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# Mannering Colliery Monthly Website Report – May 2023

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<b>Site:</b>	Mannering Colliery
<b>Department:</b>	Technical Services
<b>Report Title:</b>	Monthly Environmental Report – May 2023
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# Monthly Website Report

Mannering Colliery Monthly Environmental Report – May 2023

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## Summary

Environmental monitoring results are presented in this report for monitoring undertaken during the period of May 2023.

## Introduction

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

Mannering Colliery operates under the following regulatory instruments:

- Section 66(6) of the *Protection of the Environment 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 Mannering Colliery EPL 191 are provided below.

Mannering Colliery Information	
Premises name	Mannering 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 Mannering 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 Mannering 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 MP06\_0311 (as modified)

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

ALS - Dust Deposition Report **May 2023**

ALS – MC Water Analysis Reports **May 2023**

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## Monitoring Results

### Water – Quality

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

May 2023				
EPL	191			
Licensee	Great Southern Energy Pty Ltd			
Premises	Mannering Colliery			
Location	LDP001 (EPA ID # 1)			
Sample Frequency	Weekly			
pH limit	6.5 - 8.5			
TSS limit (mg/L)	50			
Oil and grease limit (mg/L)	10			
Water Quality Results				
Date	pH	TSS (mg/L)	Oil and grease (mg/L)	Electrical Conductivity (µS/cm)
04/05/2023	8.05	6	<5	17,500
12/05/2023	8.10	6	<5	18,100
17/05/2023	8.18	28	<5	15,100
25/05/2023	8.12	10	<5	4,310
31/05/2023	7.79	6	<5	25,300
Average	8.0	11.2	<5	16,062

There were no exceedances of water quality criteria in May 2023 at Mannering 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	17-May-2023 12:10
Compound	CAS Number	LOR	Unit	ES2316437-001
				Result
<b>ED040F: Dissolved Major Anions</b>				
Sulfur as S	63705-05-5	1	mg/L	87
Silicon as SiO <sub>2</sub>	14464-46-1	0.1	mg/L	6.4
<b>ED093T: Total Major Cations</b>				
Calcium	7440-70-2	1	mg/L	118
Magnesium	7439-95-4	1	mg/L	154
Potassium	7440-09-7	1	mg/L	15
<b>EG020F: Dissolved Metals by ICP-MS</b>				
Aluminium	7429-90-5	10	µg/L	<10
Arsenic	7440-38-2	1	µg/L	12
Beryllium	7440-41-7	1	µg/L	<1
Cadmium	7440-43-9	0.1	µg/L	<0.1
Chromium	7440-47-3	1	µg/L	<1
Cobalt	7440-48-4	1	µg/L	<1
Copper	7440-50-8	1	µg/L	<1
Lead	7439-92-1	1	µg/L	<1
Manganese	7439-96-5	1	µg/L	19
Molybdenum	7439-98-7	1	µg/L	7
Nickel	7440-02-0	1	µg/L	2
Selenium	7782-49-2	10	µg/L	<10
Silver	7440-22-4	1	µg/L	<1
Vanadium	7440-62-2	10	µg/L	<10
Zinc	7440-66-6	5	µg/L	8
<b>EG020T: Total Metals by ICP-MS</b>				
Aluminium	7429-90-5	10	µg/L	460
Antimony	7440-36-0	1	µg/L	6
Arsenic	7440-38-2	1	µg/L	14
Beryllium	7440-41-7	1	µg/L	1
Barium	7440-39-3	1	µg/L	454
Cadmium	7440-43-9	0.1	µg/L	0.2
Chromium	7440-47-3	1	µg/L	1
Cobalt	7440-48-4	1	µg/L	<1
Copper	7440-50-8	1	µg/L	<1
Lead	7439-92-1	1	µg/L	2
Lithium	7439-93-2	1	µg/L	364
Molybdenum	7439-98-7	1	µg/L	8
Nickel	7440-02-0	1	µg/L	2
Selenium	7782-49-2	10	µg/L	<10
Silver	7440-22-4	1	µg/L	<1
Tin	7440-31-5	1	µg/L	<1
Titanium	7440-32-6	10	µg/L	<10
Vanadium	7440-62-2	10	µg/L	<10
Zinc	7440-66-6	5	µg/L	13
Boron	7440-42-8	50	µg/L	220
Iron	7439-89-6	50	µg/L	130
<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	0.10
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>				
Total Phosphorus as P	----	0.01	mg/L	0.04

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### Water – Volume

Monthly water volumes discharged via MC's LDP1 during April 2023 at Mannering Colliery are summarised below.

