

# ENVIRONMENTAL DUST MONITORING REPORT WALLERAWANG POWER STATION, WALLERAWANG NSW 2845

Job Number:	JN0271
Issued date:	29 November 2021
In care of:	Liberty Industrial
Prepared for:	Liberty Industrial
Client Address:	95-99 Bridge Road Glebe NSW 2037
Report by:	Mr Faz Jalali, Occupational Hygienist
Approved by:	Faz Jalali
Total No of pages:	27

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# WALLERAWANG POWER STATION, WALLERAWANG NSW 2845

EHO Consulting Pty Ltd JN02271-DMR-RN08881

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# Abbreviations/Definition

Air toxics	Air toxics are gaseous, aerosol or particulate pollutants which are present in the air in low concentrations with characteristics such as toxicity or persistence so as to be a hazard to human, plant or animal life
Airborne particles (aerosols)	Airborne Particles are suspended in the air and exist as aerosolsdust, fumes, smoke or mists. These different aerosols are classified according to their processes of formation, as indicated below. However, from a health and nuisance impact perspective, particles are classified primarily by size, defined below as PM <sub>10</sub> , PM <sub>2.5</sub> and TSP.
	Dust is an aerosol formed by mechanical subdivision of bulk material into airborne fines having the same chemical composition. Dust particles are generally solid and irregular in shape and have diameters greater than one micrometre.
	A fume is an aerosol of solid particles formed by condensation of vapours formed at elevated temperatures. The primary particles are generally very small (less than 0.1 micrometre) and have spherical or characteristic crystalline shapes. Since they may be formed in high number concentrations, they often rapidly coagulate, forming aggregate clusters of low overall density.
	Smoke is formed by condensation of combustion products, generally of organic materials. The particles are generally liquid droplets with diameters of less than 0.5 micrometre.
	Mist is droplet aerosol formed by mechanical shearing of a bulk liquid; for example, by atomisation, nebulisation, bubbling, or spraying. The droplet size can cover a very large range, usually from about two micrometres to greater than 50 micrometres.
BAM	eta Attenuation Monitor (dust monitoring equipment)
DEC	Department of Environment and Conservation
Dust	The generic term used to describe solid airborne particles generated and dispersed into the air by processes such as handling, crushing and grinding of organic or inorganic materials such as rock, ore, metal, coal, wood or grain and stockpiling of materials and wind blown dust.
Diffuse Source	Source of dust from non-point sources (see definition of point source below) such as land clearing, quarrying etc.
EMP	Environmental management plan
µg/m³	Microgram per cubic metre referenced to a temperature of 0 degrees Celsius and an absolute pressure of 101.325 kilopascals.
Fugitive dust	Fugitive dust is dust which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.
MIL	Monitoring investigation levels
NEPM	National environment protection measure
PM <sub>10</sub>	Refers to dust particles/particulate matter with an equivalent aerodynamic diameter of up to 10 micrometres.
Point source	Source of dust from the works conducted
Sensitive receptor	Individuals/communities/components of the environment which could be adversely affected by dust emissions, such as people in dwellings, schools, hospitals, nursing homes, child care facilities, offices, public recreation areas that exist now and in the future and protected wetlands. Some individuals may be more susceptible to adverse air quality, such as, children, the elderly and people with pre-existing medical conditions such as asthma or heart disease.
Trigger levels	The 'corrective action' trigger level is the ambient air dust level which if exceeded will result in corrective action being taken to reduce dust emissions until the dust levels fall below the corrective action trigger level. The 'work stoppage' trigger level is the ambient air dust level which will result in work stoppage until the dust levels fall below the work stoppage trigger level.



## 1. Introduction

### 1.1 General Background

As Part of the demolition / redevelopment project at Wallerawang Power Station, Wallerawang NSW 2845, Liberty Industrial (client), has engaged EHO to conduct Environmental Dust Monitoring (EDM) at their demolition site during blast demolition of the site. The EDM has been conducted on 24 November 2021during the blast phase of the demolition works only.

#### 1.2 Purpose

Wallerawang is primarily influenced by emissions from coal mining, with a total of 70 diffuse and three industry-specific emitted substances identified. The daily air quality is likely to be influenced by the prevailing weather and climatic conditions, bushfires and other natural factors such as pollen. EPL 766 requires Energy Australia to maintain the site in a condition that minimises or prevents the emission of dust from the site.

requirements and references Commonwealth air quality legislation.

