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# Manning Colliery Monthly Website Report – December 2022

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<b>Site:</b>	Manning Colliery
<b>Department:</b>	Technical Services
<b>Report Title:</b>	Monthly Environmental Report – December 2022
<b>Prepared by:</b>	Lachlan McWha
<b>Report Date:</b>	05 January 2023
<b>Distribution:</b>	Delta Coal website

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# Monthly Website Report

Manning Colliery Monthly Environmental Report – December 2022

## Summary

Environmental monitoring results are presented in this report for monitoring undertaken during the period of December 2022.

## Introduction

Great Southern Energy Pty Ltd (trading as Delta Coal) operates Manning Colliery, an underground coal mine at the southern end of Lake Macquarie.

Manning Colliery operates under the following regulatory instruments:

- Section 66(6) of the *Protection of the Environmental Operations Act 1997*, to make monitoring data related to an Environment Protection Licence (EPL) publicly available;
- Condition 10 & 13, Schedule 5, of Project Approval 06\_0311 (as modified) to provide details of monitoring results and environmental performance;
- An Environment Protection Licence (EPL 191) issued under the *Protection of the Environment Operations Act 1997*; and
- A Water Access Licence (WAL40461), Aquifer (Sydney Basin – North Coast Groundwater Source) for 450-unit shares (megalitres).

Details of the Manning Colliery EPL 191 are provided below.

Manning Colliery Information	
Premises name	Manning Colliery
Address	Ruttleys Road, Doyalson, NSW, 2262
Licensee	Great Southern Energy Pty Ltd
EPL #	191
EPL location	<a href="#">EPL 0191 - 14 April 2021</a>

The overall purpose of this monthly report is to keep stakeholders informed of the environmental monitoring results at Manning Colliery and maintain a transparent and accountable reporting system.

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## Scope

This report presents the results from the various environmental monitoring programs undertaken for Manning Colliery. Results are presented monthly with annual data, averages and trends in data also shown where relevant.

Where applicable, the results of the monitoring programs are compared with the relevant criteria (from the EPL or Project Approval) to assess compliance.

Monitoring results presented include:

- Water – quality;
- Water – volume;
- Air Quality – Depositional Dust
- Air Quality – PM<sub>10</sub>
- Air Quality – PM<sub>2.5</sub>; and
- Meteorological data.

## Definitions

g/m<sup>2</sup>/month – grams per square metre per month;

kL – kilolitre;

ML – megalitre;

mg/L – milligrams per litre;

TSS – total suspended solids;

µg/L – micrograms per litre; and

µS/cm – microSiemens per centimetre.

## References

Project Approval 06\_0311 (as modified)

Environment Protection Licence 191 (Licence version date: 14 April 2021)

ALS - Dust Deposition Report **December 2022**

ALS – MC Water Analysis Reports **December 2022**

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## Monitoring Results

Water – Quality

Weekly water quality results for discharge point LDP001 are presented below.

December 2022				
<b>EPL</b>	191			
<b>Licensee</b>	Great Southern Energy Pty Ltd			
<b>Premises</b>	Manning Colliery			
<b>Location</b>	LDP001 (EPA ID # 1)			
<b>Sample Frequency</b>	Weekly			
<b>pH limit</b>	6.5 - 8.5			
<b>TSS limit (mg/L)</b>	50			
<b>Oil and grease limit (mg/L)</b>	10			
Water Quality Results				
Date	pH	TSS (mg/L)	Oil and grease (mg/L)	Electrical Conductivity (µS/cm)
01/12/2022	7.66	9	<5	28,300
05/12/2022	7.64	<5	<5	28,000
13/12/2022	7.55	9	<5	28,000
21/12/2022	7.59	13	<5	28,500
31/12/2022	8.41	8	<5	8,690
<b>Average</b>	7.77	8.3	<5	24,298

There were no exceedances of water quality criteria in December 2022 at Manning Colliery.

Monthly water quality results, primarily metals and metalloids, at LDP001 are presented below for the period.