EPL	191
Licensee	Great Southern Energy Pty Ltd
Premises	Mannering 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)
01/05/2023	952	0
02/05/2023	945.98	0.4
03/05/2023	660.27	0
04/05/2023	48.83	0
05/05/2023	948.65	0
06/05/2023	1023.19	0.2
07/05/2023	16.06	2.2
08/05/2023	127.58	4
09/05/2023	0	0
10/05/2023	208.59	0
11/05/2023	0	0
12/05/2023	0	0.2
13/05/2023	0	1
14/05/2023	0	1.2
15/05/2023	0	0.2
16/05/2023	0	0
17/05/2023	394.93	22.4
18/05/2023	300.75	3.6
19/05/2023	0	0
20/05/2023	0	0
21/05/2023	0	0
22/05/2023	0	0
23/05/2023	0	0
24/05/2023	0	0.2
25/05/2023	3.06	0.2
26/05/2023	1199.21	22.2
27/05/2023	1530.57	0
28/05/2023	53.89	0
29/05/2023	0	0
30/05/2023	486.82	0
31/05/2023	1653.62	0

Average	340 kL/day	1.9 mm/day
Maximum	1,654 kL/day	22.4 mm/day

There were no exceedances of volumetric discharge limits at LDP1 in May 2023.

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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	23.9	24
Aug-22	21.7	46
Sep-22	23.9	69
Oct-22	18.4	88
Nov-22	25.9	114
Dec-22	16.7	130
Jan-23	33.3	164
Feb-23	22.9	187
Mar-23	24.8	211
Apr-23	23.3	235
May-23	8.0	243
Jun-23		

