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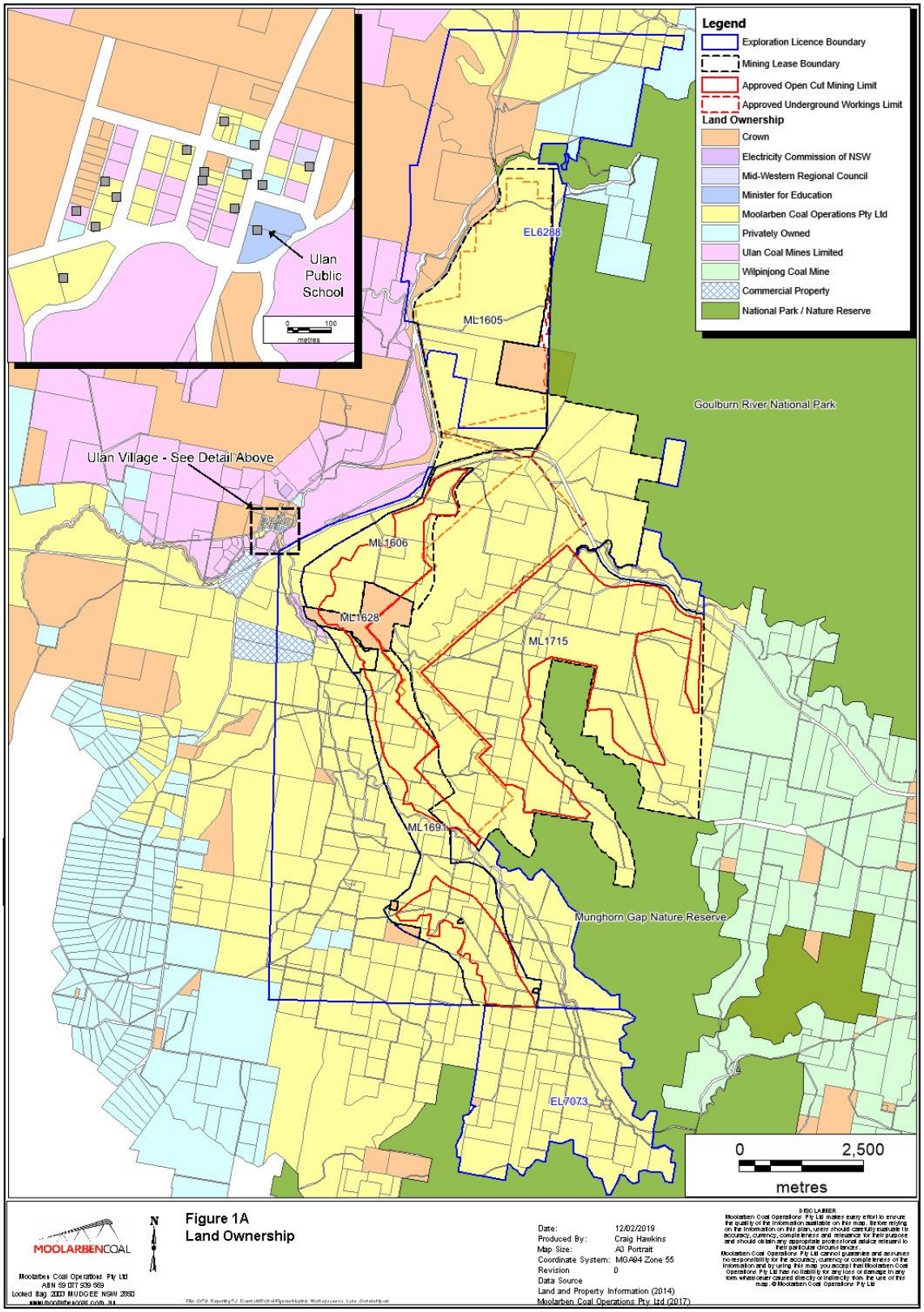


