WERRIS CREEK COAL

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2009/2010

Name of Mine:	WERRIS CREEK No. 2 COAL MINE
Mining Titles/Leases:	Mining Lease No. 1563 (1992) Exploration Lease 5993 Exploration Lease 7422
MOP Commencement Date: MOP Completion Date:	01 October 2009 31 December 2012
AEMR Commencement Date: AEMR Completion Date:	01 April 2009 31 March 2010
Name of Leaseholder:	Whitehaven Coal Pty Ltd
Name of Mine Operators: Name of Coal Plant Operator:	Whitehaven Coal Pty Ltd Whitehaven Coal Pty Ltd
Reporting Officer:	Andrew Wright
Title:	Environmental Officer – Whitehaven Coal
Signature:	
Date:	

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i PURPOSE OF THE REPORT

Werris Creek Coal Pty Ltd (WCC) has prepared this report to fulfil the Annual Environmental Management Report (AEMR) requirements of Mining Lease (ML) 1563 (Mining Act 1992) Condition 2 and the Development Consent (DA 172-7-2004) Condition 5 (Schedule 6) for the Werris Creek No. 2 Coal Mine.

This AEMR has been prepared in accordance with Industry and Investment NSW (formerly Department of Primary Industries – Mineral Resources) Director-General's guidelines titled "Environmental Management Guidelines for Industry – Guidelines to the Mining, Rehabilitation and Environmental Management Process", Version 3 dated January 2006.

This report provides a detailed review of WCC's environmental management over the annual reporting period 1st April 2009 to 31st March 2010 including performance and forecasts relating to:

- The current Mining Operations Plan (MOP);
- Development Consent DA 172-7-2004 MOD5 conditions and commitments;
- Environmental Protection Licence (EPL) 12290;
- Any other requirements of the Industry and Investment NSW (I&I NSW); Department of Environment, Climate Change and Water (DECCW) including NSW Office Of Water (NOW), Liverpool Plains Shire Council (LPSC) and Department of Planning (DoP) including other licences and approvals held by WCC;
- Other statutory environmental guidelines and requirements;
- Details of any variations to environmental approvals applicable to the lease area; and
- Where relevant, progress towards final rehabilitation objectives.

ii WERRIS CREEK COAL ENVIRONMENTAL POLICY

WCC has a documented environmental policy a copy of which can be found on the company website: www.whitehavencoal.com.au.

iii REPORT DISTRIBUTION

This AEMR has been submitted to the administrating authority Industry and Investment NSW:

Mr Michael Lloyd
Regional Environmental Officer
Industry and Investment NSW
PO Box 344
HUNTER REGION MAIL CENTRE NSW 2310

In addition has been distributed to the following government departments:

Senior Planner Att: **Mr Colin Phillips**
Mining and Extractive Industries
Department of Planning
GPO Box 39
SYDNEY NSW 2001

General Manager Att: **Mr. Robert Hunt**
Liverpool Plains Shire Council
PO Box 152
QUIRINDI NSW 2343

Head, Regional Operations Armidale Att: **Mr Robert O'Hern**
Department of Environment and Climate Change
PO Box 494
ARMIDALE NSW 2380

Department of Primary Industries – Agriculture Att: **Mr Andrew Scott**
Resource Management Officer
4 Marsden Park Road
TAMWORTH NSW 2340

Department of Water & Energy Att: **Christie Jackson**
PO Box 550
TAMWORTH NSW 2340

Werris Creek Coal Mine **Att: Mr Ron Short**
Community Consultative Committee Chairman

1 INTRODUCTION

This Annual Environmental Management Report (AEMR) is the fifth document submitted for the Werris Creek No 2 Coal Mine and details the environment and community performance of WCC operations for the 12 month period ending 31st March 2010.

WCC is located approximately 4 km south of Werris Creek and 11 km north-northwest of Quirindi in central northern New South Wales (**Figure 1.1**) and lies within a 679 ha area covered by Mining Lease 1563 (ML 1563).

The current Mining Operations Plan (MOP) covers a 3 year period from the 1st October 2009 to 31st December 2012.

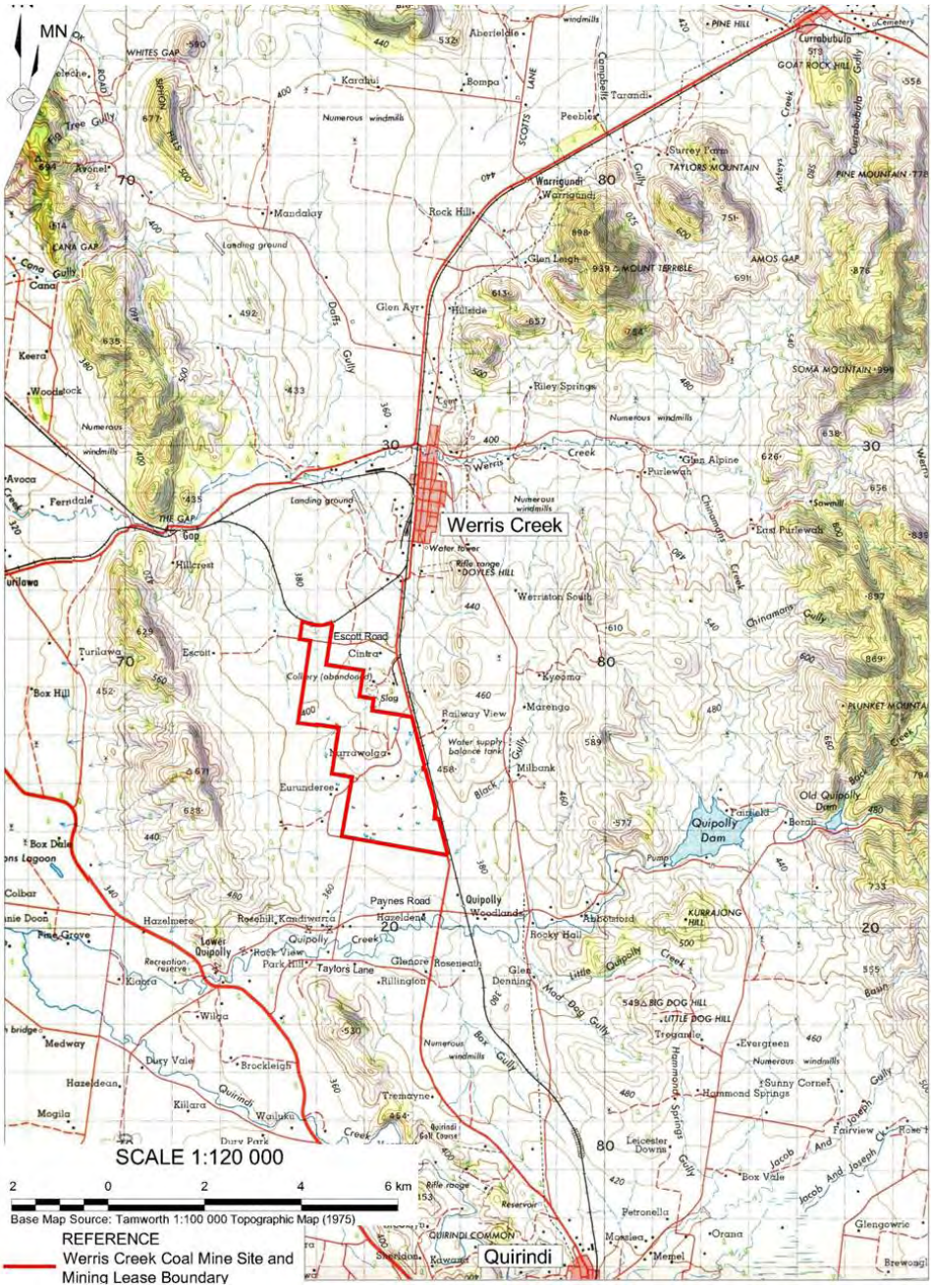


Figure 1.1 WCC Mine Site and Locality

1.1 CONSENT, LEASES AND LICENCES

WCC applicable consents, leases and licences for the 2009/2010 period are identified in **Table 1.1**.

Table 1.1 Consents, Leases and Licences

Type	Title	Issuing Authority	Date of Issue	Expiry	Modifications/Amendments/Variations
Development Application/ Consent (**Appendix 1**)	DA 172-7-2004	DoP	18/02/2005	18/02/2020	MOD 1 approved 19 October 2005 MOD 2 approved 6 March 2007 MOD 3 approved 17 September 2008 MOD 4 15 April 2008 MOD 5 approved 6 October 2009
Environment Protection Licence (**Appendix 2**)	EPL 12290	DECCW	18/04/2005	1/04/2011 (Anniversary date)	Variation approved 23 May 2006 Variation approved 14 September 2006 Variation approved 4 January 2007 Variation approved 7 October 2009
Mining Lease (**Appendix 2**)	ML 1563	I&I NSW	23/03/2005	23/03/2026	
Mining Operations Plan	MOP	I&I NSW	1/09/2008	31/12/2012	MOP Amendment 28 November 2006 MOP Amendment 20 July 2007 MOP Amendment 4 April 2008 New MOP approved 21 August 2008 MOP Amendment 21 November 2008 MOP Amendment 9 November 2009
Exploration Licence	EL 5993	I&I NSW	18/09/2002	17/09/2013	Renewed 10 April 2006 Renewed 1 May 2009
	EL 7422	I&I NSW	26/11/2009	26/11/2011	
On-Site Sewerage Management Systems	04/06	LPSC	01/03/2006		
	05/06	LPSC	01/03/2006		
Water Licence	90BL252588	NOW	15/10/2008		Industrial and Mining Allocation 50MLpa
	90BL253367	NOW	18/05/2006	Perpetuity	Monitoring Piezometer “P3”
	90BL253363	NOW	18/05/2006	Expired	Test
	90BL253360	NOW	18/05/2006	Expired	Test
	90BL252589	NOW	18/05/2006	Perpetuity	Monitoring Piezometer “P1”
	90BL252590	NOW	18/05/2006	Perpetuity	Monitoring Piezometer “P2”
	90BL253361	NOW	18/05/2006	Expired	Test
	90BL253503	NOW			“Branga” Property
	90BL252587	NOW			
	90BL251769	NOW			Monitoring Piezometer “MW2”
	90BL254903	NOW			Monitoring Piezometer “MW4B”
	90BL254902	NOW			Monitoring Piezometer “MW5”
	90BL254901	NOW			Monitoring Piezometer “MW6”
	90BL254899	NOW			Monitoring Piezometer “MW9”
	90BL254900	NOW			Monitoring Piezometer “MW14”
Radiation Licence	RL41800	DECCW		8/02/2013	

1.1.1 Amendments to Consents, Leases and Licences

Table 1.2 summarises the modifications, variations, amendments or new consents, leases and licences obtained by WCC during the period.

Table 1.2 Amendments to Leases, Licences and Approvals

Date	Title	Details
6th October 2009	DA 172-7-2004 MOD5	Modification for minor northern extension, mining and managing water from underground workings and increase in dump height and footprint, revised Biodiversity Offset Area
7th October 2009	EPL 12290	Amendment of noise, dust, surface water and groundwater monitoring locations as well as standardisation of EPL
9th November 2009	MOP Amendment	Modification for minor northern extension, mining and managing water from underground workings and increase in dump height and footprint
26th November 2009	EL 7422	New Exploration Licence for north eastern extent of the coal deposit within the LOM Project Area

1.2 MINE CONTACTS

The Werris Creek Coal Mine continued to be managed by Whitehaven Coal under the trading title of Werris Creek Coal Pty Limited during the period.

1.2.1 WCC Personnel

All Whitehaven Coal (WHC) management personnel responsible for operational and environmental performance at the WCC mine for this reporting period are listed in **Table 1.3**.

Table 1.3 WHC Management Team at WCC

Name	Title	Contact	Period
Mr Tony Haggarty	WHC Managing Director	02 8507 9700	16/10/2008 - Present
Mr Casper Dieben	WHC General Manager	02 6742 4337	27/11/2007 – Present
Mr Brian Cullen	WHC General Manager	02 6742 4337	11/1/2008 – Present
Mr Des George	WCC Manager Mining Engineering for WHC	02 6763 6001	JHG 01/04/2008 – 01/01/2009 WHC 01/01/2009 – Present
Mr Michael Post	WCC Project Manager for WHC	02 6763 6001	01/01/2009 – Present
Mr Danny Young	WHC Environmental Group Manager	02 6742 4337	11/1/2008 – Present
Mr Andrew Wright	WCC Environmental Officer for WHC	02 6768 7071	01/02/2010 – Present

1.2.2 Support Personnel

In addition to the personnel identified in **Section 1.2.1**, WCC utilise a range of consultants specialising in a wide variety of environmental fields as and when required. Specialist consultants involved in activities at the mine during the reporting period included:

- Geoff Cunningham Natural Resource Consultants Pty Ltd;
- Countrywide Ecological Services;
- ALS/ACIRL Pty Limited;
- Orica Blasting Services;
- R.W. Corkery & Associates Pty Ltd;
- Kelley Covey Group Pty Ltd;
- Robert Carr & Associates;

- Department of Lands - Soil Services;
- Spectrum Acoustics; and
- GSS Environmental

1.3 ANNUAL AEMR REVIEW & INSPECTION

The Annual Environmental Inspection was held at WCC on 9th July 2009 to review compliance with environmental requirements of relevant approval instruments including the Mining Lease, MOP and the AEMR. The inspection and meeting was attended by representatives of I&I NSW, LPSC, DECCW and NOW. During the inspection, Michael Lloyd (I&I NSW) reported that there was general compliance with the relevant statutory approval instruments administered by I&I NSW. The inspection also noted that the rehabilitation was progressing according to the rehabilitation plan.

There were no actions raised from either the site inspection or review of the AEMR.

2 OPERATIONS DURING THE REPORTING PERIOD

Extent of operations at the WCC mine is presented in **Figure 2.1** for the end of the 2009/2010 period.

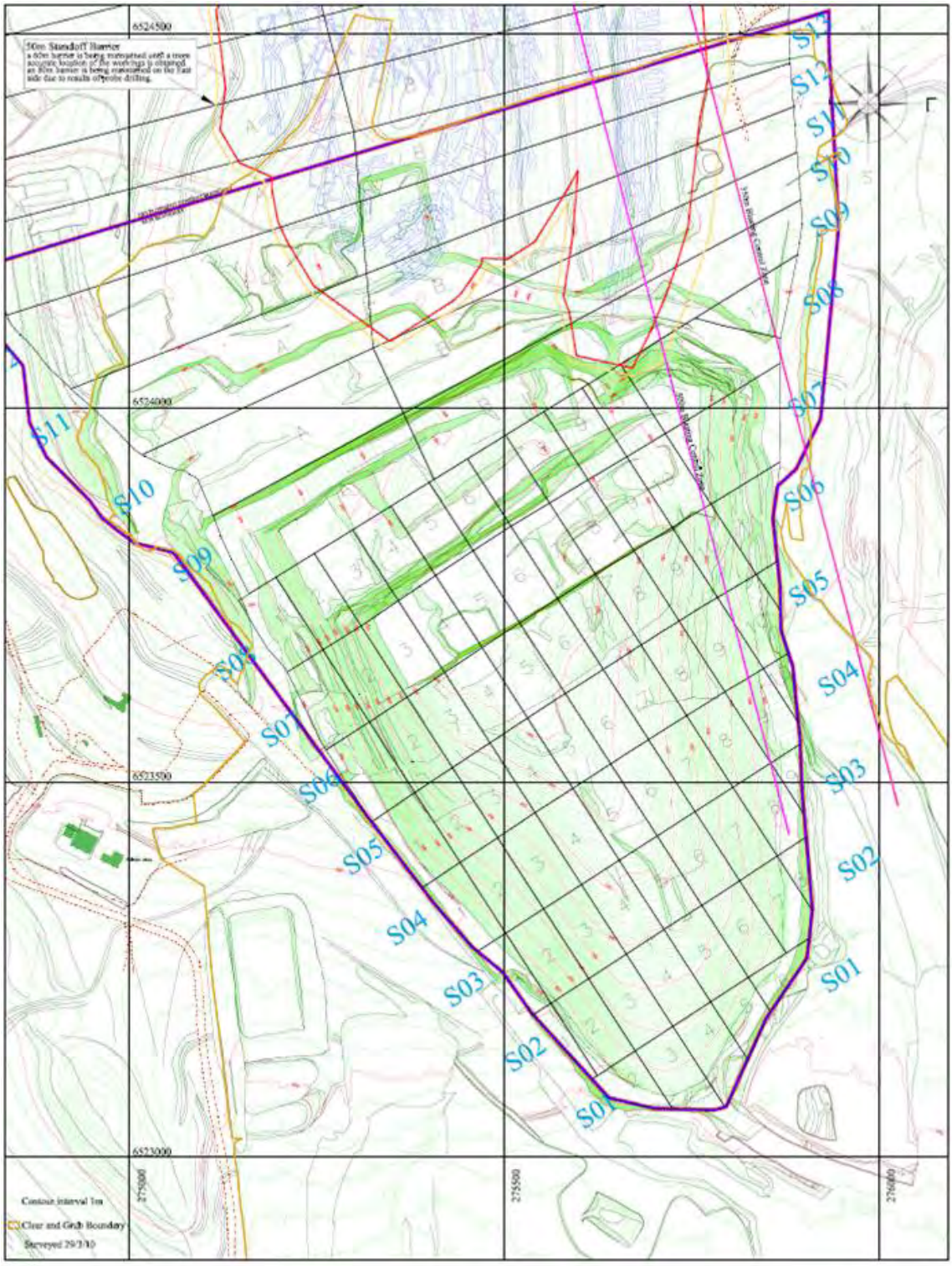


Figure 2.1 Werris Creek Coal Mining Operations as at March 2010

The extent of operations at the WCC mine as at the beginning of the period is presented in **Figure 2.2** below.

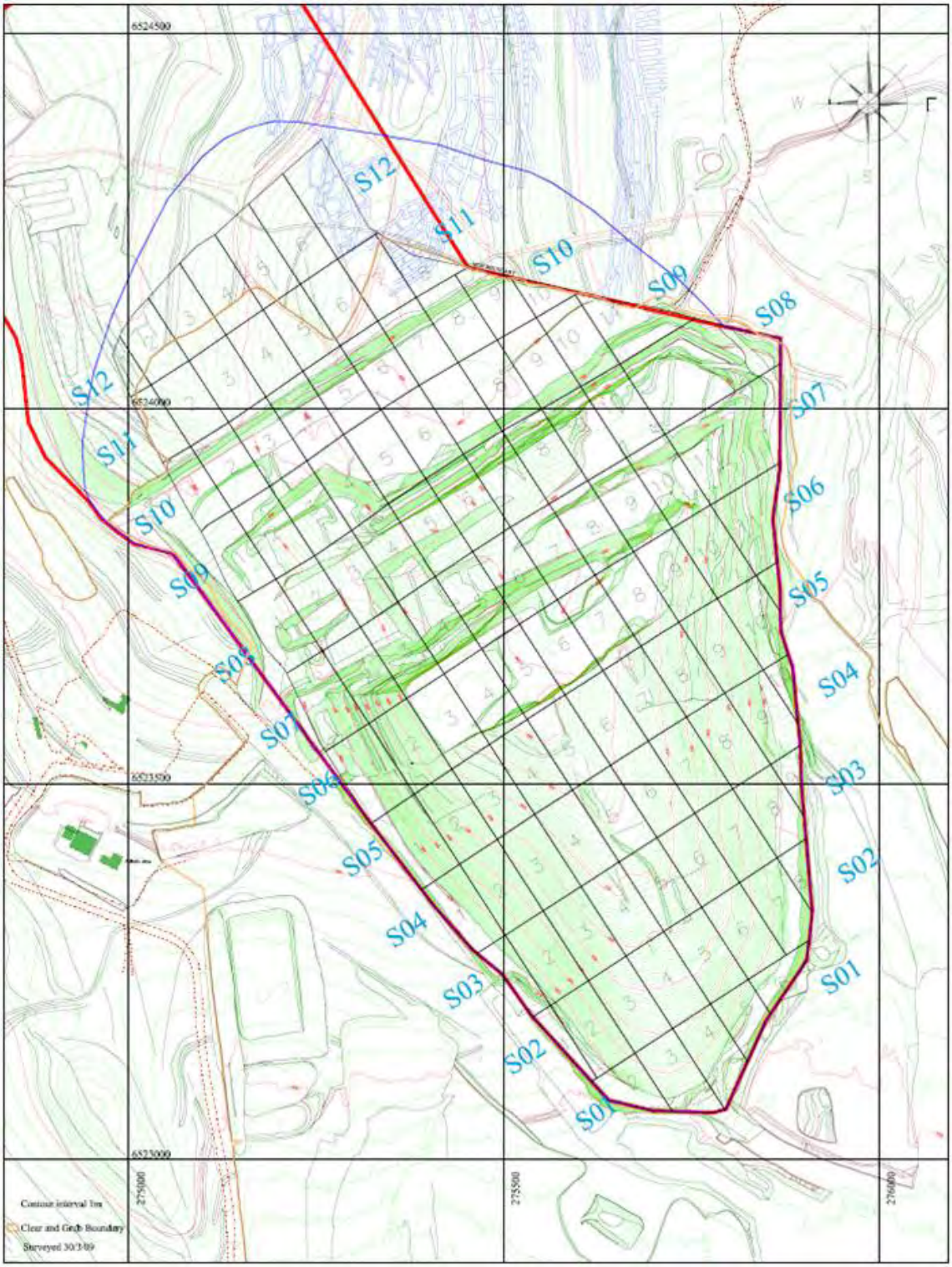


Figure 2.2 Werris Creek Coal Mining Operations as at March 2009

2.1 EXPLORATION

2.1.1 Drilling Program

There was one drilling program conducted during the period. A series of eight 100mm conventional cores were drilled from July 2009 to January 2010 for coal quality scheduling purposes.

2.1.2 Resource and Reserve Estimation

The total thickness of the coal-bearing sequence is 190m within the synclinal basin at WCC. The Werris Creek deposit is an outlier of the Greta Coal Measures comprising of eight coal seams (Seams BL and A to G), although the uppermost coal seams within the sequence (BL Seam, A Seam and B Seam) contain only limited quantities of coal separated by thick interburden layers (typically 30m to 40m).

Significantly greater quantities of coal are present within the C Seam to G Seam. With the exception of the interburden layer between the F Seam and G Seam, which ranges in thickness from 20m to 40m, these seams are generally separated by reduced thicknesses of interburden (typically 2m to 6m). The deposit has synclinally folded coal seams forming a basin shape, both in an east-west and north-south cross section the seams dip towards the centre of the deposit and then rise again at the other sub crop line.

The most recent resource statement (Coxhead, 2009) identified the coal resource as a 'Measured' or 'Indicated' resource with less than 8% of the coal remaining 'Inferred' at WCC. Coxhead (2009) reports the coal resource as 38 million tonnes (**Table 2.1**).

Table 2.1 Werris Creek Coal Resource Summary

Category	ML 1563	EL5967	EL7422
Measured	22.11 Mt	7.34 Mt	0.51 Mt
Indicated	3.62 Mt	1.17 Mt	-
Inferred	1.57 Mt	1.07 Mt	0.04 Mt
TOTAL	**27.30 Mt**	**9.58 Mt**	**0.55 Mt**

The most recent reserve statement was compiled in September 2009 (Minarco-Mineconsult, 2009) identifying a proved and probable reserve of 31.98 million tonnes incorporating ML 1563 and EL5993 and EL7422 (**Table 2.2**). This reserve excludes the coal removed by the former Werris Creek Colliery.

Table 2.2 Werris Creek Coal Reserve Summary

Proved Reserves	27.61Mt
Probable Reserves	4.38Mt
Proved + Probable	**31.98Mt**

2.2 LAND PREPARATION

Land preparation activities undertaken at the Werris Creek Coal Mine during the reporting period were conducted in accordance with the MOP for:

- Vegetation removal in advance of the active pit over an area of approximately 26.7ha of White Box, Yellow Box, Blakely's Red Gum Community and cleared lands previously used for grazing. All clearing works were undertaken following a pre-start clearing check;
- Stripping of topsoil and subsoil was undertaken only for areas with viable soil. All soil stripped during the reporting period was classified as Soil Mapping Unit 3 from the current MOP; and

- At the end of the reporting period, the total volume of soil stockpiled was 1,118,420m^3.

Figure 2.3 shows the locations of the soil stockpile areas as of April 2010.

2.3 CONSTRUCTION

There were no construction activities during the period.

2.4 MINING

During the 2009/2010 period, a total of 8,728,748bcm of overburden was removed to produce 1,220,910t of ROM coal at an average overburden to coal stripping ratio of 7.15:1 (**Table 2.3**).

During the Reporting Period, the mine continued to develop as a series of approximately 100 metre wide east-west orientated strips, advancing in a northerly direction. This has allowed for progressive intersection of each coal seam and has enabled a relatively consistent stripping ratio to be achieved.

Table 2.3 Cumulative Production and Waste Summary

	Start of Reporting Period 1 April 2009	At end of Reporting Period 31 March 2010	End of MOP Period (estimated) 31 December 2012
Soil Stripped (m^3)	1,142,950	1,147,010	1,341,500
Soil Used/Spread(m^3)	234,649	234,649	536,600
Waste Rock (bcm)	24,151,821	32,880,569	40,856,470
ROM coal (t)	4,103,728	5,324,638	9,834,000
Product coal (t)	4,103,728	5,324,638	9,834,000

2.5 PROCESSING

Processing, involving crushing and screening, is undertaken at an average rate of 500t/hr (maximum 650t/hr) 10 hours per day Monday to Friday and if required 8 hours on Saturdays.

The ROM coal is fed into a Stamler breaker for primary size reduction (to <250mm) and subsequently to a Stamler sizer to reduce the coal to <50mm size, this being the specification for export quality coal. The processing plant also incorporates a divergater to enable the separation of particular sized materials to suit specific customer requirements.

Plan 4 details the current location and layout of the coal processing area beyond the western perimeter of the open cut mine and includes some additional area on the southern ROM pad boundary for operational and coal blending requirements.

Figure 2.4 presents a schematic of coal movements, outputs and yields for the reporting period and shows that a total of 1,125,908t coal was processed through the crusher. Domestic coal produced includes 49,981t trucked by road and 6,999t rallied offsite. Total coal railed offsite (domestic and export) was 1,198,661t.

Figure 2.3 Soil Stockpile Locations

Figure 2.4 Coal Movements and Production Summary for 2009/2010 Period

Note: Difference between crusher input, coal sales and exported volumes, reflects product coal stockpiled at either the processing area or the rail siding prior to the reporting period.

2.6 WASTE MANAGEMENT

Wastes produced from WCC during the period continued to comprise of:

- Production wastes - overburden and inter-burden from mining activities; and
- Non-production wastes comprising of:
    - general domestic-type wastes from the on-site buildings and routine maintenance consumables;
    - oils and grease; and
    - sewage.

Waste management procedures adopted for each of these waste streams during the period included:

General domestic-type wastes

- All non recyclable general wastes originating from the site office, amenities and ablutions buildings, together with routine maintenance consumables from the daily servicing of equipment are disposed of in mobile garbage bins. Bins are collected regularly and contents placed in large waste storage receptacles positioned adjacent to the workshop building. Rubbish is then removed by Cleanaway the licensed industrial waste collection contractor. Industrial waste collection was undertaken on a fortnightly basis.

- The WCC offices and workshop collect all recyclable shredded paper and cardboard which is deposited in specified recycling bins and are collected by the Quirindi Aboriginal Corporation for sorting and recycling at their depot.

Oils and grease

- Within the workshop building, waste oil and grease is collected and pumped to bunded bulk storage tanks by evacuation pumps.
- In case of emergency or breakdown maintenance of equipment within the mine area or on the overburden emplacement, oils and grease can be pumped from this equipment to a tank on the service vehicle using an evacuation pump and then transferred to the self bunded bulk storage tank at the workshop building. All parts and packaging are collected and transferred to the workshop building for disposal or recycling.
- Waste oil and grease stored in the bunded area at the workshop building are collected by a licensed waste contractor (Northern Lubequip – Tamworth) for recycling, approximately once every month.
- Runoff from the concrete vehicle and equipment wash pad is directed to an oil separator and containment system for subsequent pump out and disposal by the licensed waste contractor, Northern Lubequip.
- Waste batteries are disposed of by Gunnedah Windscreens and Batteries.
- Waste tyres are disposed of by Browns Tyre Service.

Sewage

- WCC has a biocycle sewage treatment system approved by Liverpool Plains Shire Council that is serviced by a licensed waste collection and disposal contractor as required.

Overburden and Interburden

- All of the overburden and interburden materials are blasted and removed by haul truck for placement in the out-of-pit overburden emplacement area or in the in-pit emplacement area.

Coal Processing Plant Residues

- No wastes are produced from processing the ROM coal through the crushing and screening plant, i.e. all ROM coal is ultimately sold as a product.

2.7 COAL STOCKPILES

The Product Coal/Rail Load Out Coal Stockpile is limited to 100,000t coal and the ROM Coal Stockpile is also limited to 100,000t ROM coal. At the end of the AEMR period 82,950t of coal was stored at the rail load-out facility and 12,345t of coal was stored at the ROM and crushed coal processing area.

2.8 WATER MANAGEMENT

2.8.1 Discharges

WCC maintain three licensed discharge points (LDP) in accordance with EPL 12290. The three dams where discharges are permitted to occur are at SB2 (southern), SB9 (mid) and SB10 (northern) with

waters for the first two dams draining towards Quipolly Creek and SB10 discharging towards Werris Creek. WCC is permitted to discharge when the water quality is within the criteria specified in EPL 12290, however if a rainfall event greater than 39.2mm occurs in a 5 day period then the Total Suspended Solids (TSS) limit does not apply. There were two discharge events during this AEMR period as a result of wet weather events.

- From SB9 – 6th January 2010 from rainfall runoff event. The water quality was compliant with EPL 12290;
- From SB9 – 15th February 2010 from rainfall runoff event. The discharge was compliant with EPL 12290 for rainfall events greater than 39.2mm over 5 days;

The water quality analysis of these discharge events are presented in **Table 2.4.** Further discussion of water monitoring data is presented in **Section 3.3** and all surface and groundwater monitoring data has been included in **Appendix 4 (a).**

Table 2.4 WCC Discharge Data

Date	Dam / LDP	5 day Rainfall	pH	TSS (mg/L)	EC (µS/cm)	Oil & Grease (mg/L)
6/01/10	SB9	63.7mm	7.4	30	122	<5
15/02/10	SB9	43.0mm	7.9	138[1]	129	<5
EPL 12290 Criteria			8.5	50	-	10

1 – Elevated TSS was compliant as greater than 39.2mm fell in the 5 days prior to discharge

2.8.2 Water Sources, Demand and Use

An updated site water balance was prepared by GSS Environmental in compliance with Schedule 3, Condition 31 of DA-172-7-2004 and submitted to DoP as a component of the March 2009 Site Water Management Plan. This new water balance provides an adequate picture of water management on the site and has classified site water from three separate sources into dry, average and wet years. The results for the Void Water Balance, Dirty Water Balance and Clean Water Balance are presented in **Tables 2.5**, **2.6** and **2.7** respectfully.