The impacts of dust emissions under namely health and amenity are measured under the potential for health impacts as attributable to the concentration of particles in ambient air. Particles of dust (PM10) would have maximum impact under light winds and stable atmospheric conditions. These conditions most frequently occur overnight and very early in the morning. Greater amounts of dust can be generated from exposed surfaces under strong wind conditions which are associated with a neutral atmospheric stability.

The proposed demolition works have the potential to cause airborne dust, depending on the methodologies utilised and the prevailing weather.

The purpose of the EDP is to provide a snap shot of dust levels generated during the blast demolition works, to allow the client to monitor their compliance with EPA requirement for environmental management. The Plan has been developed in accordance with NSW EPA.

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### 1.3 Legislative requirement

This dust monitoring and EMP has been provided with reference to the following legislations and guideline documents:

- Air quality on construction sites Office of Environment and Heritage
- A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities. (Department of Environment and Conservation, 2011)
- National Environment Protection (Ambient Air Quality) Measure (Air NEPM, 2021);
- National Environment Protection (Air Toxics) Measure (Air Toxics NEPM, 2004);

### 1.4 Physical nature of dust

Airborne particles are characterised as fumes, smokes, mists or dusts depending on the nature of the particle and its size. Particles are commonly classified by size expressed as equivalent aerodynamic diameter (EAD) in micrometres ( $\mu$ m) as follows:

- Total suspended particles (TSP) diameter  $\leq$  50µm
- PM10 diameter ≤ 10μm
- PM2.5 diameter ≤ 2.5µm

#### 1.5 Health impact

The World Health Organisation (WHO) and United States Environmental Protection Agency (USEPA) indicate that numerous scientific studies have linked particle pollution exposure to a variety of health effects, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, aggravated asthma, development of chronic bronchitis, and breathing difficulty through decreased lung function;
- irregular heartbeat and non-fatal heart attacks
- premature death in people with heart or lung disease
- toxic effects by absorption of the toxic material into the blood (e.g. lead, cadmium, zinc)
- allergic or hypersensitivity effects (e.g. some woods, flour grains, chemicals)
- bacterial and fungal infections (from live organisms)
- fibrosis (e.g. asbestos, quartz) cancer (e.g. asbestos, chromates, benzene) irritation of mucous membranes (e.g. acid and alkalis).



## 2. Existing Conditions

#### 2.1 Climate

The Bureau of Meteorology (BOM) weather station is situated at Marrangaroo (Defence) is situated approximately 7 km away from Lithgow town centre. The weather conditions at the time of monitoring were as below.

#### Table 1 Lithgow Climate Summary

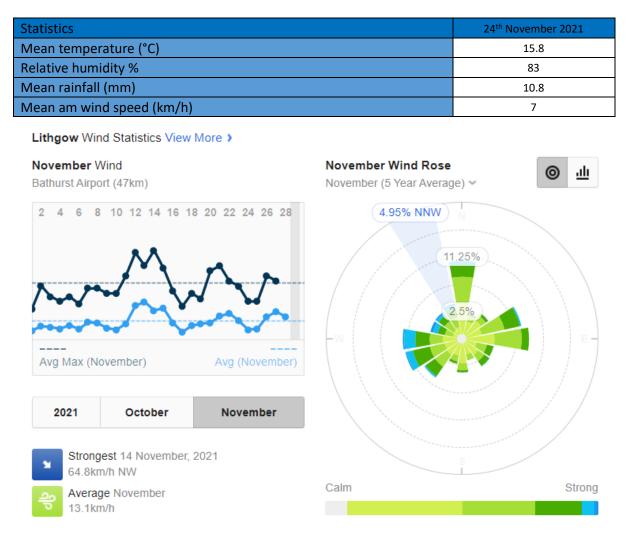


Figure 1 Wind rose typical of the month of November, am

The wind roses demonstrate that the direction of wind during the morning was mostly a north westerly, however, at the day of monitoring a southerly was blowing.