Figure 1-a Land Ownership

APPENDIX 2. MONITORING LOCATIONS

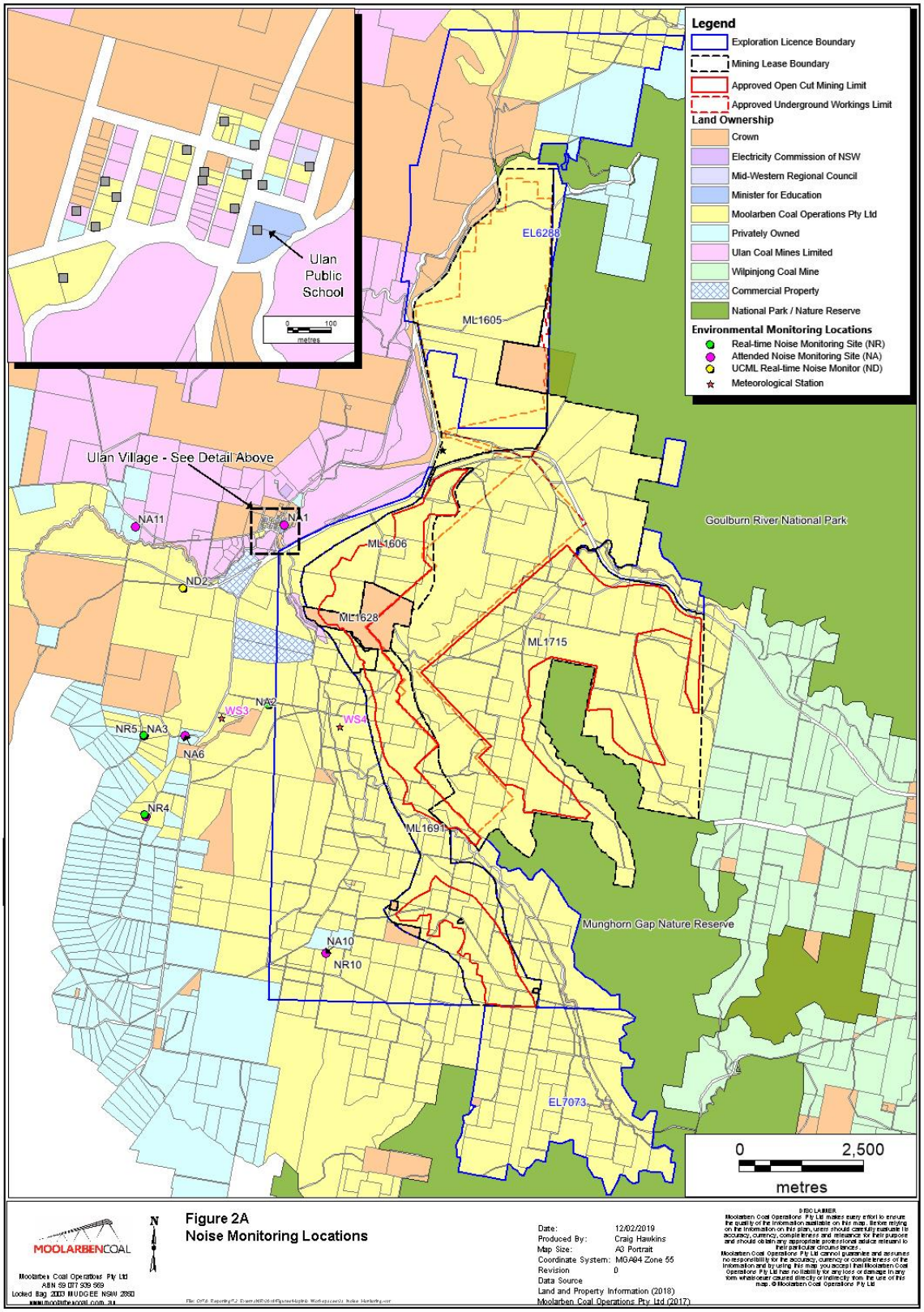


Figure 2-a Noise Monitoring Locations

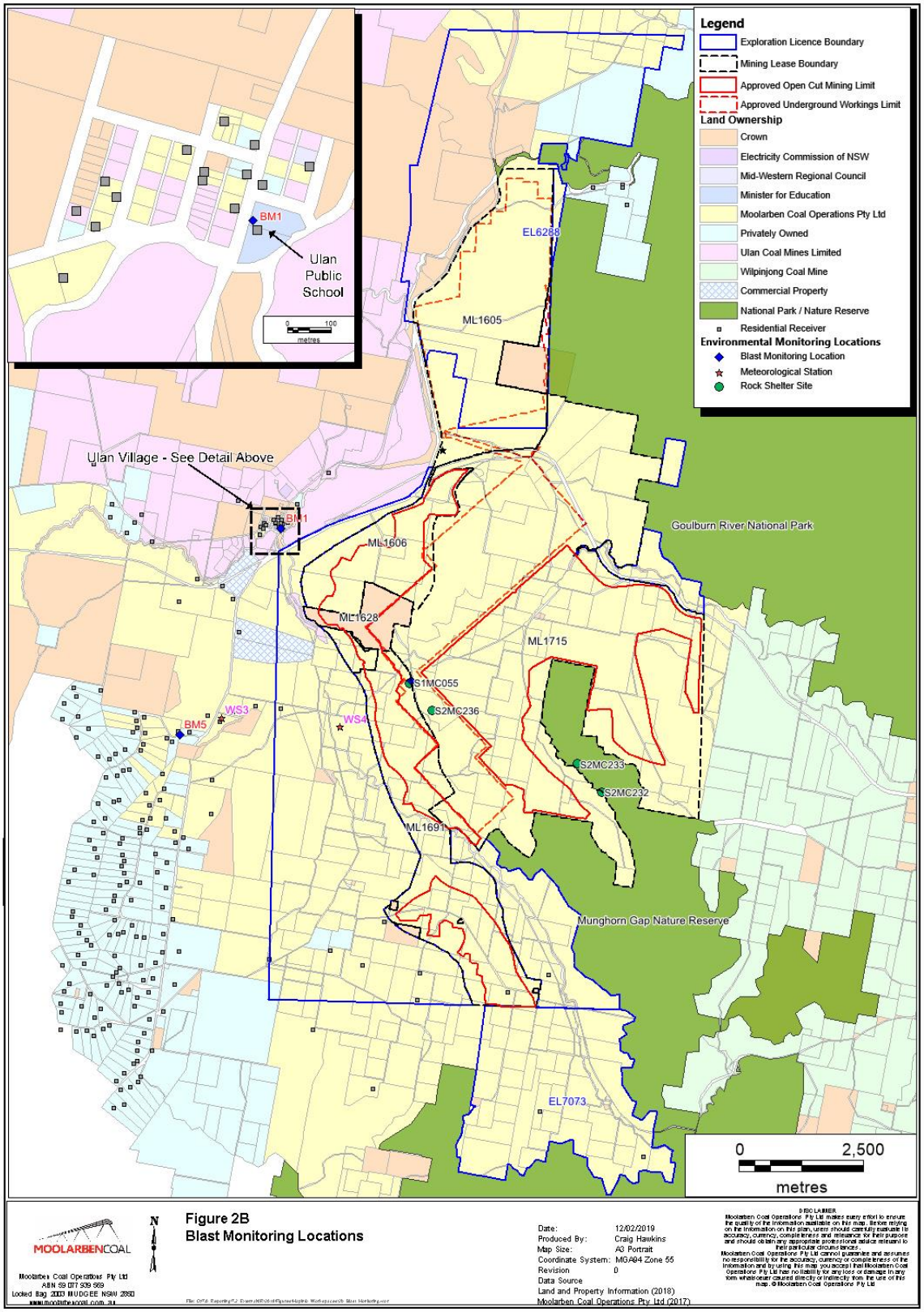


Figure 2-b Blast Monitoring Locations

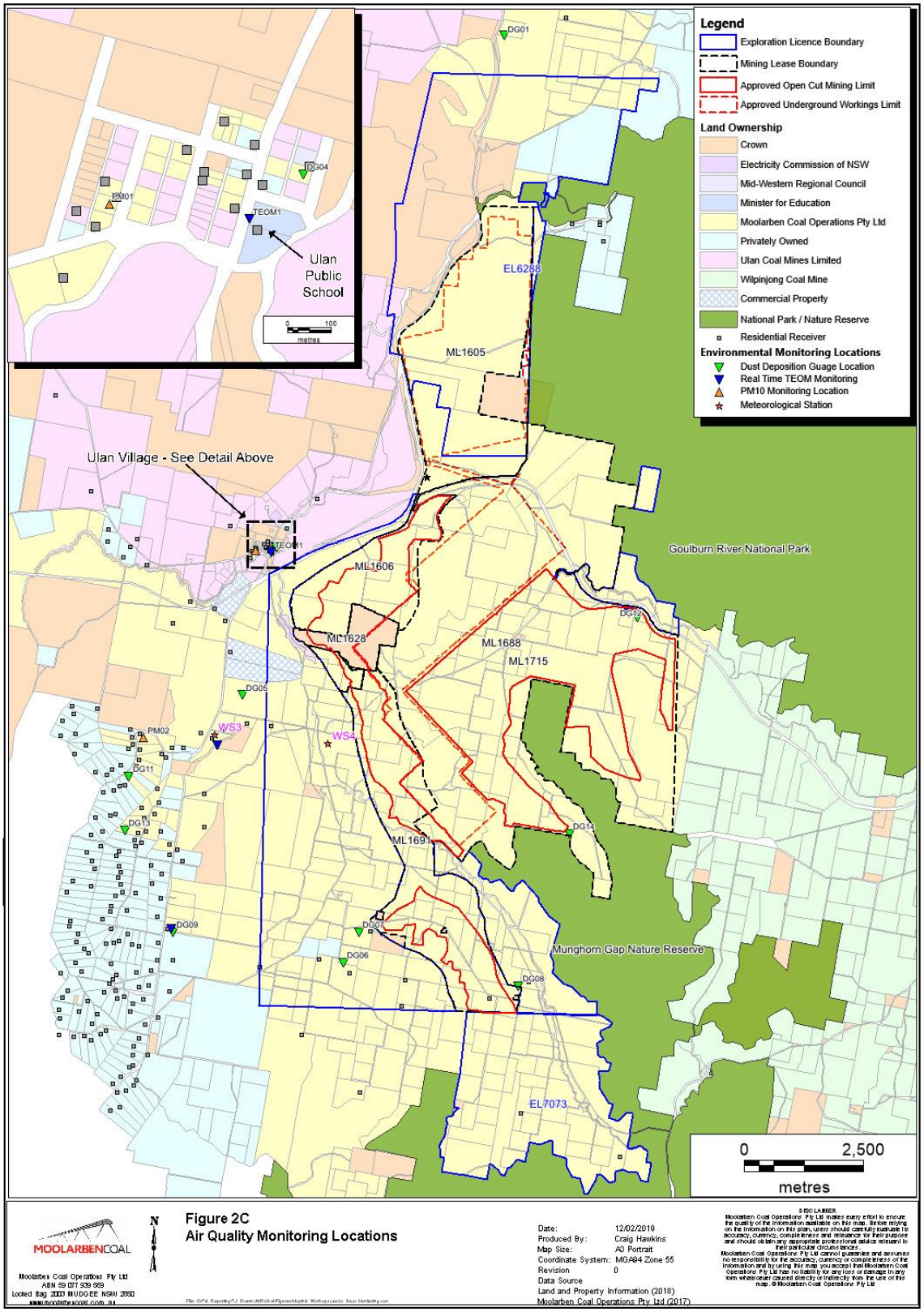


Figure 2-c Air quality Monitoring Locations

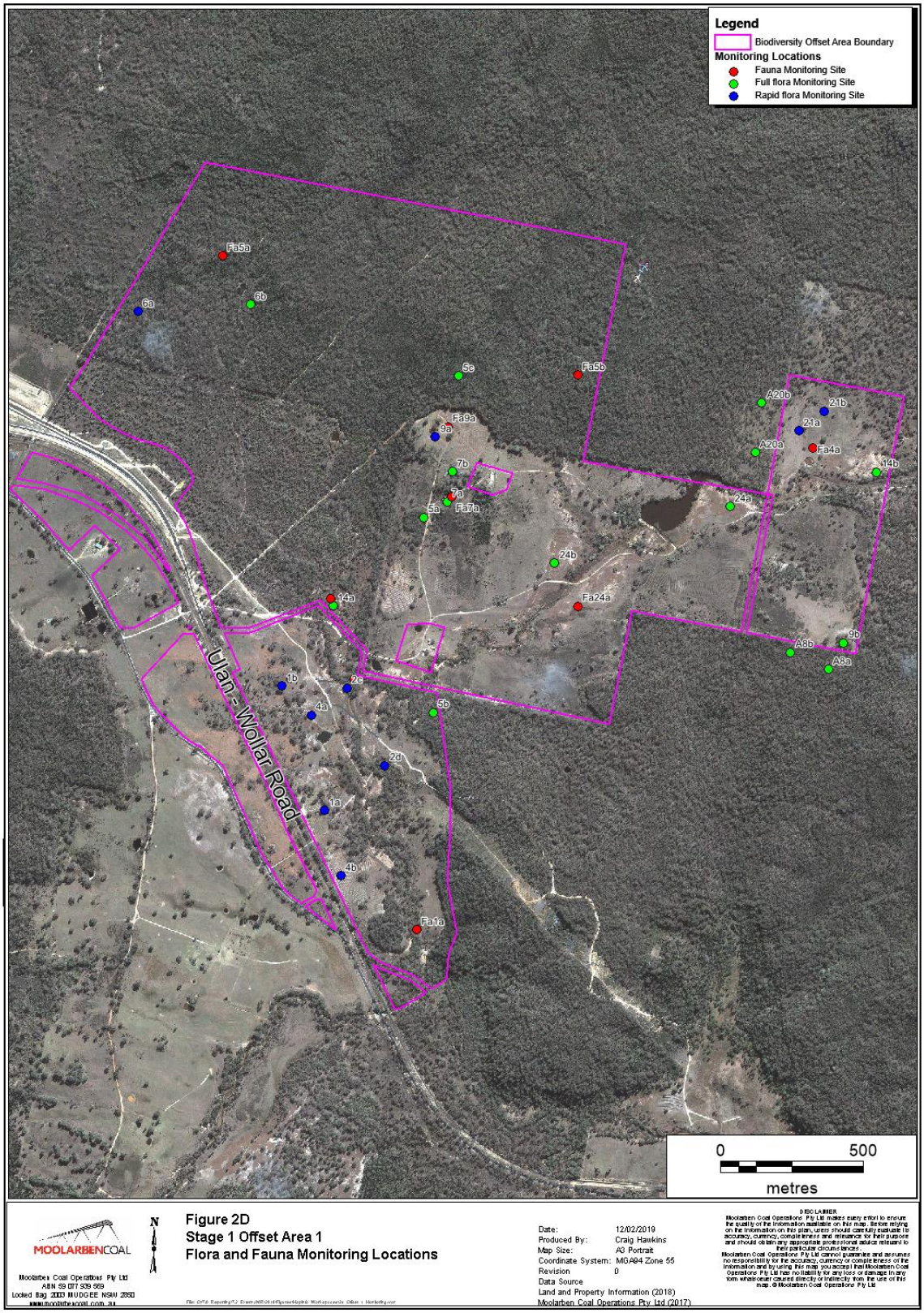


Figure 2-d MCO Stage 1 Offset Area 1 monitoring site locations

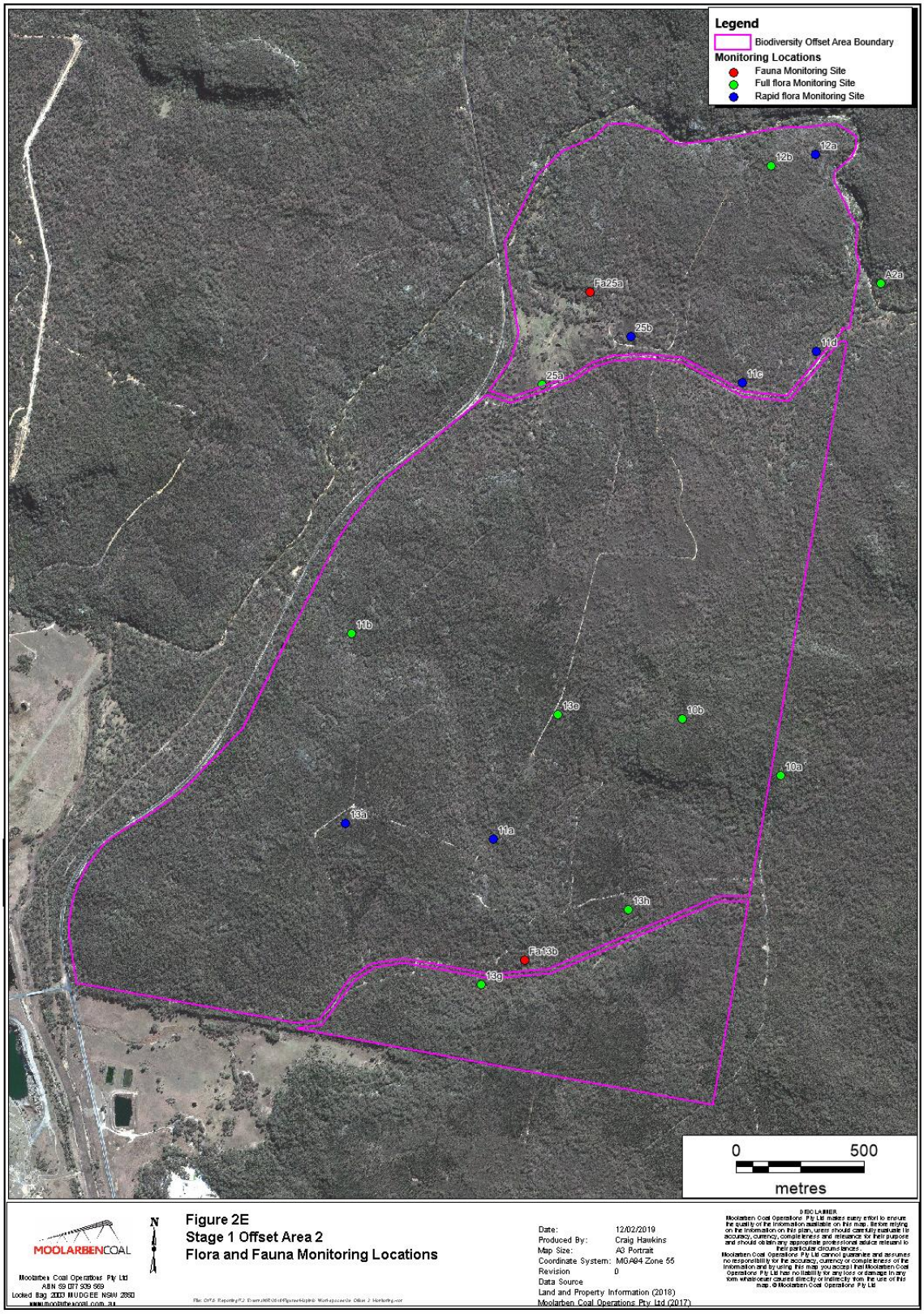


Figure 2-e MCO Stage 1 Offset Area 2 monitoring site locations

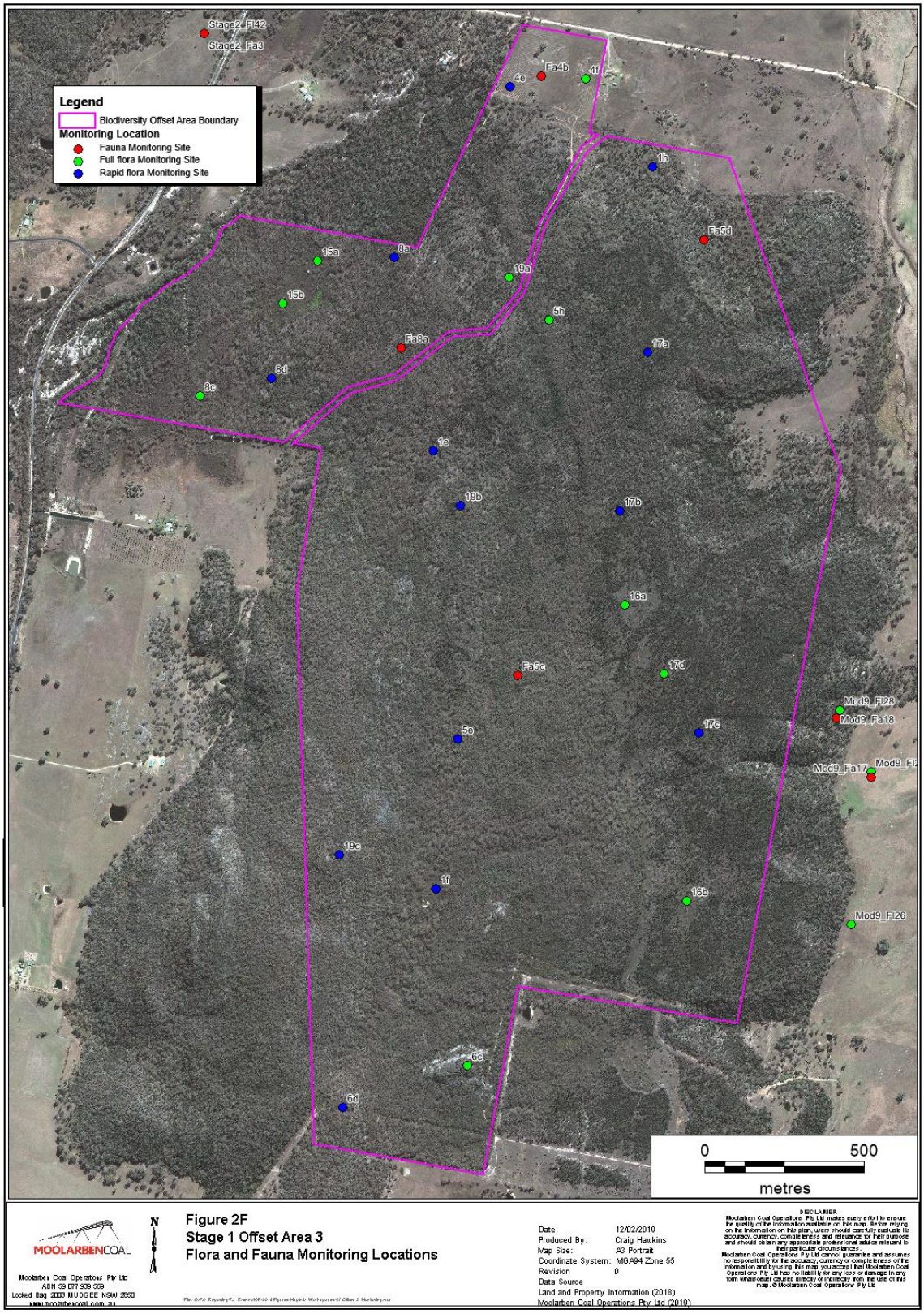


Figure 2-f Stage 1 Offset Area 3 monitoring site locations

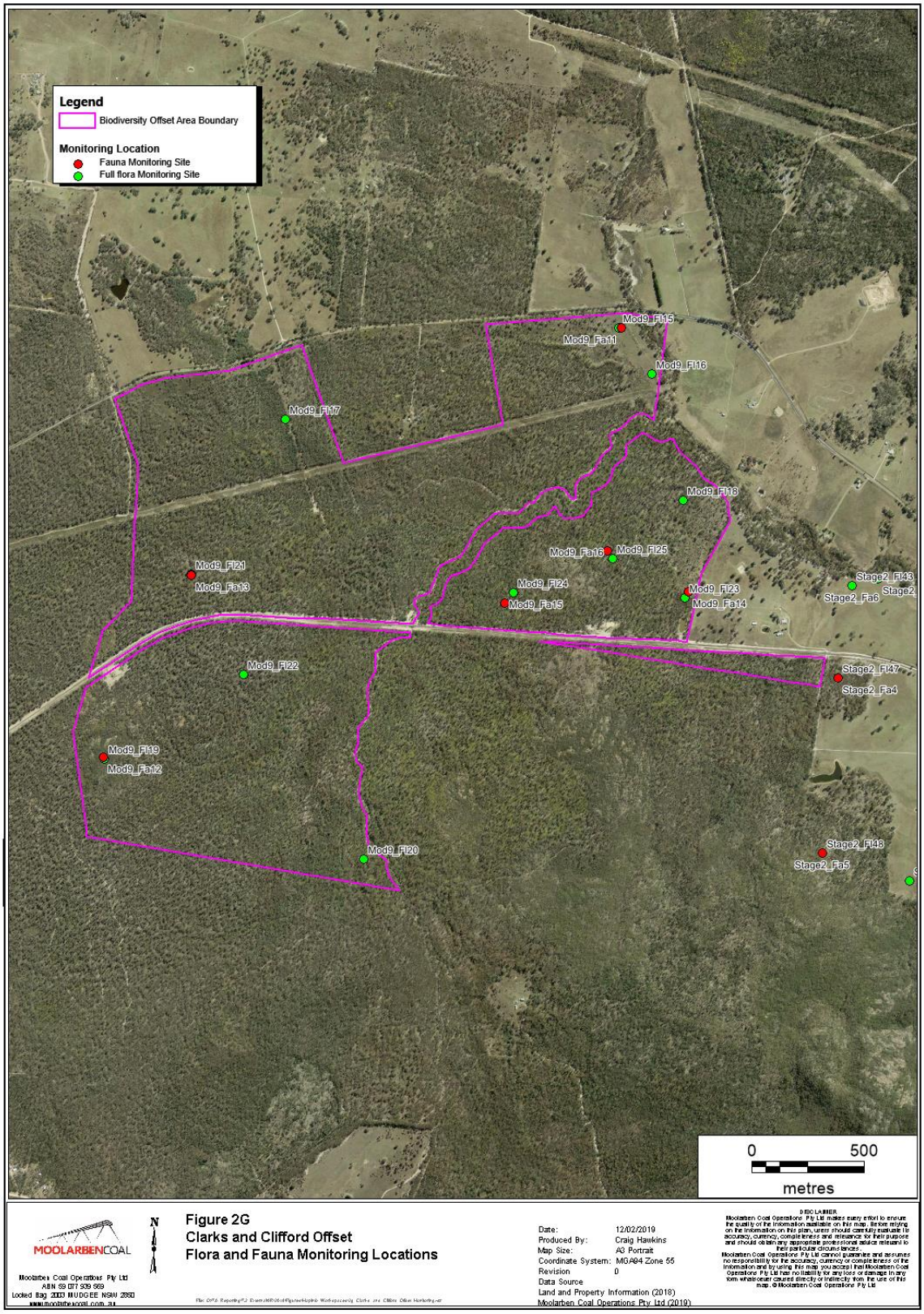


Figure 2-g Clarks and Clifford Offset monitoring site locations

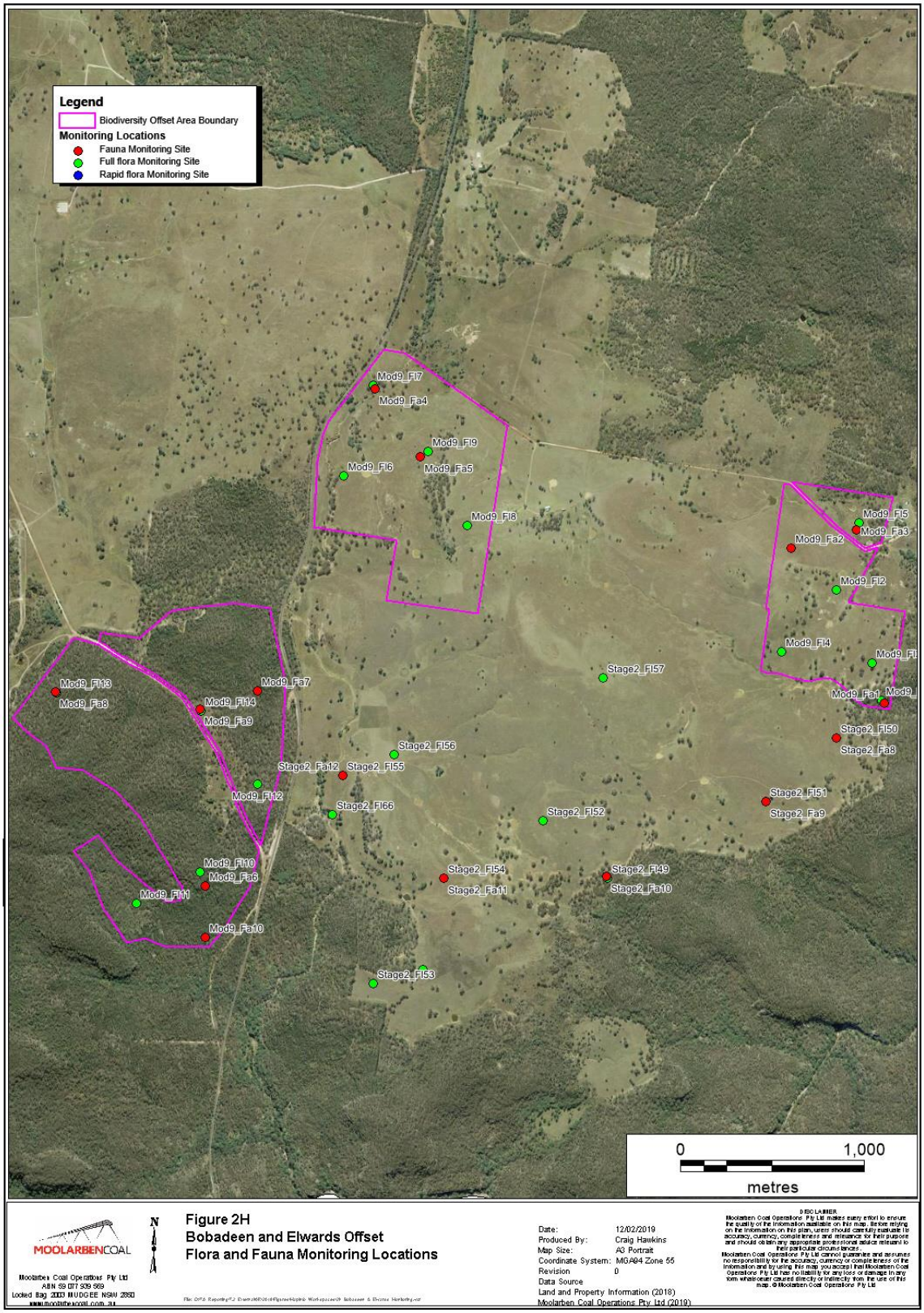


Figure 2-h Bobadeen and Elwards Offset monitoring site locations

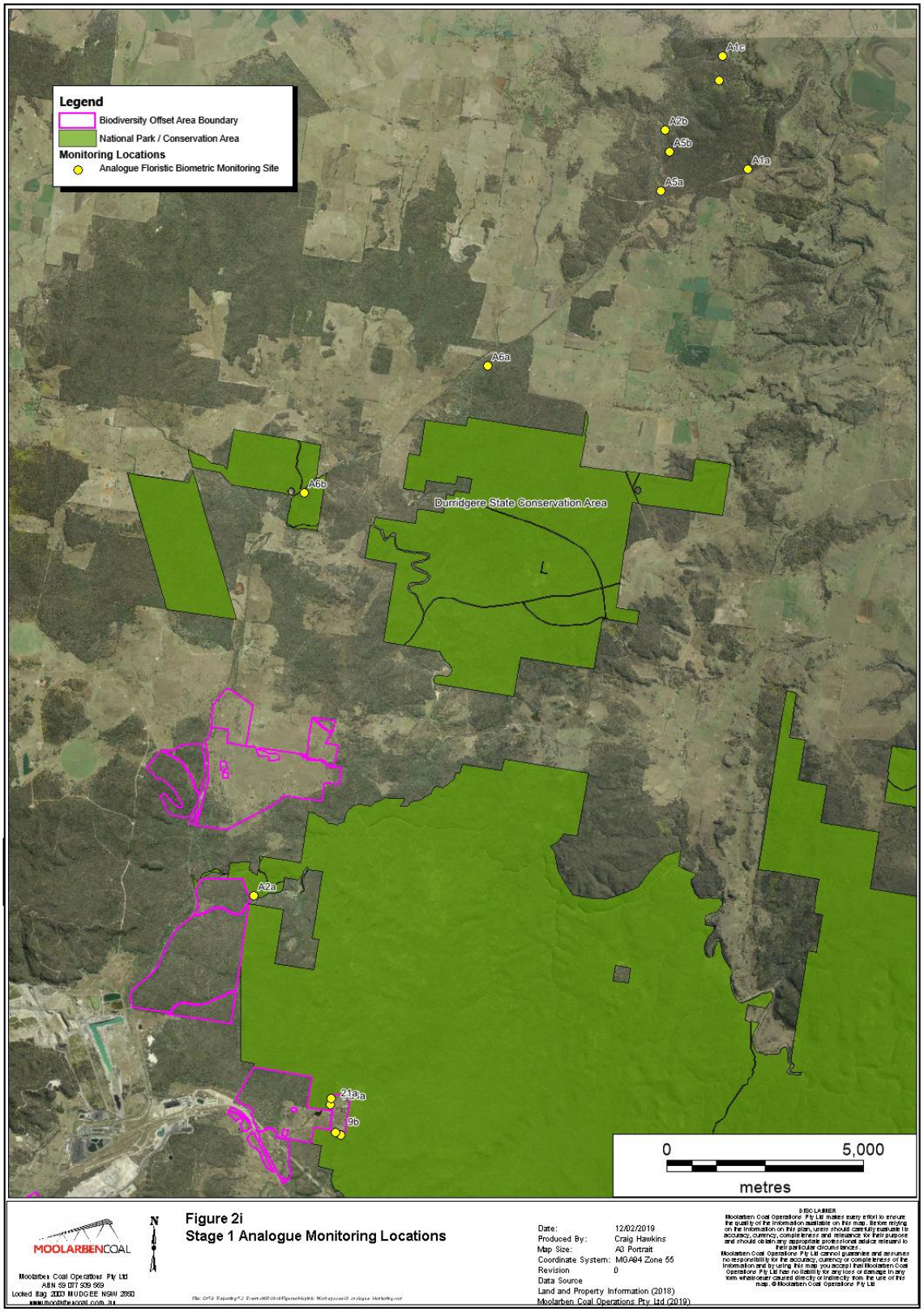


Figure 2-i MCO analogue monitoring site locations

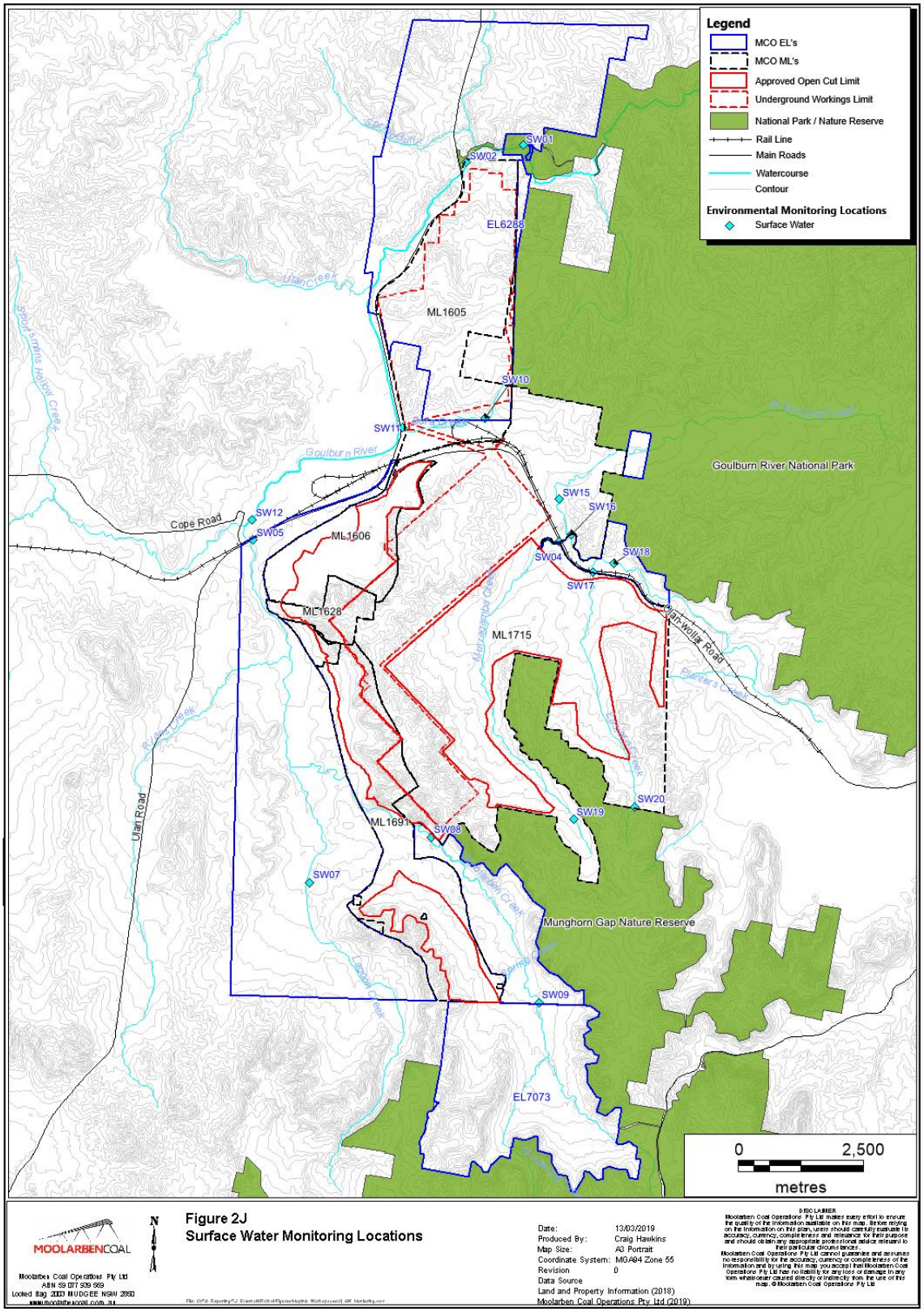


Figure 2-jSurface Water Monitoring Locations

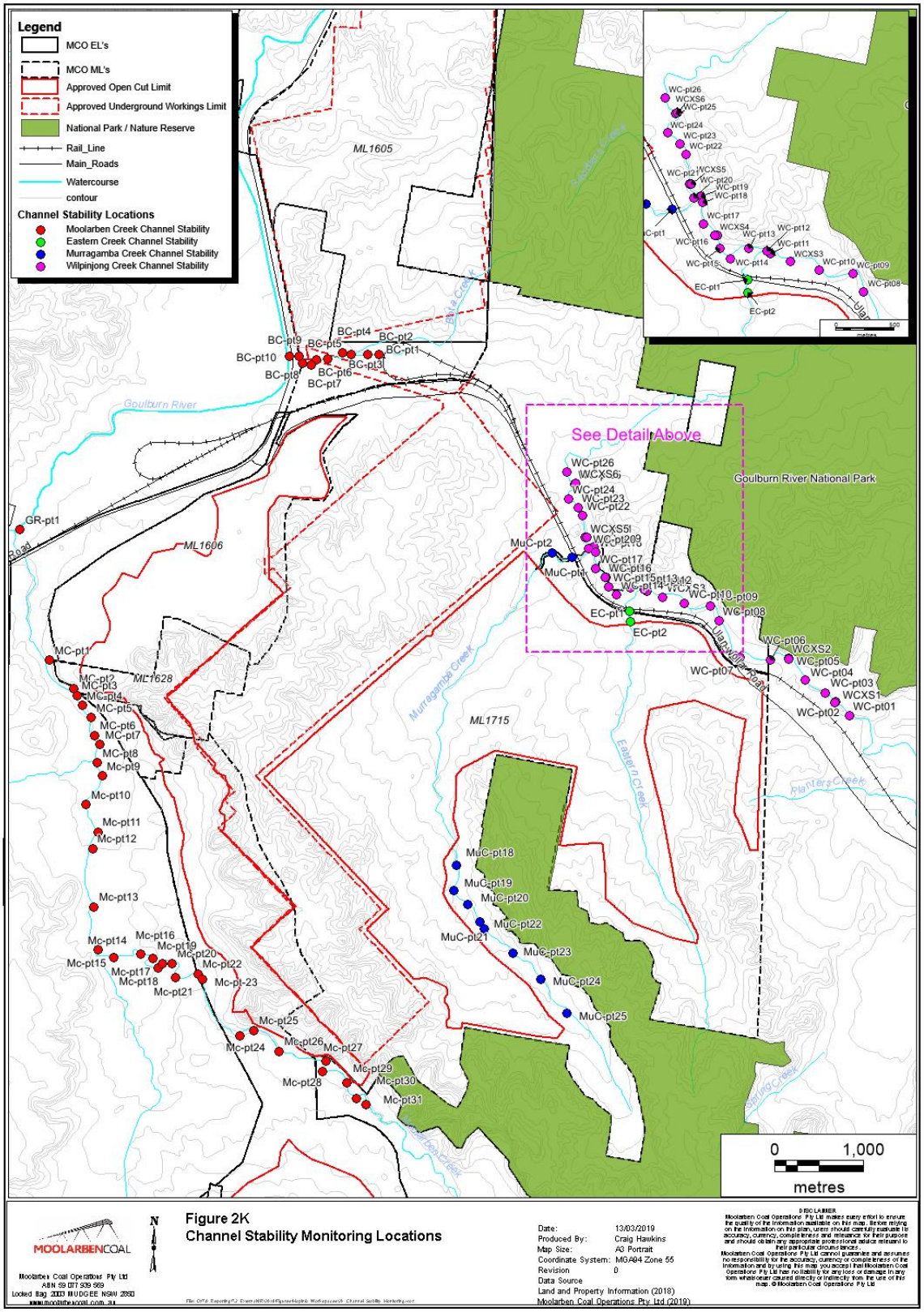


Figure 2-kChannel Stability Monitoring Locations

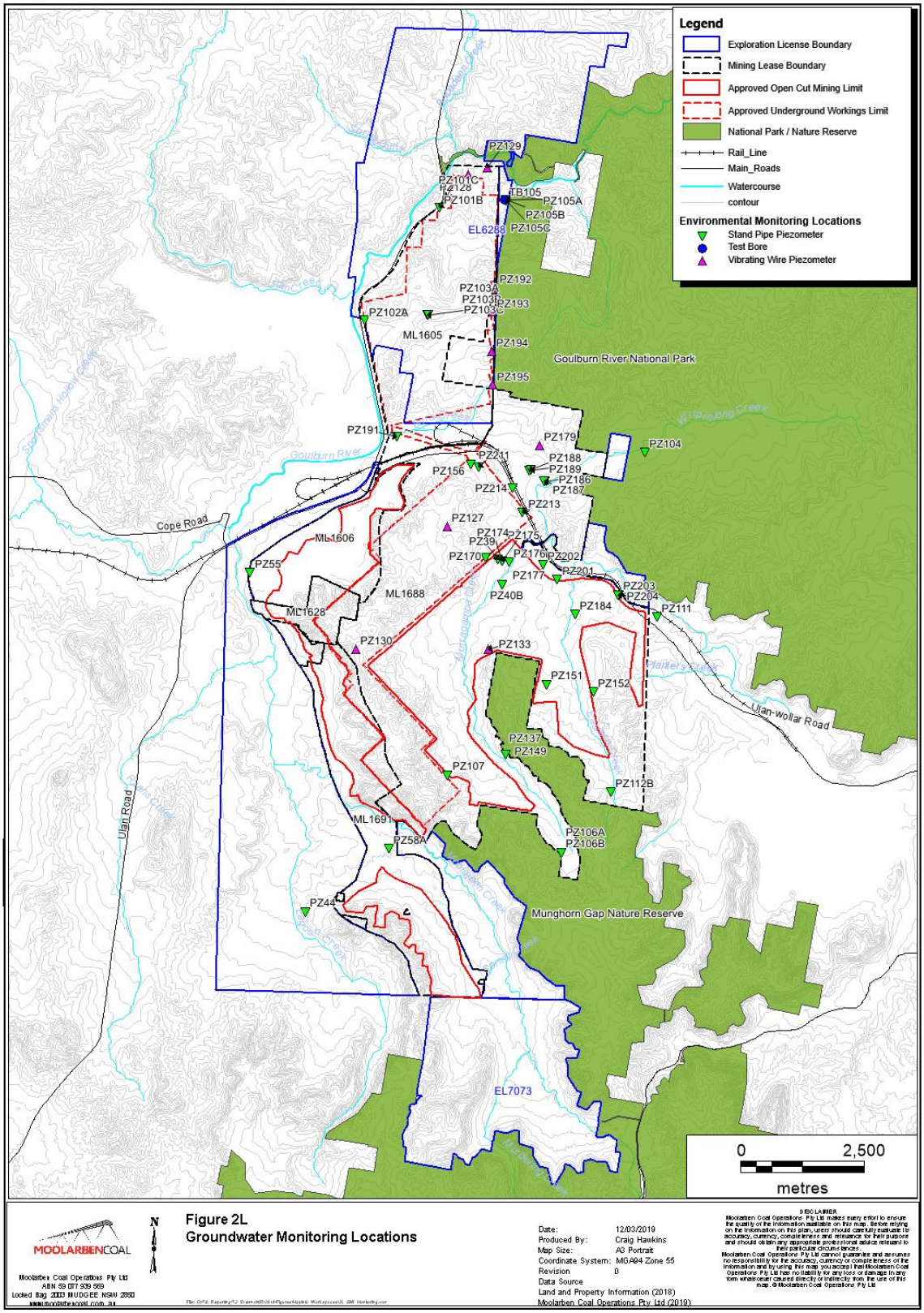


Figure 2-l Groundwater Monitoring Locations

Figure 2-m Location of floristic and Fauna monitoring sites

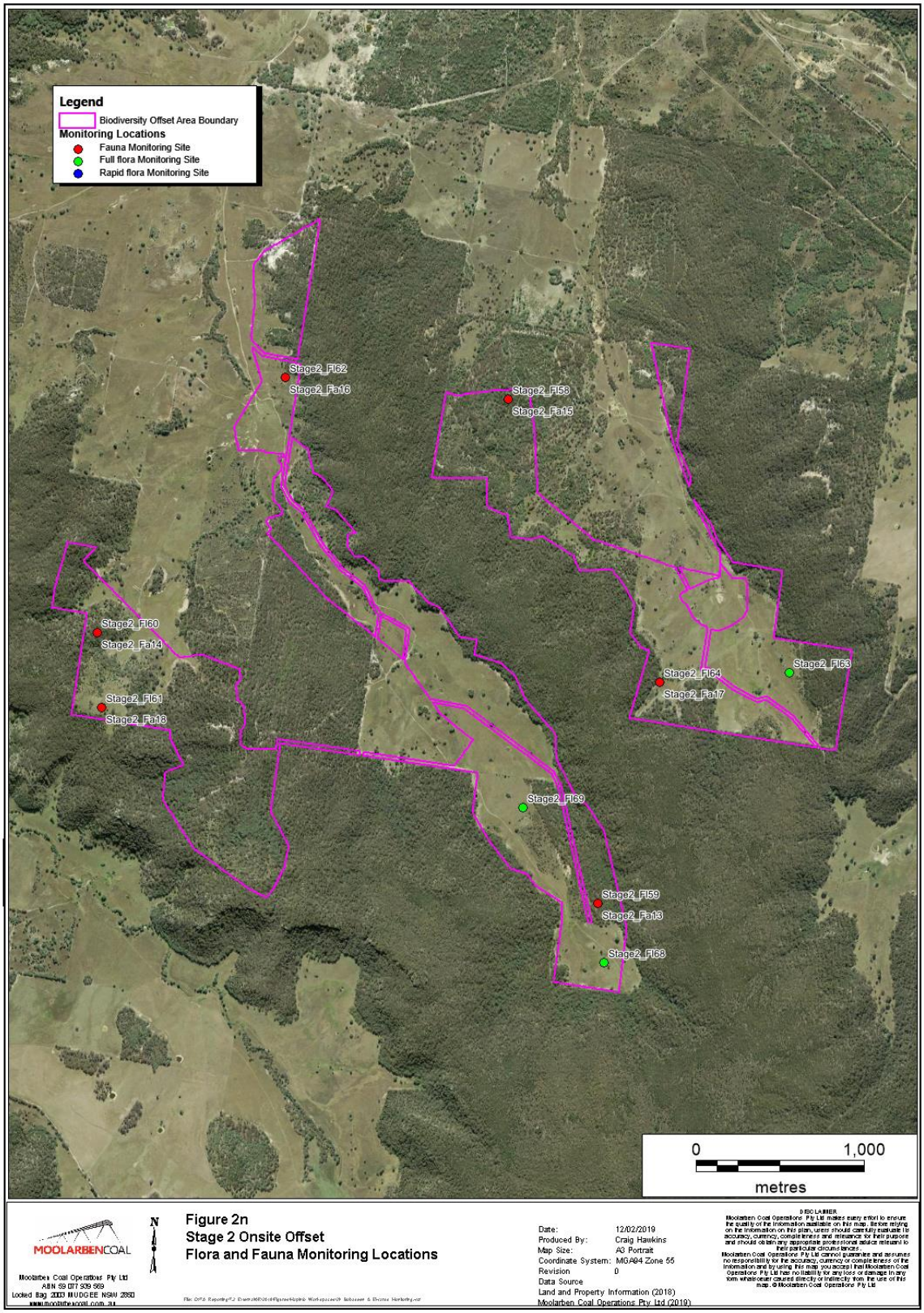


Figure 2-n Stage 2 Onsite Offset Flora and Fauna Monitoring Locations

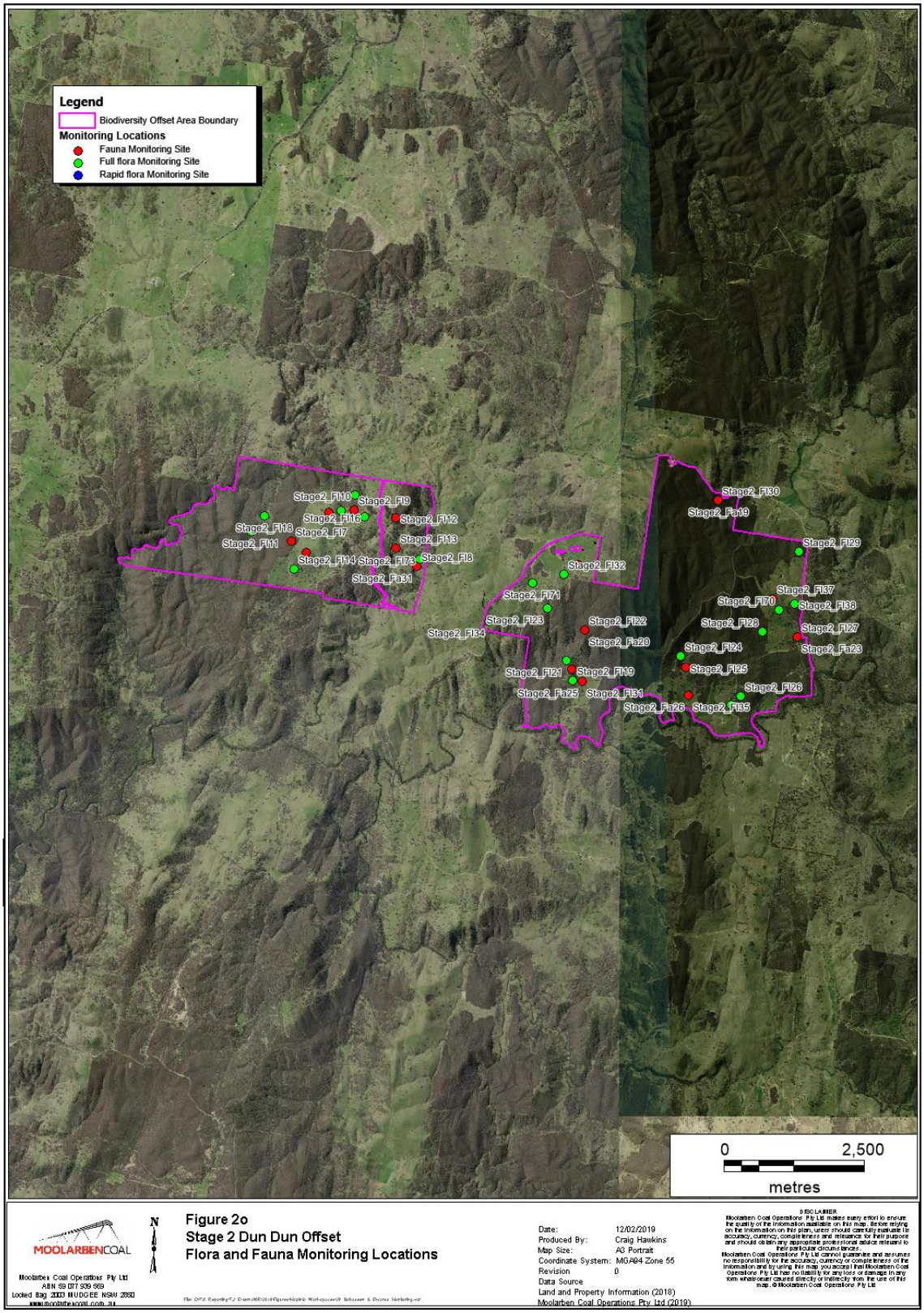


Figure 2-o Stage 2 Dun Dun Offset Flora and Fauna Monitoring Locations

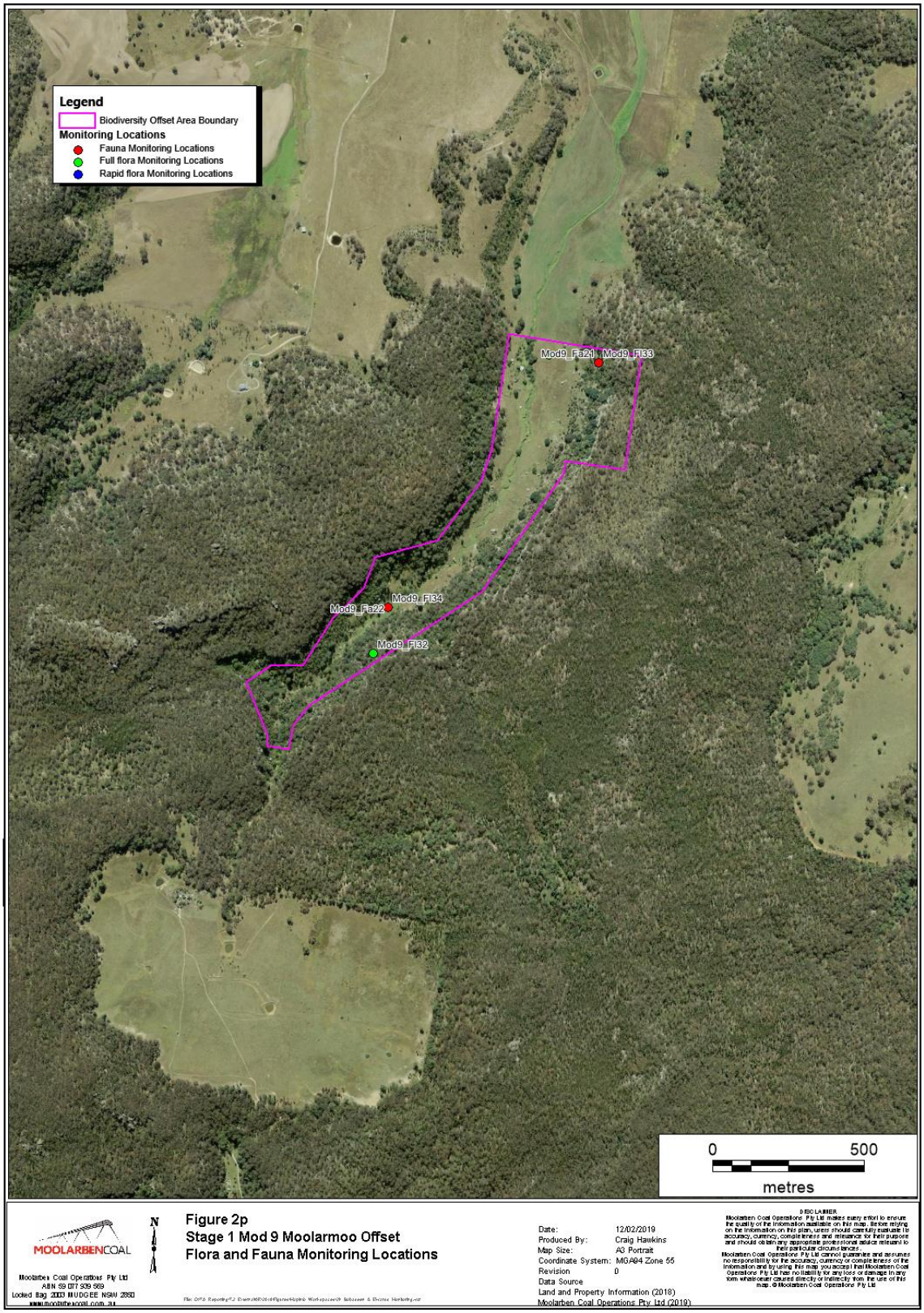


Figure 2-p Stage 1 Mod 9 Moolarmoo Offset Monitoring Locations

APPENDIX 3. MONITORING DATA

APPENDIX 3A. DAILY METEOROLOGICAL DATA (WS03)

Date	Temperature (2m) (ºC)		Temperature (10m) (ºC)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
01/01/18	15.7	33.1	16.3	32.2	54.9	0.0
02/01/18	15.0	32.9	16.6	32.1	54.0	0.0
03/01/18	13.4	30.3	14.5	28.6	63.5	0.0
04/01/18	16.7	31.6	16.7	30.1	57.4	0.0
05/01/18	14.8	36.3	15.5	34.3	47.8	0.0
06/01/18	14.3	37.9	16.0	36.3	48.3	0.0
07/01/18	19.2	41.4	21.2	39.5	39.0	0.0
08/01/18	24.9	38.0	25.9	36.9	34.1	0.0
09/01/18	17.6	34.9	18.4	33.7	58.3	7.8
10/01/18	17.5	29.7	18.1	29.2	72.4	0.4
11/01/18	18.0	31.0	18.0	30.0	78.9	8.6
12/01/18	17.6	38.4	18.4	36.9	59.9	0.0
13/01/18	20.6	30.7	20.9	31.5	49.7	0.0
14/01/18	14.7	25.8	14.7	25.1	39.0	0.0
15/01/18	7.9	29.2	8.5	28.8	46.8	0.0
16/01/18	10.8	28.7	12.0	28.0	46.1	0.0
17/01/18	9.5	31.2	10.3	30.7	45.1	0.0
18/01/18	11.0	35.8	12.2	34.4	34.0	0.0
19/01/18	10.9	38.9	13.4	38.5	26.6	0.0
20/01/18	10.4	36.8	12.1	36.4	23.1	0.0
21/01/18	15.3	37.8	17.0	36.8	32.0	0.0
22/01/18	15.7	39.8	17.1	38.0	41.4	0.0
23/01/18	18.6	38.9	20.2	37.7	49.6	1.6
24/01/18	18.4	36.0	19.7	35.0	57.7	0.0
25/01/18	20.7	33.1	21.3	32.3	57.7	0.4
26/01/18	20.0	33.5	20.5	32.6	62.0	4.8
27/01/18	19.9	33.5	20.4	32.1	74.9	4.2
28/01/18	20.1	29.9	20.4	27.9	77.1	0.2
29/01/18	14.8	31.4	16.1	31.0	59.1	0.0
30/01/18	14.8	34.9	15.9	33.9	53.3	0.0
31/01/18	16.2	27.0	16.3	27.2	61.1	0.0
01/02/18	14.4	20.8	14.4	20.5	58.4	0.0
02/02/18	13.2	21.4	13.4	21.2	60.1	0.0
03/02/18	9.0	25.7	10.1	25.1	58.6	0.0
04/02/18	10.0	27.8	10.9	26.9	54.2	0.0
05/02/18	10.5	31.2	11.9	30.7	47.4	0.0
06/02/18	13.5	31.3	14.9	29.9	47.2	0.0
07/02/18	16.6	31.8	16.7	30.6	49.2	0.0
08/02/18	12.9	35.1	13.8	34.2	44.4	0.0
09/02/18	15.4	38.2	16.8	37.4	37.4	0.0
10/02/18	15.7	38.0	16.3	37.3	45.7	0.0
11/02/18	20.4	34.5	21.9	33.7	37.4	0.0
12/02/18	17.4	33.7	18.1	32.8	47.8	0.0
13/02/18	19.7	35.2	20.1	34.4	48.8	1.4
14/02/18	14.8	34.9	16.3	34.4	44.4	0.0
15/02/18	15.3	34.7	17.0	33.8	31.7	0.0
16/02/18	9.7	33.6	10.9	32.6	21.5	0.0
17/02/18	17.4	33.3	17.7	33.0	51.2	0.0
18/02/18	15.9	37.0	17.2	36.1	53.0	0.0
19/02/18	17.5	29.2	17.3	28.6	62.3	13.4
20/02/18	15.3	21.0	15.4	20.7	69.6	0.0
21/02/18	13.9	26.8	14.1	26.4	58.6	0.0
22/02/18	12.0	29.0	12.8	28.5	57.8	0.0
23/02/18	14.7	32.8	15.9	31.7	55.4	0.0

Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain
	Min	Max	Minimum	Maximum	Average	(mm)
24/02/18	19.1	33.1	19.8	32.0	60.2	0.0
25/02/18	16.3	33.5	15.5	31.9	79.5	61.2
26/02/18	15.1	20.6	15.2	20.5	80.3	1.0
27/02/18	10.1	24.7	10.6	24.5	68.8	0.0
28/02/18	12.3	32.1	13.0	31.2	65.0	0.0
01/03/18	14.7	32.7	15.6	32.2	53.2	0.0
02/03/18	15.8	28.3	16.0	28.4	64.2	0.0
03/03/18	15.3	33.3	16.0	32.7	63.6	0.0
04/03/18	17.1	33.6	18.1	32.6	73.1	1.6
05/03/18	17.6	23.8	17.7	23.5	86.6	4.2
06/03/18	16.8	21.6	16.9	21.5	72.9	0.0
07/03/18	16.1	23.3	16.3	22.9	61.9	0.0
08/03/18	12.4	23.6	13.5	23.3	65.1	0.0
09/03/18	10.7	23.9	12.0	23.7	67.3	0.0
10/03/18	13.2	24.6	14.7	24.5	62.5	0.0
11/03/18	10.1	28.6	11.8	28.3	64.3	0.0
12/03/18	9.3	30.7	10.2	29.7	59.0	0.0
13/03/18	15.2	27.8	15.6	27.2	64.0	0.0
14/03/18	16.7	29.6	17.4	28.5	65.0	0.0
15/03/18	13.8	32.2	14.8	31.3	57.4	0.0
16/03/18	18.1	30.2	19.4	30.0	63.3	0.0
17/03/18	14.1	34.4	14.8	33.8	55.4	0.0
18/03/18	14.4	35.7	15.9	35.1	43.6	0.0
19/03/18	14.1	34.9	15.2	33.9	40.9	0.0
20/03/18	8.2	31.6	9.4	31.0	41.1	0.0
21/03/18	17.7	23.5	17.7	23.1	63.8	0.0
22/03/18	14.7	20.2	14.7	19.8	72.1	1.4
23/03/18	16.1	21.4	16.1	21.2	74.7	0.2
24/03/18	15.7	29.3	16.6	28.4	69.6	0.0
25/03/18	12.5	30.3	13.5	29.5	69.6	3.4
26/03/18	8.0	21.2	10.2	20.8	67.8	15.2
27/03/18	3.7	23.9	4.6	23.8	64.0	0.0
28/03/18	10.1	29.9	11.0	28.7	76.1	0.0
29/03/18	11.9	30.5	12.8	30.1	66.9	0.0
30/03/18	11.8	31.5	12.6	31.3	60.2	0.0
31/03/18	12.6	27.5	14.0	27.4	67.1	0.0
01/04/18	14.5	31.3	15.5	30.5	68.9	0.0
02/04/18	12.2	31.1	13.5	30.4	62.4	0.0
03/04/18	13.2	24.5	14.6	24.6	71.7	0.0
04/04/18	15.5	26.1	16.2	25.6	71.2	0.0
05/04/18	15.2	28.5	15.7	28.4	66.4	0.0
06/04/18	10.7	30.5	11.5	30.2	59.5	0.0
07/04/18	10.7	29.4	12.2	29.3	67.7	0.0
08/04/18	10.2	29.8	11.2	29.8	57.6	0.0
09/04/18	9.9	31.2	11.0	30.9	47.3	0.0
10/04/18	13.7	27.0	14.6	26.7	63.7	0.0
11/04/18	10.5	31.0	11.3	30.5	65.6	0.0
13/04/18	11.5	28.4	12.8	27.8	57.7	0.0
13/04/18	10.2	29.8	12.3	28.7	60.2	1.0
14/04/18	14.5	25.4	14.7	25.0	68.9	16.8
15/04/18	12.1	19.8	12.8	19.5	61.8	0.0
16/04/18	9.9	24.4	11.5	24.0	66.1	0.0
17/04/18	7.5	23.8	8.7	23.7	70.9	0.0
18/04/18	14.2	22.4	14.3	22.3	67.2	0.0
19/04/18	10.2	25.9	10.9	25.5	82.6	7.2
20/04/18	9.0	26.2	9.8	25.5	75.5	0.2
21/04/18	12.0	22.5	13.3	22.6	76.9	0.0
22/04/18	10.6	22.3	11.6	22.5	75.2	0.0
23/04/18	8.6	23.6	9.3	24.1	81.0	2.0

Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
24/04/18	7.9	24.5	9.1	24.8	75.0	0.0
25/04/18	3.9	25.5	4.8	25.3	72.3	0.0
26/04/18	8.4	24.3	9.1	24.0	64.0	0.2
27/04/18	7.3	20.9	8.4	20.8	71.3	0.0
28/04/18	5.6	19.5	6.7	19.3	74.4	0.0
29/04/18	3.9	20.7	4.8	20.8	78.7	0.0
30/04/18	4.6	20.3	6.0	20.2	74.4	0.0
01/05/18	4.9	21.2	5.9	21.4	71.5	0.2
02/05/18	8.5	22.4	9.3	22.5	72.6	0.0
03/05/18	6.1	25.3	7.2	24.4	67.8	0.0
04/05/18	7.9	19.6	9.8	19.3	54.6	0.0
05/05/18	0.6	20.8	1.5	20.6	63.6	0.0
06/05/18	0.3	21.1	1.3	21.1	58.6	0.0
07/05/18	2.7	23.4	3.7	22.4	66.6	0.0
08/05/18	5.9	22.1	7.0	22.1	67.2	0.0
09/05/18	3.9	23.0	4.8	22.7	60.9	0.0
10/05/18	4.9	21.0	6.1	20.1	60.6	0.0
11/05/18	4.1	9.5	4.1	9.1	73.4	1.0
12/05/18	7.5	14.4	7.5	14.3	80.9	3.2
13/05/18	3.0	18.1	4.7	18.2	70.2	0.0
14/05/18	2.6	17.6	4.0	17.4	76.0	0.2
15/05/18	0.0	18.8	1.1	18.8	69.3	0.0
16/05/18	0.6	16.5	2.0	16.7	73.7	0.0
17/05/18	1.9	18.1	3.8	17.9	73.4	0.0
18/05/18	-1.1	16.7	-0.3	16.5	70.2	0.0
19/05/18	1.0	18.6	1.7	18.4	67.4	0.0
20/05/18	2.6	16.6	3.7	16.4	67.0	0.2
21/05/18	1.2	16.5	2.6	16.1	71.8	0.0
22/05/18	4.4	18.1	6.7	17.8	68.0	0.0
23/05/18	3.4	20.5	5.0	20.8	73.9	0.0
24/05/18	1.3	23.3	2.1	22.7	68.7	0.0
25/05/18	4.8	18.5	6.6	18.6	68.7	0.0
26/05/18	2.0	19.7	3.2	19.4	77.9	0.2
27/05/18	0.9	18.7	1.6	18.6	81.8	0.0
28/05/18	4.4	21.1	5.3	20.0	78.4	0.2
29/05/18	2.6	21.8	3.6	21.1	73.4	8.8
30/05/18	4.2	12.2	5.6	12.3	75.7	1.8
31/05/18	1.2	12.7	2.3	12.4	78.2	0.0
01/06/18	-2.0	15.0	-1.0	15.3	73.3	0.0
02/06/18	-0.9	15.3	1.1	14.8	74.4	0.0
03/06/18	3.4	4.8	4.4	6.5	97.7	0.0
04/06/18	4.5	17.6	6.0	17.1	64.3	0.0
05/06/18	1.2	16.5	2.3	16.3	79.0	0.0
06/06/18	5.2	15.2	6.9	15.0	83.6	0.0
07/06/18	5.4	17.3	7.0	17.1	75.2	0.0
08/06/18	3.8	17.1	5.3	16.5	85.1	1.0
09/06/18	7.2	13.7	7.8	12.2	95.6	3.0
10/06/18	4.3	15.9	4.8	15.5	87.5	0.0
11/06/18	1.6	15.1	2.5	14.9	86.9	0.0
12/06/18	2.2	19.5	3.6	19.2	80.7	0.2
13/06/18	0.2	14.6	1.3	14.3	80.9	0.2
14/06/18	0.0	14.9	1.1	14.6	73.9	0.0
15/06/18	-0.8	15.5	0.7	15.0	70.4	0.0
16/06/18	0.3	13.5	2.3	12.8	68.4	0.6
17/06/18	4.2	7.1	4.3	6.9	86.2	2.2
18/06/18	4.3	12.2	5.1	12.1	78.2	0.2
19/06/18	1.9	14.8	2.8	14.7	74.1	0.0
20/06/18	1.1	16.4	1.9	16.0	76.3	0.0
21/06/18	0.0	16.4	1.2	16.0	81.7	0.2

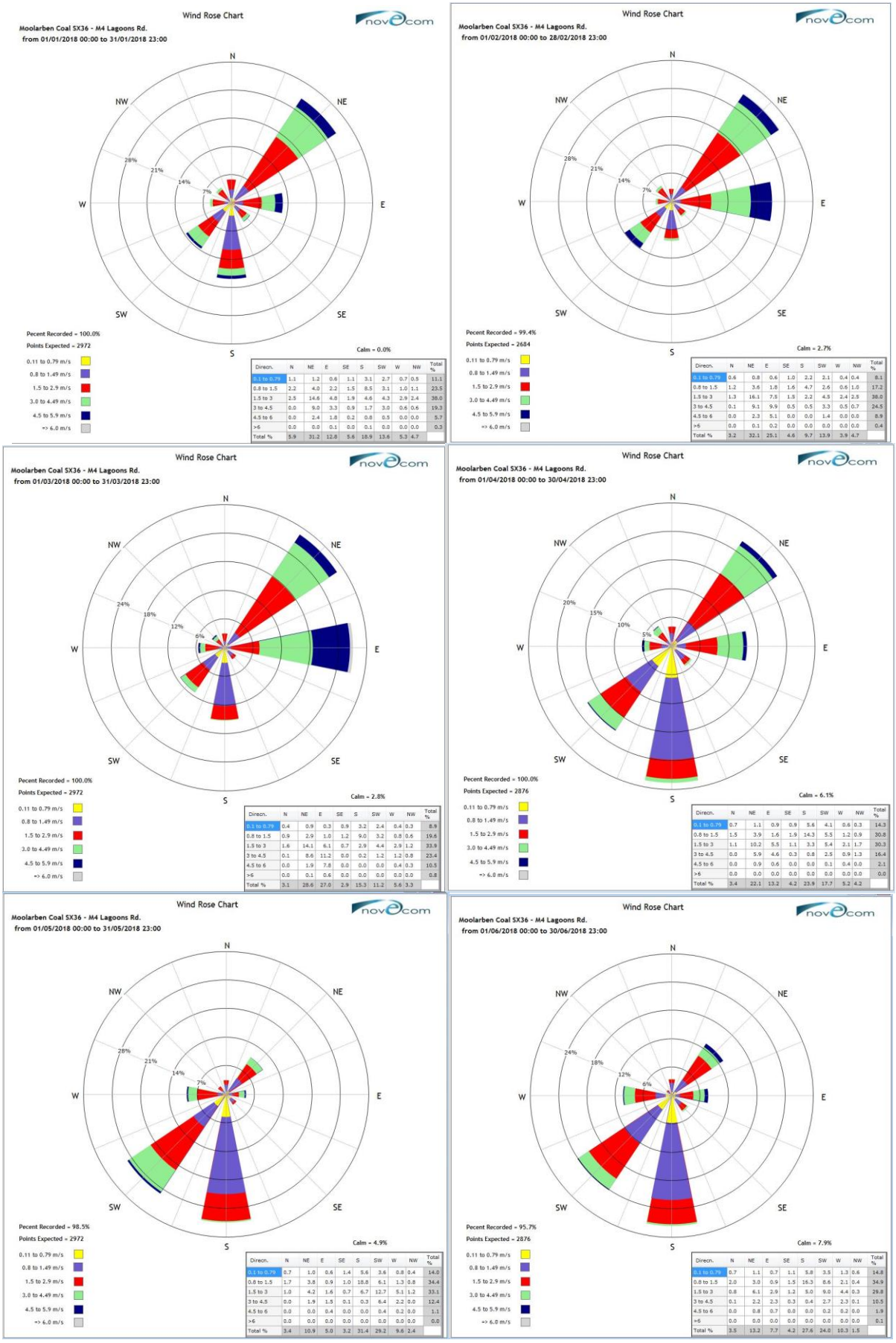
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
22/06/18	-0.5	17.0	-0.1	16.7	83.1	0.0
23/06/18	-2.0	16.3	-1.2	16.2	74.5	0.0
24/06/18	-3.9	16.4	-3.5	16.3	74.0	0.2
25/06/18	-2.5	15.9	-1.1	16.2	77.7	0.0
26/06/18	-1.7	14.9	-0.1	15.1	76.3	0.0
27/06/18	0.0	14.8	2.4	14.7	82.0	1.4
28/06/18	2.5	11.0	3.0	10.3	97.8	22.2
29/06/18	-1.1	10.4	-1.5	9.6	95.5	0.2
30/06/18	-1.1	14.0	-0.6	13.8	83.8	0.0
01/07/18	-2.4	12.4	-1.4	12.7	80.3	0.2
02/07/18	3.7	12.1	5.4	12.0	82.1	0.0
03/07/18	-0.1	14.0	0.5	14.0	88.4	0.0
04/07/18	2.7	17.8	4.3	17.9	84.7	0.2
05/07/18	3.6	22.3	4.1	21.4	80.9	0.0
06/07/18	3.1	21.0	5.5	20.4	76.5	0.2
07/07/18	0.0	11.4	1.9	10.9	80.3	1.0
08/07/18	2.9	9.1	3.1	9.1	77.0	0.0
09/07/18	0.9	13.6	2.2	13.8	72.9	0.0
10/07/18	-2.2	14.1	-1.3	14.2	80.0	0.0
11/07/18	-1.5	15.6	-0.8	15.2	77.5	0.0
12/07/18	-1.9	13.6	-1.1	12.8	71.6	1.8
13/07/18	-1.1	11.0	0.7	10.9	74.7	0.0
14/07/18	-4.8	13.3	-4.2	13.2	72.3	0.2
15/07/18	-7.0	13.2	-6.4	12.7	67.8	0.0
16/07/18	-6.2	13.3	-5.4	13.0	64.6	0.0
17/07/18	-3.1	18.1	-2.2	17.7	41.8	0.0
18/07/18	0.8	17.4	1.9	17.1	49.2	0.0
19/07/18	-2.4	19.5	-1.5	19.1	62.0	0.0
20/07/18	0.2	13.7	3.5	13.4	63.2	0.0
21/07/18	-1.7	12.8	0.6	12.6	68.7	0.0
22/07/18	-4.5	14.7	-3.9	14.0	66.2	0.0
23/07/18	-5.1	15.7	-4.1	15.0	56.9	0.0
24/07/18	1.8	18.9	3.7	18.6	40.7	0.0
25/07/18	0.2	18.1	1.6	17.8	40.7	0.0
26/07/18	-1.0	17.1	0.2	17.1	67.2	0.0
27/07/18	0.4	18.7	1.5	18.6	62.4	0.0
28/07/18	4.9	20.5	5.7	20.1	73.0	2.4
29/07/18	0.4	19.5	3.1	18.9	71.6	6.2
30/07/18	-0.3	12.7	1.4	12.4	68.5	0.0
31/07/18	-2.2	15.6	-0.8	15.1	62.8	0.0
01/08/18	1.7	16.6	3.2	16.3	59.2	0.0
02/08/18	-1.4	18.3	-0.8	17.8	71.5	0.0
03/08/18	0.2	20.2	2.1	19.5	69.0	2.8
04/08/18	1.2	13.7	2.0	13.5	80.7	0.0
05/08/18	-1.6	19.8	-0.9	19.3	69.8	0.2
06/08/18	4.4	13.9	6.4	13.7	70.2	7.4
07/08/18	-0.2	12.5	0.7	12.1	64.5	0.0
08/08/18	-2.2	14.6	-1.3	14.3	67.7	0.0
09/08/18	0.4	16.8	1.7	16.7	65.8	0.0
10/08/18	-2.0	20.1	-1.4	19.5	66.1	0.0
11/08/18	0.5	21.5	2.0	20.9	52.6	0.0
12/08/18	2.8	10.3	3.4	9.8	65.9	0.0
13/08/18	-1.2	13.9	0.0	13.6	68.9	0.0
14/08/18	-0.3	17.3	1.2	17.2	71.2	0.0
15/08/18	-1.2	19.4	-0.2	18.9	52.8	0.0
16/08/18	1.7	17.9	3.5	17.5	43.8	0.0
17/08/18	-2.5	14.3	-1.9	14.0	63.4	0.0
18/08/18	-2.7	18.2	-1.9	17.6	54.9	0.0
19/08/18	4.7	10.7	4.7	10.5	55.3	0.0