## Air Quality – Depositional Dust

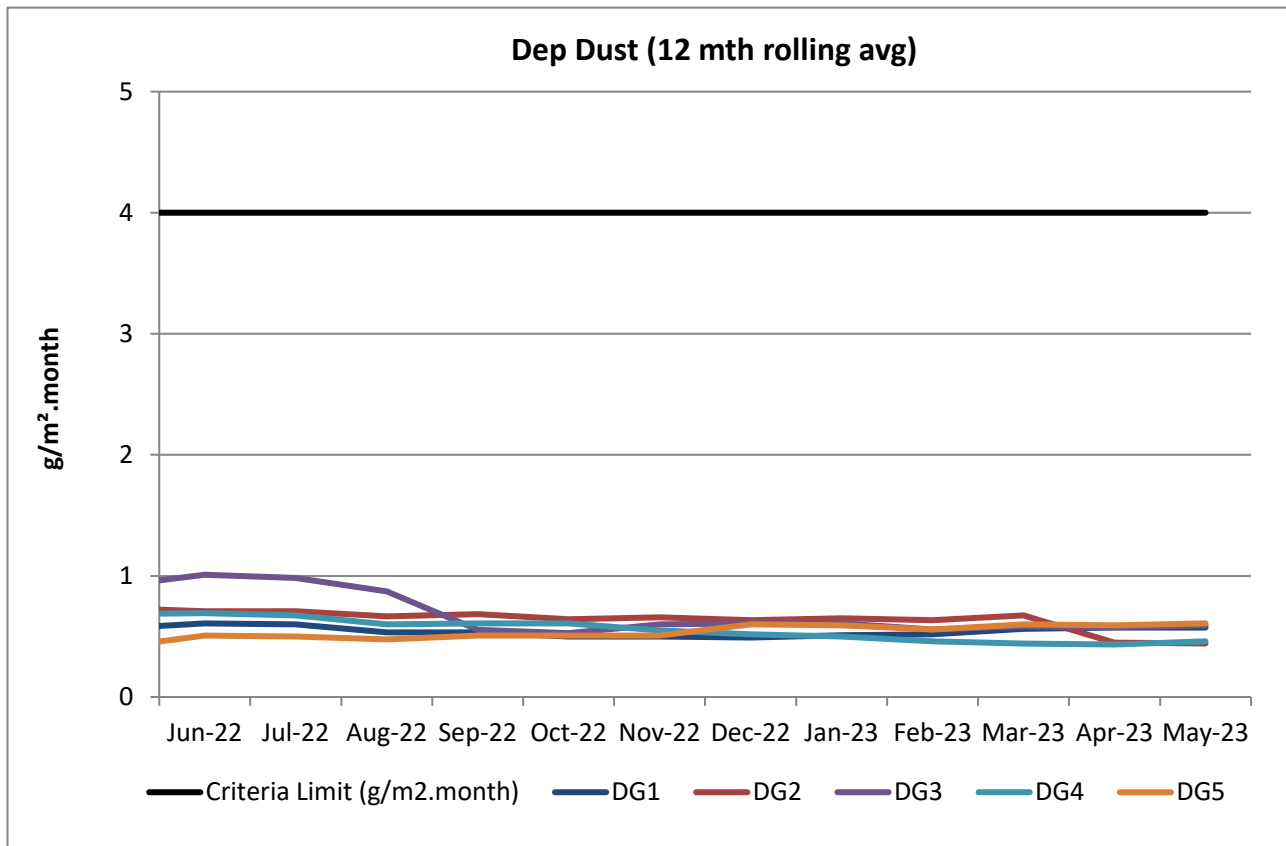
Monthly depositional dust results are shown below.

May 2023		
<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>	03/04/2023 – 03/05/2023	
EPA ID no.	Site	Insoluble Matter (g/m <sup>2</sup> /month)
3	DG1	0.3
4	DG2	0.1
5	DG3	0.3
6	DG4	0.4
7	DG5	0.3
Notes:	Sampling locations provided in Delta Coal Air Quality and Greenhouse Gas 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. Mannering Colliery's dust gauges are located around the perimeter of the Mannering Colliery site boundary.

