

Werris Creek Coal Community Consultative Committee

46th Meeting of the Committee to be held on site at the Werris Creek

Coal Mine

9:30am 7th March 2018

AGENDA

The normal quarterly meeting will begin at 9.30am, with a site tour following the meeting (weather conditions permitting).

1. Record of Attendance
 - a. Apologies
2. Declaration of Pecuniary or Other Interests
3. New Matters for Discussion under General Business
4. Minutes of Previous Meeting
5. Matters Arising
 - a. Actions from Previous Meeting
6. Environmental Monitoring Report
7. General Business
 - a. Letter from QWAG to WCC 31st January 2018
 - b. Discussion regarding the frequency of meetings and potential for change
 - c. Request for Mr Peter Wills to attend next meeting as an observer

Copy to: CCC Chairperson
Community Representatives
LPSC
WCC

Werris Creek Coal Community Consultative Committee

MINUTES

46th Meeting of the Committee, 7th March 2018.

Werris Creek Coal (WCC) Community Consultative Committee (CCC) met on site at Werris Creek Coal Mine from 9:30am for the quarterly meeting followed by a pit tour of the mine site, inspecting operations.

Meeting Opened at 9.38am.

1. Record of Attendance:

Present

Lindsay Bridge	Community Representative
Rod Hicks	WCC Operations Manager
Shannon Reid	WCC Site Clerk and Minute Taker
Lynden Cini	WCC Environmental Officer

Noel Taylor	Community Representative
Gae Swain	Independent Chairperson
Col Stewart	Community Representative

Apologies

Virginia Black
Donna Ausling
James O'Brien
Mike Lomax

Moved: Col Stewart Seconded Noel Taylor. Motion carried

2. Declaration of Pecuniary or Other Interests.

Gae Swain has a Son in law working for Whitehaven Coal at Narrabri Underground Mine and a son working at Maules Creek Mine

Lindsay Bridge – Working with government and industry on application of coal dust technology

3. New Matters for Discussion under General Business

- a) Letter from QWAG to WCC 31st January 2018
- b) Discussion regarding the frequency of meetings and potential for change
- c) Request for Mr Peter Wills to attend next meeting as an observer
- d) Noel Taylor - Offsite Irrigation Project update

4. Minutes of Previous Meeting

Moved: Col Stewart Seconded Lindsay Bridge. Motion carried.

5. Matters Arising

None

6. Environmental Monitoring Report

Lynden provided commentary on the report.

Motion to accept the report. Moved: Noel Taylor Seconded Lindsay Bridge. Motion Carried.

7. General Business.

a. Letter from QWAG to WCC 31st January 2018

LC tabled the letter received from QWAG. General discussion from LC regarding the items raised by QWAG. CCC minutes and quarterly reporting data were updated on the website and a response on details pertaining to the new monitoring bores and data provided directly to QWAG.

Moved: Lindsay Bridge Seconded: Col Stewart Motion Carried

b. Discussion regarding the frequency of meetings and potential for change

LC – On review of the CCC Guidelines there is a potential for this committee to consider meeting at a reduced frequency. I would like the committee to consider the potential for meetings be held twice a year, noting that should there be a need, an extra ordinary meeting can be held at any time.

CS – has a concern that by decreasing from four to two meetings 2 that the community may perceive the reduction as trying to hide something. It will be a 6-month gap between receiving information.

NT – What if we decreased to 3 meeting a year so every 4 months instead of every 3 months?

LB – I would like to keep it as is. I like to be kept informed what is happening at the mine. Guided tours help to keep me up to speed with what is happening in the mine so when questioned from people outside the mine I can converse with them. I'm here to help the mine engage with the community.

GS – By going with Noel's suggestion that means we only push the meetings out by one month

NT & LB – Both agree they do not want to go to six monthly meetings.

GS – Does the committee reduce it to three meetings a year being every four months?

CCC agree to the reduction of meetings from every three months to every four months, with the option to hold an extra ordinary meeting if needed.

Moved: Lindsay Bridge Seconded: Noel Taylor Motion carried

c. Request for Mr Peter Wills to attend next meeting as an observer

GS - Reviewed the CCC guidelines – Observers can attend meetings by invitation from a member but can only observe and not participate.

Open discussion on the request.

CS – I question the value an observer would bring given they cannot participate and the potential for a reduction in free speech by members within the committee.

GS – Should members of the community have concern the current committee members can be approached to formally raise issues, and there is opportunity to raise items directly with the committee through by letter should the need arise. This has always been the best approach.

Committee vote.

GS - We acknowledge the request, but have agreed unanimously this is not how our committee operates and respectfully decline the request from Mr Wills.

ACTION for GS - A response will be issued by the Chairperson to Mr Wills advising the committee's decision.

Moved: Col Stewart Seconded: Lindsay Bridge Motion Carried

d. Water off site irrigation

NT – would like to know a bit about the irrigator, when it runs and who pays for it?

LC – The pivot irrigator for Plain View is a 230m centre pivot. Construction was completed in Dec 2017. It is used to move water from VWD1. Since there have been approximately 5 watering's of the current crop, using approximately 4 ML per watering however this varies based on the required application rate. WHC own the infrastructure and pay for costs as required.

Meeting Closed. 10.56am

Next Meeting Scheduled for Wednesday 11th July 2018

Site tour by Lynden.

Copy to:

All Committee members

The minutes will also be posted on the Whitehaven Coal Website

http://www.whitehavencoal.com.au/environment/werris_creek_mine_environmental_management.cfm



WERRIS CREEK COAL PTY LTD

QUARTERLY ENVIRONMENTAL MONITORING REPORT

November, December 2017 and January 2018

This Environmental Monitoring Report covers the period 1st November 2017 to 31st January 2018 for the Werris Creek Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

Note: Elevated monitoring results above the relevant monitoring criteria are highlighted in **yellow**.

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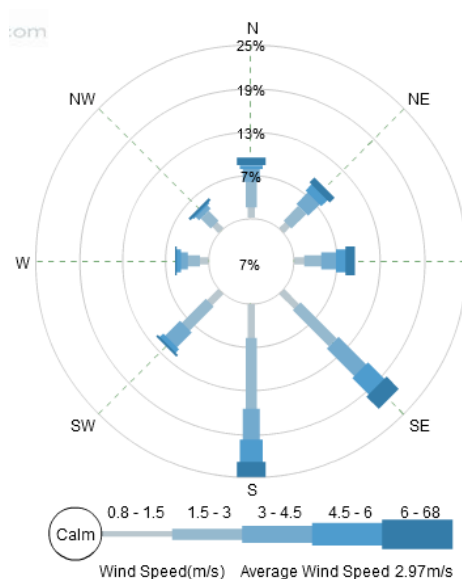
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1.0 METEOROLOGY

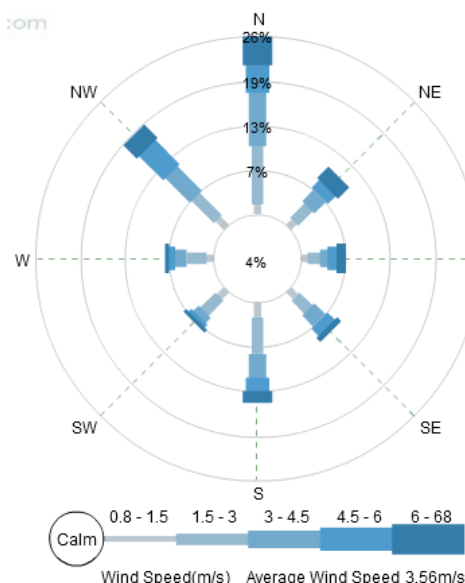
1.1 WEATHER STATION

Werris Creek Coal (WCC) collects meteorological data from the onsite weather station located on the top level of the overburden emplacement. The following table summarises rainfall data for the last three months. Monthly totals throughout the quarter were lower than the historical average. Directional wind data, presented in the wind-rose figures below, indicate the prevailing wind direction was predominantly from the south to southeast in November, north to northwest in December 2017 and south to northeast in January 2018.

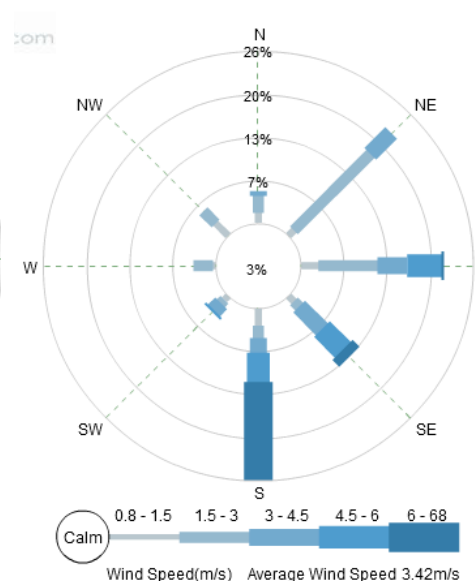
Month	Rainfall (mm)			
	Onsite	Historical Average	2017 Total	2018 Total
November 2017	66	85	503.2	NA
December 2017	68	95.7	571.2	NA
January 2018	27.8	63.8	NA	27.8



November 2017



December 2017



January 2018

2.0 AIR QUALITY

2.1 HVAS (PM₁₀) and TEOM (PM₁₀ & PM_{2.5})

WCC operates five High Volume Air Samplers (HVAS) measuring particulate matter less than 10 micron (PM₁₀) and total suspended particulate (TSP) matter at four sites. HVAS sampling is scheduled every 6 days for a 24-hour run period in accordance with Environment Protection Authority (EPA) guidelines. Results are reported in micro grams per cubic metre (µg/m³) of air sampled. In addition, WCC operates a Tapered Element Oscillating Microbalance (TEOM) monitor in Werris Creek measuring real time PM₁₀ and PM_{2.5} (particulate matter less than 2.5 micron) dust levels. Dust monitoring locations are identified in Figure 1.

2.1.1 Monitoring Data Results

The average results for the last three months are provided in the table below.

Monitor Location	Daily Maximum (µg/m ³)	November 2017 (µg/m ³)	December 2017 (µg/m ³)	January 2018 (µg/m ³)	2017 Average (g/m ² /month)	2018 Average (g/m ² /month)	Criteria (µg/m ³)	
							Annual	Daily
PM _{2.5} – TEOM92 “Werris Creek”	13.2	5.6	7.1	8.1	6.1	8.1	8	25
PM ₁₀ – TEOM92 “Werris Creek”	31.9	10.0	12.3	15.5	10.8	15.5	30	50
PM ₁₀ – HVP20 “Tonsley Park”	27.0	14.5	17.3	15.7	15.0	15.7	30	50
PM ₁₀ – HVP1 “Escott”	20.2	7.7	13.4	13.2	9.2	13.2	30	50
PM ₁₀ – HVP11 “Glenara”	28.2	15.1	21.5	18.6	19.1	18.6	30	50
PM ₁₀ – HVP98 “Kyooma”	36.4	7.5	13.4	11.3	8.7	11.3	30	50
TSP – HVT98 “Kyooma”	36.3	17.1	24.7	22.8	17.4	22.8	90	-

Yellow Bold – Elevated dust level.

2.1.2 Discussion - Compliance / Non Compliance

All TSP, PM₁₀ and PM_{2.5} dust results were within criteria during the period.

2.2 WERRIS CREEK MINE DEPOSITED DUST

Deposited dust monitoring measures particulate matter greater than 30 microns in size that readily settles out of the air related to visual impact. Dust deposition is monitored at 20 locations around WCC. Sampling is scheduled monthly in accordance with EPA guidelines and results are reported as grams per square metre per month (g/m²/month). Dust monitoring locations are identified in **Figure 1**.

2.2.1 Monitoring Data Results

The results for the last three months are provided in the table below.

Monitor Location	November 2017 (g/m ² /month)	December 2017 (g/m ² /month)	January 2018 (g/m ² /month)	2017 Average (g/m ² /month)	2018 Average (g/m ² /month)	Annual Criteria (g/m ² /month)
DG1 "Escott"	0.6	0.5	2.1	0.6	2.1	4.0
DG2 "Cintra"	1.9	1.8	3.5	3.0	3.5	4.0
DG3 "Eurunderee"	0.9	1.2	17.3*	1.6	17.3*	4.0
DG5 "Railway View"	1.8	3.6	3.2	2.3	3.2	4.0
DG9 "Marengo"	0.8	2.3	1.5	1.0	1.5	4.0
DG11 "Glenara"	1.6	0.9	1.2	1.1	1.2	4.0
DG14 "Greenslopes"	0.5	0.7	0.7	0.9	0.7	4.0
DG15 "Plain View"	1.2	0.9	0.7	1.5	0.7	4.0
DG17 "Woodlands"	3.0	4.7c	1.3	1.3	1.3	4.0
DG20 "Tonsley Park"	0.2	1.3	2.1	1.0	2.1	4.0
DG22 "Mountain View"	1.0	0.9	1.4	1.8	1.4	4.0
DG24 "Hazeldene"	0.8	0.6	0.7	1.3	0.7	4.0
DG34 8 Kurrara St	0.3	15.2	2.1	7.1	2.1	4.0
DG62 Werris Creek South	0.3	1.2	0.4	1.0	0.4	4.0
DG92 Werris Creek Centre	0.5	6.8	0.5	1.1	0.5	4.0
DG96 "Talavera"	NS	NS	NS	NA		4.0
DG98 "Kyooma"	0.3	1.6	0.7	0.7	0.7	4.0
DG101 "Westfall"	0.3	0.7	1.3	0.9	1.3	4.0
DG103 West Street	0.4	0.8	1.8	0.7	1.8	4.0

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e. bird droppings and insects); # - indicates sample is contaminated from a Non-Werris Creek Coal dust source; **Yellow Bold** – Elevated dust level; NS – Not Sampled.

2.2.2 Discussion - Compliance / Non Compliance

All monthly dust deposition gauge results were below the annual criteria of 4.0g/m²/month throughout the period with the exception of DG34 (8 Kurrara St) which had a high result in December 2017 and rolling 2017 average above criteria. Consistently high dust levels at this gauge and low deposited dust levels at nearby gauges indicate a localised source of dust generation, unrelated to activities at Werris Creek Coal Mine. DG92 had one anomalous high dust deposition measurement during December 2017 deposited dust levels remained low at nearby gauges, also indicating a localised source of dust, unrelated to activities at Werris Creek Coal Mine.

2.3 QUIRINDI TRAIN DUST DEPOSITION

2.3.1 Monitoring Data Results

The results for the last three months are provided in the table below.

Monitor Location	November 2017		December 2017		January 2018		2017 Average (g/m ² /month)	2018 Average (g/m ² /month)
	g/m ² /month	% Coal	g/m ² /month	% Coal	g/m ² /month	% Coal		
DDW30	1.0	<5%	1.0	5%	1.0	15%	1.3	1.0
DDW20	1.0	<5%	0.8	10%	0.8	10%	0.9	0.8
DDW13	3.1	<5%	1.1	10%	0.8	10%	1.2	0.8
Train Line								
DDE13	1.2	20%	1.3	5%	14.3*	<5%	1.2	N/A
DDE20	1.0	5%	1.4	10%	1.4	10%	0.9	1.4
DDE30	3.0*	<5%	5.0*	<5%	3.0*	10%	1.1	N/A

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e. bird droppings and insects); NS – Not Sampled, bottle and funnel smashed.

2.3.2 Discussion - Compliance / Non Compliance

Overall, the dust fallout levels adjacent to the train line are low, well below the impact assessment criteria nominated by the EPA of 4.0 g/m²/month and comparable to the levels monitored around Werris Creek Coal Mine. Coal contributions to the dust fraction remain generally low.

2.4 AIR QUALITY COMPLAINTS

There were three odour complaints recorded during the period.

3.0 NOISE

3.1 OPERATIONAL NOISE

Monthly attended noise monitoring is undertaken representative of the following 16 properties from 13 monitoring points below. Attended noise monitoring was undertaken twice for either 60 minutes at privately owned properties or 15 minutes at properties with private agreements; representative of the day period and the evening/night period.

3.1.1 Monitoring Data Results

The WCC operations only noise level (not ambient noise) results for the last three months are outlined in the table below. Noise monitoring locations are identified in **Figure 2**.