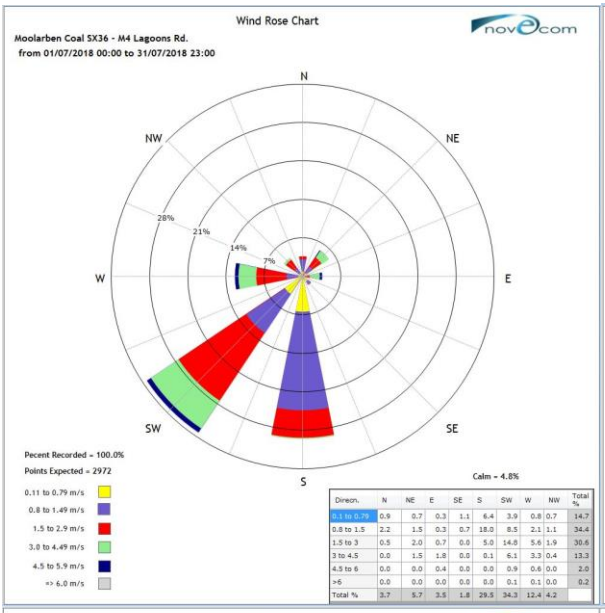
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
20/08/18	-1.3	12.7	0.2	12.2	52.8	0.0
21/08/18	-3.1	12.9	-1.7	12.2	63.6	0.0
22/08/18	-0.7	12.8	1.1	12.5	63.0	0.0
23/08/18	-3.1	16.3	-2.0	16.1	65.7	0.0
24/08/18	-1.0	19.2	0.1	18.8	70.5	0.0
25/08/18	6.9	14.1	8.0	14.0	70.5	15.0
26/08/18	8.0	11.0	7.0	9.7	95.9	13.6
27/08/18	6.4	16.5	5.8	16.1	77.1	0.0
28/08/18	-0.1	14.0	0.8	13.6	73.8	0.0
29/08/18	-3.4	14.6	-2.6	14.2	65.0	0.0
30/08/18	-3.5	18.2	-2.6	18.1	53.7	0.2
31/08/18	5.4	16.8	6.8	16.8	69.1	6.8
01/09/18	5.5	14.8	7.4	14.2	78.6	0.8
02/09/18	2.2	16.5	2.9	16.4	71.2	0.2
03/09/18	5.4	13.9	6.2	14.0	68.7	0.0
04/09/18	8.5	14.9	8.6	14.8	74.2	1.2
05/09/18	8.4	17.3	8.6	17.1	68.4	0.0
06/09/18	8.4	18.6	9.2	18.0	77.3	14.2
07/09/18	8.1	16.0	8.7	15.4	95.7	7.0
08/09/18	5.3	19.7	8.2	18.1	81.6	0.2
09/09/18	2.1	18.0	4.1	17.8	64.6	0.2
10/09/18	4.1	22.0	5.0	21.4	63.6	0.0
11/09/18	4.1	24.4	5.1	23.6	69.8	0.0
12/09/18	5.8	26.3	7.3	25.6	61.0	0.0
13/09/18	7.4	25.4	9.1	24.7	60.9	0.0
14/09/18	6.7	26.1	8.1	25.4	59.6	0.0
15/09/18	4.0	27.9	5.4	27.2	43.1	0.0
16/09/18	1.0	14.3	2.0	14.1	43.2	0.0
17/09/18	-0.9	18.7	0.2	17.9	61.7	0.0
18/09/18	0.8	23.5	1.5	22.5	63.3	0.0
19/09/18	4.6	21.7	6.1	20.8	54.9	0.0
20/09/18	-1.5	17.0	-0.4	16.5	48.4	0.0
21/09/18	-0.2	20.6	0.3	19.8	58.9	0.0
22/09/18	1.0	21.7	2.1	20.9	55.8	0.0
23/09/18	1.6	23.6	3.1	23.0	54.2	0.0
24/09/18	9.6	16.0	9.7	15.6	66.1	0.0
25/09/18	7.3	18.9	8.8	18.2	65.4	0.0
26/09/18	3.3	14.6	4.3	13.8	90.1	9.6
27/09/18	5.5	21.3	7.4	20.6	70.5	0.2
28/09/18	3.2	27.0	4.4	26.5	50.6	0.0
29/09/18	2.3	17.9	4.0	17.4	50.0	0.0
30/09/18	2.3	18.1	4.0	18.0	57.6	0.0
01/10/18	3.1	21.8	4.5	21.4	66.1	0.0
02/10/18	3.4	26.3	4.8	25.5	56.3	0.0
03/10/18	6.4	23.8	7.7	23.0	61.9	0.0
04/10/18	12.5	16.9	12.6	17.3	84.5	3.4
05/10/18	11.3	14.5	11.4	14.4	80.1	3.4
06/10/18	6.7	20.2	8.7	19.9	69.3	0.0
07/10/18	2.6	21.8	3.9	21.5	66.9	0.2
08/10/18	9.1	23.3	9.7	22.7	66.3	0.0
09/10/18	7.3	25.2	8.7	24.5	61.9	0.0
10/10/18	9.1	16.1	9.9	16.0	83.7	10.0
11/10/18	9.9	15.3	9.9	15.1	72.3	0.0
12/10/18	9.5	17.7	9.5	17.2	68.3	0.0
13/10/18	10.6	19.6	10.7	19.4	65.3	0.0
14/10/18	8.2	20.7	9.9	20.4	70.4	0.0
15/10/18	12.9	23.6	13.1	23.4	67.7	0.0
16/10/18	12.4	25.3	13.2	25.1	68.0	0.0
17/10/18	13.7	21.7	13.1	21.4	88.5	27.4

Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
18/10/18	11.2	25.8	10.5	25.1	82.1	0.4
19/10/18	11.2	27.1	11.9	26.6	73.4	0.0
20/10/18	12.5	27.9	13.3	27.0	83.6	10.0
21/10/18	11.6	23.9	11.7	23.3	73.0	0.2
22/10/18	14.9	25.1	15.0	25.0	73.9	0.0
23/10/18	10.9	29.7	11.8	29.0	60.5	0.0
24/10/18	9.0	25.6	10.2	25.3	61.7	0.0
25/10/18	10.1	27.9	11.2	27.4	61.7	0.0
26/10/18	5.9	27.0	7.5	26.5	45.2	0.0
27/10/18	12.4	26.5	12.7	26.0	52.4	0.0
28/10/18	11.2	20.8	12.0	20.5	58.1	0.0
29/10/18	8.1	25.8	8.8	25.1	62.0	0.0
30/10/18	8.1	29.6	8.8	28.5	57.0	0.0
31/10/18	10.7	32.7	12.4	31.7	50.2	0.0
01/11/18	16.2	33.4	16.5	32.2	48.9	0.0
02/11/18	15.9	33.2	17.0	32.0	43.2	7.8
03/11/18	16.1	31.0	17.1	30.3	55.8	1.0
04/11/18	10.6	29.6	11.6	28.6	58.2	0.0
05/11/18	9.5	29.6	10.7	28.9	51.4	0.0
06/11/18	16.1	33.5	17.1	33.0	57.3	0.0
07/11/18	10.5	22.7	10.3	23.2	84.8	21.6
08/11/18	7.9	19.3	7.8	18.5	56.9	0.0
09/11/18	6.2	23.7	7.8	22.2	60.8	0.2
10/11/18	6.2	25.4	7.2	24.3	46.6	0.0
11/11/18	6.5	27.6	7.8	26.7	49.9	0.0
12/11/18	9.4	28.1	10.7	27.2	54.8	0.0
13/11/18	12.9	30.4	13.9	29.6	52.2	0.0
14/11/18	13.3	24.3	14.7	23.2	61.2	0.0
15/11/18	10.3	30.7	10.9	29.4	62.2	0.0
16/11/18	14.7	23.9	14.6	22.9	67.5	0.0
17/11/18	13.8	25.4	14.5	24.6	61.9	0.0
18/11/18	13.7	23.9	13.9	23.2	57.6	0.0
19/11/18	12.8	26.5	12.9	25.9	54.2	0.0
20/11/18	11.3	30.9	12.8	29.7	61.7	4.6
21/11/18	17.7	23.4	17.7	22.5	82.5	4.6
22/11/18	13.9	20.5	13.9	19.5	46.5	0.0
23/11/18	10.0	18.9	10.1	18.1	44.8	0.0
24/11/18	9.9	22.6	10.2	21.7	41.6	0.0
25/11/18	11.1	24.7	12.1	23.5	43.1	0.0
26/11/18	6.2	28.0	7.3	26.8	45.6	0.0
27/11/18	12.5	28.6	12.8	27.6	61.5	0.0
28/11/18	14.6	21.1	14.4	19.8	81.7	27.4
29/11/18	8.8	24.9	9.2	24.2	67.4	0.0
30/11/18	12.2	27.0	12.6	26.1	59.8	0.0
01/12/18	8.9	31.3	10.1	30.3	46.9	0.0
02/12/18	10.5	32.8	11.7	31.9	43.9	0.0
03/12/18	8.5	26.7	10.2	25.6	37.9	0.0
04/12/18	9.2	31.7	10.1	30.5	47.1	0.0
05/12/18	16.8	26.3	16.8	25.7	62.1	0.0
06/12/18	14.7	27.4	14.8	26.8	55.9	0.0
07/12/18	9.8	30.0	11.0	29.4	49.3	0.0
08/12/18	11.3	34.5	12.4	33.0	45.7	0.0
09/12/18	12.7	36.5	13.9	35.1	38.3	0.0
10/12/18	15.6	33.9	16.8	32.6	43.6	0.0
11/12/18	16.9	22.3	16.8	22.3	88.2	16.8
12/12/18	16.2	22.4	15.9	22.0	83.6	19.4
13/12/18	16.3	29.1	15.3	28.0	81.2	15.0
14/12/18	16.8	26.9	16.5	24.9	77.7	3.6
15/12/18	18.0	29.7	18.0	28.4	64.9	0.8

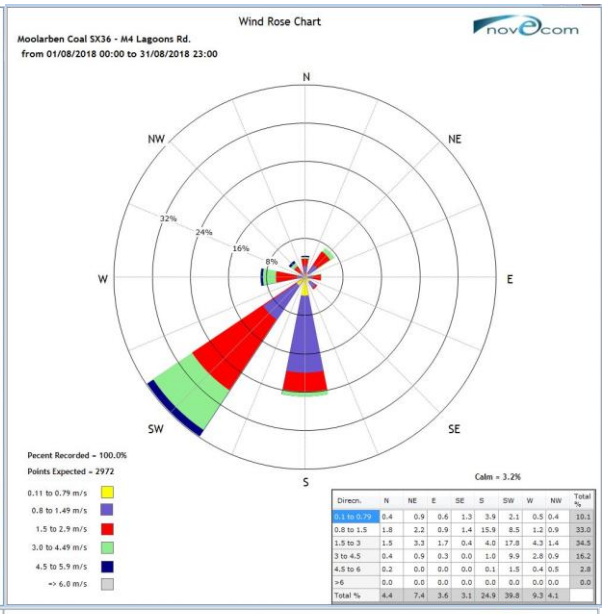
Date	Temperature (2m) (°C)		Temperature (10m) (°C)		Relative Humidity	Rain (mm)
	Min	Max	Minimum	Maximum	Average	
16/12/18	14.2	33.4	14.8	32.2	58.6	0.0
17/12/18	17.1	32.7	17.6	31.7	63.8	0.0
18/12/18	17.1	35.0	18.1	33.4	66.0	0.0
19/12/18	19.3	33.4	19.0	32.7	76.6	12.0
20/12/18	18.1	36.7	18.5	35.6	72.4	2.8
21/12/18	17.6	29.8	17.9	28.0	71.8	0.0
22/12/18	13.1	25.7	13.0	25.2	66.5	0.8
23/12/18	9.6	24.1	10.8	23.5	58.2	0.2
24/12/18	11.7	28.7	12.4	28.0	52.0	0.0
25/12/18	11.6	33.7	12.6	32.8	53.7	0.0
26/12/18	13.6	36.4	15.1	35.0	43.5	0.0
27/12/18	15.5	37.0	16.8	35.9	42.8	0.0
28/12/18	15.9	38.7	17.2	36.8	39.8	0.0
29/12/18	15.0	37.8	16.3	35.9	44.6	0.0
30/12/18	15.0	36.8	16.3	35.2	39.8	0.0
31/12/18	16.1	37.2	17.0	35.3	46.0	0.8

Figure 3-a Monthly Wind Rose

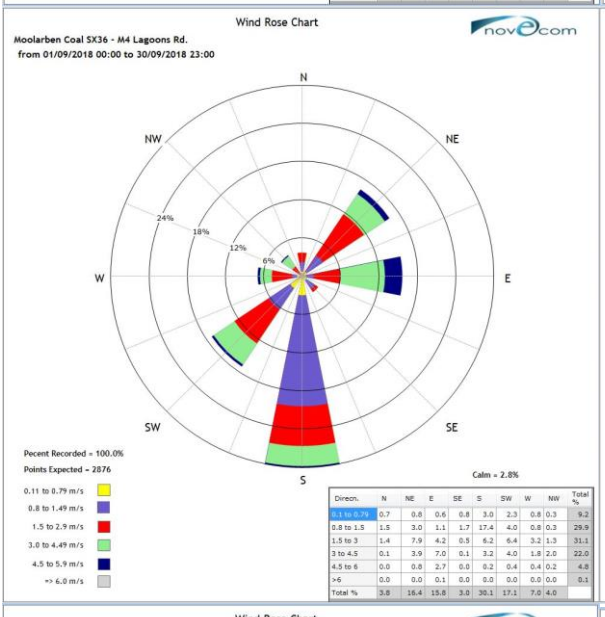




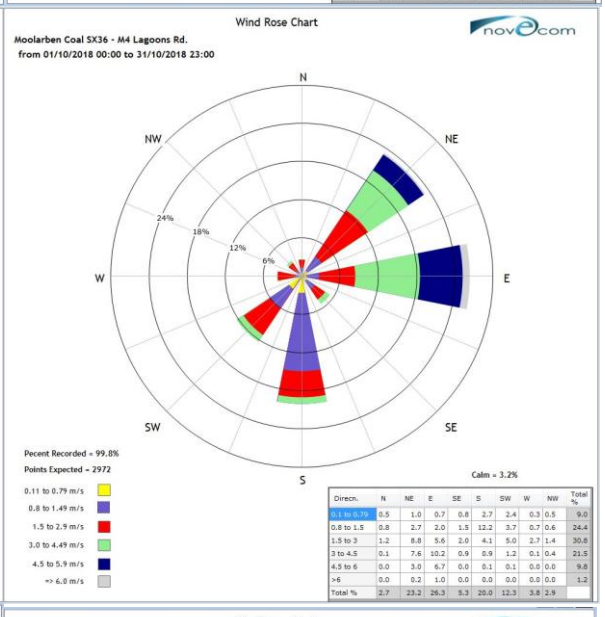
Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.9	0.7	0.3	1.1	6.4	3.9	0.8	0.7	14.7
0.8 to 1.5	2.2	1.5	0.3	0.7	18.0	8.5	2.1	1.1	34.4
1.5 to 3	0.5	2.0	0.7	0.0	5.0	14.8	5.6	1.9	30.6
3 to 4.5	0.0	1.5	1.8	0.0	0.1	6.1	3.3	0.4	13.3
4.5 to 6	0.0	0.0	0.4	0.0	0.0	0.9	0.6	0.0	2.0
>6	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2
Total %	3.7	5.7	3.5	1.8	29.5	34.3	12.4	4.2	



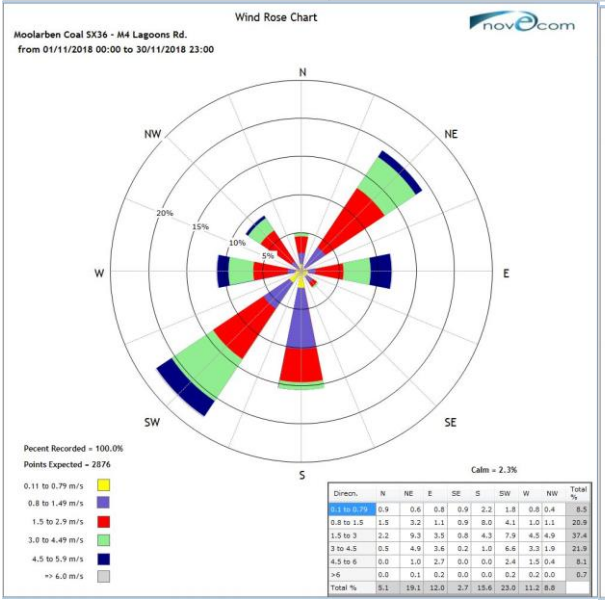
Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.4	0.9	0.6	1.3	3.9	2.1	0.5	0.4	10.1
0.8 to 1.5	1.8	2.2	0.9	1.4	15.9	8.5	1.2	0.9	33.0
1.5 to 3	1.5	3.3	1.7	0.4	4.0	17.8	4.3	1.4	34.5
3 to 4.5	0.4	0.9	0.3	0.0	1.0	9.9	2.8	0.9	16.2
4.5 to 6	0.2	0.0	0.0	0.0	0.1	1.5	0.4	0.5	2.8
>6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total %	4.4	7.4	3.6	3.1	24.9	39.8	9.3	4.1	



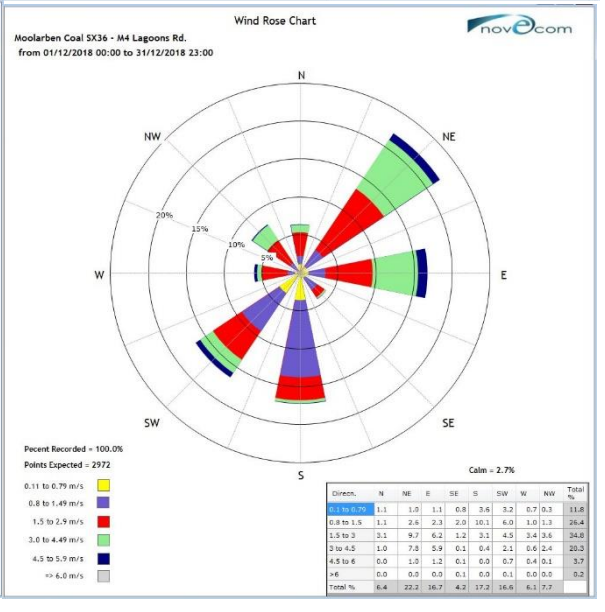
Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.7	0.8	0.6	0.8	3.0	2.3	0.8	0.3	9.2
0.8 to 1.5	1.5	3.0	1.1	1.7	17.4	4.0	0.8	0.3	29.9
1.5 to 3	1.4	7.9	4.2	0.5	6.2	6.4	3.2	1.3	31.1
3 to 4.5	0.1	3.9	7.0	0.1	3.2	4.0	1.8	2.0	22.0
4.5 to 6	0.0	0.8	2.7	0.0	0.2	0.4	0.4	0.2	4.8
>6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total %	3.8	16.4	15.8	3.0	30.1	17.1	7.0	4.0	



Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.5	1.0	0.7	0.8	2.7	2.4	0.3	0.5	9.0
0.8 to 1.5	0.8	2.7	2.0	1.5	12.2	3.7	0.7	0.6	24.4
1.5 to 3	1.2	8.8	5.6	2.0	4.1	5.0	2.7	1.4	30.8
3 to 4.5	0.1	7.6	10.2	0.9	0.9	1.2	0.1	0.4	21.5
4.5 to 6	0.0	3.0	6.7	0.0	0.1	0.1	0.0	0.0	9.8
>6	0.0	0.2	1.0	0.0	0.0	0.0	0.0	0.0	1.2
Total %	2.7	23.2	26.3	5.3	20.0	12.3	3.8	2.9	



Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	0.9	0.6	0.8	0.9	2.2	1.8	0.8	0.4	8.5
0.8 to 1.5	1.5	3.2	1.1	0.9	8.0	4.1	1.0	1.1	20.9
1.5 to 3	2.2	9.3	3.5	0.8	4.3	7.9	4.5	4.9	37.4
3 to 4.5	0.5	4.9	3.6	0.2	1.0	6.6	3.3	1.9	21.9
4.5 to 6	0.0	1.0	2.7	0.0	0.0	2.4	1.5	0.4	8.1
>6	0.0	0.1	0.2	0.0	0.0	0.2	0.2	0.0	0.7
Total %	5.1	19.1	12.0	2.7	15.6	23.0	11.2	8.8	



Direcn.	N	NE	E	SE	S	SW	W	NW	Total %
0.1 to 0.79	1.1	1.0	1.1	0.8	3.6	3.2	0.7	0.3	11.8
0.8 to 1.5	1.1	2.6	2.3	2.0	10.1	6.0	1.0	1.3	26.4
1.5 to 3	3.1	9.7	6.2	1.2	3.1	4.5	3.4	3.6	34.8
3 to 4.5	1.0	7.8	5.9	0.1	0.4	2.1	0.6	2.4	20.3
4.5 to 6	0.0	1.0	1.2	0.1	0.0	0.7	0.4	0.1	3.7
>6	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.2
Total %	6.4	22.2	16.7	4.2	17.2	16.6	6.1	7.7	

APPENDIX 3B. NOISE COMPLIANCE REPORT

Moolarben Coal Operations

Environmental Noise Monitoring

Annual Report

1 January to 31 December 2018

Prepared for

Moolarben Coal Operations Pty Ltd

Global Acoustics

Noise and Vibration Analysis and Solutions

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Moolarben Coal Operations

Environmental Noise Monitoring
Annual Report – 1 January to 31 December 2018

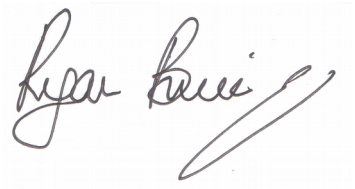
Reference: 18432_R02
Report date: 26 February 2019

Prepared for

Moolarben Coal Operations
12 Ulan-Wollar Road
Ulan NSW 2850

Prepared by

Global Acoustics Pty Ltd
PO Box 3115
Thornton NSW 2322



Prepared:	Robert Kirwan Consultant	QA Review:	Ryan Bruniges Consultant

Global Acoustics Pty Ltd ~ Environmental noise modelling and impact assessment ~ Sound power testing ~ Noise control advice ~ Noise and vibration monitoring ~ OHS noise monitoring and advice ~ Expert evidence in Land and Environment and Compensation Courts ~ Architectural acoustics ~ Blasting assessments and monitoring ~ Noise management plans (NMP) ~ Sound level meter and noise logger sales and hire

EXECUTIVE SUMMARY

Global Acoustics was engaged by Moolarben Coal Operations Pty Ltd (MCO) to provide a summary of operational environmental noise surveys conducted around Moolarben Coal Mine (MCM) from 1 January to 31 December 2018 and to compare results against noise levels predicted in the Underground 1 Optimisation Modification model, Year 2018.

During the 2018 reporting period, attended noise monitoring described in this report was conducted on a monthly, and quarterly basis in accordance with Project Approvals 05_0117 and 08_0135, the MCO Noise Management Plan (NMP) and EPL 12932. More detail regarding monitoring locations and timing of monitoring during 2018 is provided in Section 1.2 of this report.

Attended noise monitoring was carried out during 2018 to quantify and describe the existing acoustic environment around MCO and compare the results with relevant limits.

January to December 2018 Compliance

MCO complied with the project specific criteria at all monitoring sites during attended noise monitoring undertaken between January and December 2018.

EIS Comparison

Results indicated that MCO levels were often well under the predicted levels where meteorological conditions were relevant and there are no systemic noise issues as a result of the operation.

The measured LAeq noise level was greater than predicted by 1 dB in February for NA6 under calm conditions. The model (Year 2018 of the UG1 Optimisation Modification) predicts that there will be no exceedances of the criterion for the indicative scenarios and at no point were measured levels greater than the relevant criterion for each location where criteria applied.

Global Acoustics Pty Ltd

Table of Contents

1 INTRODUCTION

1.1 Background

Global Acoustics was engaged by Moolarben Coal Operations Pty Ltd (MCO) to provide a summary of operational environmental noise surveys conducted around Moolarben Coal Mine (MCM) from 1 January to 31 December 2018.

The MCM is located on Ulan Road, approximately 40 kilometres north east of Mudgee. Stage 1 of the mine consists of the construction and operation of three separate open cut mines (OC1, OC2 and OC3), an underground mine (UG4), the coal handling and preparation plant (CHPP) and mining infrastructure area (MIA). Stage 2 includes the construction and operation of Open Cut 4 (OC4), Underground Mine (UG1 and UG2) and a ROM coal facility in OC4.

During this reporting period, major activities included:

- The operation of OC1, OC2 and OC4;
- The operation of the CHPP and rail load-out facilities;
- Vegetation clearing, topsoil stripping, drilling, overburden removal, coaling and rehabilitation activities in OC1, OC2 and OC4; and
- Construction and operation activities in the Underground (MIA and Boxcut) and CHPP areas.

Attended noise monitoring was carried out during 2018 in accordance with the approved "Moolarben Coal Complex Noise Management Plan" as required by EPL condition M9 to quantify and describe the existing acoustic environment around MCO and compare the results with relevant limits.

1.2 Monitoring Locations and Timing

1.2.1 January to December 2018, Monthly

There were six monthly attended monitoring locations between January and December 2018 as detailed in Table 1.1 and shown on Figure 1. It should be noted that this figure shows the actual monitoring position, not the location of residences.

Table 1.1: ATTENDED NOISE MONITORING LOCATIONS – JANUARY TO DECEMBER 2018, MONTHLY

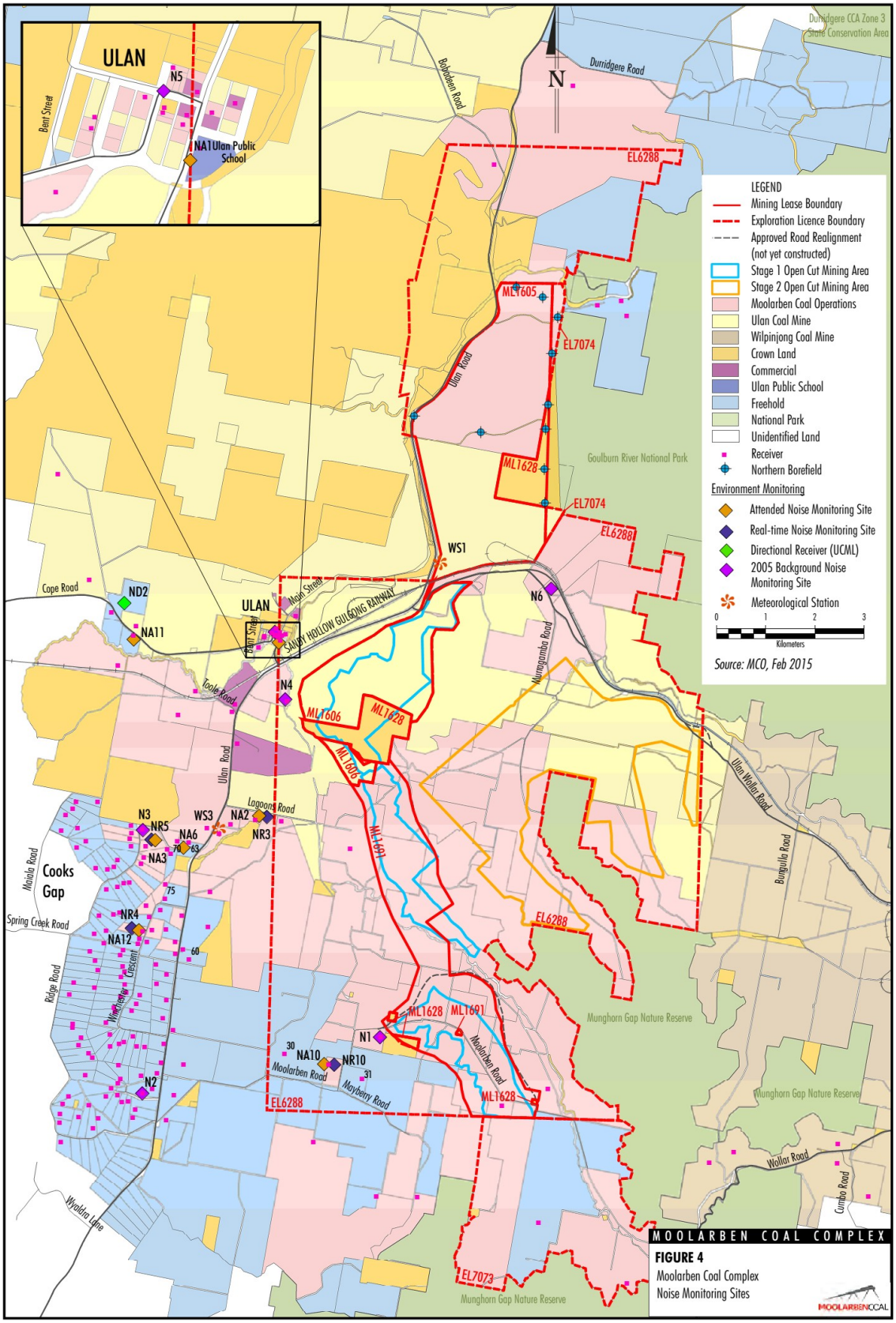
Report Descriptor	Monitoring Location	Location Purpose	Monitoring Period
NA1	Ulan Public School, Ulan Village	Compliance	Day
NA2	Lagoons Road, Ulan	Validation	Night
NA3	Upper Ridge Road, Cooks Gap	Validation	Night
NA6	Lower Ridge Road, Cooks Gap	Compliance	Night
NA10	Moolarben Road, Moolarben	Validation	Night
NA12	Winchester Crescent, Cooks Gap	Compliance/Validation	Night

1.2.2 January to December 2018, Quarterly

In addition to the monthly monitoring locations detailed in Table 1.1, quarterly surveys were completed at these additional attended monitoring locations (conducted in February, May, August and November 2018). These are detailed in Table 1.2 and shown in Figure 1 and Figure 2. It should be noted that the figures show the actual monitoring position, not the location of residences.

Table 1.2: ATTENDED NOISE MONITORING LOCATIONS – JANUARY TO DECEMBER 2018, QUARTERLY

Report Descriptor	Monitoring Location	Location Purpose	Monitoring Period
NA11	Cope Road (Receiver 258), Ulan	Management	Night
GRNP	Goulburn River National Park	Compliance	Night
MGNR	Munghorn Gap Nature Reserve	Compliance	Night



Source: Moolarben Coal Operations Pty Ltd

Figure 1: MCO Attended Noise Monitoring Sites, January to December 2018

Figure 2: MCO Quarterly Attended Monitoring Locations, January to December 2018

1.3 Terminology & Abbreviations

Some definitions of terms and abbreviations, which may be used in this report, are provided in Table 1.3.

Table 1.3: TERMINOLOGY & ABBREVIATIONS

Descriptor	Definition
L_A	The A-weighted root mean squared (RMS) noise level at any instant
L_{Amax}	The maximum A-weighted noise level over a time period or for an event
L_{A1}	The noise level which is exceeded for 1 per cent of the time
L_{A10}	The noise level which is exceeded for 10 percent of the time, which is approximately the average of the maximum noise levels
L_{A50}	The noise level which is exceeded for 50 per cent of the time
L_{A90}	The level exceeded for 90 percent of the time, which is approximately the average of the minimum noise levels. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes
L_{Amin}	The minimum A-weighted noise level over a time period or for an event
L_{Aeq}	The average noise energy during a measurement period
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise
SPL	Sound pressure level (SPL), fluctuations in pressure measured as 10 times a logarithmic scale, the reference pressure being 20 micropascals
Hertz (Hz)	Cycles per second, the frequency of fluctuations in pressure, sound is usually a combination of many frequencies together
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude. Estimated from wind speed and sigma theta data
IA	Inaudible. When site only noise is noted as IA, there was no noise from the source of interest audible at the monitoring location
NM	Not Measurable. If site only noise is noted as NM, this means some noise from the source of interest was audible at low-levels, but could not be quantified
Day	This is the period 7:00am to 6:00pm
Evening	This is the period 6:00pm to 10:00pm
Night	This is the period 10:00pm to 7:00am

2 CONSENTS

MCO operates under two project approvals:

- 05_0117 for Stage 1, revised in January 2017; and
- 08_0135 for Stage 2, revised in April 2016.

MCO holds Environmental Protection Licence (EPL) No.12932, most recently revised on 16 February 2018. Section L5 of the licence outlines noise limits and meteorological conditions required for criteria to apply.

The Noise Management Plan (NMP) was approved most recently in July 2015, including Stage 1 and Stage 2 of the operation.

3 METHODOLOGY

3.1 Overview

All noise monitoring was conducted at the monitoring locations in accordance with Australian Standard AS1055 ' Acoustics, Description and Measurement of Environmental Noise', relevant NSW EPA requirements and the MCO NMP.

3.2 Modifying Factors

The EPA 'Noise Policy for Industry' (NPfI, 2017) was approved for use in NSW in October 2017, and supersedes the EPA's Industrial Noise Policy (INP, 2000). Assessment and reporting of modifying factors is to be carried out in accordance with Fact Sheet C of the NPfI.

Years of monitoring have indicated that noise levels from mining operations, particularly those measured at significant distances from the source are relatively continuous and broad spectrum. Given this, noise levels from MCO at the monitoring locations are unlikely to be intermittent or tonal.

Assessment of low-frequency modifying factors is necessary when application of the maximum correction could potentially result in an exceedance of the relevant site-only L_{Aeq} criterion. Low-frequency analysis is therefore undertaken for measurements in this report where:

- meteorological conditions resulted in criteria being applicable;
- contributions from MCO were audible and directly measurable, such that the site-only L_{Aeq} was not "NM" or less than a maximum cut off value (e.g. "<20 dB" or "<30dB");
- contributions from MCO were within 5 dB of the relevant L_{Aeq} criterion, as 5 dB is the maximum penalty that can be applied by low-frequency modifying factors; and
- MCO was the dominant low-frequency noise source.

All measurements meeting these conditions were evaluated for possible low frequency penalty applicability in accordance with the NPfI.

3.3 Log of Operations

MCO personnel have a recorded log of operations that confirms full or partial operations were in progress during all survey periods.

4 RESULTS

The following sub-sections present a summary of 2018 monitoring data. Table 4.2 compares MCO levels during January 2018 against land acquisition and mitigation criteria detailed in the project approval.

4.1 January 2018

Table 4.1 compares MCO levels during January 2018 against impact assessment criteria detailed in the project approval.

