



## Stephenson

Environmental Management Australia

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### EMISSION TEST REPORT (ETR) No. 6049

**COMPLIANCE EMISSION SURVEY - EPL 5803**

**BATTERY ENERGY POWER SOLUTIONS PTY LTD**

**96 FAIRFIELD STREET, FAIRFIELD, NSW**

**PROJECT No.:** 6049/S25256/19

**DATE OF SURVEY:** 20 FEBRUARY 2019

**DATE OF ISSUE:** 26 MARCH 2019



NATA accredited laboratory number 15043.

Accredited for Compliance with ISO/IEC 17025 - Testing

## SUMMARY OF EMISSION TEST RESULTS – 20 FEBRUARY 2019

Parameter	Unit	Location	EPL 5803 Point 1 100 Percentile Concentration Limit
		Battery Fabrication Baghouse	
Stack Temperature	°C	28	--
Velocity	m/s	4.9	--
Volumetric Flow	m <sup>3</sup> /s	0.6	--
Moisture	%	0.7	--
Molecular Weight Dry Stack Gas	g/g mole	28.8	--
Gas Density	kg/m <sup>3</sup>	1.29	--
Stack pressure	kPa	101.2	--
Oxygen	%	20.9	--
Cadmium (Cd)	mg/m <sup>3</sup>	<0.0001	--
Lead (Pb)	mg/m <sup>3</sup>	<0.001	--
Type I & II Substances in Aggregate	mg/m <sup>3</sup>	0.012	10
Total Solid Particulates	mg/m <sup>3</sup>	0.12	250

## Key:

°C	=	degrees Celsius
m/s	=	metres per second
m <sup>3</sup> /s	=	dry cubic metre per second 0°C and 101.3 kilopascals (kPa)
g/g mole	=	grams per gram mole
kg/m <sup>3</sup>	=	Kilograms per cubic metre
kPa	=	Kilo Pascals
%	=	percentage
mg/m <sup>3</sup>	=	milligrams per cubic metre at 0°C and 101.3 kilopascals (kPa)
--	=	not specified
<	=	less than

**DETAILED EMISSION TEST RESULTS – TSP AND METALS**

<b>Emission Test Results</b>	<b>TSP</b>	<b>Metals - Type I &amp; II</b>
Project Number	6049	6049
Project Name	Battery Energy Power Solutions	Battery Energy Power Solutions
Test Location	Battery Fabrication Baghouse	Battery Fabrication Baghouse
Date	20 February 2019	20 February 2019
RUN	1	1
Sample Start Time (hrs)	10:23	10:23
Sample Finish Time (hrs)	11:43	11:43
Sample Location (Inlet/Exhaust)	Exhaust	Exhaust
Stack Temperature (°C)	28	28
Stack Cross-Sectional area (m <sup>2</sup> )	0.135	0.135
Average Stack Gas Velocity (m/s)	4.9	4.9
Actual Gas Flow Volume (am <sup>3</sup> /min)	40	40
Total Normal Gas Flow Volume (m <sup>3</sup> /min)	36	36
Total Normal Gas Flow Volume (m <sup>3</sup> /sec)	0.6	0.6
Total Stack Pressure (kPa)	101.2	101.2
Analysis	TSP	Metals
Method	TM-15	TM-12,13,14 (USEPA M29)
SEMA Lab Number	727377	727378
Mass In Sample (mg)	0.12	0.012
Air Volume Sampled (am <sup>3</sup> )	1.125	1.116
Normal Sample Volume (m <sup>3</sup> )	1.04	1.03
<b>Concentration at Stack O<sub>2</sub> (mg/m<sup>3</sup>)</b>	0.12	0.012
<b>EPL 5803 Concentration Limit (mg/m<sup>3</sup>)</b>	<b>250</b>	<b>10</b>
Mass Emission Rate (g/s)	0.000069	0.0000071
Moisture Content (% by volume)	0.71	1.7
Molecular Weight Dry Stack Gas (g/g-mole)	28.8	28.8
Dry Gas Density (kg/m <sup>3</sup> )	1.29	1.29
Isokinetic Sampling Rate (%)	98.9	97.7
Sample Storage Period	3 months	Consumed in Analysis
Sampling Performed by	JW, PWS	JW, PWS
Sample Analysed by (Laboratory)	SEMA	Envirolab
Calculations Entered by	JW	JW
Calculations Checked by	PWS	PWS

## Abbreviations of Personnel

PWS = Peter W Stephenson  
 JW = Jay Weber

### ESTIMATED UNCERTAINTY OF MEASUREMENT

Pollutant	Methods	Uncertainty
Metals	NSW TM-12,13 & 14, USEPA 29	100% (50-200%)
Moisture	AS4323.2, NSW TM-22, USEPA 4	25%
Oxygen	NSW TM-24, USEPA 3A	1% actual
Particulate > 20 mg/m <sup>3</sup>	NSW TM-15, AS4323.2	15%
Particulate < 20 mg/m <sup>3</sup>	NSW TM-15, AS4323.2	50%
Velocity	AS4323.1, NSW TM-2, USEPA 2	5%

**Key:**

Unless otherwise indicated the uncertainties quoted have been determined @ 95% level of Confidence level (i.e. by multiplying the repeatability standard deviation by a co-efficient equal to 1.96) (Source - Measurement Uncertainty)

Sources: *Measurement Uncertainty – implications for the enforcement of emission limits* by Maciek Lewandowski (Environment Agency) & Michael Woodfield (AEAT) UK

*Technical Guidance Note (Monitoring) M2 Monitoring of stack emissions to air Environment Agency Version 3.1 June 2005.*

*Note: ISO 9096 is for 20-1000 mg/m<sup>3</sup> which AS4323.2 is based on.*

*Note DSEN 13284-1 testing for < 5 mg/m<sup>3</sup> correlates to 5 mg/m<sup>3</sup> with most quoted uncertainties of ± 5.3 mg/m<sup>3</sup> @ 6.4 mg/m<sup>3</sup>. From Clean Air Engineering in the United States the lowest practical limit of USEPA M5 is 5 mg/m<sup>3</sup> under lab conditions.*