



## Berrima Colliery in Medway POELA Act 2011 Monitoring Data - 2018

### Berrima Colliery, Medway, NSW

### Environmental Protection Licence Number 608, held by Boral Limited

Explanation of units of measure:

mg/m<sup>3</sup> = milligrams per cubic metre

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

µg/m<sup>3</sup> = micrograms per cubic metre

mg/L = milligrams per litre

ML/d = megalitres per day

Record updated on: **14 August 2018**

#### 1. Water monitoring

Berrima Colliery has two licensed discharge points and four ambient background monitoring points:

##### Discharge Points:

- Mine Adit - Naturally occurring groundwater is captured in the underground workings and is discharged into the Wingecarribee River. The monitoring point is referred to as the V Notch Weir (Licence Point 4).
- Pit Top Dam – Referred to as the Chitter Dam, this dam collects water runoff from the surface facilities area. This dam did not discharge during the reporting period.

##### Ambient background monitoring points:

- Wingecarribee River upstream of the mine adit discharge at Old Hume Highway Crossing at Berrima (Licence Point 9).
- Wingecarribee River upstream of the mine adit discharge at Macarthur's Crossing (Licence Point 10).
- Wingecarribee River downstream of the mine adit discharge at Biloela Camp Site (Licence Point 11).
- Wingecarribee River downstream of mine adit discharge at Black Bob's confluence (Licence Point 12).

Licence limits for both discharge points are as follows:

pH: 6.5-8.5

Oil and Grease: 10 mg/L

Total Suspended Solids: 50 mg/L

Table 1 shows the results of parameters for Licence Point 4 for which the licence limits apply as listed above.

Table 2 provides the data for all of the parameters monitored at the Licenced Discharge Point 4 while Table 3 presents ambient water monitoring data. No concentration limits are assigned to these parameters with the exception of pH, suspended solids, and oil and grease as described above for the discharge point.

**Table 1 – Discharge Monitoring Data (Licence Point 4)**

Sampling Date	Report received	Date published	pH	Oil and Grease (mg/L)	Total Suspended Solids (mg/L)
23/01/17	03/02/17	6/02/17	6.72	<5	24
31/03/17	08/05/17	5/06/17	6.83	<5	7
30/05/17	06/06/17	4/07/17	6.71	<5	9
04/07/17	07/08/17	8/08/17	6.80	<5	9
12/09/17	10/10/17	13/10/17	6.75	<5	32
09/11/17	17/11/17	6/12/17	6.60	<5	10
31/01/18	09/02/18	13/02/18	6.77	<5	34
27/03/18	12/04/18	14/04/18	6.84	<5	8
31/05/18	11/06/18	12/06/18	6.98	<5	14
26/07/18	1/08/18	14/08/18	6.85	<5	11

Note: values noted as <5 means that the levels were below laboratory detection limits.  
Compliance summary: Discharge within the licence limits.

**Table 2 – Additional Monitoring Parameters for Licence Point 4**

Parameter	Date Sampled: 23/01/17 Report Received: 03/02/17 Date Published: 06/02/17	Date Sampled: 31/03/17 Report Received: 08/05/17 Date Published: 05/06/17	Date Sampled: 30/05/17 Report Received: 06/06/17 Date Published: 04/07/17	Date Sampled: 04/07/17 Report Received: 07/08/17 Date Published: 08/08/17	Date Sampled: 12/09/17 Report Received: 10/10/17 Date Published: 13/10/17
pH	6.72	6.83	6.71	6.80	6.75
Electrical conductivity	1030	1100	960	997	976
Total Suspended Solids	24	7	9	9	32
Sulphate	333	323	332	310	335
Chloride	52	59	59	58	50
Cobalt (dissolved)	0.147	0.135	0.134	0.139	0.134
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	10.9	10.4	11.2	11.3	11.1
Nickel (dissolved)	0.421	0.367	0.393	0.414	0.386
Zinc (dissolved)	1.25	0.678	0.684	0.731	0.572
Iron (dissolved)	9.13	0.73	6.28	13.3	<0.05

Parameter	Date Sampled: 23/01/17 Report Received: 03/02/17 Date Published: 06/02/17	Date Sampled: 31/03/17 Report Received: 08/05/17 Date Published: 05/06/17	Date Sampled: 30/05/17 Report Received: 06/06/17 Date Published: 04/07/17	Date Sampled: 04/07/17 Report Received: 07/08/17 Date Published: 08/08/17	Date Sampled: 12/09/17 Report Received: 10/10/17 Date Published: 13/10/17
Oil and Grease	<5	<5	<5	<5	<5
Dissolved oxygen	10.1	8.6	8.8	9.6	7.0

Units measured in milligrams per litre unless otherwise specified.