Table 2.5 Void Water Balance

		Avg Yr (ML)	Dry Yr (ML)	Wet Yr (ML)
Inputs	Rainfall Runoff	108.8	73.7	145.9
	Groundwater Inflow	52	52	52
	Total	161	126	198
Outputs	Evaporation	33	33	33
	Dust Suppression and Crushing/Screening Operations	128	93	117
	Total	161 *	126 *	150
	Excess (+ve) or Deficit (-ve)	0	0	+48

* Dust Suppression and Crushing/Screening Operations requirements for a Dry Year total 143 ML and for a Average Year total 130ML, however only 93 ML in a Dry year and 128ML in an Average year is taken from the Void water system as this is all that is available, and the remaining requirements are sourced from other sources.

The Void water balance shows that for Dry and Average years the Void water will be consumed on site and there is minimal requirement for any storage. For a Wet year there is an excess of Void water (48 ML) that would need to be stored on-site. Werris Creek Coal Mine has a combined void water storage capacity of 55 ML, (VWD1 – 20ML and VWD2 – 35ML) this provides for 7ML of additional storage capacity to be retained for precautionary measures. In the unlikely event that void water accumulated beyond the capacity of the mine to use or store void water; it will accumulate in

the void. Whilst this may disrupt mining operations, it will prevent the off-site discharge of void water.

Table 2.6 Dirty Water Balance

		Avg Yr (ML)	Dry Yr (ML)	Wet Yr (ML)
Inputs	Rainfall Runoff	364.1	249.6	487.6
	Total	364	250	488
Outputs	Evaporation	48	48	48
	Dust Suppression and Crushing/Screening Operations	2 *	50 *	0 *
	Total	50	98	48
	Excess (+ve) or Deficit (-ve)	+314	+151	+439
* The majority of the Dust Suppression and Crushing/Screening Operations requirements are sourced from the Void water system.				

The Dirty water balance shows that for Dry, Average and Wet years there is an excess of Dirty water. This water will initially be pumped from sediment basins to the onsite water cart where access to the structures is available. The water will then be used on site for dust suppression. In the event dirty water sites cannot be accessed and used for dust suppression, then water will be treated within the detention basins and discharged through the LDPs of EPL 12290.

Table 2.7 Clean Water Balance

		Avg Yr (ML)	Dry Yr (ML)	Wet Yr (ML)
Inputs	Rainfall Runoff	656	445	881
	Total	656	445	881
Outputs	Evaporation	33	33	33
	Dust Suppression and Crushing/Screening Operations	0 *	0 *	0 *
	Total	33	33	33
	Excess (+ve) or Deficit (-ve)	+624	+412	+848
* The Dust Suppression and Crushing/Screening Operations requirements are sourced from the Void and Dirty water system. A maximum of 47.53 ML can be sourced from the Clean water, in accordance with the calculated Maximum Harvestable Right.				

The Clean water balance shows that for Dry, Average and Wet years there is an excess of Clean water. This water will be discharged off-site. As water within the clean water catchment does not interact with disturbed surfaces of the mining operation, there is no requirement to further capture and/or treat this water prior to it discharging off site.

For the 2009/2010 period, WCC used an estimated 154.6ML for trafficable dust suppression purposes based on water cart loads. The water for the dust suppression was sourced from:

- Former Underground Workings (90BL2525878) – 21.5ML;
- Void Water – 118.2ML;
- Dirty Water – 14.9ML.

2.8.3 Stored Water

Table 2.8 presents an estimate of the volume of stored water at the beginning and end of the 2009/2010 period. Details for individual storages are presented in **Table 2.9**.

Table 2.8 Summary of WCC Onsite Water Storage

	Volumes Held (ML)		
	Start of Reporting Period	**At end of Reporting Period**	**Nominal Storage Capacity**
Clean Water (in Storage Dams)	10.6	9.5	25.85
Dirty Water (in Sediment Basins)	26.7	32.1	58.9
Void Water (in Void Water Dams)	22.0	41.0	55.0

Table 2.9 Detail on Individual Dams Water Storage

Label	Function	Capacity (ML)	Source of Capacity	Storage @ 31/03/2010 (ML)
Clean Water Storage Dams				
SD2	Clean water capture and use Diversion of Clean water around mine	3.0	Estimated	2.0
SD3	Clean water capture and use Diversion of Clean water around mine	2.0	Estimated	0
SD3A	Clean water capture and use Diversion of Clean water around mine	5.9	Surveyed	0
SD4	Clean water capture and use Diversion of Clean water around mine	5.05	Surveyed	4.0
SD5	Clean water capture and use Diversion of Clean water around mine	4.0	Surveyed	0
SD10	Clean water capture and use	1.9	Surveyed	1.0
SD11	Clean water capture and use	3.0	Estimated	2.5
Total Capacity of All Clean Water Dams		24.85 ML		9.5 ML
Dirty Water Sediment Basins & Ancillary Dams				
Farm 2	Ancillary to Dirty Water System	0.4	Estimated	0.2
Farm 3	Ancillary to Dirty Water System	0.4	Estimated	0.2
Farm 4	Ancillary to Dirty Water System	4.2	Estimated	2.5
Farm 5	Ancillary to Dirty Water System	0.45	Estimated	0.2
Farm 6	Ancillary to Dirty Water System	10.7	Surveyed	5.0
Sub-Total (Ancillary Dams)		16.15 ML		8.1 ML
SB10	Northern Area – Dirty water capture, treatment and use EPL discharge point (NO. 14)	2.85	Surveyed	0
SB8	Middle Area – Dirty water capture, treatment and use	3.0	Estimated	3.0
SB9	Middle Area – Dirty water capture, treatment and use EPL discharge point (NO. 12)	4.0	Estimated	1.5
SB1	Southern area – Dirty water capture, treatment and use EPL discharge point (NO. 10)	8.5	Surveyed	4.0
SB2	Southern Area – Dirty water capture, treatment and use	7.0	Estimated	6.0
SB3	Southern Area – Dirty water capture, treatment and use	6.5	Estimated	6.0

Label	Function	Capacity (ML)	Source of Capacity	Storage @ 31/03/2010 (ML)
SB4	Southern Area – Dirty water capture, treatment and use	2. 5	Estimated	2.0
SB5	Southern Area – Dirty water capture, treatment and use	1.4	Estimated	0
SB6	Southern Area – Dirty water capture, treatment and use	4.5	Estimated	1.0
SB7	Southern Area – Dirty water capture, treatment and use	2.5	Estimated	0.5
Total Capacity of All Dirty Water Dams		58.9 ML		24.0 ML
Void Water Dams				
VWD1	Southern Area – Void water storage	20.0	Surveyed	17.0
VWD2	Middle Area – Void water storage.	35.0	Surveyed	24.0
Total Capacity of Void Water Dams		55.0 ML		41.0 ML

The only changes to the water management infrastructure during the period were the removal of SD1 due to the prestrip extension of the mine resulting in mining through the storage dam and the recommissioning of VWD2 following maintenance works to the dam lining.

2.8.4 Void Water Management

Water accumulation within the open cut is variable in its rate of occurrence and results from a combination of:

- Direct rainfall runoff which subsequently flows along the floor of the pit to the open cut sump(s); and
- Groundwater seepage, primarily through the exposed coal seams, from the former underground workings or the surrounding basalt aquifer.

As noted in **Section 2.8.2**, during the Reporting Period, a total of 118.2ML was pumped from the open cut and stored in VWD1 or VWD2. This water was preferentially used for dust suppression purposes by water carts within the mining area and sprays on the conveyors and hoppers.

2.9 Hazardous and Explosive Material Management

ANFO-based bulk explosives are used at the mine with electronic detonators used for blast initiation. The components of the bulk explosives, ammonium nitrate prill (AN) and emulsion (EP) are transported onto site by the mine blasting contractor. Emulsion is stored in a 27t tank with AN stored separately. Two licensed explosives magazines are maintained on ML 1563 as shown on **Plan 4**, one for storage of detonators and the other for boosters.

Materials Safety Data Sheets (MSDS) are retained on-site for all hazardous materials, independent of the quantity held. Additionally, all contractors are required to supply MSDS sheets for any hazardous goods they propose to bring onto the site. Explosives and security sensitive dangerous substances are currently stored in accordance with the Orica Mining Services Security Plan and managed by Orica. Orica are currently the licence holders to both store and manufacture explosives at the WCC.

2.10 Other Infrastructure Management

WCC has acquired an additional three neighbouring properties since the previous period. The acquisitions are as a result of future proposed projects and to alleviate any current or future environmental impacts on these residents. **Table 2.10** details the properties purchased by the company and the subsequent dates of purchase.

Table 2.10 Project Related Properties

Property Name	Purchase Date
The Colliery	14th February 2008
Railway View	5th June 2008
Preston Park	20th October 2008
Branga	20th October 2008
Escott	7th May 2009
Cintra	31st March 2010
Marengo	17th May 2010

Note: The Zeolight Australia property has also become a project related property through the property purchase of "Escott". Other Project related properties previously purchased by WCC include, "Eurunderee" and "Hillview".

Management of other infrastructure (buildings, roads, generators, pumps etc) and other facilities not specified elsewhere within this AEMR, is undertaken on an as-needs basis or in accordance with statutory requirements in order to maintain them in an operationally efficient and safe condition, and which does not result environmental impacts.

2.11 Product Transport

The despatch of product coal from WCC is either railed to the Port of Newcastle or by road, to domestic customers. The despatch of coal by rail requires the product coal to be transported by road trucks from the coal processing area to the product coal stockpile area and rail load-out facility via the private coal haul road.

During the period 1,190,422t of coal was transported to the rail load-out storage area via the internal coal haul road using road-registered semi-trailers.

A total of 1,191,662t of export coal was loaded onto 261 trains during the reporting period.

During the reporting period 49,981t of coal was transported by road to domestic markets in 1,750 truckloads at an average load of 28.5t.The domestic coal is loaded from the stockpiles at the coal processing area and despatched to the public road network via the mine access road and was primarily sold into local markets.

3.0 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

The following sub-sections of this document discuss the implementation and effectiveness of the various environmental control strategies adopted by WCC, together with monitoring data for the 2009/2010 period.

3.1 AIR QUALITY

3.1.1 Air Quality Criteria and Monitoring Program

The air quality criteria applicable to WCC are specified in Condition 1, Schedule 4 of DA 172-7-2004 summarised in **Table 3.1**.

Table 3.1 Air Quality Impact Assessment Criteria

Pollutant	Averaging Period	Criterion
Total Suspended Particulate (TSP) Matter	Annual	90µg/m^3
Particulate Matter < 10 microns (µm) (PM_{10})	Annual	30µg/m^3
Particulate Matter < 10 microns (µm) (PM_{10})	24 hour	50µg/m^3
Deposited Dust	Annual	3.6g/m^2/month

During the period, WCC revised the Air Quality Monitoring Program for approval by DECCW and DoP. The air quality monitoring for the WCC continues to be undertaken for deposited dust, total suspended particulates and PM10 particulates. A summary of the air quality monitoring network is provided in **Table 3.2** and the locations are shown on **Figure 3.1**.

Table 3.2 Air Quality Monitoring Program

Pollutant	Frequency	Locations
TSP	6 Days	"Railway View"
PM_{10}	6 Days	"Eurunderee", "Railway View", "Cintra", "Tonsley Park"
Deposited Dust	Monthly	"Plain View", "Railway View", "Cintra", "Tonsley Park", "Marengo"

3.1.2 Control Procedures

As well as aiming to meet the criteria identified above, WCC continues to employ a range of air quality control measures to maintain its "operations and activities ... in a manner that will minimise the emission of dust" in accordance with EPL 12290. WCC utilises water carts as the principle method to minimise air quality impacts from our operations. WCC maintain and use three water carts onsite, two 14,000L capacity trucks dedicated to the active mining operations area and one 36,000L capacity semi trailer truck for the coal processing and product coal stockpile areas. From daily load counts undertaken by the water cart operators, WCC use 13ML per month of water for dust suppression activities, which is approximately 154ML per year. The water is primarily sourced for dust suppression from pit dewatering activities.

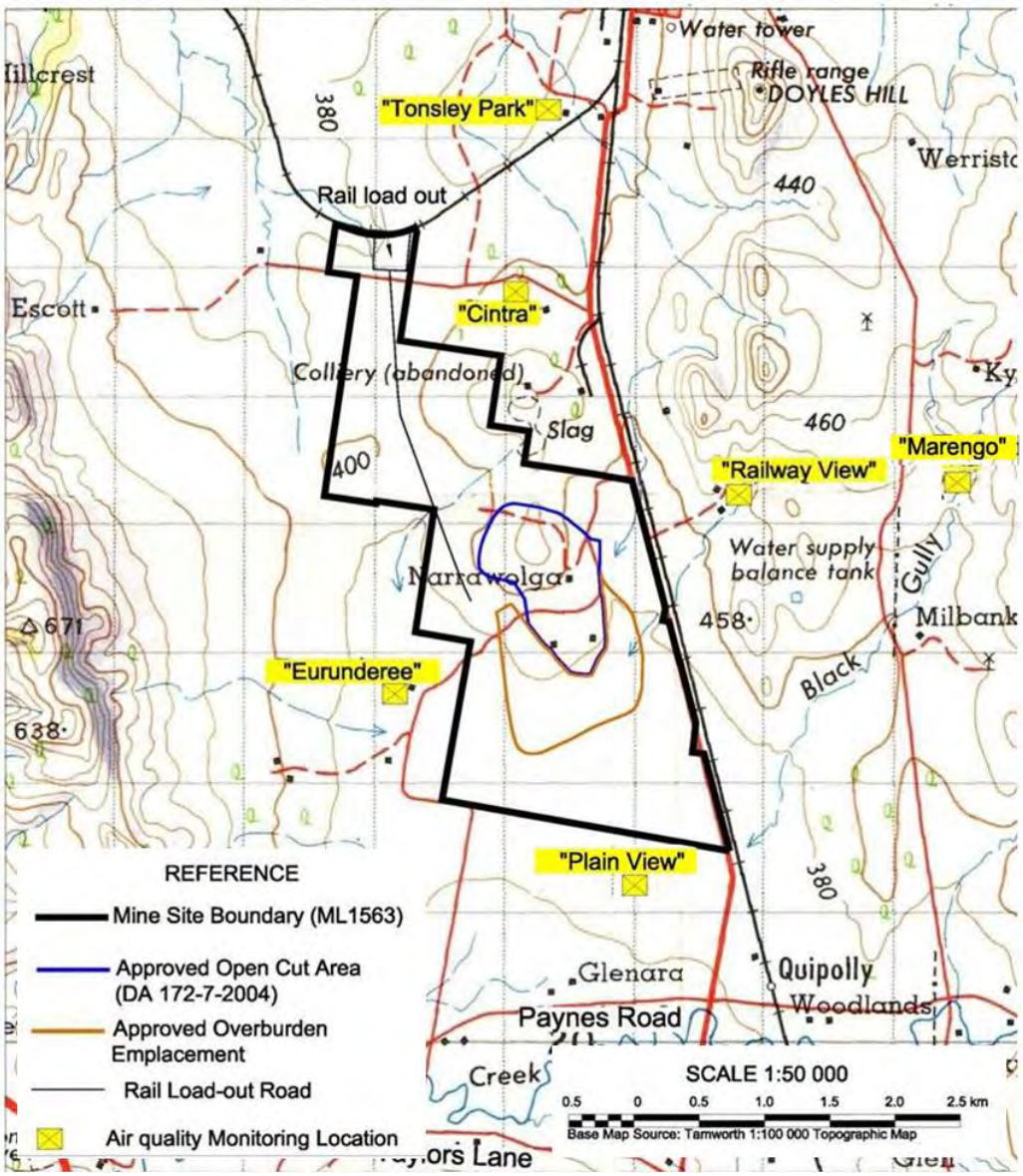


Figure 3.1 Air Quality Monitoring Network

WCC also employ further management controls to minimise dust generation onsite that include:

- Overburden, coal and soil loading activities are not undertaken during periods of high winds or dry conditions causing significant dust lift-off. If these activities cannot be adequately managed, they will be suspended until conditions improve;
- Water sprays used on the coal feed hopper, crusher and at all conveyor transfer and discharge points;
- The extent of disturbed areas (pre-strip clearing and rehabilitation) are the minimum required for mining operations with revegetation undertaken as soon as practicable once areas are no longer needed; and
- Where possible all vehicles must drive to the conditions to minimise trafficable dust generation and utilise existing tracks onsite;

3.1.3 Dust Deposition Monitoring

The dust deposition monitoring requirements for WCC are based on particulate matter that is solely generated onsite by WCC related activities. Dust results can be influenced by sources not from WCC activities and therefore these are excluded from annual averages. Excluded results range from organic matter contamination from bird droppings, insects, leaves and grass slashing as well as dust (inorganic) from other sources such as local farmers ploughing paddocks, property owners burning off or regional dust storms (such as the two events over eastern Australia in September 2009).

Monitoring results for the last 12 months indicate that for all gauges including our closest neighbours, WCC did not at anytime exceed our dust deposition air quality criteria in **Table 3.3** as a result of WCC operations. Detailed dust deposition results are provided in **Appendix 3(a)**.

WCC has undertaken dust deposition monitoring since 2005 and the annual averages since that time are presented in **Table 3.4**. The annual monitoring results do not identify any trend of increasing dust levels since 2005, however it is likely that dust levels in the immediate area would have increased since the mine commenced. Nevertheless, the variations in the annual average levels more reflect the prevailing environmental conditions than specifically increasing dust levels associated with WCC. Most notably the influence of broader climatic events such as the prevailing drought conditions during 2005-2006, changing to average rainfall conditions in 2007-2008, can have on the ambient dust levels rather than the impacts of WCC alone.

Table 3.3 Dust Deposition Monitoring Results April 2009 to March 2010 (g/m^2/month)

	WC1	WC2	WC3	WC4	WC5	WC6	WC7	WC8	WC9	DA
	Escott	Cintra	The Colliery	Hillview	Railway View	Southern Boundary	Tonsley Park	Plain View	Marengo	Limit
April 2009	0.3	0.6	2.2	0.7	0.4	2.3	0.4			**3.6**
May 2009	0.7	1.4	7.8 [c]	1.5	1.1	7.9 [c]	5.0 [c]			**3.6**
June 2009	0.3	0.6	2.2	0.7	0.4	2.3	0.4			**3.6**
July 2009	0.2	0.5	2.2	0.4	0.3	2.4	1.4			**3.6**
August 2009	1.3	1.5	2.9	1.6	1.5	6.6 [c]	4.0 [c]			**3.6**
September 2009	5.8^	5.9^	3.9^	7.9^	4.3^	6.1^	4.6^			**3.6**
October 2009	1.7*	3.3	2.9*	2.5*	2.4	37.5 [c]*	2.1			**3.6**
November 2009		2.8			0.9		0.9	0.7**	0.6**	**3.6**
December 2009		1.4			1.0		1.5	1.4	1.4	**3.6**
January 2010		2.1			0.9		2.0	2.1	1.2	**3.6**
February 2010		2.0			1.5		1.5	2.1	3.3	**3.6**
March 2010		1.7			1.2		50.0[#]	3.1	1.1	**3.6**
MEAN	0.7	1.6	2.5	1.2	1.1	2.3	1.3	1.9	1.5	**3.6**
MINIMUM	0.2	0.5	2.2	0.4	0.3	2.3	0.4	0.7	0.6	**NA**
MAXIMUM	1.7	3.3	2.9	2.5	2.4	2.4	2.1	3.1	3.3	**3.6**

* Dust deposition monitoring gauges decommissioned during the period

** Dust deposition monitoring gauges commissioned during the period

^ Dust results excluded due to two dust storm events over eastern Australia

[c] Sample contaminated with organic matter from non-mining source (i.e. bird droppings and insects)

[#] Sample contaminated from local dust source non-mining related (i.e. fire)

Table 3.4 Dust Deposition Annual Averages since 2006 (g/m^2/month)

	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010	DA Limit
WC1	0.6	0.8	0.7	0.5	0.7	3.6
WC2	1.2	1.4	1.1	1.3	1.6	3.6
WC3	1.5	2.3	2.9	3.7	2.5	3.6
WC4	0.8	0.9	0.7	0.7	1.2	3.6
WC5	2.0	1.2	0.6	0.7	1.1	3.6
WC6	5.4	9.4	5.1	4.8	2.3	3.6
WC7	1.3	3.9	1.6	0.9	1.3	3.6
WC8	-	-	-	-	1.9	3.6
WC9	-	-	-	-	1.5	3.6

3.1.4 TSP and PM10 Monitoring

Detailed air quality monitoring results for TSP and PM10 over the last 12 months has been included in **Appendix 3(b)** with **Table 3.5** summarizing the monthly averages. Overall, both TSP and PM10 levels were below the annual average criteria set by DA 172-7-2004 (30µg/m^3 and 90µg/m^3 respectively). However, on several occasions PM10 results exceeded the 24 hour (short term) criteria at "Cintra" (20/11/09 59µg/m^3, 8/12/09 70 µg/m^3 and 14/12/09 51µg/m^3), "Railway View" (21/10/09 55 µg/m^3) and "Eurunderee" (15/09/09 81 µg/m^3 and 16/02/10 73 µg/m^3) from the 60 occasions recorded at each monitor over the last 12 months. Eurunderee was the exception with only a 53% capture rate during the period due to a dispute with the joint venture partner preventing access to the site and the drive motor of the HVAS failing. On those occasions with elevated levels, WCC operations would have been the likely source due to the pre-dominate wind direction on those days. WCC own "Cintra", "Railway View" and "Eurunderee" in recognition that these properties have the potential to be impacted by the nearby mining operations. It should be noted that at no time has WCC exceeded the annual average limit for PM10 or TSP since mining operations commenced.

Table 3.5 Monthly PM10 and TSP Averages

	WCHV-1	WCHV-2	WCHV-3	WCHV-4	WCHV-5	DA	DA
	Cintra	Tonsley Park	Railway View	Eurunderee	Railway View	Limit	Limit
	PM10	PM10	PM10	PM10	TSP	PM10	TSP
April 2009	17.8	15.6	12.6	13.0	30.6	**30**	**90**
May 2009	20.0	15.8	11.6	5.0	24.0	**30**	**90**
June 2009	8.0	3.8	2.8	-	7.4	**30**	**90**
July 2009	7.4	7.8	5.6	7.0	17.0	**30**	**90**
August 2009	15.0	21.8	16.6	15.2	32.0	**30**	**90**
September 2009	18.8	20.0	20.3	34.5	47.4	**30**	**90**
October 2009	19.0	15.8	21.8	11.7	64.6	**30**	**90**
November 2009	30.6	20.6	18.6	3.0	34.4	**30**	**90**
December 2009	34.8	25.8	27.6	-	58.4	**30**	**90**
January 2010	21.0	20.0	20.6	-	39.4	**30**	**90**
February 2010	17.0	15.8	13.6	30.2	26.6	**30**	**90**
March 2010	20.6	16.2	20.6	18.8	51.2	**30**	**90**
MEAN	19.2	16.4	15.0	17.7	35.7	**30**	**90**
MINIMUM	2	1	1	1	4	**-**	**-**
MAXIMUM	70	46	55	81	134	**50**	**90**
% CAPTURE	100%	100%	100%	53%	100%	**100%**	**100%**

3.1.5 Greenhouse Gas

Diesel combustion during the reporting period totalled 9,030,260 L of fuel was used on the Werris Creek Mine site. Assuming an energy content of Automotive Diesel Oil (diesel) of 38.6 MJ/L and "National Greenhouse Accounts (NGA) Factors" June 2009, the estimated direct Scope 1 Greenhouse Gas (GHG) emissions from diesel combustion are outline in **Table 3.6**.

Table 3.6 Greenhouse Gas Emissions at WCC

	Diesel Fuel Usage kL	Emission Factor t $CO_{2\text{-}e}$/kL	Equivalent Tonnes
GHG 2005/06	5,590	2.7	15,093
GHG 2006/07	5,855	2.7	15,809
GHG 2007/08	7,566	2.7	20,428.
GHG 2008/09	6,838	2.7	18,427
GHG 2009/10	9,030	2.7	24,382

Electricity usage during the reporting period totalled 1,019,149 kWh power used at the Werris Creek Coal Mine which was supplied from the national electricity grid. The "National Greenhouse Accounts (NGA) Factors" June 2009 and a Scope 2 (indirect) emission factor of 0.89 kg CO_2 – equivalents / kWh, the estimated greenhouse emissions from electricity usage was 907.4 equivalent tonnes of CO_2.

WCC will undertake an Energy Savings Action Plan (ESAP) during the next period for submission to the Department of Planning. Potential ideas for energy and greenhouse gas emissions reductions include:

- a review of the air compressor system;
- upgrade of crushing plant to reduce the number of conveyors and remove diesel power packs; and
- Investigate replacing coal transport by semi trailers with conveyor system.

3.2 EROSION AND SEDIMENTATION

3.2.1 Management

Methods for the management of erosion and sediment control at the Werris Creek Coal Mine are presented in the current MOP and in Section 5.0 of the Site Water Management Plan (GSS Environmental, 2009) and include:

- The segregation of water streams with all water from clean, dirty or void water catchments retained onsite for dust suppression;
- Dirty water dams (Sediment Basins – SB) are designed to retain 39.2mm rainfall events over 5 day periods before spilling and are to be maintained in a drawn down state;
- Revegetation of soil stockpiles, areas shaped to their final landform and areas no longer required for mining-related purposes;
- Installation of upslope protective earthworks such as contour banks or straw bale protection; and
- Installation of contour banks and lined waterways on the final landform following soil application.

3.2.2 Performance

The effectiveness of the procedures for erosion and sedimentation management are assessed visually as part of routine mine operations and supervision undertaken by WCC, with any ameliorative works initiated as and when required.

3.3 SURFACE WATER

3.3.1 Management

The prevention of surface water pollution is achieved through the management of surface water as discussed in **Section 2.8**.

3.3.2 Performance

Surface water monitoring for the period indicated that there was no change in water quality from the previous year and that void and dirty water streams remained representative of the main water source utilised on the Werris Creek site. The routine quarterly results collected from Void Water Dam (VWD) 1 and 2 and Sediment Basins 2, 9 and 10 (including discharges) are presented in **Table 3.7** and detailed results included in **Appendix 4(a)** with locations as shown on **Figure 3.2**.

Table 3.7 Surface Water Analysis for Licensed Water Storages

Dam	Monitoring Site (EPA No)	Number of Samples	pH	Conductivity (µS/cm)	Suspended Solids (mg/L)	Grease & Oil (mg/L)
VWD1	16	4	8.25	1034	9	<5
VWD2	27	3	8.15	1044	93	<5
SB2	10	5	8.15	371	20.4	<5
SB9	12	8	8.21	575	151	<5
SB10	14	4	7.9	216	155	<5

Routine and discharge water quality monitoring results in **Table 3.8** for offsite locations in Quipolly and Werris Creeks indicate no impact on the streams as a result of WCC operations. As discussed in **Section 2.8.1**, there were only two surface water discharges during the period both from SB9 into Quipolly Creek catchment. GeoTerra (2010) identified no impact on Quipolly Creek water quality as a result of the two surface water discharges by WCC during the period. Elevated nutrient levels in samples taken could be a result of intensive agriculture on the fertile alluvium along Quipolly Creek rather than from WCC activities.

Table 3.8 Quipolly and Werris Creek Water Quality

Creek	Monitoring Site (EPA No)	Number of Samples	pH	Conductivity (µS/cm)	Suspended Solids (mg/L)	Grease & Oil (mg/L)
Quipolly Downstream	26	2	7.77	774	10	<5
Quipolly Upstream	25	0	Dry	Dry	Dry	Dry
Werris Downstream	24	2	7.99	393	58	<5
Werris Upstream	23	2	7.86	1190	18	<5

The 2009/2010 Annual Review of Surface Water and Ground Water Monitoring report has been included as **Appendix 4(b).**

3.4 GROUNDWATER

3.4.1 Management

The methods for management of potential pollutants are summarised in **Section 2.8.4**. A three-phase system of management for any significant spills is identified in the Groundwater Contingency Plan. At this stage no significant spills have been recorded and the management system has not been activated.

3.4.2 Performance

Performance with respect to groundwater management, the prevention of pollution and the assessment of impacts on groundwater availability to other surrounding users, is assessed through groundwater level and chemistry monitoring. Monitoring is undertaken at 14 sites (MW1 to MW14) including both onsite and offsite bores and piezometers located up to 7 km from mining activities.

Included in **Appendix 4(a)** is the groundwater monitoring data for the 2009/2010 period. All groundwater sampling and analyses were undertaken by ACIRL/ALS Pty Ltd.

Condition 36 of DA 172-7-2004 Schedule 4 specifies that an independent review of water monitoring results is undertaken annually. The 2009/2010 Annual Review of Surface Water and Ground Water Monitoring report was conducted by GeoTerra Pty Ltd and is included as **Appendix 4(b).**

The GeoTerra report (2010) conclusions for surface water, groundwater level and water quality monitoring undertaken for the period (results from 6th May 2009 and 23rd February 2010) are:

- No sustained change in groundwater levels or groundwater quality that would trigger the Groundwater Contingency Plan (change greater than 15%) compared to the baseline "natural" condition within the Quipolly Creek alluvium aquifer;
- No sustained change in groundwater levels or groundwater quality that would trigger the Groundwater Contingency Plan (change greater than 15%) compared to the baseline "natural" condition within the Werrie Basalt aquifer; and
- There has been a reduction in rainfall recharge that has been observed as a general water level decline for the majority of groundwater monitoring locations. The effect of reduced rainfall recharge means that analysing if any mining depressurisation has occurred outside of the open cut or the quantifying the performance of the impervious layer between the basalt and coal measure aquifers cannot be interpreted for the period.

General trends over the period identified by GeoTerra (2010) was that the majority of monitoring locations groundwater levels had fallen for both the alluvium and basalt aquifers, but these levels were all within the range of historical levels and was attributed to reduced rainfall recharge over 2009/2010. A number of groundwater monitoring locations and Quipolly Creek surface water had either elevated Phosphorus or Nitrogen levels above the ANZECC (2000) long term trigger value for irrigation. These locations have either had a previous history or are still currently used for intensive agriculture and while not definitive, are the likely source of these nutrients than WCC current activities.

Piezometer P3 was removed during the period due to the expansion of mining operations and will need to be reinstated for continued monitoring of the impermeable layer between the coal measure and basalt aquifers.