Tuesday 21st and Wednesday 22nd November 2017

Location		Day dB(A) L _{eq} 15min	Criteria dB(A) L _{eq} 15min	Evening/Night dB(A) L _{eq} 15min	Criteria dB(A) L _{eq} 15min
A	"Rosehill" R5	Inaudible	35	Inaudible#	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	Inaudible#	40
C	Central Quipolly (R10*, R11*)	Inaudible#	40	Inaudible#	40
D	"Hazeldene" R24	Inaudible	37	Inaudible#	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible#	38
F	"Talavera" R96	Inaudible	38	Inaudible#	37
H	"Kyooma" R98	Inaudible	38	Inaudible#	38
I	Kurrara St, WC R57	Inaudible	35	Inaudible#	35
J	Coronation Ave, WC	Inaudible	35	Inaudible#	35
K	Alco Park (R21*)	Inaudible	40	<25#	40
L	West St, WC (R103)	Inaudible	35	27#	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

Tuesday 26th and 27th December 2017

Location		Day dB(A) L _{eq} 15min	Criteria dB(A) L _{eq} 15min	^Evening/Night dB(A) L _{eq} 15min	Criteria dB(A) L _{eq} 15min
A	"Rosehill" R5	Inaudible#	35	22#	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible#	40	21#	40
C	Central Quipolly (R10*, R11*)	NM#	40	<30#	40
D	"Hazeldene" R24	Inaudible#	37	<20#	37
E	"Railway Cottage" R12	Inaudible#	38	NM#	38
F	"Talavera" R96	Inaudible#	38	28#	37
H	"Kyooma" R98	<30#	40	<30#	40
I	Kurrara St, WC R57	Inaudible#	35	Inaudible#	35
J	Coronation Ave, WC	Inaudible#	35	Inaudible#	35
K	Alco Park (R21*)	Inaudible#	40	Inaudible#	40
L	West St, WC (R103)	Inaudible#	35	Inaudible#	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

~~NM~~ Not monitored - Denotes 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

^Multiple evening and night measurement was taken, for reporting purposes the highest reading of the period was used.

Wednesday 24th and Thursday 25th January 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	^Evening/Night dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible	35	NM	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	Inaudible	40
C	Central Quipolly(R10*, R11*)	Inaudible	40	Inaudible#	40
D	"Hazeldene" R24	Inaudible#	37	Inaudible	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible#	38
F	"Talavera" R96	25	38	Inaudible#	37
H	"Kyooma" R98	Inaudible	40	Inaudible#	40
I	Kurrara St, WC R57	Inaudible	35	<30#	35
J	Coronation Ave, WC	Inaudible	35	Inaudible#	35
K	Alco Park (R21*)	Inaudible	40	<30	40
L	West St, WC (R103)	NM#	35	Inaudible#	35

WC – Werris Creek; * – Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

NM₂ Denotes 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

^Multiple evening and night measurement was taken, for reporting purposes the highest reading of the period was used.

3.1.2 Discussion - Compliance / Non Compliance

Noise from Werris Creek Coal Mine was inaudible at a high percentage of the monitoring sites during the quarter. Throughout the period, Werris Creek Coal Mine adjusted mining operations and shut down equipment at various times to reduce noise generation potential in response to noise levels measured at the real time noise monitors.

3.2 Noise complaints

There were no noise complaints recorded during the period.

4.0 BLASTING

During the reporting period there was a total of thirty-two blasts fired by WCC with monitoring of each blast undertaken at "Glenara", "Kyooma", "Werris Creek South" and "Werris Creek Mid". Compliance limits for blasting overpressure is 115dB(L (and up to 120dB(L for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). Blast monitoring locations are identified in **Figure 3**.

4.1 BLAST MONITORING**4.1.1 Monitoring Data Results**

The summary tables of blasting results over the last three months are provided below.

November 2017		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.12	98.6	0.70	100.9	0.35	99.1	0.22	99.7
Monthly Maximum		0.24	107.9	1.60	108.9	0.75	111.6	0.41	111.2
Annual Average		0.12	100.38	0.70	101.02	0.36	98.66	0.22	99.39
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.94%
	Reporting Year	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%

December 2017		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.20	97.7	1.22	96.9	0.40	94.1	0.28	96.8
Monthly Maximum		0.42	105.7	2.26	101.3	0.54	103.0	0.50	106.2
Annual Average		0.13	100.16	0.74	100.68	0.36	98.28	0.22	99.17
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%
	Reporting Year	0.00%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%

January 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.17	97.6	1.00	98.6	0.42	99.6	0.32	98.0
Monthly Maximum		0.36	108.5	1.32	108.3	0.68	105.3	0.55	107.9
Annual Average		0.17	97.64	1.00	98.57	0.42	99.56	0.32	97.99
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	1.40%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%
	Reporting Year	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Yellow – overpressure >115dB(L) or Werris Creek vibration >5.0mm/s.

4.1.2 Discussion - Compliance / Non Compliance

All blasts over the period complied with maximum licence limits (120dB(L) and 10mm/s) as well as the 95th percentile limits (115dB(L) and 5mm/s).

4.2 BLAST COMPLAINTS

There were two blast complaints during the period.

5.0 WATER

The groundwater monitoring program monitors groundwater levels bi-monthly and groundwater quality six monthly. Surface water monitoring is undertaken quarterly.

5.1 GROUND WATER

Groundwater monitoring is undertaken to identify if there are any impacts on groundwater quality and water levels as a result of the mining operations. WCC monitors approximately 38 groundwater wells/bores and piezometers in the key aquifers surrounding WCC including Werrie Basalt (next to WCC and further afield) and Quipolly Creek Alluvium. Groundwater level surveys were completed on the 3, 6, 7 and 9 November 2017 and 5, 8 and 9 January 2018. Groundwater monitoring locations are identified in **Figure 4**.

5.1.1 Monitoring Data Results

A summary of groundwater monitoring results has been provided below.

Site		November-17	
		mbgl	%
Werrie Basalt near WCC	MW1	Dry	
	MW2	44.53	-8%
	MW3	19.35	0%
	MW4B	16.42	-1%
	MW5	12.18	-1%
	MW6	15.81	-2%
	MW27*	49.88	-1%
	MW36A	23.69	-2%
	MW36B	23.65	-2%
	MW8*	17.66	-2%
Werrie Basalt	MW10	12.31	7%
	MW14	19.51	-2%
	MW17B*	12.76	-2%
	MW19A*	12.77	-3%
	MW20*	21.8	-1%
	MW38A	14.33	-3%
	MW38B*	9.86	-1%
	MW38C*	22.81	-2%
	MW38E*	10.20	-2%
	MW41	8.49	-3%
	MW43	7.34	-4%
	MW24A*	15.1	-29%
	MW29*	13.02	-2%
	MW12*	12.19	-2%
Quipolly Alluvium	MW13*	6.79	-4%
	MW13B*	5.12	-5%
	MW13D*	5.1	-4%
	MW15*	6.26	-3%
	MW16*	7.35	-3%
	MW17A*	6.44	-4%
	MW18A*	6.25	-3%
	MW21A*	10.15	-2%
	MW22A*	7.48	-4%
	MW22B*	7.79	-3%
	MW23A*	4.07	-4%
	MW23B*	4.25	-4%
	MW26B*	8.96	-3%
	MW28A*	13.94	-5%
	MW32*	4.03	0%
	MW40	8.58	-4%
	MW42	7.23	-4%
#2	MW34*	11.06	-2%

Site		January-18	
		mbgl	%
Werrie Basalt near WCC	MW1	Dry	
	MW2	44.87	-1%
	MW3	19.41	0%
	MW4B	16.81	-2%
	MW5	12.29	-1%
	MW6	15.83	0%
	MW27*	50.80	-2%
	MW36A	23.54	1%
	MW36B	23.48	1%
	MW8*	18.28	-3%
Werrie Basalt	MW10	13.64	-10%
	MW14	18.6	5%
	MW17B*	12.49	2%
	MW19A*	13.26	-4%
	MW20*	21.85	0%
	MW38A	14.57	-2%
	MW38B*	9.96	-1%
	MW38C*	23.16	-2%
	MW38E*	10.44	-2%
	MW41	8.75	-3%
	MW43	7.57	-3%
	MW24A*	15.41	-2%
	MW29*	13.25	-2%
	MW12*	Dry	
Quipolly Alluvium	MW13*	6.99	-3%
	MW13B*	5.37	-5%
	MW13D*	5.48	-7%
	MW15*	6.56	-5%
	MW16*	7.61	-3%
	MW17A*	6.7	-4%
	MW18A*	6.55	-5%
	MW21A*	10.47	-3%
	MW22A*	7.80	-4%
	MW22B*	Dry	
	MW23A*	4.19	-3%
	MW23B*	No access	
	MW26B*	9.05	-1%
	MW28A*	14.56	-4%
	MW32*	4.15	-3%
	MW40	8.78	-2%
	MW42	7.45	-3%
#2	MW34*	11.45	-3%

mbgl – meters below ground level is the distance in meters from top of bore to groundwater surface; **Orange** – Change decrease; **Green** – change increase or no change; * - Indicates bore is used for water extraction unrelated to WCC (i.e. stock and domestic or irrigation). #¹ – Werrie Basalt in the Black Soil Gully valley to east of Werris Creek Mine. #² - Werris Creek Alluvium.

5.1.2 Discussion - Compliance / Non Compliance

Measured groundwater levels in the Werrie Basalt and Quipolly Alluvium aquifer indicate general sustained or decreased water levels during November 2017 and January 2018 with the exception of increases in depth at MW10 in November and MW36A, MW36B, MW14 and MW17B in January 2018.

5.2 SURFACE WATER

Surface water monitoring is undertaken in local creeks offsite as well as from discharge point dirty water dams to monitor for potential water quality issues. Quarterly surface water monitoring was undertaken on the 22nd November and 4th December 2017. Surface water monitoring locations are identified in **Figure 5**.

5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results has been provided below.

Site	pH	EC	TSS	O&G	Change from Previous Quarter or General Comments
ONSITE					
SB2	Dry	Dry	Dry	Dry	Dry. Grass on bottom of dam.
SB9	Dry	Dry	Dry	Dry	Dry. Grass on bottom of dam.
SB10	Dry	Dry	Dry	Dry	Dry.
OFFSITE					
QCU	Dry	Dry	Dry	Dry	Dry. Wet gravel
QCD	7.9	1047	10	<5	pH slightly decreased and EC slightly increased, TSS was stable and O&G unchanged. Flowing slowly.
WCU	Dry	Dry	Dry	Dry	Dry
WCD	8.0	1295	22	<5	pH and EC slightly decreased, TSS increased from 14 to 22 and O&G unchanged. Flowing slowly.

pH – measure of acidity/alkalinity; EC – Electrical Conductivity measures salinity; TSS – Total Suspended Solids is a measure of suspended sediment in water (i.e. similar to turbidity); O&G – Oil and Grease measures amount of hydrocarbons (oils and fuels) in water

5.2.2 Discussion - Compliance / Non Compliance

Quarterly surface water monitoring was undertaken on 22nd November and 4th December 2017 with all onsite and offsite sampling undertaken in dry conditions represented by low or dry pools, which reflected on water quality. All water quality results were within long-term averages and the Site Water Management Plan trigger values.

5.3 SURFACE WATER DISCHARGES

There were no discharge events in November, December 2017 and January 2018.

5.3 WATER COMPLAINTS

There were no water release complaints during the period.

6.0 COMPLAINTS SUMMARY

There were 5 complaints received during the period, which are summarised below.

#	Date	Issue	Complaint	Investigation	Action Taken
562	5/12/2017	Odour	Complainant advised they could detect a smell of burning coal.	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place. EO offered to provide a site tour and further discuss management practices.	Complainant was content with EO response.
563	12/12/2017	Blast	Complainant advised they felt the blast at their residence.	EO confirmed a blast had taken place at 2.30pm and all monitoring data was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
564	12/12/2017	Blast	Complainant advised they felt the blast at their residence.	EO confirmed a blast had taken place at 2.30pm and all monitoring data was within compliance limits.	Complainant was content with EO response.
565	21/12/2017	Odour	Complainant advised they could detect an odour at their residence	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place.	Complainant was content with EO response.
566	2/01/2018	Odour	Complainant advised they could detect an odour at their residence	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place.	Complainant was content with EO response.