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## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Sample ID		LDP001
		Sampling date / time		13-Dec-2022 10:20
Compound	CAS Number	LOR	Unit	ES2245056-001 Result
<b>ED040F: Dissolved Major Anions</b>				
Sulfur as S	63705-05-5	1	mg/L	186
Silicon as SiO2	14464-46-1	0.1	mg/L	16.3
<b>ED093T: Total Major Cations</b>				
Calcium	7440-70-2	1	mg/L	288
Magnesium	7439-95-4	1	mg/L	332
Sodium	7440-23-5	1	mg/L	6260
<b>EG020F: Dissolved Metals by ICP-MS</b>				
Aluminium	7429-90-5	10	µg/L	<100
Arsenic	7440-38-2	1	µg/L	<10
Beryllium	7440-41-7	1	µg/L	<10
Cadmium	7440-43-9	0.1	µg/L	<1.0
Chromium	7440-47-3	1	µg/L	<10
Cobalt	7440-48-4	1	µg/L	<10
Copper	7440-50-8	1	µg/L	<10
Lead	7439-92-1	1	µg/L	<10
Manganese	7439-96-5	1	µg/L	64
Molybdenum	7439-98-7	1	µg/L	<10
Nickel	7440-02-0	1	µg/L	<10
Selenium	7782-49-2	10	µg/L	<100
Silver	7440-22-4	0.001	mg/L	<0.010
Vanadium	7440-62-2	10	µg/L	<100
Zinc	7440-66-6	5	µg/L	<50
<b>EG020T: Total Metals by ICP-MS</b>				
Aluminium	7429-90-5	0.01	mg/L	<0.10
Antimony	7440-36-0	0.001	mg/L	<0.010
Arsenic	7440-38-2	0.001	mg/L	<0.010
Beryllium	7440-41-7	0.001	mg/L	<0.010
Barium	7440-39-3	0.001	mg/L	0.214
Cadmium	7440-43-9	0.0001	mg/L	<0.0010
Chromium	7440-47-3	0.001	mg/L	<0.010
Cobalt	7440-48-4	0.001	mg/L	<0.010
Copper	7440-50-8	0.001	mg/L	<0.010
Lead	7439-92-1	0.001	mg/L	<0.010
Lithium	7439-93-2	0.001	mg/L	0.674
<b>EG020T: Total Metals by ICP-MS - Continued</b>				
Molybdenum	7439-98-7	0.001	mg/L	<0.010
Nickel	7440-02-0	0.001	mg/L	<0.010
Selenium	7782-49-2	0.01	mg/L	<0.10
Silver	7440-22-4	1	µg/L	<10
Tin	7440-31-5	0.001	mg/L	<0.010
Titanium	7440-32-6	10	µg/L	<100
Vanadium	7440-62-2	0.01	mg/L	<0.10
Zinc	7440-66-6	0.005	mg/L	<0.052
Boron	7440-42-8	0.05	mg/L	0.43
Iron	7439-89-6	0.05	mg/L	0.25
<b>EG035F: Dissolved Mercury by FIMS</b>				
Mercury	7439-97-6	0.1	µg/L	<0.1
<b>EG035T: Total Recoverable Mercury by FIMS</b>				
Mercury	7439-97-6	0.1	µg/L	<0.1
<b>EK055G: Ammonia as N by Discrete Analyser</b>				
Ammonia as N	7664-41-7	0.01	mg/L	1.15
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>				
Total Phosphorus as P	----	0.01	mg/L	0.12

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## Water – Volume

Monthly water volumes discharged via LDP001 at Manning Colliery are summarised below.

December 2022	
EPL	191
Licensee	Great Southern Energy Pty Ltd
Premises	Manning Colliery
Date Sampled	Daily
Date Reported	Refer report date
Discharge volume limit	4000 kilolitres per day
Sampling Point	LDP001 (EPA ID # 1)

Date (24 hour period)	LDP 1 Volume (kL/day)	Rainfall (mm)
01/12/2022	1535.68	0
02/12/2022	1512.61	0
03/12/2022	1496.23	0
04/12/2022	929.95	0
05/12/2022	397.19	0.2
06/12/2022	189.75	0.6
07/12/2022	0	0
08/12/2022	496.87	0
09/12/2022	279.02	1.2
10/12/2022	869.39	2.6
11/12/2022	907.69	0
12/12/2022	1186.17	7
13/12/2022	1192.49	0
14/12/2022	1641.34	0
15/12/2022	1009.26	0
16/12/2022	557.99	6.6
17/12/2022	843.73	3
18/12/2022	157.34	12.4
19/12/2022	1069.85	1.6
20/12/2022	534.56	0
21/12/2022	751.18	0
22/12/2022	346.49	1.8
23/12/2022	555.06	0.2
24/12/2022	9	0
25/12/2022	8	0
26/12/2022	8	0
27/12/2022	8	0
28/12/2022	8	0
29/12/2022	9	0.4
30/12/2022	15	7.6
31/12/2022	9	0

Average	598 kL/day	1.4 mm/day
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There were no exceedances of volumetric discharge limits at LDP1 in December 2022.