Table 4.1: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JANUARY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	12/01/2018 11:17	52	1.2	D	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	11/01/2018 22:30	33	0.6	F	37	30	Yes	Nil	45	39	Yes	Nil
NA12	11/01/2018 22:00	32	1.7	F	35	27	Yes	Nil	45	30	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.2: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – JANUARY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	11/01/2018 22:30	33	0.6	F	37	40	30	Yes	Nil	Nil
NA12	11/01/2018 22:00	32	1.7	F	37	40	27	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.2 February/Quarter 1 2018

Table 4.3 compares MCO levels during February 2018 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.4 compares MCO levels during February 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.3: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – FEBRUARY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	09/02/2018 10:58	47	3.9	A	43[1]	IA	No	NA	NA	NA	NA	NA
NA6	08/02/2018 23:21	31	0.0	G	37	28	No	NA	45	33	No	NA
NA12	08/02/2018 23:45	30	0.6	G	35	<20	No	NA	45	23	No	NA
GRNP	08/02/2018 22:00	26	1.1	F	50	IA	Yes	Nil	NA	IA	NA	NA
MGNR	09/02/2018 01:16	27	0.5	G	50	IA	No	NA	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.4: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – FEBRUARY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	08/02/2018 23:21	31	0.0	G	37	40	28	No	NA	NA
NA12	08/02/2018 23:45	30	0.6	G	37	40	<20	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.3 March 2018

Table 4.5 compares MCO levels during March 2018 against impact assessment criteria detailed in the project approval. Table 4.6 compares MCO levels during March 2016 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.5: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – MARCH 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s[5]	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	28/03/2018 14:32	44	1.2	A	43[1]	IA	Yes	Nil	NA	NA	NA	NA
NA6	28/03/2018 22:24	42	0.5	G	37	30	No	NA	45	35	No	NA
NA12	28/03/2018 22:00	36	0.7	G	35	<25	No	NA	45	27	No	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.6: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – MARCH 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	28/03/2018 22:24	42	0.5	G	37	40	30	No	NA	NA
NA12	28/03/2018 22:00	36	0.7	G	37	40	<25	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.4 April 2018

Table 4.7 compares MCO levels during April 2018 against impact assessment criteria detailed in the project approval. Table 4.8 compares MCO levels during April 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.7: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – APRIL 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	10/04/2018 11:56	46	2.7	A	43[1]	IA	Yes	Nil	NA	NA	NA	NA
NA6	09/04/2018 22:00	36	0.1	G	37	<25	No	NA	45	<25	No	NA
NA12	09/04/2018 22:28	36	1.3	G	35	<25	No	NA	45	<25	No	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.8: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – APRIL 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	09/04/2018 22:00	36	0.1	G	37	40	<25	No	NA	NA
NA12	09/04/2018 22:28	36	1.3	G	37	40	<25	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.5 May/Quarter 2 2018

Table 4.9 compares MCO levels during May 2018 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.10 compares MCO levels during May 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.9: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – MAY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	08/05/2018 09:38	38	0.3	A	43[1]	IA	Yes	Nil	NA	NA	NA	NA
NA6	07/05/2018 23:20	38	0.0	G	37	IA	No	NA	45	IA	No	NA
NA12	08/05/2018 00:15	35	0.0	G	35	<20	No	NA	45	<20	No	NA
GRNP	07/05/2018 22:00	41	0.0	G	50	<30	No	NA	NA	NA	NA	NA
MGNR	08/05/2018 01:17	22	0.5	G	50	IA	No	NA	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.10: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – MAY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	07/05/2018 23:20	38	0.0	G	37	40	IA	No	NA	NA
NA12	08/05/2018 00:15	35	0.0	G	37	40	<20	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.6 June 2018

Table 4.11 compares MCO levels during June 2018 against impact assessment criteria detailed in the project approval. Table 4.12 compares MCO levels during June 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.11: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JUNE 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	05/06/2018 11:00	42	2.1	C	43[6]	IA	Yes	Nil	NA	NA	NA	NA
NA6	04/06/2018 22:00	30	0.9	F	37	30	Yes	Nil	45	35	Yes	Nil
NA12	04/06/2018 22:30	40	0.7	F	35	27	Yes	Nil	45	31	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.12: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – JUNE 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	04/06/2018 22:00	30	0.9	F	37	40	30	Yes	Nil	Nil
NA12	04/06/2018 22:30	40	0.7	F	37	40	27	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.7 July 2018

Table 4.13 compares MCO levels during July 2018 against impact assessment criteria detailed in the project approval. Table 4.14 compares MCO levels during July 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.13: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – JULY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	12/07/2018 09:52	52	0.7	D	43[6]	IA	Yes	Nil	NA	NA	NA	NA
NA6	11/07/2018 22:55	47	0.5	G	37	<30	No	NA	45	30	No	NA
NA12	11/07/2018 22:00	38	0.3	G	35	29	No	NA	45	31	No	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.14: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – JULY 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	11/07/2018 22:55	47	0.5	G	37	40	<30	No	NA	NA
NA12	11/07/2018 22:00	38	0.3	G	37	40	29	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.8 August/Quarter 3 2018

Table 4.15 compares MCO levels during August 2018 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.16 compares MCO levels during August 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.15: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – AUGUST 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	08/08/2018 11:32	47	6.9	A	43	IA	No	NA	NA	NA	NA	NA
NA6	08/08/2018 00:15	32	0.8	G	37	IA	No	NA	45	IA	No	NA
NA12	08/08/2018 00:45	39	0.3	G	35	IA	No	NA	45	IA	No	NA
GRNP	07/08/2018 22:01	41	2.1	G	50	36	No	NA	NA	NA	NA	NA
MGNR	08/08/2018 01:54	21	0.5	G	50	IA	No	NA	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.16: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – AUGUST 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	08/08/2018 00:15	32	0.8	G	37	40	IA	No	NA	NA
NA12	08/08/2018 00:45	39	0.3	G	37	40	IA	No	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.9 September 2018

Table 4.17 compares MCO levels during September 2018 against impact assessment criteria detailed in the project approval. Table 4.18 compares MCO levels during September 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.17: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – SEPTEMBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	21/09/2018 11:53	38	1.6	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	20/09/2018 22:00	26	0.7	E	37	<25	Yes	Nil	45	32	Yes	Nil
NA12	20/09/2018 22:30	37	0.7	F	35	25	Yes	Nil	45	30	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.18: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – SEPTEMBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	20/09/2018 22:00	26	0.7	E	37	40	<25	Yes	Nil	Nil
NA12	20/09/2018 22:30	37	0.7	F	37	40	25	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.10 October 2018

Table 4.19 compares MCO levels during October 2018 against impact assessment criteria detailed in the project approval. Table 4.20 compares MCO levels during October 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.19: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – OCTOBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	19/10/2018 10:05	48	0.7	A	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	18/10/2018 22:00	38	1.8	E	37	32	Yes	Nil	45	36	Yes	Nil
NA12	18/10/2018 22:30	36	0.6	F	35	<30	Yes	Nil	45	39	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.20: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – OCTOBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	18/10/2018 22:00	38	1.8	E	37	40	32	Yes	Nil	Nil
NA12	18/10/2018 22:30	36	0.6	F	37	40	<30	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.11 November/Quarter 4 2018

Table 4.21 compares MCO levels during November 2018 against impact assessment criteria detailed in the project approval. In accordance with the NMP (approved July 2015) additional sites are required to be monitored on a quarterly basis and include GRNP and MGNP. Table 4.22 compares MCO levels during November 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.21: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – NOVEMBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	06/11/2018 10:49	46	1.1	F	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	05/11/2018 23:20	39	0.8	E	37	30	Yes	Nil	45	32	Yes	Nil
NA12	06/11/2018 00:14	37	0.8	E	35	<25	Yes	Nil	45	<25	Yes	Nil
GRNP	05/11/2018 22:00	48	0.9	D	50	<20	Yes	Nil	NA	NA	NA	NA
MGNR	06/11/2018 01:49	27	0.2	E	50	<20	Yes	Nil	NA	NA	NA	NA

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.22: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – NOVEMBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	05/11/2018 23:20	39	0.8	E	37	40	30	Yes	Nil	Nil
NA12	06/11/2018 00:14	37	0.8	E	37	40	<25	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.12 December 2018

Table 4.23 compares MCO levels during December 2018 against impact assessment criteria detailed in the project approval. Table 4.24 compares MCO levels during December 2018 against land acquisition and mitigation criteria detailed in the project approval.

Table 4.23: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL IMPACT ASSESSMENT CRITERIA – DECEMBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Impact Assess. L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of L_{Aeq} Criterion	$L_{A1,1min}$ Criterion dB	MCO $L_{A1,1min}$ dB	Criterion Applies?	Exceedance of $L_{A1,1min}$ Criterion
NA1	04/12/2018 11:00	43	2.2	D	43	IA	Yes	Nil	NA	NA	NA	NA
NA6	03/12/2018 22:00	30	2.2	F	37	IA	No	NA	45	IA	No	NA
NA12	03/12/2018 22:30	34	1.8	F	35	IA	Yes	Nil	45	IA	Yes	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

Table 4.24: NOISE LEVELS GENERATED BY MCO AGAINST PROJECT APPROVAL MITIGATION AND LAND ACQUISITION CRITERIA – DECEMBER 2018

Location	Start Date and Time	Total L_{Aeq} dB[1]	Wind Speed m/s	Stability Class	Mitigation L_{Aeq} Criterion dB	Land Acquisition L_{Aeq} Criterion dB	MCO $L_{Aeq,15min}$ dB	Criterion Applies?	Exceedance of Mitigation Criterion	Exceedance of Land Acquisition Criterion
NA6	03/12/2018 22:00	30	2.2	F	37	40	IA	No	NA	NA
NA12	03/12/2018 22:30	34	1.8	F	37	40	IA	Yes	Nil	Nil

Notes:

1. *Total L_{Aeq} levels are not necessarily the result of activity at MCO.*

4.13 Summary of Operational Results

4.13.1 Day

A summary of MCO daytime operational $L_{Aeq,15minute}$ results from 2018 is presented in Table 4.25.

Table 4.25: 2018 MCO OPERATIONAL $L_{Aeq,15minute}$ SUMMARY - DAY

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA1 Ulan School	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA

4.13.2 Night

A summary of MCO night operational $L_{Aeq,15minute}$ results from 2018 is presented in Table 4.26.

Table 4.26: 2018 MCO OPERATIONAL $L_{Aeq,15minute}$ SUMMARY – NIGHT

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA6 Lower Ridge Road	30	28	30	<25	IA	30	<30	IA	<25	32	30	IA
NA12 Winchester Crescent	27	<20	<25	<25	<20	27	29	IA	25	<30	<25	IA
GRNP	-	IA	-	-	<30	-	-	36	-	-	<20	-
MGNR	-	IA	-	-	IA	-	-	IA	-	-	<20	-

Notes:

1. *GRNP and MGNR locations monitored quarterly.*

A summary of MCO night operational $L_{A1,1minute}$ results from 2018 is presented in Table 4.27.

Table 4.27: 2018 MCO OPERATIONAL $L_{A1,1minute}$ SUMMARY – NIGHT

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA6 Lower Ridge Road	39	33	35	<25	IA	35	30	IA	32	36	32	IA
NA12 Winchester Crescent	30	23	27	<25	<20	31	31	IA	30	39	<25	IA

4.14 Comparison with Environmental Assessment Predictions

Predicted Year 2018 operational noise levels are provided in UG1 Optimisation Modification Noise Assessment by SLR (May 2015).

Table 9 of the UG1 Optimisation Modification report details different modelling parameters for different periods. Of particular relevance in this comparison exercise is the meteorological parameters (wind speed and direction and temperature gradient) for day (NA1 only) and night. Table 9 has been reproduced below. Monitoring was not undertaken during the evening period during 2018 and therefore no comparison has been made with these predictions.

Table 9 Calm (Neutral) and Noise Enhancing Meteorological Modelling Parameters

Period	Meteorological Parameter	Air Temperature	Relative Humidity	Wind Velocity	Temperature Gradient
Daytime	Calm	18°C	55%	0 m/s	0°C/100 m
	Wind only	19°C	55%	WSW and W 3 m/s	0°C/100 m
Evening	Calm	16°C	66%	0 m/s	0°C/100 m
	Wind only	16°C	65%	ENE, SSW, SW, WSW and W 3 m/s	0°C/100 m
Night-time	Calm	12°C	75%	0 m/s	0°C/100 m
	Wind only	12°C	75%	ENE, E, SSW, SW and WSW 3 m/s	0°C/100 m
	Strong Inversion	6°C	70%	0 m/s	5.2°C/100 m
	Strong Inversion plus Drainage	6°C	70%	ENE 1.0 m/s	5.2°C/100 m

Predicted Year 2018 operational noise levels from Table 22 of the modification report are summarised in Table 4.28 for comparison with attended monitoring results, with the exception of NA1 as predicted $L_{Aeq,15minute}$ levels were not provided. However, Table 23 of the modification report details $L_{Aeq,period}$ amenity levels for NA1 (Ulan School). While it is not strictly correct to compare $L_{Aeq,15minute}$ with $L_{Aeq,period}$, results for these parameters (when predicted) are usually similar (within 2 to 3 dB), and, in the case of NA1, the predicted $L_{Aeq,period}$ is very low. Notwithstanding that it is also not possible to directly compare atmospheric condition results for NA1, it is assumed that if measured $L_{Aeq,15minute}$ values are less than 30 dB then this approximately correlates with the predicted $L_{Aeq,period}$.

Table 4.28: MCO OPERATIONAL PREDICTIONS, YEAR 2018 - dB

Location	$L_{Aeq,period}$	$L_{Aeq,15minute}$ Calm	$L_{Aeq,15minute}$ Wind or Inversion	$L_{A1,1minute}$ Wind or Inversion
NA1 Ulan School[1,2]	29	NA	NA	NA
NA6 Lower Ridge Road[3]	NA	27	37	40
NA8 South Ridge Road[4]	NA	15	22	25
NA9 Winchester Cres[5]	NA	21	33	36
NA12 Winchester Cres[6]	NA	24	34	37

Source: MCO UG1 Optimisation Modification Noise Assessment (SLR, May 2015).

Notes:

1. *$L_{Aeq,period}$ result for worst case atmospheric condition;*
2. *Day result only for this location corresponding to period of use;*
3. *Predicted levels for 70 – DJ & A Coventry;*
4. *Predicted levels for 171 – AD & SA McGregor;*
5. *Predicted levels for 83 – CF & CR Wall; and*
6. *Predicted levels for 238 – B Powell; and*
7. *NA is not applicable at this location.*

4.14.1 2018 Comparison

Table 4.29 to Table 4.32 in this report compare the measured operational levels to the predicted levels for Year 2018 in the modification report for the relevant meteorological conditions. The difference against predicted levels for all relevant meteorological parameters as detailed in Table 9 of the modification report (shown above) have been included.

In the tables below, a positive difference is where the measured level is greater than the predicted level and a negative difference is where the measured levels are less than the predicted level. Notation used in the tables to denote differences is irrespective of the integer value sign. For example, the notation >-17 means the values are more than 17 dB less than the predicted level.

Where the meteorological conditions (primarily wind direction and temperature gradient) during the attended monitoring do not correspond with those that are modelled, no further analysis is undertaken.

4.14.2 Day Comparison

Detailed analysis of meteorological conditions which were present during 2018 attended day monitoring show that the following conditions did not occur:

- Calm.

Table 4.29 provides the difference between measured and predicted levels during the day period.

Table 4.29: 2018 MCO OPERATIONAL $L_{Aeq,period}$ dB DIFFERENCE AGAINST PREDICTED WIND CONDITIONS - DAY, YEAR 2018 [1,2,3]

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA1 Ulan School	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Notes:

1. *NR denotes met conditions not relevant, IA denotes conditions relevant but MCO inaudible during monitoring;*
2. *Wind conditions assumes winds at speeds between 0.1 and 3 m/s during monitoring; and*
3. *Assumes the following possible predicted wind directions: WSW from 236.25 to 258.75 degrees; W from 258.75 to 281.25 degrees.*

4.14.3 Night Comparison

Detailed analysis of meteorological conditions which were present during 2018 attended night monitoring show that the following conditions did not occur:

- strong inversion plus ENE drainage.

Table 4.30 provides the difference between measured and predicted levels for calm conditions during the night for $L_{Aeq,15minute}$ levels.

Table 4.30: 2018 MCO OPERATIONAL $L_{Aeq,15minute}$ dB DIFFERENCE AGAINST PREDICTED CALM CONDITIONS - NIGHT, YEAR 2018[2,4]

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA6 Lower Ridge Road	NR	+1[2]	NR	NR	IA[2]	NR	NR	NR	NR	NR	NR	NR
NA12 Winchester Cres	NR	NR	NR	NR	NM[2]	NR	NR	NR	NR	NR	NR	NR

Notes:

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, NM denotes conditions relevant but MCO not directly measurable during monitoring; and*
2. *Calm conditions assumes winds of 0.0 m/s.*

Table 4.31 provides the difference between measured and predicted levels for ENE, E, SSW, SW or WSW winds during the night for $L_{Aeq,15minute}$ levels. As the reported model results are the highest predicted noise level (without specifying the actual meteorological condition responsible) it is not possible to determine which conditions match specifically. Differences during strong inversions of 5.2 degrees Celsius per 100 m are also indicated.

Table 4.31: 2018 MCO OPERATIONAL $L_{Aeq,15minute}$ dB DIFFERENCE AGAINST PREDICTED WIND AND INVERSION CONDITIONS - NIGHT, YEAR 2018[2,4]

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA6 Lower Ridge Road	NR	-9[3]	NR	NR	IA[3]	-7[2]	NR	IA[2]	NR	NR	NR	IA[2]
NA12 Winchester Cres	-7[2]	NR	>-9[2]	>-9[2]	>-14[3]	-7[2]	NR	NR	NR	NR	NR	NR

Notes:

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, NM denotes conditions relevant but MCO not directly measurable during monitoring;*
2. *Wind conditions assumes winds at speeds between 0.1 and 3 m/s during monitoring and assumes the following possible predicted wind directions: ENE from 56.25 to 78.75 degrees, E from 78.75 to 101.25 degrees, SSW from 191.25 to 213.75 degrees, SW from 213.75 to 236.25 degrees and WSW from 236.25 to 258.75 degrees; and*
3. *Strong Inversion of 5.2 degrees Celsius per 100 m or greater.*

Table 4.32 provides the difference between measured and predicted levels for ENE, E, SSW, SW or WSW winds during the night for $L_{A1,1minute}$ levels. Differences during strong inversions of 5.2 degrees Celsius per 100 m are also indicated.

Table 4.32: 2018 MCO OPERATIONAL $L_{A1,1minute}$ dB DIFFERENCE AGAINST PREDICTED WIND AND INVERSION CONDITIONS - NIGHT, YEAR 2018[2]

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA6 Lower Ridge Road	NR	-7[3]	NR	NR	IA[2]	-5[2]	NR	IA[2]	NR	NR	NR	IA[2]
NA12 Winchester Cres	-7[2]	NR	-10[2]	>-12[2]	>-17[2]	-6[2]	NR	NR	NR	NR	NR	NR

Notes:

1. *NR denotes met conditions not relevant, NA denotes not applicable, IA denotes conditions relevant but MCO inaudible during monitoring, NM denotes conditions relevant but MCO not directly measurable during monitoring;*
2. *Wind conditions assumes winds at speeds between 0.1 and 3 m/s during monitoring and assumes the following wind directions: ENE from 56.25 to 78.75 degrees, E from 78.75 to 101.25 degrees, SSW from 191.25 to 213.75 degrees, SW from 213.75 to 236.25 degrees and WSW from 236.25 to 258.75 degrees;*
3. *Strong inversion.*

As shown above, a comparison of predicted and measured levels from MCO Year 2018 UG1 operation varies greatly. This comparison does not take into account operational activities at the time of monitoring compared to predicted scenarios.

Results indicated that MCO levels were often well under the predicted levels where meteorological conditions were relevant and there are no systemic issues as a result of the operation.

The measured L_{Aeq} noise level was greater than predicted by 1 dB in February for NA6 under calm conditions. The model (Year 2018 of the UG1 Optimisation Modification) predicts that there will be no exceedances of the criterion for the indicative scenarios and at no point were measured levels greater than the relevant criterion for each location where criteria applied.

5 SUMMARY OF COMPLIANCE

During the 2018 reporting period, attended environmental noise monitoring described in this report was conducted monthly. More detail regarding monitoring locations and timing of monitoring during 2018 is provided in Section 1.2 of this report.

Attended noise monitoring was carried out during 2018 to quantify and describe the existing acoustic environment around MCO and compare the results with relevant limits and to compare results against noise levels predicted in the Underground 1 Optimisation Modification model, Year 2018.

5.1 January to December 2018 Compliance

MCO complied with the project specific criteria at all monitoring sites during attended noise monitoring undertaken between January and December 2018.

5.2 EIS Comparison

Results indicated that MCO levels were often well under the predicted levels where meteorological conditions were relevant and there are no systemic issues as a result of the operation.

The measured LAeq noise level was greater than predicted by 1 dB in February for NA6 under calm conditions. The model (Year 2018 of the UG1 Optimisation Modification) predicts that there will be no exceedances of the criterion for the indicative scenarios and at no point were measured levels greater than the relevant criterion for each location where criteria applied.

Global Acoustics Pty Ltd

APPENDIX 3C. BLAST MONITORING DATA

Date	Time	BM1 Ulan School		BM5 Ridge Road	
		Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)
3/01/2018	16:05	92.9	0.16	94.5	0.2
5/01/2018	16:14	84.7	0.13	88.7	0.18
6/01/2018	15:59	90.2	0.24	90.7	0.63
8/01/2018	12:10	87.1	0.09	84.1	0.1
8/01/2018	12:33	97.3	0.07	99.4	0.13
9/01/2018	11:57	89.6	0.06	89.7	0.08
12/01/2018	12:03	99.2	0.05	95.7	0.15
16/01/2018	16:03	104.5	0.4	99.5	0.12
18/01/2018	12:01	90.6	0.12	81.9	0.2
20/01/2018	16:14	93.4	0.16	94.5	0.27
22/01/2018	11:56	92.5	0.18	92.7	0.32
22/01/2018	15:57	89.7	0.07	88.2	0.05
29/01/2018	12:12	107.4	0.69	106.7	0.15
30/01/2018	16:02	88.7	0.04	88.4	0.06
1/02/2018	11:57	91	0.03	102.8	0.09
3/02/2018	12:03	98.9	0.25	95	0.24
5/02/2018	12:02	102	0.25	111.3	0.13
8/02/2018	16:02	97.6	0.22	92.3	0.23
12/02/2018	16:16	87.6	0.07	96.8	0.09
15/02/2018	16:24	97.8	0.16	93.9	0.16
17/02/2018	16:10	92.2	0.28	94.7	0.27
19/02/2018	16:04	102.5	0.05	98.3	0.19
24/02/2018	11:59	93.8	0.1	97.6	0.1
28/02/2018	16:05	104	0.57	94.8	0.37
1/03/2018	15:56	91	0.17	78.8	0.14
6/03/2018	16:10	97.9	0.22	102.7	0.63
7/03/2018	16:15	97.2	0.15	112.1	0.2
14/03/2018	16:16	96.5	0.26	101.9	0.73
16/03/2018	12:19	90.8	0.17	85.6	0.13
21/03/2018	16:35	108.7	0.19	105.5	0.22
23/03/2018	12:15	111.4	0.24	103.6	0.15
24/03/2018	13:08	86.2	0.24	84.1	0.33
28/03/2018	16:06	94	0.14	93.5	0.1
29/03/2018	16:03	91.9	0.12	106.5	0.38
4/04/2018	12:01	92.9	0.05	97.6	0.1
5/04/2018	16:09	97.8	0.22	105.5	0.78
7/04/2018	15:58	102.8	0.35	98.6	0.16
9/04/2018	16:00	93.3	0.28	90.7	0.15
12/04/2018	12:00	89.7	0.14	99.5	0.22
16/04/2018	12:21	89	0.26	103	0.26
19/04/2018	16:02	91.4	0.26	98.1	0.28
19/04/2018	15:59	90	0.11	94.2	0.12
21/04/2018	16:02	110.8	0.61	100.8	0.43
30/04/2018	12:14	110.3	0.15	102.1	0.39
2/05/2018	16:04	95	0.3	100.7	0.82
5/05/2018	16:17	103.4	0.36	94.3	0.39
8/05/2018	12:12	93.9	0.3	99.5	0.69
10/05/2018	16:03	108.9	0.28	105	0.29
14/05/2018	12:09	91.7	0.11	96.3	0.14
18/05/2018	12:01	91.9	0.05	95.7	0.08
18/05/2018	16:09	90	0.11	89.9	0.1
19/05/2018	16:00	95.8	0.25	95	0.19
21/05/2018	12:03	99.9	0.56	94	0.3
24/05/2018	12:21	104	0.3	98	0.15
25/05/2018	16:27	97.9	0.32	105.4	0.25
26/05/2018	12:13	93.4	0.24	88.2	0.21
26/05/2018	16:28	81.1	0.09	83.6	0.06
28/05/2018	12:09	97.4	0.13	107.3	0.33
29/05/2018	12:12	92.3	0.14	97.6	0.28
2/06/2018	12:05	101.9	0.43	97.4	0.18
2/06/2018	16:59	100.7	0.28	96.5	0.31

Date	Time	BM1 Ulan School		BM5 Ridge Road	
		Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)
4/06/2018	11:56	94.3	0.2	94.2	0.38
5/06/2018	12:03	89.4	0.07	91.5	0.08
7/06/2018	15:59	103.7	0.37	109.4	0.23
13/06/2018	16:05	87.7	0.11	84.3	0.12
14/06/2018	12:07	100.7	0.40	99.5	0.22
14/06/2018	12:12	85.7	0.07	94.8	0.11
14/06/2018*	12:55	93.9	0.03	96.6	0.01
16/06/2018	16:09	94.9	0.14	92.1	0.4
18/06/2018	16:04	96.8	0.18	104.2	0.28
20/06/2018	16:15	94.7	0.09	96.4	0.09
22/06/2018	16:02	100.1	0.2	99.1	0.22
23/06/2018	15:57	94.1	0.55	91.3	0.55
23/06/2018	16:01	87.3	0.03	86.3	0.21
27/06/2018	16:01	94.9	0.07	103.1	0.21
29/06/2018	12:11	103.5	0.44	97.3	0.37
2/07/2018	12:29	105.2	0.42	97.7	0.56
03/07/18	12:09	93.9	0.07	96.2	0.3
3/07/2018	12:14	86.1	0.06	103.7	0.13
5/07/2018	12:04	104.1	0.62	104.5	0.46
7/07/2018	12:07	98.5	0.55	103.1	0.31
9/07/2018	16:06	105.3	0.22	94.3	0.23
10/07/2018	16:05	92.4	0.06	101.8	0.2
12/07/2018	16:00	89.1	0.05	97.2	0.17
13/07/2018	12:02	89.4	0.1	94.3	0.16
14/07/2018	12:37	106	0.15	101.5	0.21
20/07/2018	16:15	106.7	0.12	90.7	0.3
23/07/2018	12:11	105.5	0.28	97.5	0.29
26/07/2018	16:12	97.8	0.2	92.5	0.23
27/07/2018	16:14	92.4	0.13	92.1	0.17
2/08/2018	16:04	88.5	0.11	94.8	0.13
3/08/2018	16:12	101.8	0.6	102.4	0.24
10/08/2018	16:01	98.6	0.63	99.6	0.48
10/08/2018	16:07	110	0.59	106.5	0.44
11/08/2018	16:13	101.2	0.22	97.3	0.31
17/08/2018	16:06	97.6	0.12	102.1	0.15
20/08/2018	12:12	97	0.35	88.4	0.3
21/08/2018	15:57	93.3	0.09	102.5	0.05
28/08/2018	15:57	102.7	0.22	90.6	0.27
31/08/2018	12:02	88.4	0.12	96.5	0.41
4/09/2018	13:19	102.5	0.11	107.1	0.09
8/09/2018	16:41	103.2	0.21	93.7	0.18
10/09/2018	11:59	94.2	0.1	104.6	0.22
12/09/2018	12:01	109.9	0.32	99.9	0.41
18/09/2018	16:08	94.7	0.22	92.3	0.22
19/09/2018	16:08	100.6	0.53	96.8	0.29
21/09/2018	16:00	91.3	0.16	93.7	0.47
26/09/2018	16:05	107.3	0.15	98.1	0.32
28/09/2018	12:13	97.5	0.2	98.2	0.18
29/09/2018	16:08	100.2	0.23	99.3	0.42
4/10/2018	12:02	113.0	0.32	103.9	0.41
6/10/2018	16:13	96.8	0.34	95.1	0.28
9/10/2018	12:04	94.4	0.03	101.7	0.03
10/10/2018	16:09	113.1	0.46	105.6	0.13
11/10/2018	16:26	114.8	0.05	112.9	0.09
13/10/2018	16:04	93.5	0.17	98.2	0.08
15/10/2018	15:58	107.3	0.2	106.2	0.17
20/10/2018	12:05	93.7	0.19	95.1	0.43
20/10/2018	15:51	97.1	0.15	**117.3**	0.19
22/10/2018	16:03	101	0.17	99.4	0.27
24/10/2018	12:11	103.6	0.25	99.4	0.19
26/10/2018	12:05	101.8	0.24	101.8	0.17
31/10/2018	12:29	91.4	0.12	94.3	0.46
31/10/2018	16:06	98.6	0.32	96	0.24
1/11/2018	16:01	93.2	0.25	93.3	0.13

Date	Time	BM1 Ulan School		BM5 Ridge Road	
		Blast Overpressure (dBL)	Ground Vibration (mm/s)	Blast Overpressure (dBL)	Ground Vibration (mm/s)
3/11/2018	12:01	100.4	0.06	96.8	0.02
6/11/2018	16:16	105.2	0.43	96.1	0.18
10/11/2018	16:04	105.4	0.3	100.5	0.21
12/11/2018	16:00	89.6	0.14	97.8	0.36
14/11/2018	16:05	93.7	0.46	89.5	0.35
19/11/2018	12:07	87.3	0.14	96.9	0.47
19/11/2018	15:58	106	0.28	107.2	0.18
20/11/2018	16:04	100.2	0.17	96	0.19
24/11/2018	12:11	101.1	0.76	97	0.49
26/11/2018	16:09	95.4	0.11	93.2	0.44
30/11/2018	16:00	91.4	0.21	101.9	0.61
5/12/2018	16:33	**116.6**	0.3	114.9	0.26
8/12/2018	16:03	94.7	0.22	96.1	0.2
10/12/2018	15:59	87.2	0.05	92.1	0.09
15/12/2018	12:10	90	0.1	97.3	0.06
17/12/18	15:53	88.9	0.12	102.4	0.23
18/12/2018	12:00	91.5	0.24	97.4	0.27
29/12/2018	12:24	88.4	0.15	89.6	0.22

*Misfired portion of blast fired at 12:12pm on 14/06/18 required a re-fire to ensure the safety of the mine and it's workers.

APPENDIX 3D. AIR QUALITY DATA

Table A : Summary of the MCO Air Quality-Monitoring Program

Monitoring Parameter	Monitoring Location	Frequency	Justification
Dust Deposition	DG01 – Bobadeen	Every 30 days ± 2 days	Background monitoring north of the Moolarben Coal Complex.
	DG04 – Ulan Village	Every 30 days ± 2 days	Representative of nearest non-mine owned residences to the north-west of the Moolarben Coal Complex.
	DG05 – Glenmoor	Every 30 days ± 2 days	Representative of nearest non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	DG06 – Barcoo	Every 30 days ± 2 days	Representative of non-mine owned residences to the south, south-west and west of the Moolarben Coal Complex.
	DG07 – Hillside	Every 30 days ± 2 days	Representative of non-mine owned residences to the south of the Moolarben Coal Complex. Due to its close proximity to OC3, DG07 will be discontinued prior to mining OC3 and an alternative location will be investigated.
	DG08 – Croydon	Every 30 days ± 2 days	Representative of non-mine owned residences to the south of the Moolarben Coal Complex. Due to its close proximity to OC3, DG08 will be discontinued prior to mining OC3 and an alternative location will be investigated.
	DG09 – Wilga	Every 30 days ± 2 days	Representative of non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	DG11 – Ridge Road	Every 30 days ± 2 days	Representative of non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
	DG12 – Ulan-Wollar Rd	Every 30 days ± 2 days	Representative of mine owned land east of the Moolarben Coal Complex.
	DG 13 – Winchester Cres	Every 30 days ± 2 days	Representative of mine owned land south of the southwest and south of the Moolarben Coal Complex
	DG 14 – Murragamba Valley	Every 30 days ± 2 days	Representative of non-mine owned residences to the south-west and west of the Moolarben Coal Complex.
HVAS – PM10	PM01 (Ulan Village)	Every 6 days	Indicative of potential impacts to nearest non-mine owned residences to the north-west of the Moolarben Coal Complex.
	PM02 (Ridge Road)	Every 6 days	Background monitoring south-west west of the Moolarben Coal Complex.
Real Time PM_{10}	TEOM 01 (Ulan School)	Real Time PM_{10}	Real time monitoring at Ulan Public School.
	TEOM 04 (Ulan Road)	Real Time PM_{10}	Real-time monitoring representative of nearest non-mine owned residences to the west of the Moolarben Coal Complex.
	TEOM 07 (Ulan Road)	Real Time PM_{10}	Real time monitoring representative of non-mine owned residences to the south-west of and west of the Moolarben Coal Complex.
	TEOM06 (Ulan-Wollar Rd)	Real Time PM_{10}	Real time monitoring representative of mine owned land to the east of Moolarben Coal Complex and indicator of background air quality. (Note there are no residences on private or mine owned land in the vicinity of the monitor).

Table B : Summary of the MCO Air Quality-Monitoring Program – Dust Deposition

Dust Gauge	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18	Nov-18	Dec-18
DG1	0.9	0.7	0.8	0.6	0.6	0.5	0.2	0.6	1.4	0.7	2.2	1.9
DG4	2.2	0.8	1	0.8	1.1	0.9	0.8	0.7	2.2	0.7	1.1	4.7*
DG5	1.8	1.5	1.2	1.3	2.9	1.1	0.5	0.6	0.7	2.9	3.6	4*
DG6	0.9	1	1.5	0.9	0.7	0.6	0.4	0.9	3.4	0.8	0.7	8.2*
DG7	1.4	0.7	1.1	0.9	1.8	0.6	0.5	1.0	2.5	0.9	1.5	4.4*
DG8	1.3	1.5	1.5	1.2	0.8	0.5	0.6	1.0	3.4	0.7	2.1	6*
DG9	0.7	2.6	0.6	1	0.6	0.4	0.1	0.6	3.3	0.6	1.2	9.7*
DG11	2.1	1.2	1.2	1.9	1	0.7	0.5	0.2	2.1	1.6	2.3	5.1*
DG12	2.1	1.1	1	2.1	2.4	1.6	1.6	1.6	3.9	0.8	C*	4.5
DG13	0.9	1.2	1.1	1.6	1.2	0.6	0.9	0.8	4.1	0.7	1.1	5.2*
DG14	2.4	0.8	0.9	3.2	1.9	0.9	0.5	1.0	3.1	0.8	1.2	6.3*

* - Result attributable to regional dust storms

C* – Dust gauge deemed contaminated after analysis of influencing factors. These factors include an ash residue result of <50%, the presence of bird droppings or other contaminants such as insects in the dust gauge and analysis of historical results from the dust gauge.

Figure 3-b 2013 to 2018 Dust Depositional Results

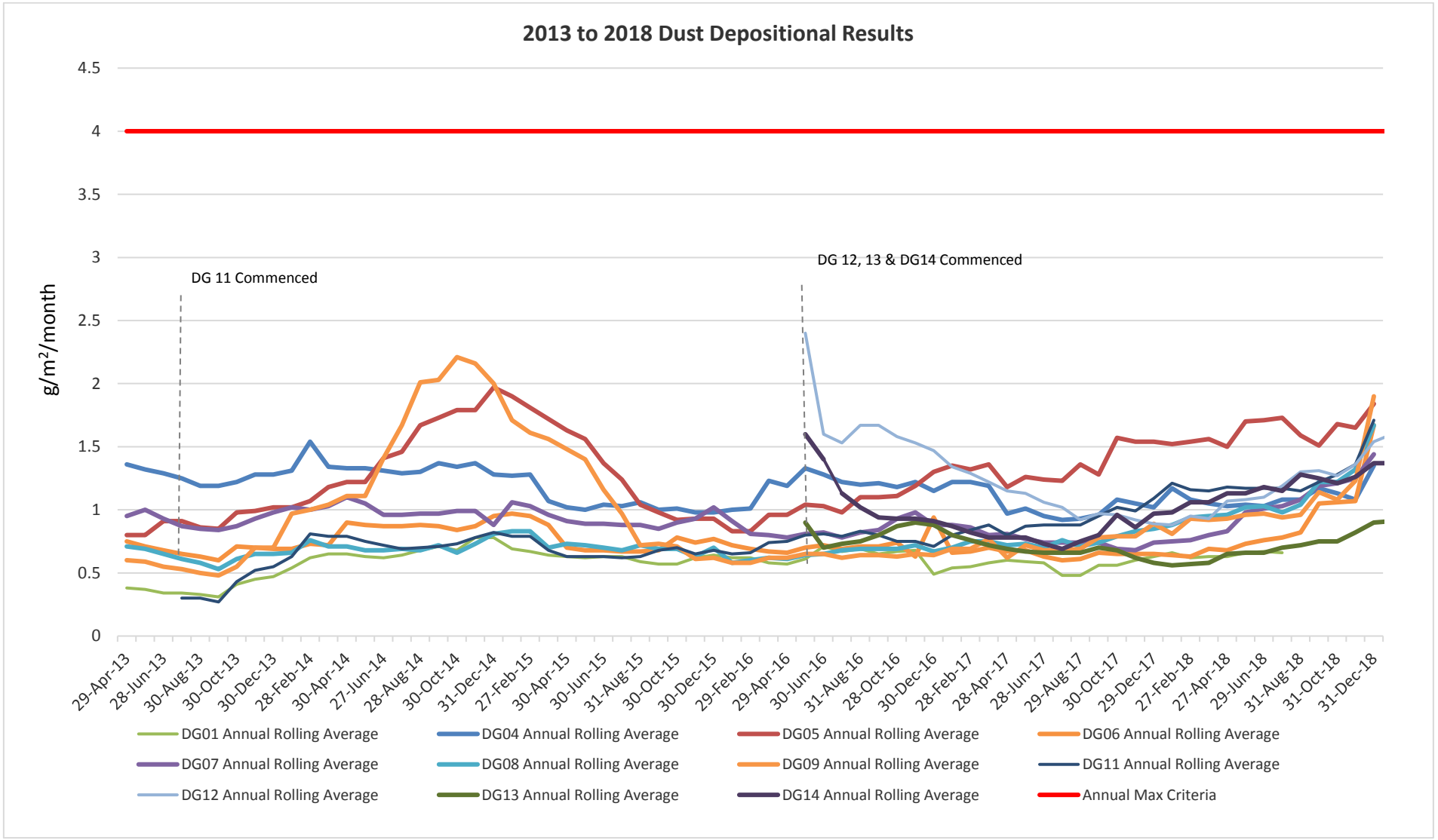


Table 3: TEOM Monitoring Data

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))				
1/01/2018	18.4	12.1	13.9	11.5	
2/01/2018	21.6	15.0	15.6	14.4	
3/01/2018	26.0	19.1	16.0	16.7	
4/01/2018	26.7	18.5	16.1	12.7	
5/01/2018	26.7	14.1	14.6	17.0	
6/01/2018	29.0	22.1	27.0	20.7	
7/01/2018	19.2	16.3	0.1	22.6	
8/01/2018	24.5	20.2	23.2	17.8	
9/01/2018	18.0	16.0	14.2	12.7	
10/01/2018	15.8	11.8	9.8	10.8	
11/01/2018	19.8	3.6	13.8	12.2	
12/01/2018	15.9	11.8	10.1	12.2	
13/01/2018	15.6	13.0	23.8	15.3	
14/01/2018	7.6	5.3	11.4	3.6	
15/01/2018	14.6	13.3	11.1	8.8	
16/01/2018	22.0	20.6	15.9	13.8	
17/01/2018	26.8	31.1	17.5	16.8	
18/01/2018	26.0	19.8	17.1	19.1	
19/01/2018	28.2	23.5	1.2	17.2	
20/01/2018	34.2	20.7	19.1	16.7	
21/01/2018	29.9	21.6	15.3	16.2	
22/01/2018	31.9	24.4	5.7	21.7	
23/01/2018	37.7	34.8	6.5	26.7	
24/01/2018	43.5	38.1	40.5	35.0	
25/01/2018	37.7	33.5	32.5	28.6	
26/01/2018	25.7	18.7	20.4	18.9	
27/01/2018	32.9	4.3	20.9	25.6	
28/01/2018	15.5	9.1	4.9	7.8	
29/01/2018	28.2	18.9	15.5	16.3	
30/01/2018	23.8	15.0	16.8	18.0	
31/01/2018	18.5	18.5	9.5	12.1	
1/02/2018	20.8	11.4	8.4	8.7	
2/02/2018	10.1	7.4	5.1	4.4	
3/02/2018	9.6	8.2	6.6	5.3	
4/02/2018	13.0	8.5	4.9	6.2	
5/02/2018	12.6	13.2	6.8	5.5	
6/02/2018	23.2	8.6	10.1	12.2	
7/02/2018	20.5	15.3	7.4	13.0	
8/02/2018	21.4	19.0	11.7	14.8	
9/02/2018	41.6	33.7	43.6	33.3	
10/02/2018	20.7	14.6	19.2	14.5	
11/02/2018	22.7	21.0	28.6	16.6	
12/02/2018	21.4	18.2	30.2	18.3	
13/02/2018	23.3	21.0	22.0	19.6	
14/02/2018	28.3	26.2	26.1	32.4	
15/02/2018	39.7	33.3	40.6	45.4	
16/02/2018	25.4	17.8	37.4	23.8	
17/02/2018	37.1	31.3	25.3	34.0	
18/02/2018	32.3	28.2	22.6	33.2	
19/02/2018	51.4c	36.9	27.0	42.5	Regional bushfire event
20/02/2018	14.0	12.5	10.0	12.2	
21/02/2018	18.1	12.5	8.2	12.9	
22/02/2018	20.8	15.8	7.6	13.4	
23/02/2018	30.2	22.8	12.0	20.8	
24/02/2018	14.5	14.4	19.1	12.5	
25/02/2018	6.2	4.6	14.5	7.3	
26/02/2018	5.5	3.0	1.4	3.7	
27/02/2018	14.7	13.8	8.2	12.8	
28/02/2018	14.4	12.9	11.1	15.3	
1/03/2018	27.2	26.0	25.5	31.7	
2/03/2018	24.3	20.4	15.1	20.4	