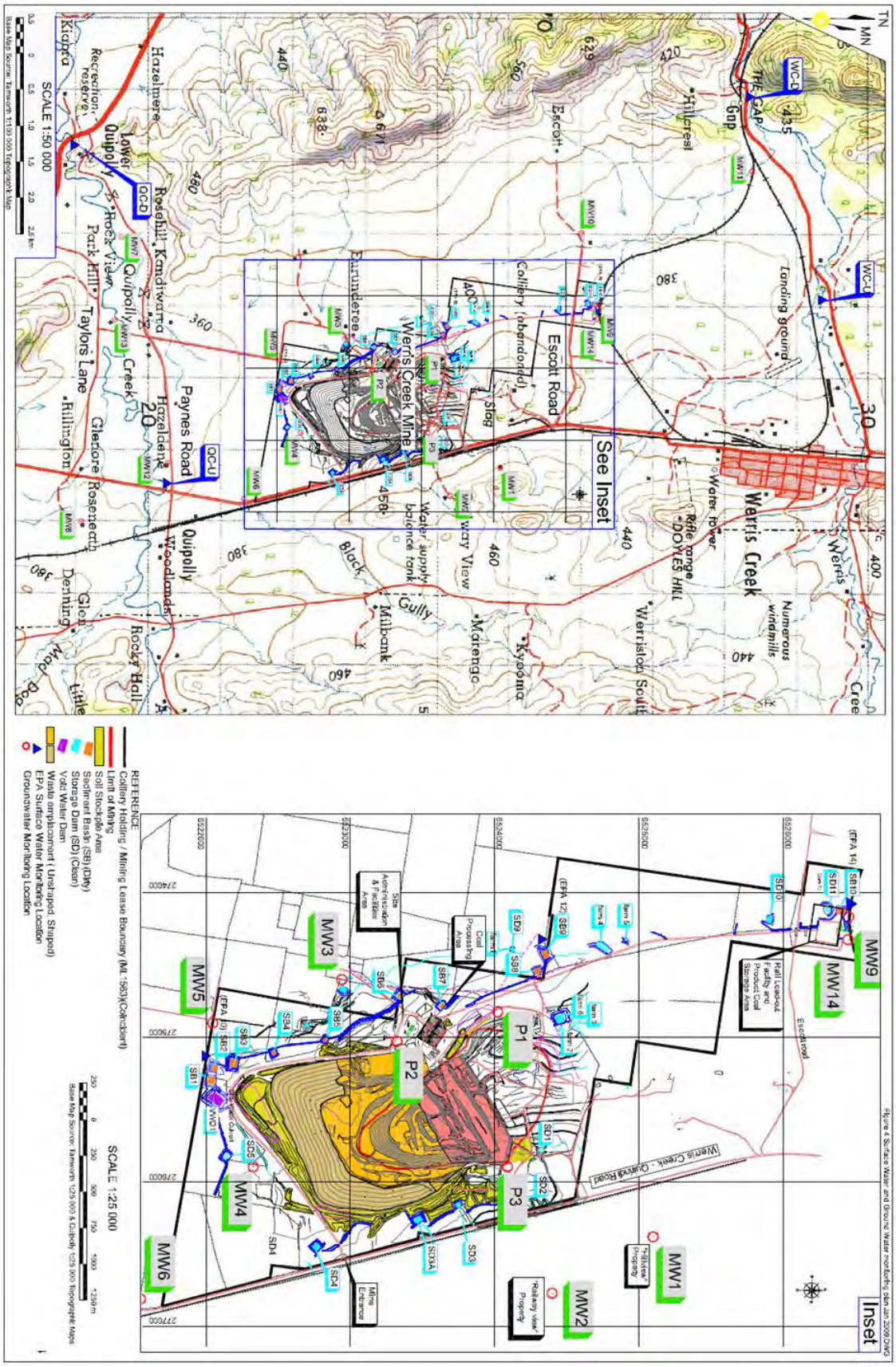


Figure 3.2 Water Monitoring Network

3.5 CONTAMINATED LAND

The situation in regard to potentially contaminated or polluted land remains unchanged to date and at this stage there is no reason to suspect that contaminated lands would be present within the ML 1563 area.

3.6 FLORA

Remnants of two endangered ecological communities (EEC) have been identified at WCC:

- Brigalow Community; and
- White Box, Yellow Box, Blakely's Red Gum Woodland.

For successful rehabilitation including the re-establishment of native communities, WCC are developing a Landscape Management Plan for the ongoing management and monitoring of both undisturbed native vegetation communities as well as rehabilitation areas.

Monitoring is conducted over six monitoring plots or quadrants. Four were established on 25 October 2005 to provide baseline data on which to assess changes over time within the de-stocked area surrounding the mine. A fifth monitoring site was established on 17th May 2006 within White Box / Yellow Box / Blakely's Red Gum Woodland west of the coal haul road as a possible replacement for Quadrant 3. The sixth quadrant has been established in the rehabilitation area.

The annual flora monitoring was undertaken on 21st April 2010, however due to family issues with the consultant the report has not been completed at the time of writing the AEMR. The results will be included in next year's AEMR when available from the consultant.

3.6.1 Biodiversity Offset Strategy

WCC undertook and coordinated a specialist consultant to revise the Biodiversity Offset Strategy and Management Plan (BOMP – ELA, 2010) for the site to meet Condition 40 of DA 174-7-2004 Schedule 4. The offset properties are located approximately six kilometres south of the township of Werris Creek and have been acquired by WCC to meet the biodiversity offset requirements for the current operation.

The BOMP has been written to provide a management framework that will lead to an improvement in the condition of native vegetation on the site through specific woodland restoration techniques. These actions will aid to minimise the effect of key threatening processes that may impact upon the EEC and potential threatened species that inhabit the site. The Landscape Management Plan has been written to align to the BOMP in particular to the revegetation and monitoring methodologies. The management actions specified within the BOMP include:

- Placing a caveat on the relevant land titles to conserve the offset area in perpetuity;
- Management of human disturbance;
- Management of grazing;
- Weed control;
- Bushfire management;
- Retention of regrowth and remnant native vegetation;
- In fill planting;

- Retention of dead timber;
- Erosion and sediment control;
- Soil and water management;
- Retention of rock; and
- Control of feral and overabundant native species.

The WCC Biodiversity Offset area covers a minimum area of 362 hectares (ha) and consists of 272.04ha of remnant native vegetation in various condition classes on the 'Eurunderee' and 'Railway View' properties, 4.96 ha of non vegetated areas and a significant area of the proposed mine site rehabilitation area (**Figure 3.3**).

3.7 FAUNA

Fauna monitoring was undertaken between 2 and 4 November 2009 sampling at eight plots representative of fauna habitat onsite, including a "rehabilitated" plot. The fauna monitoring serves to record and determine if the proposed measures to minimise impact on the fauna are effective and the predicted impacts of the activity during the proposal on the local biodiversity have been accurately determined. The specialist consultant's fauna monitoring report is included in **Appendix 5**.

Notable results from monitoring have been that the rehabilitation plot now has two reptile species recorded increasing from last year by the addition of a second skink species. Also observed was a large male Euro that had taken up residence in the rehabilitation area.

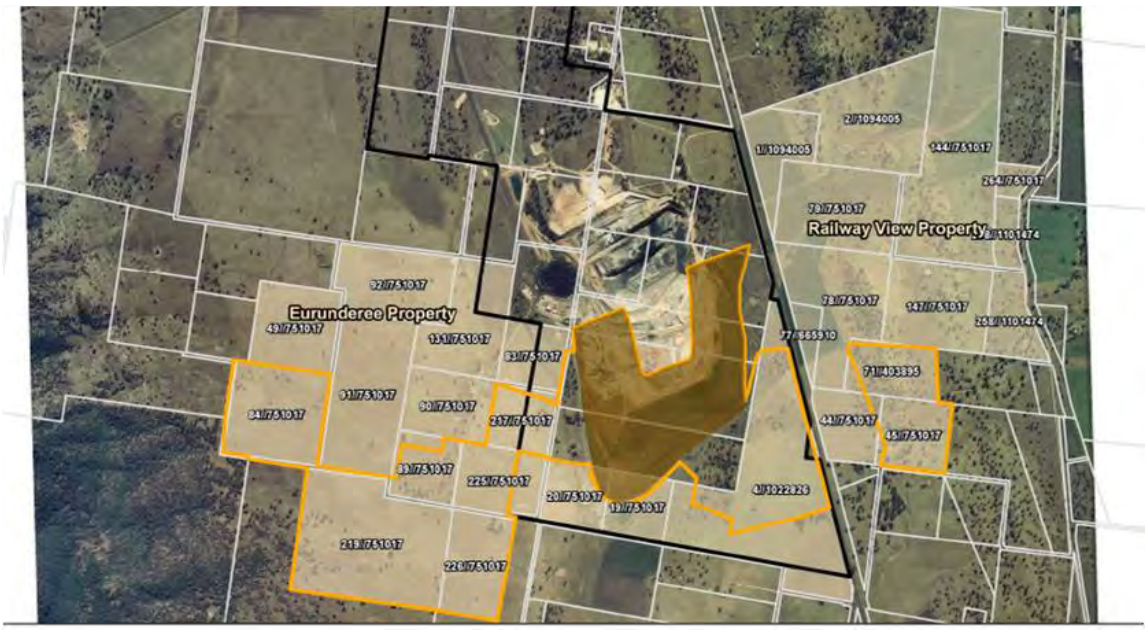


Figure 3.3 WCC Biodiversity Offset Area

It was noted by the consultant that the late Spring monitoring results may have been adversely impacted by the following factors:

- In general, the season has been preceded by over 12 months of below average rainfall and last summer was severe, hot and dry;

- The fauna has already been affected by last summer's adverse conditions; and
- Plot 1 had been progressively isolated and the surrounding habitat patch quality diminished with the progression of the mine.

A general decline in fauna diversity and richness is most likely a consequence of the extremes in climatic conditions over the period; however the modifications and extension of the mine has also resulted in a need to replace over half of the monitoring plots. Therefore, conclusions as to the effectiveness of the fauna safeguards and ameliorative measures that were put in place since the mine began cannot be made without further long term monitoring utilising plots that will not be subject to additional disturbance (Countrywide Ecological Services, 2010).

3.8 WEEDS

During the Reporting Period, WCC maintained its weed control program focusing on noxious weeds of Spiny Burrgrass, St Johns Wort and Bathurst Burrs. Spiny Burrgrass has been identified as an ongoing issue at WCC through the last three Flora Monitoring Reports. The Spiny Burrgrass eradication program commenced last year including spot spraying and targeted burns. It appears that the control program was reasonably successful as only follow up spot spraying in the rehabilitation area and along the coal haul road was required.

Monthly environmental inspections of the mine site and quarterly inspections of the rehabilitation and biodiversity offset area as well as knowledge from previous years weed control programs are used to identify weeds locations and when control is required. The development of the Landscape Management Plan in 2010/2011 period will formalise the weed management strategy and procedures at WCC.

3.9 BLASTING

3.9.1 Blast Criteria and Control Procedures

Blasting criteria for the Werris Creek Coal Mine are nominated in DA 172-7-2004, Schedule 4 Conditions 18-23 and Conditions O1 and L8 of EPL 12290 and specify that:

- Blasting must only be carried out between 9.00 am and 5.00 pm, Monday to Friday for Stage 2 operations. No blasting is allowed on Saturdays, Sundays or Public Holidays without the prior approval of the DECCW;
- No more than one blast per day can be undertaken unless with the approval of DECCW;

The overpressure level from blasting operations must not:

- Exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over a period of 12 months; and
- Exceed 120dB (Lin Peak) at any time;

Ground vibration peak particle velocity from the blasting operations must not:

- Exceed 5mm/s for more than 5% of the total number of blasts over a period of 12 months; and
- Exceed 10mm/s at any time, when measured at any point within 30 metres of any affected non-project related residence or other noise sensitive location.

The acquisition of "Hillview", "Old Colliery" "Railway View" "Escott" and "Zeolight" properties has substantially reduced the potential for future blast exceedance, as has ongoing consultation between the blasting contractor and DECCW in terms of ensuring blasting is appropriately controlled and managed.

3.9.2 Performance

During the reporting period, a total of 114 blasts were carried out on site by the blast contractor Orica Mining Services. There were no exceedances of the approval/licence limits for the period at privately owned residences as seen in **Table 3.9** and **Figure 3.4**. During the period, WCC revised its Blasting Monitoring Program and modified EPL 12290 to relocate monitoring locations to adjacent non-mine owned properties. Detailed blast monitoring results are included in **Appendix 6**.

Table 3.9 WCC 2009/2010 Blast Monitoring Results Summary

Month	# of Blasts	Overpressure		Vibration	
		Max dB(L)	Location	Max mm/s	Location
April 2009	4	113.6*	Old Colliery	3.31*	Railway View
May 2009	7	113.6*	Railway View	1.54*	Railway View
June 2009	6	122.1*	Railway View	2.59*	Railway View
July 2009	13	114.3*	Old Colliery	2.24*	Old Colliery
August 2009	10	114.8*	Old Colliery	3.23*	Railway View
September 2009	11	116.6*	Old Colliery	2.44*	Railway View
October 2009	13	125.8*	Old Colliery	2.29*	Railway View
November 2009	11	112.6	Marengo	1.20	Cintra
December 2009	7	110.0	Tonsley Park	0.99	Cintra
January 2010	8	114.5	Cintra	1.47	Cintra
February 2010	11	113.2	Cintra	1.32	Cintra
March 2010	13	114.3*	Cintra	1.00*	Cintra
TOTAL/MAX	114	125.8*	Old Colliery	3.31*	Railway View

* Indicates project related properties not subject to blasting criteria

3.10 OPERATIONAL NOISE

3.10.1 Criteria

The noise emission criteria applicable to WCC are outlined in EPL 12290 and DA 172-7-2004 Schedule 4 Conditions 7 and 8 (**Tables 3.10** and **3.11**) as summarised below:

EPL 12290 L6.1 Noise from the premises must not exceed:

- an $L_{A1(1\ minute)}$ noise emission criteria of 45 dB(A) at night; and
- At all other times (including at night), a $L_{Aeq\ (15minute)}$ noise emission criterion of 35 dB (A), except as expressly provided by this licence.

The noise emission criteria in L6.1 apply under all meteorological conditions except:

- during rain and wind speeds (at 10m height) greater than 3m/s; and
- Under "non-significant weather conditions".

Table 3.10 Noise Impact Assessment Criteria dB(A) at any residence on privately owned land:

Day	Evening	Night	Night
$L_{Aeq(15\ minute)}$	$L_{Aeq(15minute)}$	$L_{Aeq(15minute)}$	$L_{A1(1\ minute)}$
35	35	35	45

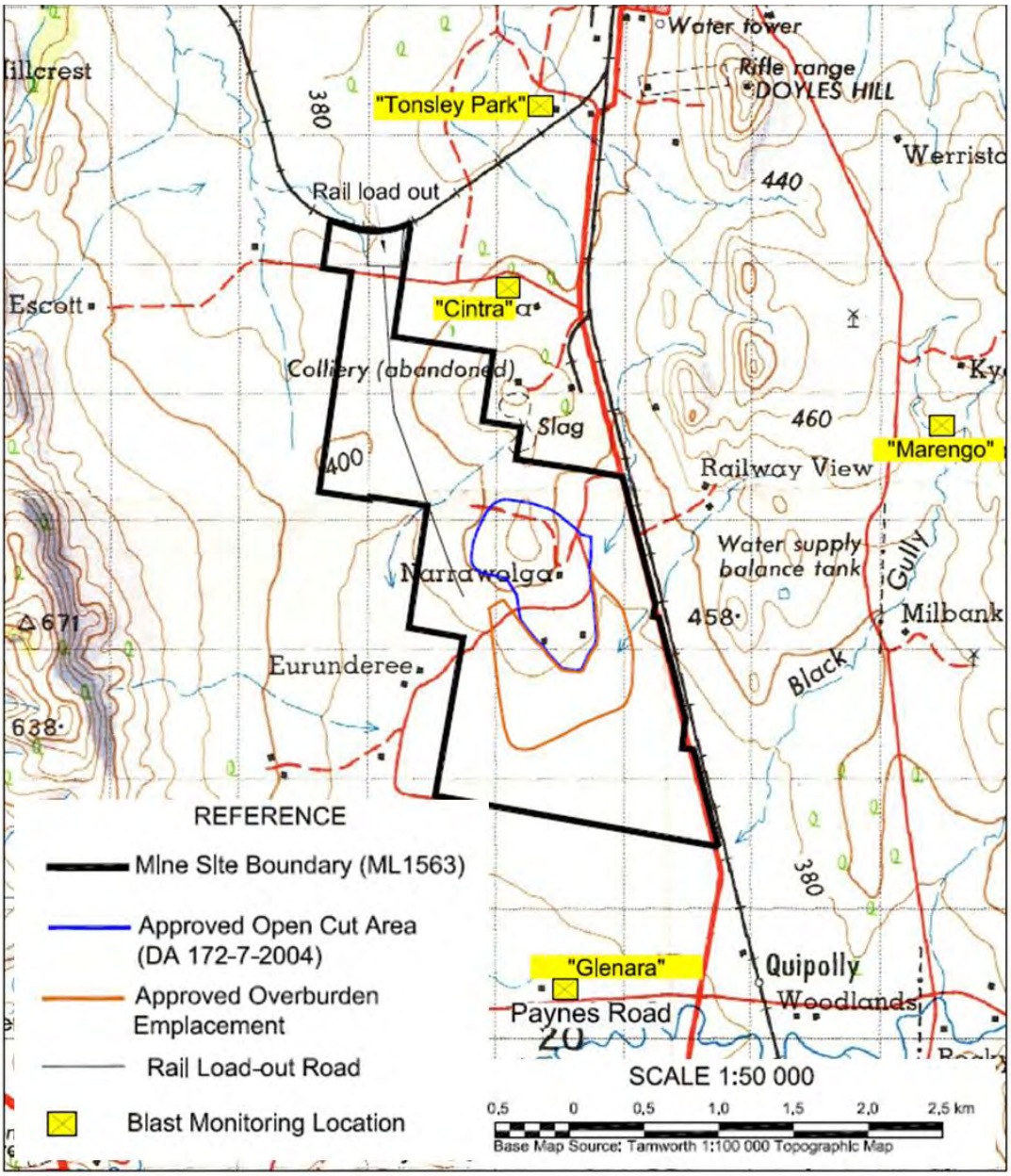


Figure 3.4 Revised WCC Blasting Monitoring Locations from October 2009

Table 3.11 Rail Shunting Noise Criteria dB(A) at any residence on privately owned land:

Day / Evening / Night Leq(24 Hour)	Day / Evening / Night LA(Max)	Property
55	80	Any residence on privately owned Land

3.10.2 Control Procedures

Control of noise generation and propagation on the Werris Creek Coal Mine site has been by managing both the general source and propagation paths methods including:

- The construction of the out of pit waste emplacements to the East and around to the West of the pit.

- Installation and maintenance of appropriate mufflers on plant and equipment;
- Where operationally feasible, scheduling activities to minimise operation of equipment or changing operational procedures on the recommendation of Spectrum Acoustics.
- Treatment or replacement of noisy equipment, or equipment shown to not comply with the sound power levels used in the modelling undertaken for the EIS;
- Regular service of equipment to ensure sound power levels remain at or below nominated levels;
- Restricting hours of operations;
- Enclosure of fixed items of plant, e.g. generators;
- Bunding close to noise sources to create obstructions to the propagation path;
- On-going site road maintenance to limit body noise from empty trucks travelling on internal roads;
- Workforce education or instruction. For example, truck drivers have been trained to avoid use of engine brakes when approaching the mine site entrance or Escott Road intersection.
- Speed restrictions to 15kph on Rail Spur;
- Minimising coal drop into wagons; and
- Maintaining coal within loading bin.

Additionally, the coal processing area has been positioned to maximise the acoustic shielding provided by the natural landform and constructed overburden placement. WCC regularly liaise with the surrounding neighbours to seek feedback on the mining activities.

Noise monitoring is undertaken at the following locations in **Figure 3.5**.

3.10.3 Operational Noise Monitoring

The results of routine operational noise monitoring conducted on a monthly basis by Spectrum Acoustics Pty Limited are included in **Appendix 7**. Monitoring was conducted each month of the AEMR period (12) with attended monitoring conducted initially at eight (April to September) locations and then at six (October to March) locations in accordance with a revised Noise Monitoring Program covering day, evening and night periods.

During the period, attended noise monitoring identified only one exceedance of noise criteria summarised in **Table 3.12**.

Table 3.12 WCC Record Noise Exceedances for 2009/2010

Location	Date	Time	Inversion °C/100m	Wind Speed/ direction	Noise Level dB(A)	
					Ambient	WCC only
Marengo	15/10/2009	8:02 AM	Not Present	2.2 m/s NNW	42	40

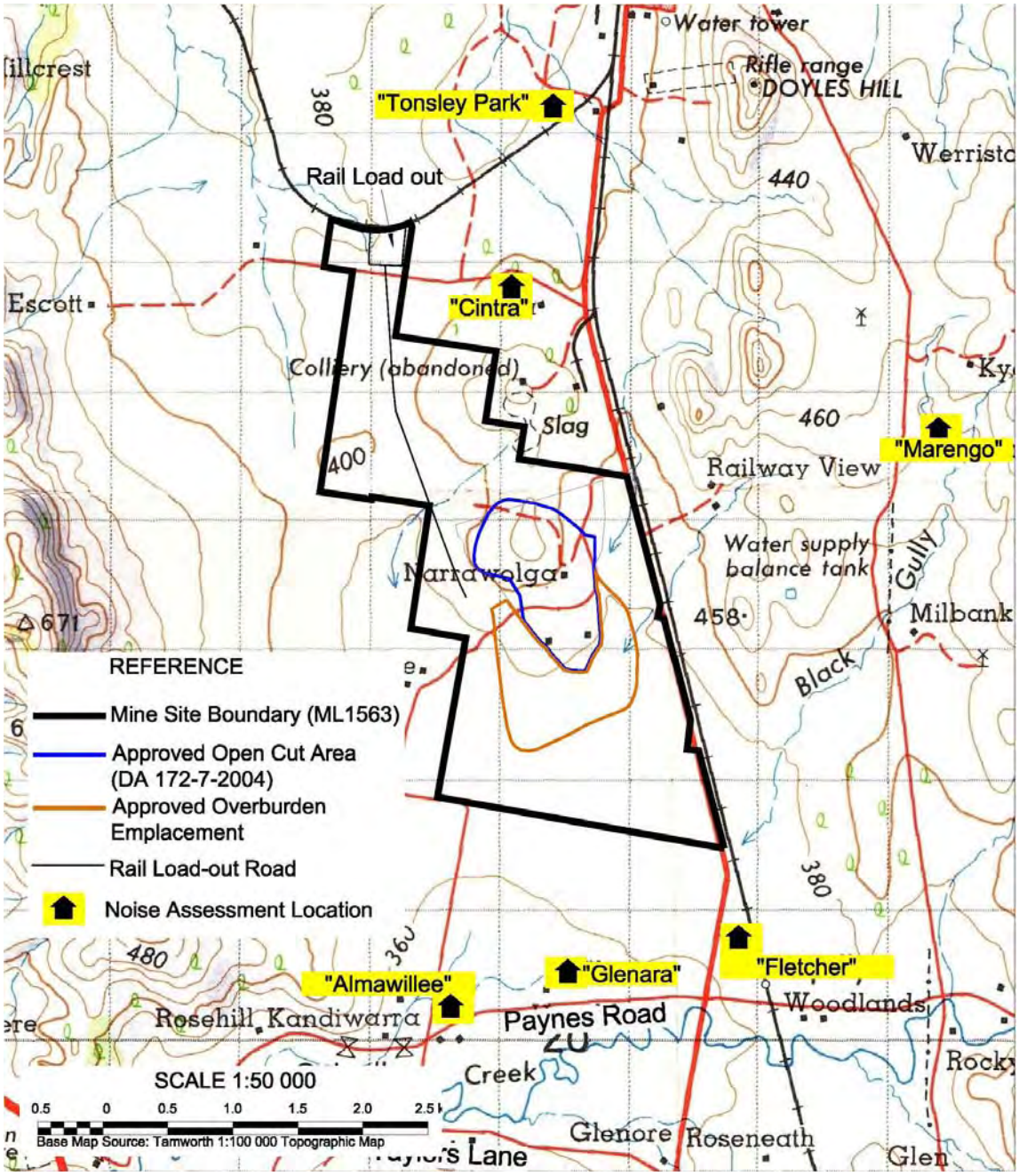


Figure 3.5 Revised WCC Noise Monitoring Locations from October 2009

The cause of the exceedance was due to an irregular operational activity of relocating soil stockpiles on the surface at the eastern extremity of the pit with a range of machinery that would not ordinarily operate together at that elevation. The exceedance was immediately reported to DECCW, who issued WCC with a warning over the exceedance.

Since WHC took over 100% ownership in late 2007 and became an owner/operated site, WCC has made significant efforts reducing the likelihood of noise exceedances. This is evident from the reduction in the number of monitored exceedances from 23 in 2007/2008, to 3 exceedances for 2008/2009 and only one for 2009/2010 period.

WCC will continue to monitor noise levels on neighbouring properties and will maintain close working relations with the community and DoP/DECCW in relation to noise management. Following discussions with DECCW, WCC commencing using a continuous noise monitor and developed a "Noise Management and Mitigation Procedure" to monitor and maintain operational noise levels within WCC compliance limits by providing real time feeback through alarms directly to production personnel who can immediately modify operations if required.

3.11 VISUAL AMENITY

3.11.1 Management

Various mining activities and/or features of the Werris Creek Coal Mine are visible from local and distant vantage points including the elevated adjacent residences to the north-east of the mine and from Werris Creek Road. Where practical the mine has been designed to minimise the duration and/or extent of any visual impact.

Management controls to minimise the potential visual and light related impacts include:

- Tree screen plantings along the south-east margin of ML 1563 and the eastern and southern margins of the train load-out area;
- Undertaking activities in accordance with the various management plans applicable to the mine, all of which incorporate safeguards which indirectly reduce visual impact;
- Minimising the extent of land disturbance / clearing in advance of mining;
- Progressive rehabilitation of disturbed areas;
- Sympathetic positioning and direction of lights to avoid them impacting on local residences;
- Acquisition of a number of properties to the east, north and west of operations;
- Restricting locomotive headlights to low beam when on the rail siding; and
- Installation of lighting at the train loading facility in accordance with AS 1680.2.4:1997 and their use only when the facility is in operation.

3.11.2 Performance

With the acquisition of all private neighbouring properties with direct views into the pit, the visual impacts of the operation on surrounding landholders has been substantially reduced.

During the reporting period there were no complaints made in regard to visual impact including impact from lighting plants. This can also be attributed to ongoing environmental training of staff with a more responsible approach to the set up of lighting plants for night work as well as the acquisition of impacted residents.

With approval of DA 174-7-2004 MOD5 for the eastern emplacement extension, Werris Creek Coal have commenced the construction of an earthen screen along Werris Creek Road to reduce the direct visual impact of mining operations on commuters travelling past the site. The first 400m of the visual screen was completed in March 2010 (**Figure 3.6**) and seeded with Oats cover crop to stabilise the outer batter. The remainder of the visual screen will be completed during 2010/2011 period in advance of the dump being constructed closer to the road.

Figure 3.6 Construction of Visual Screen along Werris Creek Road at WCC

3.12 CULTURAL HERITAGE MANAGEMENT

WCC manage cultural heritage issues and impacts through the Archaeological & Cultural Heritage Management Plan which allowed for the relocation of the "Narrawolga" Site undertaken in March 2007 in accordance with Condition 45A of DA 172-7-2004 MOD 2. The storage area for the axe grinding grooves is located adjacent to the mine site and has been fenced off with fluorescent flagging on three sides, with the fourth side being a barbed-wire fence line, with the actual "grooved" rock supported on crusher dust to provide stability to the blocks.

During the period, the "Narrawolga" grooves were inspected by Corie Taylor (Aboriginal Support Officer for the Namoi CMA) who recommended that tarps be installed to cover over the "Narrawolga" grooves to prevent debris build up and rain water in the grooves that could deteriorate the grooves. The tarps were installed and pegged down into the crusher dust during March 2010 (**Figure 3.7**).

At the completion of mining and rehabilitation, the Archaeological & Cultural Heritage Management Plan allows for the axe-grinding grooves to be returned to their original location adjacent to the current site facilities, in consultation with the local Aboriginal community.

3.13 EUROPEAN HERITAGE

With the removal of the "Narrawolga" residence, there are no other buildings located on the mine site or items that would have any heritage status.

Figure 3.7 Tarps used to cover over and protect "Narrawolga" grooves

3.14 SPONTANEOUS COMBUSTION

3.14.1 Propensity

Self Heating Temperature (SHT) determinations for the B to G seams at the Werris Creek Coal Mine were undertaken during the preparation of the EIS and showed the:

- Coal from the B, C and G seams to have a theoretical high spontaneous combustion potential;
- Coal from the D, E and F seams to have a theoretical medium spontaneous combustion potential; and

The overburden and interburden have a very low spontaneous combustion potential due to their low percentage of inorganic sulphur and the absence of unoxidised coal.

3.14.2 Occurrence and Management

There were no reported instances of spontaneous combustion (sponcom) on site during the reporting period. WCC has a Spontaneous Combustion Management Plan that all operators work to if spontaneous combustion occurs at either the rail load-out facility, the ROM / screening plant or from within the pit. This management plan also outlines the identification of sponcom, the preventative actions to reduce occurrences of sponcom, the correct handling and remediation procedures and reporting of sponcom. All incidents are reported to the Coal Processing Manager and are recorded.

A procedure for the minimisation of spontaneous combustion occurrences on site is also listed under page 10, point xiv, of the current Bushfire Management Plan and under section 5.13.2 of the Stockpile Management Procedure for WHC.

3.15 BUSHFIRE MANAGEMENT

The Bushfire Management Plan was completed and forwarded to Department of Planning on 3rd August 2007. During the commissioning of this document consultation between the Werris Creek Rural Fire Service and WCC staff was undertaken. Members of the Rural Fire Service were inducted onto the site and provided input into the development of the Bushfire Management Plan.

At this stage the procedural use of the management plan has not been used as the site has not experienced a bush fire since the management plans conception.

3.16 MINE SUBSIDENCE

Mine subsidence is not considered an issue at the Werris Creek Coal Mine. The presence however of the old underground workings known as Werris Creek Colliery has resulted in the commissioning of survey investigations to more accurately define the location and extent of these former workings.

3.17 HYDROCARBON CONTAMINATION

3.17.1 Management

WCC management practices for hydrocarbon management include:

- All bulk hydrocarbons (including fuel, oils, grease – new and waste) are retained at the mine contained within bunded areas (or self bunded tanks) within the contained water management system as described in **Section 2.8**;
- All fixed or portable equipment (pumps etc) incorporate self-contained bunding;
- Hydrocarbon-contaminated materials as a consequence of any spillages will be disposed of appropriately;
- Minor spillages are cleaned up and the contaminated soil either bio-remediated or transferred off-site to an appropriately licensed waste disposal area;
- Liquid from the truck wash area is currently captured in a sump and pumped through an oil separator where hydrocarbons are drawn out of suspension and taken off site for disposal.
- WCC test the residual materials in the sump of the wash bay quarterly for hydrocarbons. If the results are low then the remaining solids are classed as general solids waste and can be buried within the pit. If the solids are above the threshold for general solid waste classification, bioremediation of this waste product maybe required before on site disposal;
- A concrete apron has been installed in front of the diesel bowsers on site. This bunded area contains spills around the fill point draining back to the wash bay sump;
- The concrete bunded area for bulk oil storage was installed in May 2010 containing any spills within the wash bay sump; and
- WCC regularly reviews hydrocarbon storage and bunded areas.

If any major spillage were to occur, they would be treated in accordance with the three-phase system identified in the approved Groundwater Contingency Plan.