7.0 GENERAL

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

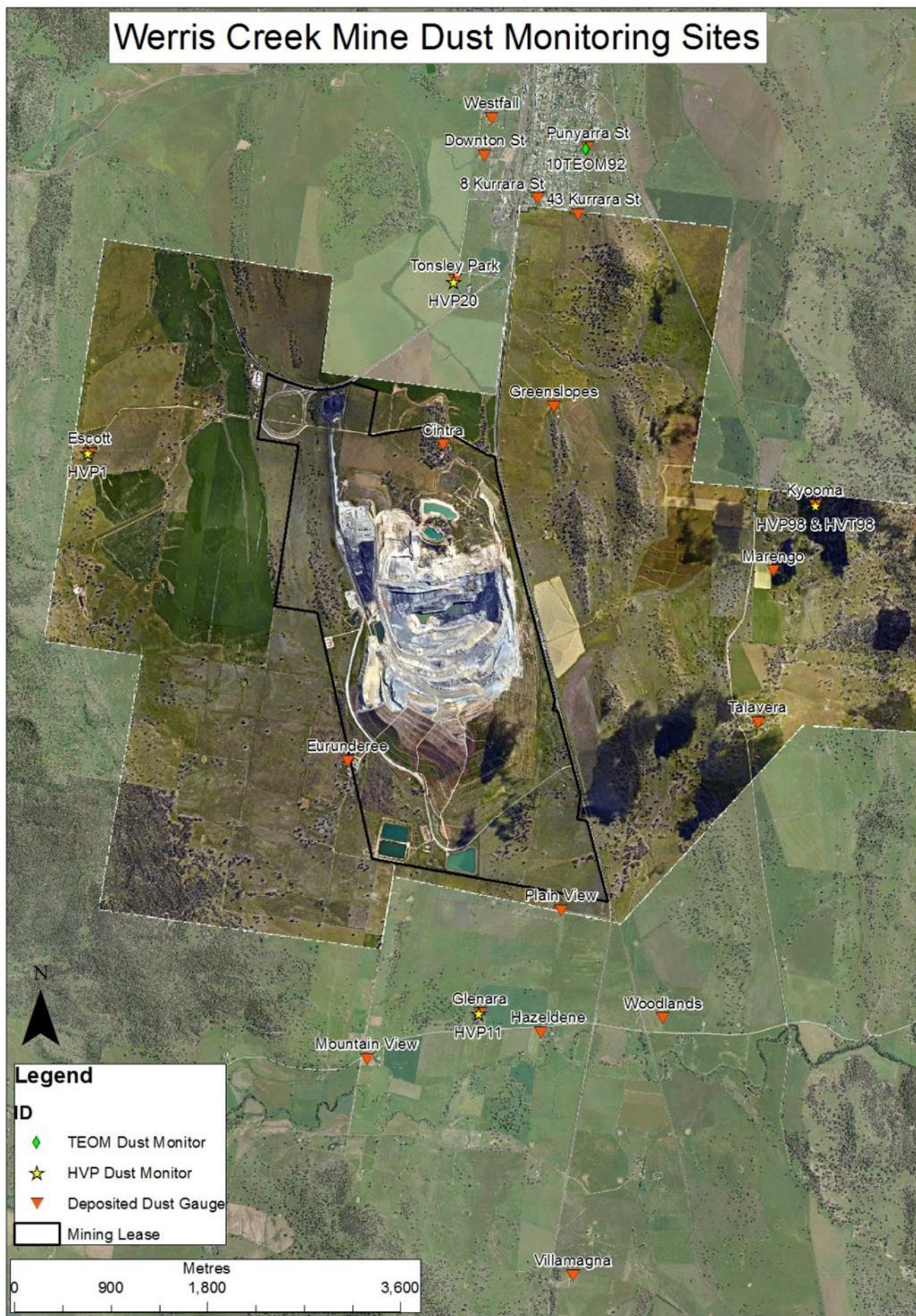


Figure 1 – WCC Dust Monitoring Locations



Figure 2 – WCC Noise Monitoring Locations

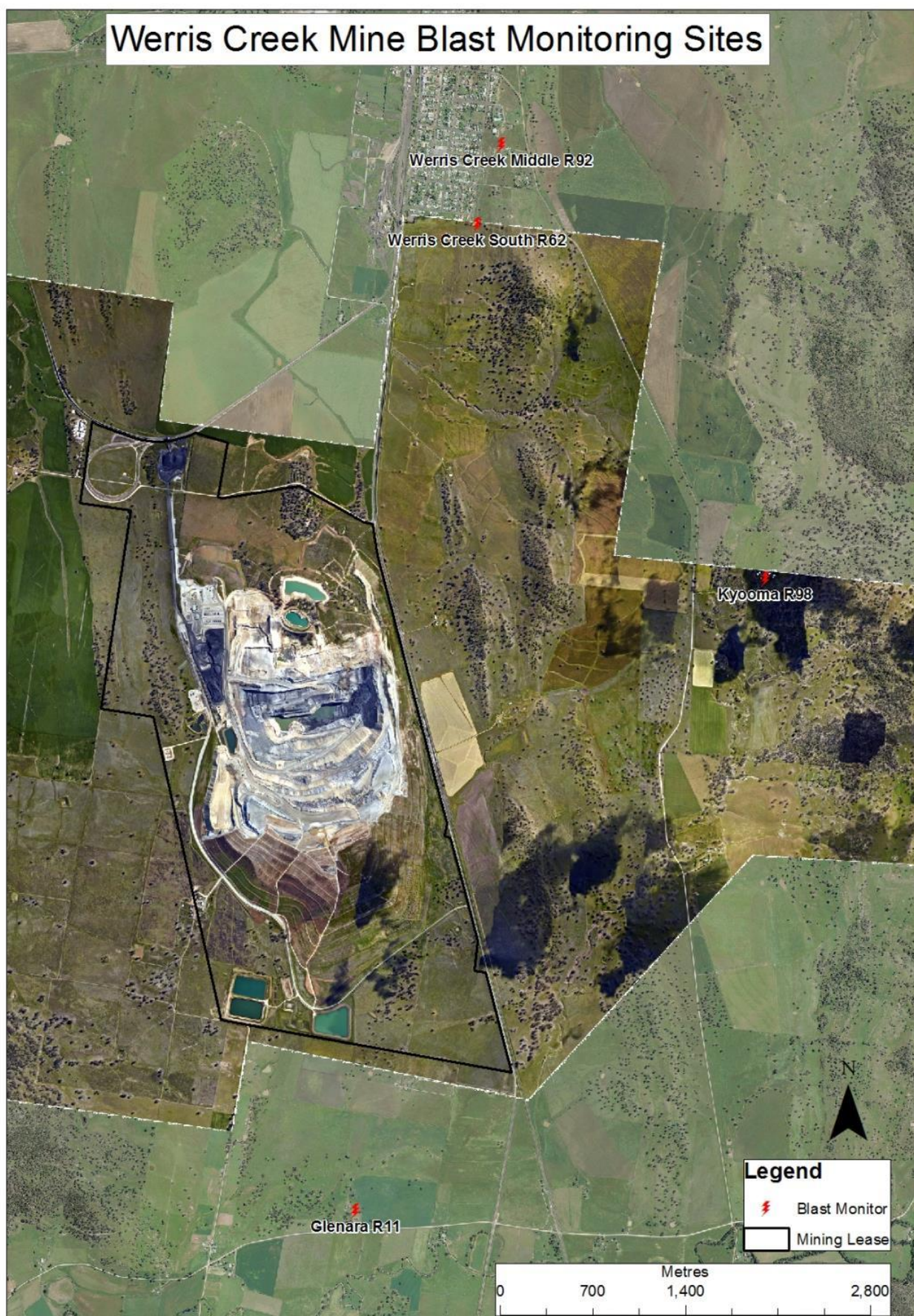


Figure 3 – WCC Blast Monitoring Locations

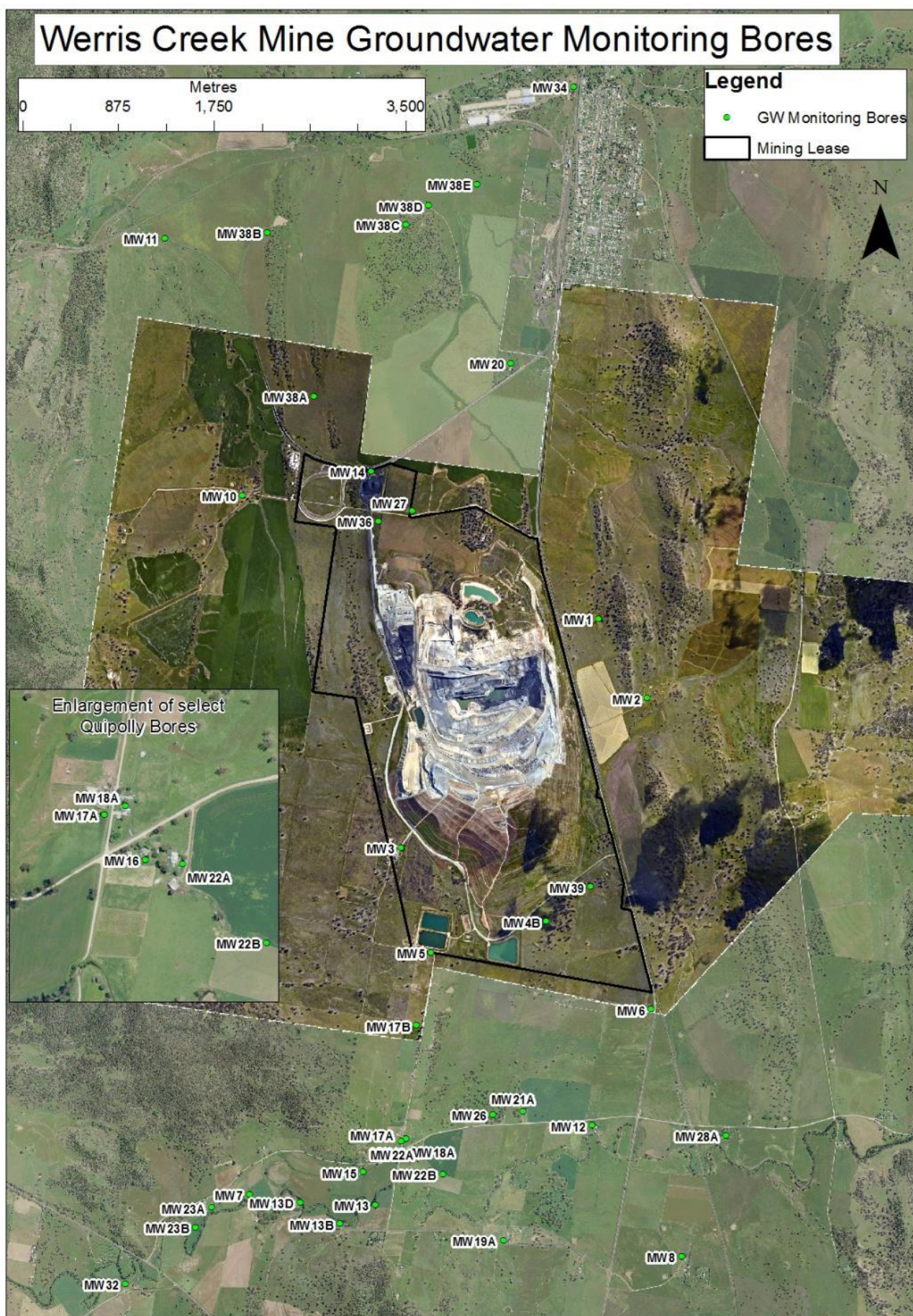


Figure 4 – WCC Groundwater Monitoring Locations



Figure 5 – WCC Surface Water Monitoring Locations



WERRIS CREEK COAL PTY LTD

QUARTERLY ENVIRONMENTAL MONITORING REPORT

February, March, April and May 2018

This Environmental Monitoring Report covers the period 1st February 2018 to 31st May 2018 for the Werris Creek Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

Note: Elevated monitoring results above the relevant monitoring criteria are highlighted in **yellow**.

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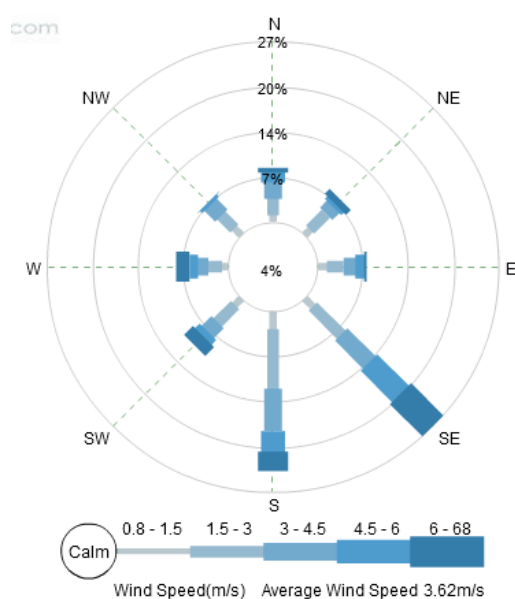
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1.0 METEOROLOGY

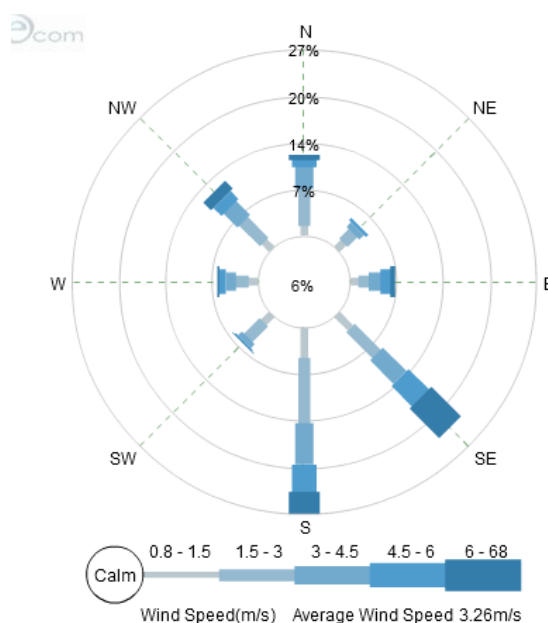
1.1 WEATHER STATION

Werris Creek Coal (WCC) collects meteorological data from the onsite weather station located on the top level of the overburden emplacement. The following table summarises rainfall data for the last four months. Monthly totals over the four months were lower than the historical average. Directional wind data, presented in the wind-rose figures below, indicate the prevailing wind direction was predominantly from the south in May and the south to southeast during February, March and April 2018.

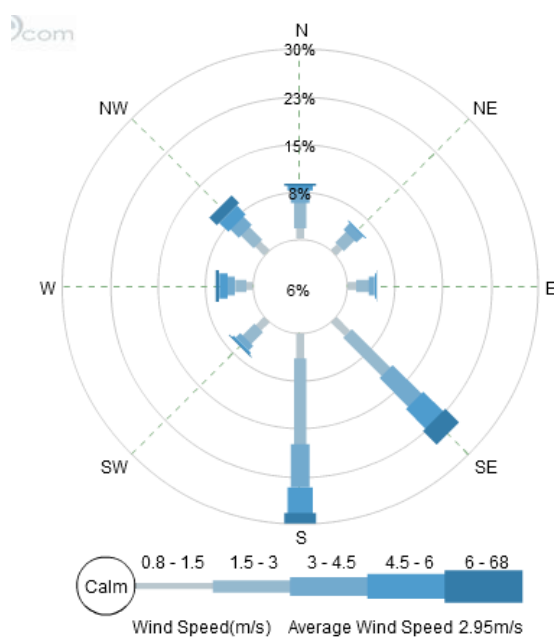
Month	Rainfall (mm)		
	Onsite	Historical Average	2018 Total
February 2018	45.2	69.0	73.0
March 2018	50.8	52.7	123.8
April 2018	14.4	30.8	138.2
May 2018	3.4	31.9	141.6



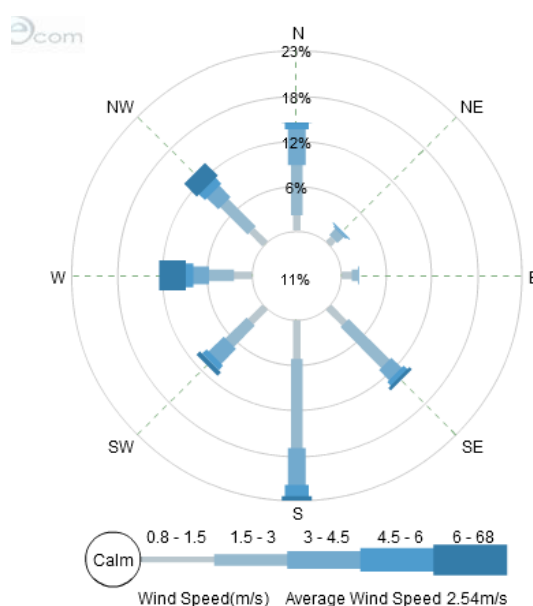
February 2018



March 2018



April 2018



May 2018

2.0 AIR QUALITY

2.1 HVAS (PM₁₀) and TEOM (PM₁₀ & PM_{2.5})

WCC operates five High Volume Air Samplers (HVAS) measuring particulate matter less than 10 micron (PM₁₀) and total suspended particulate (TSP) matter at four sites. HVAS sampling is scheduled every 6 days for a 24-hour run period in accordance with Environment Protection Authority (EPA) guidelines. Results are reported in micro grams per cubic metre (µg/m³) of air sampled. In addition, WCC operates a Tapered Element Oscillating Microbalance (TEOM) monitor in Werris Creek measuring real time PM₁₀ and PM_{2.5} (particulate matter less than 2.5 micron) dust levels. Dust monitoring locations are identified in **Figure 1**.

2.1.1 Monitoring Data Results

The average results for the last four months are provided in the table below.

Monitor Location	Daily Maximum (µg/m ³)	February 2018 (µg/m ³)	March 2018 (µg/m ³)	April 2018 (µg/m ³)	May 2018 (µg/m ³)	2018 Average (g/m ² /month)	Criteria (µg/m ³)	
							Annual	Daily
PM _{2.5} – TEOM92 “Werris Creek”		3.4	4.3	5.3	9.2	6.1	8	25
PM ₁₀ – TEOM92 “Werris Creek”		12.1	11.9	15.2	19.3	14.8	30	50
PM ₁₀ – HVP20 “Tonsley Park”		20.9	18.6	18.0	20.0	18.6	30	50
PM ₁₀ – HVP1 “Escott”		17.0	15.0	12.3	9.9	13.7	30	50
PM ₁₀ – HVP11 “Glenara”		31.4	23.6	23.8	22.8	24.0	30	50
PM ₁₀ – HVP98 “Kyooma”		20.5	12.5	12.2	11.8	13.7	30	50
TSP – HVT98 “Kyooma”		70.9	23.9	30.8	33.2	36.3	90	-

Yellow Bold – Elevated dust level.

2.1.2 Discussion - Compliance / Non Compliance

All TSP, PM₁₀ and PM_{2.5} dust results were within criteria during the period with the exception of two PM₁₀ results measured at “HVP11 “Glenara””, on the 18th February 2018 and “TEOM92 “Werris Creek””, on the 15 April 2018.

2.2 WERRIS CREEK MINE DEPOSITED DUST

Deposited dust monitoring measures particulate matter greater than 30 microns in size that readily settles out of the air related to visual impact. Dust deposition is monitored at 20 locations around WCC. Sampling is scheduled monthly in accordance with EPA guidelines and results are reported as grams per square metre per month (g/m²/month). Dust monitoring locations are identified in **Figure 1**.

2.2.1 Monitoring Data Results

The results for the last four months are provided in the table below.