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))				
3/03/2018	27.6	17.3	18.4	22.3	
4/03/2018	20.7	17.9	17.6	20.0	
5/03/2018	15.1	13.6	20.9	14.5	
6/03/2018	13.0	8.0	2.9	8.0	
7/03/2018	19.3	17.9	6.5	12.5	
8/03/2018	13.2	11.0	4.8	10.8	
9/03/2018	11.1	8.9	2.7	8.6	
10/03/2018	14.7	11.9	5.6	13.8	
11/03/2018	19.0	12.2	6.6	14.8	
12/03/2018	27.9	23.6	16.4	24.1	
13/03/2018	22.6	24.3	11.2	20.5	
14/03/2018	27.8	21.9	11.1	20.6	
15/03/2018	31.3	21.7	24.4	30.4	
16/03/2018	41.8	35.7	31.2	41.5	
17/03/2018	32.5	20.5	24.1	38.0	
18/03/2018	35.7	31.3	60.7c	49.1	Regional dust event
19/03/2018	68.0c	59.6c	74.7c	71.3c	Regional dust event
20/03/2018	54.3c	46.6	45.7	50.7c	Regional dust event
21/03/2018	11.8	12.6	8.7	9.5	
22/03/2018	5.8	6.5	3.0	5.5	
23/03/2018	10.7	7.5	4.5	8.1	
24/03/2018	19.8	8.6	5.8	12.6	
25/03/2018	16.9	15.3	15.2	17.9	
26/03/2018	8.1	5.7	8.8	7.1	
27/03/2018	20.4	14.2	11.0	16.8	
28/03/2018	18.7	14.1	10.5	19.8	
29/03/2018	27.6	18.4	15.1	22.3	
30/03/2018	23.6	14.6	15.3	17.4	
31/03/2018	35.3	25.5	36.7	32.0	
1/04/2018	22.3	15.1	16.8	18.7	
2/04/2018	18.3	13.2	28.0	17.9	
3/04/2018	26.4	21.3	23.7	21.3	
4/04/2018	22.4	20.8	-	17.6	TEOM06 electrical outage
5/04/2018	23.6	12.2	0.3	17.7	
6/04/2018	21.3	19.9	21.2	23.5	
7/04/2018	38.3	21.5	22.5	24.2	
8/04/2018	30.9	17.1	31.5	26.7	
9/04/2018	28.6	20.3	33.2	29.4	
10/04/2018	38.5	30.0	20.5	32.0	
11/04/2018	42.4	23.0	19.6	29.6	
12/04/2018	25.3	22.4	31.3	36.9	
13/04/2018	22.8	21.1	21.8	29.3	
14/04/2018	27.5	23.3	27.7	12.3	
15/04/2018	48.9	44.5	49.5	52.9c	Regional dust event
16/04/2018	13.3	10.9	14.2	16.3	
17/04/2018	18.4	13.0	13.1	17.7	
18/04/2018	27.7	16.9	13.6	19.9	
19/04/2018	17.2	14.5	10.6	14.8	
20/04/2018	15.2	12.0	9.2	13.0	
21/04/2018	22.3	20.8	16.1	21.1	
22/04/2018	19.6	15.9	11.9	16.5	
23/04/2018	16.4	15.3	12.5	15.0	
24/04/2018	17.0	14.1	12.6	17.7	
25/04/2018	20.3	15.2	15.8	17.9	
26/04/2018	14.7	9.8	17.6	22.5	
27/04/2018	22.8	18.6	28.4	19.4	
28/04/2018	10.2	13.3	13.7	9.2	
29/04/2018	16.9	10.7	9.6	13.0	
30/04/2018	11.9	14.2	8.3	9.2	
1/05/2018	21.7	17.9	13.1	13.9	
2/05/2018	35.4	27.4	21.4	27.3	
3/05/2018	24.5	23.7	24.1	27.2	
4/05/2018	37.2	38.5	55.0	42.2	Monitor located upwind of MCO

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))				
5/05/2018	26.6	14.0	18.1	16.5	
6/05/2018	22.6	18.4	19.6	20.1	
7/05/2018	34.4	23.3	22.7	30.7	
8/05/2018	33.3	27.0	26.4	30.1	
9/05/2018	22.0	18.4	26.2	28.5	
10/05/2018	23.1	20.7	36.0	28.5	
11/05/2018	8.2	6.7	7.9	9.2	
12/05/2018	6.8	3.6	6.3	6.5	
13/05/2018	6.4	4.4	5.4	6.4	
14/05/2018	13.1	10.3	11.7	11.2	
15/05/2018	14.2	13.5	13.3	19.2	
16/05/2018	21.7	16.7	16.9	15.7	
17/05/2018	24.1	18.7	27.1	17.7	
18/05/2018	14.7	14.1	21.9	18.8	
19/05/2018	9.1	7.2	11.3	10.3	
20/05/2018	10.7	8.4	19.2	12.4	
21/05/2018	11.2	11.8	16.8	13.3	
22/05/2018	12.5	9.0	14.0	15.7	
23/05/2018	30.7	13.9	11.4	19.3	
24/05/2018	27.6	18.0	20.4	28.6	
25/05/2018	28.0	24.0	21.0	17.8	
26/05/2018	29.8	19.6	18.5	19.6	
27/05/2018	24.0	18.7	18.9	19.0	
28/05/2018	29.5	24.6	17.7	16.8	
29/05/2018	17.1	19.5	29.7	18.8	
30/05/2018	5.7	5.3	6.3	5.7	
31/05/2018	6.7	6.0	6.5	7.4	
1/06/2018	7.5	6.4	9.5	8.1	
2/06/2018	7.7	6.4	12.1	7.9	
3/06/2018	11.3	8.2	10.6	8.6	
4/06/2018	13.0	10.8	8.5	9.9	
5/06/2018	9.4	10.0	6.1	6.8	
6/06/2018	10.8	10.5	4.4	7.0	
7/06/2018	18.7	15.4	11.3	15.7	
8/06/2018	15.7	19.4	17.2	13.5	
9/06/2018	6.8	3.1	4.9	5.6	
10/06/2018	7.2	5.0	3.3	5.6	
11/06/2018	9.3	5.7	4.4	6.9	
12/06/2018	10.8	9.8	14.5	10.4	
13/06/2018	9.5	10.2	10.5	12.1	
14/06/2018	9.3	10.2	11.9	13.8	
15/06/2018	8.6	8.0	11.1	9.5	
16/06/2018	8.3	7.2	8.3	9.3	
17/06/2018	4.4	1.7	2.1	4.5	
18/06/2018	4.7	3.3	5.9	4.6	
19/06/2018	5.2	5.4	7.1	5.3	
20/06/2018	12.6	14.0	10.7	9.8	
21/06/2018	14.2	13.3	12.6	10.9	
22/06/2018	11.8	8.1	12.2	10.2	
23/06/2018	10.5	8.0	15.6	9.8	
24/06/2018	19.0	10.7	12.8	13.8	
25/06/2018	23.0	19.4	20.6	14.5	
26/06/2018	17.5	20.0	16.9	14.4	
27/06/2018	14.9	15.3	19.7	10.4	
28/06/2018	6.3	3.8	3.2	5.1	
29/06/2018	5.7	7.2	5.8	5.7	
30/06/2018	7.3	6.3	8.3	7.1	
1/07/2018	8.2	7.7	6.0	6.1	
2/07/2018	11.5	9.4	6.3	7.8	
3/07/2018	9.7	10.4	6.6	6.9	
4/07/2018	17.5	16.3	10.8	12.2	
5/07/2018	7.5	10.7	13.4	8.3	
6/07/2018	8.8	10.3	14.7	8.9	

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))				
7/07/2018	9.3	7.6	10.4	9.6	
8/07/2018	8.8	5.9	8.8	8.8	
9/07/2018	6.2	4.2	7.9	8.9	
10/07/2018	13.1	10.3	11.0	10.4	
11/07/2018	12.6	14.8	14.0	10.3	
12/07/2018	11.2	10.2	13.7	13.4	
13/07/2018	8.2	9.8	12.1	9.3	
14/07/2018	11.0	7.6	12.8	11.9	
15/07/2018	11.6	10.5	16.0	12.6	
16/07/2018	14.8	12.7	20.5	17.1	
17/07/2018	11.5	23.2	18.7	13.1	
18/07/2018	48.5	50.8	54.2	50.8	Regional dust event
19/07/2018	38.6	37.8	45.4	44.5	
20/07/2018	15.6	22.2	36.4	17.7	
21/07/2018	11.3	11.0	-	10.0	TEOM06 Communication Outage
22/07/2018	17.7	13.6	-	11.9	TEOM06 Communication Outage
23/07/2018	18.0	22.7	12.4	21.1	
24/07/2018	19.5	24.2	49.5	23.0	
25/07/2018	20.1	26.6	32.0	22.0	
26/07/2018	20.5	25.0	36.5	20.0	
27/07/2018	29.6	26.6	36.9	31.6	
28/07/2018	20.4	21.4	40.7	19.5	
29/07/2018	12.1	9.9	18.6	11.9	
30/07/2018	9.9	14.3	20.7	12.2	
31/07/2018	10.2	11.9	18.4	11.5	
1/08/2018	12.5	14.6	22.1	14.3	
2/08/2018	19	16.9	19.9	17.7	
3/08/2018	31.9	36.5	33.5	32.3	
4/08/2018	62.0c	53.3c	63.5c	51.9c	Bushfire Event
5/08/2018	19.4	17.1	20.5	21.1	
6/08/2018	15.3	17	17.3	16.2	
7/08/2018	27.5	23	30.4	33.5	
8/08/2018	8.2	3.7	11.3	8.9	
9/08/2018	12.3	9.6	11.5	12.6	
10/08/2018	17	12.7	14.1	13.6	
11/08/2018	16.7	15.6	25.4	18	
12/08/2018	4.8	2.2	11.8	6.5	
13/08/2018	6.9	6.3	12.2	9.7	
14/08/2018	7.7	7.4	14.9	13.6	
15/08/2018	4.4	3.6	15.7	8.8	
16/08/2018	9.3	6.1	19.4	4.5	
17/08/2018	19.3	9.6	22.9	18.6	
18/08/2018	14.8	12.5	25.5	17	
19/08/2018	13.9	12.8	23.2	16.7	
20/08/2018	7.8	6.3	15.7	9.8	
21/08/2018	9.2	8.2	16.2	13.6	
22/08/2018	9.3	3.1	7.7	8.9	
23/08/2018	16.9	19.1	19.5	15.5	
24/08/2018	23.6	24.4	18.6	25.2	
25/08/2018	12.7	8.3	10.4	10	
26/08/2018	4.3	1.3	1.8	4.7	
27/08/2018	8.7	7	5.6	9.4	
28/08/2018	12.4	11.9	10.7	13.3	
29/08/2018	10	8.7	9.8	10.4	
30/08/2018	14.4	11.4	8.1	12.5	
31/08/2018	28.6	25.2	24	26.8	
1/09/2018	12.7	10.8	11.6	12.5	
2/09/2018	8.4	6.1	7.7	9.1	
3/09/2018	10.4	11	6.3	9	
4/09/2018	6.7	4.1	1.9	4.6	
5/09/2018	11.4	19.4	3.5	7.1	
6/09/2018	11.8	9.8	3.8	8	
7/09/2018	6.8	5.3	2.1	6.3	

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))				
8/09/2018	9	6.7	8.7	9.4	
9/09/2018	7.8	6.2	10.8	8.6	
10/09/2018	12.5	10.2	8.8	11.6	
11/09/2018	18.7	13.2	16	15.2	
12/09/2018	18.5	14.9	19.5	15.8	
13/09/2018	22.4	17.3	27	23	
14/09/2018	24.5	20.1	22.6	22.4	
15/09/2018	33.8	34.1	49.2	36.1	
16/09/2018	12	8.7	11.1	11.1	
17/09/2018	22.4	15.2	16.2	17.2	
18/09/2018	31.9	26.1	29.4	30.1	
19/09/2018	24.3	40.2	38.2	30.2	
20/09/2018	11.4	7.9	13.9	11.2	
21/09/2018	20.6	12.3	18.6	15.1	
22/09/2018	18.7	14.6	29.1	19.8	
23/09/2018	18.7	10.1	24.1	17.3	
24/09/2018	16.2	14.3	7.2	10.5	
25/09/2018	16.2	9.4	5.3	12.9	
26/09/2018	10.6	7.3	6.5	8.6	
27/09/2018	10.2	7	6.3	8.7	
28/09/2018	14	27.4	17.2	16.8	
29/09/2018	13.7	11.3	18.1	14	
30/09/2018	16.1	13.8	14.5	14.3	
1/10/2018	19.5	8.3	8.7	11.6	
2/10/2018	22	16.3	14.3	16.3	
3/10/2018	27.3	20.5	23.2	24.7	
4/10/2018	14.5	12.3	12	13	
5/10/2018	2.6	1.3	0.3	2.7	
6/10/2018	8	9	3	6.5	
7/10/2018	6.4	7.5	6.8	6.4	
8/10/2018	6.3	5.9	10	7.3	
9/10/2018	17.5	11.1	9.1	13	
10/10/2018	11.4	1.4	13.3	9.6	
11/10/2018	13.4	5.6	3.9	6.4	
12/10/2018	11.4	7.9	5.2	7.3	
13/10/2018	11	7.3	4.7	7.2	
14/10/2018	14.3	9.5	6.6	9.9	
15/10/2018	14.7	9.3	6.6	9.7	
16/10/2018	14.3	8.3	5.2	7.6	
17/10/2018	9.3	5.9	4	7.6	
18/10/2018	8.9	6.8	4.5	8.7	
19/10/2018	12.9	9.2	7	11.2	
20/10/2018	12.4	13.2	14.7	13.2	
21/10/2018	17.6	16.2	16.8	16.8	
22/10/2018	19.1	14.9	15.3	16.8	
23/10/2018	15.1	10.4	15	17.4	
24/10/2018	29.1	27.2	27	23.8	
25/10/2018	18	10.8	10.5	14.4	
26/10/2018	23.3	14.2	23.6	22.6	
27/10/2018	21.4	17.3	20.6	25.6	
28/10/2018	24.7	19	22.1	24.4	
29/10/2018	25.9	20	14.8	21.6	
30/10/2018	45.6	15.8	15	22.5	
31/10/2018	42.6	18.2	30	38.3	
1/11/2018	29.4	24.1	14.6	33.6	
2/11/2018	25.9	25.3	32.4	28.4	
3/11/2018	15.8	11.6	20.6	19.5	
4/11/2018	21.4	15.8	23.7	22.5	
5/11/2018	26.9	15.4	22.4	21.7	
6/11/2018	29.1	11.8	16.2	26.9	
7/11/2018	11.5	12.7	15.3	14	
8/11/2018	8	5	9.2	7.9	
9/11/2018	11.4	10.8	12.6	14.8	

Date	Lagoons Road TEOM04	Ulan School TEOM01 EPL 17	Ulan-Wollar Road TEOM06 EPL15	Ulan Road TEOM07 EPL27	Comment
	Daily Result (24hr Average Limit = 50µg/m³))				
10/11/2018	15.2	11	12.4	13.4	
11/11/2018	23.6	19.5	9.3	18.5	
12/11/2018	21.7	9.2	10	18.6	
13/11/2018	21	14.3	5.6	19.3	
14/11/2018	21.5	23.7	15.2	21.9	
15/11/2018	14.4	12.1	17.7	15.1	
16/11/2018	12.2	5.7	2.2	7.1	
17/11/2018	19.8	14.5	9.4	13.5	
18/11/2018	17.8	11	7.1	10.7	
19/11/2018	20.6	10.7	8.1	14.5	
20/11/2018	18.9	13.9	11.3	15.8	
21/11/2018	64.5c	59.8c	61.9c	67.5c	State-wide dust event
22/11/2018	158.9c	147.2c	157.8c	160.0c	State-wide dust event
23/11/2018	67.6c	77.3c	93.2c	90.0c	State-wide dust event
24/11/2018	14.4	11.6	21.2	17.3	
25/11/2018	12	10.8	26.8	15.9	
26/11/2018	18.3	14.2	10.8	18.7	
27/11/2018	22.5	21.3	19.6	21	
28/11/2018	9.7	6.9	4.7	7.6	
29/11/2018	8.1	5.8	6.1	7	
30/11/2018	12.3	9.3	10.8	13	
1/12/2018	13.5	8.1	14	11.5	
2/12/2018	36.9	35.6	57.8c	38.4	Regional dust event
3/12/2018	22.9	22.5	41.1	25.8	
4/12/2018	26.5	22.4	30.5	22.6	
5/12/2018	26.3	30.5	13.8	19.2	
6/12/2018	20.4	14.7	10.3	15.2	
7/12/2018	22.6	16.7	13.6	15.6	
8/12/2018	26.5	18.1	11	24	
9/12/2018	27.9	23	26.7	25.9	
10/12/2018	32.1	32.6	38.8	27.7	
11/12/2018	11	9.4	8.3	9.7	
12/12/2018	15.4	11.2	8.5	12.9	
13/12/2018	16.9	17.5	8.2	14.7	
14/12/2018	116.0c	111.7c	90.1c	118.9c	Regional dust event
15/12/2018	253.56c	234.5c	200.8c	268.7c	Regional dust event
16/12/2018	84.5c	93.9c	74.0c	71.1c	Regional dust event
17/12/2018	23.6	18.8	28.7	21.8	
18/12/2018	34.1	27.3	25.1	30.1	
19/12/2018	23.7	3.6	2.5	22.6	
20/12/2018	46.6	39.6	38.1	44.3	
21/12/2018	23.8	18.3	16	24.5	
22/12/2018	13.9	10.5	8.8	12.7	
23/12/2018	13.4	11	5.5	8.6	
24/12/2018	13.3	8.4	6.7	12.1	
25/12/2018	12.4	9.1	7.6	12.5	
26/12/2018	19.2	12.3	13.4	16.5	
27/12/2018	23.5	20.4	-	20.8	D1 power outages
28/12/2018	29.2	18.7	-	25.6	D1 power outages.
29/12/2018	26.1	17	22	29.1	
30/12/2018	19.9	14.7	17.7	22.4	
31/12/2018	26.2	21.9	25	26	

Figure 3-c 2013 to 2018 TEOM Rolling Average

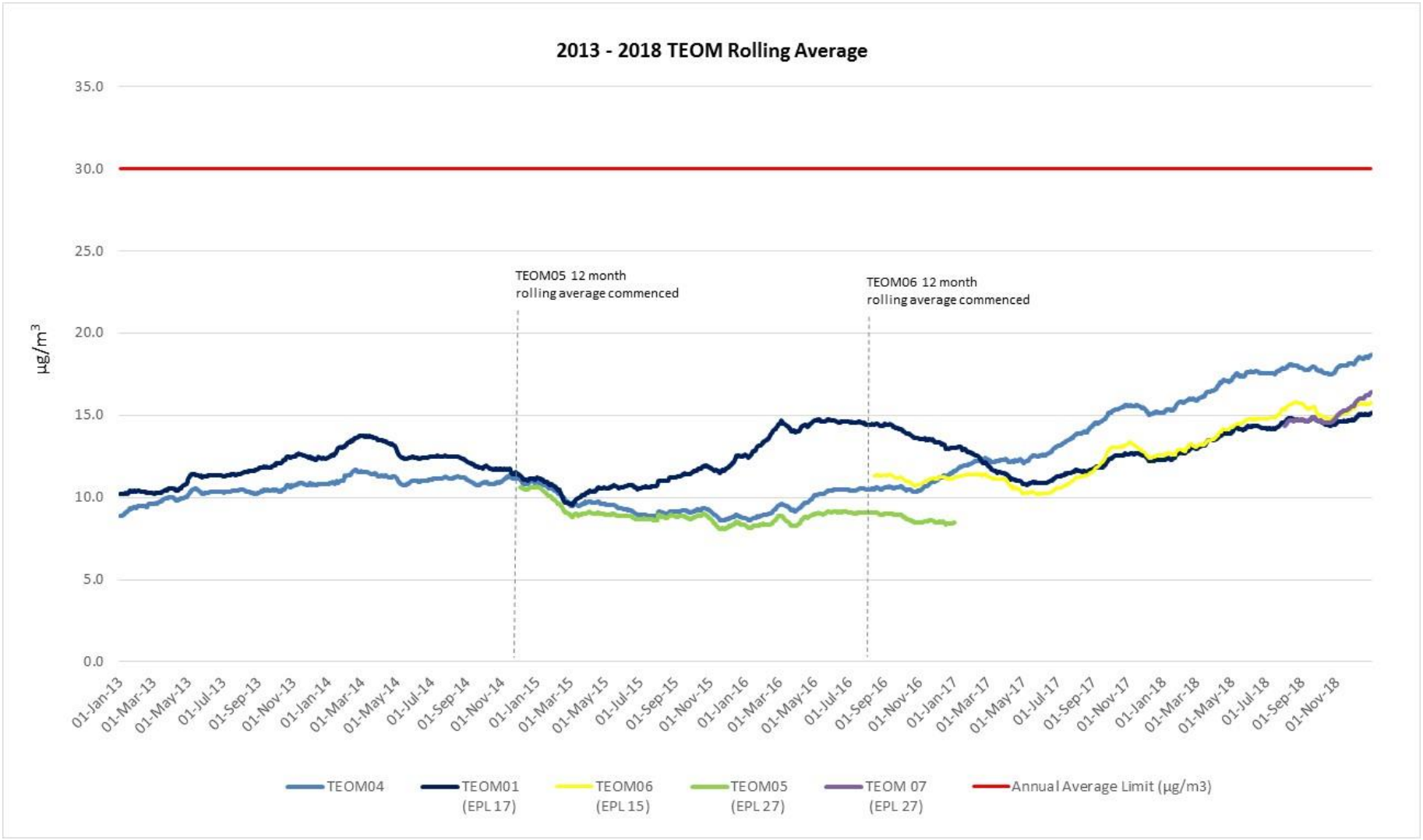
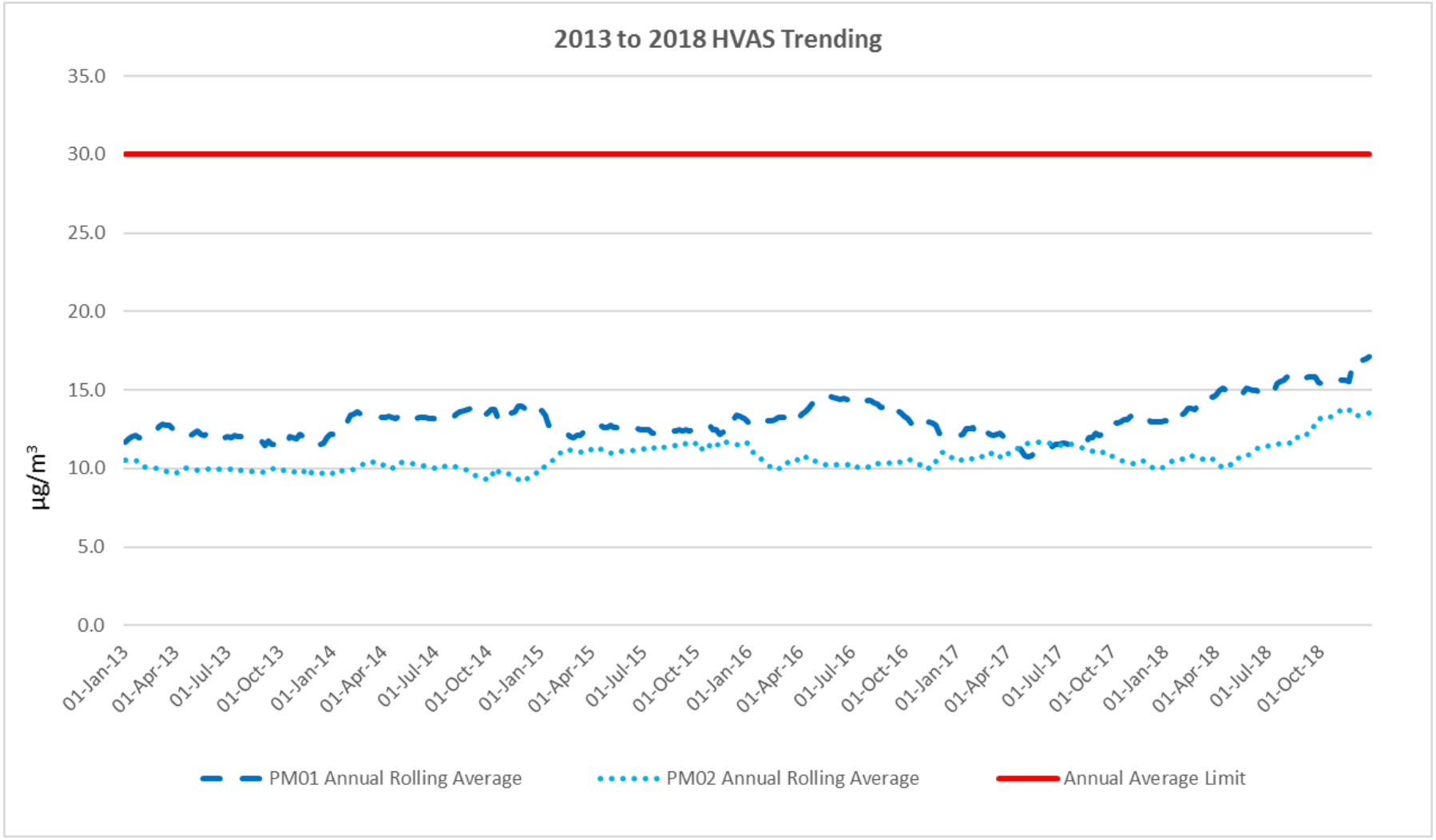


Table 4: HVAS monitoring results

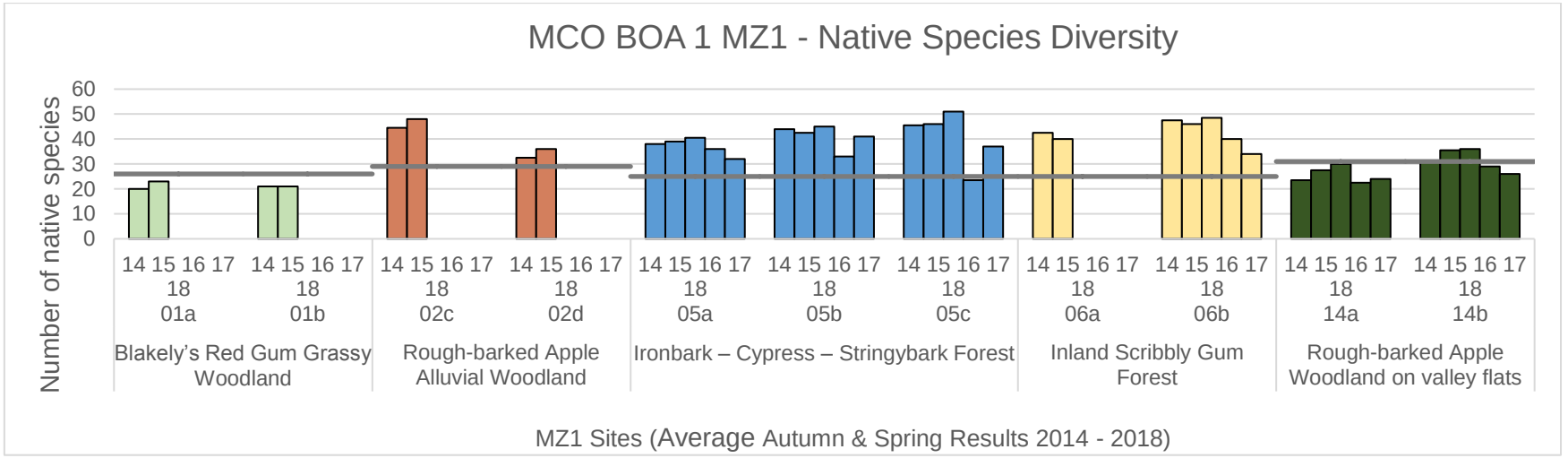
Sample Location	Sampling Date	Particulate Matter <10 µm µg/m³	Sample Location	Sampling Date	Particulate Matter <10 µm µg/m³
PM01	1-Jan-18	17	PM01	30-Jun-18	6
PM02	1-Jan-18	19	PM02	30-Jun-18	8
PM01	7-Jan-18	18	PM01	6-Jul-2018	8
PM02	7-Jan-18	19	PM02	6-Jul-2018	7
PM01	13-Jan-18	21	PM01	12-Jul-2018	8
PM02	13-Jan-18	20	PM02	12-Jul-2018	12
PM01	19-Jan-18	29	PM01	18-Jul-2018	42
PM02	19-Jan-18	28	PM02	18-Jul-2018	47
PM01	25-Jan-18	48	PM01	24-Jul-2018	17
PM02	25-Jan-18	44	PM02	24-Jul-2018	13
PM01	31-Jan-18	20	PM01	05-Aug-18	16
PM02	31-Jan-18	19	PM02	05-Aug-18	19
PM01	6-Feb-18	23	PM01	11-Aug-18	14
PM02	6-Feb-18	24	PM02	11-Aug-18	15
PM01	12-Feb-18	31	PM01	17-Aug-18	11
PM02	12-Feb-18	27	PM02	17-Aug-18	12
PM01	18-Feb-18	35	PM01	23-Aug-18	18
PM02	18-Feb-18	36	PM02	23-Aug-18	17
PM01	24-Feb-18	19	PM01	29-Aug-18	7
PM02	24-Feb-18	17	PM02	29-Aug-18	10
PM01	2-Mar-18	26	PM01	04-Sep-18	4
PM02	2-Mar-18	24	PM02	04-Sep-18	3
PM01	8-Mar-18	14	PM01	10-Sep-18	8
PM02	8-Mar-18	12	PM02	10-Sep-18	8
PM01	14-Mar-18	24	PM01	16-Sep-18	7
PM02	14-Mar-18	21	PM02	16-Sep-18	8
PM01	20-Mar-18	43	PM01	22-Sep-18	10
PM02	20-Mar-18	44	PM02	22-Sep-18	12
PM01	26-Mar-18	9	PM01	28-Sep-18	11
PM02	26-Mar-18	9	PM02	28-Sep-18	10
PM01	1-Apr-18	18	PM01	04-Oct-18	11
PM02	1-Apr-18	20	PM02	04-Oct-18	10
PM01	7-Apr-18	24	PM01	10-Oct-18	10
PM02	7-Apr-18	32	PM02	10-Oct-18	8
PM01	13-Apr-18	20	PM01	16-Oct-18	11
PM02	13-Apr-18	21	PM02	16-Oct-18	12
PM01	19-Apr-18	12	PM01	22-Oct-18	17
PM02	19-Apr-18	19	PM02	22-Oct-18	21
PM01	25-Apr-18	15	PM01	28-Oct-18	19
PM02	25-Apr-18	17	PM02	28-Oct-18	26
PM01	1-May-18	13	PM01	03-Nov-18	17
PM02	1-May-18	18	PM02	03-Nov-18	21
PM01	7-May-18	18	PM01	09-Nov-18	11
PM02	7-May-18	18	PM02	09-Nov-18	14
PM01	13-May-18	4	PM01	15-Nov-18	15
PM02	13-May-18	4	PM02	15-Nov-18	17
PM01	19-May-18	5	PM01	21-Nov-18	60c*
PM02	19-May-18	8	PM02	21-Nov-18	62c*
PM01	25-May-18	21	PM01	27-Nov-18	24
PM02	25-May-18	25	PM02	27-Nov-18	22
PM01	31-May-18	2	PM01	03-Dec-18	22
PM02	31-May-18	2	PM02	03-Dec-18	25
PM01	6-Jun-18	7	PM01	09-Dec-18	31
PM02	6-Jun-18	6	PM02	09-Dec-18	39
PM01	12-Jun-18	7	PM01	15-Dec-18	251c*
PM02	12-Jun-18	7	PM02	15-Dec-18	271c*
PM01	18-Jun-18	<1	PM01	21-Dec-18	27
PM02	18-Jun-18	<1	PM02	21-Dec-18	30
PM01	24-Jun-18	10	PM01	27-Dec-18	29
PM02	24-Jun-18	17	PM02	27-Dec-18	35

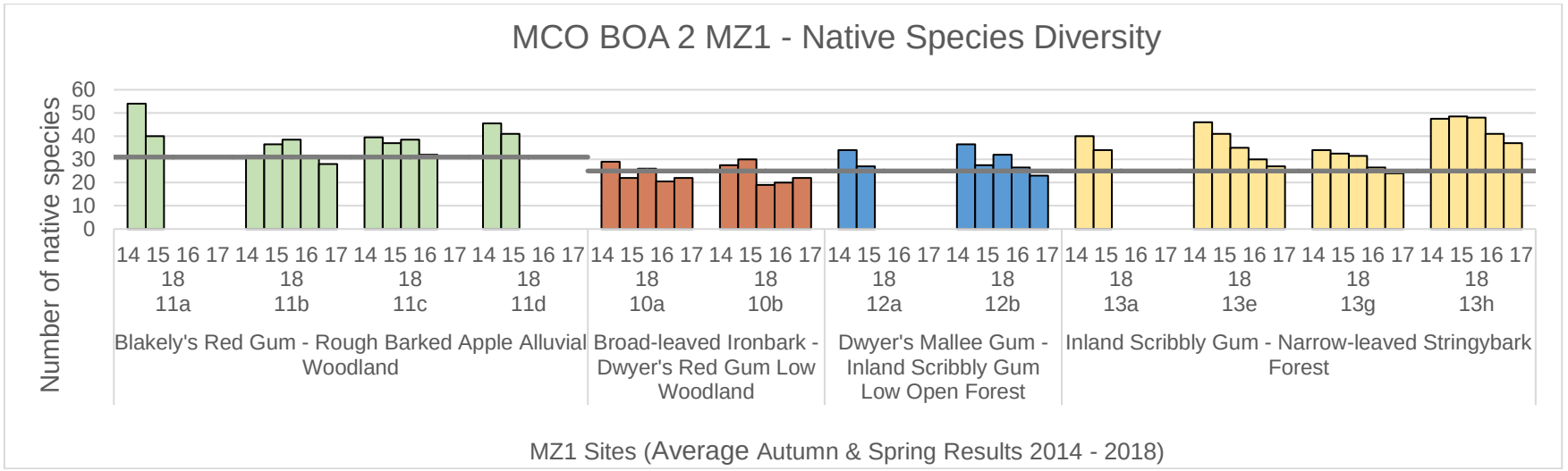
c* - Result attributable to regional dust events

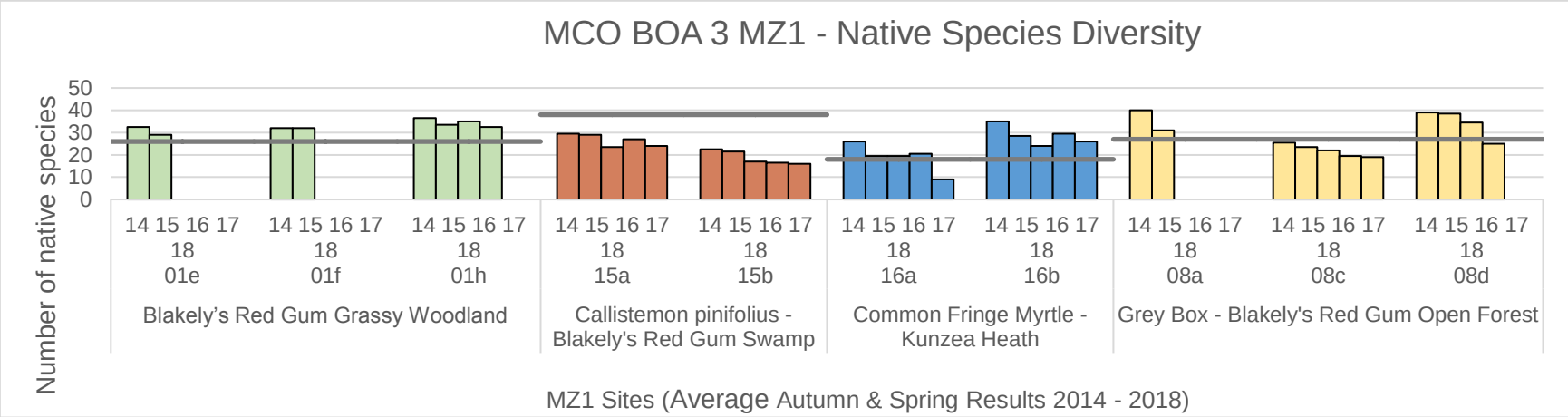
Figure 3-d 2013 to 2018 HVAS Trending

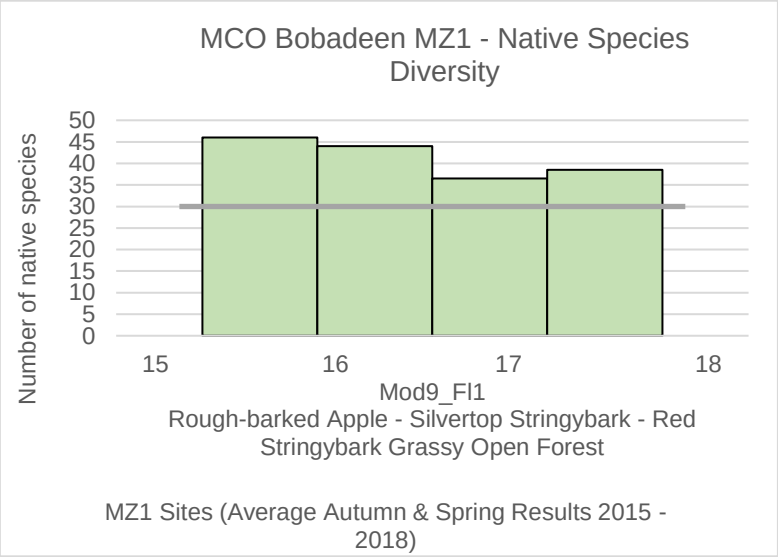


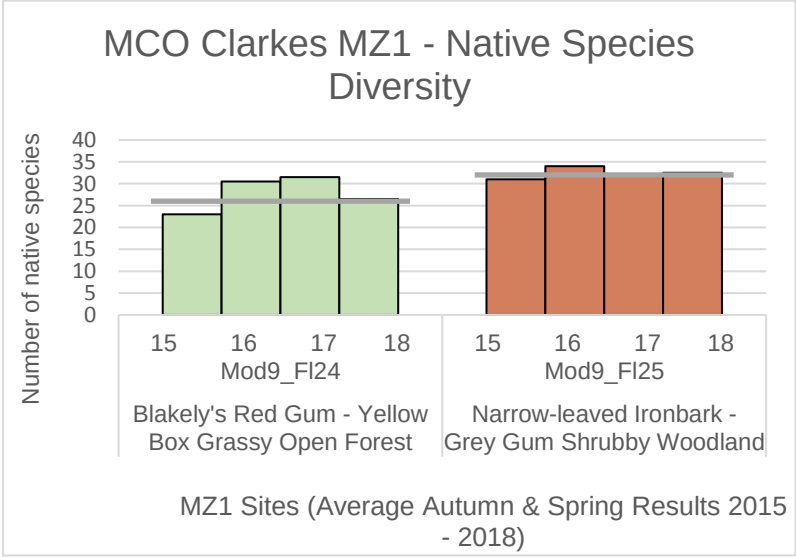
APPENDIX 3E. BIODIVERSITY MONITORING DATA

