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**Report Number R004464-1**

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**Emission Testing Report**  
**Parex Group Pty Ltd, Wetherill Park**

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## Document Information

**Client Name:** Parex Group Pty Ltd  
**Report Number:** R004464-1  
**Date of Issue:** 19 June 2017  
**Attention:** Kevin Middlebrook  
**Address:** 67 Elizabeth St  
 WETHERILL PARK NSW 2164  
**Testing Laboratory:** Ektimo (ETC) ABN 74 474 273 172

## Report Status

Format	Document Number	Report Date	Prepared By	Reviewed By (1)	Reviewed By (2)
Preliminary Report	-	-	-	-	-
Draft Report	-	-	-	-	-
Final Report	R004464-1	19/06/2017	JKr	SCo	ADa
Amend Report	-	-	-	-	-

Template Version: 170407

## Amendment Record

Document Number	Initiator	Report Date	Section	Reason
Nil	-	-	-	-

## Report Authorisation



Steven Cooper  
Client Manager



NATA Accredited Laboratory  
No. 14601

Accredited for compliance with ISO/IEC 17025. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.



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## 1 EXECUTIVE SUMMARY

Ektimo was engaged by Parex Group to perform emission monitoring at the Wetherill Park site pursuant to Environmental Protection Licence (EPL) 6459.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA 1 - Concrete Powders Stack	18 May 2017	Solid particles
Liquid Adhesives Stack	18 May 2017	Speciated volatile organic compounds
Solvent Process Stack	18 May 2017	Speciated volatile organic compounds

\* Flow rate, velocity, temperature and moisture were determined unless otherwise stated

The sampling methodologies chosen by Ektimo are those recommended by the NSW Office of Environment and Heritage (as specified in the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales, January 2007*).

All results are reported on a dry basis at STP. Unless otherwise indicated, the methods cited in this report have been performed without deviation.

Plant operating conditions have been noted in the report.

## 2 LICENCE COMPARISON

The following licence comparison table shows that all analytes highlighted in green are below the licence limit set by the NSW EPA as per licence 6459 (last amended on 28/04/2015).


EPA	Location Description	Unit of measure	Parameter	Licence limit	Detected values 18/05/2017
1	Concrete Powders Stack	milligrams per cubic meter (mg/m <sup>3</sup> )	Solid Particles	40	6.4

### 3 RESULTS

#### 3.1 EPA 1 – Concrete Powders Stack

Date	18/05/2017	Client	Parex Group Pty Ltd
Report	R004464	Stack ID	EPA 1 - Concrete Powders Stack
Licence No.	6459	Location	Wetherill Park
Ektimo Staff	Steven Cooper & Zoe Parker	State	NSW
Process Conditions	Normal Operating Conditions		

Sampling Plane Details	
Sampling plane dimensions	375 mm
Sampling plane area	0.11 m <sup>2</sup>
Sampling port size, number	2" Flange (x2)
Access & height of ports	Ground level 2 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 1.5 D
Upstream disturbance	Bend 2.5 D
No. traverses & points sampled	2 12
Sample plane compliance to AS4323.1	Compliant but non-ideal



Comments	
The discharge is assumed to be composed of dry air and moisture	
<b>The sampling plane is deemed to be non-ideal or non-compliant due to the following reasons:</b>	
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D	
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D	

Stack Parameters		
Moisture content, %w/v	1.5	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m <sup>3</sup>	1.29 (wet)	1.29 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0917 & 1030	
Temperature, °C	22	
Temperature, K	295	
Velocity at sampling plane, m/s	23	
Volumetric flow rate, discharge, m <sup>3</sup> /s	2.6	
Volumetric flow rate (wet STP), m <sup>3</sup> /s	2.4	
Volumetric flow rate (dry STP), m <sup>3</sup> /s	2.4	
Mass flow rate (wet basis), kg/hour	11000	

Isokinetic Results	Sampling time	Results	
		0923-1026	
		Concentration	Mass Rate
		mg/m <sup>3</sup>	g/min
Solid Particles		6.4	0.9
Isokinetic Sampling Parameters			
Sampling time, min		60	
Isokinetic rate, %		102	
Velocity difference, %		10	