Monitor Location	February 2018 (g/m ² /month)	March 2018 (g/m ² /month)	April 2018 (g/m ² /month)	May 2018 (g/m ² /month)	2018 Average (g/m ² /month)	Annual Criteria (g/m ² /month)
DG1 “Escott”	0.8	1.6	1.2	0.2	1.2	4.0
DG2 “Cintra”	2.6	3.2	6.7	4.3	4.1	4.0
DG3 “Eurunderee”	1.2	1.2	2.0	0.9	1.3	4.0
DG5 “Railway View”	1.8	1.8	3.1	1.9	2.4	4.0
DG9 “Marengo”	4.3	2.1	1.3	0.4	1.9	4.0
DG11 “Glenara”	1.3	1.6	1.6	0.7	1.3	4.0
DG14 “Greenslopes”	1.3	1.3	1.0	0.6	1.0	4.0
DG15 “Plain View”	0.9	2.3	1.0	0.5	1.1	4.0
DG17 “Woodlands”	1.3	1.0	1.5	0.3	1.1	4.0
DG20 “Tonsley Park”	0.6	1.2	1.8	0.1	1.2	4.0
DG22 “Mountain View”	1.5	1.1	2.3	0.5	1.4	4.0
DG24 “Hazeldene”	0.7	0.7	2.8	0.9	1.2	4.0
DG34 8 Kurrara St	0.5	0.4	11.1	0.4	2.9	4.0
DG62 Werris Creek South	0.3	0.4	0.5	0.4	0.4	4.0
DG92 Werris Creek Centre	0.3	0.5	0.5	0.4	0.4	4.0
DG96 “Talavera”	NS	NS	NS	NS	NA	4.0
DG98 “Kyooma”	0.5	0.5	0.5	0.4	0.5	4.0
DG101 “Westfall”	0.3	1.0	0.1	0.4	0.6	4.0
DG103 West Street	0.8	1.1	1.1	0.5	1.1	4.0

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e. bird droppings and insects); # - indicates sample is contaminated from a Non-Werris Creek Coal dust source; **Yellow Bold** – Elevated dust level; NS – Not Sampled.

2.2.2 Discussion - Compliance / Non Compliance

All monthly dust deposition gauge results were below the annual criteria of 4.0g/m²/month throughout the period with the exception of DG2 (Cintra) which had high results in April and May 2018 and a rolling average above criteria.

DG9 in February 2018 and DG34 in April had one anomalous high dust deposition measurement, deposited dust levels remained low at nearby gauges, also indicating a localised source of dust, unrelated to activities at Werris Creek Coal Mine.

2.3 QUIRINDI TRAIN DUST DEPOSITION

2.3.1 Monitoring Data Results

The results for the last three months are provided in the table below.

Monitor Location	February 2018		March 2018		April 2018		May 2018		2018 Average (g/m ² /month)
	g/m ² /month	% Coal	g/m ² /month	% Coal	g/m ² /month	% Coal	g/m ² /month	% Coal	
DDW30	1.0	10%	0.8	10%	1.1	5%	0.9	15%	1.0
DDW20	2.5	20%	1.0	25%	1.8	20%	0.8	30%	1.4
DDW13	1.2	10%	1.8	15%	1.2	10%	0.8	25%	1.2
Train Line									
DDE13	3.7*	10%	2.1	5%	0.9	10%	0.6	15%	1.2
DDE20	1.6	10%	1.2	10%	5.4	5%	0.8	10%	2.1
DDE30	5.1*	10%	5.3*	10%	2.4	5%	0.4	10%	1.4

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e. bird droppings and insects); NS – Not Sampled, bottle and funnel smashed.

2.3.2 Discussion - Compliance / Non Compliance

Overall, the dust fallout levels adjacent to the train line are low, well below the impact assessment criteria nominated by the EPA of 4.0 g/m²/month and comparable to the levels monitored around Werris Creek Coal Mine. Coal contributions to the dust fraction remain generally low.

2.4 AIR QUALITY COMPLAINTS

There were two dust complaints recorded during the period.

3.0 NOISE

3.1 OPERATIONAL NOISE

Monthly attended noise monitoring is undertaken representative of the following 16 properties from 13 monitoring points below. Attended noise monitoring was undertaken twice for either 60 minutes at privately owned properties or 15 minutes at properties with private agreements; representative of the day period and the evening/night period.

3.1.1 Monitoring Data Results

The WCC operations only noise level (not ambient noise) results for the last three months are outlined in the table below. Noise monitoring locations are identified in **Figure 2**.

Monday 14th and Tuesday 15th February 2018

Location		Day dB(A) L _{eq} 15min	Criteria dB(A) L _{eq} 15min	Evening/Night dB(A) L _{eq} 15min	Criteria dB(A) L _{eq} 15min
A	"Rosehill" R5	Inaudible#	35	Inaudible#	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible#	40	NM#	40
C	Central Quipolly (R10*, R11*)	Inaudible#	40	<25#	40
D	"Hazeldene" R24	Inaudible	37	NM#	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible	38
F	"Talavera" R96	Inaudible#	38	<30	37
H	"Kyooma" R98	Inaudible#	38	32	38
I	Kurrara St, WC R57	Inaudible	35	Inaudible	35

J	Coronation Ave, WC	Inaudible#	35	Inaudible#	35
K	Alco Park (R21*)	NM	40	31#	40
L	West St, WC (R103)	Inaudible	35	<30#	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) $L_{eq\ 15min}$ while R9 is 37 dB(A) $L_{eq\ 15min}$

NM- Denotes 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

^Multiple evening and night measurement was taken, for reporting purposes the highest reading of the period was used.

Monday 19th and Tuesday 20th March 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	^Evening/Night dB(A) $L_{eq\ 15min}$	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible	35	Inaudible	35
B	West Quipolly (R7*, R8*, R9* & R22*)	26	40	Inaudible	40
C	Central Quipolly (R10*, R11*)	Inaudible	40	Inaudible	40
D	"Hazeldene" R24	Inaudible	37	Inaudible	37
E	"Railway Cottage" R12	Inaudible	38	<25	38
F	"Talavera" R96	Inaudible	38	<25	37
H	"Kyooma" R98	<20	40	<30	40
I	Kurrara St, WC R57	Inaudible	35	<30	35
J	Coronation Ave, WC	Inaudible	35	<25	35
K	Alco Park (R21*)	<25	40	<30	40
L	West St, WC (R103)	Inaudible	35	<30	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) $L_{eq\ 15min}$ while R9 is 37 dB(A) $L_{eq\ 15min}$

NM- Denotes 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

^Multiple evening and night measurement was taken, for reporting purposes the highest reading of the period was used.

Thursday 26th and Friday 27th April 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	^Evening/Night dB(A) $L_{eq\ 15min}$	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible	35	Inaudible	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	Inaudible	40
C	Central Quipolly (R10*, R11*)	Inaudible	40	Inaudible	40
D	"Hazeldene" R24	Inaudible	37	Inaudible	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible	38
F	"Talavera" R96	Inaudible	38	Inaudible	37
H	"Kyooma" R98	Inaudible	40	20	40
I	Kurrara St, WC R57	Inaudible	35	<20	35
J	Coronation Ave, WC	Inaudible	35	<20	35
K	Alco Park (R21*)	<20	40	28	40
L	West St, WC (R103)	<20	35	<20	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) $L_{eq\ 15min}$ while R9 is 37 dB(A) $L_{eq\ 15min}$

NM- Denotes 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

^Multiple evening and night measurement was taken, for reporting purposes the highest reading of the period was used.

Thursday 28th May 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	^Evening/Night dB(A) $L_{eq\ 15min}$	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible	35	Inaudible	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	Inaudible	40
C	Central Quipolly (R10*, R11*)	Inaudible	40	Inaudible	40
D	"Hazeldene" R24	Inaudible	37	Inaudible	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible	38
F	"Talavera" R96	<25	38	Inaudible	37
H	"Kyooma" R98	Inaudible	40	Inaudible	40
I	Kurrara St, WC R57	<25	35	<25	35
J	Coronation Ave, WC	Inaudible	35	Inaudible	35
K	Alco Park (R21*)	Inaudible	40	29	40
L	West St, WC (R103)	Inaudible	35	Inaudible	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) $L_{eq\ 15min}$ while R9 is 37 dB(A) $L_{eq\ 15min}$

NM- Denotes 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

^Multiple evening and night measurement was taken, for reporting purposes the highest reading of the period was used.

3.1.2 Discussion - Compliance / Non Compliance

Noise from Werris Creek Coal Mine was inaudible at a high percentage of the monitoring sites during the quarter. Throughout the period, Werris Creek Coal Mine adjusted mining operations and shut down equipment at various times to reduce noise generation potential in response to noise levels measured at the real time noise monitors.

3.2 Noise complaints

There were no noise complaints recorded during the period.

4.0 BLASTING

During the reporting period there was a total of forty-one blasts fired by WCC with monitoring of each blast undertaken at "Glenara", "Kyooma", "Werris Creek South" and "Werris Creek Mid". Compliance limits for blasting overpressure is 115dB(L) (and up to 120dB(L) for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). Blast monitoring locations are identified in **Figure 3**.

4.1 BLAST MONITORING

4.1.1 Monitoring Data Results

The summary tables of blasting results over the last four months are provided below.

February 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.10	98.4	0.82	101.2	0.26	101.5	0.19	103.4
Monthly Maximum		0.19	114.5	1.45	112.3	0.48	106.4	0.40	117.2
Annual Average		0.13	98.00	0.91	99.87	0.34	100.53	0.25	100.68
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	1.54%	0.00%	0.00%	0.00%	0.00%	0.00%	2.31%
	Reporting Year	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.56%

March 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.10	99.75	0.56	98.96	0.26	99.92	0.20	98.53
Monthly Maximum		0.22	109.00	1.04	106.10	0.53	104.40	0.37	103.00
Annual Average		0.12	98.58	0.79	99.57	0.31	100.33	0.24	99.96
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	1.57%	0.00%	0.00%	0.00%	0.00%	0.00%	1.57%
	Reporting Year	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.45%

April 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.09	101.52	0.58	99.61	0.24	98.31	0.16	98.73
Monthly Maximum		0.18	110.40	1.50	105.80	0.42	103.50	0.30	102.50
Annual Average		0.11	99.32	0.74	99.58	0.29	99.82	0.22	99.66
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	1.56%
	Reporting Year	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.63%

May 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.09	99.32	0.61	100.98	0.29	98.38	0.20	95.23
Monthly Maximum		0.24	120.40	1.95	120.20	0.78	110.10	0.53	114.10

May 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Annual Average		0.11	99.32	0.71	99.86	0.29	99.53	0.21	98.77
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	3.23%	0.00%	0.81%	0.00%	0.00%	0.00%	1.61%
	Reporting Year	0.00%	3.92%	0.00%	1.96%	0.00%	0.00%	0.00%	1.96%

Yellow – overpressure >115dB(L) or Werris Creek vibration >5.0mm/s.

4.1.2 Discussion - Compliance / Non Compliance

All blasts over the period complied with maximum licence limits of 10mm/s) as well as the 95th percentile limits 5mm/s. However one blast was above the maximum licence limits for overpressure (120dB(L) at Glenara R11 and Kyooma R98 on the 4 May 2018. This over pressure exceedance was reported to the departments and the landholders. The blast was internally investigated and appropriate remedial actions implemented.

4.2 BLAST COMPLAINTS

There were ten blast complaints during the period.

5.0 WATER

The groundwater monitoring program monitors groundwater levels bi-monthly and groundwater quality six monthly. Surface water monitoring is undertaken quarterly.

5.1 GROUND WATER

Groundwater monitoring is undertaken to identify if there are any impacts on groundwater quality and water levels as a result of the mining operations. WCC monitors approximately 43 groundwater wells/bores and piezometers in the key aquifers surrounding WCC including Werrie Basalt (next to WCC and further afield) and Quipolly Creek Alluvium. Groundwater level surveys were completed on the 8, 13, 14, 15, 19 and March 23 2018 and 3, 4 and 7 May 2018. Groundwater monitoring locations are identified in **Figure 4**.

5.1.1 Monitoring Data Results

A summary of groundwater monitoring results has been provided below.

Site		March-18	
		mbgl	%
Werrie Basalt near WCC	MW1	Dry	
	MW2	58.97	-24%
	MW3	19.57	-1%
	MW4B	17.08	-2%
	MW5	12.48	-2%
	MW6	15.82	0%
	MW27*	56.47	-10%
	MW36A	20.89	13%
	MW36B	20.75	13%
Werrie Basalt	MW8*	18.73	-2%
	MW10	13.93	-2%
	MW14	15.69	19%
	MW17B*	13.25	-6%
	MW19A*	0	
	MW20*	21.85	0%
	MW38A	14.26	2%
	MW38B*	10.09	-1%
	MW38C*	23.61	-2%
	MW38E*	10.75	-3%
	MW41	9.03	-3%
	MW43	7.84	-3%
#1	MW24A*	15.51	-1%
	MW29*	13.49	-2%
Quipolly Alluvium	MW12*	Dry	
	MW13*	7.27	-4%
	MW13B*	5.65	-5%
	MW13D*	5.67	-3%
	MW15*	6.81	-4%
	MW16*	Dry	
	MW17A*	7.02	-5%
	MW18A*	6.88	-5%
	MW21A*	10.8	-3%
	MW22A*	8.47	-8%
	MW22B*	Dry	
	MW23A*	4.31	-3%
	MW23B*	4.36	
	MW26B*	9.37	-3%
	MW28A*	15.17	-4%
	MW32*	4.2	-1%
	MW40	9.06	-3%
	MW42	7.72	-3%
#2	MW34*	11.67	-2%

Site		May-18	
		mbgl	%
Werrie Basalt near WCC	MW1	Dry	
	MW2	47.51	24%
	MW3	19.68	-1%
	MW4B	17.37	-2%
	MW5	12.68	-2%
	MW6	16.17	-2%
	MW27*	56.11	1%
	MW36A	19.77	6%
	MW36B	19.79	5%
Werrie Basalt	MW8*	19.17	-2%
	MW10	14.18	-2%
	MW14	14.8	6%
	MW17B*	14.06	-6%
	MW19A*	14.15	
	MW20*	22.06	-1%
	MW38A	13.44	6%
	MW38B*	10.22	-1%
	MW38C*	23.73	-1%
	MW38E*	10.84	-1%
	MW41	9.27	-3%
	MW43	8.06	-3%
#1	MW24A*	17.07	-9%
	MW29*	15.83	-15%
Quipolly Alluvium	MW12*	Dry	
	MW13*	7.79	-7%
	MW13B*	5.78	-2%
	MW13D*	5.68	0%
	MW15*	No access	
	MW16*	Dry	
	MW17A*	7.18	-2%
	MW18A*	7.03	-2%
	MW21A*	11.03	-2%
	MW22A*	Dry	
	MW22B*	Dry	
	MW23A*	4.39	-2%
	MW23B*	4.71	-7%
	MW26B*	9.59	-2%
	MW28A*	15.68	-3%
	MW32*	4.25	-1%
	MW40	9.30	-3%
	MW42	7.95	-3%
#2	MW34*	11.95	-2%

mbgl – meters below ground level is the distance in meters from top of bore to groundwater surface; **Orange** – Change decrease; **Green** – change increase or no change; * - Indicates bore is used for water extraction unrelated to WCC (i.e. stock and domestic or irrigation). #¹ – Werrie Basalt in the Black Soil Gully valley to east of Werris Creek Mine. #² - Werris Creek Alluvium.

5.1.2 Discussion - Compliance / Non Compliance

Measured groundwater levels in the Werrie Basalt and Quipolly Alluvium aquifer indicate an overall general decreased in water levels across the majority of monitoring bores during March 2018 and May 2018.

5.2 SURFACE WATER

Surface water monitoring is undertaken in local creeks offsite as well as from discharge point dirty water dams to monitor for potential water quality issues. Quarterly surface water monitoring was undertaken on the 22nd January, 8th February 2018 and 14th May 2018. Surface water monitoring locations are identified in **Figure 5**.

5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results has been provided below.

22nd January 2018 and 8th February 2018

Site	pH	EC	TSS	O&G	Change from Previous Quarter or General Comments
ONSITE					
SB2	Dry	Dry	Dry	Dry	Dry.
SB9	Dry	Dry	Dry	Dry	Dry. Grass on bottom of dam.
SB10	Dry	Dry	Dry	Dry	Dry.
OFFSITE					
QCU	Dry	Dry	Dry	Dry	Dry.
QCD	8.2	1240	14	<5	pH and EC slightly increased, TSS was stable and O&G unchanged. Pools.
WCU	Dry	Dry	Dry	Dry	Dry
WCD	8.3	1440	27	<5	pH and EC slightly increased, TSS increased from 22 to 27 and O&G unchanged. Pools.

pH – measure of acidity/alkalinity; EC – Electrical Conductivity measures salinity; TSS – Total Suspended Solids is a measure of suspended sediment in water (i.e. similar to turbidity); O&G – Oil and Grease measures amount of hydrocarbons (oils and fuels) in water

14 May 2018

Site	pH	EC	TSS	O&G	Change from Previous Quarter or General Comments
ONSITE					
SB2	Dry	Dry	Dry	Dry	Dry.
SB9	Dry	Dry	Dry	Dry	Dry.
SB10	Dry	Dry	Dry	Dry	Dry.
OFFSITE					
QCU	Dry	Dry	Dry	Dry	Dry. Gravel bed.
QCD	8.1	1137	<5	<5	pH, TSS and O&G generally unchanged. EC decreased slightly. Flowing gently.
WCU	Dry	Dry	Dry	Dry	Dry
WCD	8.6	1310	12	<5	pH, TSS and O&G generally unchanged. EC decreased slightly. Pools.

pH – measure of acidity/alkalinity; EC – Electrical Conductivity measures salinity; TSS – Total Suspended Solids is a measure of suspended sediment in water (i.e. similar to turbidity); O&G – Oil and Grease measures amount of hydrocarbons (oils and fuels) in water

5.2.2 Discussion - Compliance / Non Compliance

Quarterly surface water monitoring was undertaken on 22nd January and 5th February and the 14th May 2018 with all onsite and offsite sampling undertaken in dry conditions represented by low or dry pools, which reflected on water quality. All water quality results were within long-term averages and the Site Water Management Plan trigger values.