### 2.2 Site Location

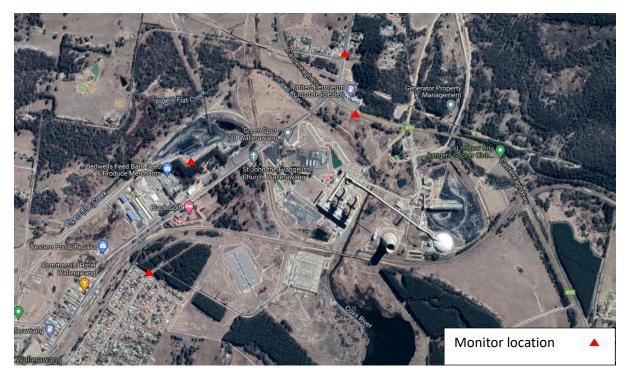


Figure 2 Site plans and monitor location



Photo 1 Depicts dust monitoring in progress

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### 3. Monitoring programme

### 3.1 Performance criteria

The monitoring programme includes monitoring dust levels within the outside boundaries of site. The monitoring locations are as follows:

- 1. 1 Duncan Street, Lidsdale
- 2. United Petrol pump
- 3. 121 Main Street, Wallerawang
- 4. 55 Cripps Avenue, Wallerawang

#### 3.2 Trigger levels and Monitoring Equipment

The trigger levels are based on ambient air quality NEPM standards, the locality of the monitors and  $PM_{10}$  particle size. Consideration has been given to the following:

- The close proximity of external monitors to the work site (Within site boundary and adjacent to works).
- Weather and morning cold / foggy conditions

# Table 2 National Environment Protection Measure for Ambient Air allowable concentrations

Location	Averaging period	Maximum	Maximum concentration
		concentration	allowable over a 24-hour period
External Monitors	1 hour	100µm/m³	50μm/m³

#### Table 3 Monitoring for dust and other particulate matter methodology

Equipment/monitoring	Pollutants	Applicable	Limitations/comment
method	monitored	standards	
High volume sampler, TSI Dusttrak monitor provides real-time aerosol mass readings with gravimetric sampling.	Particulate mass PM <sub>10</sub>	AS/NZS 3580.1.1:2016 Methods for sampling and analysis of ambient air Guide to siting air monitoring equipment	A high level of operator skill is required for the siting, operation and processing of results. A power source is required. Generators may be used where a power source is unavailable. Diesel generators produce particles that may influence monitored levels. Security for the equipment is required.



#### Table 4 Monitors specification used on site

Monitor Model	Serial Number	Calibration date required
TSI Dusttrak 8530	1709	21 May 2022
TSI Dusttrak 8532	3307	16 September 2022
TSI Dusttrak 8530	4323	21 May 2022
TSI Dusttrak 8532	3306	16 September 2022

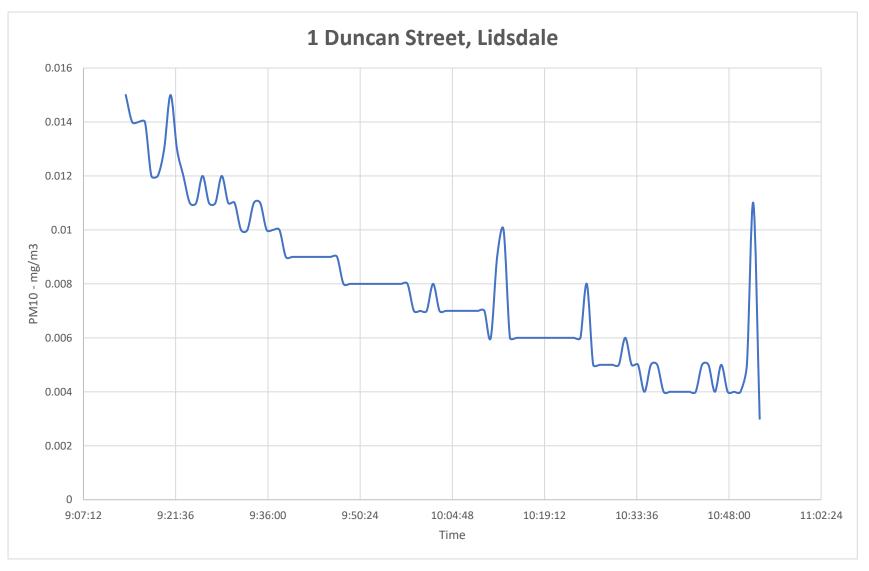
### 4. Results

Table 5	Dust Monitoring	results
---------	-----------------	---------

Date	Location	PM <sub>10</sub> 1-hour concentration peak mg/m <sup>3</sup>	Comments
	1 Duncan Street, Lidsdale	<0.1	-
24	United Petrol pump	<0.1	-
November 20221	121 Main Street, Wallerawang	<0.1	-
	55 Cripps Avenue, Wallerawang	<0.1	-