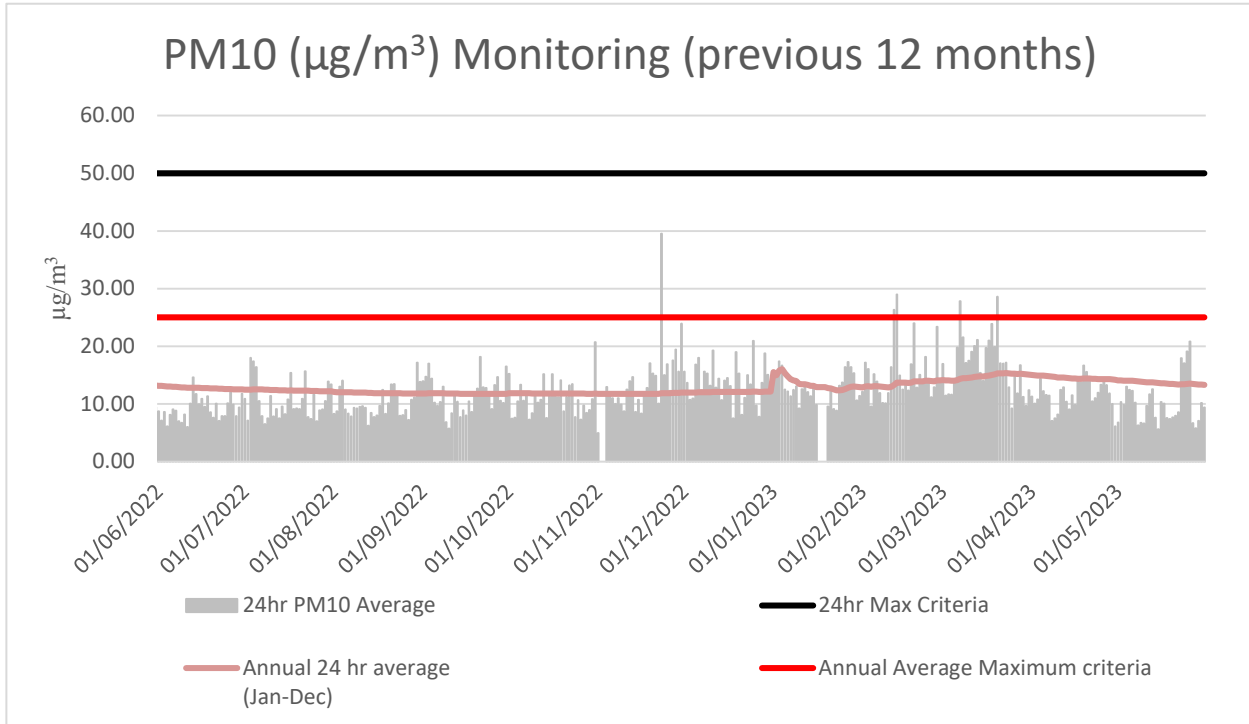


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### Air Quality – PM<sub>10</sub>

The 24hr PM<sub>10</sub> average from Delta Coal's Tapered Element Oscillating Microbalance (TEOM), located at the Mannering Park Sewage Treatment Plant, is presented below for the previous 12 months.



Annual 24hr PM<sub>10</sub> average maximum criteria for May 2023 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 **100%** for the month of May 2023.

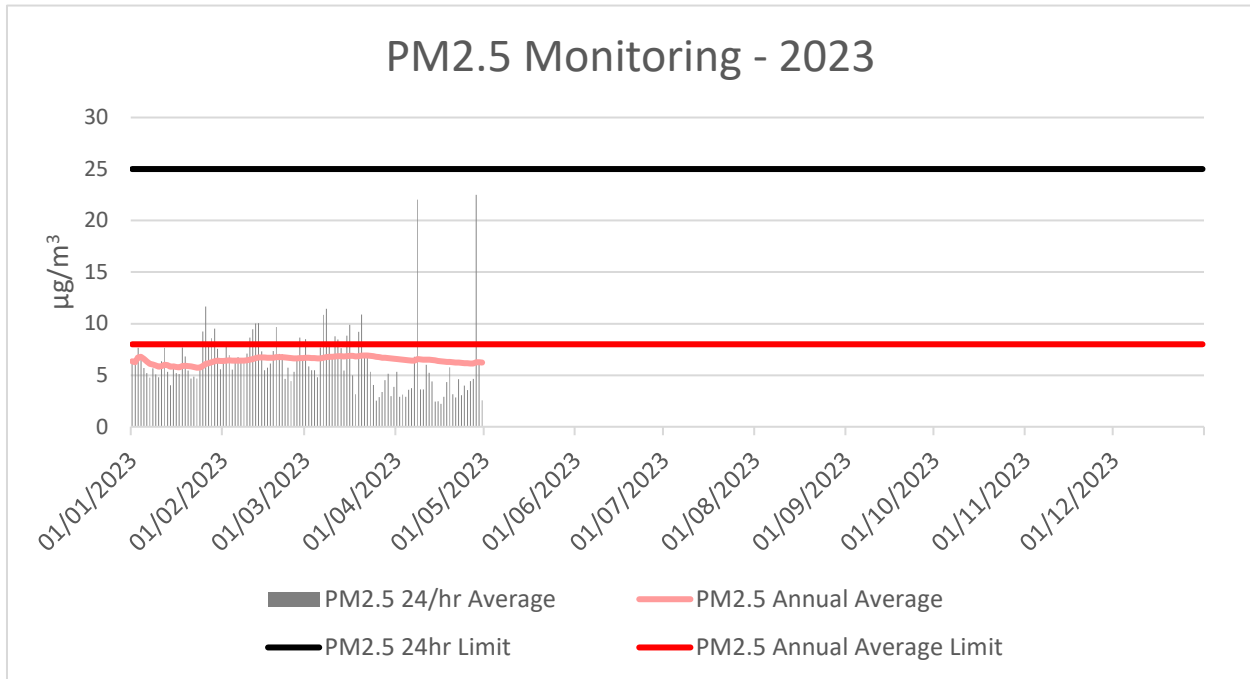
Variable	May	Total	Valid
A/C Temp	100%	8928	8928
A1	100%	8928	8928
A1_Scaled	100%	8928	8928
Bypass Flow	100%	8928	8928
Cap Temp	100%	8928	8928
Case Temp	100%	8928	8928
Config	100%	8928	8928
Dew Point	100%	8928	8928
Dig-In	100%	8928	8928
Dig-Latch	100%	8928	8928
ESN	100%	8928	8928
Filter Freq	100%	8928	8928
Filter Load	100%	8928	8928
Humidity	100%	8928	8928
MC	100%	8928	8928
MC 12Hr	100%	8928	8928
MC 1Hr	100%	8928	8928
MC 24Hr	100%	8928	8928
MC 30min	100%	8928	8928
MC 8Hr	100%	8928	8928
MC Total	100%	8928	8928
Mobile Signal	100%	8928	8928
Noise	100%	8928	8928
PM10 Flow	100%	8928	8928
Pressure	100%	8928	8928
Site	0.0%	8928	0
Temperature	100%	8928	8928
Tube Temp	100%	8928	8928
Vac Pressure	100%	8928	8928
Volts	100%	8928	8928