5.3 SURFACE WATER DISCHARGES

There were no sediment dam discharge events in February, March, April and May 2018.

5.3 WATER COMPLAINTS

There was one water complaint during the period.

6.0 COMPLAINTS SUMMARY

There were seven complaints received during the period, which are summarised below.

#	Date	Issue	Complaint	Investigation	Action Taken
567	6/02/2018	Vibration	Complainant advised that he could feel vibration from blast.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
568	6/02/2018	Blast	Complainant advised the EPA that they could feel vibration from the blast.	WCC provided an Event Report to the EPA detailing the risk assessment for the blast and the results of environmental monitoring conducted during the blast.	None required.
569	8/02/2018	Blast	Complainant advised that they felt the blast at their residence and that there was dust from the blast.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
570	8/02/2018	Blast	Complainant wanted to know why there was a large, dense 'cloud' following the blast this morning and what it contained.	EO responded to complainant providing evidence of a complaint blast via email. The blast occurred at surface level making the resultant dust cloud more visible than normal. EO also advised that no fume was visually detected and the dust cloud was expected to only contain overburden material.	Complainant was content with EO response.
571	12/02/2018	Dust	Complainant left a voice mail message on the EO phone advising they had viewed a large dust haze over the operation.	EO returned the phone call and advised that normal dust suppression techniques were in place.	Follow-up call to complainant. Complainant was happy with EO response.
572	12/02/2018	Water	Complainant spoke to the EO on the phone about their previous complaint regarding dust and advised he wished to make an additional complaint about the water evaporators. Complainant wished to advise that they felt the evaporators were inappropriate while the surrounding area was experiencing drought conditions.	EO advised that approval had been granted to supply irrigation water offsite and that an irrigation trial was underway at the Plainview property.	Complainant was content with EO response.
573	18/03/2018	Dust	Complainant advised they could identify dust coming from the mine.	EO returned the phone call and advised that standard dust suppression techniques were in place. However, should dust issue be observed, the OCE will shutdown problematic operational areas as required.	Complainant was content with EO response.
574	22/03/2018	Blast	Complainant advised they felt the blast at their residence.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
575	24/03/2018	Odour	Complainant advised they could detect an odour at their residence	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place.	Complainant was content with EO response.
576	4/06/2018	Odour	Complainant advised they could detect an odour at their residence	EO followed up with complainant, requesting an opportunity to discuss management in place.	Complainant did not respond to follow up actions
577	27/04/2018	Blast	Complainant advised they felt the blast at their residence.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
578	4/05/2018	Blast	Complainant advised they felt the blast at their residence.	EO advised blast had occurred and was currently under investigation.	EO followed up with the complainant to confirm the blast result had exceeded the overpressure limit and had been self reported to the relevant Departments. Advised the internal investigation to the cause was ongoing.

579	4/05/2018	Blast	Complainant advised they felt the blast at their residence.	EO advised blast had occurred and was currently under investigation.	EO followed up with the complainant to confirm the blast result had exceeded the overpressure limit and had been self reported to the relevant Departments. Advised the internal investigation to the cause was ongoing.
560	5/05/2018	Blast	Complainant advised they felt the blast at their residence.	EO advised blast had occurred and was currently under investigation.	EO followed up with the complainant to confirm the blast result had exceeded the overpressure limit and had been self reported to the relevant Departments. Advised the internal investigation to the cause was ongoing.
561	21/05/2018	Blast	Complainant advised they felt the blast at their residence.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.

7.0 GENERAL

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

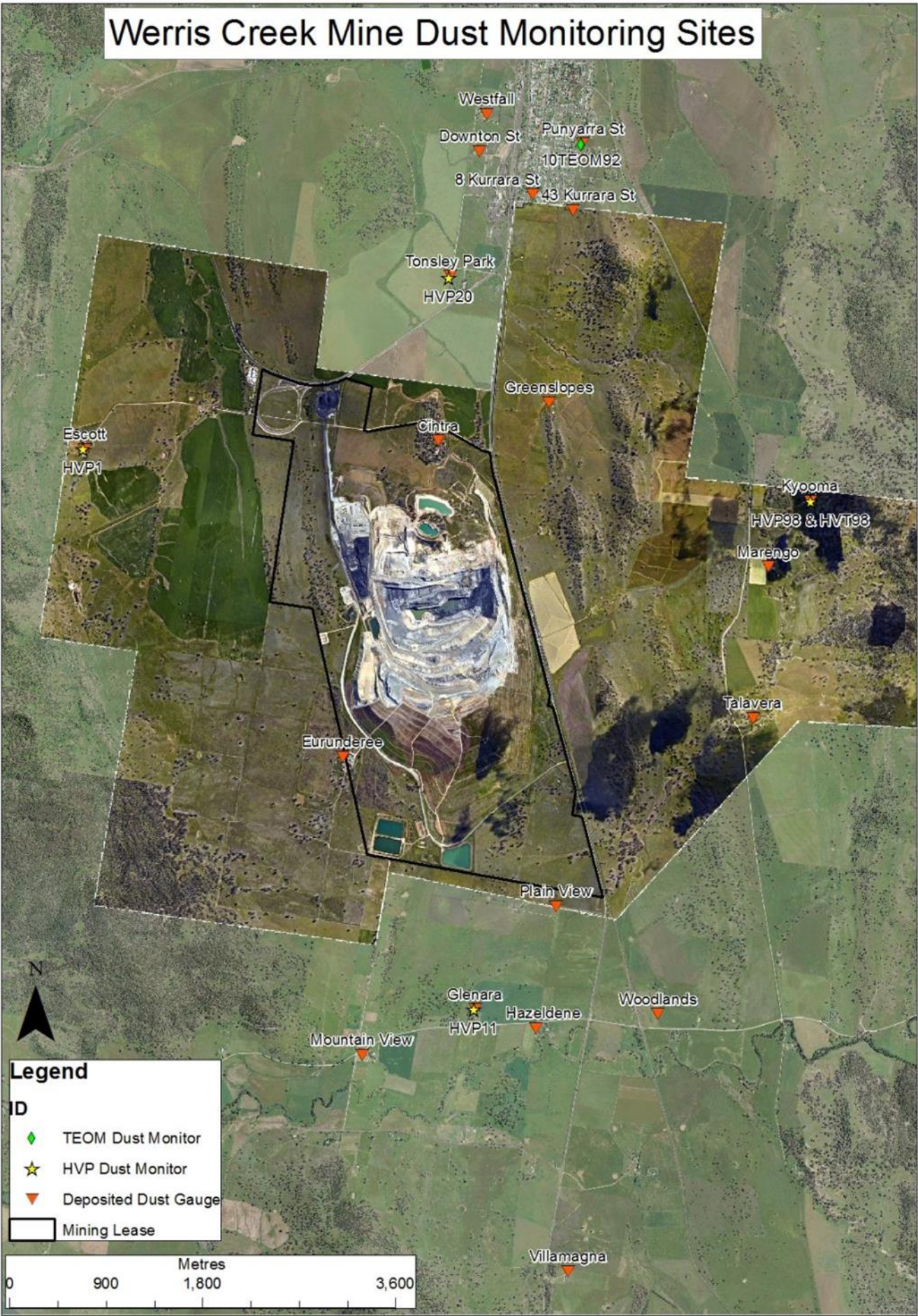


Figure 1 – WCC Dust Monitoring Locations



Figure 2 – WCC Noise Monitoring Locations

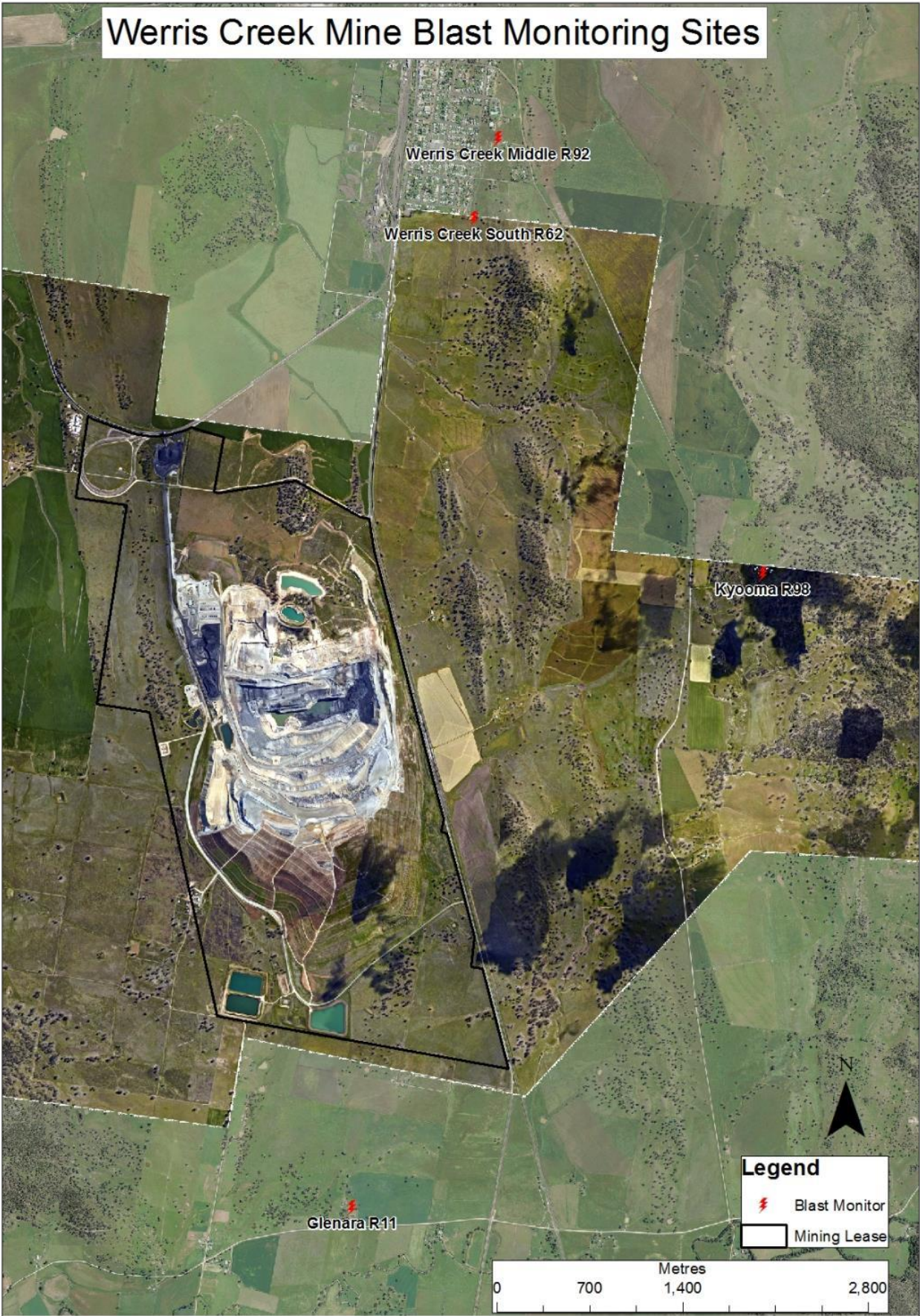


Figure 3 – WCC Blast Monitoring Locations

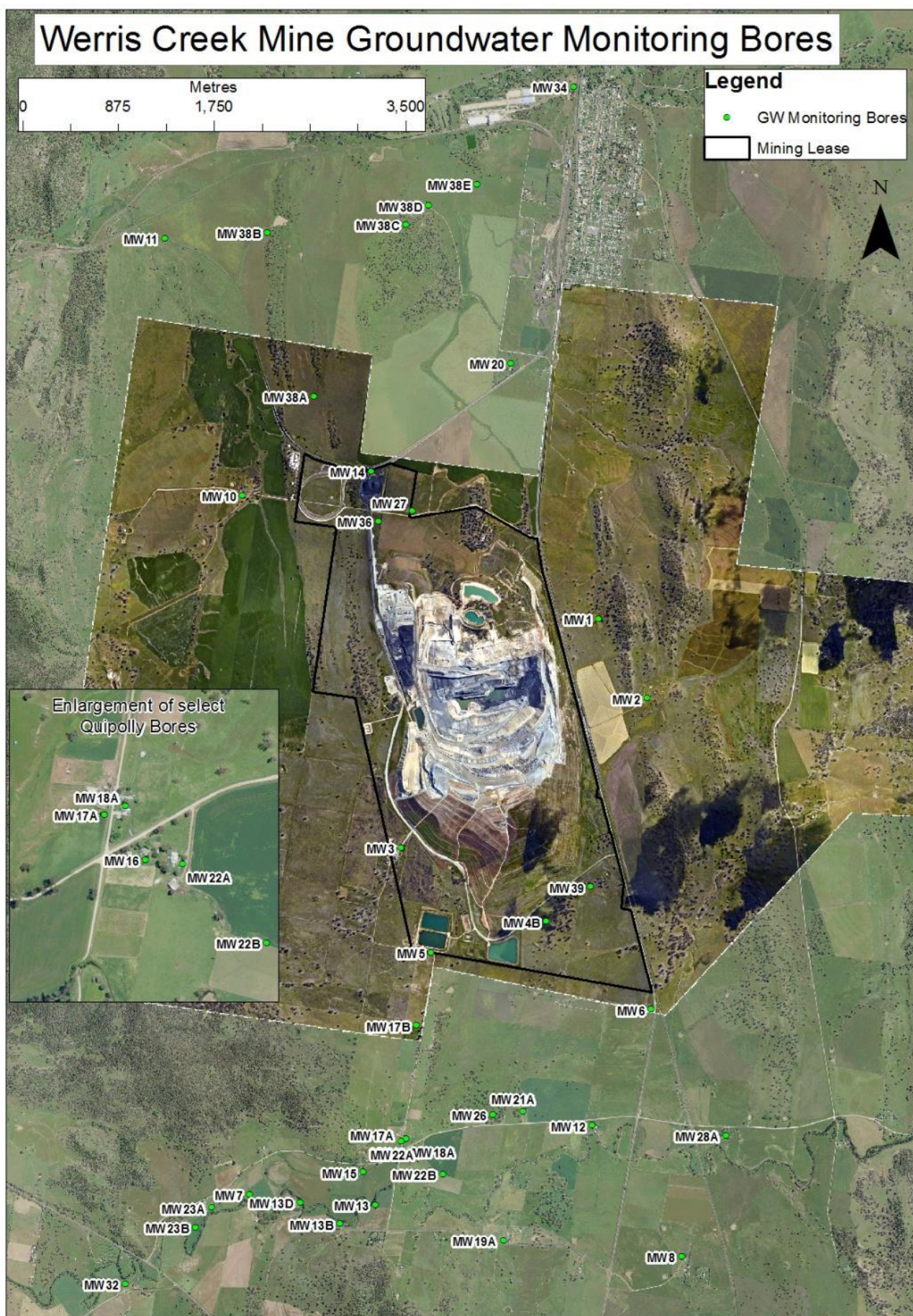


Figure 4 – WCC Groundwater Monitoring Locations



Figure 5 – WCC Surface Water Monitoring Locations

WERRIS CREEK COAL COMMUNITY CONSULTATIVE COMMITTEE
47th Meeting of the Committee to be held on site at the Werris Creek Coal Mine
Wednesday, 11 July 2018 at 9:30am

The normal quarterly meeting will begin at 9:30am, with a site tour following the meeting (weather conditions permitting)

Meeting opened at 9:10am

1 Record of attendance

Gae Swain	Independent Chairperson
Jane Bradford	Independent Minute Taker
Rod Hicks	Werris Creek Coal (WCC) Operations Manager
Lynden Cini	WCC Environmental Officer
Lindsay Bridge	Community Representative
Mike Lomas	Community Representative
James O'Brien	Community Representative
Noel Taylor	Community Representative
Donna Ausling	Director of Environment – Liverpool Plains Shire Council

Apologies

Clr Virginia Black	Community Representative (<i>or representing above Council?</i>)
Col Stewart	Community Representative (<i>is this correct?</i>)

Moved Noel Taylor, **seconded** Lindsay Bridge, THAT the apologies be accepted.
CARRIED

2 Declaration of Pecuniary or Other Interests

(new form to be included in Notice of Meeting in future)

- a) Form received from Gae Swain – has a son-in-law working for Whitehaven Coal and the Narrabri Underground Mine and a son working at the Maule's Creek Mine
- b) Lindsay Bridge – continues working with government and industry on application of coal dust technology

3 New Matters for Discussion under General Business today

- a) Letter from Quipolly Water Action Group Inc (QWAG) to Werris Creek Coal dated 7 May 2018 – CUSUM analysis
- b) Presentation and CUSUM handout from WCC Technical Water Consultant, Fiona Robinson, Division Director for Australia and New Zealand, (Ramboll)

4 Minutes of the Previous Meeting

Moved Lindsay Bridge, **seconded** Noel Taylor, THAT the Minutes of the previous meeting be accepted as a true and accurate record. CARRIED

5 Matters Arising

- a) Welcome to Jane Bradford – independent Minute Taker for the Community Consultative Committee
 - b) Actions from previous meeting
- Gae Swain confirmed that she had contacted Mr Wills regarding his request to attend this Committee as an observer and noted that it would not be appropriate and stated that he could always raise an issue / point with a Committee member who could report back to this Committee. There has not been a response from Mr Wills since this conversation.