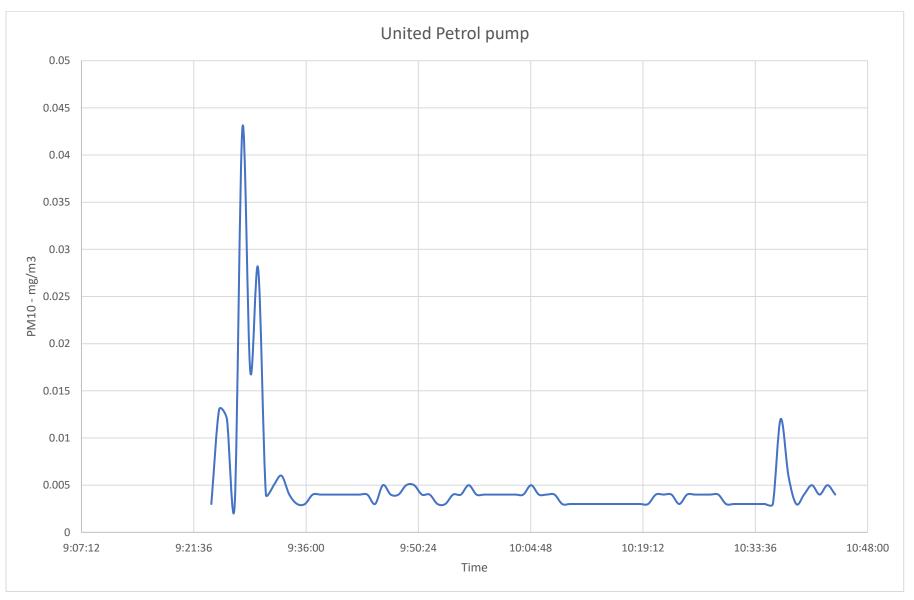


# 5. Graphs



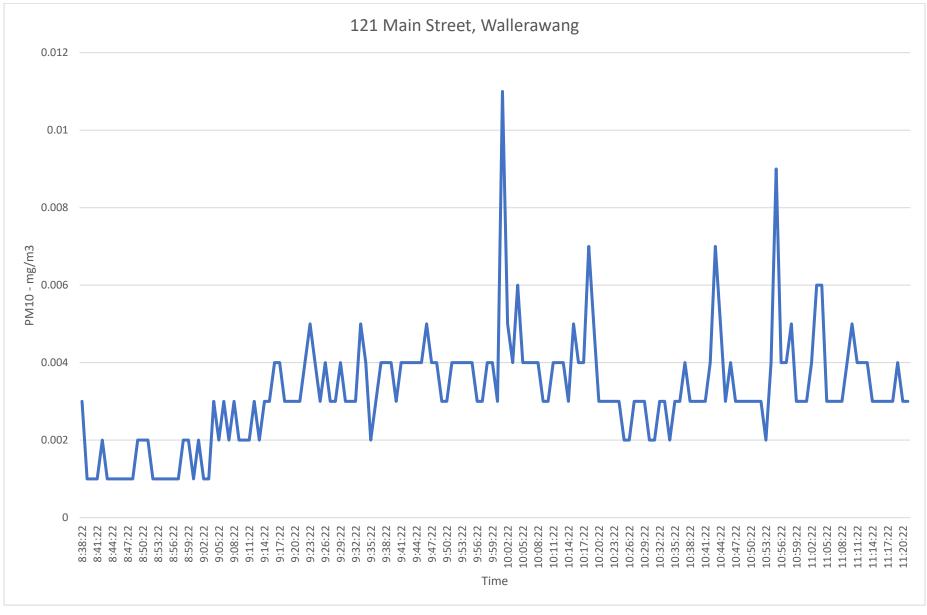
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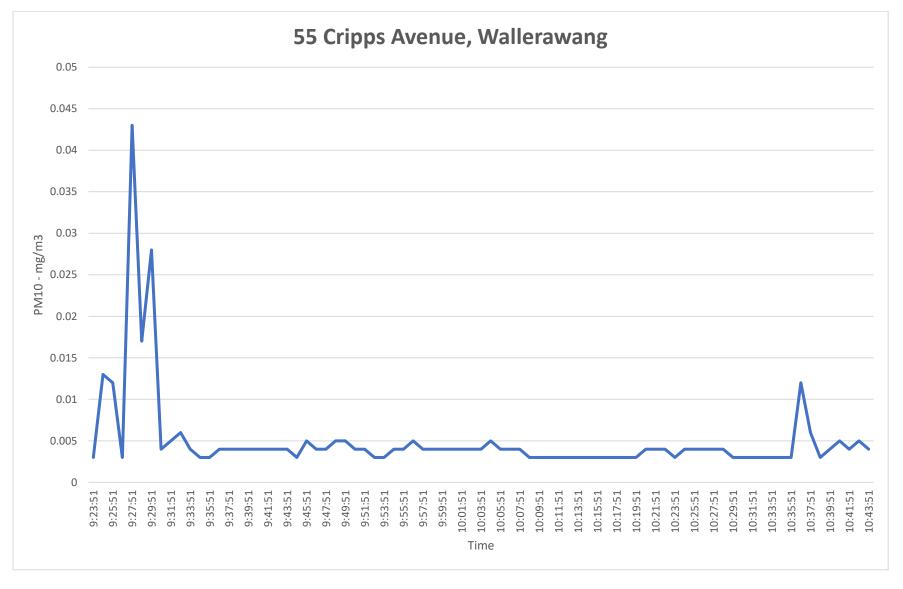