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## Air Quality – PM<sub>2.5</sub>

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 April 2023. The 12-month rolling average PM<sub>2.5</sub> value on 30 April 2023 was 6.23  $\mu\text{g}/\text{m}^3$ . PM<sub>2.5</sub> data availability in March 2023 was 97%. The 2023 year to date PM<sub>2.5</sub> data availability is 98.78%.

It is noted that due to the validation of PM<sub>2.5</sub> results, there is a one-month delay in publishing PM<sub>2.5</sub> results, however, real-time alarms remain active to ensure mitigation responses to elevated results can be applied when necessary.

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### Weather Data

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

Monthly Weather Data 2023			
Licensee	Great Southern Energy Pty Ltd		
Location	Mannering Colliery Meteorological station		
Date published	Refer report date		
Date sampled	Daily		
Date obtained	14 June 2023		
Month	Total Rainfall/Month (mm)	Min Temp	Max Temp
Jan-23	112	14.4	31.7
Feb-23	91	12.6	33.2
Mar-23	116	9.4	38.7
Apr-23	96	6.8	26.7
May-23	59.2	2.8	23.9

Variable	May	Total	Valid
Baro (Corrected)	100%	2976	2976
10m Temp	100%	2976	2976
2m Temp	100%	2976	2976
A1	100%	2976	2976
A1_Scaled	100%	2976	2976
Assumed Temp	100%	2976	2976
Barometric	100%	2976	2976
Config	100%	2976	2976
Daily Evap	100%	2976	2976
Daily Rain	100%	2976	2976
Delta T	100%	2976	2976
Dew Point	100%	2976	2976
Dig-In	100%	2976	2976
Dig-Latch	100%	2976	2976
ESN	100%	2976	2976
FDI	100%	2976	2976
Heat Index	100%	2976	2976
Humidity	100%	2976	2976
Mobile Signal	100%	2976	2976
Rain	100%	2976	2976
Raw Evap	100%	2976	2976
S Class	100%	2976	2976
Scalar WS	100%	2976	2976
Sigma	100%	2976	2976
Site	0.0%	2976	0
Solar Radiation	100%	2976	2976
Vector WD	100%	2976	2976
Vector WS	100%	2976	2976
Volts	100%	2976	2976
Wind Chill	100%	2976	2976
Wind Direction	100%	2976	2976
Wind Speed	100%	2976	2976
WS Avg	100%	2976	2976
WS Gust	100%	2976	2976