6 Environment Monitoring Report from 1 February to 31 May 2018

Note Elevated monitoring results above the relevant monitoring criteria are highlighted in yellow - Lynden provided commentary on the highlighted points in the Report

Note Noel Taylor reported his bore has been dry for three months and only ponding in the creek

Moved Noel Taylor, **seconded** Donna Ausling, THAT the Report be accepted.

CARRIED

7 General Business

a) Fiona Robinson provided a CUSUM handout to assist the members in potential discussions with community members. Fiona provided a commentary on how the CUSUM analysis with respect to groundwater levels is calculated. A PowerPoint presentation was also presented with Fiona answering various questions with explanations to the satisfaction of members present, specifically noted the following:

Base rate (say 5) – take difference above or below that figure (depending on other relevant data below) to provide a monthly rate – the checks are the same time each week / month. If triggered, a multiple line of evidence (MLE) evaluation is then used to assess if the change is due to mining. The MLE evaluation comprises:

1. Review of residual rainfall, that is the actual rainfall levels compared to the average rainfall
2. Interpreted groundwater flow directions in the basalt aquifer and if these show a change in groundwater flow direction toward the mine
3. Comparison to water level data at the background wells MW8 and MW28 for the basalt and alluvial aquifer respectively
4. Mine groundwater inflow modelling predictions verified using the mining void water balance model.

b) Letter from QWAG to WCC – Fiona will supply both Mike Lomax and Lindsay Bridge with an appropriate explanation for the QWAG meeting this afternoon

Note Due to information to be presented to QWAG – discussion will continue between members and Fiona after the close of this meeting.

Gae Swain thanked Fiona Robinson for travelling up to Werris Creek for this meeting and for the excellent presentation and as there is no further business for discussion the meeting closed at 10:55am.

Next meeting Wednesday, 14 November at 9:30am – same venue and to include a mine tour of Werris Creek Coal (weather permitting).

A mine tour was undertaken by Noel Taylor, Mike Lomax, Lindsay Bridge and Fiona Robinson.

Copy to all Committee Members

The Minutes will also be posted on the Whitehaven Coal Website

WERRIS CREEK COAL COMMUNITY CONSULTATIVE COMMITTEE
48th Meeting of the Committee to be held on site at the Werris Creek Coal Mine
Tuesday, 13 November 2018 at 9:30am

The normal quarterly meeting will begin at 9:30am, with a site tour following the meeting (weather conditions permitting)

Meeting opened at 9:40am

1 Record of attendance

Gae Swain	Independent Chairperson
Jane Bradford	Independent Minute Taker
Rod Hicks	Werris Creek Coal (WCC) Operations Manager
Lynden Cini	WCC Environmental Officer
Heidi Watters	NSW Planning & Environment
Lindsay Bridge	Community Representative
Mike Lomax	Community Representative
Noel Taylor	Community Representative
Donna Ausling	Director of Environment – Liverpool Plains Shire Council
Ian Lobsey	Councillor – Liverpool Plains Shire Council

Apologies

Clr Virginia Black	Representing Liverpool Shire Council
Col Stewart	Community Representative
James O'Brien	

Moved Lindsay Bridge, **seconded** Mike Lomax, THAT the apologies be accepted.

CARRIED

2 Declaration of Pecuniary or Other Interests

- a) Form received from Gae Swain – has a son-in-law working for Whitehaven Coal and the Narrabri Underground Mine and a son working at the Maule's Creek Mine – tabled

Note If "Confidential" – not to be discussed outside.

Note Mike Silver is the alternate Chairperson – not required as yet.

- b) Heidi Watters confirmed that changes had been made last year and some items would / could be considered Confidential hence not being discussed outside. Two Committee members do not agree so to speak with Steve O'Donoghue at the Department of Planning and report back to the Chairperson before the next meeting In March 2019 – possibly if items of a confidential nature – that person/s may be required to leave the meeting for this discussion to take place.

3 New Matters for Discussion under General Business today

- a) Lindsay Bridge – Peter Stenz gravesite on Biodiversity offset
b) Lindsay Bridge – Peter Willis

4 Minutes of the Previous Meeting

Moved Lindsay Bridge, **seconded** Donna Ausling, THAT the Minutes of the previous meeting be accepted as a true and accurate record.

CARRIED

5 Matters Arising - Nil

6 Environment Monitoring Report from 1 June to 30 September 2018

Lynden Cini provided commentary on each section of the above report

Page 11 – 6.0 – Complaints – Noel Taylor requester further information about a blast on the 21 August

This particular blast was a hot shot – a small blast near edge of high wall – heated underground workings material once blasted landed in the water within the pit – creating steam. Most blasting occurs between 12:00 and 1:00pm – can blast any time between 9:00am and 5:00pm. This particular blast was at 4:30pm which rarely occurs.

Note If Lynden Cini is not available – contact the Department of Planning – provide a reference no and they can respond.

Moved Donna Ausling, **seconded** Mike Lomax, **THAT** the Environmental Monitoring Report be accepted. **CARRIED**

7 General Business

a) **Peter Wills** – Mr Wills had requested to use a former crown road which is now owned by Werris Creek Coal (WCC) to access to his property. Access to the Wills property via this road was through a locked gate on the mine lease. Lynden Cini advised, after internal review by WCC, access was granted and the Wills have a lock on the access point.

b) **Peter Stenz** - Lindsay queried if the grave site was still there – Rod Hicks responded that it was.

Note 1 Post Meeting Lindsay Bridge and Heidi Watters visited the grave location on the Biodiversity Offset.

c) **Confidentiality** – A request has been received asking for the Community Consultative Committee (CCC) personal details be listed on the WCC website. After discussion – the concern clearly expressed by the majority was that once personal details are freely available on the website, then they could never be retrieved. The representative from the Department of Planning also confirmed that changes had been made – it was no longer necessary for names and addresses to be added under the CCC Guidelines. Names of members are listed so a member of the general public wishing to contact a member could easily do so by contacting the mine directly.

Note Only one member - Lindsay Bridge – was agreeable for his mobile number to be placed on the website and these details will be added shortly or contact Lynden Cini direct.

Next meeting Wednesday, 13 March 2019 at 9:30am – same venue and to include a mine tour of Werris Creek Coal (weather permitting).

Meeting closed at 10:50AM

Copy to all Committee Members

The Minutes will also be posted on the Whitehaven Coal Website

Gae Swain – Independent Chairperson

Date



WERRIS CREEK COAL PTY LTD

QUARTERLY ENVIRONMENTAL MONITORING REPORT

June, July, August and September 2018

This Environmental Monitoring Report covers the period 1st June 2018 to 30th September 2018 for the Werris Creek Coal Mine Community Consultative Committee.

The report includes environmental monitoring results from the on-site Weather Station, Air Quality, Noise, Blasting, Surface Water, Groundwater and Discharge Water Quality together with any community complaints received and general details on site environmental matters.

Note: Elevated monitoring results above the relevant monitoring criteria are highlighted in **yellow**.

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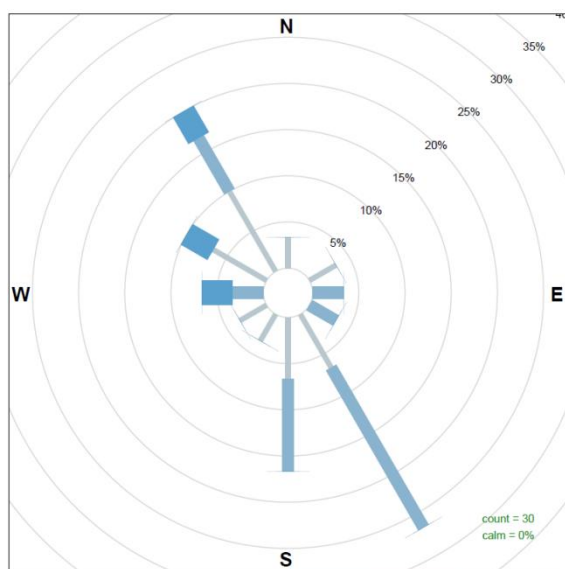
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1.0 METEOROLOGY

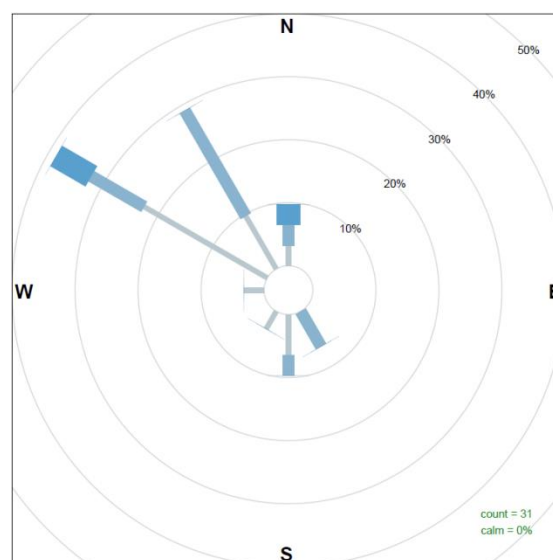
1.1 WEATHER STATION

Werris Creek Coal (WCC) collects meteorological data from the onsite weather station located on the top level of the overburden emplacement. The following table summarises rainfall data for the last four months. Monthly totals over the four months were lower than the historical average with exception of August 2018. Directional wind data, presented in the wind-rose figures below, indicate the prevailing wind direction was predominantly from the south/ south-east and north-west in June, north-west in July, north-west and south-west in August and north-west and south/ south-east in September 2018.

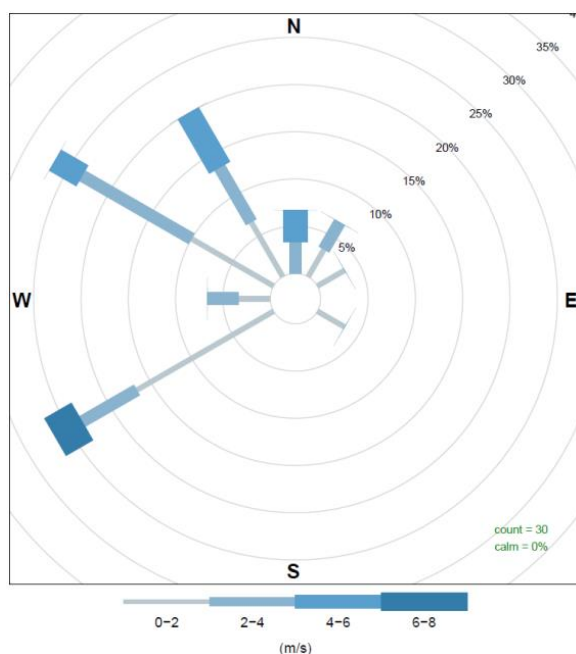
Month	Rainfall (mm)		
	Onsite	Historical Average	2018 Total
June 2018	8.4	64.5	150.0
July 2018	4.6	39.0	154.6
August 2018	34	35.8	188.6
September 2018	17	45.4	205.6



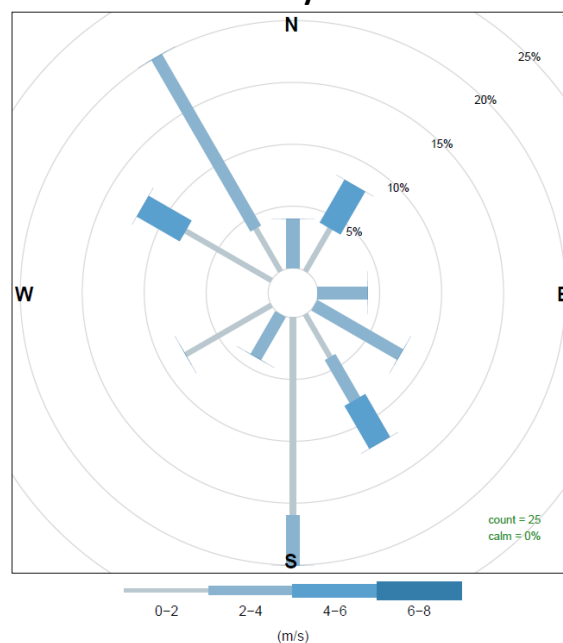
June 2018



July 2018



August 2018



September 2018

2.0 AIR QUALITY

2.1 HVAS (PM₁₀) and TEOM (PM₁₀ & PM_{2.5})

WCC operates five High Volume Air Samplers (HVAS) measuring particulate matter less than 10 micron (PM₁₀) and total suspended particulate (TSP) matter at four sites. HVAS sampling is scheduled every 6 days for a 24-hour run period in accordance with Environment Protection Authority (EPA) guidelines. Results are reported in micro grams per cubic metre (µg/m³) of air sampled. In addition, WCC operates a Tapered Element Oscillating Microbalance (TEOM) monitor in Werris Creek measuring real time PM₁₀ and PM_{2.5} (particulate matter less than 2.5 micron) dust levels. Dust monitoring locations are identified in **Figure 1**.

2.1.1 Monitoring Data Results

The average results for the last four months are provided in the table below.

Monitor Location	Daily Maximum (µg/m ³)	June 2018 (µg/m ³)	July 2018 (µg/m ³)	August 2018 (µg/m ³)	September 2018 (µg/m ³)	2018 Average (g/m ² /month)	Criteria (µg/m ³)	
							Annual	Daily
PM _{2.5} – TEOM92 “Werris Creek”	23.1	10.1	10.2	8.3	6.2	7.2	8	25
PM ₁₀ – TEOM92 “Werris Creek”	73.5	14.7	18.6	17.7	15.8	15.6	30	50
PM ₁₀ – HVP20 “Tonsley Park”	36.4	13.7	17.3	24.0	16.6	18.2	30	50
PM ₁₀ – HVP1 “Escott”	21.9	3.2	9.1	12.4	10.4	11.3	30	50
PM ₁₀ – HVP11 “Glenara”	47.7	14.7	25.9	26.3	18.9	22.7	30	50
PM ₁₀ – HVP98 “Kyooma”	35.5	4.4	16.2	20.9	11.1	13.2	30	50
TSP – HVT98 “Kyooma”	79.1	19.7	40.1	51.1	24.6	34.9	90	-

Yellow Bold – Elevated dust level.

2.1.2 Discussion - Compliance / Non Compliance

All TSP, PM₁₀ and PM_{2.5} dust results were within criteria during the period with the exception of two PM₁₀ results measured at “TEOM92 “Werris Creek””, on the 4th August and 1st September 2018. On both occasions the elevated results were reported to the DP&E, investigations identified the elevated results were affected by high regional dust levels within the North West on both occasions.