**Table 2 – Additional Monitoring Parameters for Licence Point 4 (continued)**

Parameter	Date Sampled: 09/11/17 Report Received: 17/11/17 Date Published: 06/12/17	Date Sampled: 31/01/18 Report Received: 09/02/18 Date Published: 13/02/18	Date Sampled: 27/03/18 Report Received: 12/04/18 Date Published: 14/04/18	Date Sampled: 31/05/18 Report Received: 11/06/18 Date Published: 12/06/18	Date Sampled: 26/07/18 Report Received: 1/07/18 Date Published: 14/08/18
pH	6.60	6.77	6.84	6.98	6.85
Electrical conductivity	931	931	970	923	910
Total Suspended Solids	10	34	8	14	11
Sulphate	343	380	357	341	332
Chloride	55	57	60	54	57
Cobalt (dissolved)	0.134	0.131	0.081	0.054	0.018
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	10.8	10.5	6.82	4.86	1.85
Nickel (dissolved)	0.357	0.345	0.262	0.198	0.123
Zinc (dissolved)	0.518	0.446	0.434	0.266	0.158
Iron (dissolved)	13.0	8.91	5.65	2.80	0.21
Oil and Grease	<5	<5	<5	<5	<5
Dissolved oxygen	7.6	7.1	7.7	8.6	11.1

**Table 3 – Ambient Water Monitoring Data**

Date Sampled: 31 January 2017

Report Received: 7 February 2017

Date Published: 8 March 2017

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.95	7.57	7.67	7.66
Electrical conductivity	393	301	577	586

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
Suspended Solids	8	<5	<5	8
Sulphate	29	11	126	114
Chloride	49	44	49	50
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	<0.001	<0.001	0.005	<0.001
Manganese (dissolved)	0.004	0.022	0.312	0.268
Nickel (dissolved)	<0.001	<0.001	0.006	0.004
Zinc (dissolved)	<0.005	<0.005	<0.005	<0.005
Iron (dissolved)	0.08	0.16	0.10	0.10

Units measured in milligrams per litre unless otherwise specified.

**Table 3 –Ambient Water Monitoring Data - Continued**

Date Sampled: 28 March 2017

Report Received: 6 April 2017

Date Published: 5 May 2017

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.55	7.61	7.51	7.60
Electrical conductivity	161	168	186	189
Suspended Solids	13	24	6	<5
Sulphate	5	5	9	9
Chloride	19	20	22	22
Cobalt	<0.001	<0.001	0.001	<0.001
Copper (dissolved)	0.002	0.002	0.002	0.002
Manganese (dissolved)	0.027	0.046	0.124	0.111
Nickel (dissolved)	0.001	0.001	0.006	0.006
Zinc (dissolved)	0.005	<0.005	0.011	0.011
Iron (dissolved)	0.47	0.49	0.51	0.47

Units measured in milligrams per litre unless otherwise specified.

**Table 3 –Ambient Water Monitoring Data - Continued**

Date Sampled: 30 May 2017

Report Received: 6 June 2017

Date Published: 4 July 2017

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.98	7.90	7.81	7.59
Electrical conductivity	213	222	312	302
Suspended Solids	7	6	6	<5

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
Sulphate	18	13	35	36
Chloride	33	33	37	36
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	0.036	0.006	0.078	0.064
Nickel (dissolved)	<0.001	<0.001	0.012	0.009
Zinc (dissolved)	0.038	0.034	0.046	0.044
Iron (dissolved)	0.74	0.56	0.52	0.42

Units measured in milligrams per litre unless otherwise specified.

**Table 3 –Ambient Water Monitoring Data - Continued**

Date Sampled: 3 August 2017

Report Received: 17 August 2017

Date Published: 11 September 2017

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.69	7.82	7.67	7.67
Electrical conductivity	203	222	315	251
Suspended Solids	48	17	7	6
Sulphate	15	10	44	42
Chloride	34	35	38	37
Cobalt	<0.001	<0.001	0.001	<0.001
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	0.006	0.006	0.212	0.081
Nickel (dissolved)	<0.001	<0.001	0.020	0.013
Zinc (dissolved)	<0.005	<0.005	0.021	0.014
Iron (dissolved)	0.24	0.29	0.21	0.29

Units measured in milligrams per litre unless otherwise specified.

**Table 3 –Ambient Water Monitoring Data - Continued**

Date Sampled: 5 September 2017

Report Received: 8 September 2017

Date Published: 13 October 2017

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.71	7.77	7.72	7.70
Electrical conductivity	270	273	372	378
Suspended Solids	6	<5	<5	6
Sulphate	17	14	48	52



Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
Chloride	37	39	40	40
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	0.002	0.002	0.147	0.085
Nickel (dissolved)	<0.001	<0.001	0.014	0.010
Zinc (dissolved)	<0.005	<0.005	0.010	0.006
Iron (dissolved)	<0.05	<0.05	<0.05	<0.05

Units measured in milligrams per litre unless otherwise specified.

**Table 3 –Ambient Water Monitoring Data - Continued**

Date Sampled: 8 and 9 November 2017

Report Received: 1 December 2017

Date Published: 6 December 2017

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.75	7.79	7.65	7.53
Electrical conductivity	347	315	390	347
Suspended Solids	564	14	6	<5
Sulphate	33	23	57	44
Chloride	45	43	42	40
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	0.041	0.011	0.404	0.157
Nickel (dissolved)	<0.001	<0.001	0.010	0.006
Zinc (dissolved)	<0.005	0.007	0.006	<0.005
Iron (dissolved)	0.07	0.11	0.06	<0.05

Units measured in milligrams per litre unless otherwise specified.