Figure 3 Depicts Graph(s) Unit 1-4

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## 6. Discussion and Conclusions

As per monitoring period between 8am to 11am, all measured dust levels that were the result of sitebased demolition works were below the adopted peak 0.1mg/m<sup>3</sup> aerosol limit.



# Appendix A – Limitations



The inherent limitations of a snapshot sampling regime apply to the all results laid out in this report. It needs to be understood that these results will be spread across the span of a single day and may not accurately represent the air quality under conditions other than those at the time of testing. Air quality measurements are susceptible to changes in meteorological conditions, number of occupants in a room, HVAC system operation or in-operation and activities undertaken in the built environment.

Observations and sampling/test results were indicative of the conditions present at the time of our investigation are a snapshot of conditions as they were at the time of the investigation, and may not be representative of past or future conditions.

The inspection is not considered intrusive and has not included inspection of voids, confined spaces, areas considered to require specialist heights access or any area not deemed safe to access at the time of inspection.

Our report is limited in to the agreed scope of works outlined in our fee proposal. The location of monitors are restricted as per client policies.

The report has been prepared for the benefit of the Client and no other party. EHO Consulting assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EHO Consulting or for any loss or damage suffered by any other party in relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

EHO Consulting will not be liable to update or revise the report to take into account any events, emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.



# Appendix B – Calibration Certificates





Document	KF501
Revision	D
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Customer	and the second second	Expert Testin	g Services	
Address		63 Parkway D	Drive	
		Marsden Parl	k, NSW 2765	
Contact		Aachal Chan	ł	
Equipment		TSI Dusttrak		
Model	1000	8530		
Serial Number		8530111709		
Calibration Date		May 21, 2021		
Condition as Received		As Found Pas	ssed	
		Reference	Instruments	
Measurement Variable	Mod	el No.	Serial No.	A
Photometer		8700		Calibration Due
DC Voltage (Keithley)			8587205101	15/12/2021
Pressure		700 40.00	4364761	5/01/2022
		40-SP	4146296	15/01/2022
Flow and Temperature		40	41401118008	15/11/2021
1 um PSL		518	698880	Apr-22
2.8 um PSL		520	702200	Apr-22
10 um PSL	DC	DC-10 187001		Jul-23
	nbient Temp Humidity		19°C 42%RH	
Baromet	ric Pressure		1012hPa	
Kenelec Scientific Pty Ltd Ce All performance and acceptanc test and calibration data suppli adjusted to respirable mass sta particles and verified on the TS	e tests requir ed by Keneleo indard ISO 12	ed were succe Scientific has 2103-1 Al Test	been obtained using Emery O	il and has been nominally
Procedure	s Followed:	LABP1	A CONTRACT OF	Terrington, 1- Julying of
	s Followed:	LABP1	)	terret, in hitse
	d Signatory:		t	
	d Signatory:	LABP1 24/05/2021	¥	Lenger Schlares

