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AGL UPSTREAM INVESTMENTS PTY LTD
Newcastle Gas Storage Facility
Quarterly Air Monitoring Report

Reporting Period: 2nd Quarter – April 2016

AGL Upstream Investments Pty Ltd

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Foreword

PREMISES	Newcastle Gas Storage Facility 5 Old Punt Road TOMAGO NSW 2322
LICENCE DETAILS	<u>Environment Protection Licence 20130</u>
LICENCEE	AGL Upstream Investments Pty Limited
LICENCEE'S ADDRESS	Locked Bag 1837, St Leonards, NSW 2065
MONITORING DATE	2 nd Quarter – 29 April 2016
MONITORING BY	Ektimo
ANALYSIS BY	Ektimo (laboratory report number R002666)
OBTAINED DATA DATE	27 May 2016 (Ektimo Report R002666)
REPORT DATE	30 May 2016
REPORT PREPARED BY	Aaron Clifton Environment Business Partner

SUMMARY OF ACTIVITY

The Newcastle Gas Storage Facility (NGSF) is located in Tomago, New South Wales.

The NGSF includes:

- A processing plant that converts pipeline natural gas to liquefied natural gas (LNG) by cooling it to -162°C. It is capable of processing up to 66,500 tonnes of LNG per year.
- An insulated, non-pressurised LNG storage tank capable of containing 30,000 tonnes or 63,000 m³ of LNG, equivalent to 1.5 petajoules (PJ) of natural gas, and an associated containment area.
- A re-gasification unit to convert the LNG in the storage tank back into natural gas.
- A flare stack with a height of approximately 15m to combust hydrocarbons discharged from the process.



- A truck loading facility to allow the dispatch of up to 1,000 tankers of LNG per year.
- Infrastructure and utility connection and an emergency access road.

This Monitoring Report relates to those air monitoring activities specified in Part 5, Monitoring and Recording Conditions, of the Environment Protection Licence. The Licence conditions stipulate air monitoring is required to be carried out at the locations, at the frequency and using the test methods as set out in the tables below.

This report is prepared in accordance with the *Requirements for Publishing Pollution Monitoring Data* (EPA, October 2013) (**Publication Requirements**).

AIR MONITORING LOCATIONS

Point	Location	Monitoring Frequency
7	Stack associated with the Gas Liquefaction System	Quarterly
8	Stack associated with the LNG Vaporiser	Quarterly

Note: monitoring is only undertaken when the equipment is operating.

AIR MONITORING TEST METHODS

Parameter	NSW EPA Test Method (Sampling Method)
Carbon dioxide	TM-24
Carbon monoxide	TM-32
Dry gas density	TM-23
Moisture	TM-22
Molecular weight of stack gases	TM-23
Nitrogen Oxides	TM-11
Oxygen (O ₂)	TM-25
Solid Particles	TM-15
Sulfuric acid mist and sulphur trioxide (as SO ₃)	TM-3
Sulphur dioxide	TM-4
Temperature	TM-2
Velocity	TM-2
Volatile organic compounds	OM-2
Volumetric flowrate	TM-2



Air Monitoring Results

Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Average Concentration	Concentration limit
7	Stack associated with Gas Liquefaction System	Carbon dioxide	Percent		TM-24	Quarterly	9.7	Not applicable
		Carbon monoxide	Milligrams per cubic metre	3%	TM-32	Quarterly	3.1	100
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.33	Not applicable
		Moisture	Percent		TM-22	Quarterly	11	Not applicable
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	29.8	Not applicable
		Nitrogen Oxides (as NO ₂ equivalent)	Milligrams per cubic metre		TM-11	Quarterly	74	250
		Oxygen (O ₂)	Percent		TM-25	Quarterly	4.3	Not applicable
		Solid Particles	Milligrams per cubic metre		TM-15	Quarterly	1.1	5
		Sulfuric acid mist and sulphur trioxide (as SO ₃)	Milligrams per cubic metre		TM-3	Quarterly	0.032	60
		Sulphur dioxide	Milligrams per cubic metre		TM-4	Quarterly	<5	Not applicable
		Temperature	Kelvin		TM-2	Quarterly	484	Not applicable
		Velocity	Metres per second		TM-2	Quarterly	4.3	Not applicable
		Volatile organic compounds	Milligrams per cubic metre	3%	OM-2	Quarterly	<0.02	5
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	0.65	Not applicable

Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Average Concentration	Concentration limit
8	Stack associated with LNG Vaporiser (H-501a, H-501b, H-501c)	Carbon dioxide	Percent		TM-24	Quarterly	No result*	Not applicable
		Carbon monoxide	Milligrams per cubic metre	3%	TM-32	Quarterly	No result*	125
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	No result*	Not applicable
		Moisture	Percent		TM-22	Quarterly	No result*	Not applicable
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	No result*	Not applicable
		Nitrogen Oxides (as NO ₂ equivalent)	Milligrams per cubic metre		TM-11	Quarterly	No result*	190
		Oxygen (O ₂)	Percent		TM-25	Quarterly	No result*	Not applicable
		Solid Particles	Milligrams per cubic metre		TM-15	Quarterly	No result*	Not applicable
		Sulfuric acid mist and sulphur trioxide (as SO ₃)	Milligrams per cubic metre		TM-3	Quarterly	No result*	5
		Sulphur dioxide	Milligrams per cubic metre		TM-4	Quarterly	No result*	40
		Temperature	Kelvin		TM-2	Quarterly	No result*	Not applicable
		Velocity	Metres per second		TM-2	Quarterly	No result*	Not applicable
		Volatile organic compounds	Milligrams per cubic metre	3%	OM-2	Quarterly	No result*	20
Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	No result*	Not applicable		

*LNG Vaporiser was not operating during this quarter.