### 3.2 Liquid Adhesive Stack

Date	18/05/2017	Client	Parex Group Pty Ltd
Report	R004464	Stack ID	Liquid Adhesives Stack
Licence No.	6459	Location	Wetherill Park
Ektimo Staff	Slewen Cooper & Zoe Parker	State	NSW
Process Conditions	3 Mixers operating during sampling		

#### Sampling Plane Details

Sampling plane dimensions	165 mm
Sampling plane area	0.0214 m <sup>2</sup>
Sampling port size, number	3" Flange (x2)
Access & height of ports	Stairs 5 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Bend 2 D
Upstream disturbance	Bend 7 D
No. traverses & points sampled	1 1
Sample plane compliance to AS4323.1	Satisfactory



#### Comments

The discharge is assumed to be composed of dry air and moisture

#### Stack Parameters

Moisture content, %v/v	1.5
Gas molecular weight, g/g mole	28.8 (wet)      29.0 (dry)
Gas density at STP, kg/m <sup>3</sup>	1.29 (wet)      1.29 (dry)

#### Gas Flow Parameters

Flow measurement time(s) (hhmm)	1028 & 1135
Temperature, °C	26
Temperature, K	299
Velocity at sampling plane, m/s	13
Volumetric flow rate, discharge, m <sup>3</sup> /s	0.28
Volumetric flow rate (wet STP), m <sup>3</sup> /s	0.26
Volumetric flow rate (dry STP), m <sup>3</sup> /s	0.25
Mass flow rate (wet basis), kg/hour	1200
Velocity difference, %	1

Total VOCs (as n-Propane)	Sampling time	Results 1031-1131	
		Concentration mg/m <sup>3</sup>	Mass Rate g/min
Total		6.3	0.095

VOC (speciated)	Sampling time	Results 1031-1131	
		Concentration mg/m <sup>3</sup>	Mass Rate g/min
Detection limit <sup>(1)</sup>		<0.1	<0.002
Ethylbenzene		0.22	0.0033
m + p-Xylene		0.11	0.0017
o-Xylene		0.12	0.0018
Isopropylbenzene		0.3	0.0045
Propylbenzene		0.78	0.012
1,3,5-trimethylbenzene		1.1	0.017
1,2,4-trimethylbenzene		3.6	0.054
1,2,3-trimethylbenzene		0.62	0.0093
Acetone		2.1	0.032
Butyl acetate		1.5	0.022
Nonane		2.9	0.044
Decane		1.8	0.027
Undecane		0.29	0.0044

**(1) Unless otherwise reported, the following target compounds were found to be below detection:**

Ethanol, Isopropanol, 1,1-Dichloroethane, Dichloromethane, trans-1,2-Dichloroethane, cis-1,2-Dichloroethane, Chloroform, 1,1,1-Trichloroethane, 1,2-Dichloroethane, Benzene, Carbon tetrachloride, Butanol, 1-Methoxy-2-propanol, Trichloroethane, Toluene, 1,1,2-trichloroethane, Tetrachloroethane, Chlorobenzene, Ethylbenzene, m + p-Xylene, Styrene, o-Xylene, 2-Butoxyethanol, 1,1,2,2-Tetrachloroethane, Isopropylbenzene, Propylbenzene, 1,3,5-trimethylbenzene, tert-Butylbenzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, Acetone, Pentane, Acrylonitrile, n-Hexane, Methyl ethyl ketone, Ethyl acetate, Cyclohexane, 2-Methylhexane, 2,3-Dimethylpentane, Isopropyl acetate, 3-Methylhexane, Ethyl acrylate, Heptane, Methyl methacrylate, Propyl acetate, Methylcyclohexane, MIBK, 2-Hexanone, Octane, Butyl acetate, 1-methoxy-2-propyl acetate, Butyl acrylate, Nonane, Cellosolve acetate, alpha-Pinene, beta-Pinene, Decane, 3-Carene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane

### 3.3 Solvent Process Stack

Date	18/05/2017	Client	Parex Group Pty Ltd
Report	R004464	Stack ID	Solvent Process Stack
License No.	6459	Location	Wetherill Park
Ektimo Staff	Steven Cooper & Zoe Parker	State	NSW
Process Conditions	Using 'Brushable Waterproof' during sampling		

Sampling Plane Details	
Sampling plane dimensions	585 mm
Sampling plane area	0.269 m <sup>2</sup>
Sampling port size, number	4" Flange (x2)
Access & height of ports	Fixed ladder 7 m
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit cone 6 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane compliance to AS4323.1	Satisfactory

Comments	
The discharge is assumed to be composed of dry air and moisture	

Stack Parameters		
Moisture content, %v/v	1.3	
Gas molecular weight, g/g mole	28.8 (wet)	29.0 (dry)
Gas density at STP, kg/m <sup>3</sup>	1.29 (wet)	1.29 (dry)
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0809 & 0911	
Temperature, °C	19	
Temperature, K	292	
Velocity at sampling plane, m/s	6.6	
Volumetric flow rate, discharge, m <sup>3</sup> /s	1.8	
Volumetric flow rate (wet STP), m <sup>3</sup> /s	1.7	
Volumetric flow rate (dry STP), m <sup>3</sup> /s	1.6	
Mass flow rate (wet basis), kg/hour	7700	
Velocity difference, %	7	

Total VOCs (as n-Propane)	Sampling time	Results 0810-0910	
		Concentration mg/m <sup>3</sup>	Mass Rate g/min
Total		67	6.6

VOC (specified)	Sampling time	Results 0810-0910	
		Concentration mg/m <sup>3</sup>	Mass Rate g/min
Detection limit <sup>(1)</sup>		<0.1	<0.01
Toluene		0.64	0.063
m + p-Xylene		0.8	0.079
o-Xylene		2.3	0.23
Isopropylbenzene		5.3	0.52
Propylbenzene		14	1.4
1,3,5-trimethylbenzene		19	1.8
1,2,4-trimethylbenzene		52	5.1
1,2,3-trimethylbenzene		8.8	0.87
Heptane		0.39	0.038
Methylcyclohexane		0.43	0.042
Octane		0.22	0.022
Nonane		60	6
Decane		22	2.2
Undecane		3.6	0.36

(1) Unless otherwise reported, the following target compounds were found to be below detection:

Ethanol, Iso propanol, 1,1-Dichloro ethane, Dichloro methane, trans-1,2-Dichloro ethane, cis-1,2-Dichloro ethane, Chloroform, 1,1-Trichloro ethane, 1,2-Dichloro ethane, Benzene, Carbon tetrachloride, Butanol, 1-Methoxy-2-propanol, Trichloro ethene, Toluene, 1,1,2-Trichloro ethane, Tetrachloro ethene, Chlorobenzene, Ethylbenzene, m + p-Xylene, Styrene, o-Xylene, 2-Butoxyethanol, 1,1,2,2-Tetrachloro ethane, Isopropylbenzene, Propylbenzene, 1,3,5-trimethylbenzene, tert-Butylbenzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, Acetone, Pentane, Acrylonitrile, n-Hexane, Methyl ethyl ketone, Ethyl acetate, Cyclohexane, 2-Methylhexane, 2,3-Dimethylpentane, Isopropyl acetate, 3-Methylhexane, Ethyl acrylate, Heptane, Methyl methacrylate, Propyl acetate, Methylcyclohexane, MIBK, 2-Hexanone, Octane, Butyl acetate, 1-methoxy-2-propyl acetate, Butyl acrylate, Nonane, Cellosolve acetate, alpha-Pinene, beta-Pinene, Decane, 3-Carene, D-Limonene, Undecane, Dodecane, Tridecane, Tetradecane



## 4 PLANT OPERATING CONDITIONS

Unless otherwise stated, the plant operating conditions were normal at the time of testing. See Parex Group's records for complete process conditions.