**Table 3 –Ambient Water Monitoring Data - Continued**

Date Sampled: 31 January 2018

Report Received: 9 January 2018

Date Published: 13 February 2018

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.65	7.53	7.55	7.47
Electrical conductivity	325	293	420	552
Suspended Solids	6	<5	<5	7
Sulphate	23	18	65	151
Chloride	42	39	43	46

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	0.039	0.034	0.262	0.336
Nickel (dissolved)	0.002	0.001	0.006	0.004
Zinc (dissolved)	<0.005	<0.005	0.005	<0.005
Iron (dissolved)	0.13	0.15	0.08	<0.05

Units measured in milligrams per litre unless otherwise specified.

### Table 3 –Ambient Water Monitoring Data - Continued

Date Sampled: 27/28 March 2018

Report Received: 12 April 2018

Date Published: 14 April 2018

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.51	7.7	7.54	7.67
Electrical conductivity	265	360	548	500
Suspended Solids	5	<5	<5	<5
Sulphate	24	34	117	84
Chloride	34	46	53	53
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	<0.001	0.018	0.291	0.255
Nickel (dissolved)	<0.001	<0.001	0.007	0.004
Zinc (dissolved)	<0.005	<0.005	0.012	0.006
Iron (dissolved)	0.09	0.09	<0.05	0.09

Units measured in milligrams per litre unless otherwise specified.

### Table 3 –Ambient Water Monitoring Data - Continued

Date Sampled: 28 May 2018

Report Received: 11 June 2018

Date Published: 12 June 2018

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.53	7.58	7.6	7.54
Electrical conductivity	320	268	428	483
Suspended Solids	8	<5	<5	----
Sulphate	27	19	91	114
Chloride	37	33	40	42
Cobalt	<0.001	<0.001	<0.001	<0.001

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
Copper (dissolved)	<0.001	<0.001	<0.001	0.002
Manganese (dissolved)	0.033	0.018	0.064	0.071
Nickel (dissolved)	<0.001	0.002	0.004	0.003
Zinc (dissolved)	<0.005	0.007	<0.005	<0.005
Iron (dissolved)	0.16	0.14	0.08	<0.05

Units measured in milligrams per litre unless otherwise specified.

**Table 3 – Ambient Water Monitoring Data - Continued**

Date Sampled: 26 July 2018

Report Received: 01 August 2018

Date Published: 14 August 2018

Parameter	Berrima (Licence Point 9)	Macarthur's Crossing (Licence Point 10)	Biloela (Licence Point 11)	Black Bobs Creek (Licence Point 12)
pH	7.11	6.97	7.35	7.3
Electrical conductivity	307	315	455	428
Suspended Solids	<5	<5	<5	<5
Sulphate	36	36	86	71
Chloride	36	38	44	44
Cobalt	<0.001	<0.001	<0.001	<0.001
Copper (dissolved)	<0.001	<0.001	<0.001	<0.001
Manganese (dissolved)	0.035	0.011	0.024	0.023
Nickel (dissolved)	0.264	0.001	0.005	0.003
Zinc (dissolved)	0.009	<0.005	0.006	0.008
Iron (dissolved)	0.15	0.09	0.09	0.08

Units measured in milligrams per litre unless otherwise specified.



## 2. Water Volume

The volume of water discharged from the mine is recorded at the V Notch Weir and summarised as follows:

**Table 4 - V Notch Weir Discharge Volume Data**

Data obtained on	Data published on	Volume discharged (ML/d)
19-Dec-2016	6/02/17	2.22
20-Dec-2016		2.29
21-Dec-2016		2.07
22-Dec-2016		1.91
23-Dec-2016		1.98
24-Dec-2016		2.05
25-Dec-2016		1.92
26-Dec-2016		1.9
27-Dec-2016		1.86
28-Dec-2016		1.85
29-Dec-2016		1.84
30-Dec-2016		1.81
31-Dec-2016		1.8
1-Jan-2017		1.79
2-Jan-2017		1.92
3-Jan-2017		1.89
4-Jan-2017		1.98
5-Jan-2017		2.11
6-Jan-2017		2.12
7-Jan-2017		2.1
8-Jan-2017		2.11
9-Jan-2017	1.93	
10-Jan-2017	1.88	
11-Jan-2017	2.03	
12-Jan-2017	1.92	
13-Jan-2017	1.96	
14-Jan-2017	1.95	
15-Jan-2017	1.91	
16-Jan-2017	2.02	
17-Jan-2017	2.11	
18-Jan-2017	2.15	
19-Jan-2017	2.28	
20-Jan-2017	2.65	
21-Jan-2017	2.15	



