |
| < | Less than |
| > | Greater than |
| ≥ | Greater than or equal to |
| AS | Australian Standard |
| BSP | British standard pipe |
| 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. |
| EPA | Environment Protection Authority |
| 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 |
| 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 |
| USEPA | United States Environmental Protection Agency |
| Velocity difference | The percentage difference between the average of initial flows and after flows. |
| 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. |

# Ektimo

ektimo.com.au
1300 364 005

**MELBOURNE** (Head Office)
26 Redland Drive
Mitcham
VIC 3132
AUSTRALIA

**SYDNEY**
6/78 Reserve Road
Artarmon
NSW 2064
AUSTRALIA

**WOLLONGONG**
1/251 Princes Highway
Unanderra
NSW 2526
AUSTRALIA

**PERTH**
52 Cooper Road
Cockburn Central
WA 6164
AUSTRALIA

**BRISBANE**
3/109 Riverside Place
Morningside
QLD 4170
AUSTRALIA