## 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	Method Detection Limit	Uncertainty*	NATA Accredited	
					Sampling	Analysis
Sample plane criteria	NSW TM-1	NA	NA	-	✓	NA
Moisture content	NSW TM-22	NSW TM-22	0.4%	8%	✓	✓
Temperature	NSW TM-2	NA	0°C	2%	✓	NA
Flow rate	NSW TM-2	NA	Location specific	8%	✓	NA
Velocity	NSW TM-2	NA	2m/s	7%	✓	NA
Particulate matter	NSW TM-15	NSW TM-15	0.001g/m <sup>3</sup>	5%	✓	✓
Speciated volatile organic compounds	NSW TM-34	USEPA SW-846 8260	0.1mg/m <sup>3</sup>	15%	✓	✓ <sup>1</sup>

\* Uncertainty values cited in this table are calculated at the 95% confidence level (coverage factor = 2)

1. Analysis performed by Ektimo (EML Air), NATA accreditation number 2732. Results were reported to Ektimo on 14 June 2017 in report number R004464\_SVOCs.

## 6 QUALITY ASSURANCE/ QUALITY CONTROL INFORMATION

Ektimo (EML) and Ektimo (ETC) are 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](http://www.nata.com.au).

Ektimo (EML) and Ektimo (ETC) are accredited by NATA (National Association of Testing Authorities) to ISO/IEC 17025. – General Requirements for the Competence of Testing and Calibration Laboratories. ISO/IEC 17025 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 Compliance Manager.

NATA is a member of APLAC (Asia Pacific Laboratory Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through the mutual recognition arrangements with both of these organisations, NATA accreditation is recognised world –wide.

A formal Quality Control program is in place at Ektimo to monitor analyses performed in the laboratory and sampling conducted in the field. The program is designed to check where appropriate; the sampling reproducibility, analytical method, accuracy, precision and the performance of the analyst. The Laboratory Manager is responsible for the administration and maintenance of this program.



## 7 DEFINITIONS

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

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, unless otherwise specified.
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.
VOC	Any chemical compound based on carbon with a vapour pressure of at least 0.010 kPa at 25°C or having a corresponding volatility under the particular conditions of use. These compounds may contain oxygen, nitrogen and other elements, but specifically excluded are carbon monoxide, carbon dioxide, carbonic acid, metallic carbides and carbonate salts.
TOC	The sum of all compounds of carbon which contain at least one carbon to carbon bond, plus methane and its derivatives.
OU	The number of odour units per unit of volume. The numerical value of the odour concentration is equal to the number of dilutions to arrive at the odour threshold (50% panel response).
PM <sub>2.5</sub>	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 2.5 microns (µm).
PM <sub>10</sub>	Atmospheric suspended particulate matter having an equivalent aerodynamic diameter of less than approximately 10 microns (µm).
BSP	British standard pipe
NT	Not tested or results not required
NA	Not applicable
D <sub>50</sub>	'Cut size' of a cyclone defined as the particle diameter at which the cyclone achieves a 50% collection efficiency ie. half of the particles are retained by the cyclone and half are not and pass through it to the next stage. The D <sub>50</sub> method simplifies the capture efficiency distribution by assuming that a given cyclone stage captures all of the particles with a diameter equal to or greater than the D <sub>50</sub> of that cyclone and less than the D <sub>50</sub> of the preceding cyclone.
D	Duct diameter or equivalent duct diameter for rectangular ducts
<	Less than
>	Greater than
≥	Greater than or equal to
~	Approximately
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
DER	WA Department of Environment & Regulation
DECC	Department of Environment & Climate Change (NSW)
EPA	Environment Protection Authority
FTIR	Fourier Transform Infra Red
NATA	National Association of Testing Authorities
RATA	Relative Accuracy Test Audit
AS	Australian Standard
USEPA	United States Environmental Protection Agency
Vic EPA	Victorian Environment Protection Authority
ISC	Intersociety committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
APHA	American public health association, Standard Methods for the Examination of Water and Waste Water
CARB	Californian Air Resources Board
TM	Test Method
OM	Other approved method
CTM	Conditional test method
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
NIOSH	National Institute of Occupational Safety and Health
XRD	X-ray Diffractometry