Data obtained on	Data published on	Volume discharged (ML/d)	
22-Jan-2017	6/2/17	2.14	
23-Jan-2017		2.22	
24-Jan-2017		2.31	
25-Jan-2017		2.4	
26-Jan-2017		2.62	
27-Jan-2017		2.57	
28-Jan-2017		2.55	
29-Jan-2017		2.55	
30-Jan-2017		8/3/17	2.49
31-Jan-2017	2.43		
1-Feb-2017	2.43		
2-Feb-2017	2.5		
3-Feb-2017	2.39		
4-Feb-2017	2.36		
5-Feb-2017	2.35		
6-Feb-2017	2.39		
7-Feb-2017	2.29		
8-Feb-2017	2.33		
9-Feb-2017	2.75		
10-Feb-2017	2.5		
11-Feb-2017	2.4		
12-Feb-2017	2.52		
13-Feb-2017	2.36		
14-Feb-2017	2.26		
15-Feb-2017	2.44		
16-Feb-2017	2.48		
17-Feb-2017	2.48		
18-Feb-2017	2.52		
19-Feb-2017	2.62		
20-Feb-2017	2.43		
21-Feb-2017	2.35		
22-Feb-2017	2.52		
23-Feb-2017	2.48		
24-Feb-2017	2.55		
25-Feb-2017	2.63		
26-Feb-2017	2.64		
27-Feb-2017	4/4/17		2.56
28-Feb-2017			2.63
1-Mar-2017		2.67	
2-Mar-2017		2.74	
3-Mar-2017		2.68	
4-Mar-2017	2.73		



Data obtained on	Data published on	Volume discharged (ML/d)	
5-Mar-2017	4/4/17	2.85	
6-Mar-2017		2.71	
7-Mar-2017		2.74	
8-Mar-2017		2.83	
9-Mar-2017		2.86	
10-Mar-2017		2.88	
11-Mar-2017		2.79	
12-Mar-2017		2.72	
13-Mar-2017		2.52	
14-Mar-2017		2.38	
15-Mar-2017		2.57	
16-Mar-2017		2.9	
17-Mar-2017		2.73	
18-Mar-2017		2.69	
19-Mar-2017		2.88	
20-Mar-2017		2.78	
21-Mar-2017		2.74	
22-Mar-2017		2.69	
23-Mar-2017		2.63	
24-Mar-2017		2.68	
25-Mar-2017		2.87	
26-Mar-2017		2.8	
27-Mar-2017		5/6/17	2.74
28-Mar-2017			2.84
29-Mar-2017			2.43
30-Mar-2017			2.43
31-Mar-2017	2.26		
1-Apr-2017	2.22		
2-Apr-2017	2.06		
3-Apr-2017	2.23		
4-Apr-2017	2.4		
5-Apr-2017	2.59		
6-Apr-2017	2.6		
7-Apr-2017	2.42		
8-Apr-2017	2.6		
9-Apr-2017	2.98		
10-Apr-2017	2.91		
11-Apr-2017	2.33		
12-Apr-2017	2.22		
13-Apr-2017	2.41		
14-Apr-2017	2.65		
15-Apr-2017	2.65		



<b>Data obtained on</b>	<b>Data published on</b>	<b>Volume discharged (ML/d)</b>
16-Apr-2017	5/6/17	2.67
17-Apr-2017		2.57
18-Apr-2017		2.48
19-Apr-2017		2.54
20-Apr-2017		2.56
21-Apr-2017		2.72
22-Apr-2017		2.62
23-Apr-2017		2.62
24-Apr-2017		2.65
25-Apr-2017		2.81
26-Apr-2017		2.93
27-Apr-2017		2.42
28-Apr-2017		2.26
29-Apr-2017		2.42
30-Apr-2017		2.34
1-May-2017		2.46
2-May-2017		2.48
3-May-2017		2.3
4-May-2017		2.34
5-May-2017		2.55
6-May-2017		2.62
7-May-2017		2.55
8-May-2017		2.51
9-May-2017		2.54
10-May-2017		2.56
11-May-2017		2.53
12-May-2017		2.35
13-May-2017		2.35
14-May-2017	2.45	
15-May-2017	2.52	
16-May-2017	2.42	
17-May-2017	2.34	
18-May-2017	2.19	
19-May-2017	2.22	
20-May-2017	2.45	
21-May-2017	2.44	
22-May-2017	2.56	
23-May-2017	2.47	
24-May-2017	2.52	
25-May-2017	2.41	
26-May-2017	2.45	
27-May-2017	2.49	

Data obtained on	Data published on	Volume discharged (ML/d)
28-May-2017	5/6/17	2.72
29-May-2017	8/8/17	2.36
30-May-2017		2.41
31-May-2017		2.4
1-Jun-2017		2.49
2-Jun-2017		2.66
3-Jun-2017		2.84
4-Jun-2017		2.69
5-Jun-2017		2.71
6-Jun-2017		2.64
7-Jun-2017		2.4
8-Jun-2017		2.16
9-Jun-2017		2.23
10-Jun-2017		2.28
11-Jun-2017		2.47
12-Jun-2017		2.5
13-Jun-2017		2.3
14-Jun-2017		2.39
15-Jun-2017		2.52
16-Jun-2017		2.5
17-Jun-2017		2.36
18-Jun-2017		2.27
19-Jun-2017		2.34
20-Jun-2017		2.46
21-Jun-2017		2.49
22-Jun-2017		2.39
23-Jun-2017		2.57
24-Jun-2017		2.44
25-Jun-2017		2.29
26-Jun-2017		2.11
27-Jun-2017		2.24
28-Jun-2017	2.38	
29-Jun-2017	2.44	
30-Jun-2017	2.32	
1-Jul-2017	11/9/17	2.24
2-Jul-2017		2.57
3-Jul-2017		2.71
4-Jul-2017		2.94
5-Jul-2017		2.37
6-Jul-2017		2.15
7-Jul-2017		2.47
8-Jul-2017		2.31



