Ektimo

CPE Central Park Pty Ltd, Chippendale

Emission Testing Report

Report Number R015233

Accredited for compliance with ISO/IEC 17025 - Testing. 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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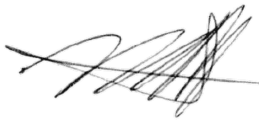
Document Information

Client Name:	CPE Central Park Pty Ltd
Report Number:	R015233
Date of Issue:	7 August 2023
Attention:	JP Ricafuente
Address:	3 Central Park Ave Chippendale NSW 2234
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation



Rick Peralta
Air Monitoring Consultant

NATA Accredited Laboratory
No. 14601

Aaron Davis
Ektimo Signatory

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.

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1 Executive Summary

1.1 Background

Ektimo was engaged by Clean Peak Energy (CPE) Central Park Pty Ltd to perform emission testing at their Chippendale plant. Testing was carried out in accordance with Environmental Licence 20768.

1.2 Project Objective & Overview

The objective of the project was to conduct a monitoring programme to quantify emissions from two (2) discharge points to determine compliance with CPE's Environment Protection Licence.

Monitoring was performed as follows:

Location	Test Date	Test Parameters*
EPA ID No. 1 - Engine 1	21 July 2023	Nitrogen Oxides (as NO_2) Ammonia (NH_3)
EPA ID No. 2 - Engine 2		

* 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 the report.

1.3 Licence Comparison

The following licence comparison table shows that all analytes are within the licence limit set by the NSW EPA as per licence 20768 (last amended on 18 April 2016).

Location ID	Location Description	Pollutant	Units	Licence Limit	Detected Values
1	Engine 1	Nitrogen Oxides	mg/m^3 at STP dry	57	**33**
		Ammonia	mg/m^3 at STP dry	4	**0.019**
2	Engine 2	Nitrogen Oxides	mg/m^3 at STP dry	57	**47**
		Ammonia	mg/m^3 at STP dry	4	**0.023**

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

Refer to the Test Methods table for the measurement uncertainties.

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2 Results

2.1 EPA ID No. 1 - Engine 1

Date	21/07/2023	**Client**	CPE Central Park Pty Ltd
Report	R015233	**Stack ID**	EPA ID No. 1 - Engine 1
Licence No.	20768	**Location**	Chippendale
Ektimo Staff	Rick Peralta/Mohamed Trabelsi	**State**	NSW
Process Conditions	Engine Load: 980kW, SCR Temp (Deg C): 415C entry, exit 410C		*230720*

Stack Parameters		
Moisture content, %v/v	6.5	
Gas molecular weight, g/g mole	28.8 (wet)	29.5 (dry)
Gas density at STP, kg/m³	1.28 (wet)	1.32 (dry)
Gas density at discharge conditions, kg/m³	0.91	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0957 & 1107	
Temperature, °C	115	
Temperature, K	389	
Velocity at sampling plane, m/s	13	
Volumetric flow rate, actual, m³/s	1.8	
Volumetric flow rate (wet STP), m³/s	1.3	
Volumetric flow rate (dry STP), m³/s	1.2	
Mass flow rate (wet basis), kg/h	6000	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1005 - 1105		1005 - 1105		1005 - 1105	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	33	2.4	26	1.9	46	3.3
	Concentration % v/v		Concentration % v/v		Concentration % v/v	
Carbon dioxide	6.3		6.2		6.3	
Oxygen	10.3		10.2		10.4	

Ammonia	Results	
Sampling time	1000-1100	
	Concentration mg/m³	Mass Rate g/min
Ammonia	0.019	0.0014

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2.2 EPA ID No. 2 - Engine 2

Date	21/07/2023	**Client**	CPE Central Park Pty Ltd
Report	R015233	**Stack ID**	EPA ID No. 2 - Engine 2
Licence No.	20768	**Location**	Chippendale
Ektimo Staff	Rick Peralta/Mohamed Trabelsi	**State**	NSW
Process Conditions	Engine Load: 980-987kW, SCR Temp (Deg C): 412C entry, exit 408C		*230720*