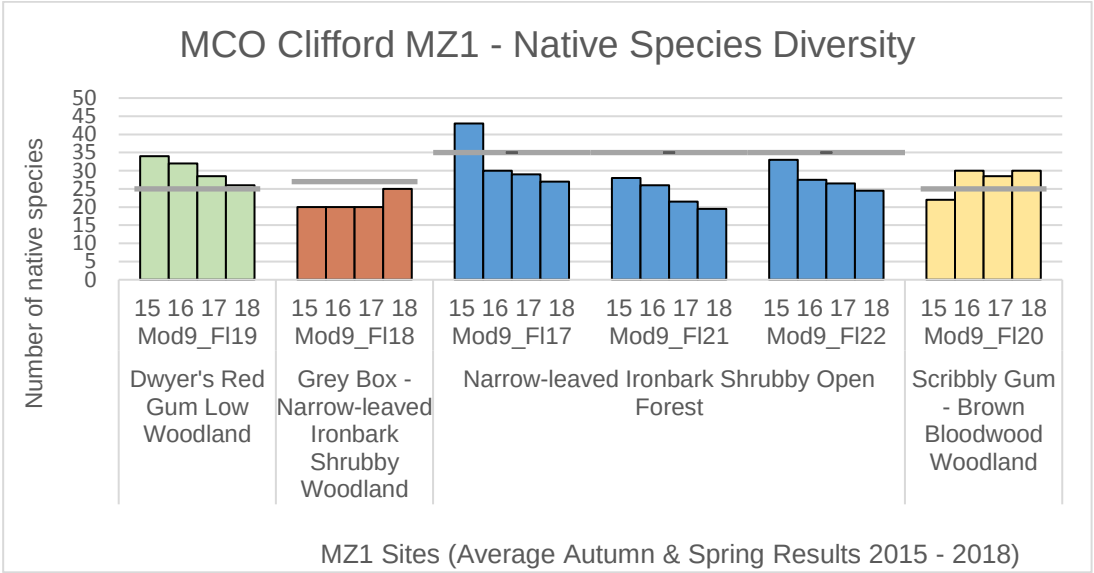


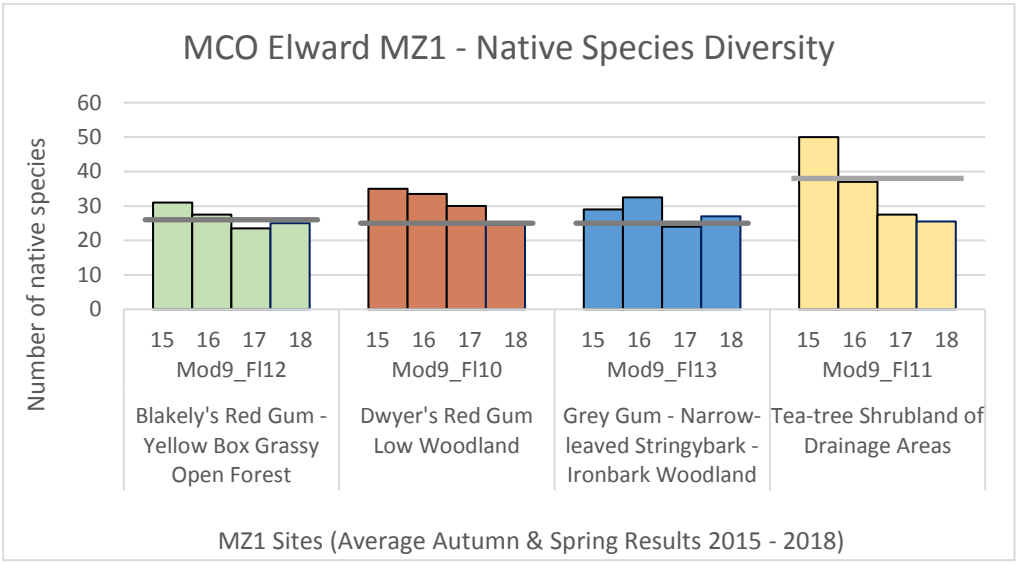


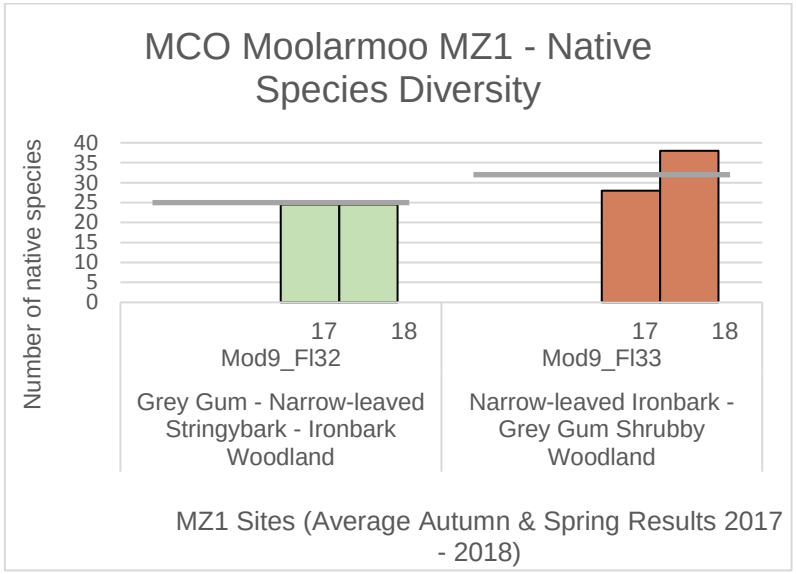

MCO BOA 3 MZ1 - Native Species Diversity
Number of native species
50
40
30
20
10
0
14 15 16 17 18
01e
01f
01h
15a
15b
16a
16b
08a
08c
08d
Blakely's Red Gum Grassy Woodland
Callistemon pinifolius - Blakely's Red Gum Swamp
Common Fringe Myrtle - Kunzea Heath
Grey Box - Blakely's Red Gum Open Forest
MZ1 Sites (Average Autumn & Spring Results 2014 - 2018)

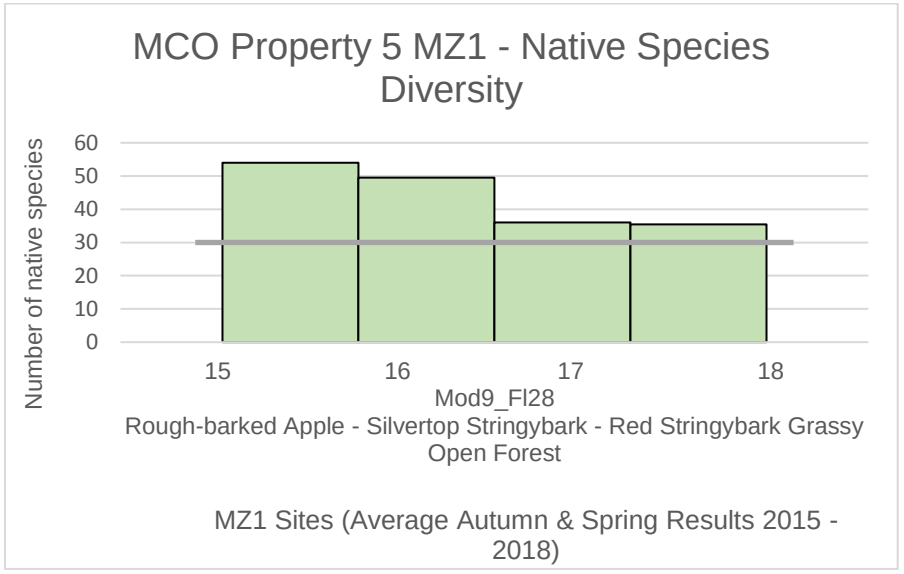

MCO Bobadeen MZ1 - Native Species Diversity
Number of native species
50
45
40
35
30
25
20
15
10
5
0
15
16
17
18
Mod9_Fl1
Rough-barked Apple - Silvertop Stringybark - Red Stringybark Grassy Open Forest
MZ1 Sites (Average Autumn & Spring Results 2015 - 2018)

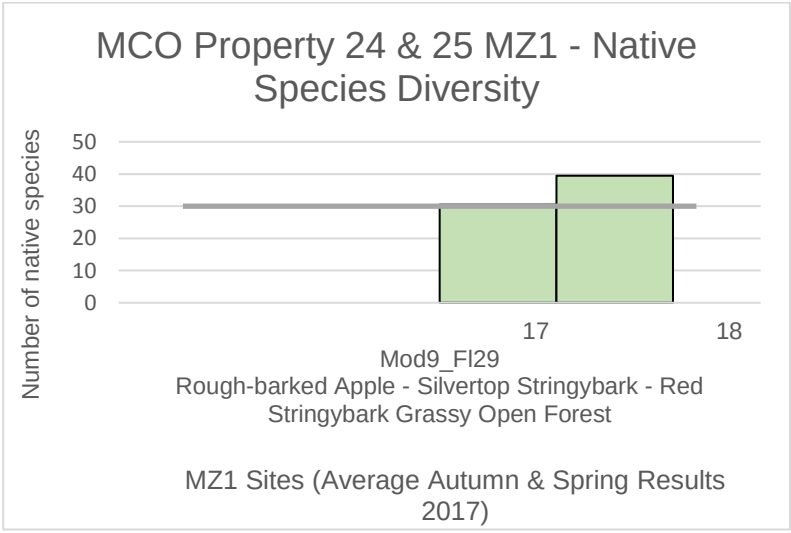

MCO Clarkes MZ1 - Native Species Diversity
Number of native species
40
35
30
25
20
15
10
5
0
15
16
17
18
Mod9_Fl24
Mod9_Fl25
Blakely's Red Gum - Yellow Box Grassy Open Forest
Narrow-leaved Ironbark - Grey Gum Shrubby Woodland
MZ1 Sites (Average Autumn & Spring Results 2015 - 2018)

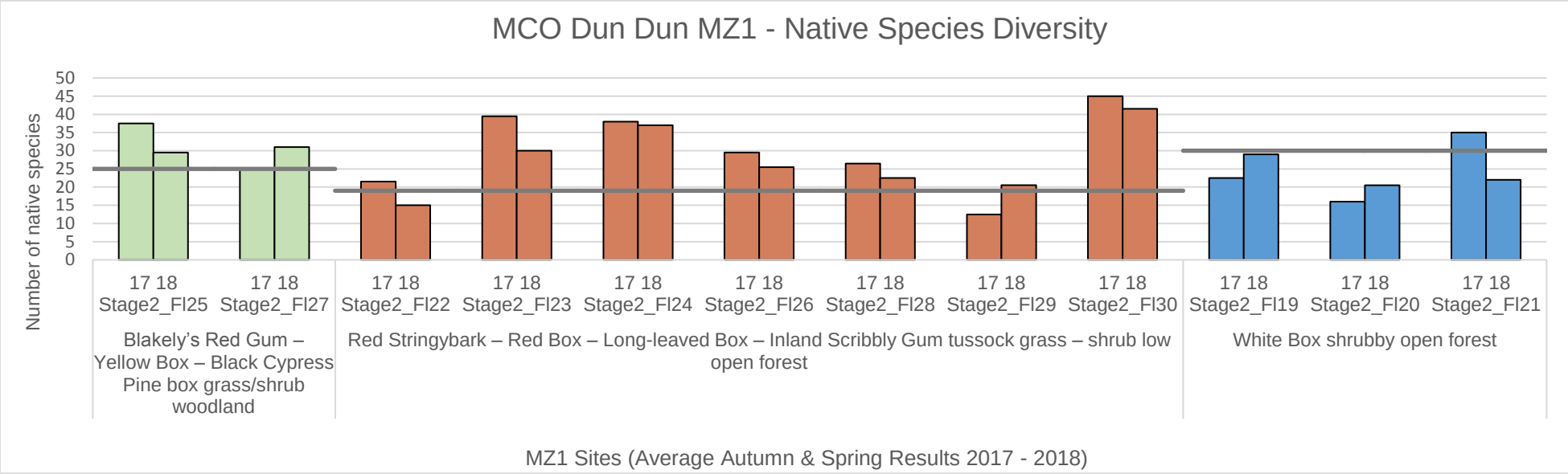

MCO Clifford MZ1 - Native Species Diversity
Number of native species
50
45
40
35
30
25
20
15
10
5
0
15 16 17 18
Mod9_Fl19
Dwyer's Red Gum Low Woodland
15 16 17 18
Mod9_Fl18
Grey Box - Narrow-leaved Ironbark Shrubby Woodland
15 16 17 18
Mod9_Fl17
15 16 17 18
Mod9_Fl21
15 16 17 18
Mod9_Fl22
Narrow-leaved Ironbark Shrubby Open Forest
15 16 17 18
Mod9_Fl20
Scribbly Gum - Brown Bloodwood Woodland
MZ1 Sites (Average Autumn & Spring Results 2015 - 2018)

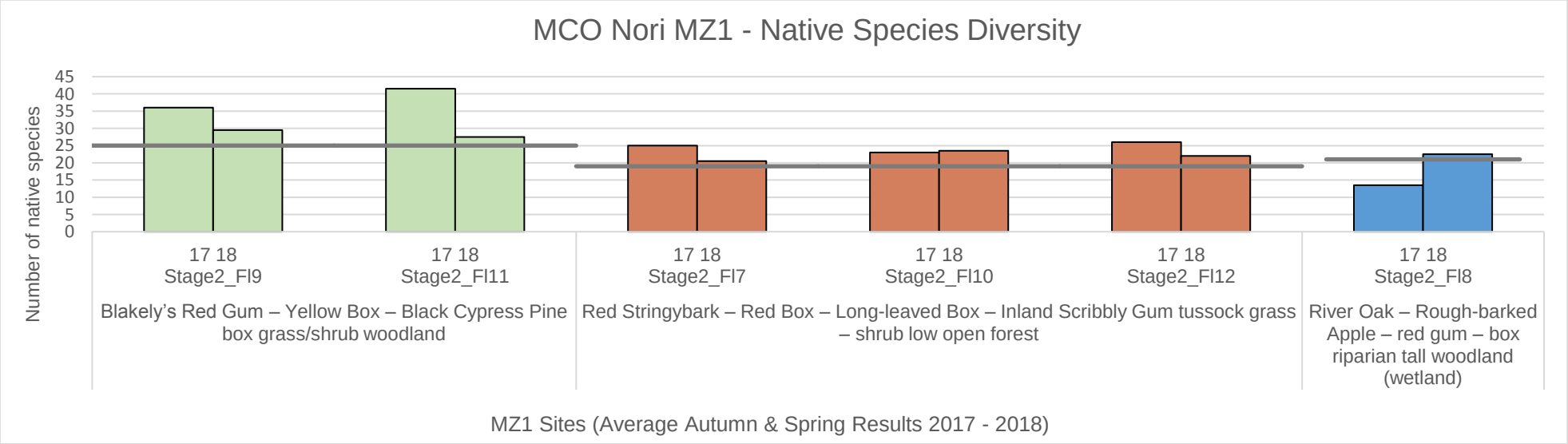

MCO Elward MZ1 - Native Species Diversity
Number of native species
60
50
40
30
20
10
0
15 16 17 18
Mod9_Fl12
Blakely's Red Gum - Yellow Box Grassy Open Forest
15 16 17 18
Mod9_Fl10
Dwyer's Red Gum Low Woodland
15 16 17 18
Mod9_Fl13
Grey Gum - Narrow-leaved Stringybark - Ironbark Woodland
15 16 17 18
Mod9_Fl11
Tea-tree Shrubland of Drainage Areas
MZ1 Sites (Average Autumn & Spring Results 2015 - 2018)

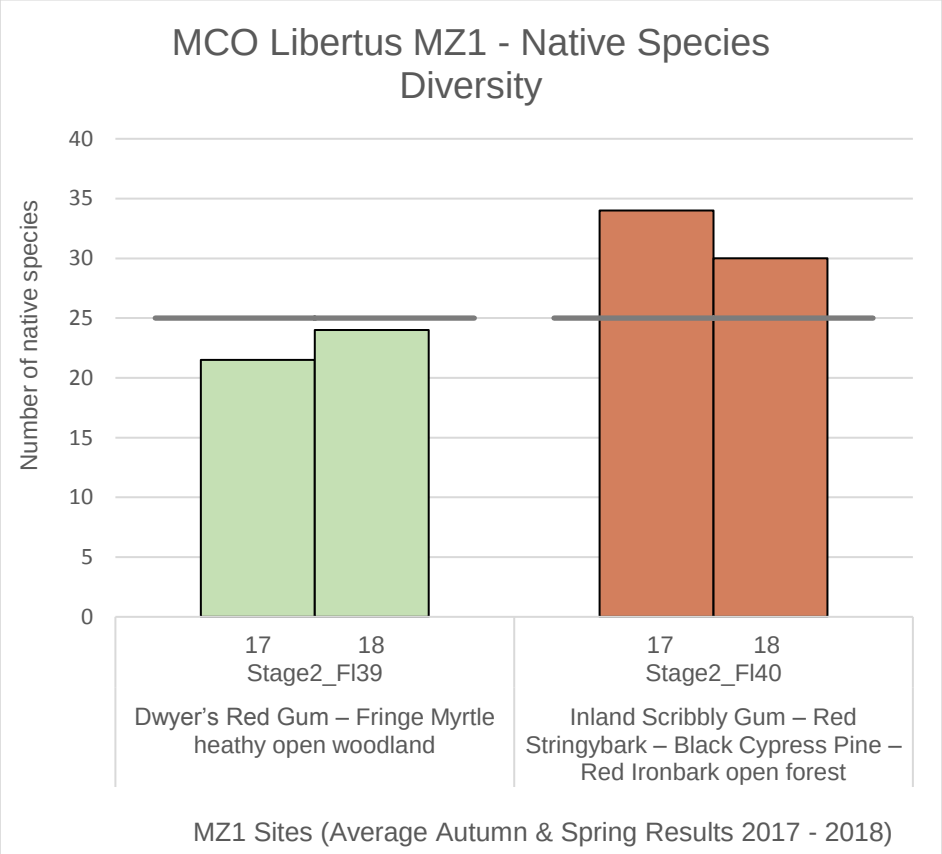

MCO Moolarmoo MZ1 - Native Species Diversity
Number of native species
40
35
30
25
20
15
10
5
0
17
18
Mod9_Fl32
Grey Gum - Narrow-leaved Stringybark - Ironbark Woodland
17
18
Mod9_Fl33
Narrow-leaved Ironbark - Grey Gum Shrubby Woodland
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)

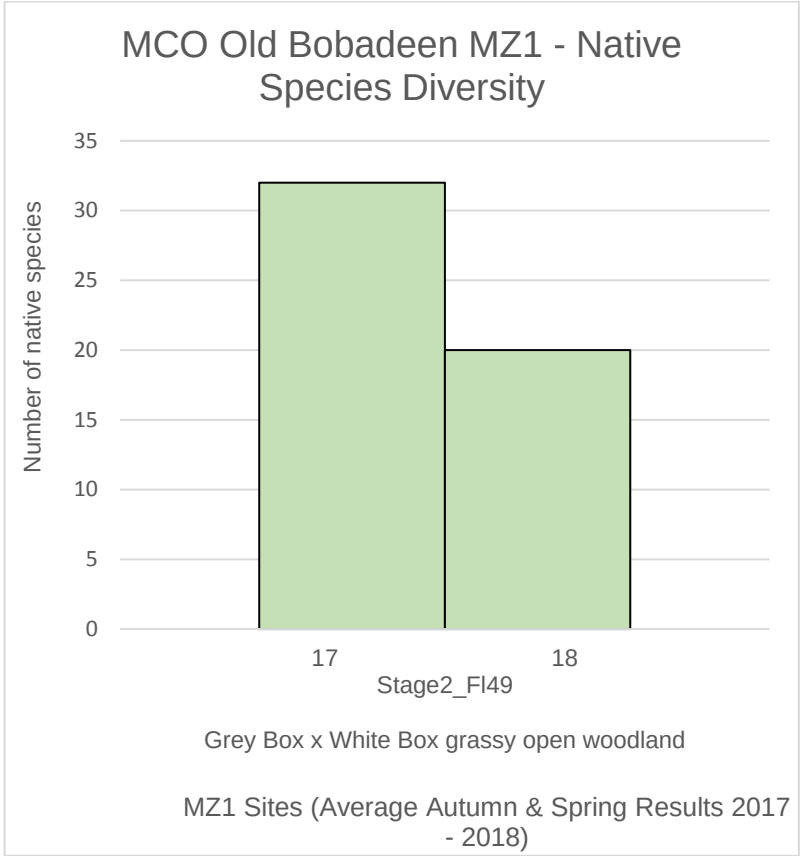

MCO Property 5 MZ1 - Native Species Diversity
Number of native species
60
50
40
30
20
10
0
15
16
17
18
Mod9_Fl28
Rough-barked Apple - Silvertop Stringybark - Red Stringybark Grassy Open Forest
MZ1 Sites (Average Autumn & Spring Results 2015 - 2018)

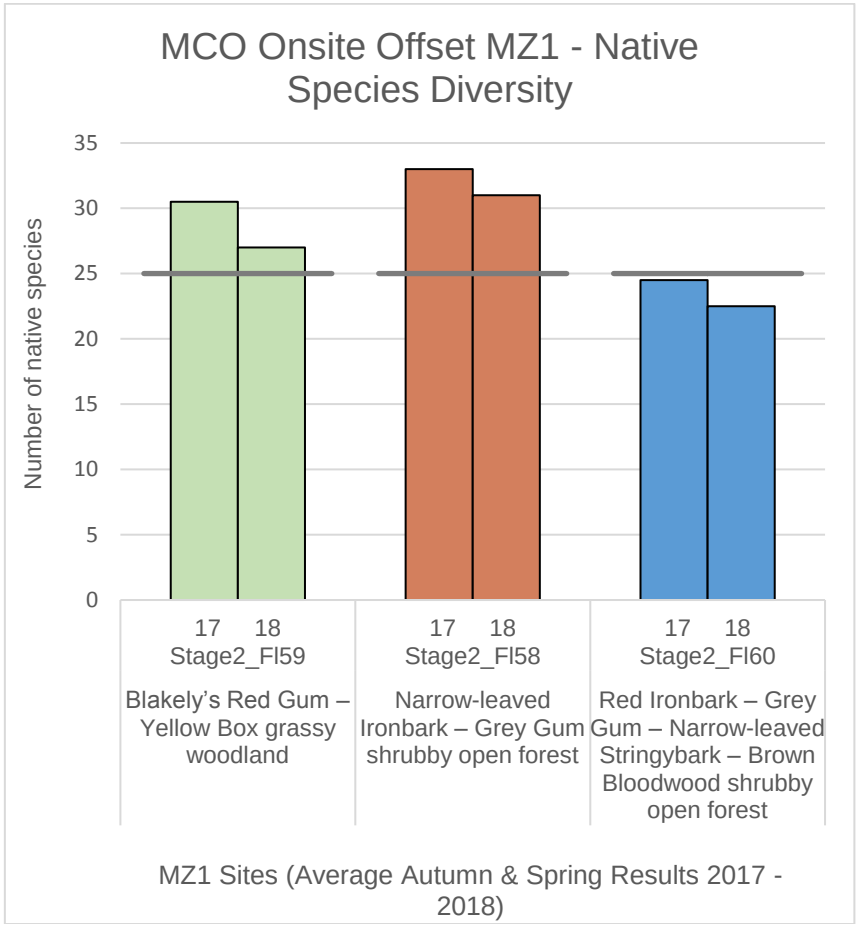

MCO Property 24 & 25 MZ1 - Native Species Diversity
Number of native species
50
40
30
20
10
0
17
18
Mod9_Fl29
Rough-barked Apple - Silvertop Stringybark - Red Stringybark Grassy Open Forest
MZ1 Sites (Average Autumn & Spring Results 2017)

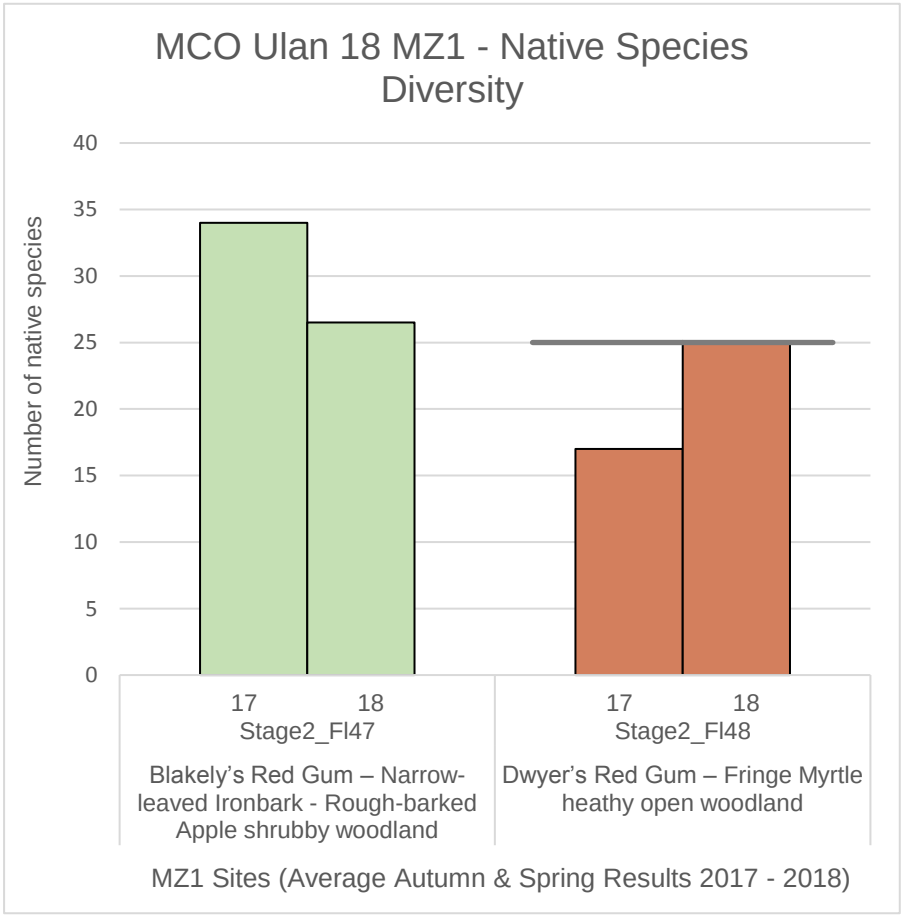

MCO Dun Dun MZ1 - Native Species Diversity
Number of native species
50
45
40
35
30
25
20
15
10
5
0
17 18 Stage2_Fl25
17 18 Stage2_Fl27
17 18 Stage2_Fl22
17 18 Stage2_Fl23
17 18 Stage2_Fl24
17 18 Stage2_Fl26
17 18 Stage2_Fl28
17 18 Stage2_Fl29
17 18 Stage2_Fl30
17 18 Stage2_Fl19
17 18 Stage2_Fl20
17 18 Stage2_Fl21
Blakely's Red Gum – Yellow Box – Black Cypress Pine box grass/shrub woodland
Red Stringybark – Red Box – Long-leaved Box – Inland Scribbly Gum tussock grass – shrub low open forest
White Box shrubby open forest
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)


MCO Nori MZ1 - Native Species Diversity
Number of native species
45
40
35
30
25
20
15
10
5
0
17 18 Stage2_Fl9
17 18 Stage2_Fl11
17 18 Stage2_Fl7
17 18 Stage2_Fl10
17 18 Stage2_Fl12
17 18 Stage2_Fl8
Blakely's Red Gum – Yellow Box – Black Cypress Pine box grass/shrub woodland
Red Stringybark – Red Box – Long-leaved Box – Inland Scribbly Gum tussock grass – shrub low open forest
River Oak – Rough-barked Apple – red gum – box riparian tall woodland (wetland)
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)


MCO Libertus MZ1 - Native Species Diversity
Number of native species
40
35
30
25
20
15
10
5
0
17
18
Stage2_Fl39
Dwyer's Red Gum – Fringe Myrtle heathy open woodland
17
18
Stage2_Fl40
Inland Scribbly Gum – Red Stringybark – Black Cypress Pine – Red Ironbark open forest
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)


MCO Old Bobadeen MZ1 - Native Species Diversity
Number of native species
35
30
25
20
15
10
5
0
17
18
Stage2_Fl49
Grey Box x White Box grassy open woodland
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)


MCO Onsite Offset MZ1 - Native Species Diversity
Number of native species
35
30
25
20
15
10
5
0
17 18
Stage2_Fl59
Blakely's Red Gum – Yellow Box grassy woodland
17 18
Stage2_Fl58
Narrow-leaved Ironbark – Grey Gum shrubby open forest
17 18
Stage2_Fl60
Red Ironbark – Grey Gum – Narrow-leaved Stringybark – Brown Bloodwood shrubby open forest
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)


MCO Ulan 18 MZ1 - Native Species Diversity
Number of native species
40
35
30
25
20
15
10
5
0
17 18
Stage2_Fl47
Blakely's Red Gum – Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland
17 18
Stage2_Fl48
Dwyer's Red Gum – Fringe Myrtle heathy open woodland
MZ1 Sites (Average Autumn & Spring Results 2017 - 2018)

Appendix 3F. SURFACE WATER MONITORING DATA

Table 5: 2018 Surface water quality data

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW01	16/01/2018 9:50	<0.001	0.040	<0.0001	<0.001	<0.001	843	855	0.61	<0.001	0.094	0.246	0.007		7.5	7.8	0.0	0.2	20.7	479	0.3	<5	1.2	1.6
SW01	13/02/2018 11:00						303	299							7.3	7.4			26.8	182		11.0	7.2	8.6
SW01	26/02/2018 10:00						256	281	1.6						7.8	7.1			19.7	202		7	2.5	0.005
SW01	14/03/2018 10:00						281	294							7.1	7.5			20.4	146		32.0	3.3	13.8
SW01	17/04/2018 8:45						1180	1087							7.5	7.8			17.6	694		<5	1.0	0.5
SW01	21/05/2018 11:35						860	838							7.2	7.3			16.9	450		<5	1.2	0.4
SW01	18/06/2018 11:30	<0.001	0.015	<0.0001	<0.001	<0.001	831	827	0.08	<0.001	0.119	0.01	0.007		8.2	7.8	<0.01	0.2	15.4	478	<0.1	<5	0.7	0.7
SW01	17/07/2018 11:10						795	817							8.0	8.1			16.3	425		<5	0.8	0.6
SW01	14/08/2018 11:05						806	792							8.0	8.1			16.2	552		<5	0.7	0.6
SW01	11/09/2018 10:45						758	746							7.7	8.0			18.4	438		5.0	2.3	1.6
SW01	8/10/2018 10:45						884	784							7.7	8.0			22.4	504		10.0	0.4	0.4
SW01	13/11/2018 10:40						877	834							7.7	7.9			27.4	441		<5	0.5	0.4
SW01	10/12/2018 10:10						818	834							7.8	7.9			33.1	562		<5	0.8	0.5
SW01	13/12/2018 9:00						608	653	0.24						7.0	7.4			24.5	424		<5	15.6	11.9
SW02	16/01/2018 10:00	<0.001	0.034	<0.0001	<0.001	<0.001	968	954	0.20	<0.001	0.117	0.187	0.007		7.7	8.0	0.0	0.3	19.8	536	0.1	<5	0.6	0.9
SW02	14/03/2018 10:05						1300	1332							6.8	7.6			20.9	932		<5	0.9	0.7
SW02	17/04/2018 10:00						1800	1624							7.1	7.5			17.1	1120		<5	0.4	0.4
SW02	21/05/2018 11:15						887	862							6.9	7.3			17.9	576		<5	0.1	0.4
SW02	18/06/2018 11:45	<0.001	0.012	<0.0001	<0.001	<0.001	838	835	0.19	<0.001	0.121	0.0	0.007		8.1	8.0	<0.01	0.2	12.1	484	0.1	<5	1.4	0.8

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW02	17/07/2018 11:40						805	755							8.4	8.1			13.4	498		<5	0.8	0.7
SW02	14/08/2018 11:25						789	778							7.8	7.9			17.6	515		<5	1.6	0.6
SW02	11/09/2018 11:10						756	733							7.8	8.0			16.9	416		<5	2.0	1.7
SW02	8/10/2018 11:05						908	807							7.7	7.9			21.8	462		<5	0.3	0.4
SW02	13/11/2018 11:00						906	854							7.7	7.8			27.3	452		<5	0.6	0.3
SW02	10/12/2018 10:45						853	869							7.8	7.9			33.2	588		<5	0.4	0.3
SW02	13/12/2018 9:45						651	688	0.24						6.9	7.5			23.0	455		<5	10.5	6.2
SW04	16/01/2018 11:40	0.0	0.015	<0.0001	<0.001	0.0	503	483	1.39	<0.001	<0.001	0.5	0.004		8.7	8.1	0.1	0.1	27.1	337	2.0	26.0	31.1	12.0
SW04	26/02/2018 11:40						144	139	1.3						7.2	7.1			21.2	187		47	234.0	0.028
SW04	14/03/2018 14:20						151	141							7.0	7.6			20.1	151		19.0	74.2	48.6
SW04	17/04/2018 13:10						270	241							6.7	7.8			19.9	238		75.0	190.0	89.7
SW04	21/05/2018 12:05						311	298							8.7	7.7			12.9	272		46.0	68.0	53.4
SW05	16/01/2018 15:55	<0.001	0.036	<0.0001	<0.001	<0.001	655	627	0.58	<0.001	0.003	0.2	<0.001		7.5	7.4	0.1	0.2	20.3	374	1.3	70.0	9.6	1.1
SW05	13/02/2018 16:05						620	570							7.2	7.4			25.3	331		99.0	92.5	135.0
SW05	26/02/2018 11:50						412	414	1.5						7.1	7.1			20.2	280		22	56.9	0.012
SW05	14/03/2018 11:50						287	529							7.0	7.3			21.3	264		12.0	13.9	12.4
SW05	17/04/2018 14:05						575	519							7.2	7.6	0.0		18.3	316	0.7	<5	4.9	1.9
SW05	21/05/2018 11:00						500	481							8.1	7.5			12.8	307		<5	9.7	10.3
SW05	18/06/2018 11:15	<0.001	0.017	<0.0001	<0.001	<0.001	508	446	1.16	<0.001	0.003	0.1	0.001		7.5	7.6	<0.01	0.1	11.0	306	0.6	<5	12.6	11.1
SW05	17/07/2018 12:05						468	444							7.6	7.5			11.4	290		<5	18.8	16.8
SW05	14/08/2018 11:30						460	459							7.8	7.4			10.5	318		<5	18.9	18.5
SW05	11/09/2018 11:45						509	466							7.3	7.1			15.8	294		16.0	31.5	32.5

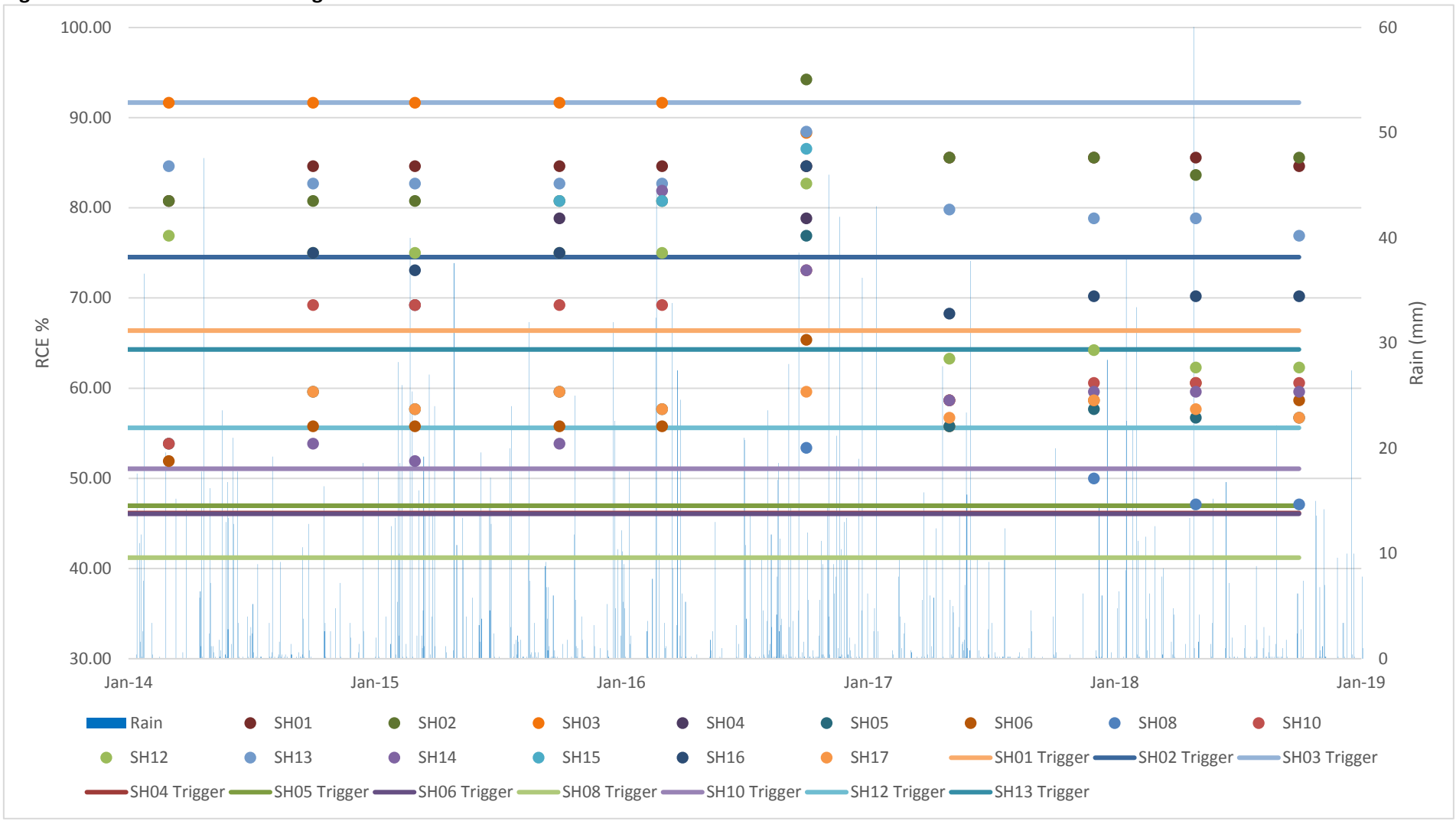
Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW05	8/10/2018 12:00						612	507							7.7	7.1	0.1		18.3	318	0.8	18.0	27.3	27.9
SW05	13/11/2018 10:00						625	590							7.2	7.1			18.1	396		8.0	10.3	7.0
SW05	10/12/2018 10:15						628	651							7.8	7.3			24.2	366		10.0	13.5	4.1
SW05	13/12/2018 9:30						135	174	2.62						6.4	7.2			22.4	225		25.0	133.0	106.0
SW07	26/02/2018 12:55						6320	6230	0.8						7.7	7.6			22.9	2950		26	15.9	0.006
SW07	14/03/2018 16:05						5430	5440							7.8	8.2			25.5	3470		10.0	13.3	1.5
SW07	17/04/2018 15:00						6200	5920							7.7	8.1			22.6	4500		<5	3.3	0.5
SW07	21/05/2018 9:30						7830	7650							7.8	7.9			12.7	5840		7.0	1.5	0.8
SW07	18/06/2018 10:00	<0.001	0.122	<0.0001	<0.001	<0.001	6760	6310	0.18	<0.001	0.004	1.3	0.002		6.3	7.7	<0.01	3.7	9.1	5090	0.6	11.0	6.4	2.2
SW08	16/01/2018 17:00	<0.001	0.119	<0.0001	<0.001	<0.001	3930	3900	2.18	<0.001	0.019	1.9	0.003		7.0	7.4	0.1	0.7	21.3	2180	0.8	14.0	24.1	1.4
SW08	13/02/2018 16:40						4660	4340							6.9	7.2			25.2	2200		19.0	43.6	29.5
SW08	26/02/2018 13:05						4100	4200	4.1						7.0	6.9			20.9	3870		21	38.7	0.021
SW08	14/03/2018 16:35						4460	4420							6.7	7.2			20.2	2910		8.0	22.8	1.5
SW08	17/04/2018 15:55						4380	4190							6.1	7.2	0.2		18.1	2760	1.6	22.0	36.6	3.6
SW08	21/05/2018 9:55						4300	4260							7.5	7.0			12.6	2540		8.0	12.0	9.2
SW08	18/06/2018 11:45	<0.001	0.109	<0.0001	<0.001	<0.001	4420	4210	1.72	<0.001	0.020	0.634	0.008		6.6	7.2	<0.01	0.6	15.1	2660	0.3	<5	19.2	6.6
SW08	17/07/2018 10:55						4010	3910							6.9	6.9			8.4	2560		<5	21.8	7.7
SW08	14/08/2018 10:30						3970	3740							7.1	6.9			8.0	2490		<5	8.2	4.8
SW08	11/09/2018 9:00						4090	3510							6.5	6.4			NR	2320		18.0	24.1	14.7
SW08	8/10/2018 10:00						4230	3710							6.7	6.4	0.0		14.5	2160	0.5	14.0	18.9	10.1
SW08	13/11/2018 9:10						4560	3780							7.1	7.0			18.6	1890		46.0	24.8	4.8
SW08	10/12/2018 9:25						4570	4240							8.0	7.1			22.6	2790		16.0	26.4	11.4