3.17.2 Performance

There were no reported hydrocarbon incidents during the period.

3.18 METHANE DRAINAGE / VENTILATION

Methane drainage/ventilation is not considered an issue at WCC.

3.19 PUBLIC SAFETY

3.19.1 Management

WCC is located 4 km south of Werris Creek Township and is accessed from Werris Creek Road. The access road into the mine is locked when no mine-related personnel are at the mine. The site is fenced and appropriate signs are installed.

Trucks carrying product coal to the Rail Siding are required to travel at low speed through the intersection with Escott Road, after giving way to any approaching traffic travelling along Escott Road. Signs are installed along Escott Road and adjacent to the rail load-out road at the intersection. Gates are positioned on either side of Escott Road and are locked to prevent public access outside of operational hours.

Employees are inducted in safe working practices and regular follow-up safety meetings, toolbox talks and reviews are held.

Visitors to the mine are required to report to the mine office and unauthorised personnel are not permitted to move around the mine area unaccompanied. WCC conducts site visits as required for approved visitors. Procedures are in place to ensure the area around each blast site is clear of personnel and that all surrounding residents are advised in advance of proposed blasts.

3.19.2 Performance

The procedures in place have been effective throughout the reporting period, with no incidents of any public safety issues arising.

3.20 FERAL ANIMAL CONTROL

Feral animals are not a significant land management issue on WCC's landholding and are limited to isolated occurrences of foxes, hares, rabbits, and mice.

In view of the low frequency of occurrence, and in the absence of an extensive programme by all surrounding landowners, no broad scale feral animal control programme was considered warranted during the period. In accordance with prior commitments, WCC will continue to monitor feral animal occurrences and implement necessary control programmes if and when necessary.

3.21 METEOROLOGICAL MONITORING

WCC maintain an onsite weather station in accordance with EPL 12290 requirements. **Table 3.13** summarises the rainfall and temperature records measured at WCC and compares the results with the longer term meteorological records for the Quirindi Post Office (1882-2010) approximately 10km away. Overall the 12 month period to the end of March 2010, WCC was just below the mean rainfall for Quirindi historically, 605mm versus 683mm respectively; however the year would still be classed

as an average rainfall year. Almost half the annual rainfall fell in December, January and February with good falls recorded across the Namoi catchment resulting in minor flooding in some areas. The temperatures recorded onsite were consistent with the long-term averages with July and January the coldest and hottest months respectively.

Table 3.13 Rainfall and Temperature Records for 2009/2010 period

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Total
Rainfall		72.6	6.6	49.4	38.8	6.6	69.0	35.4	33.4	86.8*	83.9*	93.0	29.2	604.7
QLongterm		42.1	44.4	51.4	47.9	45.2	46.6	60.6	64.9	80.3	80.9	65.5	53.1	682.7
Temperature	**Min**	5.3	2.4	-2.0	0.3	1.1	3.1	3.3	12.5	9.4	9.6	13.1	10.8	5.7
	Avg	17.4	13.5	11.1	9.5	13.3	15.5	17.8	25.2	25.6	25.7	23.9	21.9	18.4
	Max	30.6	22.7	20.7	20.8	28.4	29.6	33.9	41.3	41.0	37.7	34.4	33.9	31.3
	QMin	8.9	5.1	2.8	1.6	2.4	5.0	8.7	11.9	14.8	16.4	16.1	13.5	8.9
	QMax	24.9	20.5	16.6	15.9	17.9	21.5	25.2	28.5	31.2	32.2	31.3	29.3	24.6

* Quirindi Post Office rainfall data used to replace the lost data for December and January
QLongterm is the Quirindi Post Office long term monthly and annual rainfall average for 1882 to 2010
QMin and QMax are Quirindi Post Office long term monthly and annual temperature averages for 1910 to 2010

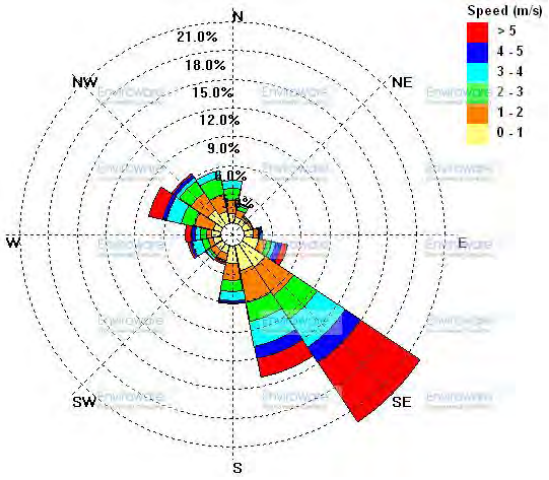
Since the introduction of the new weather station in January 2009, there has been a significant improvement in the reliability of the station. The only noticeable exception in **Table 3.14** was during the Christmas/New Year shutdown onsite with no personnel onsite to correct the flat battery issue at the time.

Table 3.14 Weather Station Performance

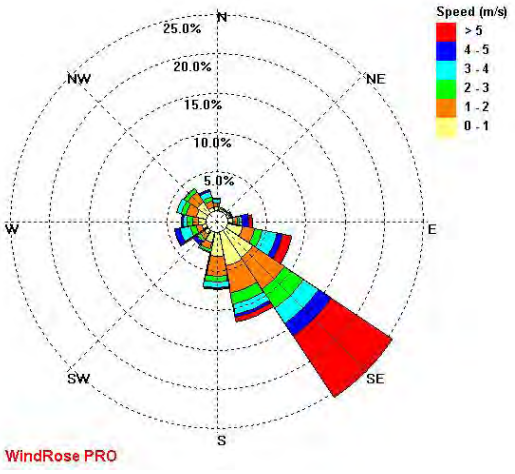
Month	% Data Available	Comments
April	100%	
May	100%	
June	100%	
July	100%	
August	100%	
September	100%	
October	99.8%	
November	100%	
December	61.2%	Over Christmas Period with no personnel to change out flat batteries
January	80.6%	
February	93.1%	
March	100%	

Wind speed and direction data is collected from the WCC meteorological station in 15 minute intervals for use to monitor environmental impacts for operations and/or specific activities undertaken at WCC. From **Figure 3.8**, WCC has a prevailing NW and SE wind axis with the former direction predominant during autumn and early spring, with the latter direction prevalent for the remainder of the year.

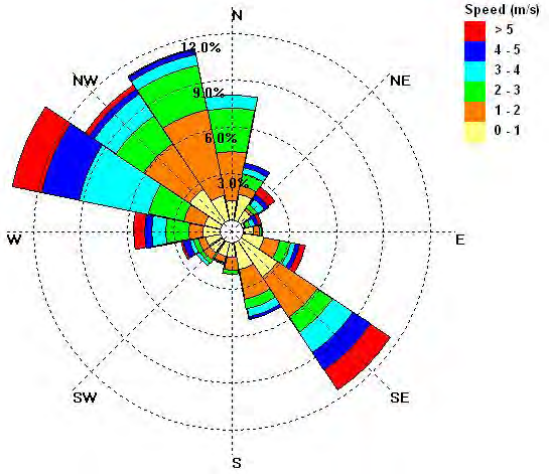
Detailed meteorological results for each month of the reporting period are presented in **Appendix 8**.



April 2009



May 2009



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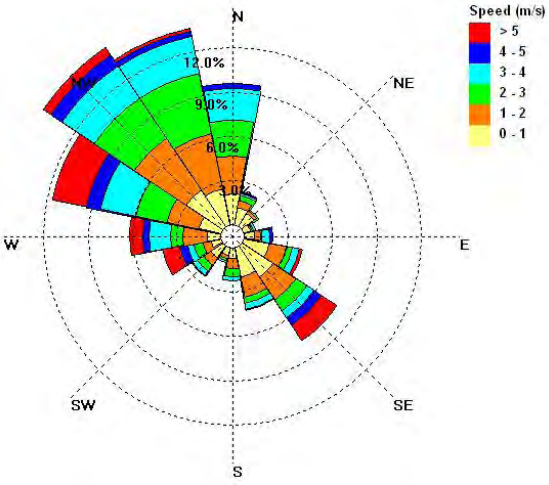
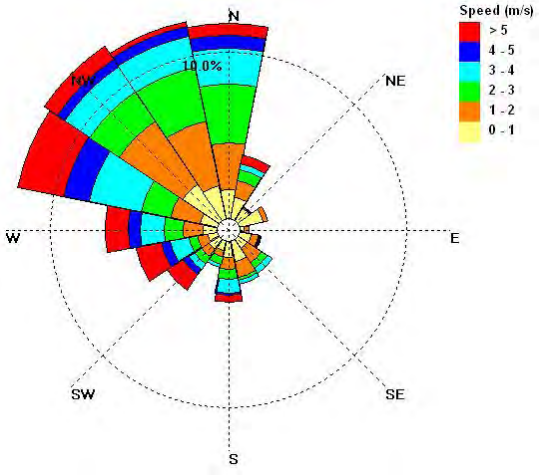
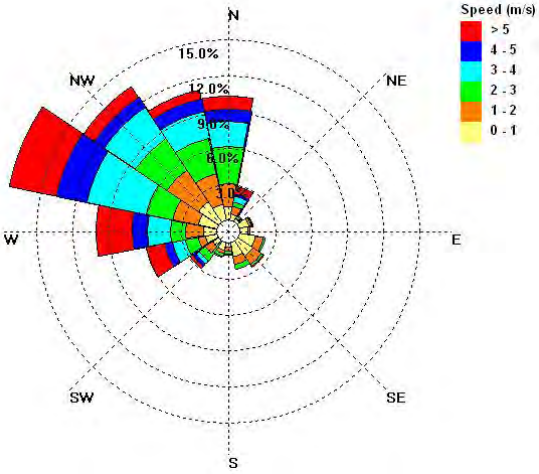


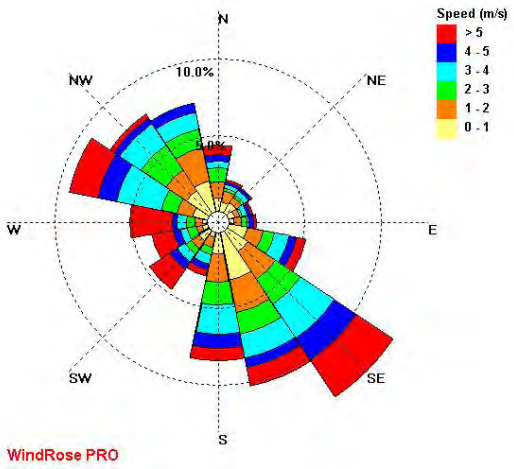
July 2009



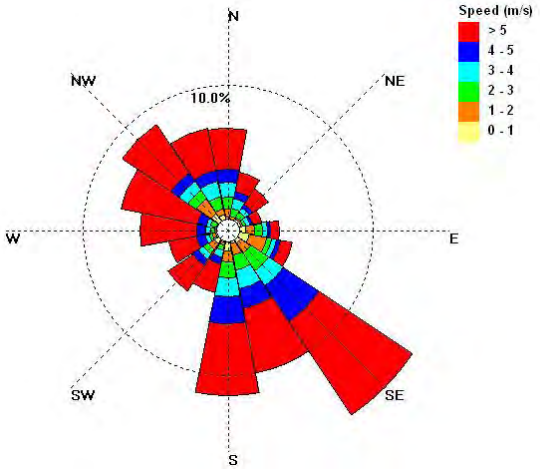
August 2009



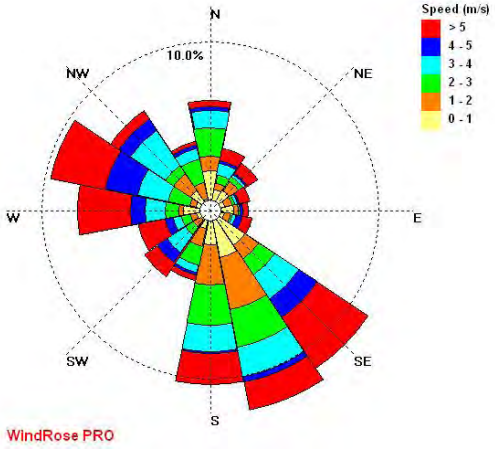
September 2009



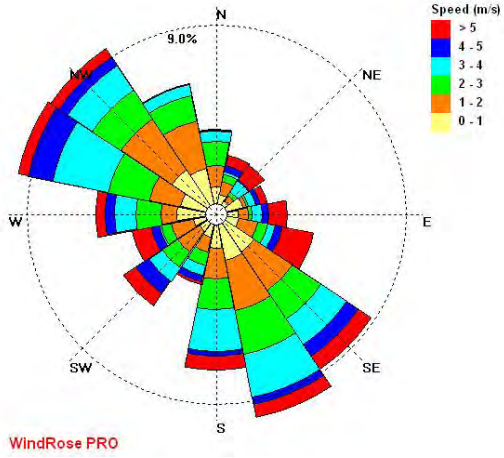
October 2009



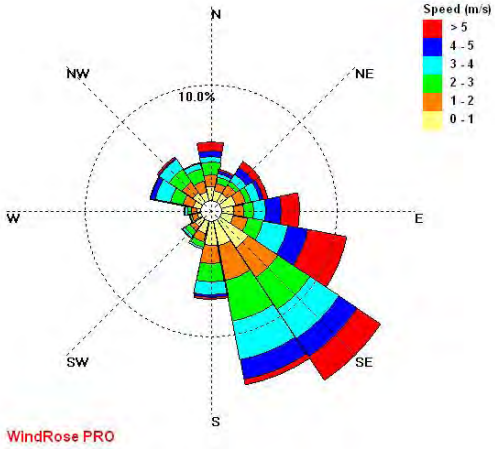
November 2009



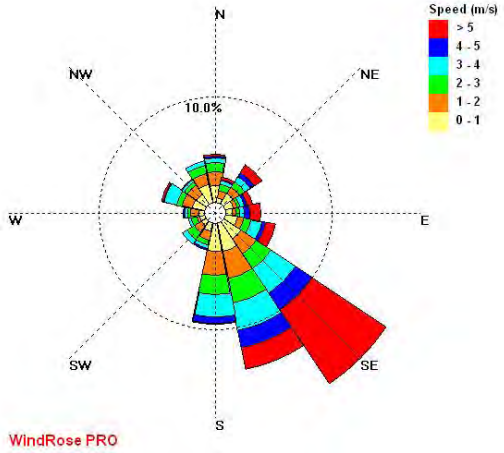
December 2009



January 2009



February 2010



March 2010

Figure 3.8 Werris Creek Coal Meteorological Wind roses April 2009 to March 2010

4.0 COMMUNITY RELATIONS

4.1 ENVIRONMENTAL COMPLAINTS

WCC maintains a designated complaints line, with messages checked on a daily basis by the Environmental Officer. In the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded on a "Complaints Form".

The environmental hotline phone number is publically available both in the community newsletter and regularly advertised in local newspapers. The complaints line has worked well, with a minor modification to the message allowing complainants to leave a message or ring directly the Environmental Officer or Open Cut Examiner for an immediate response to any issues.

For the 2009/2010 period there were 12 complaints received by WCC, which is down from 16 the previous period. The nature of the complaint, details and responses are presented in **Table 4.1**. There were four different complainants for the period. Of the 12 complaints, eight were related to blasting (including non-WCC related activities) and four that were related noise issues.

Table 4.1 Complaints Summary 2009 / 2010 AEMR Reporting Period

Method	Complainant	No/Date of Complaint	Nature of Complaint	Investigation	Action Taken / Follow Up
Phoned through to WCC complaint line	'Park Hill' property resident on Taylors Lane	No 42 21/07/2009	Blasting complaint due to vibration.	Blast monitoring results for the closest monitor to 'Park Hill' at 'Glenara' were in compliance.	None. Complainant wanted to bring this to WCC attention.
Phoned through to WCC complaint line	'Marengo' property resident on Back Werris Creek Road	No 43 04/08/2009	Blasting complaint due to fume crossing his property and potentially contaminating his rain water tank.	Weather station indicated that at time of blast was a westerly wind blowing towards 'Marengo' property and fume had been generated but dispersed after 400m into the air.	Orica blasting consultants reviewed explosive types used and recommended changing product types to minimise fume generation.
Direct phone call to Enviro Officer's Landline	'Marengo' property resident on Back Werris Creek Road	No 44 10/09/2009	Noise complaint from previous night and blasting had damaged his water tank.	Attended noise monitoring on the property indicated that the mine is in compliance with its noise limits. Structural engineer assessed tank cracks and determined that there was no additional visual damage when last assessed in 2008.	None.
Direct phone call to Enviro Officer's Landline	Resident at 7 Punyarra St, Werris Creek	No 45 08/10/2009	Blasting complaint during the evening on 6&7 October.	Werris Creek Coal does not blast at night. Permissible blasting hours are between 9am to 5pm.	None.
Phoned through to WCC complaint line	'Marengo' property resident on Back Werris Creek Road	No 46 08/10/2008	Blasting complaint from the previous day with dust and fume over his property.	Weather station indicated that at time of blast was a light wind but any dust or fume had dissipated just after the blast.	WCC installed a dust gauge on the property.

Method	Complainant	No/Date of Complaint	Nature of Complaint	Investigation	Action Taken / Follow Up
Direct phone call to Enviro Officer's Landline	Resident at 7 Punyarra St, Werris Creek	No 47 20/10/2009	Blasting complaint at 11.00pm.	Werris Creek Coal does not blast at night. Permissible blasting hours are between 9am to 5pm.	None.
Direct phone call to Enviro Officer's Landline	Resident at 7 Punyarra St, Werris Creek	No 48 02/11/2009	Blasting complaint at 10.40pm.	Werris Creek Coal does not blast at night. Permissible blasting hours are between 9am to 5pm.	None.
Direct phone call to Enviro Officer's Landline	Resident at 7 Punyarra St, Werris Creek	No 49 04/11/2009	Blasting complaint at 10.20pm.	Werris Creek Coal does not blast at night. Permissible blasting hours are between 9am to 5pm.	None.
Direct phone call to Enviro Officer's Landline	'Marengo' property resident on Back Werris Creek Road	No 50 19/01/2010	Noise complaint from the previous night.	Weather station identified presence of a temperature inversion and calm to light north-westerly winds have the potential to enhance noise levels at the Marengo residence.	None.
Direct phone call to Enviro Officer's Landline	'Marengo' property resident on Back Werris Creek Road	No 51 15/02/2010	Noise complaint from the previous night.	Weather station identified presence of a temperature inversion and calm to light north-westerly winds have the potential to enhance noise levels at the Marengo residence.	None.
Phoned through to WCC complaint line and direct call to Enviro Officer's Mobile	'Marengo' property resident on Back Werris Creek Road	No 52 09/03/2010	Noise compliant for noise between 10pm to 3.00am.	Environmental Officer and Open Cut Examiner meet with complainant at residence at 2.30am. OCE modified the dump location and complainant agreed that it reduced the noise from the mine.	Werris Creek Coal installed a continuous noise monitor and subsequently purchased the property.
Direct phone call to Enviro Officer's Landline	Resident at 35 Kurrara St, Werris Creek	No 53 17/03/2010	Blasting complaint for 1.20pm. Also a previous blast in January 2010 is alleged to have caused a crack in the garage arch.	Blast monitoring results for the closest monitor to Kurrara St at Tonsley Park were in compliance. A structural engineer was engaged to assess crack in the brickwork and determined that it was due to saturation of the foundation below the garage.	The complainant was provided with a copy of the Structural Assessment which included details on recommendation for preventing foundation failure.

4.2 COMMUNITY LIAISON

There have been 15 Community Consultative Committee (CCC) meetings held since WCC commenced operations in 2005 with details of the meetings held summarised in **Table 4.2**.

Table 4.2 Community Consultative Committee Meetings since 2005

AEMR Reporting period	No. of meetings	CCC meeting dates	No. Of Attendees
1 June 2005 - 31 March 2006	2	23 June 2005 13 October 2005	11 (incl. 5 community reps) not recorded
1 April 2006 - 31 March 2007	1	22 August 2006	9 (incl. 3 community reps)
1 April 2007 - 31 March 2008	4	14 June 2007 28 August 2007 13 December 2007 21 February 2008	7 (only 2 community reps) 6 (only 1 community rep) 10 (incl. 6 community reps) 9 (inc. 5 community reps)
1 April 2008 - 31 March 2009	4	5th June 2008 4th September 2008 17th February 2009 12th March 2009	9 (inc. 4 community reps) 8 (inc. 4 community reps) 10 (inc. 4 community reps) 7 (inc. 3 community reps)
1 April 2009 - 31 March 2010	3	29th July 2009 19th November 2009 11th March 2010	7 (inc. 3 community reps) 10 (inc. 5 community reps) 9 (inc. 4 community reps)

The frequency of meetings during the 2009/2010 reporting period has been spread out during the year. A total of three CCC meetings have been undertaken for the current AEMR period.

The meetings continue to have strong representation from the Liverpool Plains Shire Council and local community members in attendance willing to participate. Meetings are scheduled to sit quarterly however are flexible to the members needs as can be seen in the frequency of the 2009/2010 meetings. CCC members are provided the quarterly environmental monitoring data for the previous months before the meetings are held and a number of mine related topics are discussed with enthusiasm during the meetings.

4.3 EMPLOYMENT STATUS, DEMOGRAPHY, SOCIO-ECONOMIC CONTRIBUTIONS

4.3.1 Employment Status and Demography

Due to the increase in mining activities, employment and contractors onsite increased during the period. WCC currently employees 86 full-time equivalent personnel up 26 positions from the previous period, with a further 20 full-time casual staff employed at the mine. Of the full-time employees, 35 live locally in the Liverpool Plains Shire with the majority of the regular contractors based in Werris Creek or Quirindi.

4.3.2 Social and Economic Contributions

WCC has contributed to the local and regional communities, firstly through the provision of permanent employment (including training opportunities) for residents within the Liverpool Plains Shire (Werris Creek, Quipolly and Quirindi) and within the wider region (local government areas of Tamworth and Gunnedah). Current records show that 35 employees reside in the Liverpool Plains Shire local government area, with the remaining employees residing in the surrounding local government areas of Tamworth and Gunnedah. Employing locally and within the region ensures that the flow-on benefits to the socio-economic setting, i.e. through wages, viability of other businesses, remain within the local area and region.

In additional to the direct social and economic contribution, during the past 12 months WCC has contributed over $20,000 to events and services in the local area including:

- Westpac Rescue Helicopter;
- Werris Creek Community Shed;
- Werris Creek Swimming Club;
- Werris Creek Country Women's Association;
- Werris Creek Railway Museum;
- Werris Creek Boy Scouts;
- Quirindi Show 2009; and
- Currabubula Art Show.

WCC has demonstrated through these contributions its ongoing commitment to the social and economic well-being of the local communities within which the mine is located.

5.0 REHABILITATION

Rehabilitation requirements at WCC following open cut mining or other activities associated with the mining process will be implemented to achieve the rehabilitation objectives specified within **Table 5.1**.

Table 5.1 WCC Rehabilitation Objectives

Integrated Landscapes • To reduce the visibility of mine-related activities from adjacent properties and the local road network; • Blending the created landforms with the surrounding topography; and • Provide a low maintenance, geotechnically stable and safe landform with minimal erosion.
Sustainable Growth and Development • To achieve a sustainable soil profile capable of sustaining the specified final land use; and • Establishing native vegetation commensurate to the species diversity relevant to each ecological community as specified within the benchmark data.
Final Land Use • Re-instated Class III Land Capability (31ha) commensurate with the agricultural land use on and around the mine site; • Re-instated native woodland (148ha) commensurate with the nature conservation areas on or around the mine site; and • Rehabilitation will include habitat augmentation and corridors for fauna movement linking with adjacent bushland areas.

Rehabilitation will consist of two final land uses including:

- Class III cropping land; and
- Native woodland:
    - White Box, Yellow Box, Blakely's Red Gum (Box Gum) Woodland; and
    - Brigalow Community.

Woodland areas will include habitat augmentation and corridors for fauna movement linking with adjacent areas associated with the biodiversity offset area. The breakdown of the final land use post mining and rehabilitation is illustrated on **Figure 5.1** and **Table 5.2** provides a progressive rehabilitation target up to and after the completion of mining.

Rehabilitation strategies have been developed to target achieving sustainable final land uses as identified above by restoring within rehabilitation areas:

- Soil/growing medium;
- Endemic vegetation communities or exotic pastures; and
- Augmenting with habitat (ecological communities only).

Table 5.2 WCC Rehabilitation Program

Land Use	2010 (ha)	2011 (ha)	2012 (ha)	2013 + (ha)	TOTAL (ha)
Class III Land Capability	0	0	0	34	34
Box Gum Woodland	44	27	57	79.5	207.5
Brigalow Community	0	7.5	0	9	16.5

Note: Based on draft Landscape Management Plan to be finalised based on consultation/feedback from government agencies

Figure 5.1 WCC Rehabilitation Schedule and Revegetation Planning

5.1 BUILDINGS

There have been no additions/changes to buildings on site. No additional buildings have been removed and therefore no rehabilitation of building sites was necessary during the reporting period.

5.2 REHABILITATION PERFORMANCE

During the period, WCC completed maintenance works to repair gully and rill erosion and undertook temporary rehabilitation to improve grass coverage across the southern and western rehabilitation areas. Also a number of scours in the soil stockpiles and in the eastern rehabilitation area were also repaired. A summary of temporary rehabilitation works is outlined in **Table 5.3** and **Figure 5.2**. **Figure 5.3**, **5.4** and **5.5** displays the outcomes of the rehabilitation maintenance works including erosion repair and resowing cover crop undertaken in March 2010.

WCC also undertook habitat augmentation of the rehabilitation area during March 2010 by installing "Stag Trees". The "Stag Trees" were salvaged from the clearing areas using the fallen trees and reinserting the tree upright (**Figure 5.6**). The habitat augmentation of "Stag Trees" was targeting arboreal species as perching positions for birds of prey and scavenging birds as well as arboreal mammals by providing potential habitat for these species at the start of the rehabilitation (**Figure 5.7**). Normally "Stag Trees" in adjacent remnant woodland areas would take over 100 years to develop and longer to produce hollows, thus by augmenting the rehabilitation areas with "Stag Trees" will shorten the time required for the rehabilitation to be able to support arboreal species. WCC also installed coarse woody debris habitat between the "Stag Trees" for ground dwelling fauna.

Table 5.3 WCC Temporary Rehabilitation Program Summary 2009-2010

Domain:	3	**Sub Domain:**	1003WCCTR1	**Reveg Date:**	March 2010	**Area:**	8.37ha
Name:	Western & Southern Temp Rehab		**Land Use:**	Temp Rehab	**Seed/Plant:**	Cover Crop	
Description/Methodology: The western section had previously been shaped in 2008-2009 period while the southern section had been shaped and a cover crop sown. Both sections had poor grass coverage with a number of weeds present and substantial rill and gully erosion present. A D6 scalped the surface weed vegetation before re-ripping the soil to repair erosion, improve aeration and infiltration of the soil. The ripping also improves seed/soil contact prior to germination. A rear mounted seeder attached to the back of a light vehicle applied an Oats (winter) cover crop at 30t/ha followed by the dozer running back over the seeding area with harrows to bury the seed. **Status/Progress:** Autumn has been very dry with limited germination at this stage.							

5.3 REHABILITATION STATUS

For the 2009-2010 period, no additional rehabilitation was undertaken at Werris Creek Coal. The DA 172-7-2004 MOD5 and 2009 MOP Amendment indicated that additional rehabilitation was not going to be possible due to the increase in the volume of overburden required to be removed. The additional overburden meant that the emplacement area height had to increase by 35m to RL445m initially without creating any additional rehabilitation until the new height is achieved.

The eastern dump extension during 2009-2010 had to disturb an extra 4ha of previously completed rehabilitation while the 1.1ha rehabilitation trial was also disturbed during period due to poor germination and subsequently no growth. The result is that WCC has completed 12ha of Grassy White Box Woodland rehabilitation to date as indicated in **Table 5.4** and **Figure 5.2**.

Due to the recent approval modification and MOP amendments, WCC is currently in line with the Landscape Management Plan (AECOM, 2010a) and MOP commitments for rehabilitation progress.

Table 5.4 WCC Annual Rehabilitation

Period	Woodland Ecological Community		Agriculture	Annual Total (ha)	LMP/MOP(ha) Commitment
	Box Gum(ha)	Brigalow(ha)	Class 3 (ha)		
2008-2009	17.09	0	0	17.09	17.09
2009-2010	-5.12	0	0	-5.12	-5.12
Cumulative Total				11.97	11.97

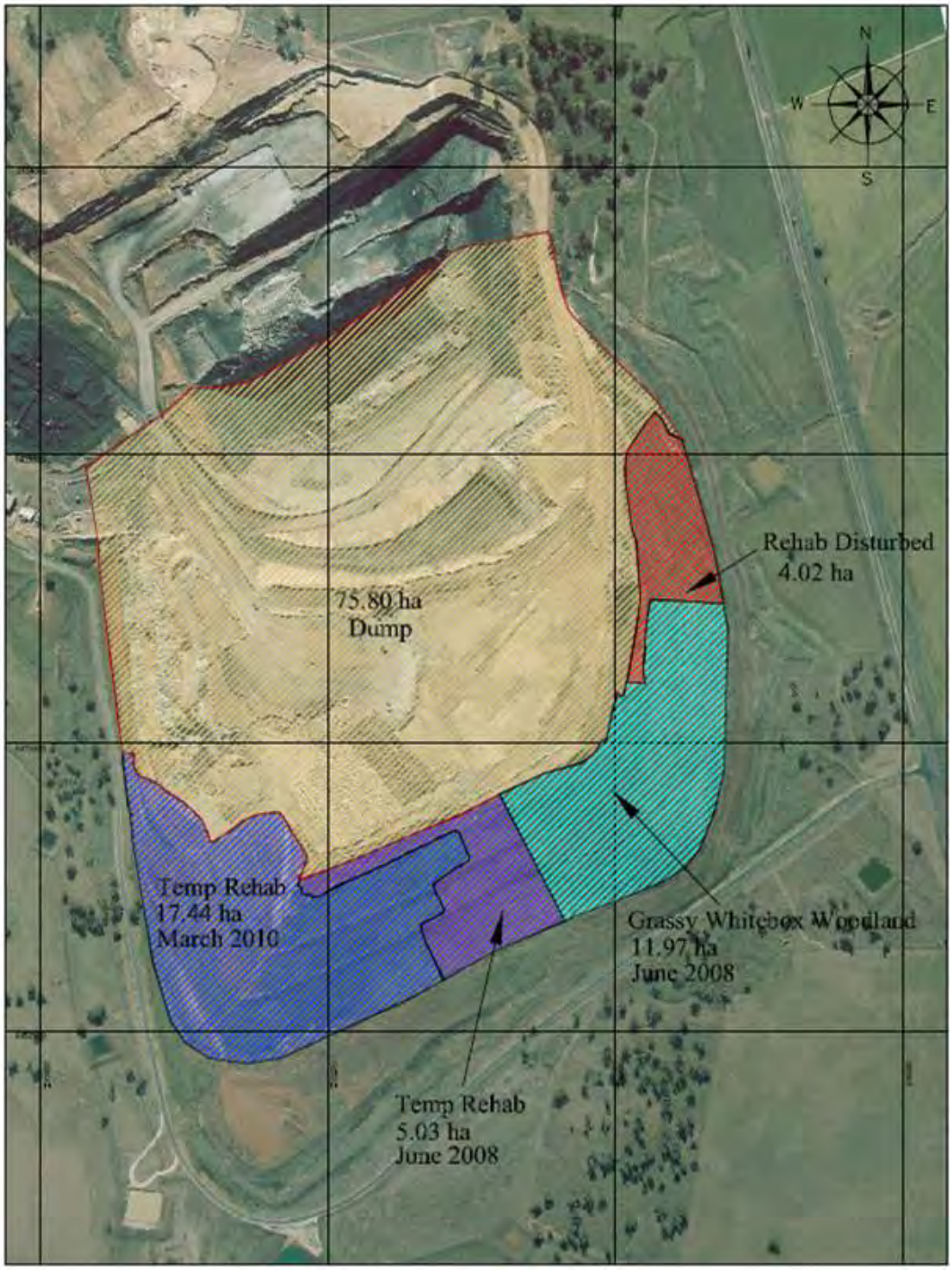


Figure 5.2 WCC Rehabilitation Status as at the end March 2010

Figure 5.3 Western & Southern Rehabilitation Area before erosion repairs and resowing in March

Figure 5.4 Close up of erosion and poor ground cover prior to maintenance works March 2010

Figure 5.5 Western & Southern Rehabilitation Area after erosion repairs in May 2010

Figure 5.6 Stag Tree being installed in the rehabilitation area

Figure 5.7 Australian Ravens perching in a Stag Tree scanning for prey in the rehabilitation area

Tables 5.5 and **5.6** outlines the mine disturbance status and maintenance works respectively undertaken at WCC as at end of the reporting period.