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## Water – Groundwater Discharge

Groundwater discharged from underground workings to the MCs surface retention Dams has been detailed below. Manning Colliery operates Water Access License 40461 permitting the extraction of 450 megalitres per financial year and reports annual use to the Water NSW, Water Accounting System (iWAS).

MC Groundwater Pumped to Surface Totals FY2022-2023		
Date (month)	Groundwater Discharge (ML)	Groundwater Discharge (Total ML Water Year to Date)
Jul-22	23.88	24
Aug-22	21.7	46
Sep-22	23.9	69
Oct-22	18.4	88
Nov-22	25.9	114
Dec-22	16.69	130
Jan-23		
Feb-23		
Mar-23		
Apr-23		
May-23		
Jun-23		

## Air Quality – Depositional Dust

Monthly depositional dust results are shown below.

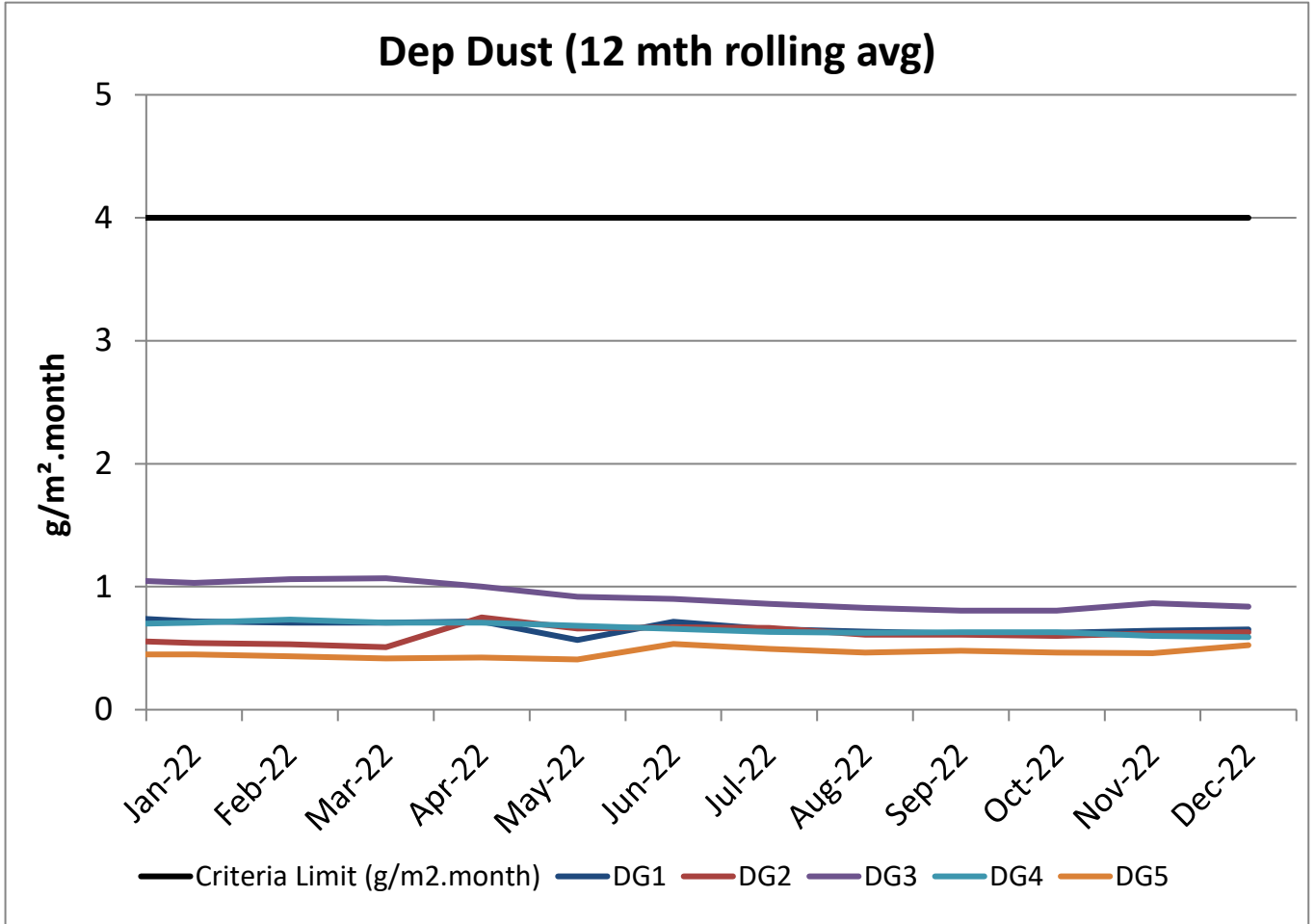
December 2022		
<b>EPL</b>	191	
<b>Limits</b>	Max. total deposited dust level	4g/m <sup>2</sup> /month
	Max. increase in deposited dust level	2g/m <sup>2</sup> /month
<b>Sampling Date</b>	04/11/2022 to 05/12/2022	
EPA ID no.	Site	Insoluble Matter (g/m <sup>2</sup> /month)
3	DG1	0.6
4	DG2	0.5
5	DG3	0.7
6	DG4	0.5
7	DG5	1.7
<b>Notes:</b>	Sampling locations provided in Manning Colliery Air Quality Management Plan available on the Delta Coal website.	