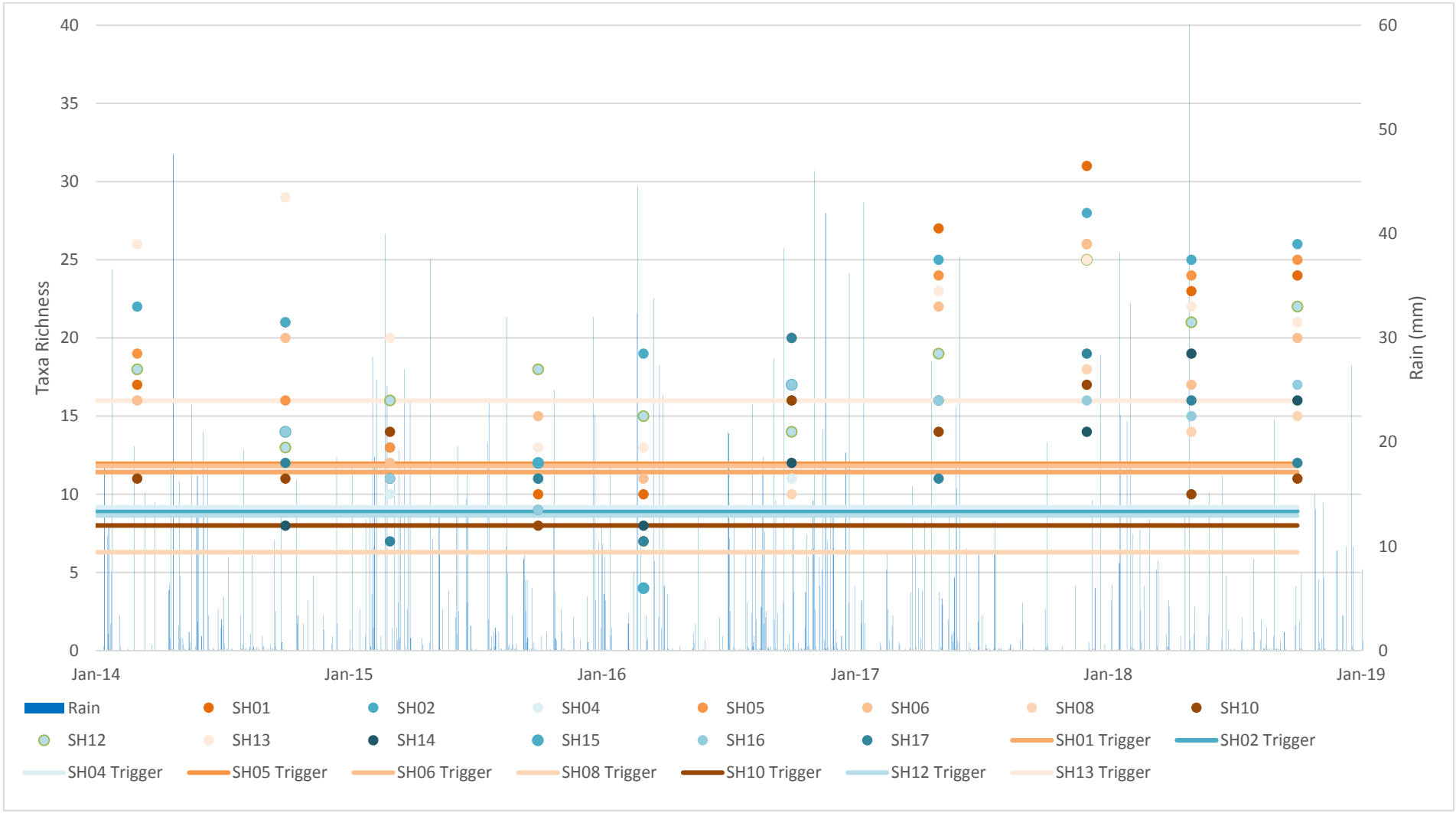
Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW08	13/12/2018 10:40						2610	2570	4.43						6.8	6.8			21.7	1910		56.0	115.0	73.2
SW09	16/01/2018 16:55	<0.001	0.092	<0.0001	<0.001	<0.001	3750	3720	0.60	<0.001	<0.001	0.135	<0.001		7.2	7.8	0.0	1.1	26.6	2040	0.3	9.0	2.2	0.5
SW09	13/02/2018 16:50						3830	3650							7.1	7.6			28.1	1950		<5	1.8	2.6
SW09	26/02/2018 13:15						3270	2640	2						6.8	6.8			20.9	1970		32	17.9	0.017
SW09	14/03/2018 16:55						3970	3990							6.7	7.4			25.0	2500		<5	8.7	0.3
SW09	17/04/2018 16:30						4030	3810							6.7	7.6			20.4	2520		8.0	6.9	0.4
SW09	21/05/2018 10:30						3940	3930							7.3	7.2			12.9	2140		<5	7.4	5.1
SW09	18/06/2018 10:30	<0.001	0.110	<0.0001	<0.001	0.0	4100	3870	1.40	<0.001	<0.001	1.56	0.003		6.7	7.2	<0.01	1.1	11.1	2440	0.4	6.0	22.1	7.0
SW09	17/07/2018 11:30						4110	4030							6.7	6.9			10.1	2630		8.0	14.1	33.1
SW09	14/08/2018 11:00						4060	3970							6.9	7.0			10.3	2530		6.0	11.1	26.2
SW09	11/09/2018 8:45						5040	4320							6.6	6.7			13.0	2640		17.0	12.1	45.1
SW09	8/10/2018 9:30						4840	4320							6.7	6.8			14.7	2600		19.0	11.4	31.8
SW09	13/11/2018 8:45						5230	4350							6.9	7.1			18.1	2310		<5	7.1	4.2
SW09	10/12/2018 9:00						4480	4300							8.0	7.3			21.8	2650		21.0	25.6	21.9
SW09	13/12/2018 10:20						3760	3960	0.96						6.4	6.9			22.5	2400		6.0	10.7	19.5
SW11 (EPA03)	13/12/2018 9:15						58	83	0.56					<5	7.0	6.8			21.6	291		162.0	491.0	507.0
SW12	16/01/2018 16:05	<0.001	0.034	<0.0001	<0.001	<0.001	621	603	1.22	<0.001	0.002	0.873	<0.001		7.2	7.7	0.0	0.2	22.3	376	0.5	6.0	5.6	3.9
SW12	13/02/2018 16:10						602	571							7.1	7.6			24.6	342		<5	5.3	5.7
SW12	26/02/2018 12:00						426	510	1.4						7.1	7.2			20.0	358		9	33.1	0.005
SW12	14/03/2018 15:40						513	499							6.7	7.5			23.8	326		24.0	11.0	4.6
SW12	17/04/2018 13:20						559	492							7.1	7.7			19.6	328		<5	3.6	1.8
SW12	21/05/2018 11:30						485	481							7.8	7.5			12.8	362		12.0	6.6	8.0

Sample Point	Date	Arsenic - Total (mg/L)	Barium - Total (mg/L)	Cadmium - Total (mg/L)	Chromium - Total (mg/L)	Copper - Total (mg/L)	Electrical Conductivity - Lab (µS/cm)	Electrical Conductivity -Field (µS/cm)	Iron - Total (mg/L)	Lead - Total (mg/L)	Lithium Total (mg/L)	Manganese - Total (mg/L)	Nickel - Total (mg/L)	Oil & Grease (mg/L)	pH (Field) (Unit)	pH Lab (Unit)	Phosphorus - Total (mg/L)	Strontium Total (mg/L)	Temperature (°C)	Total Dissolved Solids (mg/L)	Total Kjeldahl Nitrogen as N (mg/L)	Total Suspended Solids (mg/L)	Turbidity - Field (NTU)	Zinc - Total (mg/L)
SW12	18/06/2018 11:00	<0.001	0.017	<0.0001	<0.001	<0.001	477	441	0.67	<0.001	0.003	0.1	<0.001		7.5	7.5	<0.01	0.1	11.0	285	0.4	<5	7.7	8.0
SW12	17/07/2018 12:25						446	418							7.4	7.3			9.3	302		<5	13.1	12.8
SW12	14/08/2018 11:45						423	406							7.6	7.4			10.2	314		<5	12.8	13.0
SW12	11/09/2018 11:55						442	410							7.2	7.2			15.1	288		8.0	23.5	23.9
SW12	8/10/2018 10:50						566	475							7.8	7.4			17.3	320		16.0	14.3	15.7
SW12	13/11/2018 10:30						577	540							7.3	7.4			19.0	387		<5	4.0	2.9
SW12	10/12/2018 10:25						600	621							7.6	7.5			22.1	400		<5	2.7	2.1
SW12	13/12/2018 11:15						329	376	4.02						7.0	7.2			22.4	304		38.0	139.0	147.0
SW16	26/02/2018 11:05						536	542	2.3						6.9	5.9			19.3	432		24	61.8	0.082
SW16	14/03/2018 13:45						420	405							6.5	6.4			23.8	284		18.0	67.1	43.8
SW17	26/02/2018 11:30						40	40	1.6						7.1	6.3			20.8	145		22	109.0	0.018
SW17	14/03/2018 14:15						68	62							6.8	6.7			27.2	141		97.0	21.5	74.0
SW17	17/04/2018 13:00						67	61							6.4	6.9			23.3	178		66.0	235.0	152.0

Note: Sampling events where location was too low to sample have not been included.

Figure 3-e Stream Health Trending data and rainfall




Taxa Richness
Rain (mm)
0
5
10
15
20
25
30
35
40
0
10
20
30
40
50
60
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Rain
SH01
SH02
SH04
SH05
SH06
SH08
SH10
SH12
SH13
SH14
SH15
SH16
SH17
SH01 Trigger
SH02 Trigger
SH04 Trigger
SH05 Trigger
SH06 Trigger
SH08 Trigger
SH10 Trigger
SH12 Trigger
SH13 Trigger

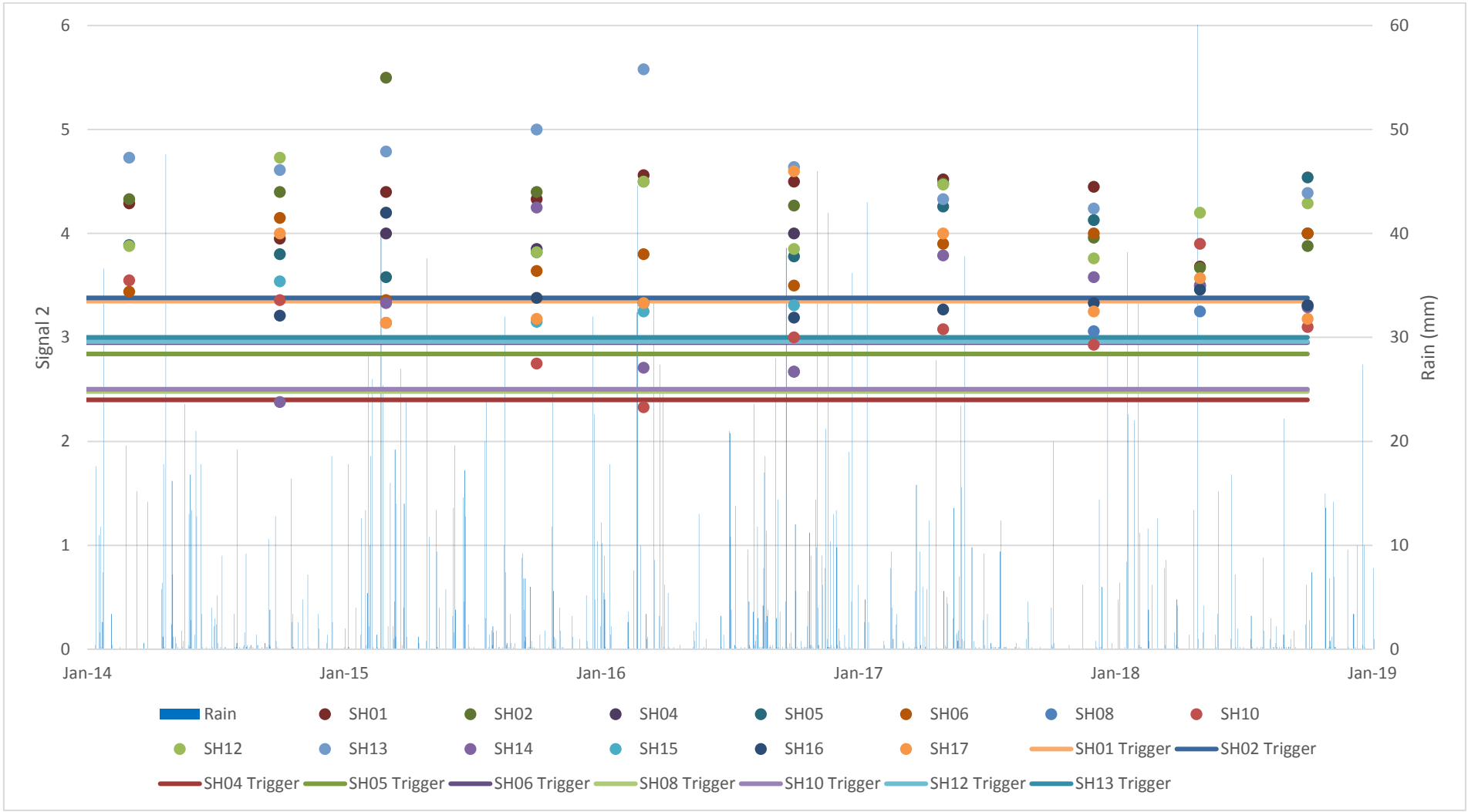
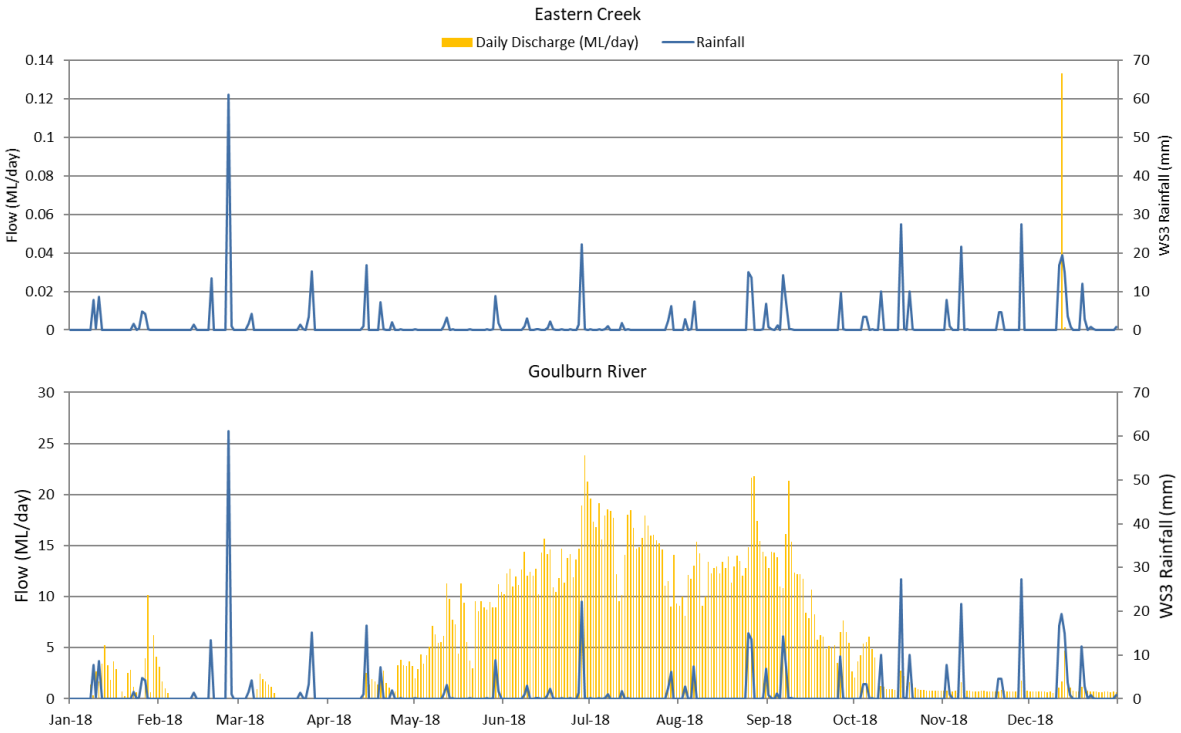

Signal 2
Rain (mm)
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Rain
SH01
SH02
SH04
SH05
SH06
SH08
SH10
SH12
SH13
SH14
SH15
SH16
SH17
SH01 Trigger
SH02 Trigger
SH04 Trigger
SH05 Trigger
SH06 Trigger
SH08 Trigger
SH10 Trigger
SH12 Trigger
SH13 Trigger

Table 6: Effluent Discharge Quality

Sample Location	Sample Date	Biological Oxygen Demand (mg/L)	Total Nitrogen (mg/L)	Oil & Grease (mg/L)	Total Phosphorus (mg/L)	pH	Total Suspended Solids (mg/L)
OC Effluent Tank	14-Feb-18	130	210	5	37.4	7.1	92
Admin Effluent	14-Feb-18	<2	29.8	<5	23.4	7.2	9
CHPP Effluent	14-Feb-18	5	3.9	<5	0.09	7.8	14
UG Effluent Tank	26-Feb-18	20	16.9	<5	6.3	7.8	36
OC Effluent Tank	22-May-18	34	29.3	<5	3.67	7.5	52
CHPP Effluent	22-May-18	18	6	6	0.14	7.8	40
Admin Effluent	22-May-18	6	47.5	<5	21	6.7	179
UG Effluent Tank	25-May-18	16	9.4	13	2.57	7.6	17
CHPP Effluent	15-Aug-18	21	2.4	<5	0.05	7.5	64
Admin Effluent	15-Aug-18	43	60.8	<5	21.2	7.1	63
UG Effluent Tank	16-Aug-18	85	16.2	11	4.87	7.6	172
OC Effluent Tank	16-Aug-18	14	17.2	<5	2.3	7.8	18
UG Effluent Tank	14-Nov-18	27	5.4	8	0.48	7.1	22
OC Effluent Tank	14-Nov-18	5	22.1	<5	3.2	7.4	31
CHPP Effluent	14-Nov-18	28	4.6	9	0.29	7.2	<5
Admin Effluent	14-Nov-18	5	25.4	<5	23.9	7.2	<5

Figure 3-f 2018 Stream Flow and rainfall



No Flow was recorded in Murragamba Creek and the upper reaches of Wilpinjong Creek. 238.85 ML of water was released from Moolarben Dam into Moolarben Creek to maintain riparian flow.

APPENDIX 3G. GROUNDWATER MONITORING DATA

Sample Point	Date	Alkalinity Bicarbonate (mg/L)	Alkalinity Carbonate (mg/L)	Alkalinity Hydroxide (mg/L)	Alkalinity Total (mg/L)	Aluminium - Dissolved (mg/L)	Ammonia as N (mg/L)	Arsenic - Dissolved (mg/L)	Boron - Dissolved (mg/L)	Cadmium - Dissolved (mg/L)	Calcium - Dissolved (mg/L)	Chloride (mg/L)	Chromium - Dissolved (mg/L)	Cobalt - Dissolved (mg/L)	Copper - Dissolved (mg/L)	Electrical Conductivity - Lab (µS/cm)	Fluoride (mg/L)	Iron - Dissolved (mg/L)	Lead - Dissolved (mg/L)	Magnesium - Dissolved (mg/L)	Manganese - Dissolved (mg/L)	Mercury - Dissolved (mg/L)	Nickel - Dissolved (mg/L)	Nitrate (mg/L)	pH Field (Unit)	Phosphorus - Total (mg/L)	Potassium - Dissolved (mg/L)	Reactive Phosphorus - Total (mg/L)	Selenium - Dissolved (mg/L)	Silver - Dissolved (mg/L)	Sodium - Dissolved (mg/L)	Sulphate - Turbidimetric (mg/L)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Zinc - Dissolved (mg/L)
Piezometer PZ003	17/04/2018 16:05	101	<1	<1	101	0.02	0.11	<0.001	<0.05	<0.0001	3	176	<0.001	<0.001	<0.001	869	0.2	9.65	<0.001	16	0.267	<0.0001	<0.001	0.06	5.88	0.06	6	<0.01	<0.01	<0.001	115	24	392	33	0.005
Piezometer PZ003	12/10/2018 12:00	102	<1	<1	102	<0.01	0.02	<0.001	<0.05	<0.0001	3	190	<0.001	<0.001	<0.001	829	0.2	<0.05	<0.001	20	0.004	<0.0001	<0.001	0.12	6.37	0.06	7	<0.01	<0.01	<0.001	120	23	418	31	<0.005
Piezometer PZ039	19/04/2018 15:40	17	<1	<1	17	<0.01	0.17	<0.001	<0.05	<0.0001	23	142	<0.001	0.002	<0.001	534	<0.1	3.31	<0.001	11	0.164	<0.0001	0.002	0.03	5.26	<0.01	8	<0.01	<0.01	<0.001	41	10	300	59	0.016
Piezometer PZ039	10/10/2018 12:30	20	<1	<1	20	<0.01	0.18	<0.001	<0.05	<0.0001	26	162	<0.001	0.002	<0.001	597	<0.1	3.98	<0.001	14	0.183	<0.0001	0.003	0.19	5.66	0.15	11	<0.01	<0.01	<0.001	48	10	376	49	0.019
Piezometer PZ040B	20/04/2018 9:30	2	<1	<1	2	0.06	0.16	<0.001	<0.05	<0.0001	9	342	<0.001	0.012	<0.001	1190	0.1	0.51	<0.001	20	0.136	<0.0001	0.01	<0.01	4.77	0.01	5	<0.01	<0.01	<0.001	143	20	545	19	0.042
Piezometer PZ040B	10/10/2018 9:35	4	<1	<1	4	0.02	0.16	<0.001	<0.05	<0.0001	7	227	<0.001	0.014	<0.001	807	<0.1	2.88	<0.001	16	0.108	<0.0001	0.01	<0.01	5.39	0.04	5	<0.01	<0.01	<0.001	110	23	418	28	0.031
Piezometer PZ044	17/04/2018 16:45	380	<1	<1	380	0.01	0.04	<0.001	<0.05	<0.0001	387	237	<0.001	<0.001	<0.001	2760	0.2	<0.05	<0.001	69	0.007	<0.0001	0.001	0.64	6.73	0.05	37	<0.01	<0.01	<0.001	97	776	1940	66	0.023
Piezometer PZ044	12/10/2018 12:45	416	<1	<1	416	<0.01	0.01	<0.001	<0.05	<0.0001	442	268	<0.001	<0.001	<0.001	2980	0.2	<0.05	<0.001	83	0.002	<0.0001	<0.001	0.51	6.81	0.03	39	<0.01	<0.01	<0.001	108	874	2060	56	0.01
Piezometer PZ055	19/04/2018 10:10	36	<1	<1	36	0.02	0.75	<0.001	<0.05	<0.0001	26	567	<0.001	0.39	<0.001	2750	0.1	1.05	<0.001	97	7.41	<0.0001	0.077	0.01	5.63	0.06	16	<0.01	<0.01	<0.001	369	461	1550	80	0.111
Piezometer PZ055	10/10/2018 15:00	35	<1	<1	35	0.02	0.86	0.002	<0.05	<0.0001	25	493	<0.001	0.457	<0.001	2640	<0.1	8.8	<0.001	110	7.36	<0.0001	0.086	0.1	5.44	<0.01	19	<0.01	<0.01	<0.001	327	482	1680	46	0.068
Piezometer PZ058A	17/04/2018 15:40	<1	<1	<1	<1	328	0.4	0.04	<0.05	0.0122	138	3530	0.08	1.86	0.26	15500	0.2	1.09	0.006	576	1.83	<0.0001	2.03	<0.01	3.41	1.37	15	0.14	0.25	<0.001	1890	4670	12000	4300	10.5
Piezometer PZ058A	12/10/2018 12:10	<1	<1	<1	<1	338	0.15	0.036	<0.05	0.0152	161	3570	0.09	1.84	0.353	16300	0.4	1.2	0.006	731	1.88	0.0001	2.38	<0.10	3.7	2.92	18	0.14	0.28	<0.001	2330	4330	12000	4980	11.6
Piezometer PZ101B	17/04/2018 10:55	345	<1	<1	345	<0.01	0.51	0.007	<0.05	<0.0001	54	52	<0.001	<0.001	<0.001	881	1.1	2.05	<0.001	21	0.239	<0.0001	0.002	0.36	7.33	0.19	17	<0.01	<0.01	<0.001	78	2	418	101	<0.005
Piezometer PZ101B	12/10/2018 11:10	343	<1	<1	343	0.06	0.5	0.002	<0.05	<0.0001	50	47	<0.001	<0.001	<0.001	862	1	<0.05	<0.001	20	0.195	<0.0001	0.003	<0.01	7.2	0.21	16	<0.01	<0.01	<0.001	76	1	431	36	<0.005
Piezometer PZ101C	17/04/2018 10:50	221	<1	<1	221	<0.01	0.23	0.002	<0.05	<0.0001	34	60	<0.001	0.002	<0.001	678	0.5	0.74	<0.001	18	0.535	<0.0001	0.022	0.01	6.94	0.13	9	<0.01	<0.01	<0.001	62	2	318	159	0.011
Piezometer PZ101C	12/10/2018 11:12	220	<1	<1	220	0.01	0.18	<0.001	<0.05	<0.0001	34	56	<0.001	0.002	<0.001	672	0.4	<0.05	<0.001	20	0.508	<0.0001	0.003	0.03	6.99	0.17	10	<0.01	<0.01	<0.001	68	<1	348	52	0.007
Piezometer PZ102A	16/04/2018 12:25	268	<1	<1	268	<0.01	0.49	0.002	<0.05	<0.0001	71	201	<0.001	0.001	<0.001	1500	1.6	1.61	<0.001	29	0.08	<0.0001	0.004	0.06	6.71	0.1	22	<0.01	<0.01	<0.001	146	140	768	27	0.041
Piezometer PZ102A	12/10/2018 8:50	281	<1	<1	281	0.01	0.52	<0.001	<0.05	<0.0001	73	210	<0.001	<0.001	<0.001	1470	1.6	<0.05	<0.001	31	0.051	<0.0001	0.002	0.03	6.95	<0.01	22	<0.01	<0.01	<0.001	160	131	773	30	0.008
Piezometer PZ102B	16/04/2018 12:30	201	<1	<1	201	<0.01	0.54	<0.001	<0.05	<0.0001	185	133	<0.001	0.001	<0.001	2580	1.1	3.86	<0.001	79	0.865	<0.0001	0.005	<0.01	6.61	0.04	32	<0.01	<0.01	<0.001	231	910	1710	43	0.034
Piezometer PZ102B	12/10/2018 9:00	200	<1	<1	200	0.02	0.42	<0.001	<0.05	<0.0001	207	145	<0.001	0.002	<0.001	2600	1.1	<0.05	<0.001	92	0.687	<0.0001	0.007	0.19	6.75	0.01	34	<0.01	<0.01	<0.001	262	933	1670	63	0.152
Piezometer PZ103A	16/04/2018 10:40	181	<1	<1	181	<0.01	0.17	<0.001	<0.05	<0.0001	40	82	<0.001	0.002	<0.001	701	0.3	5.6	<0.001	18	0.135	<0.0001	0.007	0.04	6.28	0.01	10	<0.01	<0.01	<0.001	36	13	305	31	0.027
Piezometer PZ103A	12/10/2018 9:15	155	<1	<1	155	<0.01	0.23	<0.001	<0.05	<0.0001	40	69	<0.001	0.002	<0.001	651	0.3	0.59	<0.001	20	0.146	<0.0001	0.006	0.04	6.74	0.02	11	<0.01	<0.01	<0.001	42	13	315	76	<0.005
Piezometer PZ103C	16/04/2018 10:50	13	<1	<1	13	0.02	0.71	<0.001	<0.05	<0.0001	4	70	<0.001	0.016	<0.001	339	<0.1	<0.05	<0.001	8	0.383	<0.0001	0.136	0.1	4.85	0.63	7	<0.01	<0.01	<0.001	35	15	154	2270	0.046
Piezometer PZ103C	12/10/2018 9:25	14	<1	<1	14	<0.01	0.68	<0.001	<0.05	<0.0001	5	62	<0.001	0.017	<0.001	370	<0.1	<0.05	<0.001	7	0.36	<0.0001	0.122	0.09	5.43	2.39	6	<0.01	<0.01	<0.001	32	14	192	3920	0.047
Piezometer PZ104	16/04/2018 14:25	<1	36	1830	1870	0.01	0.14	<0.001	<0.05	<0.0001	738	25	0.033	<0.001	<0.001	8140	0.2	<0.05	<0.001	<1	<0.001	<0.0001	<0.001	0.17	12.7	0.02	5	<0.01	<0.01	<0.001	34	<1	1890	72	<0.005
Piezometer PZ104	11/10/2018 12:40	<1	100	1960	2060	0.02	0.32	<0.001	<0.05	<0.0001	639	18	0.028	<0.001	<0.001	8910	0.1	<0.05	<0.001	<1	<0.001	<0.0001	<0.001	0.06	12.49	0.51	4	<0.01	<0.01	<0.001	31	2	2160	61	<0.005
Piezometer PZ105A	17/04/2018 11:25	31	<1	<1	31	<0.01	0.04	<0.001	<0.05	<0.0001	7	66	<0.001	0.014	<0.001	323	<0.1	3.63	<0.001	6	0.243	<0.0001	0.112	0.16	5.42	<0.01	3	<0.01	<0.01	<0.001	34	4	162	30	0.034
Piezometer PZ105A	12/10/2018 10:20	28	<1	<1	28	<0.01	0.02	<0.001	<0.05	<0.0001	7	60	<0.001	0.013	<0.001	341	<0.1	0.2	<0.001	6	0.215	<0.0001	0.096	0.06	5.88	0.02	3	<0.01	<0.01	<0.001	33	2	172	54	0.066
Piezometer PZ105B	17/04/2018 11:20	9	<1	<1	9	0.02	0.1	<0.001	<0.05	<0.0001	3	53	<0.001	0.013	<0.001	222	<0.1	0.35	<0.001	4	0.116	<0.0001	0.078	0.06	4.88	0.02	1	<0.01	<0.01	<0.001	27	1	119	38	0.041
Piezometer PZ105B	12/10/2018 10:30	6	<1	<1	6	0.04	0.02	<0.001	<0.05	0.0002	2	48	<0.001	0.014	0.014	246	<0.1	<0.05	0.006	4	0.124	<0.0001	0.081	0.15	5.22	<0.01	1	<0.01	<0.01	<0.001	30	<1	131	20	0.056
Piezometer PZ105C	17/04/2018 11:30	20	<1	<1	20	<0.01	<0.01	<0.001	<0.05	<0.0001	5	46	<0.001	<0.001	0.001	220	<0.1	<0.05	<0.001	3	0.016	<0.0001	0.059	0.27	5.46	<0.01	2	<0.01	<0.01	<0.001	25	4	114	20	0.038
Piezometer PZ105C	12/10/2018 10:35	15	<1	<1	15	<0.01	0.03	<0.001	<0.05	<0.0001	5	42	<0.001	0.021	0.068	237	<0.1	0.65	<0.001	4	0.917	<0.0001	0.228	<0.01	5.84	0.06	2	<0.01	<0.01	<0.001	28	3	125	44	0.037
Piezometer PZ106A	20/04/2018 10:30	45	2	<1	48	0.58	<0.01	<0.001	<0.05	<0.0001	20	189	<0.001	<0.001	<0.001	801	0.1	<0.05	<0.001	2	<0.001	<0.0001	<0.001	0.95	9.03	0.02	20	0.01	<0.01	<0.001	102	12	384	51	<0.005
Piezometer PZ106A	8/10/2018 15:15	46	7	<1	53	0.57	0.02	<0.001	<0.05	<0.0001	23	201	<0.001	<0.001	0.006	808	<0.1	<0.05	<0.001	2	0.005	<0.0001	0.003	0.91	9.55	0.02	22	<0.01	<0.01	<0.001	120	13	411	88	0.009
Piezometer PZ106B	20/04/2018 10:40	10	<1	<1	10	<0.01	<0.01	<0.001	<0.05	0.0012	24	568	<0.001	<0.001	<0.001	2000	<0.1	<0.05	<0.001	43	0.005	<0.0001	0.043	0.2	6.73	<0.01	8	<0.01	<0.01	<0.001	232	41	1030	22	0.19
Piezometer PZ106B	8/10/2018 15:05	9	<1	<1	9	0.03	<0.01	<0.001	<0.05	0.0007	24	532	<0.001	0.037	0.002	1890	<0.1	<0.05	<0.001	46	0.859	0.0001	0.059	0.01	5.53	0.02	8	<0.01	<0.01	<0.001	236	42	1040	36	0.151