5.4 REHABILITATION MONITORING AND COMPLETION CRITERIA

Rehabilitation monitoring was undertaken by Geoff Cunningham Natural Resource Consulting during the period, however due to personal issues the monitoring report is not available at the time of writing this report.

A draft Landscape Management Plan has outlined a revised rehabilitation monitoring program that will be integrated with the monitoring requirements of the Biodiversity Offset Management Plan. From the next reporting period, the baseline rehabilitation and biodiversity offset monitoring program will have been completed and the results will be compared against the completion criteria for WCC.

Table 5.5 Rehabilitation Summary

	Area Affected (hectares)			
	This Report Period (as of 31.3.10)	**Last Report Period (as of 31.3.09)**	**Next Report Period (estimated) (as at 31.03.11)**	
A: MINE LEASE AREA				
A1 Mine Lease(s) Area	679			
B: DISTURBED AREAS				
B1 Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	76.0 (Note 1)	76.0 (Note 1)	76.0	
B2: Active Mining Area (excluding items B3 - B5 below)	61.0	41.7	75.0	
B3 Waste emplacements, (active/unshaped/in or out-of-pit)	75.8	65.9	86.0	
B4 Tailings emplacements, (active/unshaped/uncapped)	0	0	0	
B5 Shaped waste emplacement (awaits final vegetation)	0	21.88	0	
ALL DISTURBED AREAS	212.8	129.47	237.0	F1
C REHABILITATION PROGRESS				
C1 Total Rehabilitated area (except for maintenance)	12.0	17.1	32.0	F2
D: REHABILITATION ON SLOPES				
D1 Less than or equal to 10 degrees	34.5	30.7	34.5	
D2 10 to 18 degrees	0	0	0	
D3 Greater than 18 degrees	0	0	0	
E: SURFACE OF REHABILITATED LAND				
E1 Pasture and grasses	0	0	0	
E2 Native forest/ecosystems	12.0	17.1	32.0	
E3 Plantations and crops	0	0	0	
E4 Other (include nonvegetative outcomes)	22.5	13.6	2.5	

Note 1 Includes Infrastructure (21 ha), O/B Gravel Pits (7 ha), Sediment Dams and Basins (8 ha) and Topsoil / Subsoil stockpile areas (40 ha)

Table 5.6 Maintenance Activities on Rehabilitated Land

	Area Treated (ha)		
Nature of Treatment	**Report period**	**Next period**	**Comment/control strategies/ treatment detail**
Additional erosion control works (drains re-contouring, rock protection)	5	As required	New contour banks were installed on the western rehabilitation area
Re-covering (detail - further topsoil, subsoil sealing etc)	0	0	
Soil treatment (detail - fertilizer, lime, gypsum etc)	0	As required	
Treatment/Management (detail - grazing, cropping, slashing etc)	0	As required	
Re-seeding/Replanting (detail - species density, season etc)	17.4	As required	Reseeding cover crop over western and southern rehabilitation areas
Adversely Affected by Weeds (detail - type and treatment)	5	5	Bathurst Burr and Spiny Burr Grass control
Feral animal control (detail - additional fencing, trapping, baiting etc)	0	0	

The draft Landscape Management Plan (AECOM, 2010a) has outlined the proposed completion criteria for the rehabilitation and biodiversity offset areas to achieve the final land uses for WCC, i.e. that they would be sustainable and self supporting beyond mine closure. The completion criteria have been broken into categories aligned to the WCC rehabilitation objectives (**Table 5.1**):

- Integrated Landscapes;
- Sustainable Growth and Development; and
- Land Use.

Separate completion criteria have been established for the two different final land uses proposed for WCC of Class III Land Capability Agriculture and Woodland Ecological Community. An excerpt from the completion criteria has been included in **Table 5.7** for Woodland Ecological Community land use criteria of "Sustainable Growth and Development". For the Woodland Ecological Community land use, data from the DECCW Biobanking Vegetation Database has been used to establish the benchmark "standard" to be achieved and what the monitoring programs will compare against to determine the annual status and the trend towards being able to "sign off" on the final land uses.

Table 5.7 WCC Completion Criteria for Woodland Sustainable Growth & Development

Criteria and Intent	Measure	Standard	Remedial Action
2.1 Is there appropriate native plant species richness for the restored Ecological Community?	Vegetation monitoring (EFA score) by ecologist will determine native plant species richness.	Native plant species numbers (per 400m²): • Box Gum Woodland 23 • Tumbledown Gum Woodland 30 • Brigalow Woodland 20 • Liverpool Plains Grassland 17	Undertake maintenance rehabilitation by re-sowing / replanting missing plant species to achieve desired species richness.
2.2 Is there an appropriate density/structure of native Over Storey species?	Vegetation monitoring (EFA score) by ecologist will determine native plant species richness.	Over Storey cover range between: • Box Gum Woodland 0-25% • Tumbledown Gum Woodland 6-40% • Brigalow Woodland 0-25% • Liverpool Plains Grassland 0-0%	Undertake maintenance rehabilitation by re-sowing / replanting missing plant species to achieve desired species richness.
2.3 Is there an appropriate density/structure of native Mid Storey species?	Vegetation monitoring (EFA score) by ecologist will determine native plant species richness.	Mid Storey cover range between: • Box Gum Woodland 0-5% • Tumbledown Gum Woodland 6-25% • Brigalow Woodland 0-5% • Liverpool Plains Grassland 0-0%	Undertake maintenance rehabilitation by re-sowing / replanting missing plant species to achieve desired species richness.
2.4 Is there appropriate native ground cover?	Vegetation monitoring (EFA score) by ecologist will determine native plant species richness.	Bare ground and litter not to exceed: • Box Gum Woodland 55% • Tumbledown Gum Woodland 55% • Brigalow Woodland 65% • Liverpool Plains Grassland 50%	Undertake maintenance rehabilitation either apply mulch and/or by re-sowing / replanting missing plant species to achieve desired coverage.

Photopoint monitoring locations were established during the reporting period for the southern rehabilitation area. **Figure 5.8** displays Photopoint 1 just after establishment of the White Box tubestock in June 2008. After 20 months in March 2010, it is obvious in **Figure 5.9** that the area has been colonised by exotic pasture grasses but a reasonable survival rate is evident with the crown of a number of White Box tubestock growing above the grass.

Figure 5.8 Southern Rehabilitation Area Photopoint 1 July 2008 – One month following planting

Figure 5.9 Southern Rehabilitation Area Photopoint 1 March 2010 – 20 months after planting

5.5 REHABILITATION TRIALS AND RESEARCH

No rehabilitation trials were undertaken at the WCC during 2009-2010.

5.6 MINE CLOSURE

During 2010, WCC prepared a Mine Closure Plan (MCP – AECOM, 2010b) and a Final Void Management Plan (FVMP – AECOM, 2010c) covering the rehabilitation and management procedures for the ultimate closure of the site and final open cut mining void. Current approved mining would have WCC closing in 2012, however there is a current Environmental Assessment and Project Application being prepared for WCC Life of Mine extension to operations, and therefore the detail in both the MCP and FVMP were conceptual in detail. The MCP and FVMP covers from the cessation of mining with a final void remaining requiring management and closure due to the potential safety risks to people and stock, as well as the potential for environmental pollution.

The MCP conceptual identified five distinct domains across WCC requiring different management strategies to rehabilitate and return to a post-mining land use. Based on the analysis of constraints and opportunities, the MCP identified the preferred final land use options for each domain summarised in **Table 5.8**.

Table 5.8 Final Land Use Options for WCC Domains

Domain	Description	Land Uses
1	Mining	a) Woodland Ecological Community b) Class III (Land Capability) Agriculture c) Water Storage
2	Coal Processing and Train Load Out	a) Woodland Ecological Community
3	Rehabilitation and Biodiversity Offset Area	a) Woodland Ecological Community
4	Water Management	a) Woodland Ecological Community b) Class III (Land Capability) Agriculture
5	Buffer Land	a) Woodland Ecological Community

6.0 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

WCC have made substantial progress during the 2009/2010 period with improved environmental performance by maintaining a focus on continuous improvement of environmental management and maintaining compliance as seen by the achievements for the 2009 / 2010 period:

- Approval granted for DA174-7-2004 MOD5 from DoP for a minor expansion and increase height of the waste emplacement on 6th October 2009;
- MOP variation was approved by I&I NSW on 9th November 2009;
- Received approval from I&I NSW for mining the barrier coal of the former Werris Creek Colliery on 2nd March 2010;
- DoP approved the Waste Management Plan (19th August 2009), revised Site Water Management Plan (20th August 2009), revised Noise Monitoring Program (24th August 2009), revised Blast Monitoring Program (24th August 2009) and revised Air Quality Monitoring Program (23rd September 2009);
- Commenced the use of continuous noise monitoring to assist night operations to manage noise levels; and
- Extensive drainage maintenance and erosion repairs of the rehabilitation area.

WCC targets for the 2010 / 2011 period:

- Continue the environmental assessment process for a new Part 3A approval for the WCC Life of Mine Project;
- Construction of a visual bund and relocation of soil stockpiles along Werris Creek Road ahead of expansion of eastern emplacement area;
- Construction of new dirty and clean water management drainage around the future eastern emplacement expansion;
- Construction of new 200ML Dam (formerly known as Underground Water Dams);
- Construction of a precursor facility for the blasting contractor Orica;
- Progressive woodland rehabilitation of the southern and western rehabilitation area;
- Prepare Landscape Management Plan, Mine Closure Plan, Final Void Management Plan, Biodiversity Offset Strategy and Management Plan and Energy Savings Action Plan in accordance with DA 174-7-2004;
- Establishment of WCC Biodiversity Offset Area;
- Recommencement of regular WCC Community Newsletter;
- Undertake Schools Biodiversity Education Program with local public schools in local government area;
- Continued community liaison, support, involvement and education with respect to the Mine's activities; and
- Continued compliance with all statutory conditions of consent, leases, licence and approvals.

N 6 526 000
N 6 525 000
N 6 524 000
E 276 000
E 275 000
0 100 200 300 400 500metres
N E S W
MAIN NORTHERN RLY
QUIRINDI 12 kms
WERRIS CREEK - QUIRINDI ROAD
WERRIS CREEK 2.5 kms

LEGEND
Colliery Holding / Lease Boundary
Current Extraction Approval Area
Area to be disturbed
DA Consent Boundary

TOPSOIL MAPPING UNITS AND STRIPPING DEPTHS
4 NIL
3 900mm
2 1300mm
1 950mm
All depths are in millimetres
14 Soil test pit

I, ..., holder of Open Cut Mine Manager's Certificate of Competency No. ....., certify that the information on this plan is a true indication of the proposed development.
..... Manager ..... Date

I, ..., holder of Mine Surveyor's Certificate of Competency No. ....., certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by Industry and Investment, NSW.
..... Mine Surveyor ..... Date

REVISIONS

REV.	DATE	BY	DESCRIPTION	CHK.	REV.	DATE	BY	DESCRIPTION	CHK.

Werris Creek Coal Pty Limited
1435 Werris Creek Road. Werris Creek 2341
TEL. +61 2 6768 7039
Prepared by Horizon Surveying Pty Ltd Ph: 02 65 773214 Fax: 02 65 773216

WERRIS CREEK MINE MINING AEMR PLAN
PROPOSED LAND PREPARATION - PLAN 3

Drawing No.	Revision No.
000000-3	1

Date	Scale:	Drawn	Checked	Approved	Sheet Size
30-5-2010	1:4000	NG	AW	CD	A0

REVISIONS					
REV.					
DATE					
BY					
DESCRIPTION					

CHK.					
REV.					
DATE					
BY					
DESCRIPTION					

MW9
MW14
SB10
(EPA 14)
PRODUCT
STOCKPILE
WERRIS CREEK 2.5 kms
E 275 000
E 276 000
N 6 526 000
N
W
E
S
0 100 200 300 400 500metres
Abandoned Underground Workings
Have not been Surveyed to current standards
Further investigation will be required to ascertain
Their correct location. Floor levels have been derived
From the recent drilling geological model."
MW1
N 6 525 000
Magazines
AN RELOAD
WERRIS CREEK - QUIRINDI ROAD
MAIN NORTHERN RLY
(EPA 12) SB9
VWD2
N 6 524 000
COAL PREP
QUIRINDI 12 kms
MW3
VWD3
MW4
(EPA 10) SB2
MW5
VWD1
E 270 000
E 276 000

LEGEND

- Colliery Holding / Lease Boundary
- Current Extraction Approval Area
- Area to be disturbed
- DA Consent Boundary
- Topsoil Stockpiles (includes vegetation stacking)
- Infrastructure Areas
- Proposed Topsoil Stripping Areas
- MW10 Groundwater Monitoring Site
- EPA Discharge Points
- Area Allocated for Underground mine water dams

Mining Sequence

- 2009
- 2010
- 2011

I, ..., holder of Open Cut Mine Manager's Certificate of Competency No. ....., certify that the information on this plan is a true indication of the proposed development.

..... Manager ..... Date

I, ..., holder of Mine Surveyor's Certificate of Competency No. ....., certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by Industry and Investment, NSW.

..... Mine Surveyor ..... Date

Werris Creek Coal Pty Limited
1435 Werris Creek Road. Werris Creek 2341
TEL. +61 2 6768 7039

Prepared by Horizon Surveying Pty Ltd Ph: 02 65 773214 Fax: 02 65 773216

WERRIS CREEK MINE - AEMR PLAN
PROPOSED MINING ACTIVITIES - PLAN 4

Date	Scale:	Drawn	Checked	Approved	Sheet Size
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Revision No. 1

Drawing No. 000000-4

WERRIS CREEK MINE - AEMR PLAN
PROPOSED REHABILITATION - PLAN 5

REVISIONS

REV.	DATE	BY	DESCRIPTION

CHK.	REV.	DATE	BY	DESCRIPTION

E 274 000 · E 275 000 · E 276 000

N 6 526 000 · N 6 525 000 · N 6 524 000 · N 6523000 · N 6522000

WERRIS CREEK 2.5 kms

N · W · E · S

0 100 200 300 400 500metres

SB10 · SD11 (Dam 1) · SD10 · Magazines · farm 5 · farm 4 · farm 3 · SB9 · SB8 · VWD2 · SB7 · SB6 · SB5 · SB4 · VWD3 · SB3 · SB2 · SB1 · VWD1 · SD2 · SD3 · SD3A · SD4 · SD5

WERRIS CREEK - QUIRINDI ROAD

MAIN NORTHERN RLY

QUIRINDI 12 kms

2010 · 2011 · 2012 · 2012 Pasture · 2013

Abandoned Underground Workings
Have not been Surveyed to current standards
Further investigation will be required to ascertain
Their correct location. Floor levels have been derived
From the recent drilling geological model."

LEGEND

- Colliery Holding / Lease Boundary
- Current Extraction Approval Area
- Area to be disturbed
- DA Consent Boundary
- Existing Natural Timber
- Active Mining Area
- Existing Rehabilitation Area (2010)
- Future Rehabilitated Area (Pasture)
- Shaped Overburden
- Unshaped Overburden
- Infrastructure
- 2010 Rehabilitation Schedule
- Rehabilitated to Woodland
- Water Management (Clean)
- Water Management (Dirty)
- Water Flume
- Out of Pit Void Water Dam
- Underground Workings

Note: No Rehabilitated slopes >10°

I, ..., holder of Open Cut Mine Manager's Certificate of Competency No. ....., certify that the information on this plan is a true indication of the proposed development.

..... Manager ..... Date

I, ..., holder of Mine Surveyor's Certificate of Competency No. ....., certify that to the best of my knowledge and belief this plan conforms to the accuracy standards required by Industry and Investment, NSW.

..... Mine Surveyor ..... Date

Prepared by Horizon Surveying Pty Ltd Ph: 02 65 773214 Fax: 02 65 773216

Whitehaven

Werris Creek Coal Pty Limited

1435 Werris Creek Road. Werris Creek 2341

TEL. +61 2 6768 7039

Date	Scale:	Drawn	Checked	Approved	Sheet Size
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Revision No. 1

Drawing No. 000000-5

Development Consent

Section 80 of the *Environmental Planning and Assessment Act 1979*

I, the Minister for Infrastructure and Planning, approve the Development Application referred to in schedule 1, subject to the conditions in schedules 3 to 6.

These conditions are required to:
- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the on-going environmental management of the development.

Craig Knowles MP
Minister for Infrastructure and Planning
Minister for Natural Resources

SIGNED BY MINISTER KNOWLES ON 18 FEBRUARY 2005
Sydney, 2005 File No: S03/03677

Red type represents 19 October 2005 modification.
Blue type represents 6 March 2007 modification.
Green type represents 17 September 2008 modification.
Orange type represents 15 April 2009 modification.
Purple type represents ... September 2009 Modification.

SCHEDULE 1

Development Application:	DA-172-7-2004.
Applicant:	Werris Creek Coal Pty Limited.
Consent Authority:	Minister for Infrastructure and Planning.
Land:	See Appendix 1 and Figure i.
Proposed Development:	Construction and operation of the Werris Creek Coal Mine, about 4 kilometres south of Werris Creek, in general accordance with the Environmental Impact Statement for the *Proposed Werris Creek Coal Mine*, which includes: • undertaking open cut coal mining operations over an area of approximately 80 hectares; • constructing and operating coal screening and crushing equipment; • constructing and operating a rail load-out facility; • transporting export coal by a private haul road to the rail load-out facility; • transporting coal from the coal processing area via the mine access road and the Quirindi to Werris Creek Road to domestic markets;

- producing up to 2 million tonnes per year of Run-of-Mine (ROM) coal;
- installation of a mine access road, various support services, structures and transportable buildings; and
- progressive shaping and rehabilitation of the mine area and other areas of disturbance.

State Significant Development: The proposal is classified as State significant development, under section 76A(7) of the *Environmental Planning and Assessment Act 1979*, because it involves coal-mining related development that requires a new mining lease under section 63 of the *Mining Act 1992*.

Integrated Development: The proposal is classified as integrated development, under section 91 of the *Environmental Planning and Assessment Act 1979*, because it requires additional approvals under the:

- *Protection of the Environment Operations Act 1997;*
- *Water Act 1912; and*
- *Roads Act 1993.*

Designated Development: The proposal is classified as designated development, under section 77A of the *Environmental Planning and Assessment Act 1979*, because it is for a coal mine that would "*produce or process more than 500 tonnes of coal a day*", and consequently meets the criteria for designated development in schedule 3 of the *Environmental Planning and Assessment Regulation 2000.*

Note:

(a) To find out when this consent becomes effective, see section 83 of the Environmental Planning and Assessment Act 1979 (EP&A Act);

(b) To find out when this consent is liable to lapse, see section 95 of the EP&A Act; and

(c) To find out about appeal rights, see section 97 of the EP&A Act.

SCHEDULE 2
DEFINITIONS

AEMR	Annual Environmental Management Report
ANZECC	Australian and New Zealand Environment Consultative Council
Applicant	Werris Creek Coal Pty Limited, or its successors in title
BCA	Building Code of Australia
Bore	Any bore or well or excavation or other work connected or proposed to be connected with sources of sub-surface water, and used or proposed to be used or capable of being used to obtain supplies of such water whether the water flows naturally at all times or has to be raised whether wholly or at times by pumping or other artificial means
CCC	Community Consultative Committee
Council	Liverpool Plains Shire Council
DA	Development Application
Day	Day is the period from 7 am to 6 pm on Monday to Saturday, and 8 am to 6 pm on Sundays and Public Holidays
DECCW	Department of Environment, Climate Change and Water
Department	The Department of Planning
Director-General	Director-General of Department of Planning, or delegate
DII	Department of Industry and Investment
NOW	NSW Office of Water within DECCW
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence
Evening	Evening is the period from 6 pm to 10 pm
GTA	General Term of Approval
Land	Land means the whole of a lot in a current plan registered at the Land Titles Office at the date of this consent
Minister	Minister for Infrastructure and Planning, or delegate
MOP	Mining Operations Plan
Mtpa	Million tonnes per annum
Night	Night is the period from midnight to 7 am and 10 pm to midnight Monday to Saturday and midnight to 8 am and 10 pm to midnight on Sundays and public holidays
NP&W Act	*National Parks and Wildlife Act 1974*
PCA	Principal Certifying Authority appointed under Section 109E of the Act
Privately-owned land	Land excluding land owned by a mining company, where: • a private agreement does not exist between the Applicant and the land owner; and • there are no land acquisition provisions requiring the Applicant to purchase the land upon request from the land owner
Reasonable and Feasible	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements. Feasible relates to engineering corrections and what is practical to build
ROM coal	Run-of-mine coal
DTI	Department of Transport and Infrastructure
Site	Land to which the DA applies
tpa	tonnes per annum

SCHEDULE 3
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Applicant shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

Terms of Approval

2. The Applicant shall carry out the development generally in accordance with the:
   (a) DA 172-7-2004;
   (b) EIS titled *Environmental Impact Statement for the Proposed Werris Creek Coal Mine*, and *Specialist Consultant Studies Compendium*, dated August 2004, and prepared by R.W. Corkery & Co. Pty. Limited;
   (c) letter from the Applicant, dated 1 December 2004, indicating the relocated position of the mine access entrance and road;
   (d) document titled, *Application to Modify Conditions 4(48) and 4(51) of Development Consent DA 172-7-2004,* dated October 2005, prepared by Werris Creek Coal Pty Ltd;
   (e) document titled, *Application to Modify Condition 44 of Development Consent DA 172-7-2004,* dated 11 December 2006, prepared by Werris Creek Coal Pty Ltd;
   (f) the Statement of Environmental Effects titled *Statement of Environmental Effects for Minor Modifications to Werris Creek Coal Mine prepared by Werris Creek Coal Pty Limited* and dated June 2008 (the SEE);
   (g) the Response to Submissions titled *Werris Creek Coal Pty Ltd Response to Public and Government Agency Submissions Modification Application to DA 172-7-2004 (MOD 3)* prepared by Werris Creek Coal Pty Limited and dated July 2008; and
   (h) the Statement of Environmental Effects titled *Statement of Environmental Effects – Precursor Storage Facility at Werris Creek Coal Mine & Alternate Biodiversity Offset Area for Werris Creek Coal Mine* prepared by Werris Creek Coal Pty Limited and dated November 2008;
   (i) *Statement of Environmental Effects for a Modification to the Mining Area and Related Activities at the Werris Creek Coal Mine* prepared by RW Corkery & Co Pty Limited, dated March 2009;
   (j) *Responses to Submissions for the Statement of Environmental Effects for a Modification to the Mining Area and Related Activities at the Werris Creek Coal Mine* prepared by RW Corkery & Co Pty Limited, dated July and August 2009; and
   (k) the conditions of this consent.

3. If there is any inconsistency between the above documents, the latter document shall prevail over the former to the extent of the inconsistency. However, the conditions of this consent shall prevail over all other documents to the extent of any inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any reports, plans or correspondence that are submitted in accordance with this consent; and
   (b) the implementation of any actions or measures contained in these reports, plans or correspondence.

4A. The Applicant shall prepare revisions of any strategies, plans or programs required under this consent if directed to do so by the Director-General. Such revisions shall be prepared to the satisfaction of, and within a timeframe approved by, the Director-General.

Limits on Approval

5. This consent lapses 15 years after the date it commences.

6. The Applicant shall not extract more than 2 million tonnes of ROM coal a year from the development.

7. The Applicant shall not transport more than 50,000 tonnes of saleable coal a year from the development by public road.

7A The Applicant shall ensure the rail load-out coal stockpile does not:
(a) exceed 15 m in height; and
(b) contain more than 100,000 tonnes of coal.

Structural Adequacy

8. The Applicant shall ensure that all new buildings and structures are constructed in accordance with the relevant requirements of the BCA.

Note:
(a) Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works.
(b) Part 8 of the EP&A Regulation sets out the requirements for the certification of development.

Demolition

9. The Applicant shall ensure that any demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

10. The Applicant shall ensure that all plant and equipment used at the site, or to transport coal off-site, are:
(a) maintained in a proper and efficient condition; and
(b) operated in a proper and efficient manner.

Section 94 Contributions

11. Before carrying out any development, or as otherwise agreed by Council, the Applicant shall pay Council:
- $20,000 towards the operation of the Werris Creek Rail Museum; and
- $15,000 towards the provision of youth facilities for Werris Creek,

as a community enhancement program for the Werris Creek area.

12. Prior to 31 December 2008, the Applicant shall enter into a road maintenance agreement with Council regarding public roads maintained with Council funds and used for the transport of saleable coal from the development, to the satisfaction of Council. If agreement cannot be reached, the matter shall be referred to the Director-General for resolution.

SCHEDULE 4
SPECIFIC ENVIRONMENTAL CONDITIONS

AIR QUALITY

Impact Assessment Criteria

1. The Applicant shall ensure that dust emissions generated by the development do not cause exceedances of the air quality criteria listed in Tables 1, 2 and 3 at any residence on, or on more than 25 percent of, any privately-owned land.

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 $\mu g/m^3$
Particulate matter < 10 µm (PM_{10})	Annual	30 $\mu g/m^3$

Table 1: Long-term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	50 $\mu g/m^3$

Table 2: Short-term Impact Assessment Criterion for Particulate Matter

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	3.6 g/m^2/month

Table 3: Long-term Impact Assessment Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

Land Acquisition Criteria

2. If the dust emissions generated by the development exceed the criteria in Tables 4, 5 and 6 at any residence on, or on more than 25 percent of, any privately-owned land, the Applicant shall, upon receiving a written request for acquisition from the landowner, initiate an independent review in accordance with conditions 4-9 of schedule 5 and, if required, acquire the land in accordance with the procedures in conditions 10-12 of schedule 5.

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 $\mu g/m^3$
Particulate matter < 10 µm (PM_{10})	Annual	30 $\mu g/m^3$

Table 4: Long-term Land Acquisition Criteria for Particulate Matter

Pollutant	Averaging period	Criterion	Percentile[1]	Basis
Particulate matter < 10 µm (PM_{10})	24 hour	150 µg/m^3	99[2]	Total[3]
Particulate matter < 10 µm (PM_{10})	24 hour	50 µg/m^3	98.6	Increment[4]

Table 5: Short-term Land Acquisition Criteria for Particulate Matter

[1]Based on the number of block 24 hour averages in an annual period.
[2]Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with the DECCW.
[3]Background PM_{10} concentrations due to all other sources plus the incremental increase in PM_{10} concentrations due to the mine alone.
[4]Incremental increase in PM_{10} concentrations due to the mine alone.

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2/month	3.6 g/m^2/month

Table 6: Long-term Land Acquisition Criteria for Deposited Dust

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, 1991, AS 3580.10.1-1991: Methods for Sampling and Analysis of Ambient Air - Determination of Particulates - Deposited Matter - Gravimetric Method.

[1]Operating Conditions

3. The Applicant shall carry out the development in a way that prevents and/or minimises the air pollution generated by the development.

4. The Applicant shall:
   (a) ensure any visible air pollution generated by the development is assessed regularly, and that mining operations are relocated, modified, and/or stopped as required to minimise air quality impacts on privately-owned land and ensure the visibility and safety of motorists using the surrounding public roads is not compromised;
   (b) ensure that trucks entering and leaving the site carrying loads are covered at all times, except during loading and unloading; and
   (c) implement all practicable measures to minimise the off-site odour and fume emissions generated by any spontaneous combustion or blasting at the development,

   to the satisfaction of the Director-General.

Additional Air Quality Mitigation Measures

5. Upon receiving a written request from any landowner where subsequent dust monitoring shows the dust generated by the development is greater than the deposited dust criteria in Table 6, the Applicant shall, in consultation with the landowner, install a first flush system (or similar) on any water tank used as a drinking water supply on the land. If within 3 months of receiving this request, the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

[1] Incorporates DECCW GTA

[2]Monitoring

6. Within 3 months of this consent, the Applicant shall prepare and implement a detailed Air Quality Monitoring Program in consultation with the DECCW, and to the satisfaction of the Director-General. The Air Quality Monitoring Program shall include an air quality monitoring protocol for evaluating compliance with the air quality impact assessment and land acquisition criteria in this consent.

[3]NOISE

Noise Impact Assessment Criteria

7. The Applicant shall ensure that the noise generated by the development does not exceed the noise impact assessment criteria presented in Table 7 at any residence on privately-owned land.

Day (Construction Stage) $L_{Aeq(15\ minute)}$	Day (Operational Stage) $L_{Aeq(15\ minute)}$	Evening $L_{Aeq(15\ minute)}$	Night $L_{Aeq(15\ minute)}$	Night $L_{A1(1\ minute)}$
40	35	35	35	45

Table 7: Noise Impact Assessment Criteria dB(A)

Note:

(a) Noise from the development is to be measured at the most affected point or within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary,

(b) To determine compliance with the $LA_{eq(15\ minute)}$ noise limits in the above table, where it can be demonstrated that direct measurement of noise from the development is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

(c) Noise from the development is to be measured at 1 metre from the dwelling façade to determine compliance with the $L_{A1(1\ minute)}$ noise limits in the above table.

(d) The noise emission limits identified in the above table apply under meteorological conditions of:

i wind speeds of up to 3 m/s at 10 metres above ground level; or

ii Temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

(e) "Construction Stage" applies Monday to Saturday, excluding public holidays, until 6 months after the commencement of operations, or the completion of the 15 metre high acoustic bund, whichever occurs first.