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A 12-month rolling average of depositional dust concentrations has been presented below. Manning Colliery's dust gauges are located around the perimeter of the Manning Colliery site boundary.

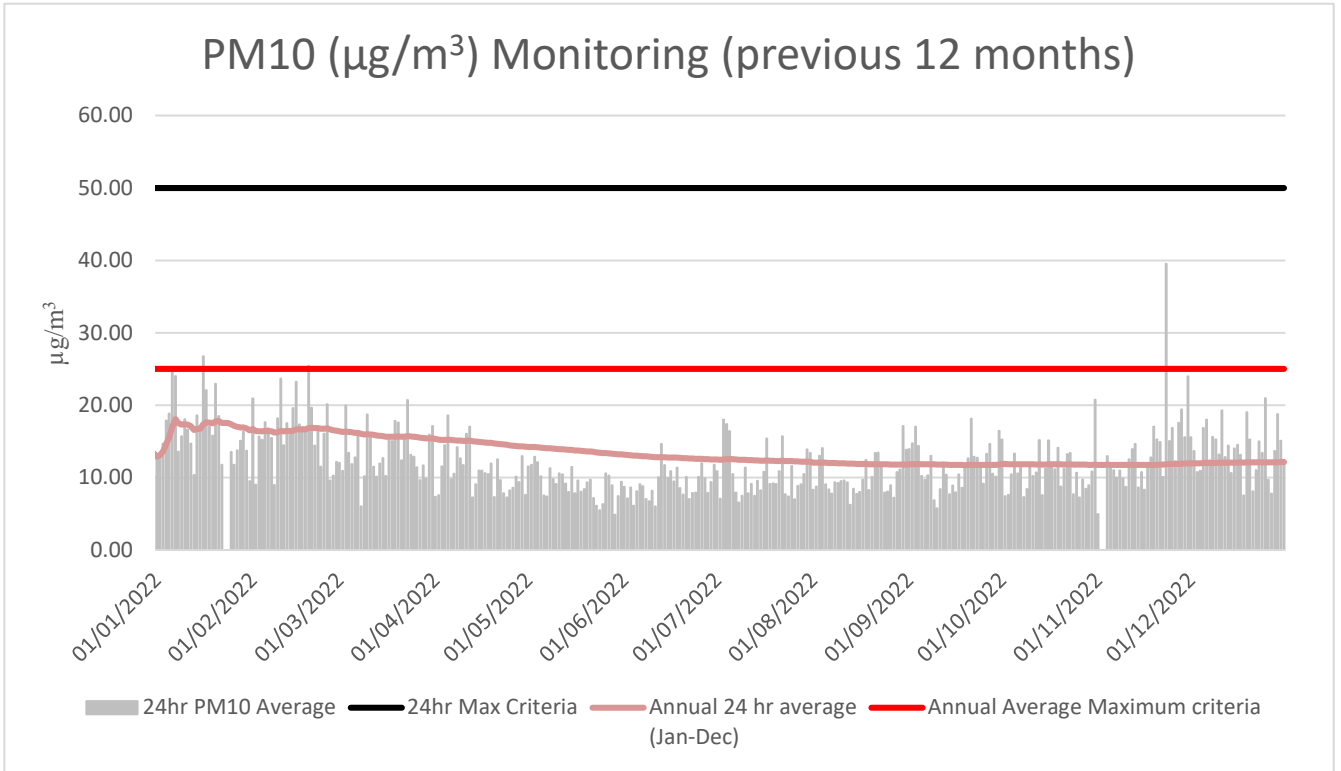


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## Air Quality – PM<sub>10</sub>

The 24hr PM<sub>10</sub> average from Delta Coal’s Tapered Element Oscillating Microbalance (TEOM), located at the Manning Park Sewage Treatment Plant, is presented below for the year to date.



Annual 24hr PM<sub>10</sub> average maximum criteria for December 2022 was below the annual average maximum criteria limit. A summary of data availability for Delta Coal’s TEOM is presented below for the reporting period. Delta Coals TEOM had a data availability of **99.9%** for the month of December 2022