2.2 WERRIS CREEK MINE DEPOSITED DUST

Deposited dust monitoring measures particulate matter greater than 30 microns in size that readily settles out of the air related to visual impact. Dust deposition is monitored at 20 locations around WCC. Sampling is scheduled monthly in accordance with EPA guidelines and results are reported as grams per square metre per month (g/m²/month). Dust monitoring locations are identified in **Figure 1**.

2.2.1 Monitoring Data Results

The results for the last four months are provided in the table below.

Monitor Location	June 2018 (g/m ² /month)	July 2018 (g/m ² /month)	August 2018 (g/m ² /month)	September 2018 (g/m ² /month)	2018 Average (g/m ² /month)	Annual Criteria (g/m ² /month)
DG1 “Escott”	0.3	0.2	0.7	1.3	0.9	4.0
DG2 “Cintra”	4.8	5.1	2.7	5.0	4.2	4.0
DG3 “Eurunderee”	2.9	4.3*	1.1	2.3	1.7	4.0
DG5 “Railway View”	2.8	3.7	3.2	Broken	2.7	4.0
DG9 “Marengo”	0.5	6.6	1.2	5.2	2.6	4.0
DG11 “Glenara”	0.6	0.8	1.3	2.3	1.3	4.0
DG14 “Greenslopes”	1.2	0.7	0.9	2.5	1.1	4.0
DG15 “Plain View”	0.7	0.3	1.0	3.1	1.2	4.0
DG17 “Woodlands”	0.9	14*	1.0	2.4	1.2	4.0
DG20 “Tonsley Park”	1.4	1.0	0.8	3.7	1.4	4.0
DG22 “Mountain View”	1.4	3.0	1.3	2.5	1.7	4.0
DG24 “Hazeldene”	2.5	1.3	1.1	2.2	1.4	4.0
DG34 8 Kurrara St	61.4	0.4	0.8	1.9	8.8	4.0
DG62 Werris Creek South	0.4	22.2	1.4	1.9	3.1	4.0
DG92 Werris Creek Centre	1.8	1.7	0.8	1.7	0.9	4.0
DG96 “Talavera”	NS	NS	NS	NS	NA	4.0
DG98 “Kyooma”	0.5	4.3*	1.0	2.5	0.8	4.0

Monitor Location	June 2018 (g/m ² /month)	July 2018 (g/m ² /month)	August 2018 (g/m ² /month)	September 2018 (g/m ² /month)	2018 Average (g/m ² /month)	Annual Criteria (g/m ² /month)
DG101 "Westfall"	0.5	0.4	2.8	3.1	1.1	4.0
DG103 West Street	1.1	2.0	1.9	2.0	1.4	4.0

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e. bird droppings and insects); # - indicates sample is contaminated from a Non-Werris Creek Coal dust source; **Yellow Bold** – Elevated dust level; NS – Not Sampled; Broken- Dust bottle broken in transit

2.2.2 Discussion - Compliance / Non Compliance

All monthly dust deposition gauge results were below the annual criteria of 4.0g/m²/month throughout the period with the exception of DG2 (Cintra) which had high results in June, July and September 2018 and a rolling average above criteria. Consistently high dust levels at this gauge and low deposited dust levels at nearby gauges indicate a localised source of dust generation, unrelated to activities at Werris Creek Coal Mine. DG9 (Marengo) had high results in July and September 2018 however the rolling average remains below criteria.

DG34 (8 Kurrara St) in June 2018 and DG62 (Werris Creek South) in July 2018 had one anomalous high dust deposition measurement, deposited dust levels remained low at nearby gauges, also indicating a localised source of dust, unrelated to activities at Werris Creek Coal Mine.

2.3 QUIRINDI TRAIN DUST DEPOSITION

2.3.1 Monitoring Data Results

The results for the last three months are provided in the table below.

Monitor Location	June 2018		July 2018		August 2018		September 2018		2018 Average (g/m ² /month)
	g/m ² /month	% Coal	g/m ² /month	% Coal	g/m ² /month	% Coal	g/m ² /month	% Coal	
DDW30	1.1	20%	1.4	20%	1.4	15%	3.7	10%	1.4
DDW20	0.8	25%	1.9	20%	1.2	20%	3.4	5%	1.6
DDW13	1.0	25%	1.4	30%	1.5	15%	3.4	5%	1.5
Train Line									
DDE13	0.7	30%	2.2	30%	1.8	30%	4.0	10%	1.8
DDE20	0.6	15%	1.5	40%	1.2	25%	2.0	5%	1.7
DDE30	1.6	10%	1.5	10%	1.2	10%	4.8	5%	2.0

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e. bird droppings and insects); NS – Not Sampled, bottle and funnel smashed.

2.3.2 Discussion - Compliance / Non Compliance

Overall, the dust fallout levels adjacent to the train line are low, well below the impact assessment criteria nominated by the EPA of 4.0 g/m²/month and comparable to the levels monitored around Werris Creek Coal Mine. Levels were slightly elevated at all sites in September 2018. Coal contributions to the dust fraction remain generally low.

2.4 AIR QUALITY COMPLAINTS

There were three dust complaints recorded during the period.

3.0 NOISE

3.1 OPERATIONAL NOISE

Monthly attended noise monitoring is undertaken representative of the following 16 properties from 13 monitoring points below. Attended noise monitoring was undertaken twice for either 60 minutes at privately owned properties or 15 minutes at properties with private agreements; representative of the day period and the evening/night period.

3.1.1 Monitoring Data Results

The WCC operations only noise level (not ambient noise) results for the last three months are outlined in the table below. Noise monitoring locations are identified in **Figure 2**.

Wednesday 27th and Thursday 28th June 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	Evening/Night dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible	35	28	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	Inaudible#	40
C	Central Quipolly (R10*, R11*)	Inaudible	40	32#	40
D	"Hazeldene" R24	Inaudible#	37	33	37
E	"Railway Cottage" R12	Inaudible#	38	Inaudible	38
F	"Talavera" R96	28	38	Inaudible	37
H	"Kyooma" R98	Inaudible#	38	28	38
I	Kurrara St, WC R57	Inaudible#	35	Inaudible	35
J	Coronation Ave, WC	Inaudible	35	Inaudible	35
K	Alco Park (R21*)	Inaudible#	40	Inaudible	40
L	West St, WC (R103)	Inaudible	35	Inaudible	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

NM- Denotes 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

Thursday 26th July 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	Evening/Night dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible#	35	Inaudible	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible#	40	Inaudible	40
C	Central Quipolly (R10*, R11*)	Inaudible#	40	Inaudible	40
D	"Hazeldene" R24	Inaudible#	37	26	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible	38
F	"Talavera" R96	Inaudible	38	<20	37
H	"Kyooma" R98	30#	40	<20	40
I	Kurrara St, WC R57	Inaudible	35	Inaudible	35
J	Coronation Ave, WC	Inaudible	35	Inaudible	35
K	Alco Park (R21*)	Inaudible	40	Inaudible	40
L	West St, WC (R103)	Inaudible	35	Inaudible	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

NM- Denotes 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

Thursday 9th and Friday 10th August 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	Evening/Night dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible	35	Inaudible	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	Inaudible	40
C	Central Quipolly (R10*, R11*)	Inaudible	40	Inaudible	40
D	"Hazeldene" R24	Inaudible	37	Inaudible	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible	38
F	"Talavera" R96	Inaudible	38	30	37
H	"Kyooma" R98	Inaudible#	40	Inaudible	40
I	Kurrara St, WC R57	Inaudible	35	Inaudible	35
J	Coronation Ave, WC	Inaudible	35	Inaudible	35
K	Alco Park (R21*)	Inaudible	40	30	40
L	West St, WC (R103)	Inaudible	35	Inaudible	35

WC – Werris Creek; * - Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

NM- Denotes 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

Tuesday 11 September 2018

Location		Day dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min	Evening/Night dB(A) L_{eq} 15min	Criteria dB(A) L_{eq} 15min
A	"Rosehill" R5	Inaudible#	35	Inaudible#	35
B	West Quipolly (R7*, R8*, R9* & R22*)	Inaudible	40	NM##	40
C	Central Quipolly (R10*, R11*)	Inaudible#	40	27#	40
D	"Hazeldene" R24	Inaudible#	37	25#	37
E	"Railway Cottage" R12	Inaudible	38	Inaudible	38
F	"Talavera" R96	Inaudible#	38	Inaudible#	37
H	"Kyooma" R98	NM#	40	27#	40
I	Kurrara St, WC R57	Inaudible	35	26	35
J	Coronation Ave, WC	Inaudible	35	Inaudible	35
K	Alco Park (R21*)	Inaudible	40	32	40
L	West St, WC (R103)	Inaudible	35	Inaudible#	35

WC – Werris Creek; * – Private agreement in place with resident; **Yellow Bold** – Elevated noise; # Adverse weather with wind >3m/s, temperature inversions >+12°C/100m or >2m/s and >0°C/100m; 1 – R22 criteria is 36 dB(A) L_{eq} 15min while R9 is 37 dB(A) L_{eq} 15min

NM – Denotes 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

3.1.2 Discussion - Compliance / Non Compliance

Noise from Werris Creek Coal Mine was inaudible at a high percentage of the monitoring sites during the quarter. Throughout the period, Werris Creek Coal Mine adjusted mining operations and shut down equipment at various times to reduce noise generation potential in response to noise levels measured at the real time noise monitors.

3.2 Noise complaints

There were no noise complaints recorded during the period.

4.0 BLASTING

During the reporting period there was a total of forty-one blasts fired by WCC with monitoring of each blast undertaken at "Glenara", "Kyooma", "Werris Creek South" and "Werris Creek Mid". Compliance limits for blasting overpressure is 115dB(L) (and up to 120dB(L) for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). Blast monitoring locations are identified in **Figure 3**.

4.1 BLAST MONITORING**4.1.1 Monitoring Data Results**

The summary tables of blasting results over the last four months are provided below.

June 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.10	98.88	0.68	101.27	0.34	98.38	0.20	97.68
Monthly Maximum		0.26	105.10	2.28	109.40	0.86	104.40	0.40	109.40
Annual Average		0.11	99.24	0.71	100.09	0.30	99.34	0.21	98.59
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	3.67%	0.00%	0.92%	0.00%	0.00%	0.00%	1.83%
	Reporting Year	0.00%	3.17%	0.00%	1.59%	0.00%	0.00%	0.00%	1.59%

July 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.11	101.26	0.81	103.10	0.37	103.02	0.21	98.32
Monthly Maximum		0.30	109.40	1.62	110.80	0.69	116.70	0.35	109.30
Annual Average		0.11	99.53	0.72	100.52	0.31	99.87	0.21	98.55
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	3.28%	0.00%	0.82%	0.00%	0.82%	0.00%	1.64%
	Reporting Year	0.00%	2.78%	0.00%	1.39%	0.00%	1.39%	0.00%	1.39%

August 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.07	97.97	0.43	101.09	0.26	99.98	0.13	94.73
Monthly Maximum		0.14	113.10	0.98	112.30	0.56	114.10	0.26	101.80
Annual Average		0.10	99.34	0.68	100.59	0.31	99.88	0.20	98.07
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	3.17%	0.00%	0.79%	0.00%	0.79%	0.00%	0.79%
	Reporting Year	0.00%	2.30%	0.00%	1.15%	0.00%	1.15%	0.00%	1.15%

September 2018		"Glenara" R11		"Kyooma" R98		Werris Creek South R62		Werris Creek Mid R92	
		mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)	mm/s	dB(L)
Monthly Average		0.09	100.61	0.51	101.98	0.30	98.90	0.18	96.95
Monthly Maximum		0.22	108.90	0.93	108.30	0.68	107.40	0.54	106.20
Annual Average		0.10	99.48	0.67	100.75	0.30	99.77	0.20	97.95
Criteria		5	115	5	115	5	115	5	115
% >115dB(L) or 5mm/s	Rolling Ave	0.00%	2.27%	0.00%	0.76%	0.00%	0.76%	0.00%	0.76%
	Reporting Year	0.00%	1.92%	0.00%	0.96%	0.00%	0.96%	0.00%	0.96%

Yellow – overpressure >115dB(L) or Werris Creek vibration >5.0mm/s.

4.1.2 Discussion - Compliance / Non Compliance

All blasts over the period complied with maximum licence limits of 10mm/s) as well as the 95th percentile limits 5mm/s. However one blast was above the 95th percentile limits of 115dB(L) at Werris Creek South R62 on the 26 July 2018.

4.2 BLAST COMPLAINTS

There were six blast complaints during the period.

5.0 WATER

The groundwater monitoring program monitors groundwater levels bi-monthly and groundwater quality six monthly. Surface water monitoring is undertaken quarterly.

5.1 GROUND WATER

Groundwater monitoring is undertaken to identify if there are any impacts on groundwater quality and water levels as a result of the mining operations. WCC monitors approximately 38 groundwater wells/bores and piezometers in the key aquifers surrounding WCC including Werrie Basalt (next to WCC and further afield) and Quipolly Creek Alluvium. Groundwater level surveys were completed on the 11 and 12 July 2018 and 6, 10, 11 and 23 September 2018. Groundwater monitoring locations are identified in **Figure 4**.

5.1.1 Monitoring Data Results

A summary of groundwater monitoring results has been provided below.

Site		July-18		Site		September-18	
		mbgl	%			mbgl	%
Werrie Basalt near WCC	MW1	Dry		Werrie Basalt near WCC	MW1	Dry	
	MW2	56.64	-16%		MW2	50.1	13%
	MW3	19.91	-1%		MW3	19.9	0%
	MW4B	17.59	-1%		MW4B	17.78	-1%
	MW5	12.91	-2%		MW5	12.92	0%
	MW6	16.17	0%		MW6	16.17	0%
	MW27*	54.31	3%		MW27*	54.16	0%
	MW36A	20.65	-4%		MW36A	20.78	-1%
	MW36B	20.68	-4%		MW36B	20.81	-1%
Werrie Basalt	MW8*	19.56	-2%	Werrie Basalt	MW8*	19.60	0%
	MW10	14.48	-2%		MW10	14.52	0%
	MW14	15.46	-4%		MW14	15.6	-1%
	MW17B*	14.17	-1%		MW17B*	13.85	2%
	MW19A*	14.39	-2%		MW19A*	14.75	-2%
	MW20*	22.16	0%		MW20*	22.25	0%
	MW38A	13.09	3%		MW38A	13.12	0%
	MW38B*	10.27	0%		MW38B*	10.26	0%
	MW38C*	23.91	-1%		MW38C*	23.44	2%
	MW38E*	11.14	-3%		MW38E*	11.26	-1%
	MW41	9.52	-3%		MW41	9.71	-2%
	MW43	8.28	-3%		MW43	8.47	-2%
#1	MW24A*	16.7	2%	#1	MW24A*	16.61	1%
	MW29*	13.96	13%		MW29*	14.39	-3%
Quipolly Alluvium	MW12*	Dry		Quipolly Alluvium	MW12*	Dry	
	MW13*	Dry			MW13*	Dry	
	MW13B*	6.02	-4%		MW13B*	6.13	-2%
	MW13D*	5.82	-2%		MW13D*	6.18	-6%
	MW15*	No access			MW15*	No access	
	MW16*	Dry			MW16*	Dry	
	MW17A*	7.43	-3%		MW17A*	8.42	-12%
	MW18A*	Dry			MW18A*	Dry	
	MW21A*	11.34	-2%		MW21A*	11.55	-2%
	MW22A*	Dry			MW22A*	Dry	
	MW22B*	Dry			MW22B*	Dry	
	MW23A*	4.42	-1%		MW23A*	4.43	0%
	MW23B*	No access			MW23B*	4.25	11%
	MW26B*	9.85	-3%		MW26B*	10.06	-2%
	MW28A*	16.17	-3%		MW28A*	16.64	-3%
	MW32*	4.19	1%		MW32*	4.22	-1%
	MW40	9.56	-3%		MW40	9.74	-2%
	MW42	8.17	-3%		MW42	8.36	-2%
#2	MW34*	11.55	3%	#2	MW34*	11.52	0%

mbgl – meters below ground level is the distance in meters from top of bore to groundwater surface; **Orange** – Change decrease; **Green** – change increase or no change; * - Indicates bore is used for water extraction unrelated to WCC (i.e. stock and domestic or irrigation). #1 – Werrie Basalt in the Black Soil Gully valley to east of Werris Creek Mine. #2 - Werris Creek Alluvium.