Rail Noise Impact Assessment Criteria

8. The Applicant shall ensure that the noise generated by shunting operations associated with the development does not exceed the noise impact assessment criteria presented in Table 8.

Day/Evening/Night $L_{Aeq(24\ hour)}$	Day/Evening/Night $L_{A(max)}$	Property
55	80	Any residence on privately-owned land.

Table 8: Rail Shunting Noise Criteria dB(A)

Note: Shunting operations directly related to coal loading activities are subject to noise impact criteria in Table 7.

[2] Incorporates DECCW GTA
[3] Incorporates DECCW GTA

Land Acquisition Criteria

9. If the noise generated by the development exceeds the criteria in Table 9, the Applicant shall, upon receiving a written request from the landowner, initiate an independent review in accordance with the procedures in conditions 4-9 of schedule 5 and, if required, acquire the land in accordance with the procedures in conditions 10-12 of schedule 5.

Day/Evening/Night $L_{Aeq(15\ minute)}$	***Property***
40	*All privately-owned land.*

Table 9: Land Acquisition Criteria dB(A)

Note: The provisions of this condition do not apply during the Construction Stage of the mine.

[4]Operating Conditions

10. The Applicant shall ensure that all reversing alarms fitted to vehicles on the site shall be of a mid-high frequency broadband type as described in the EIS.

Rail Spur Management Plan

11. The Applicant shall prepare and implement a detailed Rail Spur Management Plan for shunting operations associated with the development, in consultation with the Australian Rail Track Corporation and the company providing rail freight services to the Applicant. The Applicant shall not carry out any shunting operations before the Director-General has approved this Plan. This plan must include:
    (a) a noise monitoring program for privately-owned residences in proximity to the spur line to the development's rail load-out facilities;
    (b) measures to reduce noise and vibration impacts on impacted residences; and
    (c) measures to avoid or minimise impacts other than noise and vibration including, but not limited to, train headlights and interruption of public road access across the spur line,

    to the satisfaction of the Director-General.

Operating Hours – Construction Stage

12. The Applicant is permitted to operate the development between 7 am to 6 pm Monday to Friday and 8 am to 6 pm Saturday, excluding public holidays, during the "Construction Stage" as defined in condition 7. Construction activities must not commence until 8 am during temperature inversion conditions, southeast winds exceeding 3 m/s and northwest winds exceeding 3 m/s, unless approved by the DECCW. The Applicant shall notify the Department of the date of commencement of construction activities.

Operating Hours – Stage 1 Operations

13. On completion of the eastern acoustic bund to a height of 15 metres, the Applicant is permitted to operate the development between 7 am and 10 pm Monday to Friday and 8 am to 2 pm Saturday, excluding public holidays. Operations must not commence until 8 am during temperature inversion conditions, southeast winds exceeding 3 m/s and northwest winds exceeding 3 m/s unless approved by the DECCW. The Applicant shall notify the Department of the date of commencement of Stage 1 operations.

14. In addition to the permitted operational hours set out in condition 13, the Applicant may operate the train load-out facility between 2 pm and 10 pm Saturday, excluding public holidays, and maintenance operations may be conducted 24 hrs a day, Monday to Saturday.

[4] Incorporates DECCW GTA

Operating Hours – Stage 2 Operations

15. The Applicant shall undertake an acoustical validation study, in a manner approved by the DECCW, of predicted noise impacts contained in the EIS against measured noise impacts of the development during the initial 6 months of its operation (or other time agreed by the Director-General). If, following consideration of the acoustical validation study, the DECCW and the Director-General are satisfied that predicted noise impacts are unlikely to be exceeded by the development, the Applicant may progress to Stage 2 operating hours.

Stage 2 operating hours are defined as:
(a) midnight to 4 am; and 7 am to midnight Monday to Friday;
(b) midnight to 4 am; and 7 am to 2 pm Saturday;
(c) on-site processing of coal is permitted between the additional hours of 2 pm to 10 pm Saturday;
(d) overburden removal and emplacement is permitted at any time Monday to Saturday; and
(e) operation of the coal load-out facility and maintenance activities is permitted at any time Monday to Sunday

These hours may be varied, with the approval of the DECCW, if the Director-General is satisfied that the amenity of residents in the locality will not be adversely affected.

Note: Stage 2 operating hours do not apply to blasting (see conditions 20 & 23) or to the dispatch of coal by road (see condition 52).

Monitoring

16. Before carrying out any development, the Applicant shall prepare a Noise Monitoring Program for the development in consultation with the DECCW, and to the satisfaction of the Director-General, which includes a noise monitoring protocol for evaluating compliance with the criteria in conditions 7, 8, and 9.

Additional Noise Mitigation Measures

16A. If noise monitoring shows the noise generated by the development is equal to or greater than 38 dB(A) $L_{Aeq(15\ minute)}$ at any privately-owned residence (except where a written negotiated noise agreement is in place or the landowner has requested acquisition); then upon receiving a written request from the landowner, the Applicant shall implement reasonable and feasible noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner. If within 3 months of receiving this request from the landowner, the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

METEOROLOGICAL MONITORING

17. Within 6 months of this consent, the Applicant shall ensure that there is a suitable meteorological station operating in the vicinity of the development in accordance with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales*, and to the satisfaction of the DECCW and the Director-General.

BLASTING & VIBRATION

Airblast Overpressure Limits

18. The Applicant shall ensure that the airblast overpressure level from blasting at the development does not exceed the criteria in Table 10 at any residence on privately-owned land.

Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
115	5% of the total number of blasts in a 12 month period
120	0%

Table 10: Airblast Overpressure Impact Assessment Criteria

Note: The overpressure values in Table 12 apply when the measurements are performed with equipment having a lower cut-off frequency of 2 Hz or less. If the instrumentation has a higher cut-off frequency a correction of 5 dB should be added to the measured value. Equipment with a lower cut-off frequency exceeding 10 Hz should not be used.

Ground Vibration Impact Assessment Criteria

19. The Applicant shall ensure that the ground vibration level from blasting at the development does not exceed the criteria in Table 11 at any residence on privately-owned land or noise sensitive location as defined in the DECCW's Industrial Noise Policy.

Peak particle velocity (mm/s)	Allowable exceedance
5	5% of the total number of blasts in a 12 month period
10	0%

Table 11: Ground Vibration Impact Assessment Criteria

Blasting Hours

20. The Applicant shall only carry out blasting at the development between 10 am and 4 pm Monday to Friday during the Construction Stage and 9 am to 5 pm for Stages 1 and 2, except as further restricted by condition 22. No blasting is allowed on Saturdays, Sundays, public holidays or any other time without the written approval of the DECCW.

Blasting Frequency

21. The Applicant shall not carry out more than 1 blast a day at the site without the written approval of the DECCW.

Monitoring

22. Prior to carrying out any blasting, the Applicant shall prepare and implement a detailed Blasting Monitoring Program for the development in consultation with the DECCW and to the satisfaction of the Director-General. The Applicant shall monitor the airblast overpressure and ground vibration impacts of blasting operations of the development at privately-owned residences or noise sensitive locations as defined in the DECCW's Industrial Noise Policy, using the units of measurement, frequency, sampling method, and locations specified in Table 12.

Parameter	Units of Measure	Frequency	Sampling Method	Measurement Location
Airblast overpressure	dB(Lin Peak)	During every blast	AS2187.2-1993[1]	Not less than 3.5 m from a building or structure
Peak particle velocity	mm/s	During every blast	AS2187.2-1993	Not more than 30 m from a building or structure

Table 12: Airblast Overpressure and Ground Vibration Monitoring

[1]*Standards Australia, 1993, AS2187.2-1993: Explosives - Storage, Transport and Use - Use of Explosives.*

Blasting in Proximity to the Quirindi to Werris Creek Road

23. The Applicant shall prepare and implement a Traffic Management Plan in consultation with Council and the DII, and to the satisfaction of the Director-General for blasting activities that require the temporary periodic closure of the Quirindi to Werris Creek Road. This plan shall include measures to ensure:
    - adequate warning is given to road users prior to blasting;
    - follow up inspections are made to ensure that public roads are safe and clear of debris; and
    - blasting does not occur at any time which delays the transportation of children to or from school.

Public Notice

24. During the life of the development, the Applicant shall:
    (a) operate a blasting hotline, or alternate system agreed to by the Director-General, to enable the public to get up-to-date information on blasting operations at the development; and
    (b) notify the landowner/occupier of any land within 2 km of the development about this hotline or system on an annual basis.

Property Inspections

25. Before carrying out any blasting, the Applicant shall advise all landowners within 2 km of the development, and any other landowner nominated by the Director-General, that they are entitled to a property inspection.

26. If the Applicant receives a written request for a property inspection from any landowner within 2 km of the development, or any other landowner nominated by the Director-General, the Applicant shall within 3 months of receiving this request:
    (a) commission a suitably qualified person, whose appointment has been approved by the Director-General, to inspect the condition of any building or structure on the land, and recommend measures to mitigate any potential blasting impacts; and
    (b) give the landowner a copy of this property inspection report.

Property Investigations

27. If any landowner within a 2 km of the development, or any other landowner nominated by the Director-General, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting at the development, the Applicant shall within 3 months of receiving this request:
    (a) commission a suitably qualified person whose appointment has been approved by the Director-General to investigate the claim; and
    (b) give the landowner a copy of the property investigation report.

If this independent investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant shall repair the damages to the satisfaction of the Director-General.

If the Applicant or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 2).

[5]SURFACE & GROUND WATER

Pollution of Waters

28. Except as may be expressly provided by a DECCW licence, the Applicant shall comply with section 120 of the *Protection of the Environment Operations Act 1997* during the carrying out of the development.

Discharge Limits

29. Except as may be expressly provided by a DECCW Licence, the Applicant shall ensure that the discharges from any licenced discharge point comply with the limits in Table 13.

Pollutant	Units of measure	50 percentile concentration limit	90 percentile concentration limit	100 percentile concentration limit
pH				6.5 ≤ pH ≤8.5
Total Suspended Solids	mg/L	20	35	50
Grease & Oil	mg/L			10

Table 13: Discharge Limits

Note: This condition does not authorise the discharge or emission of any other pollutants.

[6]Groundwater Contingency Plan

30. Within 6 months of this consent, the Applicant shall prepare a Groundwater Contingency Plan to the satisfaction of the Director-General. This Plan shall:
    (a) include a program to establish the natural variability of groundwater quality and quantity;
    (b) establish trigger levels, benchmarks and contingency criteria;
    (c) provide measures to mitigate any impacts of the mine on the quality or quantity of groundwater supplies available on privately-owned land; and
    (d) provide for negotiated agreements with affected landowners, including compensation where mining impacts result in increased extraction costs for landowners.

[7]Site Water Balance

31. Each year, the Applicant shall:
    (a) review the site water balance for the development against the predictions in the EIS;
    (b) re-calculate the site water balance for the development; and

[5] Incorporates DECCW GTA
[6] Incorporates Department's GTA
[7] This should differentiate between licensed extracted water (from surface or groundwater sources), incidental water encountered in mining operations, and Harvestable Right water. These calculations must exclude the clean water system, including any sediment control structures, and any dams in the mine lease area which fall under the Maximum Harvestable Right Dam Capacity; include any dams that are licensable under Section 205 of the Water Act 1912, and water harvested from any non-harvestable rights dam on the mine lease area; address balances of inflows, licenced water extractions, and any transfers of water from the site; include an accounting system for water budgets; and include a salt budget.

(c) report the results of this review in the AEMR,
to the satisfaction of the Director-General.

Site Water Management Plan

32. Before carrying out any development, the Applicant shall prepare a Site Water Management Plan for the development in consultation with DECCW, and to the satisfaction of the Director-General. This plan must include:
    (a) the predicted site water balance;
    (b) an Erosion and Sediment Control Plan;
    (c) a Surface Water Monitoring Program;
    (d) a Groundwater Management Plan; and
    (e) a strategy for the decommissioning of water management structures on the site.

33. The Erosion and Sediment Control Plan shall:
    (a) be consistent with the requirements of the Department of Housing's *Managing Urban Stormwater: Soils and Construction* manual;
    (b) identify activities for the construction and operational phases of the development that could cause soil erosion and generate sediment;
    (c) describe the location, function, and capacity of erosion and sediment control structures; and
    (d) describe measures to minimise soil erosion and the potential for the migration of sediments to downstream waters.

34. The Surface Water Monitoring Program shall include:
    (a) surface water impact assessment criteria;
    (b) a program to monitor the land in waste water utilisation area(s) and receiving waters;
    (c) a program to monitor the quality of water contained in, or discharged from, water storages (including the mining void) associated with the development;
    (d) a program to monitor surface water flows and quality upstream and downstream of the confluence of the Northern catchment into Werris Creek and the Southern catchment into Quipolly Creek; and
    (e) a program to monitor the effectiveness of the Erosion and Sediment Control Plan.

35. [8]The Groundwater Management Plan must cover the full cycle of operation from pre-mining to completion of rehabilitation/restoration of all groundwater. This plan must include:
    (a) clearly defined objectives for the Groundwater Management Plan;
    (b) release criteria applicable to the objectives of the Groundwater Management Plan;
    (c) identification of monitoring bores and piezometers which are representative of those areas likely to be impacted within and around the operational area;
    (d) inclusion of at least one monitoring bore at a location outside the predicted influence of the mine, within the regional fractured rock layers;
    (e) inclusion of bores representative of groundwater use in the area, including the shallow aquifer adjacent to Quipolly Creek;
    (f) pre-mining and post-mining, for a period of 10 years after mining has ceased, monitoring of watertable levels and water quality;
    (g) analytes to be monitored;
    (h) procedures for sampling and monitoring;
    (i) frequency of readings in relation to all specified parameters;
    (j) levels of readings indicating contamination/impacts of the groundwater; and
    (k) procedures for investigation of detected contamination/impacts.

[9]Independent Review of Monitoring

36. The Applicant shall provide to the Department an annual review and report on surface and groundwater monitoring and observable trends. The report is to be completed by a suitably qualified and independent hydrogeologist, whose appointment has been approved by the Director-General.

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[8] Incorporates Department's GTAs

[9] Incorporates Department's GTA

Final Void Management

37. At least 3 years before the cessation of mining, or as otherwise directed by the Director-General, the Applicant shall prepare and implement a Final Void Management Plan, in consultation with the DII and DECCW, and to the satisfaction of the Director-General. This plan must:
    (a) investigate options for the future use of the final void;
    (b) re-assess the potential groundwater impacts of the development; and
    (c) describe what actions and measures would be implemented to:
        - minimise any potential adverse impacts associated with the final void; and
        - manage, and monitor the potential impacts of, the final void over time.

FAUNA & FLORA

Biodiversity Offset Strategy

38. The Applicant shall implement the Biodiversity Offset Strategy (as summarised in Table 16 and shown in the figure in Appendix 3) in accordance with best practice flora and fauna management, and to the satisfaction of the Director-General.

Component	*Location*	*Size (ha)*
White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community (22 ha) and Native Vegetation on Cracking Clay Soils of the Liverpool Plains endangered ecological community (102 ha)	south west of the mine	124
Area remaining from the original "200 ha" offset	south east and east of the open cut	77
Potential Linkage of remnant White Box, rehabilitation and plantings	south and south west of the open cut	129
White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community	"Railway View"	20
Tumbledown Gum Woodland Community	"Railway View"	4.5
Cleared land	"Railway View"	7.5
Total Offset Area		**362**

Table 16: Biodiversity Offset Strategy

Agreement to Conserve Offset Areas

39. Prior to 30 June 2009, the Applicant shall implement suitable arrangements to provide long-term security for the offset in the Biodiversity Offset Strategy to the satisfaction of the Director-General.

    Note: The long-term security of the offset can be achieved through one, or a combination, of the following: Deed of Agreement with the Minister, rezoning the land under the Liverpool Plains Local Environment Plan, caveats on the title under the Conveyancing Act 1919, etc..

Biodiversity Offset Management Plan

40. Prior to 31 August 2009, the Applicant shall prepare and subsequently implement a Management Plan for the Biodiversity Offset Strategy to the satisfaction of the Director-General. This plan must include:
    (a) a description of the Biodiversity Offset Strategy in broad terms, including its objectives and its relationship to the mine's Rehabilitation Management Plan;
    (b) assessment and completion criteria for the Biodiversity Offset Strategy;

(c) a detailed flora and fauna monitoring program for the Biodiversity Offset Strategy that is based on sound statistical principles; and

(d) a detailed description of the procedures to be applied within the Biodiversity Offset lands, including;

- erosion and sedimentation control;
- soil and water management;
- bushfire management;
- exclusion of domestic livestock grazing;
- weed management, targeting major woody and noxious weeds;
- retention of regrowth native vegetation;
- maintaining availability of a suitable fire control unit on site;
- limiting human access to the offset area to authorised personnel only;
- retaining all dead timber and fallen logs;
- retaining bush rock in situ;
- carrying out infill planting of native vegetation tubestock; and
- feral animal control.

Annual Review of Biodiversity Offset Management Plan

41. The Applicant shall:
    (a) annually review performance under the Biodiversity Offset Management Plan; and
    (b) if necessary, revise the Biodiversity Offset Strategy,
    to the satisfaction of the Director-General.

Independent Audit of the Biodiversity Offset Management Plan

42. Prior to 31 August 2011, and every 3 years thereafter, the Applicant shall commission, and pay the full cost of, an Independent Audit of the Biodiversity Offset Management Plan. This audit must:
    (a) be conducted by a suitably qualified, experienced, and independent person whose appointment has been approved by the Director-General;
    (b) assess the performance of the Biodiversity Offset Management Plan; and
    (c) if necessary, recommend actions or measures to improve the performance of the Biodiversity Offset Management Plan.

Conservation Bond

41. Following the independent audit of the Biodiversity Offset Strategy at the end of year 6 of the development, or prior to the cessation of mining, whichever occurs first, the Applicant shall lodge a reasonable conservation bond with the Department to ensure that there are sufficient resources available to fully implement the Biodiversity Offset Strategy. The amount of the bond shall be set by the Director-General, in consultation with the Applicant, and reflect the costs, at that time, of fully implementing the Biodiversity Offset Strategy. The Director-General, in consultation with the Applicant, may adjust the amount of the bond after any subsequent independent audit of the Biodiversity Offset Strategy.

ABORIGINAL & EUROPEAN HERITAGE

Conservation of the "Narrawolga Site"

42. The Applicant shall manage the removal, re-location and protection of the axe-grinding grooves known as the *"Narrawolga Site"* in accordance with the information accompanying modification application DA 172-7-2004 MOD-2 and to the satisfaction of the Director-General.

Archaeology and Cultural Heritage Management Plan

43. The Applicant shall prepare and implement an Archaeology and Cultural Heritage Management Plan, in consultation with the DECCW and the Nungaroo LALC. This plan must:

(a) describe in detail a conservation program for Aboriginal cultural heritage during the development;
(b) establish a consultation protocol, including regular meetings, with the local Nungaroo LALC for Aboriginal cultural heritage management on-site during the development;
(c) make provision for the local Aboriginal community to monitor works at the development that occur in areas considered by the local Aboriginal community to be culturally sensitive;
(d) describe the procedures that would be implemented if any heritage or archaeological sites were discovered during the development;
(e) describe a contingency plan and reporting procedure should damage to Aboriginal sites or places occur at the development; and
(f) describe the induction and training program to be undertaken by all employees and contractors in respect of cultural heritage awareness and protection.

The Applicant shall not carry out any development before the Director-General has approved this plan.

45A. Prior to 31 May 2007, the Applicant shall revise the Werris Creek Coal Mine Archaeology and Cultural Heritage Management Plan in respect of the ongoing management of the *"Narrawolga Site"*, in consultation with the DECCW, the Nungaroo LALC and other representatives of the local Aboriginal community, to the satisfaction of the Director-General.

"Narrawolga" Homestead

44. The Applicant shall, within 12 months of the date of this consent, ensure that a qualified heritage architect fully and appropriately records the "Narrawolga" homestead building in a report that:
- records the material elements of the building; and
- identifies materials to be recovered during the demolition of the building for reuse.

The Applicant shall implement the recommendations of the report and provide a copy of the report to Council.

Reporting

45. The Applicant shall give a detailed progress report on the measures implemented to preserve and protect Aboriginal cultural heritage in the AEMR.

TRAFFIC & TRANSPORT

[10]New Mine Access Road Intersection to Werris Creek Road

46. The Applicant shall:
(a) prior to 31 January 2006, design and construct a mine access road from the mine site to the Quirindi to Werris Creek Road;
(b) prior to construction of the mine site access road / Quirindi to Werris Creek Road intersection, produce a Traffic Management Plan for its construction and operation;
(c) maintain the intersection for the life of the mine; and
(d) provide street lighting in accordance with local electricity authority guidelines,
to the satisfaction of Council.

[11]Escott Road and Coal Haul Road Intersection

47. The Applicant shall:
(a) prior to the use of the coal haul road from the mine site to rail load-out facility, design and construct the intersection of the coal haul road and Escott Road;
(b) prior to construction of the intersection, produce a Traffic Management Plan for its construction and operation;

[10] Incorporates Council GTA
[11] Incorporates Council GTA

(c) maintain the intersection for the life of the mine; and
(d) provide street lighting in accordance with local electricity authority guidelines,
to the satisfaction of Council.

[12]Escott Road and Werris Creek Road Intersection

48. The Applicant shall maintain the Escott Road/Werris Creek Road intersection for the life of the mine to the satisfaction of Council.

Internal Roads

49. The Applicant shall tar seal the:
(a) mine access road prior to 31 January 2006; and
(b) coal haul road from the mine to the rail load-out facilities prior to its use to transport coal.

Coal Haulage

52. The Applicant shall only haul coal from the site by road between the hours of;
(a) 7 am to 6 pm Monday to Friday;
(b) 7 am to 2 pm Saturday; and
(c) at no time on public holidays.

Coal haulage by road must not commence until 8 am during temperature inversion conditions, southeast winds exceeding 3 m/s and northwest winds exceeding 3 m/s, unless approved by the DECCW.

53. The Applicant shall ensure that spillage from coal haulage vehicles is minimised and that sediment-laden runoff from roads is effectively managed to prevent harm to the environment.

Monitoring

54. The Applicant shall:
(a) keep records of the:
- amount of coal transported from the site each year; and
- number of coal haulage truck movements generated by the development; and

(b) include these records in the AEMR.

VISUAL IMPACT

Visual Amenity

55. The Applicant shall carry out the development in a way that prevents and/or minimises the visual impacts of the development, including:
(a) design and construction of development infrastructure in a manner that minimises visual contrasts;
(b) progressive rehabilitation of mine overburden emplacements (particularly outer batters), including partial rehabilitation of temporarily inactive areas and proposed topsoil storage stockpiles; and
(c) construction of a 15 metre high acoustic/visual bund along the eastern perimeter of the overburden emplacement (parallel to the Quirindi to Werris Creek Road) during the Construction Stage of the mine,
(d) tree planting on the northern and eastern sides of the coal stockpile and rail load-out facility,
to the satisfaction of the Director-General.

56. If a landowner of any privately-owned residence having direct views of the mine or train load-out facility of less than 2 km distance requests the Applicant in writing to investigate ways to minimise the visual impact of the development on his/her dwelling, the Applicant shall within 3 months:

[12] Incorporates Council GTA

(a) commission a suitably qualified person whose appointment has been approved by the Director-General, to investigate ways to minimise the visual impacts from the development on the landowner's dwelling; and
(b) give the landowner a copy of the visual impact mitigation report.

If both parties agree on the measures that should be implemented to minimise the visual impact from the development, then the Applicant shall implement these measures to the satisfaction of the Director-General.

If the Applicant and the landowner disagree on the measures that should be implemented to minimise the visual impact from the development, then either party may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 2).

Lighting Emissions

57. The Applicant shall:
(a) take all practicable measures to mitigate off-site lighting impacts from the development; and
(b) ensure that all external lighting associated with the development complies with *Australian Standard AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting*,
to the satisfaction of the Director-General.

GREENHOUSE GAS EMISSIONS

58. The Applicant shall: shall implement an Energy Savings Action Plan for the project to the satisfaction of the Director-General. This plan must:

a) be prepared in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS, 2005), or its latest version;

b) include consideration of energy use by mobile equipment and investigate ways to reduce greenhouse gas emissions generated by the development; including the use of mains electric power to operate equipment associated with the coal processing plant and the rail load-out facility; and

c) be submitted to the Director-General for approval prior to 30 June 2010; and

d) include a program to monitor the effectiveness of measures to reduce energy use on site.

The Applicant must also report on greenhouse gas monitoring and management measures in the AEMR, to the satisfaction of the Director-General.

WASTE MANAGEMENT

59. The Applicant shall:
(a) monitor the amount of waste generated by the development;
(b) investigate ways to minimise waste generated by the development;
(c) implement reasonable and feasible measures to minimise waste generated by the development; and
(d) report on waste and management and minimisation in the AEMR,
to the satisfaction of the Director-General.

60. The Applicant shall not cause, permit or allow any waste generated outside the mine to be received at the mine for storage, treatment, processing, reprocessing or disposal, or any waste generated at the mine to be disposed at the mine, except as expressly permitted by a DECCW licence.

Note: This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste that requires a licence under the Protection of the Environment Operations Act 1997.

HAZARDS MANAGEMENT

Spontaneous Combustion

61. The Applicant shall:
    (a) take the necessary measures to prevent, as far as is practical, spontaneous combustion on the site; and
    (b) manage any spontaneous combustion on-site to the satisfaction of the DII.

Dangerous Goods

62. The Applicant shall ensure that the storage, handling, and transport of:
    (a) dangerous goods is done in accordance with the relevant *Australian Standards*, particularly *AS1940* and *AS1596*, and the *Dangerous Goods Code*; and
    (b) explosives are managed in accordance with the requirements of the DII.

BUSHFIRE MANAGEMENT

63. The Applicant shall:
    (a) ensure that the development is suitably equipped to respond to any fires on-site; and
    (b) assist the Rural Fire Service and emergency services as much as possible if there is a fire on-site during the development.

64. The Applicant shall prepare and implement a Bushfire Management Plan for the site, to the satisfaction of Council and the Rural Fire Service.

MINE CLOSURE STRATEGY

Landscape Management Plan

65. The Applicant shall prepare and implement a detailed Landscape Management Plan for the development to the satisfaction of the DII and the Director-General. This plan must:
    (a) be prepared in consultation with DECCW, NOW and DII by a suitably qualified expert;
    (b) be submitted to the Director-General for approval prior to 30 April 2010 or as otherwise approved by the Director-General, and include:
        - a Rehabilitation Management Plan; and
        - a Mine Closure Plan.

    Note: The Department accepts that the initial Landscape Management Plan may not include the Mine Closure Plan. However, if this occurs, the Applicant will be required to seek approval from the Director-General for an alternative timetable for the completion and approval of the Mine Closure Plan.

Rehabilitation Management Plan

66. The Rehabilitation Management Plan must include:
    (a) objectives for rehabilitation of the site;
    (b) a description of the short, medium, and long term measures that would be implemented to:
        - rehabilitate the site;
        - manage the remnant vegetation and habitat on the site;
        - maximise effective habitat linkages to surrounding vegetated lands;
        - conserve and reuse topsoil;
        - control weeds, feral pests and access; and
        - manage any potential conflicts between the rehabilitation works and Aboriginal cultural heritage;
    (c) detailed performance and completion criteria for the rehabilitation of the site;
    (d) a discussion of its relationship with the Biodiversity Offset Management Plan;
    (e) a detailed description of how the performance of the rehabilitation of the mine would be monitored over time to achieve the stated objectives;

(f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
(g) details of who (by person and/or position) is responsible for monitoring, reviewing, and implementing the plan.

Note: Reference to "rehabilitation" in this consent includes all works associated with the rehabilitation and restoration of the site as described in the documents listed in condition 1.

Mine Closure Plan

67. The Mine Closure Plan must:
(a) define the objectives and criteria for mine closure;
(b) investigate options for the future use of the site, including the final void;
(c) investigate ways to minimise the adverse socio-economic effects associated with mine closure, including reduction in local employment levels;
(d) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the development; and
(e) describe how the performance of these measures would be monitored over time.

SCHEDULE 5
ADDITIONAL PROCEDURES FOR AIR QUALITY & NOISE MANAGEMENT

Notification of Landowners

1. If the air dispersion and/or noise model predictions in the documents listed in condition 2 of schedule 3 identify that the air pollution and/or noise generated by the development are likely to be greater than the air quality and/or noise impact assessment criteria in schedule 4, then the Applicant shall notify the relevant landowners and/or existing or future tenants (including tenants of mine-owned properties) accordingly before it carries out any development.

2. If the results of the air quality and/or noise monitoring required in schedule 4 identify that the air pollution and/or noise generated by the development is greater than any of the air quality and/or noise criteria in schedule 4, except where this is predicted in the EIS, then the Applicant shall notify the Director-General and the affected landowners and/or existing or future tenants (including tenants of mine-owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the air quality and/or noise criteria in schedule 4.

3. Within 6 months of this consent, the Applicant shall develop a brochure to advise landowners and/or existing or future tenants (including tenants of mine-owned properties) of the possible health and amenity impacts associated with exposure to particulate matter, in consultation with NSW Health, and to the satisfaction of the Director-General.

   The Applicant shall review relevant human health studies and update this brochure every 3 years, to the satisfaction of the Director-General.

   The Applicant shall provide this brochure (and associated updates) to all landowners and/or existing or future tenants (including tenants of mine-owned properties) of properties where the monitoring results identify that the mine is exceeding the air quality land acquisition criteria in schedule 4.

Independent Review

4. If a landowner considers the development to be exceeding the air quality and/or noise criteria in schedule 4, except where this is predicted in the EIS, then he/she may ask the Applicant in writing for an independent review of the air pollution and/or noise impacts of the development on his/her land.

   If the Director-General is satisfied that an independent review is warranted, the Applicant shall within 3 months of the Director-General advising that an independent review is warranted:
   (a) consult with the landowner to determine his/her concerns;
   (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct air quality and/or noise monitoring on the land, to determine whether the development is complying with the relevant air quality and/or noise criteria in schedule 4, and identify the source(s) and scale of any air quality and/or noise impact on the land, and the development's contribution to this impact;
   (c) give the Director-General and landowner a copy of the independent review.

5. If the independent review determines that the development is complying with the relevant air quality and/or noise criteria in schedule 4, then the Applicant may discontinue the independent review with the approval of the Director-General.

6. If the independent review determines that the development is not complying with the relevant air quality and/or noise criteria in schedule 4, and that the development is primarily responsible for this non-compliance, then the Applicant shall:
   (a) take all practicable measures, in consultation with the landowner, to ensure that the development complies with the relevant air quality and/or noise criteria; and

(b) conduct further air quality and/or noise monitoring to determine whether these measures ensure compliance; or
(c) secure a written agreement with the landowner to allow exceedances of the air quality and/or noise criteria in schedule 4,

to the satisfaction of the Director-General.

If the additional monitoring referred to above subsequently determines that the development is complying with the relevant air quality and/or noise criteria in schedule 4, then the Applicant may discontinue the independent review with the approval of the Director-General.