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Testing Number	Calibration Reference mg/m3	Instrument Output mg/m3	0.00000	le Range 10%
1	0.089	0.081	0.080	0.095
2	1.144	1.063	1.030	1.258
3	4.196	3.881	3.776	4.616
4	51,919	48.923	46.727	57.11

Flow			Prossure				
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow Lpm	3	2.960	3.150 - 2.850	Pressure kPA	100.999	100.810	105.049-95.949

Testing Number	Calibration Reference mg/m3	Instrument Output mg/m3	12221677	le Range 10%
1	0.094	0.091	0.085	0.100
2	1.231	1.23	1.108	1.354
3	4.303	4.276	3.873	4.73
4	55.837	56.403	50.253	61.42

			As Left Pressu	re/Flow Results	201210	1.101.101.2011	AC402 #62534
Flow Pressure							
Parameter	Standard	Massurori	Allowable Kange	Parameter	Standard	Measured	Allowable Range
Flow Lpm	3	3.040	3.150 - 2.850	Pressure kPA	101.229	101.240	106.290-96.165

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Report Number: DT221741

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Customer	Expert Testing Services
Address	5 Glen Maragret Avenue
	Lurnea, NSW 2170
Contact	Amend Kumar
Equipment	TSI Dusttrak
Model	8532
Serial Number	8532183307
Calibration Date	September 16, 2021
Condition as Received	As Found Passed

Reference Instruments				
Measurement Variable	Model No.	Serial No.	Calibration Due	
Photometer	858700	8587205101	15/12/2021	
DC Voltage (Keithley)	2700	4364761	5/01/2022	
Pressure	276140-SP	4146296	15/01/2022	
Flow and Temperature	4140	41401118008	15/11/2021	
1 um PSL	19518	698880	Apr-22	
2.8 um PSL	19520	702200	Apr-22	
10 um PSL	DC-10	187001	Jul-23	

ENVIRONMENTA	L CONDITIONS
Ambient Temp	17°C
Humidity	54%RH
Barometric Pressure	1004hPa

#### Kenelec Scientific Pty Ltd Certifies That :-

All performance and acceptance tests required were successfully conducted according to required specifications. All test and calibration data supplied by Kenelec Scientific has been obtained using Emery Oil and has been nominally adjusted to respirable mass standard ISO 12103-1 Al Test Dust. Calibration of sizing is performed using the above particles and verified on the TSI calibration bench.

Procedures Followed:	LABP1
Approved Signatory:	e afr
Date:	17/09/2021

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Testing Number	Calibration Reference mg/m3	Instrument Output mg/m3		le Range 10%
1	0.063	0.057	0.057	0.069
2	0.71	0.681	0.639	0.781
3	4.07	3.876	3.663	4.477
4	35.156	34.327	31.640	38.672

Flow				Pressure			
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow Lpm	3	3.040	3.150 - 2.850	Pressure kPA	100.913	101.020	105.959-95.86
Pump Ru	in Hours:	31		100			

Testing Number	Calibration Reference mg/m3	Instrument Output mg/m3	Allowable Range +/- 10%	
1	0.063	0.06	0.057	0.069
2	0.714	0.711	0.643	0.785
3	4.07	4.017	3.663	4.477
4	34.99	35.483	31.491	38.48

Flow					Pres	sure	
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow Lpm	3	3.020	3.150 - 2.850	Pressure kPA	100.662	100.660	105.695-95.629

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Customer	Expert Testing Services
Address	5 Glen Maragret Avenue
· Chab	Lurnea, NSW 2170
Contact	Amend Kumar
Equipment	TSI Dusttrak
Model	8532
Serial Number	8532183306
Calibration Date	September 16, 2021
Condition as Received	As Found Passed