Data obtained on	Data published on	Volume discharged (ML/d)	
9-Jul-2017	11/9/17	2.14	
10-Jul-2017		2.07	
11-Jul-2017		2.04	
12-Jul-2017		2.05	
13-Jul-2017		2.68	
14-Jul-2017		2.79	
15-Jul-2017		2.44	
16-Jul-2017		2.43	
17-Jul-2017		2.51	
18-Jul-2017		2.71	
19-Jul-2017		2.58	
20-Jul-2017		2.55	
21-Jul-2017		2.24	
22-Jul-2017		2.36	
23-Jul-2017		2.56	
24-Jul-2017		2.36	
25-Jul-2017		2.22	
26-Jul-2017		2.22	
27-Jul-2017		2.28	
28-Jul-2017		2.43	
29-Jul-2017		2.29	
30-Jul-2017		2.18	
31-Jul-2017		2.04	
1-Aug-2017		1.83	
2-Aug-2017		1.98	
3-Aug-2017		13/10/17	2.38
4-Aug-2017			2.53
5-Aug-2017			2.09
6-Aug-2017			1.94
7-Aug-2017			1.92
8-Aug-2017			1.75
9-Aug-2017	1.7		
10-Aug-2017	1.95		
11-Aug-2017	1.9		
12-Aug-2017	1.78		
13-Aug-2017	1.89		
14-Aug-2017	2.01		
15-Aug-2017	2.03		
16-Aug-2017	2.1		
17-Aug-2017	1.82		
18-Aug-2017	1.87		
19-Aug-2017	1.84		

<b>Data obtained on</b>	<b>Data published on</b>	<b>Volume discharged (ML/d)</b>	
20-Aug-2017	13/10/17	1.98	
21-Aug-2017		2.15	
22-Aug-2017		2.11	
23-Aug-2017		2.09	
24-Aug-2017		2.16	
25-Aug-2017		2.06	
26-Aug-2017		2.15	
27-Aug-2017		2.48	
28-Aug-2017		2.3	
29-Aug-2017		2.12	
30-Aug-2017		2.12	
31-Aug-2017		2.11	
1-Sep-2017		2.28	
2-Sep-2017		2.25	
3-Sep-2017		2.34	
4-Sep-2017		2.37	
5-Sep-2017		2.29	
6-Sep-2017		2.18	
7-Sep-2017		2.12	
8-Sep-2017		2.3	
9-Sep-2017		2.3	
10-Sep-2017		2.37	
11-Sep-2017		13/11/17	1.99
12-Sep-2017			1.64
13-Sep-2017			1.7
14-Sep-2017			1.65
15-Sep-2017			1.61
16-Sep-2017			1.82
17-Sep-2017			1.81
18-Sep-2017			1.88
19-Sep-2017			2.09
20-Sep-2017	1.98		
21-Sep-2017	1.96		
22-Sep-2017	1.88		
23-Sep-2017	1.77		
24-Sep-2017	1.77		
25-Sep-2017	1.69		
26-Sep-2017	1.63		
27-Sep-2017	1.66		
28-Sep-2017	2.01		
29-Sep-2017	1.83		
30-Sep-2017	2.03		



Data obtained on	Data published on	Volume discharged (ML/d)
1-Oct-2017	13/11/17	1.92
2-Oct-2017		2.08
3-Oct-2017		2.09
4-Oct-2017		2.23
5-Oct-2017		2.07
6-Oct-2017		2.21
7-Oct-2017		2.08
8-Oct-2017		2.23
9-Oct-2017		2.21
10-Oct-2017		2.08
11-Oct-2017		2.08
12-Oct-2017		2.28
13-Oct-2017		2.17
14-Oct-2017		2.31
15-Oct-2017		2.34
16-Oct-2017		2.38
17-Oct-2017		2.52
18-Oct-2017		2.57
19-Oct-2017		2.51
20-Oct-2017		2.73
21-Oct-2017		2.7
22-Oct-2017		2.82
23-Oct-2017	6/12/17	2.7
24-Oct-2017		2.68
25-Oct-2017		2.73
26-Oct-2017		2.54
27-Oct-2017		2.47
28-Oct-2017		3.19
29-Oct-2017		2.54
30-Oct-2017		2.02
31-Oct-2017		2.12
1-Nov-2017		2.16
2-Nov-2017		2.26
3-Nov-2017	2.3	
4-Nov-2017	2.29	
5-Nov-2017	2.36	
6-Nov-2017	2.41	
7-Nov-2017	2.41	
8-Nov-2017	2.2	
9-Nov-2017	2.06	
10-Nov-2017	1.93	
11-Nov-2017	1.98	