If the measures referred to in (a) do not achieve compliance with the air quality and/or noise land acquisition criteria in schedule 4, and the Applicant cannot secure a written agreement with the landowner to allow these exceedances within 3 months, then the Applicant shall, upon receiving a written request from the landowner, acquire the landowner's land in accordance with the procedures in conditions 10-12 below.

7. If the independent review determines that the relevant air quality and/or noise criteria in schedule 4 are being exceeded, but that more than one development is responsible for this non-compliance, then the Applicant shall:
(a) take all practicable measures with the relevant development/s, in consultation with the landowner, to ensure that the relevant air quality and/or noise criteria are complied with; and
(b) conduct further air quality and/or noise monitoring to determine whether these measures ensure compliance; or
(c) secure a written agreement with the landowner to allow exceedances of the air quality and/or noise criteria in schedule 4,

to the satisfaction of the Director-General.

8. If the independent review determines that the relevant air quality and/or noise land acquisition criteria in schedule 4 are being exceeded at the residence and/or on the landowner's land, and that more than one development is responsible for this non-compliance, and the Applicant cannot secure a written agreement with the landowner to allow these exceedances within 3 months, then upon receiving a written request from the landowner, the Applicant shall acquire all or part of the landowner's land on as equitable a basis as possible with the relevant development/s in accordance with the procedures in conditions 10-12 below.

If the Applicant is unable to finalise an agreement with the landowner and/or other development/s, then the Applicant or landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process.

If, following the Independent Dispute Resolution Process, the Director-General decides that the Applicant shall acquire all or part of the landowner's land, then the Applicant shall acquire this land in accordance with the procedures in conditions 10-12 below.

9. If the landowner disputes the results of the independent review, either the Applicant or the landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process.

Land Acquisition

10. Within 3 months of receiving a written request from a landowner with acquisition rights, the Applicant shall make a binding written offer to the landowner based on:
(a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the development the subject of the DA, having regard to the:

- existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
- presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date;

(b) the reasonable costs associated with:

- relocating within the Liverpool Plains local government area, or to any other local government area determined by the Director-General;
- obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and

(b) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Applicant and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution.

Upon receiving such a request, the Director-General shall request the President of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

If either party disputes the independent valuer's determination, then the independent valuer should refer the matter back to the Director-General.

Upon receiving such a referral, the Director-General shall appoint a panel comprising the:
(i) appointed independent valuer;
(ii) Director-General and/or nominee/s; and
(iii) President of the Law Society of NSW or nominee,
to consider submissions from both parties, including meeting with the parties individually if requested, and to determine a fair and reasonable acquisition price for the land, and/or the terms upon which the land is to be acquired.

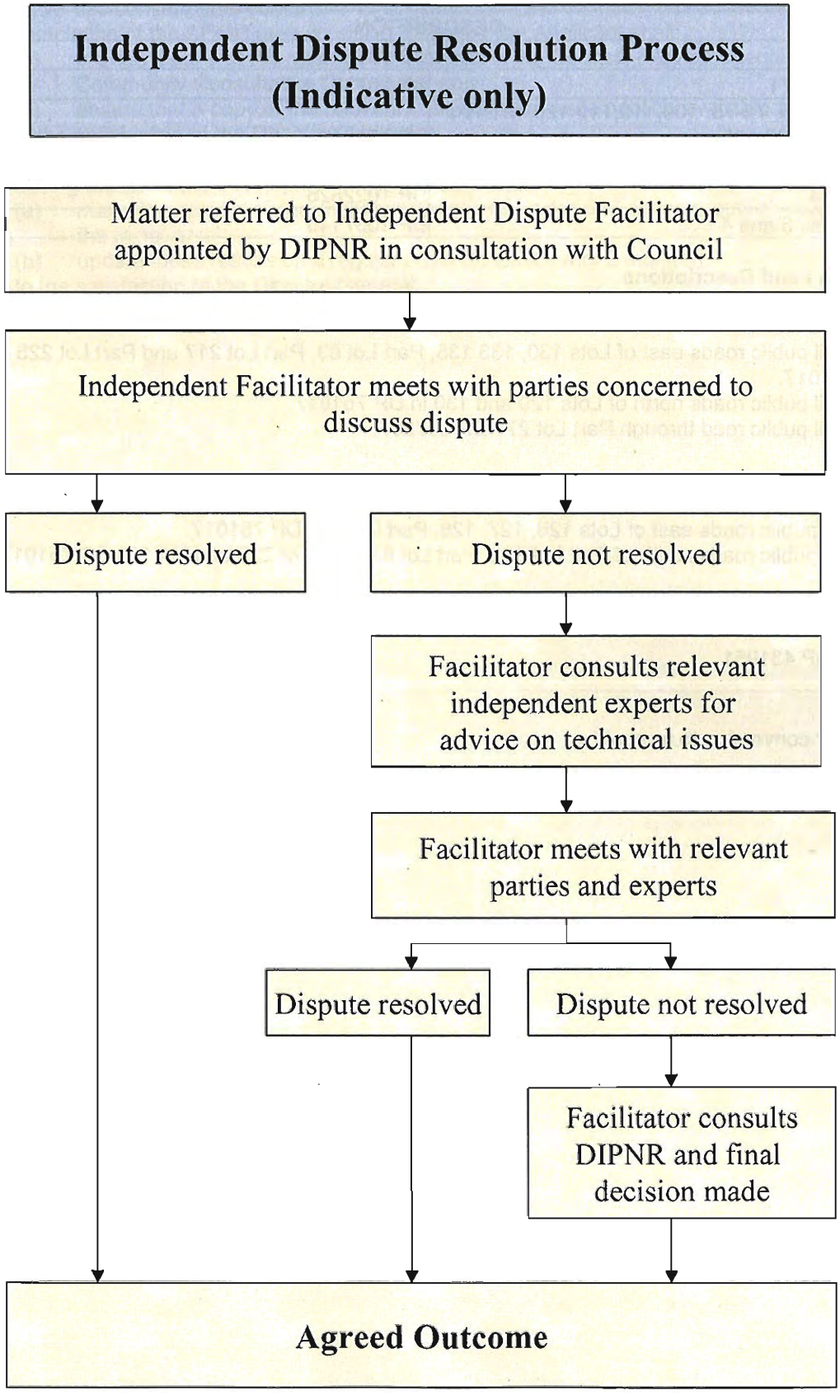
Within 14 days of receiving the panel's determination, the Applicant shall make a written offer to purchase the land at a price not less than the panel's determination.

If the landowner refuses to accept this offer within 6 months of the date of the Applicant's offer, the Applicant's obligations to acquire the land shall cease, unless otherwise agreed by the Director-General.

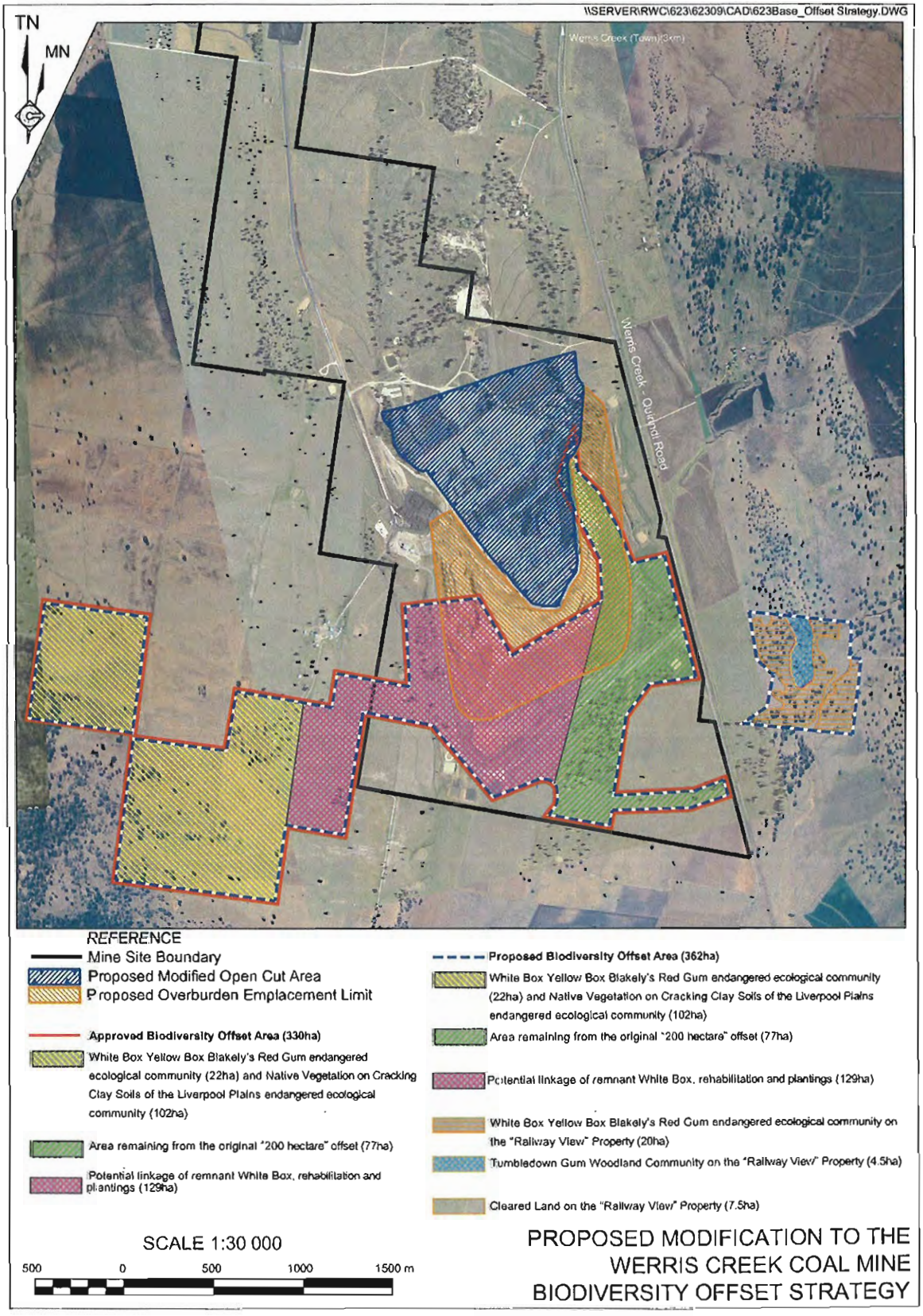
11. The Applicant shall bear the costs of any valuation or survey assessment requested by the independent valuer, panel, or the Director-General and the costs of determination referred above.

12. If the Applicant and landowner agree that only part of the land shall be acquired, then the Applicant shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision, and registration of the plan at the Office of the Registrar-General.

APPENDIX 2
INDEPENDENT DISPUTE RESOLUTION PROCESS



APPENDIX 3
LOCATION OF BIODIVERSITY OFFSET STRATEGY



Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

Licence - 12290

Department of
Environment, Climate Change and Water NSW

Licence Details	
Number:	12290
Anniversary Date:	01-April
Review Due Date:	23-Jun-2014

Licensee

WERRIS CREEK COAL PTY LIMITED
PO BOX 125
WERRIS CREEK NSW 2341

Licence Type

Premises

Premises

Werris Creek Coal Mine
Werris Creek Quirindi Road
WERRIS CREEK NSW 2341

Scheduled Activity

Mining for coal
Coal works

Fee Based Activity	**Scale**
Coal works	0 - 2000000 T loaded
Mining for coal	> 500000 - 2000000 T produced

Region

North West - Armidale
Level 1, NSW Govt Offices, 85 Faulkner Street
ARMIDALE NSW 2350
Phone: 02 6773 7000
Fax: 02 6772 2336

PO Box 494 ARMIDALE
NSW 2350

Environment Protection Licence

Licence - 12290

Department of
Environment, Climate Change and Water NSW

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act); and
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

WERRIS CREEK COAL PTY LIMITED
PO BOX 125
WERRIS CREEK NSW 2341

subject to the conditions which follow.

1 Administrative conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled development work listed below at the premises listed in A2.
Construct mine entrance/access/rail load-out roads; site preparation (clearing/soil removal) including initial mining activities; earthworks for processing plant, coal loading & office facility installation; install initial water management controls.

A1.2 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity
Mining for coal
Coal works

Fee Based Activity	Scale
Coal works	0 - 2000000 T loaded
Mining for coal	> 500000 - 2000000 T produced

A1.3 The licensee must not carry on any scheduled activities until the scheduled development works are completed, except as elsewhere provided in this licence.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
Werris Creek Coal Mine
Werris Creek Quirindi Road
WERRIS CREEK
NSW
2341
SEE FULL DESCRIPTION IN CONDITION A2.2 OF THIS LICENCE
GRENFELL PARISH, BUCKLAND COUNTY, LIVERPOOL PLAINS SHIRE

A2.2 For the purposes of this licence, the premise comprises the following land.

Freehold Land

Lot 1 DP 186633.
Lots 19, 20, 73, 74, 75, 109, 110, 112, 120, 121, 123, 126, 127, 128, 129, 130, 133 & 135 DP 751017;
Part lots 83, 131, 132, 217 & 225 DP 751017.
Part lot 2 DP 1085891.
Part lot 4 DP 1022826
Lots 1, 2 & 3 DP 1022826.
Part lots 3 & 4 DP1037145.

Crown Land Descriptions

Council Roads
Council public roads east of lots 130, 133, 135, part lot 83, part lot 217 and part lot 225 in DP 751017.
Council public roads north of lots 129 and 130 in DP 751017.
Council public road through part lot 2 DP 1085891.

Crown Roads
Crown public roads east of lots 126, 127, 128, part lot 132 DP 751017.
Crown public roads south of part lot 132, part lot 83, part lot 225 and lot 109 DP 751017.

Railway Land
Lot 2 DP 431951.

A3 Other activities

A3.1 This licence applies to all other activities carried on at the premises, including:

Crushing, Grinding or Separating Works

A4 Information supplied to the EPA

A4.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to air and water and applications to land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

Air

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
1	Ambient Air Monitoring / Air Discharge Quality	Ambient Air Monitoring / Air Discharge Quality	Within 100 metres of the residence marked as "Tonsley Park" in Figure 1 of the Air Quality Monitoring Program dated August 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
2	Ambient Air Monitoring / Air Discharge Quality	Ambient Air Monitoring / Air Discharge Quality	Within 100 metres of the residence marked as "Eurunderee" on Figure 2 of the Air Quality Monitoring Program dated August 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
4	Ambient Air Monitoring / Air Discharge Quality	Ambient Air Monitoring / Air Discharge Quality	Within 100 metres of the residence marked as "Railway View" on Figures 1 and 2 in the Air Quality Monitoring Program dated August 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
7	Ambient Air Monitoring / Air Discharge Quality	Ambient Air Monitoring / Air Discharge Quality	Within 100 metres of the residence marked as "Cintra" on Figures 1 and 2 of the Air Quality Monitoring Program dated Auguist 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
8	Ambient Air Monitoring / Air Discharge Quality	Ambient Air Monitoring / Air Discharge Quality	Within 100 metres of the residence marked as "Plain View" in Figure 1 of the Air Quality Monitoring Program dated August 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
9	Ambient Weather Monitoring.		Weather station located in the north east corner of the premises.

P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

P1.3 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.

Environment Protection Licence

Licence - 12290

Water and land

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
10	Wet Weather Discharge / Discharge Water Quality Monitoring.	Wet Weather Discharge / Discharge Water Quality Monitoring.	Point SB2 marked on Figure 3 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
12	Wet Weather Discharge / Discharge Water Quality Monitoring	Wet Weather Discharge / Discharge Water Quality Monitoring	Point SB9 marked on Figure 3 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
14	Wet Weather Discharge / Discharge Water Quality Monitoring	Wet Weather Discharge / Discharge Water Quality Monitoring	Point SB10 marked on Figure 3 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
15		Discharge to Utilisation Area	Waste Water Utilisation Area marked on Figure 3 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
16	Water Quality Monitoring		Point VWD1 marked on Figure 3 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
17	Groundwater Quality Monitoring		Point MW-1 marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
18	Groundwater Quality Monitoring		Point MW-2 marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
19	Groundwater Quality Monitoring		Point MW-3 marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
20	Groundwater Quality Monitoring		Point MW-4 marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
21	Groundwater Quality Monitoring		Point MW-5 marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
22	Groundwater Quality Monitoring		Point MW-6 marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
23	Ambient/Discharge Water Quality Monitoring		Point WC-U on Werris Creek marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029.09.

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
24	Ambient/Discharge Water Quality Monitoring		Point WC-D on Werris Creek marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
25	Ambient/Discharge Water Quality Monitoring		Point QC-U on Quipolly Creek marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
26	Ambient/Discharge Water Quality Monitoring		Point QC-D on Quipolly Creek marked on Figure 4 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.
27	Water Quality Montioring		Point VWD2 marked on Figure 3 in the Site Water Management Plan for Werris Creek Coal Mine dated March 2009 that was submitted to EPA on 22-9-09 and which is kept on file LIC07/2029-09.

3 Limit conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Load limits

L2.1 Not applicable.

L2.2 Not applicable.

L3 Concentration limits

L3.1 For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.

L3.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.

L3.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.

Water and Land

POINTS 10,12,14

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre	-	-	-	10
pH	pH	-	-	-	6.5- 8.5
Total suspended solids	milligrams per litre	20	35	-	50

L3.4 The Total Suspended Solids concentration limits specified for Points 10, 12 and 14 may be exceeded for water discharged from the sediment basins provided that:

(a) the discharge occurs solely as a result of rainfall measured at the premises that exceeds 39.2 millimetres over any consecutive 5 day period immediately prior to the discharge occurring; and

(b) all practical measures have been implemented to dewater all sediment dams within 5 days of rainfall such that they have sufficient capacity to store run off from a 39.2 millimetre, 5 day rainfall event.

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

L5.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if those activities require an environment protection licence.

L6 Noise Limits

L6.1 Noise from the premises must not exceed:

(a) an $L_{A1\ (1\ minute)}$ noise emission criterion of 45 dB(A) at night; and
(b) at all other times (including at night), an $L_{Aeq\ (15\ minute)}$ noise emission criterion of 35 dB(A), except as expressly provided by this licence.

L6.2 Noise from the premises is to be measured at a point within 30 metres of any non-project related residence to determine compliance with this condition.

L6.3 **Definitions**

$L_{Aeq\ (15\ minute)}$ is the equivalent continuous noise level- the level of noise equivalent to the energy-average of noise levels occurring over a measurement period (i.e. 15 minutes).

$L_{A1\ (1\ minute)}$ is the A-weighted sound pressure level that is exceeded for 1 per cent of the time over a 1 minute measurement period.

Night is the period between midnight to 7am and 10pm to midnight Monday to Saturday and midnight to 8am and 10pm to midnight Sundays and Public Holidays.

L6.4 **Noise Management**

Note: For the purpose of noise measures required for this condition, the L_{Aeq} noise level must be measured or computed at any point within 30 metres of any non-project related residence over a period of 15 minutes using "FAST" response on the sound level meter.

Note: For the purpose of the noise criteria for this condition, 5dBA must be added to the measurement level if the noise is substantially tonal or impulsive in character.

L6.5 The noise emission limits identified in this licence apply under all meteorological conditions except:
(a) during rain and wind speeds (at 10m height) greater than 3m/s; and
(b) under "non-significant weather conditions".

Note: Field meteorological indicators for non-significant weather conditions are described in the NSW Industrial Noise Policy, Chapter 5 and Appendix E in relation to wind and temperature inversions.

L6.6 Noise impacts where wind speed exceeds 3 metres per second at 10 metres above the ground must be addressed by:

a) documenting noise complaints received to identify any higher level of impacts or wind patterns;
b) where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts where wind speed exceeds 3 metres per second at 10 metres above the ground must be developed and implemented.

L6.7 The noise limits set by condition L6.1 of the licence do not apply where a current legally binding agreement exists between the proponent and the occupant of a residential property that:

a) agrees to an alternative noise limit for that property; or
b) provides an alternative means of compensation to address noise impacts from the premises.

A copy of any agreement must be provided to the EPA before the proponent can take advantage of the agreement.

L7 Hours of Operation

L7.1 All construction activities at the premises must only be conducted between 7am to 10pm Mondays to Fridays, 8am to 6pm on Saturdays and at no time on Sundays and Public Holidays.

L7.2 Activities at the premises, other than construction work, may only be carried out at the times specified in the table below:

Permitted Operating Hours		
Activity	**Monday to Friday**	**Saturday**
Vegetation clearing / soil removal	7 am to 8 pm	
Drilling	7 am to 8 pm	7 am to 2 pm
Blasting	9 am to 5 pm	
Overburden removal & emplacement	24 hours	24 hours
Internal transport of coal products to ROM stockpiles	Midnight to 4 am; and 7 am to midnight	Midnight to 4 am; and 7 am to 2 pm
On-site processing	7 am to 10 pm	7 am to 10 pm
Coal transport to rail load-out facility	7 am to 10 pm	7 am to 2 pm
Maintenance	24 hours	24 hours *
Coal loading to trains	24 hours	24 hours *
Coal loading to trucks for domestic market	7 am to 6 pm	7 am to 2 pm
Rehabilitation	7 am to 10 pm	7 am to 2 pm
* Note: and Sundays, if required		

L7.3 This condition does not apply to the delivery of material outside the hours of operation permitted by condition L7.1 or L7.2, if that delivery is required by police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification is provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of emergency.

L7.4 The hours of operation specified in conditions L7.1 or L7.2 may be varied with written consent if the EPA is satisfied that the amenity of the residents in the locality will not be adversely affected.

L8 Blasting

L8.1 The overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L8.2 The overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L8.3 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L8.4 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L8.5 Blasting operations at the premises may only take place between 9:00am-5:00pm Monday to Friday. (Where compelling safety reasons exist, the Authority may permit a blast to occur outside the abovementioned hours. Prior written (or facsimile) notification of any such blast must be made to the Authority).

L8.6 The hours of operation for blasting operations specified in condition L7.2 may be varied by the EPA, having regard to the effect that the proposed variation would have on the amenity of the residents in the locality, gives written consent to the variation.

L8.7 Blasting at the premises is limited to 1 blast on each day on which blasting is permitted.

Note: Additional blasts are permitted where it is demonstrated to be necessary for safety reasons and the EPA and neighbours have been notified of the intended blast prior to the additional blast being fired.

L8.8 To determine compliance with condition(s) L8.1, L8.2, L8.3 and L8.4:

a) Airblast overpressure and ground vibration levels must be measured and electronically recorded at any point within 30 metres of any non-project related residential building or other sensitive locations such as a school or hospital - for all blasts carried out in or on the premises; and
b) Instrumentation used to measure the airblast overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006.

L9 Potentially offensive odour

L9.1 No condition in this licence identifies a potentially offensive odour for the purposes of section 129

of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997 provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

4 Operating conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:
(a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
(b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
(a) must be maintained in a proper and efficient condition; and
(b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O3.2 Trucks transporting coal from the premises must be covered immediately after loading to prevent wind blown emissions and spillage. The covering must be maintained until immediately before unloading the trucks.

O4 Stormwater/ Sediment Control- Operation Phase

O4.1 A Stormwater Management Scheme must prepared for the development and must be implemented. Implementation of the Scheme must mitigate the impacts of stormwater run- off from and within the premises following the completion of construction activities. The Scheme should be consistent with the current Stormwater Management Plan for the catchments on the site.

O5 Waste Water Utilisation Areas

O5.1 Waste water must only be applied to the following areas: Point 15 defined in condition P1.3 of this licence.

O5.2 Spray from waste water application must not drift beyond the boundary of the waste water utilisation area to which it is applied.

O6 Maintaining Waste Water Utilisation Areas

O6.1 Waste water utilisation areas must effectively utilise the waste water applied to those areas. This includes the use for pasture or crop production, as well as ensuring the soil is able to absorb the nutrients, salts, hydraulic load and organic materials in the solids or liquids. Monitoring of land and receiving waters to determine the impact of waste water application may be required by the EPA.

O7 Noise

O7.1 All reversing beepers fitted to vehicles on the premises must be a mid- high frequency broadband type as described in the EIS.

5 Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.

M1.2 All records required to be kept by this licence must be:
(a) in a legible form, or in a form that can readily be reduced to a legible form;
(b) kept for at least 4 years after the monitoring or event to which they relate took place; and
(c) produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
(a) the date(s) on which the sample was taken;
(b) the time(s) at which the sample was collected;
(c) the point at which the sample was taken; and
(d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

POINTS 1,4,7

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Every 6 days	AM-18
Solid Particles	grams per square metre per month	Continuous	AM-19

POINT 2

Pollutant	Units of measure	Frequency	Sampling Method
PM10	micrograms per cubic metre	Every 6 days	AM-18

POINT 8

Pollutant	Units of measure	Frequency	Sampling Method
Solid Particles	grams per square metre per month	Continuous	AM-19

POINTS 10,12,14

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 1	Grab sample
Nitrate	milligrams per litre	Special Frequency 1	Grab sample
Nitrogen (total)	milligrams per litre	Special Frequency 1	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 1	Grab sample
Phosphorus (total)	milligrams per litre	Special Frequency 1	Grab sample
Reactive Phosphorus	milligrams per litre	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample

POINTS 16,27

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Every 3 months	Grab sample
Nitrate	milligrams per litre	Every 3 months	Grab sample
Nitrogen (total)	milligrams per litre	Every 3 months	Grab sample
Oil and Grease	milligrams per litre	Every 3 months	Grab sample
Phosphorus (total)	milligrams per litre	Every 3 months	Grab sample
Reactive Phosphorus	milligrams per litre	Every 3 months	Grab sample
Total suspended solids	milligrams per litre	Every 3 months	Grab sample
pH	pH	Every 3 months	Grab sample

POINTS 17,18,19,20,21,22

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Every 6 months	Representative sample
Nitrate	milligrams per litre	Every 6 months	Representative sample
Nitrogen (total)	milligrams per litre	Every 6 months	Representative sample
Phosphorus (total)	milligrams per litre	Every 6 months	Representative sample
Reactive Phosphorus	milligrams per litre	Every 6 months	Representative sample
Standing Water Level	metres	Every 6 months	In situ
pH	pH	Every 6 months	Representative sample

POINTS 23,24,25,26

Pollutant	Units of measure	Frequency	Sampling Method
Conductivity	microsiemens per centimetre	Special Frequency 2	Grab sample
Nitrate	milligrams per litre	Special Frequency 2	Grab sample
Nitrogen (total)	milligrams per litre	Special Frequency 2	Grab sample
Oil and Grease	milligrams per litre	Special Frequency 2	Grab sample
Phosphorus (total)	milligrams per litre	Special Frequency 2	Grab sample
Reactive Phosphorus	milligrams per litre	Special Frequency 2	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample
pH	pH	Special Frequency 2	Grab sample

For the purposes of this condition, ***Special Frequency 1*** means as soon as practicable after overflow commences and in any case not more than 12 hours after any overflow commencing.

For the purposes of this condition, ***Special Frequency 2*** means within 12 hours after any overflow from a storage dam(s) on the premises occurring.

Note: The frequency of monitoring and the pollutant/s to be monitored may be varied by the EPA once the variability of the water quality and ground water quality is established.

POINT 9

Parameter	Units of measure	Frequency	Averaging Period	Sampling Method
Rainfall	Millimetres per hour	continuous	1 hour	AM-4
Wind speed @ 10 metres	Metres per second	continuous	15 minute	AM-2 & AM-4
Wind direction @ 10 metres	Degrees clockwise from true north	continuous	15 minute	AM-2 & AM-4
Temperature @ 2 metres	Degrees Celsius	continuous	15 minute	AM-4
Temperature @ 10 metres	Degrees Celsius	continuous	15 minute	AM-4
Sigma theta @ 10 metres	Degrees clockwise from true north	continuous	15 minute	AM-2 & AM-4
Solar radiation	Watts per square metre	continuous	15 minute	AM-4
Additional requirements -Siting - Measurement				 AM-1 & AM-4 & Special method 2 AM-2 & AM-4 & Special method 2

For the purposes of this condition, ***Special method 2*** means that the applicant must install a permanent meteorological monitoring station and logger. The location of the site chosen for the station and details of equipment, measurement and maintenance/service procedures and schedules to be installed and maintained must be submitted in writing to the EPA and approved in writing by the EPA before any sampling or analysis is carried out. The meteorological monitoring station must be calibrated at least once every 12 months. The EPA is to be provided with the data on request in a Microsoft ® Office software compatible format.

POINTS: Within 30 metres of the residences on the properties "Almawille", "Glenara", "Marengo", "Tonsley Park", "Cintra" and "Fletcher" marked on the map entitled *Figure 1 – Assessment Locations - Noise* in the Noise Management Protocol & Noise Management Program for the Werris Creek Coal Mine dated February 2009 that was submitted to EPA by e-mail on 22 September 2009 and which is kept on file LIC07/2029-09.

Parameter	Units of measure	Frequency	Sampling Method
Ambient Noise	$L_{Aeq\ (15\ minute)}$ L_{Amax} L_{A1} L_{A10} L_{A90} L_{Amin}	Every month for ½ hour (continuous) during full mining operations for day, evening and night time periods as defined by the EPA's Industrial Noise Policy (INP)	Attended Type 1 Noise Meter

Note: The frequency of monitoring and the parameters to be monitored may be varied by the EPA once the variability of the noise impact is established.

POINTS: Within 30 metres of the residences on the properties "Glenara", "Marengo", "Tonsley Park" and "Cintra" marked on the map entitled *Figure 1 – Blast Monitoring Locations* in the Werris Creek Coal Blast Monitoring Program dated August 2009 that was submitted to EPA by e-mail on 22 September 2009 and which is kept on file LIC07/2029-09.

Parameter	Units of measure	Frequency	Sampling Method
Blast Noise	dB (Lin Peak)	Every Blast	Type 1 Noise/Blast Logger
Blast Vibration	mm/s	Every Blast	Geophone Logger or similar

Note: The frequency of monitoring and the parameters to be monitored may be varied by the EPA once the variability of the noise impact is established.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

(a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or

(b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or

(c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M4.2 The record must include details of the following:
(a) the date and time of the complaint;
(b) the method by which the complaint was made;
(c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
(d) the nature of the complaint;
(e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
(f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M5.3 Conditions M5.1 and M5.2 do not apply until 3 months after:
(a) the date of the issue of this licence or
(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

M6 Requirement to monitor volume or mass

M6.1 Not applicable.

6 Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
(a) a Statement of Compliance; and
(b) a Monitoring and Complaints Summary.
A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:
(a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
(b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
(a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
(b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

Deadline for Annual Return

R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later

than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
(a) the licence holder; or
(b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
(a) where this licence applies to premises, an event has occurred at the premises; or
(b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:
(a) the cause, time and duration of the event;
(b) the type, volume and concentration of every pollutant discharged as a result of the event;
(c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
(d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
(f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
(g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

General conditions

G1 Copy of licence kept at the premises

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

Pollution studies and reduction programs

U1 Noise Monitoring and Assessment Program

U1.1 Completed.

Special conditions

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 1998.
flow weighted	Means a sample whose composites are sized in proportion to the flow at each composites time of

composite sample	collection.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales*.