Stack Parameters		
Moisture content, %v/v	11	
Gas molecular weight, g/g mole	28.3 (wet)	29.6 (dry)
Gas density at STP, kg/m³	1.26 (wet)	1.32 (dry)
Gas density at discharge conditions, kg/m³	0.72	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	1135 & 1243	
Temperature, °C	206	
Temperature, K	479	
Velocity at sampling plane, m/s	15	
Volumetric flow rate, actual, m³/s	2.2	
Volumetric flow rate (wet STP), m³/s	1.3	
Volumetric flow rate (dry STP), m³/s	1.1	
Mass flow rate (wet basis), kg/h	5800	

Gas Analyser Results	Average		Minimum		Maximum	
Sampling time	1139 - 1239		1139 - 1239		1139 - 1239	
	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min	Concentration mg/m³	Mass Rate g/min
Combustion Gases						
Nitrogen oxides (as NO_2)	47	3.2	37	2.5	64	4.4
	Concentration % v/v		Concentration % v/v		Concentration % v/v	
Carbon dioxide	6.4		6.4		6.5	
Oxygen	10.1		10.1		10.2	

Ammonia	Results	
Sampling time	1140-1240	
	Concentration mg/m³	Mass Rate g/min
Ammonia	0.023	0.0016

3 Sample Plane Compliance

Date	21/07/2023	**Client**	CPE Central Park Pty Ltd
Report	R015233	**Stack ID**	EPA ID No. 1 - Engine 1
Licence No.	20768	**Location**	Chippendale
Ektimo Staff	Rick Peralta/Mohamed Trabelsi	**State**	NSW
Process Conditions	Engine Load: 980kW, SCR Temp (Deg C): 415C entry, exit 410C		*230720*

Sampling Plane Details	
Source tested	Power plant - natural gas
Pollution control equipment	No pollution control equipment
Sampling plane dimensions	430 mm
Sampling plane area	0.145 m²
Sampling port size, number & depth	1" BSP (x2), 55 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Bend 7 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane conformance to AS 4323.1	Ideal sampling plane

Date	21/07/2023	**Client**	CPE Central Park Pty Ltd
Report	R015233	**Stack ID**	EPA ID No. 2 - Engine 2
Licence No.	20768	**Location**	Chippendale
Ektimo Staff	Rick Peralta/Mohamed Trabelsi	**State**	NSW
Process Conditions	Engine Load: 980-987kW, SCR Temp (Deg C): 412C entry, exit 408C		*230720*

Sampling Plane Details	
Source tested	Power plant - natural gas
Pollution control equipment	No pollution control equipment
Sampling plane dimensions	430 mm
Sampling plane area	0.145 m²
Sampling port size, number & depth	1" BSP (x2), 55 mm
Duct orientation & shape	Vertical Circular
Downstream disturbance	Bend 7 D
Upstream disturbance	Bend 6 D
No. traverses & points sampled	2 8
Sample plane conformance to AS 4323.1	Ideal sampling plane

4 Plant Operating Conditions

The below plant operating conditions have been supplied by CPE personnel.

Location Description	Date	Sample Collection Time	Operating Load/Condition
EPA ID No. 1 - Engine 1	21 July 2023	1000 – 1100	980kW, SCR Temp (°C): 415°C entry, exit 410°C
EPA ID No. 2 - Engine 2		1140 – 1240	980-987kW, SCR Temp (°C): 412°C entry, exit 408°C

From information received from the site operator, unless otherwise noted it is our understanding that samples were collected during normal plant operations. Unless otherwise noted all samples were collected in compliance with Ektimo's QA/QC standards.