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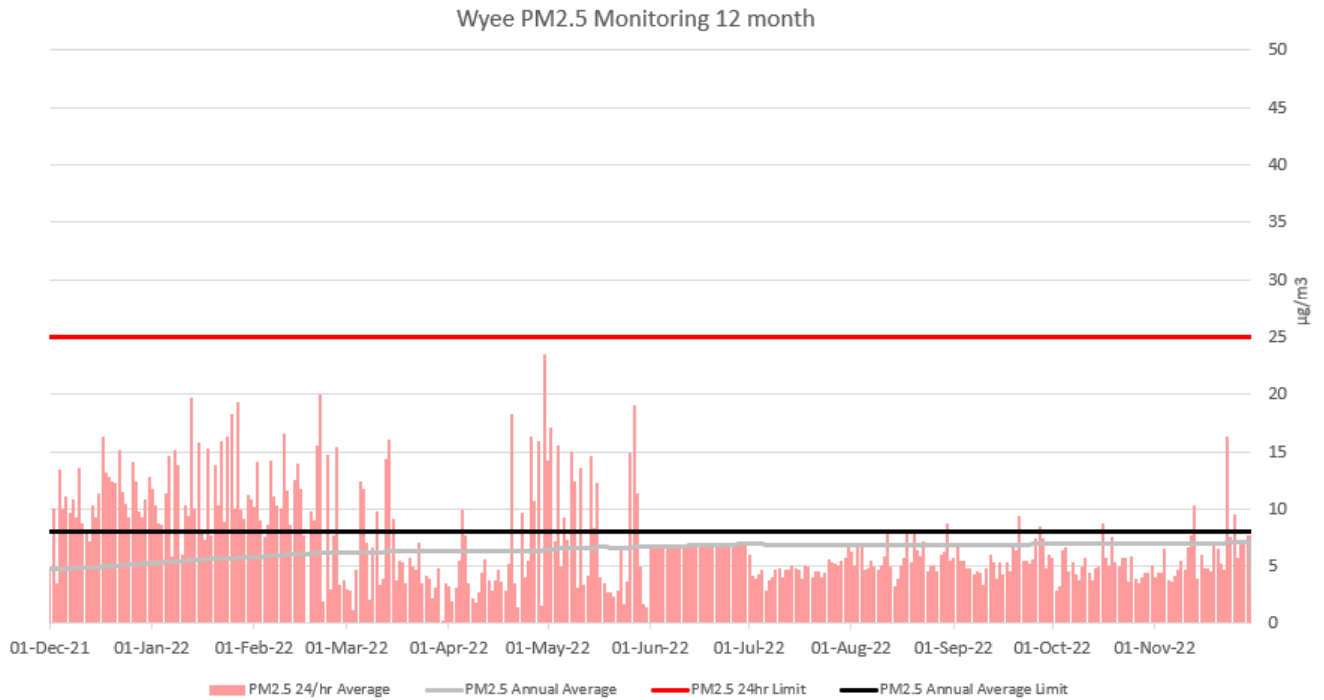
Variable	November	Total	Valid
A/C Temp	99.9%	8640	8629
A1	99.9%	8640	8629
A1_Scaled	99.9%	8640	8629
Bypass Flow	99.9%	8640	8629
Cap Temp	99.9%	8640	8629
Case Temp	99.9%	8640	8629
Config	99.9%	8640	8629
Dew Point	99.9%	8640	8629
Dig-In	99.9%	8640	8629
Dig-Latch	99.9%	8640	8629
ESN	99.9%	8640	8629
Filter Freq	99.9%	8640	8629
Filter Load	99.9%	8640	8629
Humidity	99.9%	8640	8629
MC	99.9%	8640	8629
MC 12Hr	99.9%	8640	8629
MC 1Hr	99.9%	8640	8629
MC 24Hr	99.9%	8640	8629
MC 30min	99.9%	8640	8629
MC 8Hr	99.9%	8640	8629
MC Total	99.9%	8640	8629
Mobile Signal	99.9%	8640	8629
Noise	99.9%	8640	8629
PM10 Flow	99.9%	8640	8629
Pressure	99.9%	8640	8629
Site	0.0%	8640	0
Temperature	99.9%	8640	8629
Tube Temp	99.9%	8640	8629
Vac Pressure	99.9%	8640	8629
Volts	99.9%	8640	8629

