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**AGL UPSTREAM INVESTMENTS PTY LTD
ROSALIND PARK GAS PLANT
Quarterly Air Monitoring Report**

Reporting Period: 1st Quarter – March 2013

AGL Upstream Investments Pty Ltd

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Foreword

PREMISES	Rosalind Park Gas Plant Lot 35 Medhurst Road GILEAD NSW 2560
LICENCE DETAILS	<u>Environment Protection Licence 12003</u>
LICENCEE	AGL Upstream Investments Pty Limited
LICENCEE'S ADDRESS	Locked Bag 1837, North Sydney, NSW 2060
MONITORING DATE	1 st Quarter – 27-28 March 2013
MONITORING BY 2013)	Emission Testing Consultants (Report 130086, 03 June
REPORT DATE	06 June 2013
REPORT PREPARED BY	Aaron Clifton Environmental Manager

SUMMARY OF ACTIVITY

Rosalind Park Gas Plant, located approximately 60km south west of Sydney, is a natural gas processing and treatment plant, used to process coal seam natural gas from the Camden Gas Project.

Produced natural gas is cleaned, dehydrated, compressed and odourised before being measured and transported by pipeline about 500 metres into the nearby Moomba to Sydney Natural Gas Pipeline. The premises covered by this Environment Protection Licence also includes all gas wells, gas gathering, reticulation systems, trunk lines and associated effluent storage areas and work areas of the Camden Gas Project.

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 sets out the results of quarterly monitoring. A separate report is issued for continuous monitoring.

This report is prepared in accordance with the *Requirements for Publishing Pollution Monitoring Data* (EPA, March 2012) (**Publication Requirements**).

AIR MONITORING LOCATIONS

Point	Location	Monitoring Frequency
1	Exhaust Stack 1 on Compression Engine 1	Quarterly
2	Exhaust Stack 2 on Compression Engine 2	Quarterly
3	Exhaust Stack 3 on Compression Engine 3	Quarterly
4	Reboiler Flue	Quarterly
5	Reflux Column Vent	Quarterly
6	Carbon Scrubber Vent	Quarterly

AIR MONITORING TEST METHODS – POINTS 1, 2, 3, 4, 5

Parameter	NSW EPA Test Method (Sampling Method)
Carbon dioxide	TM-24
Dry gas density	TM-23
Moisture	TM-22
Molecular weight of stack gases	TM-23
Nitrogen Oxides	TM-11
Oxygen (O ₂)	TM-25
Sulfuric acid mist and sulphur trioxide (as SO ₃)	TM-3
Sulphur dioxide	TM-4
Temperature	TM-2



Velocity	TM-2
Volumetric flowrate	TM-2

AIR MONITORING TEST METHODS – POINT 6

Parameter	NSW EPA Test Method (Sampling Method)
Carbon dioxide	TM-24
Dry gas density	TM-23
Moisture	TM-22
Molecular weight of stack gases	TM-23
Odour	OM-7
Oxygen (O ₂)	TM-25
Temperature	TM-2
Velocity	TM-2
Volumetric flowrate	TM-2

In relation to sampling for sulphur dioxide in respect of EPL 12003, section M2 of the licence designates TM-4 (USEPA 6 non-isokinetic "midget impinger" method) as the appropriate method for sampling.

ETC has conducted sampling in compliance with TM-3 (USEPA 8). USEPA 8 and USEPA 6 are both approved methods for sampling sulphur dioxide within NSW.

USEPA 8 embodies the principles of USEPA 6 however also provides for the concurrent sampling of sulphur trioxide. The principles of sampling are the same except sampling pursuant to USEPA 8 is conducted isokinetically and utilises larger impingers. Accordingly USEPA 8 is effectively considered an extension and improvement of USEPA 6.



Air Monitoring Results

Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Concentration	Concentration limit
1	Compressor Engine 1	Carbon dioxide	Percent		TM-24	Quarterly	5.3	
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.3	
		Moisture	Percent		TM-22	Quarterly	9.4	
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	29	
		Nitrogen Oxides	Milligrams per cubic metre	7% oxygen	TM-11	Quarterly	350	461
		Oxygen (O2)	Percent		TM-25	Quarterly	11.4	
		Sulfuric acid mist and sulphur trioxide (as SO3)	Milligrams per cubic metre		TM-3	Quarterly	<0.5	5.0
		Sulphur dioxide	Milligrams per cubic metre		TM-3	Quarterly	<0.09	7
		Temperature	Degrees Celsius		TM-2	Quarterly	371	
		Velocity	Metres per second		TM-2	Quarterly	26	
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	2.83	



Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Concentration	Concentration limit
2	Compressor Engine 2	Carbon dioxide	Percent		TM-24	Quarterly	11.3	
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.3	
		Moisture	Percent		TM-22	Quarterly	17	
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	30.0	
		Nitrogen Oxides	Milligrams per cubic metre	7% oxygen	TM-11	Quarterly	210	461
		Oxygen (O2)	Percent		TM-25	Quarterly	0.54	
		Sulfuric acid mist and sulphur trioxide (as SO3)	Milligrams per cubic metre		TM-3	Quarterly	<0.5	5.0
		Sulphur dioxide	Milligrams per cubic metre		TM-3	Quarterly	<0.1	7
		Temperature	Degrees Celsius		TM-2	Quarterly	414	
		Velocity	Metres per second		TM-2	Quarterly	17	
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	0.66	



Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Concentration	Concentration limit
3	Compressor Engine 3	Carbon dioxide	Percent		TM-24	Quarterly	11.3	
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.3	
		Moisture	Percent		TM-22	Quarterly	14	
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	30	
		Nitrogen Oxides	Milligrams per cubic metre	7% oxygen	TM-11	Quarterly	150	461
		Oxygen (O2)	Percent		TM-25	Quarterly	0.67	
		Sulfuric acid mist and sulphur trioxide (as SO3)	Milligrams per cubic metre		TM-3	Quarterly	<0.4	5.0
		Sulphur dioxide	Milligrams per cubic metre		TM-3	Quarterly	<0.09	7
		Temperature	Degrees Celsius		TM-2	Quarterly	436	
		Velocity	Metres per second		TM-2	Quarterly	21	
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	0.82	

Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Concentration	Concentration limit
4	Reboiler Flue	Carbon dioxide	Percent		TM-24	Quarterly	4.4	
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.3	
		Moisture	Percent		TM-22	Quarterly	7.2	
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	29	
		Nitrogen Oxides	Milligrams per cubic metre	7% oxygen	TM-11	Quarterly	100	110
		Oxygen (O2)	Percent		TM-25	Quarterly	12.7	
		Sulfuric acid mist and sulphur trioxide (as SO3)	Milligrams per cubic metre		TM-3	Quarterly	<1	3.5
		Sulphur dioxide	Milligrams per cubic metre		TM-3	Quarterly	<0.3	35
		Temperature	Degrees Celsius		TM-2	Quarterly	259	
		Velocity	Metres per second		TM-2	Quarterly	3.2	
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	0.082	

The selection of the sampling position for quarterly monitoring at point 4 was not carried out in accordance with test method TM-1 as specified in the "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, 2000" (**Approved Methods**). The Approved Methods provides that in relation to TM-1, the selection of sampling positions should be assessed in accordance with "AS 4323.1 - 1995 Stationary Source Emissions Method 1: Selection of Sampling Positions" (**AS-4323.1**).

AS 4323.1 requires that a monitoring point have two access holes at 90 degrees to each other, and that the location of the sampling plane must meet relevant criteria, including that the gas velocity at all sampling points be greater than 3m/s. At the time of sampling, there was no second port installed at 90 degrees to the existing port, and because of the very low flow rate emitted at this point, it is not possible to meet the gas velocity threshold of greater than 3m/s.

Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Concentration	Concentration limit
5	Reflux Column Vent	Carbon dioxide	Percent		TM-24	Quarterly	13.7	
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.3	
		Moisture	Percent		TM-22	Quarterly	72	
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	30	
		Nitrogen Oxides	Milligrams per cubic metre	7% oxygen	TM-11	Quarterly	<3	13
		Oxygen (O2)	Percent		TM-25	Quarterly	<0.4	
		Sulfuric acid mist and sulphur trioxide (as SO3)	Milligrams per cubic metre		TM-3	Quarterly	<2	35
		Sulphur dioxide	Milligrams per cubic metre		TM-3	Quarterly	<0.4	1042
		Temperature	Degrees Celsius		TM-2	Quarterly	90	
		Velocity	Metres per second		TM-2	Quarterly	<2	
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	<0.2	

The selection of the sampling position for quarterly monitoring at point 5 was not carried out in accordance with test method TM-1 as specified in the "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, 2000" (**Approved Methods**). The Approved Methods provides that in relation to TM-1, the selection of sampling positions should be assessed in accordance with "AS 4323.1 - 1995 Stationary Source Emissions Method 1: Selection of Sampling Positions" (**AS-4323.1**).

AS 4323.1 requires that a monitoring point have two access holes at 90 degrees to each other, and that the location of the sampling plane must meet relevant criteria, including that the gas velocity at all sampling points be greater than 3m/s. At the time of sampling, there was no second port installed at 90 degrees to the existing port, and because of the very low flow rate emitted at this point, it is not possible to meet the gas velocity threshold of greater than 3m/s.



Monitoring Point	Description	Pollutant	Units of measure	Oxygen correction	Sampling method	Monitoring frequency required by licence	Concentration	Concentration limit
6	Carbon Scrubber Vent	Carbon dioxide	Percent		TM-24	Quarterly	<0.2	
		Dry gas density	Kilograms per cubic metre		TM-23	Quarterly	1.3	
		Moisture	Percent		TM-22	Quarterly	1.0	
		Molecular weight of stack gases	Grams per gram mole		TM-23	Quarterly	29	
		Odour	Odour Units		OM-7	Quarterly	630	
		Oxygen (O2)	Percent		TM-25	Quarterly	20.8	
		Temperature	Degrees Celsius		TM-2	Quarterly	35	
		Velocity	Metres per second		TM-2	Quarterly	5.5	
		Volumetric flowrate	Cubic metres per second		TM-2	Quarterly	0.138	