5 Test Methods

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

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited	
				Sampling	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 content	NSW EPA TM-22 (USEPA Alt-Method 008)	NSW EPA TM-22 (USEPA Alt-Method 008)	19%	✓	✓
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%	✓	✓
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%	✓	✓
Ammonia	Ektimo 260	Envirolab in-house methods Inorg-093 & Inorg-057	18%	✓	✓‡

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

‡ Analysis performed by Envirolab, NATA accreditation number 2901. Results were reported to Ektimo on 28 July 2023 in report 328635.

5.1 Deviations to Test Methods

Ektimo notes that Environmental Licence 20768 references the sampling and analysis of ammonia via Special Method 1 i.e. Sampling Method SCAQMD Method 207.1 or USEPA CTM-027. USEPA CTM-027 is an isokinetic method which was not possible to perform at testing locations EPA ID No. 1 or EPA ID No. 2, due to port size restrictions, out-of-stack obstructions, and positive pressure within the sampling planes at both test locations. Alternatively, Ektimo utilised NATA accredited in-house method, Ektimo 260. Ektimo 260 is a mini-impinger method, which utilises 0.1N sulfuric acid as a sampling solution and is analysed via an in-house colorimetric method (phenolate method i.e. Envirolab inorg-093 and Envirolab inorg-057) which has a sampling range of 0.003 mg/m^3 to 25 mg/m^3.

Sampling Method SCAQMD Method 207.1 utilises 0.1N sulfuric acid as a sampling solution and is analysed via ion selective electrode (ISE). Ektimo considers utilising Ektimo 260 instead of Sampling Method SCAQMD Method 207.1 to be a minor deviation.

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.

7 Definitions

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

% v/v	Volume to volume ratio, dry basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
APHA	American Public Health Association, Standard Methods for the Examination of Water and Waste Water
AS	Australian Standard
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
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
FTIR	Fourier transform infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
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
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
XRD	X-ray diffractometry
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.

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8 Appendices

Appendix A: Chain(s) of Custody

JOB NUMBER R015233

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Checked at Ektimo Dispatch by: 21/07/23 Sign/Date

Samples received in good order: 21/7/23 Sign/D

Sample ID	Job No.	Analysis Required	Units Required	Analytical Lab	Purchase Order No.	Ektimo Contact	Notes	TAT Require
N 19502 1	R015233	NH3 for sample 1	ug/litre	Envirolab		Rick Peralta	sample 1	
N 19503 2	R015233	NH3 for sample 2	ug/litre	Envirolab		Rick Peralta	sample 2	
N 19504 3	R015233	NH3 Blank for all locations	ug/litre	Envirolab		Rick Peralta	Blank solution	

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 328035
Date Received: 21/7/23
Time Received: 1550
Received By:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Appendix B: Laboratory Results

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 328635

Client Details

Client	Ektimo (Unanderra)
Attention	Rick Peralta
Address	1/251 Princes Hwy, Unanderra, NSW, 2526

Sample Details

Your Reference	**R015233**
Number of Samples	3 Water
Date samples received	21/07/2023
Date completed instructions received	21/07/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	28/07/2023
Date of Issue	28/07/2023

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Nick Sarlamis, Assistant Operation Manager

Authorised By
Nancy Zhang, Laboratory Manager

Miscellaneous Inorganics				
Our Reference		328635-1	328635-2	328635-3
Your Reference	UNITS	N19502	N19503	N19504
Type of sample		Water	Water	Water
Date prepared	-	21/07/2023	21/07/2023	21/07/2023
Date analysed	-	21/07/2023	21/07/2023	21/07/2023
Volume	mL	50	55	49
Ammonia as N in impinger	mg	<0.01	<0.01	<0.01
Ammonia as N in water	mg/L	0.036	0.039	<0.005

Method ID	Methodology Summary
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a KCl extraction.
Inorg-093	Ammonia in impingers/filter pads using Discrete Analyser.

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/07/2023	[NT]	[NT]	[NT]	[NT]	21/07/2023	[NT]
Date analysed	-			21/07/2023	[NT]	[NT]	[NT]	[NT]	21/07/2023	[NT]
Ammonia as N in impinger	mg	0.01	Inorg-093	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	94	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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