<b>Data obtained on</b>	<b>Data published on</b>	<b>Volume discharged (ML/d)</b>
12-Nov-2017	6/12/17	2.35
13-Nov-2017		2.73
14-Nov-2017		2.93
15-Nov-2017		2.63
16-Nov-2017		2.42
17-Nov-2017		2.39
18-Nov-2017		2.7
19-Nov-2017		2.68
20-Nov-2017		2.73
21-Nov-2017		2.54
22-Nov-2017		2.47
23-Nov-2017		3.19
24-Nov-2017		2.54
25-Nov-2017		2.02
26-Nov-2017		2.12
27-Nov-2017		9/1/18
28-Nov-2017	3.03	
29-Nov-2017	2.84	
30-Nov-2017	3.11	
1-Dec-2017	2.86	
2-Dec-2017	2.98	
3-Dec-2017	2.81	
4-Dec-2017	2.67	
5-Dec-2017	2.9	
6-Dec-2017	2.85	
7-Dec-2017	2.55	
8-Dec-2017	2.7	
9-Dec-2017	2.59	
10-Dec-2017	2.66	
11-Dec-2017	2.78	
12-Dec-2017	2.78	
13-Dec-2017	2.74	
14-Dec-2017	2.7	
15-Dec-2017	2.49	
16-Dec-2017	2.54	
17-Dec-2017	2.65	
18-Dec-2017	2.76	
19-Dec-2017	2.61	
20-Dec-2017	13/2/18	2.18
21-Dec-2017		1.97
22-Dec-2017		2.17
23-Dec-2017		2.31

<b>Data obtained on</b>	<b>Data published on</b>	<b>Volume discharged (ML/d)</b>
24-Dec-2017	13/2/18	2.33
25-Dec-2017		2.3
26-Dec-2017		2.41
27-Dec-2017		2.53
28-Dec-2017		2.36
29-Dec-2017		2.34
30-Dec-2017		2.42
31-Dec-2017		2.22
1-Jan-2018		2.27
2-Jan-2018		2.18
3-Jan-2018		2.13
4-Jan-2018		2.13
5-Jan-2018		2.04
6-Jan-2018		2.12
7-Jan-2018		2.1
8-Jan-2018		2
9-Jan-2018		2.08
10-Jan-2018		2.22
11-Jan-2018		2.18
12-Jan-2018		2.26
13-Jan-2018		2.34
14-Jan-2018		2.44
15-Jan-2018		2.32
16-Jan-2018		2.24
17-Jan-2018		2.29
18-Jan-2018		2.31
19-Jan-2018		2.18
20-Jan-2018		2.16
21-Jan-2018		2.16
22-Jan-2018		1.85
23-Jan-2018		1.53
24-Jan-2018	1.71	
25-Jan-2018	1.87	
26-Jan-2018	1.77	
27-Jan-2018	1.85	
28-Jan-2018	1.94	
29-Jan-2018	2.12	
30-Jan-2018	2.19	
31-Jan-2018	13/3/18	3.92
1-Feb-2018		4.98
2-Feb-2018		5.05
3-Feb-2018		5.18



Data obtained on	Data published on	Volume discharged (ML/d)	
4-Feb-2018	13/3/18	5.21	
5-Feb-2018		4.95	
6-Feb-2018		3.89	
7-Feb-2018		2.58	
8-Feb-2018		2	
9-Feb-2018		1.67	
10-Feb-2018		1.83	
11-Feb-2018		2.1	
12-Feb-2018		2.36	
13-Feb-2018		2.55	
14-Feb-2018		2.59	
15-Feb-2018		2.67	
16-Feb-2018		2.77	
17-Feb-2018		2.76	
18-Feb-2018		2.74	
19-Feb-2018		2.74	
20-Feb-2018		2.76	
21-Feb-2018		2.79	
22-Feb-2018		2.91	
23-Feb-2018		2.79	
24-Feb-2018		2.7	
25-Feb-2018		2.7	
26-Feb-2018		2.48	
27-Feb-2018		2.03	
28-Feb-2018		1.94	
1-Mar-2018		14/4/18	2.08
2-Mar-2018			2.15
3-Mar-2018			2.19
4-Mar-2018	2.11		
5-Mar-2018	1.97		
6-Mar-2018	2.1		
7-Mar-2018	2.11		
8-Mar-2018	2.36		
9-Mar-2018	2.29		
10-Mar-2018	2.33		
11-Mar-2018	2.3		
12-Mar-2018	2.32		
13-Mar-2018	2.16		
14-Mar-2018	2.13		
15-Mar-2018	2.07		
16-Mar-2018	2.11		
17-Mar-2018	2.04		