	Reference	Instruments	
Measurement Variable	Model No.	Model No. Serial No.	
Photometer	858700	8587205101	15/12/2021
DC Voltage (Keithley)	2700	4364761	5/01/2022
Pressure	276140-SP	4146296	15/01/2022
Flow and Temperature	4140	41401118008	15/11/2021
1 um PSL	19518	698880	Apr-22
2.8 um PSL	19520	702200	Apr-22
10 um PSL	DC-10	187001	.lul-23

ENVIRONMENTAL CONDITIONS			
Ambient Temp	17°C		
Humidity	54%RH		
Barometric Pressure	1004hPa		

#### Kenelec Scientific Pty Ltd Certifies That :-

All performance and acceptance tests required were successfully conducted according to required specifications. All test and calibration data supplied by Kenelec Scientific has been obtained using Emery Oil and has been nominally adjusted to respirable mass standard ISO 12103-1 Al Test Dust. Calibration of sizing is performed using the above particles and verified on the TSI calibration bench.

		Procedures Followed: LABP1
gh	gh	Approved Signatory:
		Date: 17/09/2021

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Testing Number	Calibration Reference mg/m3	Instrument Output mg/m3	Allowable Range +/- 10%	
1	0.061	0.059	0.055	0.067
2	0.677	0.66	0.609	0.745
3	3.878	3.741	3.490	4.266
4	33.693	33.137	30.324	37.06

Flow			Pressure				
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow Lpm	3	3.000	3.150 - 2.850	Pressure kPA	100.765	100.686	105.803-95.727

Testing Number	Calibration Reference mg/m3	Instrument Output mg/m3	Allowable Range +/- 10%	
1	0.063	0.061	0.057	0.069
2	0.714	0.712	0.643	0.785
3	4.07	4.018	3.663	4.477
4	34.99	35.483	31,491	38.489

			As Left Pressu	re/Flow Results			
Flow				Pressure			
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable Range
Flow Lpm	3	2.980	3.150 - 2.850	Pressure kPA	100.559	100.574	105.587-95.531

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Report Number: DT220519

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Customer	Expert Testing Services
Address	63 Parkway Drive
	Marsden Park, NSW 2765
Contact	Aachal Chand
Equipment	TSI Dusttrak
Model	8530
Serial Number	8530114323
Calibration Date	May 21, 2021
Condition as Received	As Found Failed

Reference Instruments					
Measurement Variable	Model No.	Serial No.	Calibration Due		
Photometer	858700	8587205101	15/12/2021		
DC Voltage (Keithley)	2700	4364761	5/01/2022		
Pressure	276140-SP	4146296	15/01/2022		
Flow and Temperature	4140	41401118008	15/11/2021		
1 um PSL	19518	698880	Apr-22		
2.8 um PSL	19520	702200	Apr-22		
10 um PSL	DC-10	187001	Jul-23		

ENVIRONMENTAL CONDITIONS			
Ambient Temp         19°C           Humidity         42%RH			
Humidity	42%RH		
Barometric Pressure	1012hPa		

#### Kenelec Scientific Pty Ltd Certifies That :-

All performance and acceptance tests required were successfully conducted according to required specifications. All test and calibration data supplied by Kenelec Scientific has been obtained using Emery Oil and has been nominally adjusted to respirable mass standard ISO 12103-1 Al Test Dust. Calibration of sizing is performed using the above particles and verified on the TSI calibration Bench.

LABP1
Ý
24/05/2021

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CALIBRATIC	ON RESULTS			
As Left Verification Data				
Calibration Reference mg/m3	Instrument Output	Allowable Range +/- 10%		
0.094	0.092			
1.231	1.229		0.103	
4.303	4.239		1.354	
55.837	56.443		4.733	
	As Left Verif Calibration Reference mg/m3 0.094 1.231 4.303	Calibration Reference mg/m3         Instrument Output           0.094         0.092           1.231         1.229           4.303         4.239	As Left Verification Data           Calibration Reference mg/m3         Instrument Output         Allowal +/-           0.094         0.092         0.085           1.231         1.229         1.108           4.303         4.239         3.873	

Flow And Pressure Verification				System	DTII01-01		
Parameter	Standard	Measured	Allowable Range	Parameter	Standard	Measured	Allowable
Flow Lpm	3	3.030	3.150 - 2.850	Pressure kPA	101.242	101 240	Range
Pump Ru	n Hours:	0	2.000	Flessule KPA	101.242	101.240	106.304-96.18

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