Sample Point	Date	Alkalinity Bicarbonate (mg/L)	Alkalinity Carbonate (mg/L)	Alkalinity Hydroxide (mg/L)	Alkalinity Total (mg/L)	Aluminium - Dissolved (mg/L)	Ammonia as N (mg/L)	Arsenic - Dissolved (mg/L)	Boron - Dissolved (mg/L)	Cadmium - Dissolved (mg/L)	Calcium - Dissolved (mg/L)	Chloride (mg/L)	Chromium - Dissolved (mg/L)	Cobalt - Dissolved (mg/L)	Copper - Dissolved (mg/L)	Electrical Conductivity - Lab (µS/cm)	Fluoride (mg/L)	Iron - Dissolved (mg/L)	Lead - Dissolved (mg/L)	Magnesium - Dissolved (mg/L)	Manganese - Dissolved (mg/L)	Mercury - Dissolved (mg/L)	Nickel - Dissolved (mg/L)	Nitrate (mg/L)	pH Field (Unit)	Phosphorus - Total (mg/L)	Potassium - Dissolved (mg/L)	Reactive Phosphorus - Total (mg/L)	Selenium - Dissolved (mg/L)	Silver - Dissolved (mg/L)	Sodium - Dissolved (mg/L)	Sulphate - Turbidimetric (mg/L)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Zinc - Dissolved (mg/L)
Piezometer PZ107	20/04/2018 10:05	265	<1	<1	265	<0.01	0.01	<0.001	<0.05	<0.0001	46	274	<0.001	<0.001	<0.001	1590	0.2	<0.05	<0.001	53	0.003	<0.0001	0.002	0.12	6.37	0.12	17	<0.01	<0.01	<0.001	144	118	776	86	0.01
Piezometer PZ109	17/04/2018 10:25	227	<1	<1	227	<0.01	0.02	<0.001	<0.05	<0.0001	39	82	<0.001	<0.001	<0.001	798	0.2	<0.05	<0.001	32	0.005	<0.0001	0.003	0.18	6.41	0.05	2	0.02	<0.01	<0.001	58	15	382	117	0.012
Piezometer PZ109	8/10/2018 10:00	231	<1	<1	231	0.01	<0.01	<0.001	<0.05	<0.0001	38	69	0.002	<0.001	0.002	781	<0.1	<0.05	<0.001	35	0.004	<0.0001	0.003	0.21	6.64	0.06	3	0.02	<0.01	<0.001	63	15	396	35	0.024
Piezometer PZ111	16/04/2018 15:05	35	<1	<1	35	<0.01	0.93	<0.001	<0.05	<0.0001	43	306	<0.001	0.024	<0.001	1140	0.1	14.5	<0.001	29	1.04	<0.0001	0.071	0.29	6.88	<0.10	13	<0.01	<0.01	<0.001	83	16	647	3600	0.01
Piezometer PZ111	11/10/2018 9:20	93	<1	<1	93	<0.01	0.3	<0.001	<0.05	<0.0001	50	279	<0.001	0.016	<0.001	1110	0.2	<0.05	<0.001	31	0.674	<0.0001	0.04	0.19	6.22	0.02	15	<0.01	<0.01	<0.001	72	16	611	931	0.02
Piezometer PZ112B	16/04/2018 16:35	2	<1	<1	2	0.13	<0.01	<0.001	<0.05	0.0002	1	479	<0.001	0.022	0.002	2270	0.1	<0.05	<0.001	22	0.061	<0.0001	0.055	2.08	4.94	0.03	8	<0.01	<0.01	<0.001	375	321	1300	88	0.103
Piezometer PZ112B	8/10/2018 14:05	3	<1	<1	3	0.14	<0.01	<0.001	<0.05	0.0003	2	584	<0.001	0.029	0.001	2760	<0.1	<0.05	<0.001	32	0.074	<0.0001	0.071	2.15	5.38	0.49	10	<0.01	<0.01	<0.001	475	361	1680	844	0.109
Piezometer PZ137	20/04/2018 9:50	66	<1	<1	66	<0.01	0.02	<0.001	<0.05	<0.0001	47	347	<0.001	<0.001	<0.001	1430	<0.1	0.15	<0.001	41	0.03	<0.0001	0.002	0.2	6.09	<0.01	29	<0.01	<0.01	<0.001	109	64	770	43	0.01
Piezometer PZ137	10/10/2018 10:05	98	<1	<1	98	<0.01	0.25	0.002	<0.05	<0.0001	65	415	<0.001	0.002	<0.001	1700	<0.1	7.14	<0.001	58	0.629	<0.0001	0.005	0.1	6.1	0.07	31	<0.01	<0.01	<0.001	131	71	1000	172	0.017
Piezometer PZ151	17/04/2018 15:55	228	<1	<1	228	<0.01	0.19	<0.001	<0.05	<0.0001	110	290	<0.001	0.002	<0.001	1940	0.4	<0.05	<0.001	54	0.045	<0.0001	0.011	0.02	6.35	0.35	25	<0.01	<0.01	<0.001	171	300	1110	1520	0.015
Piezometer PZ170	19/04/2018 13:55	224	<1	<1	224	<0.01	0.26	0.004	<0.05	<0.0001	250	1270	<0.001	0.006	<0.001	4490	<0.1	9.85	<0.001	171	0.357	<0.0001	0.04	0.16	6.21	0.07	29	<0.01	<0.01	<0.001	292	5	2640	61	0.006
Piezometer PZ170	10/10/2018 11:30	250	<1	<1	250	<0.01	0.18	0.006	<0.05	0.0001	260	1180	<0.001	0.006	<0.001	4710	<0.1	8.56	<0.001	195	0.36	<0.0001	0.044	<0.01	6.39	<0.01	30	0.02	<0.01	<0.001	340	3	3460	41	0.097
Piezometer PZ174	20/04/2018 8:45	428	<1	<1	428	<0.01	0.11	<0.001	<0.05	<0.0001	224	4420	<0.001	0.167	0.002	13800	0.6	<0.05	<0.001	710	1.01	<0.0001	0.081	<0.01	6.16	0.02	4	<0.01	<0.01	<0.001	1480	459	9020	19	0.053
Piezometer PZ174	10/10/2018 11:50	454	<1	<1	454	<0.01	0.1	<0.001	<0.05	0.0012	246	4560	<0.001	0.161	<0.001	15100	0.7	<0.05	<0.001	843	0.931	<0.0001	0.089	<0.01	6.38	<0.02	5	0.03	<0.01	<0.001	1720	459	10100	15	0.071
Piezometer PZ175	20/04/2018 8:55	641	<1	<1	641	<0.01	0.04	0.001	<0.05	<0.0001	165	4910	<0.001	0.026	<0.001	15700	1.2	0.95	<0.001	891	0.277	<0.0001	0.006	0.22	6.49	<0.02	2	<0.01	<0.01	<0.001	1930	621	10300	52	<0.005
Piezometer PZ175	10/10/2018 11:40	610	<1	<1	610	0.01	0.02	0.001	<0.05	<0.0001	198	5560	<0.001	0.037	<0.001	17000	1.2	0.14	<0.001	1020	0.294	<0.0001	0.01	0.07	6.48	0.22	2	<0.01	<0.01	<0.001	2120	495	12100	2580	0.009
Piezometer PZ176	20/04/2018 9:10	45	<1	<1	45	<0.01	0.02	<0.001	<0.05	<0.0001	14	164	<0.001	<0.001	0.002	650	<0.1	0.17	<0.001	20	0.053	<0.0001	<0.001	0.06	6.09	0.02	4	<0.01	<0.01	<0.001	62	1	328	7	0.006
Piezometer PZ176	10/10/2018 12:10	44	<1	<1	44	<0.01	<0.01	<0.001	<0.05	<0.0001	15	166	<0.001	<0.001	<0.001	647	<0.1	<0.05	<0.001	23	0.032	<0.0001	<0.001	0.08	6.49	0.02	4	<0.01	<0.01	<0.001	73	1	371	24	0.008
Piezometer PZ177	20/04/2018 9:20	275	<1	<1	275	3.95	0.04	0.008	<0.05	0.0011	28	1950	0.009	0.018	0.026	7010	0.8	5.47	0.018	156	0.027	<0.0001	0.028	<0.01	6.36	0.76	<1	<0.01	<0.01	<0.001	1090	273	6250	3730	0.184
Piezometer PZ184	17/04/2018 15:40	<1	<1	<1	<1	20.7	1.25	0.001	<0.05	0.0006	28	1370	0.018	0.169	0.025	5480	0.2	57.6	0.029	94	0.847	0.0022	0.278	0.1	3.15	1	6	<0.01	<0.01	<0.001	777	444	2940	7960	0.367
Piezometer PZ186	17/04/2018 14:00	77	<1	<1	77	<0.01	0.14	0.003	<0.05	<0.0001	20	56	<0.001	<0.001	<0.001	380	0.2	7.49	<0.001	11	0.194	<0.0001	0.001	0.03	6.08	1.89	9	<0.01	<0.01	<0.001	26	2	202	54	0.011
Piezometer PZ186	11/10/2018 12:00	80	<1	<1	80	<0.01	0.8	<0.001	<0.05	<0.0001	21	59	<0.001	<0.001	<0.001	404	0.1	<0.05	<0.001	13	0.192	<0.0001	0.002	0.28	6.3	10.3	11	<0.01	<0.01	<0.001	28	3	210	912	0.017
Piezometer PZ187	17/04/2018 14:05	21	<1	<1	21	0.04	0.08	0.003	<0.05	<0.0001	<1	39	0.002	<0.001	<0.001	189	<0.1	0.4	<0.001	2	0.016	<0.0001	0.002	0.01	5.29	0.03	<1	<0.01	<0.01	<0.001	30	2	108	17	0.009
Piezometer PZ187	11/10/2018 12:10	30	<1	<1	30	<0.01	0.06	<0.001	<0.05	<0.0001	2	262	<0.001	<0.001	<0.001	969	<0.1	<0.05	<0.001	11	0.022	<0.0001	0.003	0.67	5.91	0.15	<1	<0.01	<0.01	<0.001	152	19	485	225	0.017
Piezometer PZ188	17/04/2018 13:35	6	<1	<1	6	<0.01	0.04	<0.001	<0.05	<0.0001	<1	47	<0.001	0.006	<0.001	193	<0.1	<0.05	<0.001	3	0.033	<0.0001	0.012	0.21	5.04	<0.01	<1	<0.01	<0.01	<0.001	29	2	114	33	0.016
Piezometer PZ188	11/10/2018 11:30	7	<1	<1	7	0.02	0.02	<0.001	<0.05	<0.0001	<1	41	<0.001	0.005	<0.001	206	<0.1	0.06	<0.001	3	0.027	<0.0001	0.012	0.1	5.15	0.04	<1	<0.01	<0.01	<0.001	30	<1	103	100	0.024
Piezometer PZ189	17/04/2018 13:40	35	<1	<1	35	<0.01	0.05	<0.001	<0.05	<0.0001	11	76	<0.001	<0.001	<0.001	373	0.2	20.2	<0.001	10	0.474	<0.0001	0.001	0.05	5.95	0.11	5	<0.01	<0.01	<0.001	32	2	212	44	0.018
Piezometer PZ189	11/10/2018 11:45	34	<1	<1	34	<0.01	0.02	<0.001	<0.05	0.0001	12	114	<0.001	<0.001	<0.001	414	0.2	21.5	<0.001	9	0.549	<0.0001	0.001	0.07	6.11	0.19	4	<0.01	<0.01	<0.001	30	4	244	248	0.052
Piezometer PZ191	17/04/2018 9:30	<1	<1	<1	<1	0.01	0.32	<0.001	<0.05	<0.0001	6	91	<0.001	<0.001	<0.001	381	<0.1	12.2	<0.001	6	0.389	<0.0001	0.002	0.09	4.87	0.35	4	<0.01	<0.01	<0.001	34	<1	186	1930	0.021
Piezometer PZ191	9/10/2018 10:20	<1	<1	<1	<1	0.25	0.62	<0.001	<0.05	0.0001	41	428	0.001	0.005	0.01	1840	0.2	12.5	0.001	31	1.36	<0.0001	0.015	0.1	3.47	0.52	11	<0.01	<0.01	<0.001	136	3	810	709	0.201
Piezometer PZ203	17/04/2018 15:30	12	<1	<1	12	<0.01	<0.01	<0.001	<0.05	<0.0001	4	76	<0.001	0.042	<0.001	361	<0.1	<0.05	<0.001	5	0.225	<0.0001	0.035	0.07	5.91	<0.01	<1	<0.01	<0.01	<0.001	49	15	187	73	0.06
Piezometer PZ203	11/10/2018 9:45	10	<1	<1	10	<0.01	<0.01	<0.001	<0.05	<0.0001	4	66	<0.001	0.048	<0.001	384	<0.1	<0.05	<0.001	6	0.254	<0.0001	0.039	0.13	5.52	0.03	1	<0.01	<0.01	<0.001	53	14	195	249	0.139
Piezometer PZ213	19/04/2018 14:55	43	<1	<1	43	<0.01	0.02	<0.001	<0.05	<0.0001	20	119	<0.001	0.092	<0.001	760	0.1	1.76	<0.001	20	0.737	<0.0001	0.114	0.03	5.33	0.08	5	<0.01	<0.01	<0.001	74	106	467	44	0.037
Piezometer PZ213	10/10/2018 13:40	30	<1	<1	30	<0.01	<0.01	<0.001	<0.05	0.0001	10	120	<0.001	0.1	0.003	506	<0.1	<0.05	<0.001	12	0.43	<0.0001	0.179	0.23	5.99	0.11	4	<0.01	<0.01	<0.001	56	17	274	59	0.112
Piezometer PZ214	19/04/2018 15:20	38	<1	<1	38	<0.01	<0.01	<0.001	<0.05	<0.0001	5	29	<0.001	0.002	0.004	196	<0.1	<0.05	<0.001	5	0.016	<0.0001	0.01	1.01	7.14	<0.01	1	<0.01	<0.01	<0.001	20	5	102	<5	0.025
Piezometer PZ214	10/10/2018 13:20	34	<1	<1	34	<0.01	<0.01	<0.001	<0.05	<0.0001	5	30	<0.001	0.002	0.002	210	<0.1	<0.05	<0.001	5	0.02	<0.0001	0.009	0.93	7.21	<0.01	1	<0.01	<0.01	<0.001	20	3	115	6	0.019

BORE	PZ127 - 43m	PZ127 - 68m	PZ127 - 112m	PZ127 - 141m	PZ128 - 20m	PZ128 - 36m	PZ128 - 55m	PZ129 - 35m	PZ129 - 53m	PZ129 - 74m	PZ130 - 38.5m	PZ130 - 64m
Jan-18	449.13	444.43	395.31	376.46	388.82	375.94	371.61	390.53	383.98	376.85	496.98	472.73
Feb-18	449.07	443.96	392.50	378.02	388.77	375.73	371.37	390.45	384.00	376.54	496.98	472.70
Mar-18	449.10	443.10	385.80	377.50	388.80	375.80	371.80	390.40	385.40	376.40	496.90	472.70
Apr-18	449.13	442.21	383.70	376.68	388.79	375.73	371.67	390.40	385.19	376.36	496.83	472.73
May-18	449.10	441.90	383.80	376.30	388.80	375.60	371.50	390.40	385.80	376.40	496.80	472.70
Jun-18	449.10	441.70	383.80	376.10	388.80	375.60	371.30	390.40	385.10	376.40	496.80	472.70
Jul-18	449.10	441.70	383.80	375.60	388.80	375.50	371.20	390.30	385.00	376.40	496.80	472.70
Aug-18	449.10	441.60	383.80	375.10	388.80	375.40	371.00	390.30	384.60	376.30	496.80	472.70
Sep-18	449.10	441.60	384.00	374.90	388.80	375.30	371.00	390.30	384.70	376.00	496.70	472.60
Oct-18	449.10	441.90	383.80	374.90	388.80	375.20	370.90	390.30	384.90	375.70	496.70	472.60
Nov-18	449.10	441.90	383.70	374.50	388.80	375.10	370.80	390.20	384.80	375.20	496.70	472.50
Dec-18	449.10	441.90	383.60	374.40	388.70	375.00	370.70	390.20	384.60	374.90	496.70	472.60
min	*449.07*	*441.60*	*383.60*	*374.40*	*388.70*	*375.00*	*370.70*	*390.20*	*383.98*	*374.90*	*496.70*	*472.50*
max	*449.13*	*444.43*	*395.31*	*378.02*	*388.82*	*375.94*	*371.80*	*390.53*	*385.80*	*376.85*	*496.98*	*472.73*

BORE	PZ130 - 97m	PZ133 - 31.5m	PZ133 - 43m	PZ133 - 59m	PZ179 - 28m	PZ179 - 33m	PZ179 - 145m	PZ192-68m	PZ192-166m	PZ192-178m	PZ193 - 80m
Jan-18	449.59	425.81	424.34	387.78	413.74	411.57	343.27	404.11	358.41	352.94	418.58
Feb-18	449.56	424.82	423.58	387.80	413.74	411.48	341.89	404.00	358.30	352.80	418.58
Mar-18	449.50	423.10	423.20	387.80	413.80	411.50	341.90	403.80	358.00	352.50	418.50
Apr-18	450.00	422.65	422.51	387.83	413.63	411.48	341.94	403.60	357.40	352.00	418.40
May-18	450.10	421.90	420.50	387.80	413.70	411.50	341.20	403.50	357.50	352.00	418.40
Jun-18	450.00	421.20	418.60	387.80	413.50	411.20	340.00	403.40	357.40	352.10	418.30
Jul-18	450.10	420.90	417.20	387.80	413.80	411.20	338.60	403.30	357.20	352.00	418.30
Aug-18	450.10	420.40	416.00	387.80	413.70	411.20	338.60	403.30	356.80	351.80	418.30
Sep-18	450.10	420.20	415.60	387.80	413.70	411.20	338.60	403.30	356.70	351.70	418.20
Oct-18	450.00	420.20	414.30	387.90	413.80	411.60	338.40	403.30	356.40	351.60	418.20
Nov-18	450.00	419.80	414.10	387.80	414.00	412.30	337.60	403.30	356.20	351.50	418.10
Dec-18	449.90	420.00	413.20	387.80	414.10	412.10	337.30	403.30	356.00	351.30	418.10
min	*449.50*	*419.80*	*413.20*	*387.78*	*413.50*	*411.20*	*337.30*	*403.30*	*356.00*	*351.30*	*418.10*
max	*450.10*	*425.81*	*424.34*	*387.90*	*414.10*	*412.30*	*343.27*	*404.11*	*358.41*	*352.94*	*418.58*

BORE	PZ193 - 162m	PZ193 - 184m
Jan-18	360.20	352.39
Feb-18	360.39	352.30
Mar-18	360.40	352.00
Apr-18	360.00	351.40
May-18	360.00	351.50
Jun-18	360.00	351.40
Jul-18	359.90	351.20
Aug-18	359.90	351.00
Sep-18	359.90	351.00
Oct-18	359.90	350.80
Nov-18	360.00	350.70
Dec-18	359.90	350.60
min	*359.90*	*350.60*
max	*360.40*	*352.39*

BORE	PZ003	PZ39	PZ40B	PZ44	PZ55	PZ58A	PZ101C	PZ101B	PZ102B	PZ102A	PZ103C	PZ103B	PZ103A	PZ104	PZ105C	PZ105B	PZ105A	PZ106B	PZ106A
Jan-18	469.76	416.08	417.37	479.69	423.17	467.44	381.06	367.90	359.25	359.19	399.95		357.81	377.75	375.38	374.82	366.82	495.89	427.23
Feb-18	470.05	416.01	417.25	479.66	423.10	467.39	381.00	367.75	359.26	359.39	400.00		357.76	377.61	375.25	374.61	366.71	495.50	427.34
Mar-18	470.02	412.59	417.08	479.58	423.24	467.40	380.50	366.38	359.35	359.98	400.05		357.67	377.72	375.09	374.60	366.39	495.59	427.41
Apr-18	469.76	415.23	417.34	479.53	423.40	467.60	380.85	367.52	359.79	360.84	400.02		357.74	377.47	374.96	374.38	366.50	494.78	427.45
May-18	469.89	414.25	416.58	479.33	423.30	467.30	380.79	366.88	359.36	359.42	399.85		357.32	376.99	374.75	374.21	366.31	494.67	426.64
Jun-18	470.00	413.60	416.20	479.40	423.20	467.30	380.70	367.10	359.30	359.30	399.90		357.30	376.70	374.60	374.10	366.30	494.30	426.70
Jul-18	469.80	413.40	416.10	479.30	423.30	467.30	380.70	367.00	359.40	359.80	400.00		357.20	376.40	374.50	374.00	366.20	493.90	426.80
Aug-18	469.60	413.40	416.40	479.20	423.20	467.00	380.70	367.00	358.80	358.40	400.00		357.00	376.20	374.50	373.90	366.10	493.60	426.80
Sep-18	469.90	412.60	415.10	479.30	423.20	467.30	380.60	367.00	359.30	359.50	400.00		357.20	375.90	374.40	373.90	366.10	492.10	426.90
Oct-18	469.80	412.50	414.80	479.20	423.10	467.20	380.60	368.90	358.90	359.40	400.00		356.80	375.60	374.40	373.80	366.10	490.50	426.90
Nov-18	469.60	413.00	413.50	479.20	423.10	467.30	380.60	366.80	358.70	358.50	400.00		356.90	375.60	374.30	373.80	366.10	495.60	426.10
Dec-18	469.40	413.10	415.30	479.10	423.40	467.30	380.50	367.00	358.60	358.30	400.10		356.70	375.20	373.90			495.20	426.20
min	*469.40*	*412.50*	*413.50*	*479.10*	*423.10*	*467.00*	*380.50*	*366.38*	*358.60*	*358.30*	*399.85*	*0.00*	*356.70*	*375.20*	*373.90*	*373.80*	*366.10*	*490.50*	*426.10*
max	*470.05*	*416.08*	*417.37*	*479.69*	*423.40*	*467.60*	*381.06*	*368.90*	*359.79*	*360.84*	*400.10*	*0.00*	*357.81*	*377.75*	*375.38*	*374.82*	*366.82*	*495.89*	*427.45*

BORE	PZ107	PZ109	PZ111	PZ112B	PZ137	PZ149	PZ151	PZ152	PZ170	PZ174	PZ175	PZ176	PZ177	PZ184	PZ186	PZ187	PZ188	PZ189
Jan-18	434.24	382.33	371.02	479.92	460.66		374.08	441.10	420.56	416.12	417.48	415.69	415.40	411.01	393.67	412.52	415.20	408.10
Feb-18	434.32	382.37	370.68	479.98	460.70		374.17	441.13	420.37	416.03	417.17	415.65	415.04	410.99	393.24	415.44	415.10	407.93
Mar-18	434.24	382.32	370.80	479.89	460.69	467.62	374.52	441.08	420.29	414.30	417.18	415.61	415.05	410.85	392.92	415.66	415.10	407.92
Apr-18	434.24	382.31	370.50	479.85	460.68		374.35	441.07	420.19	415.27	416.89	415.47	414.80	410.74	391.38	415.56	415.10	406.61
May-18	434.24	382.02	369.83	479.72	460.70		373.81	441.01	420.40	414.46	416.58	415.34	414.65	410.65	388.39	415.22	414.90	403.55
Jun-18	434.30	381.80	369.50	479.70	460.70		373.80	441.00	420.40	413.90	416.40	415.20	414.60	410.60	387.1	414.90	413.70	401.50
Jul-18	434.40	381.80	369.30	479.60	460.70		373.90	441.00	420.30	413.70	416.20	415.20	414.50	410.60	387.1	414.80	414.80	401.70
Aug-18	434.30	381.80	369.00	479.70	460.70	467.60		440.90	420.30	413.50	416.10	415.10		410.50	386.7	414.70	414.70	401.70
Sep-18	434.40	381.60	368.80	479.40	460.70		374.00	441.00	420.20	413.00	415.90	414.90		410.40	386.3	414.60	414.60	401.60
Oct-18		381.80	368.60	479.30	460.70		374.00	441.20	420.20	412.80	415.90	414.90		410.30	386.1	414.50	414.50	401.60
Nov-18		382.30	369.00	479.30	460.70		374.30	440.90	420.10	413.30	415.90	414.70	414.60	410.30	385.80	414.50	414.50	401.50
Dec-18	434.40	382.30	368.20	479.20	460.70	468.30	374.30	440.90	420.10	413.40	415.80	414.70			384.90	414.40	414.40	401.50
min	*434.24*	*381.60*	*368.20*	*479.20*	*460.66*	*467.60*	*373.80*	*440.90*	*420.10*	*412.80*	*415.80*	*414.70*	*414.50*	*410.30*	*384.90*	*412.52*	*413.70*	*401.50*
max	*434.40*	*382.37*	*371.02*	*479.98*	*460.70*	*468.30*	*374.52*	*441.20*	*420.56*	*416.12*	*417.48*	*415.69*	*415.40*	*411.01*	*393.67*	*415.66*	*415.20*	*408.10*

BORE	PZ191	PZ201	PZ202	PZ203	PZ211	PZ213	PZ214
Jan-18	363.91	408.25	408.60	403.01	432.51	414.88	414.75
Feb-18	363.80	408.10	408.57	403.00	432.51	414.82	414.69
Mar-18	362.76	408.23	408.60	402.99	432.51	414.74	415.61
Apr-18	365.43	408.06	407.40	402.92		414.70	414.60
May-18	363.74	407.80	408.54	402.87	432.42	414.60	414.52
Jun-18	363.70	408.00	407.40	402.80		414.50	414.40
Jul-18	363.80	408.10	408.60	402.80		414.30	414.30
Aug-18	364.00	408.00		402.80	432.50	414.30	414.30
Sep-18	364.20	408.10	408.70	402.80		414.20	414.20
Oct-18	363.90	408.00	408.60	402.70		414.00	414.10
Nov-18	364.40		408.40	402.70		413.90	414.00
Dec-18	364.60		408.40	402.80		413.80	413.90
min	*362.76*	*407.80*	*407.40*	*402.70*	*432.42*	*413.80*	*413.90*
max	*365.43*	*408.25*	*408.70*	*403.01*	*432.51*	*414.88*	*415.61*

Gaps in data indicate that no result is available

GROUNDWATER LEVEL GRAPHS

Figure 3-g: Ulan Granite Composite Hydrograph

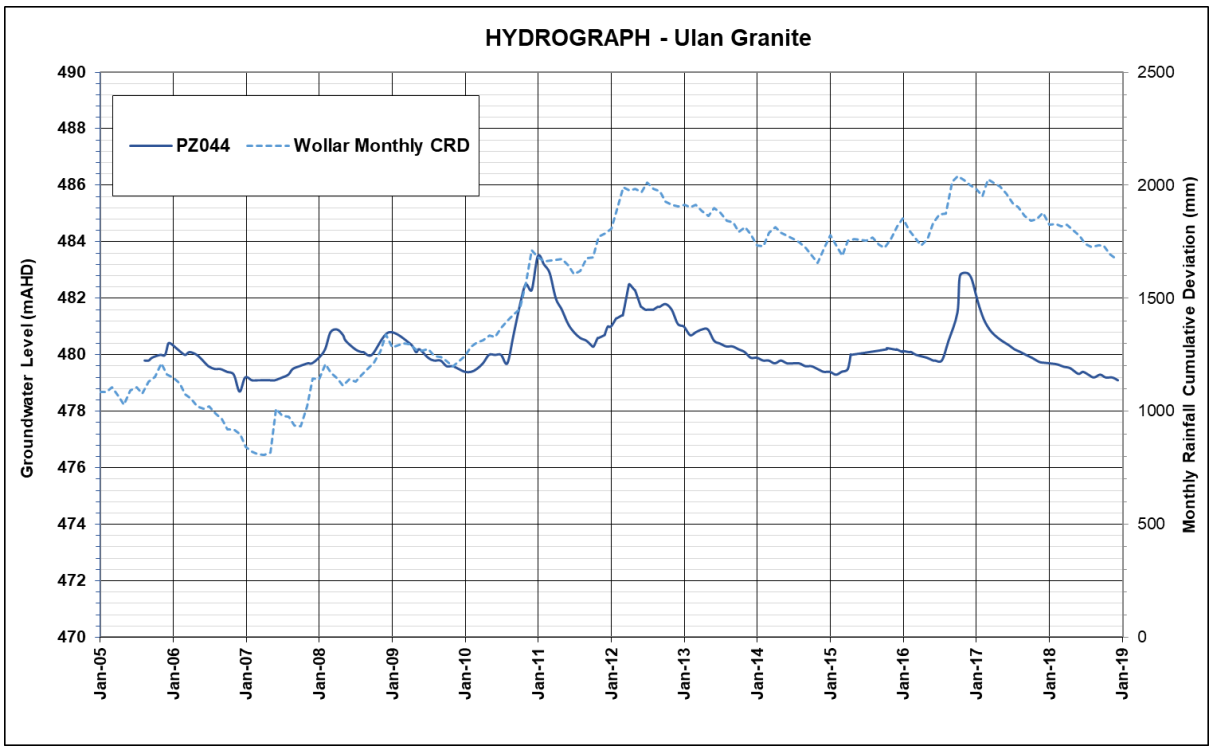


Figure 3-h: Marrangaroo and Ulan Seam Composite Hydrograph

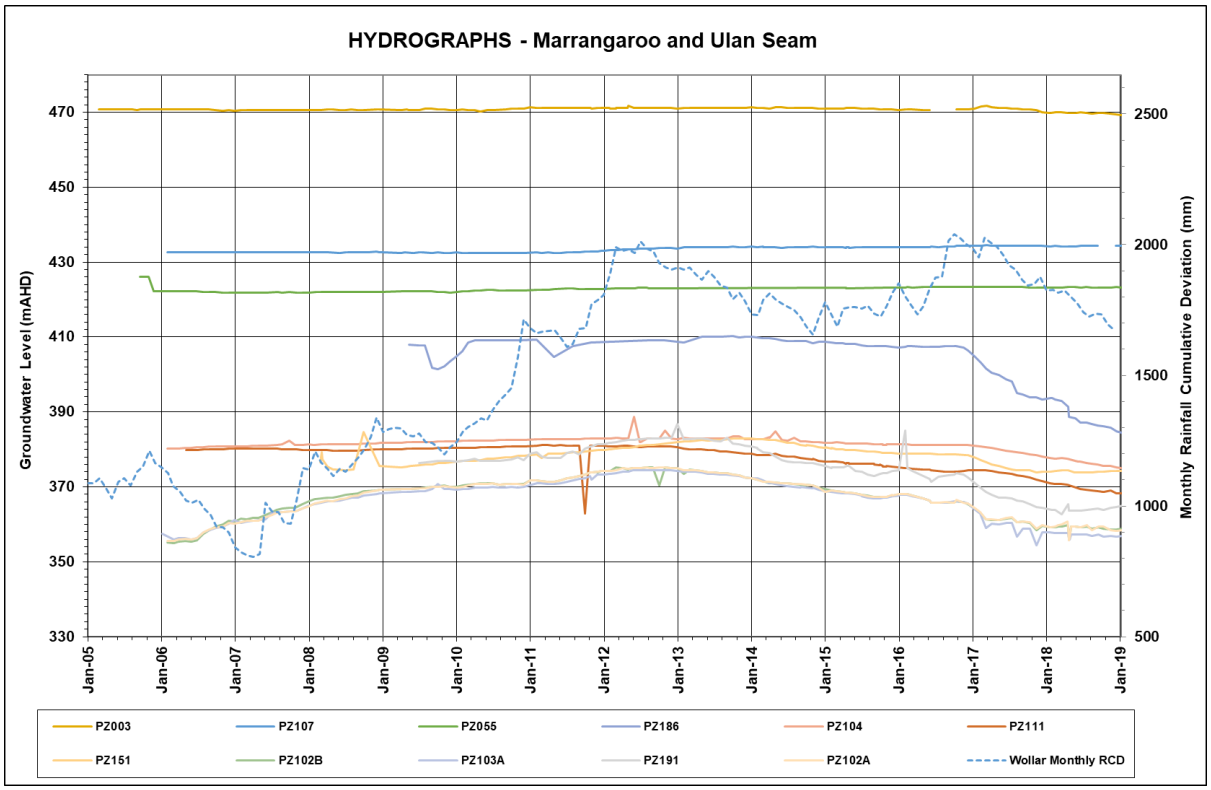


Figure 3-i: Permian Overburden Composite Hydrograph

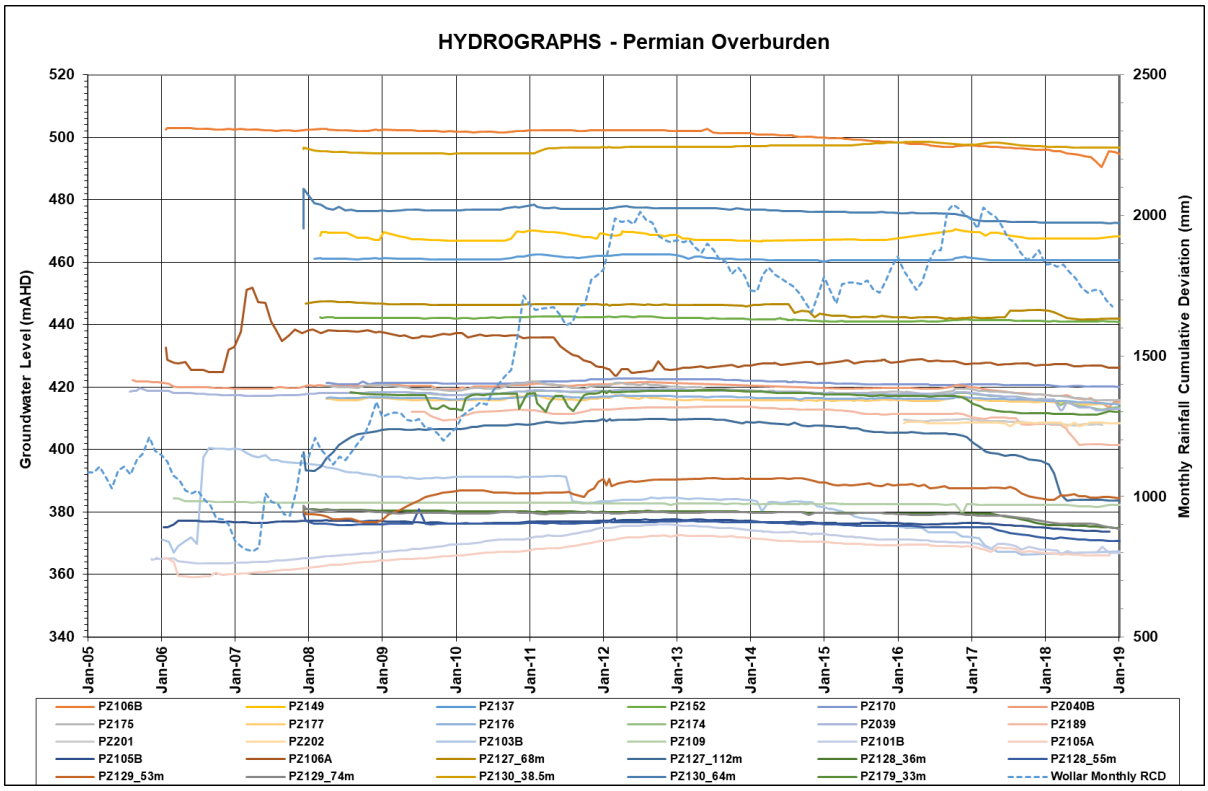


Figure 3-j: Triassic Composite Hydrograph

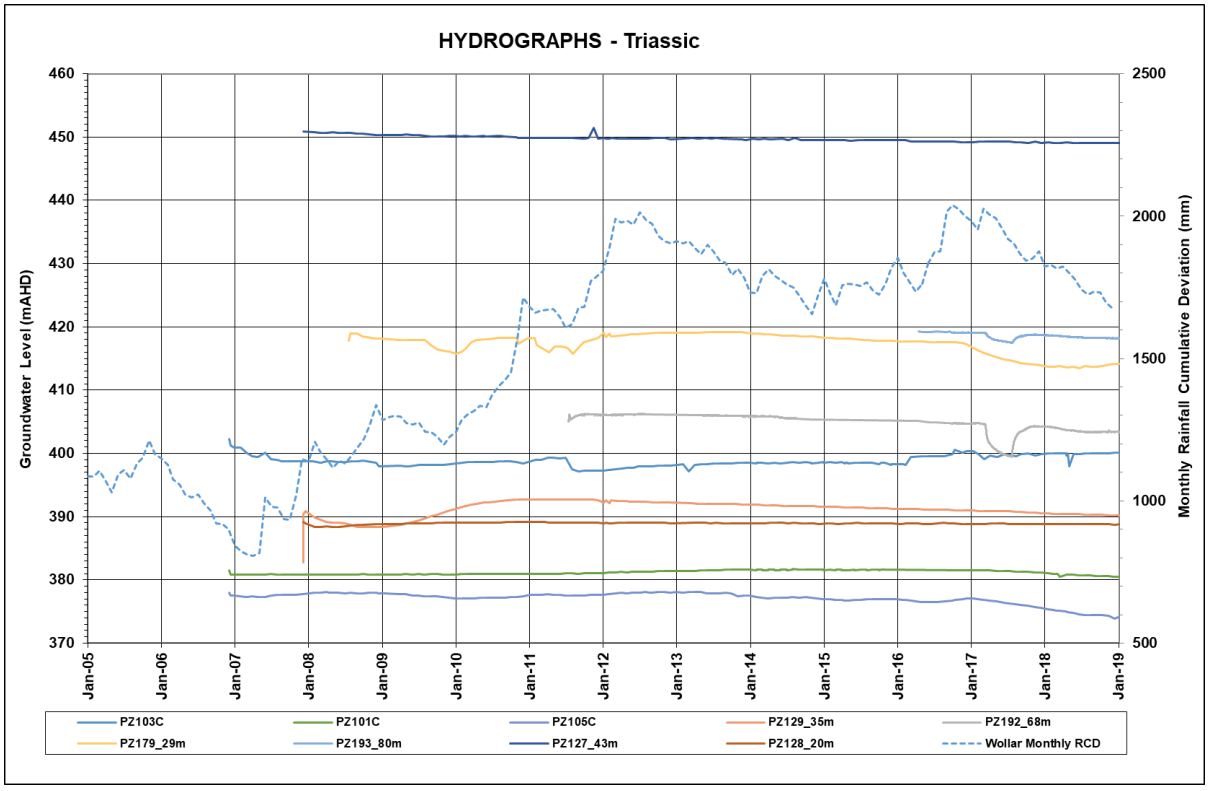
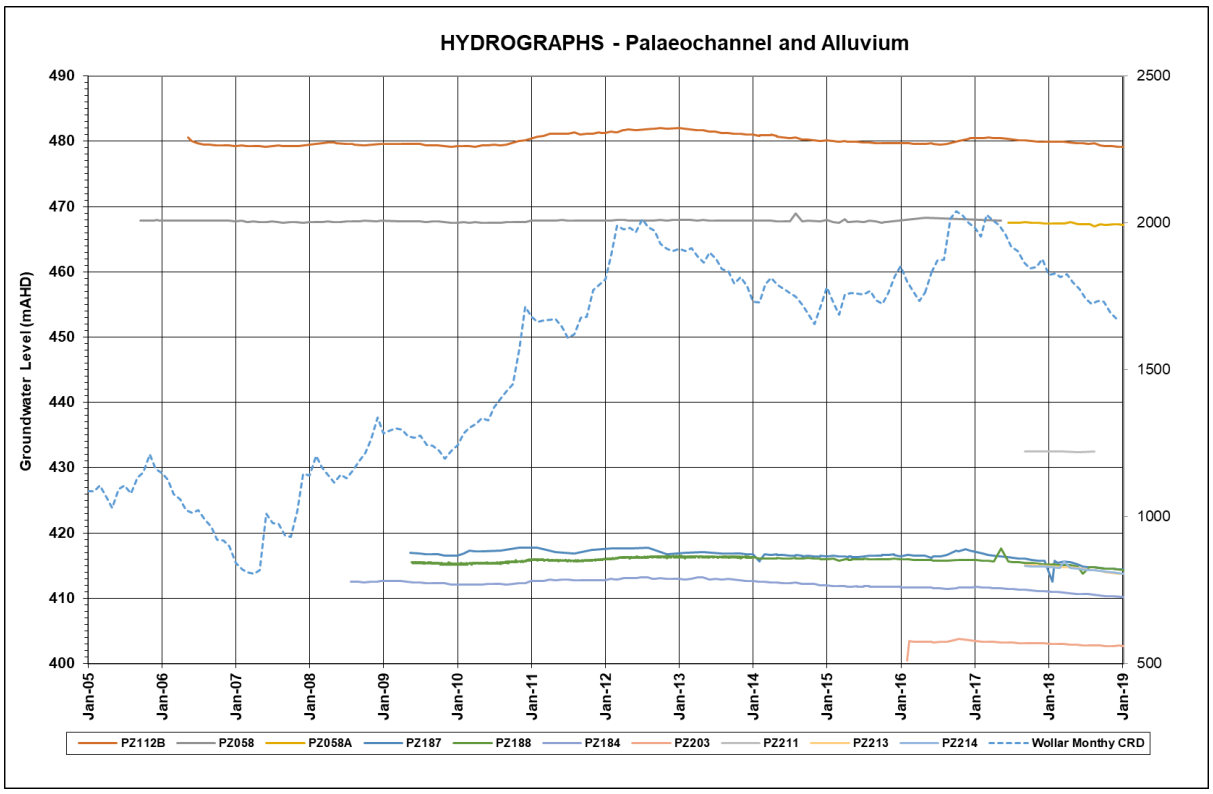


Figure 3-k Alluvium Composite Hydrograph



APPENDIX 4. COMMUNITY COMPLAINTS SUMMARY 2018

Date	Type	Location	Complaint Description
6/01/2018	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Complainant not contacted upon their request.
27/01/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. Caller advised of investigation, results and actions.
27/01/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Complainant not contacted upon their request.
27/01/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made. Caller advised of investigation, results and actions.
28/01/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required. The Complainant was Contacted on 28/01/2018, a message was left.
26/02/2018	Blast	Winchester Crescent	Investigation revealed that no blast was fired by MCO on 26/02/2018.
6/03/2018	Blast	Winchester Crescent	Investigation revealed a blast was fired at MCO on 06/03/18. Overpressure and vibration results within compliance limits.
7/03/2018	Blast	Winchester Crescent	Investigation revealed a blast was fired at MCO on 07/03/18. Overpressure and vibration results within compliance limits.
11/03/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required.
12/03/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required.
19/03/2018	Other	Ridge Road	No action required.
21/03/2018	Blast	Winchester Crescent	Investigation revealed a blast was fired at MCO on 06/03/18. Overpressure and vibration results within compliance limits.
27/03/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
1/04/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required.
3/04/2018	Blast	Winchester Crescent	Investigation revealed that no blast was fired by MCO on 03/04/18.
6/04/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required.
10/04/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
11/04/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
11/04/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. No actions required.
21/04/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
22/04/2018	Blast	Wyaldra Lane	Investigation revealed a blast was fired at MCO on 21/04/18. Overpressure and vibration results within compliance limits.

Date	Type	Location	Complaint Description
25/04/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
6/05/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels. Operational adjustments were made.
25/05/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
25/05/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
2/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
2/06/2018	Blasting (V/O)	Wyaldra Lane	Investigation revealed a blast was fired at MCO on 02/06/18. Overpressure and vibration results within compliance limits.
4/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
6/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
7/06/2018	Blasting (V/O)	Winchester Crescent	Investigation revealed a blast was fired at MCO on 07/06/18. Overpressure and vibration results within compliance limits.
7/06/2018	Blasting (V/O)	Ridge Road	Investigation revealed a blast was fired at MCO on 07/06/18. Overpressure and vibration results within compliance limits.
9/06/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
10/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
10/06/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels.
13/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
24/06/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
26/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
26/06/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
29/06/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
1/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
1/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
1/07/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
1/07/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
2/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.

Date	Type	Location	Complaint Description
3/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
4/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
5/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
10/07/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
22/07/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
22/07/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
2/08/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
2/08/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
10/08/2018	Blasting (V/O)	Ridge Road	Investigation revealed a blast was fired at MCO on 07/06/18. Overpressure and vibration results within compliance limits.
11/08/2018	Noise	Cooyal Lane	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
24/08/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
25/08/2018	Noise	Moolarben Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
27/08/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
24/09/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
26/09/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
7/10/2018	Noise	Ulan Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
27/10/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
11/11/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable Noise levels. Operational adjustments were made.
12/11/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
19/11/2018	Noise	Ridge Road	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.
27/11/2018	Noise	Winchester Crescent	Investigation revealed no unusual mining operations were occurring at the time. Monitoring results indicated acceptable noise levels.

APPENDIX 5. COMMUITY CONTRIBUTIONS

Community Support Program

Beneficiary	Project/Event
Mudgee Triathlon Club	Mudgee Running Festival
Gulgong Public School	Vegetable Garden
Sculptures in the Garden Inc	Sculptures in the Garden
Mudgee Chamber of Commerce	Mudgee Clock Awards
Rylstone Street Feast	Rylstone Street Feast
Gulgong Holtermann Museum	Gulgong Holtermann Museum Project
Mudgee Readers Festival	Mudgee Readers Festival
Henry Lawson Society	Literary Award 1st prize
Watershed Landcare	Green Day
Gulgong Little A's	Purchase Starting Blocks
Cudgegong Camera Club	Photo Competition; Henry Lawson Festival
Mudgee Rotary	Schools m3 Maths Challenge
Gulgong Mens Bowling Club	Gulgong Bowling Tournament
Gulgong Amateur Fishing Club	Restock Goulburn River with native fish stock
Mudgee Mountain Bike Club	Trail Signs & Track Maintenance
Mudgee & Districts Motocycle Club	Facility Hire Fees
Mudgee Public School	Purchase Laptops
Royary Club of Mudgee	Christmas Carols
Ulan Public School	Kitchen Garden Learning Program
Max Potential	Max Potential Program
Gulgong Show Society	Gulgong Show 2019
Lions Club	Christmas Twilight Markets
McGrath Foundation	Rylstone Breast Cancer Ball
The Business Concierge	Survivor Life Skills Program
Mudgee Playgroup	Outdoor Upgrade
Gulgong Chamber of Commerce	Gulgong Mining Festival
Cooyal Tennis Club	Painting of Tennis Club
Lue Public School	School Bus
Galloping Galloways Rugby Club	Toothy Tens Competition

Additional Donations

Beneficiary	Project/Event
Celebrity Classic	Golf Tournament 2018
Coolah Campdraft	Coolah Campdraft 2018
Kanandah Retirement Home	Wattle Café Project
200 Bales	200 Bales Hay Drive
Moolarben Spirit Awards	Spirit Awards 2018
Lifeskills Plus	Mudgee Running Festival Donation
Queensland University of Technology	Cancer and Ageing Research Program (CARP)
Mudgee Aero Club	Wings Wheels and Wine event
University of Wollongong	Mudgee Region Community Scholarship