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## Air Quality – PM2.5

Delta Coal utilises PM<sub>2.5</sub> data obtained from Delta Electricity owned and operated beta attenuation monitor (BAM). The PM<sub>2.5</sub> monitor is located on Tingley Road, Wyee.



There were no exceedances of the PM<sub>2.5</sub> daily average limit in November 2022. The 12-month rolling average PM<sub>2.5</sub> value on 30 November 2022 was 7.11 µg/m<sup>3</sup>. PM<sub>2.5</sub> data availability for November 2022 was 100%. The 2022 year to date PM<sub>2.5</sub> data availability was 91%.

December PM<sub>2.5</sub> monitoring data will be presented in the January 2023 monthly report due to data supply and validation delays.

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## Weather Data

A summary of weather data recorded by a meteorological monitoring station at the adjacent Manning Colliery is presented below for the year to date. (EPA ID no. 26).

Monthly Weather Data 2022			
Licensee	Great Southern Energy Pty Ltd		
Location	Manning Colliery Meteorological station		
Date published	Refer report date		
Date sampled	Daily		
Date obtained	05 January 2022		
Month	Total Rainfall/Month (mm)	Min Temp	Max Temp
Jan-22	110.6	15.4	30.5
Feb-22	187.2	14.1	34
Mar-22	398.4	13.1	29
Apr-22	174.4	9.8	28.3
May-22	132.4	5.3	26.1
Jun-22	24.8	3	21.5
Jul-22	356.8	2.8	21.4
Aug-22	44	3.9	23.6
Sep-22	120	6	23.6
Oct-22	163.4	6.8	29.2
Nov-22	47	7.3	32.2
Dec-22	45.2	10.7	30.8

Variable	December	Total	Valid
Baro (Corrected)	220.6%	2976	6564
10m Temp	220.6%	2976	6564
2m Temp	220.6%	2976	6564
A1	220.6%	2976	6564
A1_Scaled	220.6%	2976	6564
Assumed Temp	220.6%	2976	6564
Barometric	220.6%	2976	6564
Config	220.6%	2976	6564
Daily Evap	220.6%	2976	6564
Daily Rain	220.6%	2976	6564
Delta T	220.6%	2976	6564
Dew Point	220.6%	2976	6564
Dig-In	220.6%	2976	6564
Dig-Latch	220.6%	2976	6564
ESN	220.6%	2976	6564
FDI	220.6%	2976	6564
Heat Index	220.6%	2976	6564
Humidity	220.6%	2976	6564
Mobile Signal	220.6%	2976	6564
Rain	220.6%	2976	6564
Raw Evap	220.6%	2976	6564
S Class	220.6%	2976	6564
Scalar WS	220.6%	2976	6564
Sigma	220.6%	2976	6564
Site	0.0%	2976	0
Solar Radiation	220.6%	2976	6564
Vector WD	220.6%	2976	6564
Vector WS	220.6%	2976	6564
Volts	220.6%	2976	6564
Wind Chill	220.6%	2976	6564
Wind Direction	220.6%	2976	6564
Wind Speed	220.6%	2976	6564
WS Avg	220.6%	2976	6564
WS Gust	220.6%	2976	6564

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