Data obtained on	Data published on	Volume discharged (ML/d)	
18-Mar-2018	14/4/18	1.97	
19-Mar-2018		2.17	
20-Mar-2018		2.26	
21-Mar-2018		2.35	
22-Mar-2018		2.47	
23-Mar-2018		2.45	
24-Mar-2018		2.41	
25-Mar-2018		2.45	
26-Mar-2018		2.31	
27-Mar-2018		2.34	
28-Mar-2018		2.25	
29-Mar-2018		11/5/18	2.41
30-Mar-2018			3.38
31-Mar-2018	3.03		
1-Apr-2018	2.67		
2-Apr-2018	2.48		
3-Apr-2018	2.26		
4-Apr-2018	2.08		
5-Apr-2018	1.9		
6-Apr-2018	1.64		
7-Apr-2018	1.33		
8-Apr-2018	1.12		
9-Apr-2018	1.02		
10-Apr-2018	0.75		
11-Apr-2018	0.36		
12-Apr-2018	0.43		
13-Apr-2018	0.39		
14-Apr-2018	1.01		
15-Apr-2018	0.98		
16-Apr-2018	0.6		
17-Apr-2018	0.53		
18-Apr-2018	0.68		
19-Apr-2018	0.85		
20-Apr-2018	1.49		
21-Apr-2018	1.66		
22-Apr-2018	1.69		
23-Apr-2018	1.64		
24-Apr-2018	1.68		
25-Apr-2018	1.78		
26-Apr-2018	1.75		
27-Apr-2018	1.74		
28-Apr-2018	1.85		

<b>Data obtained on</b>	<b>Data published on</b>	<b>Volume discharged (ML/d)</b>
29-Apr-2018	11/5/18	1.95
30-Apr-2018		1.94
1-May-2018	12/6/18	2.01
2-May-2018		2.06
3-May-2018		2.35
4-May-2018		2.79
5-May-2018		2.01
6-May-2018		2.05
7-May-2018		2.72
8-May-2018		2.81
9-May-2018		3.16
10-May-2018		4.56
11-May-2018		4.94
12-May-2018		4.36
13-May-2018		3.23
14-May-2018		3.12
15-May-2018		3.52
16-May-2018		3.36
17-May-2018		3.67
18-May-2018		3.95
19-May-2018		4.21
20-May-2018		4.75
21-May-2018		4.86
22-May-2018		4.57
23-May-2018		4.26
24-May-2018		3.42
25-May-2018		2.6
26-May-2018		2.11
27-May-2018		2.11
28-May-2018		2.39
29-May-2018	2.56	
30-May-2018	2.3	
31-May-2018	10/07/2018	2.31
1-Jun-2018		2.27
2-Jun-2018		2.25
3-Jun-2018		1.92
4-Jun-2018		1.82
5-Jun-2018		2.24
6-Jun-2018		2.26
7-Jun-2018		2.24
8-Jun-2018		2.22
9-Jun-2018	2.2	

Data obtained on	Data published on	Volume discharged (ML/d)	
10-Jun-2018	10/07/2018	2.08	
11-Jun-2018		2.09	
12-Jun-2018		2.16	
13-Jun-2018		1.82	
14-Jun-2018		1.72	
15-Jun-2018		1.88	
16-Jun-2018		2.07	
17-Jun-2018		2.08	
18-Jun-2018		1.95	
19-Jun-2018		1.77	
20-Jun-2018		1.49	
21-Jun-2018		1.82	
22-Jun-2018		2.06	
23-Jun-2018		2.33	
24-Jun-2018		2.28	
25-Jun-2018		2.2	
26-Jun-2018		2.29	
27-Jun-2018		2.17	
28-Jun-2018		03/08/18	2.06
29-Jun-2018			2.03
30-Jun-2018			1.83
1-Jul-2018			1.74
2-Jul-2018			1.77
3-Jul-2018			1.69
4-Jul-2018			1.55
5-Jul-2018			1.51
6-Jul-2018			1.57
7-Jul-2018	1.66		
8-Jul-2018	1.57		
9-Jul-2018	1.7		
10-Jul-2018	1.48		
11-Jul-2018	1.07		
12-Jul-2018	1.21		
13-Jul-2018	1.7		
14-Jul-2018	1.99		
15-Jul-2018	1.97		
16-Jul-2018	1.81		
17-Jul-2018	1.63		
18-Jul-2018	1.8		
19-Jul-2018	1.87		
20-Jul-2018	2		
21-Jul-2018	1.82		



<b>Data obtained on</b>	<b>Data published on</b>	<b>Volume discharged (ML/d)</b>
23-Jul-2018	03/08/18	1.92
24-Jul-2018		2.17
25-Jul-2018		2.27

Licence Limit: 10 ML/d.

Compliance summary: Discharge within licence limits.



### 3. Ambient Air/Dust Monitoring

Berrima Colliery has 4 dust monitoring locations as described below:

- Mine Office Dust Deposition (Gauge 1)
- Medway Village Dust Deposition (Gauge 2)
- Loch Catherine Coal Stockpile Dust Deposition (Gauge 3)
- Mine Entry Road PM<sub>10</sub> Atmospheric Dust (Gauge 4)

#### 3.1 Dust Deposition Gauges: Total Insoluble Matter (grams per square metre per month)

Gauges 1 to 3 are dust deposition gauges which measure the levels of coarse dust. It is a measure of dust nuisance rather than an indication of potential health problems as this dust fraction does not penetrate into the respiratory system.

Licence limit: Not specified

Adopted limits: For dust deposition, the NSW State guideline of 4 g/m<sup>2</sup> /month (presented as a 12-month rolling average) has been adopted.