5.1.2 Discussion - Compliance / Non Compliance

Measured groundwater levels in the Werrie Basalt and Quipolly Alluvium aquifer indicate general sustained or decreased water levels during July 2018 and September 2018 with the exception of an increase in depth at MW29 and an decrease in depth at MW2 in July 2018 and an increase in depth at MW2 and a decrease at MW17A in September 2018.

5.2 SURFACE WATER

Surface water monitoring is undertaken in local creeks offsite as well as from discharge point dirty water dams to monitor for potential water quality issues. Quarterly surface water monitoring was undertaken on the 23 August 2018. Surface water monitoring locations are identified in **Figure 5**.

5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results has been provided below.

23rd August 2018

Site	pH	EC	TSS	O&G	Change from Previous Quarter or General Comments
ONSITE					
SB2	Dry	Dry	Dry	Dry	Dry
SB9	Dry	Dry	Dry	Dry	Dry
SB10	Dry	Dry	Dry	Dry	Dry
OFFSITE					
QCU	Dry	Dry	Dry	Dry	Dry. Gravel bed.
QCD	8.0	1070	<5	<5	pH and EC slightly decreased, TSS and O&G unchanged. Just flowing.
WCU	Dry	Dry	Dry	Dry	Dry
WCD	8.1	1345	12	<5	pH slightly decreased and EC slightly increased, TSS and O&G unchanged. Pools.

pH – measure of acidity/alkalinity; EC – Electrical Conductivity measures salinity; TSS – Total Suspended Solids is a measure of suspended sediment in water (i.e. similar to turbidity); O&G – Oil and Grease measures amount of hydrocarbons (oils and fuels) in water

5.2.2 Discussion - Compliance / Non Compliance

Quarterly surface water monitoring was undertaken on 23 August 2018 with all onsite and offsite sampling undertaken in dry conditions represented by low or dry pools, which reflected on water quality. All water quality results were within long-term averages and the Site Water Management Plan trigger values.

5.3 SURFACE WATER DISCHARGES

There were no discharge events in June, July, August and September 2018.

5.3 WATER COMPLAINTS

There were no water release complaints during the period.

6.0 COMPLAINTS SUMMARY

There were thirteen complaints received during the period, which are summarised below.

#	Date	Issue	Complaint	Investigation	Action Taken
583	4/06/2018	Odour	Complainant advised they could detect an odour at their residence	EO followed up with complainant, requesting an opportunity to discuss management in place.	Complainant did not respond to follow up actions
584	6/06/2018	Blast	Complainant advised they felt the blast at their residence.	EO explained that all monitors indicated the blast was within compliance limits.	None required or requested
585	6/06/2018	Blast	Complainant advised the EPA that they could feel vibration from the blast.	WCC provided an Event Report to the EPA detailing the risk assessment for the blast and the results of environmental monitoring conducted during the blast.	None required or requested
586	21/06/2018	Blast	Complainant advised they felt the blast at their residence.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
587	9/07/2018	Blast	Complainant advised they felt the blast at their residence.	Complainant left message on EO phone lodging the complaint stating no need to return call.	None required or requested
588	10/07/2018	Odour	Complainant advised they could detect an odour at their residence	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place.	Complainant was content with EO response.
589	25/07/2018	Odour	Complainant advised they could detect an odour at their residence	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place. In addition to the above an engineer was dispatched to the boundary of the complainant's residence with gas detection monitors. None identified during monitoring.	No further follow-up actions
590	25/07/2018	Odour	Complainant advised they could detect an odour at their residence	EO provided a detailed verbal response on the current mining operations and odour / spon com management practices currently in place.	Complainant was content with EO response.
591	21/08/2018	Blast	Complainant advised they felt the blast at their residence.	EO explained that all monitors indicated the blast was within compliance limits.	EO advised blast was within compliance limits and emailed a copy of the results to the complainant.
592	12/09/2018	Dust	Complainant advised they could identify dust coming from the mine post blasting.	EO advised data would be reviewed and will respond advising if compliant.	EO advised at the time of review all data was with compliance limits.
593	12/09/2018	Dust	Complainant advised they could identify dust coming from the mine post blasting.	EO advised at the time of review all data was with compliance limits.	No further follow-up actions
594	12/09/2018	Blast	Complainant left a message with the Workshop supervisor advising they felt the blast at their residence.	EO called complainant back multiple times, with no response.	No further follow-up actions
595	12/09/2018	Dust	Complainant advised they could identify dust coming from the mine post blasting.	EO advised at the time of review all data was with compliance limits.	No further follow-up actions

7.0 GENERAL

Please feel free to ask any questions in relation to the information contained within this document during Item 7 of the meeting agenda.

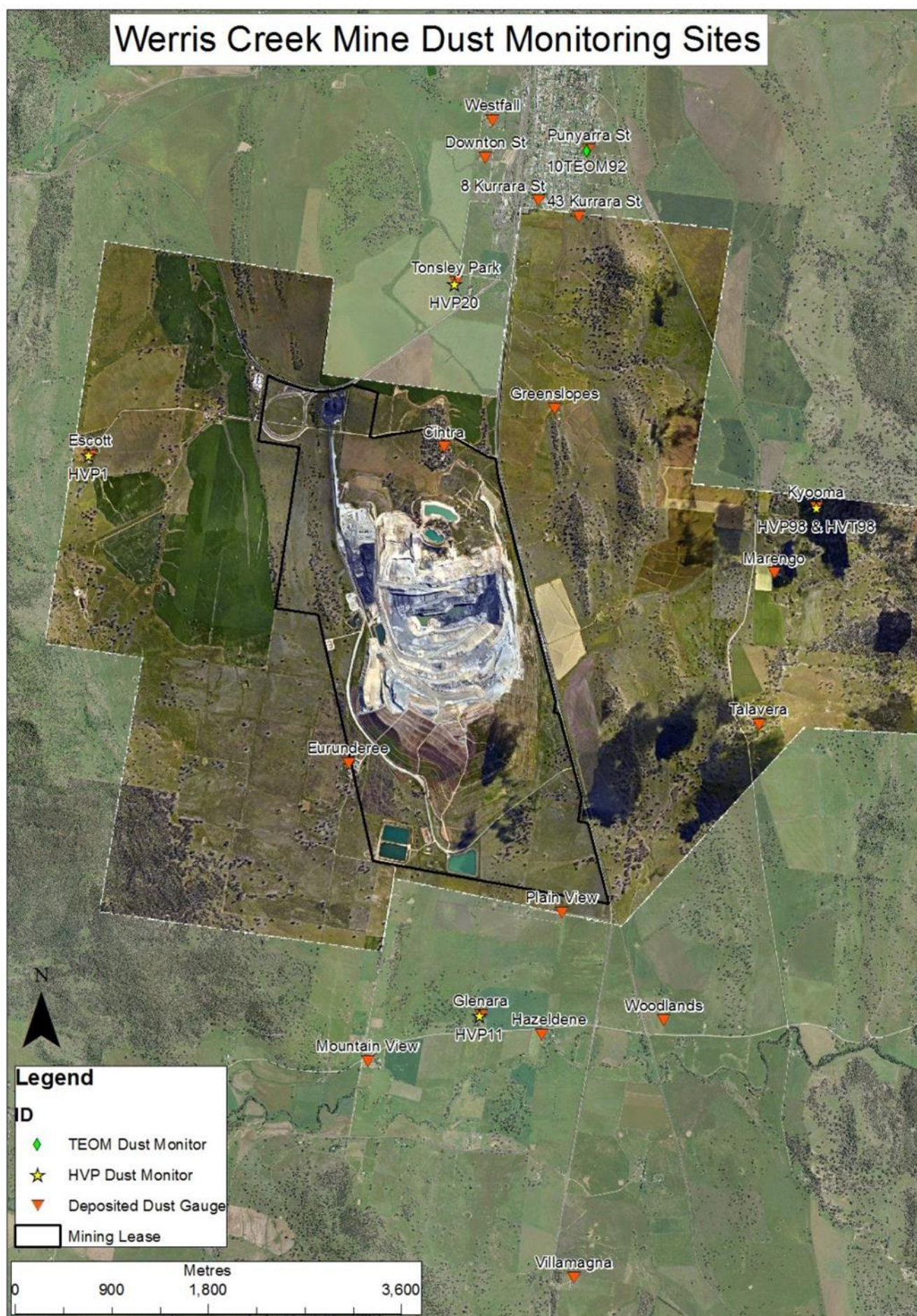


Figure 1 – WCC Dust Monitoring Locations



Figure 2 – WCC Noise Monitoring Locations

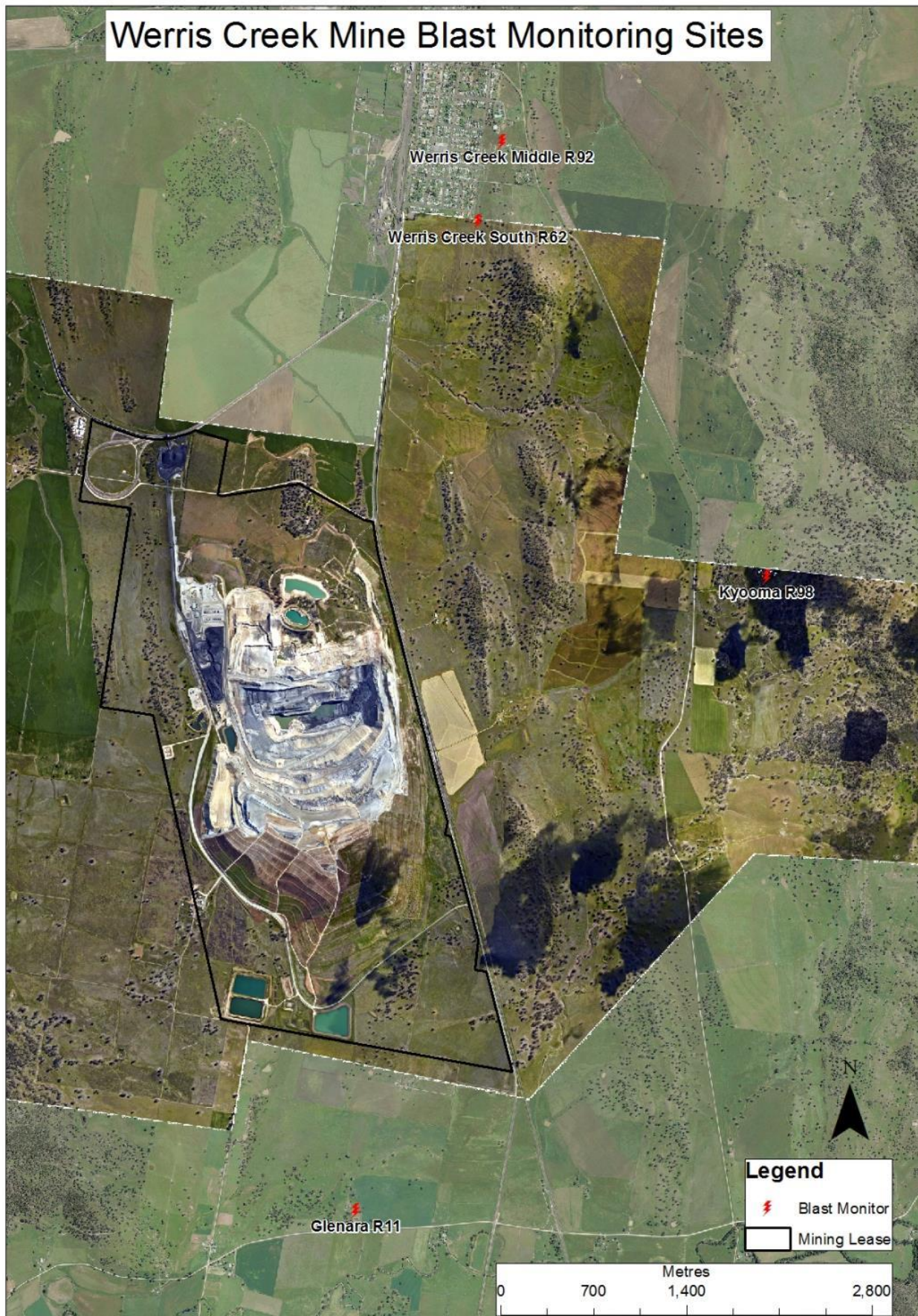


Figure 3 – WCC Blast Monitoring Locations

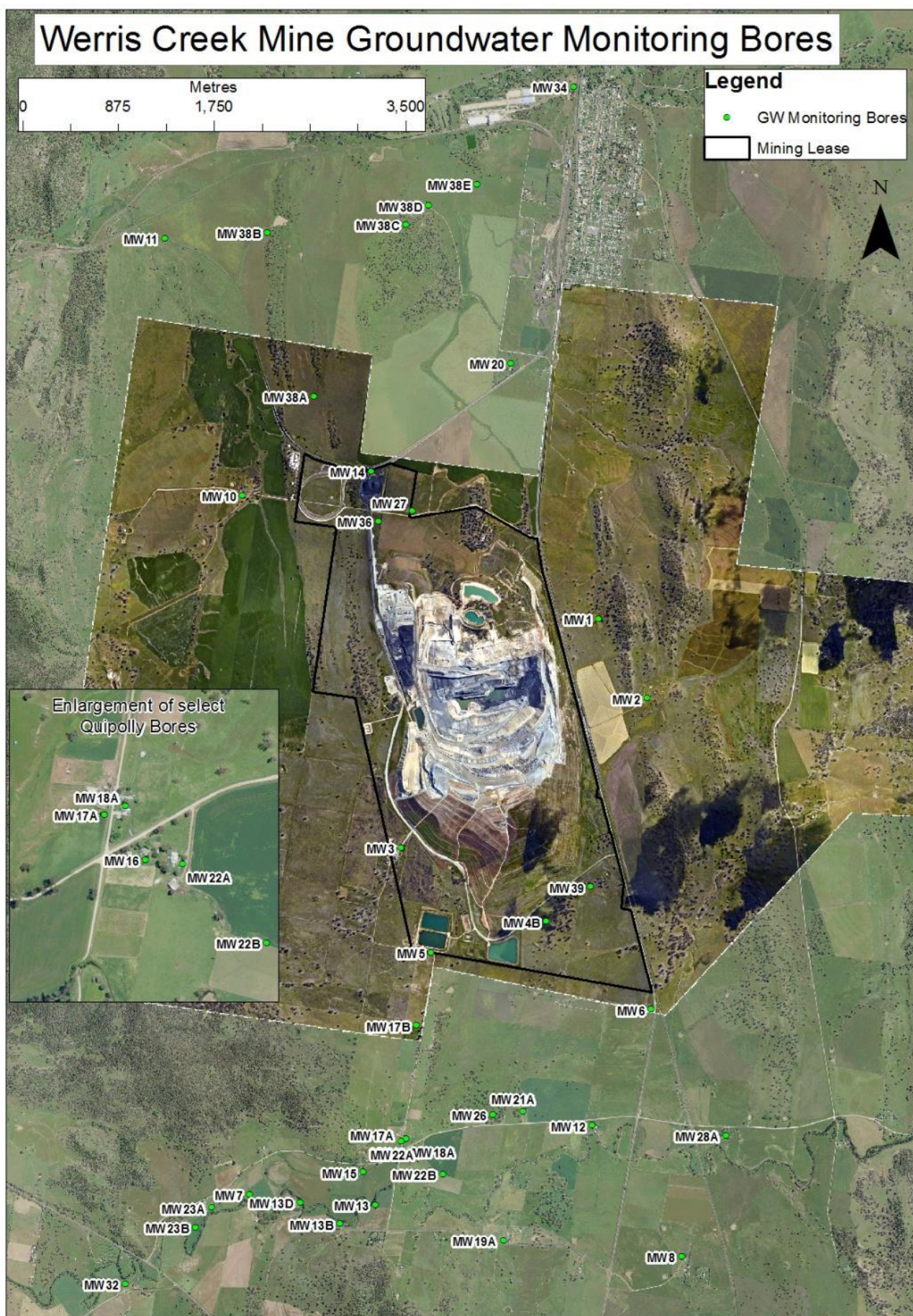


Figure 4 – WCC Groundwater Monitoring Locations



Figure 5 – WCC Surface Water Monitoring Locations