**Table 5 – Dust Deposition Data**

	Dust Deposition Gauges (g/m <sup>2</sup> /month as 12-month rolling average)		
	Site 1 Office	Site 2 Medway Village	Site 3 Loch Catherine
<b>December 2016</b> Report Received: 9/01/17 Date Published: 6/02/17	1.61	0.44	0.46
<b>January 2017</b> Report Received: 6/02/17 Date Published: 6/02/17	1.58	0.58	0.45
<b>February 2017</b> Report Received: 8/03/17 Date Published: 8/03/17	1.53	0.61	0.47
<b>March 2017</b> Report Received: 16/03/17 Date Published: 4/04/17	1.65	0.65	0.50
<b>April 2017</b> Report Received: 3/05/17 Date Published: 5/05/17	1.64	0.64	0.49
<b>May 2017</b> Report Received: 5/06/17 Date Published: 5/06/17	1.67	0.65	0.50
<b>June 2017</b> Report Received: 3/07/17 Date Published: 4/07/17	1.55	0.60	0.40
<b>July 2017</b> Report Received: 7/08/17 Date Published: 8/08/17	1.49	0.61	0.40

	Dust Deposition Gauges (g/m <sup>2</sup> /month as 12-month rolling average)		
	Site 1 Office	Site 2 Medway Village	Site 3 Loch Catherine
<b>August 2017</b> Report Received: 1/09/17 Date Published: 11/09/17	1.53	0.66	0.39
<b>September 2017</b> Report Received: 15/09/17 Date Published: 13/10/17	1.24	0.62	0.38
<b>October 2017</b> Report Received: 15/09/17 Date Published: 13/10/17	1.23	0.65	0.42
<b>November 2017</b> Report Received: 15/11/17 Date Published: 6/12/17	1.34	No Result*	0.48
<b>December 2017</b> Report Received: 5/01/18 Date Published: 9/1/18	2.07	0.70	0.48
<b>January 2018</b> Report Received: 9/03/18 Date Published: 13/3/18	2.04	0.63	0.55
<b>February 2018</b> Report Received: 21/02/18 Date Published: 13/3/18	2.12	0.69	0.50
<b>March 2018</b> Report Received: 15/03/18 Date Published: 14/4/18	1.99	0.64	0.48
<b>April 2018</b> Report Received: 11/06/18 Date Published: 12/06/18	1.98	0.65	0.55
<b>May 2018</b> Report Received: 11/06/18 Date Published: 12/06/18	0.97	0.69	0.58
<b>June 2018</b> Report Received: 18/06/18 Date Published: 10/07/18	1.97	0.75	No Result#
<b>July 2018</b> Report Received: 03/08/18 Date Published: 14/08/18	1.98	0.75	0.64

Compliance summary: The dust levels at site office and Loch meet the adopted criteria.

\*Dust gauge missing from Medway Village therefore no result for November 2017.

# Dust gauge destroyed in fire at Loch Catherine (Site 3) therefore no result for June 2018.

### 3.2 Atmospheric Dust Sampling

Berrima Colliery is required to measure the very small fraction of total suspended particulate matter, namely the 10 micron fraction (PM<sub>10</sub>). This test measures the levels of the very fine dust suspended in the air which is a measure of potential health effects (irritation of the respiratory tract) as the small particles can penetrate into the airways and the lungs. Fine dust can persist in the atmosphere for days or even months before it settles and can travel some distance. Gauge 4 is located near the mine entrance which is midway between the mine facilities and the village of Medway.

Licence limit: Not specified

Adopted limits: the National Environment Protection (Ambient Air Quality) Measure standard of 50 µg/m<sup>3</sup> for a 24-hour average has been adopted. This is in line with current standards for the coal industry.

**Table 6 – Atmospheric Dust Data**

Month	Report Received	Date Published	PM <sub>10</sub> µg/m <sup>3</sup> 24 hour average
January 2017	23/01/17	06/02/17	13.6
February 2017	16/02/17	08/03/17	73.3
March 2017	16/03/17	04/04/17	8.5
April 2017	20/04/17	05/05/17	11.6
May 2017	15/05/17	05/06/17	8.8
June 2017	14/06/17	04/07/17	2.8
July 2017	03/08/17	08/08/17	<0.1
August 2017	18/09/17	13/10/17	<0.1
September 2017	18/09/17	13/10/17	7.0
October 2017	13/10/17	06/12/17	15.5
November 2017	14/11/17	06/12/17	10.2
December 2017	18/12/17	09/01/18	9.1
January 2018	24/01/18	13/02/18	15.16
February 2018	22/02/18	13/03/18	12.0
March 2018	26/03/18	14/04/18	17.3
April 2018	24/04/18	11/05/18	21.1
May 2018	18/05/18	12/06/18	14.5
June 2018	21/06/18	26/06/18	6.7
July 2018	19/07/18	14/08/18	3.2

Compliance summary:

The February 2017 result exceeded the NEPM standard at the mine office. The corresponding deposition monitoring data at the mine office and at Medway Village was still in compliance despite the elevated PM<sub>10</sub> reading on the mine site, and therefore deposition rates at the nearest residential receptor remain in compliance. Elevated dust



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readings will be expected in future as part of the earthworks component of the rehabilitation program.

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