Environment Protection Licence

TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste

Mr Stephen O'Donoghue

Environment Protection Authority

(By Delegation)

Date of this edition - 07-Oct-2009

End Notes

1	Licence varied by notice 1059992, issued on 23-May-2006, which came into effect on 23-May-2006.
2	Licence varied by notice 1064880, issued on 14-Sep-2006, which came into effect on 14-Sep-2006.
3	Licence varied by notice 1067351, issued on 04-Jan-2007, which came into effect on 04-Jan-2007.
4	Licence fee period changed by notice 1079180 approved on .
5	Licence varied by notice 1087334, issued on 07-Oct-2009, which came into effect on 07-Oct-2009.

N.S.W. STAMP DUTY
CL No. 1846988 COAL MINING LEASE
2003•••2004•••2005

MINING LEASE

MINING ACT 1992

NO. **1563**

DATED **23rd March 2005**

THE MINISTER FOR MINERAL RESOURCES

OF THE STATE

OF NEW SOUTH WALES

TO

Creek Resources Pty Limited
(A. C. N. 100 228 886)

AND

Betalpha Pty Limited
(A. C. N. 105 663 518)

RECORDED in the Department of Primary Industries, Mineral Resources

this **fifth** day of **April 2005** A.D.

at the hour of **10:00**

o'clock in the fore noon.

Director-General

MINING ACT 1992

MINING LEASE

THIS DEED made the **twenty third**——————————day of **March**——— Two thousand and **five**——————————in pursuance of the provisions of the Mining Act 1992 (hereinafter called "the Act") BETWEEN **THE HONOURABLE KERRY ARTHUR HICKEY MINISTER FOR MINERAL RESOURCES** of the State of New South Wales (hereinafter called "the Minister" which expression shall where the context admits or requires include the successors in office of the Minister and the person acting as such Minister for the time being) AND **Creek Resources Pty Limited (A. C. N. 100 228 886) and Betalpha Pty Limited (A. C. N. 105 663 518)** (which with its successors and transferees is hereinafter called "the lease holder")

WHEREAS

(a) in conformity with the Act application was made for a mining lease over the lands hereinafter described; and

(b) all conditions and things required to be done and performed before granting a mining lease under the Act have been done and performed NOW THIS DEED WITNESSETH that in consideration of the observance and performance of the covenants contained in this Deed and the payment of royalty by the lease holder, the Minister in pursuance of the provisions of the Act DOES HEREBY demise and lease to the lease holder ALL THAT piece or parcel of land containing by admeasurement of **678.5 hectares** and more particularly described and delineated in the plan catalogue No. **M27037** attached for the purpose of prospecting and mining for **coal.**

TO HOLD the said land together with any appurtenances thereon subject to:

(a) such rights and interests as may be lawfully subsisting therein or which may be reserved by the Act at the date of this Deed; and

(b) such conditions, provisos and stipulations as are contained in this Deed UNTO the lease holder from and including the date of this Deed for the period of **twenty one (21) years** for the purpose as stated and for no other purpose.

1. THAT in this lease except insofar as the context otherwise indicates or requires:

   (a) any reference to an Act includes that Act and any Act amending or in substitution for the same; "Director-General" means the person for the time being holding office or acting as Director-General, Department of Mineral Resources, Sydney; the word "mine" has the meaning assigned to it by the Act; words importing the singular number shall include the plural, the masculine gender the feminine or neuter gender and vice versa; and

(b) any covenant on the part of two or more persons shall be deemed to bind them jointly and severally.

2. THAT the lease holder shall during the said term pay to the Minister in Sydney in respect of all such minerals as stated, recovered from the land hereby demised, royalty at the rate or rates prescribed by the Act and the Regulations thereunder at the time the minerals are recovered, or at the rate or rates fixed by the Minister from time to time during the term of this demise in exercise of the power in that behalf conferred upon him by the Act.

3. THAT the lease holder shall at all times during the term of this lease keep and preserve the said mine from all avoidable injury or damage and also the levels, drifts, shafts, watercourses, roadways, works, erections and fixtures therein and thereon in good repair and condition and in such state and condition shall on the expiration or sooner determination of the said term or any renewal thereof deliver possession of the land and the premises hereby demised to the Minister or other persons authorised to receive possession thereof.

4. THAT the conditions and provisions set forth in the Schedule of Mining Lease Conditions 2004 herein and numbered:- **1 to 21 (inclusive), 23, 24, 25, 29, 30 and 31** are embodied and incorporated within this Deed as conditions and provisions of the lease hereby granted.

PROVIDED always and it is hereby declared as follows:

(a) THAT this lease is granted subject to amendment as provided under Section 79 of the Act.

(b) THAT if the lease holder at any time during the term of this demise -

(i) fails to fulfil or contravenes the covenants and conditions herein contained; or

(ii) fails to comply with any provision of the Act or the Regulations with which the lease holder is required to comply; or

(iii) fails to comply with the requirements of any agreement or assessment in relation to the payment of compensation,

this lease may be cancelled by the Minister by instrument in writing and the cancellation shall have effect from and including the date on which notice of the cancellation is served on the lease holder or on such later date as is specified in the notice; and any liability incurred by the lease holder before the cancellation took effect shall not be affected.

(c) THAT no implied covenant for title or for quiet enjoyment shall be contained herein.

(d) THAT all the conditions and provisions contained in the Mining Act 1992 and the Regulations thereunder, the Mines Inspection Act 1901 and the Coal Mines Regulation Act 1982 or any other law hereafter to be passed or prescribed shall be incorporated within this Deed as conditions and provisions of the lease granted. The lease holder hereby covenants to observe, fulfil and perform the same.

(e) THAT such of the provisions and conditions declared and contained in this Deed as requiring anything to be done or not to be done by the lease holder, shall be read and construed as covenants by the lease holder with the Minister which are to be observed and performed.

IN WITNESS WHEREOF the parties hereto have executed this Deed the day and year first abovewritten.

SIGNED SEALED AND DELIVERED
BY

The Honourable Kerry Arthur Hickey
as such Minister as aforesaid

.....
Minister

in the presence of

.....
Witness

SIGNED SEALED AND DELIVERED
by the said

Creek Resources Pty Limited
(A. C. N. 100 228 886)

CREEK RESOURCES PTY LTD A.C.N. 100 228 886 COMMON SEAL

in the presence of

.....
Witness

SIGNED IN ACCORDANCE WITH THE CONSTITUTION '81:

Betalpha Pty Limited
(A. C. N. 105 663 518)

K ROSS - DIRECTOR.

in the presence of

.....
Witness
WHITTON - SECRETARY.

MINING LEASE CONDITIONS 2004

Notice to Landholders

1. Within a period of three months from the date of grant of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.

   If there are ten or more landholders affected, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this lease has been granted; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.

Mining, Rehabilitation, Environmental Management Process (MREMP)

Mining Operations Plan (MOP)

2. (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:-

   (a) ongoing mining operations and environmental management; and

   (b) ongoing monitoring of the project.

   (2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.

   (3) A Plan must be lodged with the Director-General:-

   (a) prior to the commencement of mining operations (including mining purposes);

   (b) subsequently as appropriate prior to the expiry of any current Plan; and

   (c) in accordance with any direction issued by the Director-General.

   (4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-

   (a) area(s) proposed to be disturbed under the Plan;

   (b) mining and rehabilitation method(s) to be used and their sequence;

   (c) areas to be used for disposal of tailings/waste;

(d) existing and proposed surface infrastructure;

(e) existing flora and fauna on the site;

(f) progressive rehabilitation schedules;

(g) areas of particular environmental, ecological and cultural sensitivity and measures to protect these areas;

(h) water management systems (including erosion and sediment controls);

(i) proposed resource recovery; and

(j) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation.

(5) The Plan when lodged will be reviewed by the Department.

(6) The Director-General may within two (2) months of the lodgement of a Plan, require modification and re-lodgement.

(7) If a requirement in accordance with clause (6) is not issued within two (2) months of the lodgement of a Plan, the lease holder may proceed with implementation of the Plan.

(8) During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) - (7) above.

Annual Environmental Management Report (AEMR)

3. (1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General.

(2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:

(a) the accepted Mining Operations Plan;

(b) development consent requirements and conditions;

(c) Department of Environment and Conservation and Department of Infrastructure, Planning and Natural Resources licences and approvals;

(d) any other statutory environmental requirements;

(e) details of any variations to environmental approvals applicable to the lease area; and

(f) where relevant, progress towards final rehabilitation objectives.

(3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice.

(4) The lease holder shall, as and when directed by the Minister, co-operate with the Director-General to conduct and facilitate review of the AEMR involving other government agencies and the local council.

Subsidence Management

4. (a) The lease holder shall prepare a Subsidence Management Plan prior to commencing any underground mining operations which will potentially lead to subsidence of the land surface.

(b) Underground mining operations which will potentially lead to subsidence include secondary extraction panels such as longwalls or miniwalls, associated first workings (gateroads, installation roads and associated main headings, etc), and pillar extractions, and are otherwise defined by the *Guideline for Applications for Subsidence Management Approvals.*

(c) The lease holder must not commence or undertake underground mining operations that will potentially lead to subsidence other than in accordance with a Subsidence Management Plan approved by the Director-General, an approval under the *Coal Mines Regulation Act 1982*, or the document *New Subsidence Management Plan Approval Process – Transitional Provisions.*

(d) Subsidence Management Plans are to be prepared in accordance with the *Guideline for Applications for Subsidence Management Approvals.*

(e) Subsidence Management Plans as approved shall form part of the Mining Operations Plan required under Condition 2 and will be subject to the Annual Environmental Management Report process as set out under Condition 3. The SMP is also subject to the requirements for subsidence monitoring and reporting set out in the document *New Approval Process for Management of Coal Mining Subsidence - Policy.*

Working Requirement

5. The lease holder must:

(a) ensure that at least **28** competent people are efficiently employed on the lease area on each week day except Saturday or any week day that is a public holiday,

OR

(b) expend on operations carried out in the course of prospecting or mining the lease area, an amount of not less than **$490,000.00** per annum whilst the lease is in force.

The Minister may at any time or times, by instrument in writing served on the lease holder, increase or decrease the expenditure required or the number of people to be employed.

Control of Operations

6. (a) If an Environmental Officer of the Department believes that the lease holder is not complying with any provision of the Act or any condition of this lease relating to the working of the lease, he may direct the lease holder to:-

(i) cease working the lease; or

(ii) cease that part of the operation not complying with the Act or conditions;

until in the opinion of the Environmental Officer the situation is rectified.

(b) The lease holder must comply with any direction given. The Director-General may confirm, vary or revoke any such direction.

(c) A direction referred to in this condition may be served on the Mine Manager.

Reports

7. The lease holder must provide an exploration report, within a period of twenty-eight days after each anniversary of the date this lease has effect or at such other date as the Director-General may stipulate, of each year. The report must be to the satisfaction of the Director-General and contain the following:

(a) Full particulars, including results, interpretation and conclusions, of all exploration conducted during the twelve months period;

(b) Details of expenditure incurred in conducting that exploration;

(c) A summary of all geological findings acquired through mining or development evaluation activities;

(d) Particulars of exploration proposed to be conducted in the next twelve months period;

(e) All plans, maps, sections and other data necessary to satisfactorily interpret the report.

Licence to Use Reports

8. (a) The lease holder grants to the Minister, by way of a non-exclusive licence, the right in copyright to publish, print, adapt and reproduce all exploration reports lodged in any form and for the full duration of copyright.

(b) The non-exclusive licence will operate as a consent for the purposes of section 365 of the Mining Act 1992.

Confidentiality

9. (a) All exploration reports submitted in accordance with the conditions of this lease will be kept confidential while the lease is in force, except in cases where:

(i) the lease holder has agreed that specified reports may be made non-confidential.

(ii) reports deal with exploration conducted exclusively on areas that have ceased to be part of the lease.

(b) Confidentiality will be continued beyond the termination of a lease where an application for a flow-on title was lodged during the currency of the lease. The confidentiality will last until that flow-on title or any subsequent flow-on title, has terminated.

(c) The Director-General may extend the period of confidentiality.

Terms of the non-exclusive licence

10. The terms of the non-exclusive copyright licence granted under condition 8 (a) are:

(a) the Minister may sub-licence others to publish, print, adapt and reproduce but not on-licence reports.

(b) the Minister and any sub-licensee will acknowledge the lease holder's and any identifiable consultant's ownership of copyright in any reproduction of the reports, including storage of reports onto an electronic database.

(c) the lease holder does not warrant ownership of all copyright works in any report and, the lease holder will use best endeavours to identify those parts of the report for which the lease holder owns the copyright.

(d) there is no royalty payable by the Minister for the licence.

(e) if the lease holder has reasonable grounds to believe that the Minister has exercised his rights under the non-exclusive copyright licence in a manner which adversely affects the operations of the lease holder, that licence is revocable on the giving of a period of not less than three months notice.

Blasting

11. (a) Ground Vibration

The lease holder must ensure that the ground vibration peak particle velocity generated by any blasting within the lease area does not exceed 10 mm/second and does not exceed 5 mm/second in more than 5% of the total number of blasts over a period of 12 months at any dwelling or occupied premises as the case may be, unless determined otherwise by the Department of Environment and Conservation.

(b) Blast Overpressure

The lease holder must ensure that the blast overpressure noise level generated by any blasting within the lease area does not exceed 120 dB (linear) and does not exceed 115 dB (linear) in more than 5% of the total number of blasts over a period of 12 months, at any dwelling or occupied premises, as the case may be, unless determined otherwise by the Department of Environment and Conservation.

Safety

12. Operations must be carried out in a manner that ensures the safety of persons or stock in the vicinity of the operations. All drill holes shafts and excavations must be appropriately protected, to the satisfaction of the Director-General, to ensure that access to them by persons and stock is restricted. Abandoned shafts and excavations opened up or used by the lease holder must be filled in or otherwise rendered safe to a standard acceptable to the Director-General.

Rehabilitation

13. (a) Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan so that:-

- there is no adverse environmental effect outside the disturbed area and that the land is properly drained and protected from soil erosion.
- the state of the land is compatible with the surrounding land and land use requirements.
- the landforms, soils, hydrology and flora require no greater maintenance than that in the surrounding land.
- in cases where revegetation is required and native vegetation has been removed or damaged, the original species must be re-established with close reference to the flora survey included in the Mining Operations Plan. If the original vegetation was not native, any re-established vegetation must be appropriate to the area and at an acceptable density.

- the land does not pose a threat to public safety.

(b) Any topsoil that is removed must be stored and maintained in a manner acceptable to the Director-General.

14. The lease holder must comply with any direction given by the Director-General regarding the stabilisation and revegetation of any mine residues, tailings or overburden dumps situated on the lease area.

Exploratory Drilling

15. (1) At least twenty eight days prior to commencement of drilling operations the lease holder must notify the relevant Department of Infrastructure, Planning and Natural Resources regional hydrogeologist of the intention to drill exploratory drill holes together with information on the location of the proposed holes.

(2) If the lease holder drills exploratory drill holes he must satisfy the Director-General that:-

(a) all cored holes are accurately surveyed and permanently marked in accordance with Departmental guidelines so that their location can be easily established;

(b) all holes cored or otherwise are sealed to prevent the collapse of the surrounding surface;

(c) all drill holes are permanently sealed with cement plugs to prevent surface discharge of groundwaters;

(d) if any drill hole meets natural or noxious gases it is plugged or sealed to prevent their escape;

(e) if any drill hole meets an artesian or sub-artesian flow it is effectively sealed to prevent contamination of aquifers.

(f) once any drill hole ceases to be used the hole must be sealed in accordance with Departmental guidelines. Alternatively, the hole must be sealed as instructed by the Director-General.

(g) once any drill hole ceases to be used the land and its immediate vicinity is left in a clean, tidy and stable condition.

Prevention of Soil Erosion and Pollution

16. Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, unless otherwise authorised by a relevant approval, and in accordance with an accepted Mining Operations Plan. For the purpose of this condition, water shall be taken to include any watercourse, waterbody or groundwaters. The lease holder must observe and perform any instructions given by the Director-General in this regard.

Transmission lines, Communication lines and Pipelines

17. Operations must not interfere with or impair the stability or efficiency of any transmission line, communication line, pipeline or any other utility on the lease area without the prior written approval of the Director-General and subject to any conditions he may stipulate.

Fences, Gates

18. (a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner thereof or the Minister and subject to any conditions the Minister may stipulate.

(b) Gates within the lease area must be closed or left open in accordance with the requirements of the landholder.

Roads and Tracks

19. (a) Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior written approval of the Director-General and subject to any conditions he may stipulate.

(b) The lease holder must pay to the designated authority in control of the road (generally the local council or the Roads and Traffic Authority) the cost incurred in fixing any damage to roads caused by operations carried out under the lease, less any amount paid or payable from the Mine Subsidence Compensation Fund.

20. Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks must be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations. The design and construction of access tracks must be in accordance with specifications fixed by the Department of Infrastructure, Planning and Natural Resources.

Trees and Timber

21. (a) The lease holder must not fell trees, strip bark or cut timber on the lease without the consent of the landholder who is entitled to the use of the timber, or if such a landholder refuses consent or attaches unreasonable conditions to the consent, without the approval of a warden.

(b) The lease holder must not cut, destroy, ringbark or remove any timber or other vegetative cover on the lease area except such as directly obstructs or prevents the carrying on of operations. Any clearing not authorised under the Mining Act 1992 must comply with the provisions of the Native Vegetation Conservation Act 1997.

(c) The lease holder must obtain all necessary approvals or licences before using timber from any Crown land within the lease area.

Resource Recovery

23. (a) Notwithstanding any description of mining methods and their sequence or of proposed resource recovery contained within the Mining Operations Plan, if at any time the Director-General is of the opinion that minerals which the lease entitles the lease holder to mine and which are economically recoverable at the time are not being recovered from the lease area, or that any such minerals which are being recovered are not being recovered to the extent which should be economically possible or which for environmental reasons are necessary to be recovered, he may give notice in writing to the lease holder requiring the holder to recover such minerals.

(b) The notice shall specify the minerals to be recovered and the extent to which they are to be recovered, or the objectives in regard to resource recovery, but shall not specify the processes the lease holder shall use to achieve the specified recovery.

(c) The lease holder must, when requested by the Director-General, provide such information as the Director-General may specify about the recovery of the mineral resources of the lease area.

(d) The Director-General shall issue no such notice unless the matter has firstly been thoroughly discussed with and a report to the Director-General has incorporated the views of the lease holder.

(e) The lease holder may object to the requirements of any notice issued under this condition and on receipt of such an objection the Minister shall refer it to a Warden for inquiry and report under Section 334 of the Mining Act, 1992.

(f) After considering the Warden's report the Minister shall decide whether to withdraw, modify or maintain the requirements specified in the original notice and shall give the lease holder written notice of the decision. The lease holder must comply with the requirements of this notice.

Indemnity

24. The lease holder must indemnify and keep indemnified the Crown from and against all actions, suits, claims and demands of whatsoever nature and all costs, charges and expenses which may be brought against the lease holder or which the lease holder may incur in respect of any accident or injury to any person or property which may arise out of the construction, maintenance or working of any workings now existing or to be made by the lease holder within the lease area or in connection with any of the operations notwithstanding that all other conditions of this lease shall in all respects have been observed by the lease holder or that any such accident or injury shall arise from any act or thing which the lease holder may be licensed or compelled to do.

Security

25. (a) A security in the sum of **$50,000.00** must be given and maintained with the Minister by the lease holder for the purpose of ensuring the fulfilment by the lease holder of obligations under this lease. If the lease holder fails to fulfil any one or more of such obligations the said sum may be applied at the discretion of the Minister towards the cost of fulfilling such obligations. For the purpose of this clause the lease holder shall be deemed to have failed to fulfil the obligations of this lease if the lease holder fails to comply with any condition or provision hereof, any provision of the Act or regulations made thereunder or any condition or direction imposed or given pursuant to a condition or provision hereof or of any provision of the Act or regulations made thereunder.

(b) The lease holder must provide the security required by sub-clause (a) in one of the following forms:

(i) cash,

(ii) a security certificate in a form approved by the Minister and issued by an authorised deposit-taking institution.

Barriers

29. (a) Unless with the consent of the Minister first had and obtained and subject to such further conditions as he may impose, the lease holder shall not mine within a barrier of 50 metres in width against the underground workings of the former Werris Creek Colliery as referred to in the Environmental Impact Statement entitled "Werris Creek Coal Pty Limited – ABN 69 107 169 103 - Environmental Impact Statement for the Proposed Werris Creek Coal Mine" dated August 2004.

(b) The lease holder must, prior to seeking the Ministers consent under this condition, complete a risk assessment to determine hazards and develop management controls. This risk assessment is to be subject to any amendments as may be required by the Director General.

Special Conditions

30. The lease holder shall ensure that operations on the lease area are conducted in a manner consistent with the Environmental Impact Statement, except were no longer applicable due to subsequent approval, conditioning or exemption.

31. The lease holder shall ensure that 53 hectares of the rehabilitated landform is revegetated with species from the White Box Yellow Box Blakley's Red Gum Endangered Ecological Community, and stock are excluded from the 200 hectares as shown in Figure 4.15 of the Environmental Impact Statement.

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: 2600 1020 - 00

Date Issued:

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	2-Apr-09	5-May-09	33	800	Clear	Clear	Insects	0.3	0.0049	0.1	0.0023	0.0026
WC2 - Cintra	2-Apr-09	5-May-09	33	800	Clear	Clear	Insects, Plant Matter	0.6	0.0116	0.3	0.0064	0.0052
WC3 - Colliery	2-Apr-09	5-May-09	33	800	Clear	Clear	Plant Matter	2.2	0.0437	0.7	0.0143	0.0294
WC4 - Hillview	2-Apr-09	5-May-09	33	800	Clear	Clear		0.7	0.0145	0.3	0.0065	0.0080
WC5 - Railway View	2-Apr-09	5-May-09	33	800	Clear	Clear	Bird Droppings	0.4	0.0082	0.2	0.0048	0.0034
WC6 - Sth Boundary	2-Apr-09	5-May-09	33	800	Clear	Clear	Insects	2.3	0.0451	0.9	0.0181	0.0270
WC7 - Patterson	2-Apr-09	5-May-09	33	700	Clear	Clear		0.4	0.0072	0.2	0.0048	0.0024
WC8 - Quirindi Rd	2-Apr-09	5-May-09	33	800	Clear	Clear		0.3	0.0049	0.1	0.0027	0.0022

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: 2600 1032 - 01

Date Issued: 6th July 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	5-May-09	4-Jun-09	30	200	Clear	Clear	Insects, Plant Matter	0.9	0.0152	0.6	0.0100	0.0052
WC2 - Cintra	5-May-09	4-Jun-09	30	300	Clear	Clear	Insects	1.4	0.0249	0.8	0.0147	0.0102
WC3 - Colliery	5-May-09	4-Jun-09	30	400	Clear	Clear	Insects, Plant Material, Bird Droppings	7.8	0.1384	1.4	0.0246	0.1138
WC4 - Hillview	5-May-09	4-Jun-09	30	250	Clear	Clear		1.5	0.0268	0.9	0.0164	0.0104
WC5 - Railway View	5-May-09	4-Jun-09	30	350	Clear	Clear		1.1	0.0203	0.8	0.0135	0.0068
WC6 - Sth Boundary	5-May-09	4-Jun-09	30	350	Clear	Clear	Insects, Plant Material, Bird Droppings	7.9	0.1402	2.3	0.0406	0.0996
WC7 - Patterson	5-May-09	4-Jun-09	30	600	Clear	Clear	Plant Material	5.0	0.0883	2.4	0.0431	0.0452
WC8 - Quirindi Rd	5-May-09	4-Jun-09	30	300	Clear	Clear	Plant Material	1.4	0.0246	0.8	0.0148	0.0098

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: **2600 1045 - 01**

Date Issued: 12th August 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	4-Jun-09	06-Jul-09	11:50	32	800	Clear	Clear	Plant Matter	0.5	0.0093	0.4	0.0067	0.0026
WC2 - Cintra	4-Jun-09	06-Jul-09	11:40	32	900	Clear	Clear	Insects,Plant Material	0.3	0.0060	0.2	0.0031	0.0029
WC3 - Colliery	4-Jun-09	06-Jul-09	12:10	32	950	Clear	Clear	Insects, Plant Material	0.7	0.0130	0.4	0.0074	0.0056
WC4 - Hillview	4-Jun-09	06-Jul-09	12:45	32	900	Clear	Clear	Insects, Bird Droppings	0.2	0.0047	0.1	0.0025	0.0022
WC5 - Railway View	4-Jun-09	06-Jul-09	12:30	32	950	Clear	Clear	Insects,Plant Material	0.2	0.0044	0.1	0.0025	0.0019
WC6 - Sth Boundary	4-Jun-09	06-Jul-09	12:00	32	900	Clear	Clear	Insects	1.8	0.0335	0.8	0.0152	0.0183
WC7 - Patterson	4-Jun-09	06-Jul-09	11:35	32	900	Clear	Clear	Insects,Plant Material, Bird Droppings	0.4	0.0072	0.2	0.0032	0.0040
WC8 - Quirindi Rd	4-Jun-09	06-Jul-09	12:50	32	830	Clear	Clear		0.2	0.0046	0.2	0.0037	0.0009

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: 2600 1057 - 01

Date Issued: 18th August 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	6-Jul-09	03-Aug-09	12.53	28	700	Clear	Clear	Plant Matter	0.2	0.0028	0.1	0.0017	0.0011
WC2 - Cintra	6-Jul-09	03-Aug-09	13.00	28	400	Clear	Clear		0.5	0.0086	0.1	0.0017	0.0069
WC3 - Colliery	6-Jul-09	03-Aug-09	12.45	28	700	Clear	Clear	Insects, Bird Droppings	2.2	0.0355	0.9	0.0152	0.0203
WC4 - Hillview	6-Jul-09	03-Aug-09	13.23	28	750	Clear	Clear	Insects	0.4	0.0062	0.2	0.0036	0.0026
WC5 - Railway View	6-Jul-09	03-Aug-09	13.30	28	700	Clear	Clear	Insects, Bird Droppings	0.3	0.0046	0.2	0.0027	0.0019
WC6 - Sth Boundary	6-Jul-09	03-Aug-09	12.15	28	656	Turbid	Brown	Insects	2.4	0.0389	0.8	0.0129	0.0260
WC7 - Patterson	6-Jul-09	03-Aug-09	12.05	28	700	Clear	Clear	Insects,Plant Material, Bird Droppings	1.4	0.0237	0.9	0.0141	0.0096
WC8 - Quirindi Rd	6-Jul-09	03-Aug-09	13.15	28	650	Clear	Clear		0.4	0.0058	0.2	0.0037	0.0021

Notes:
*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: **2600 1068 - 00**

Date Issued: 18th September 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	3-Aug-09	04-Sep-09	9:30	32	100	Clear	Clear	Plant Material	1.3	0.0242	0.7	0.0134	0.0108
WC2 - Cintra	3-Aug-09	04-Sep-09	9:20	32	100	Clear	Clear	Insects, Plant Material	1.5	0.0288	1.0	0.0182	0.0106
WC3 - Colliery	3-Aug-09	04-Sep-09	8:20	32	100	Clear	Clear	Bird Droppings	2.9	0.0550	2.5	0.0474	0.0076
WC4 - Hillview	3-Aug-09	04-Sep-09	8:55	32	100	Clear	Clear	Insects, Plant Material	1.6	0.0298	1.1	0.0213	0.0085
WC5 - Railway View	3-Aug-09	04-Sep-09	9:10	32	100	Clear	Clear	Insects, Plant Material	1.5	0.0282	1.0	0.0180	0.0102
WC6 - Sth Boundary	3-Aug-09	04-Sep-09	8:40	32	100	Turbid	Grey	Insects, Bird Droppings, Plant Material	6.6	0.1242	1.8	0.0342	0.0900
WC7 - Patterson	3-Aug-09	04-Sep-09	8:00	32	100	Clear	Clear	Insects, Plant Material	4.0	0.0760	2.5	0.0479	0.0281
WC8 - Quirindi Rd	3-Aug-09	04-Sep-09	9:40	32	100	Clear	Clear	Insects, Plant Material	0.4	0.0066	0.1	0.0010	0.0056

Notes:
*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: **2600 1101 - 01**

Date Issued: 21st October 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	4-Sep-09	2-Oct-09	13:23	28	1200	Clear	Clear	Insects, Plant Material	5.8	0.0951	4.3	0.0705	0.0246
WC2 - Cintra	4-Sep-09	2-Oct-09	13:15	28	1100	Clear	Clear	Insects, Plant Material	5.9	0.0980	4.7	0.0767	0.0213
WC3 - Colliery	4-Sep-09	2-Oct-09	14:00	28	500	Clear	Clear	Insects	3.9	0.0637	2.5	0.0413	0.0224
WC4 - Hillview	4-Sep-09	2-Oct-09	13:36	28	1000	Clear	Clear	Insects	7.9	0.1299	6.7	0.1105	0.0194
WC5 - Railway View	4-Sep-09	2-Oct-09	14:33	28	800	Clear	Clear	Insects, Plant Material	4.3	0.0704	4.9	0.0804	-0.0100
WC6 - Sth Boundary	4-Sep-09	2-Oct-09	14:26	28	1000	Turbid	Brown	Insects, Bird Droppings, Plant Material	6.1	0.1012	4.7	0.0772	0.0240
WC7 - Patterson	4-Sep-09	2-Oct-09	14:45	28	1100	Clear	Clear	Insects	4.6	0.0754	3.4	0.0563	0.0191
WC8 - Quirindi Rd	4-Sep-09	2-Oct-09	13:03	28	900	Clear	Clear	Insects, Plant Material	8.8	0.1457	5.2	0.0858	0.0599

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Lynden Cini - Environmental Officer

Report Number: **2600 1131 - 00**

Date Issued: 18th November 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC1 - Escott	2-Oct-09	04-Nov-09	10:34	33	400	Clear	Clear	Insects	1.7	0.0324	1.3	0.0262	0.0062
WC2 - Cintra	2-Oct-09	04-Nov-09	10:25	33	450	Clear	Clear	Insects	3.3	0.0633	2.2	0.042	0.0213
WC3 - Colliery	2-Oct-09	04-Nov-09	10:58	33	500	Clear	Clear	Insects, Bird Droppings, Plant Material	2.9	0.0572	2.0	0.0397	0.0175
WC4 - Hillview	2-Oct-09	04-Nov-09	14:10	33	450	Clear	Clear	Insects	2.5	0.0484	1.9	0.0372	0.0112
WC5 - Railway View	2-Oct-09	04-Nov-09	13:53	33	450	Clear	Clear	Insects	2.4	0.0464	1.9	0.0368	0.0096
WC6 - Sth Boundary	2-Oct-09	04-Nov-09	13:44	33	450	Clear	Clear	Insects, Bird Droppings, Plant Material	37.5	0.7284	26.3	0.5113	0.2171
WC7 - Patterson	2-Oct-09	04-Nov-09	10:17	33	400	Clear	Clear	Insects, Plant Material	2.1	0.0407	1.6	0.0315	0.0092
WC8 - Quirindi Rd	2-Oct-09	04-Nov-09	12:45	33	500	Clear	Clear	Insects, Plant Material	4.3	0.0829	3.3	0.0637	0.0192

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**
*** Escott, Old Colliery, South Boundary, Hillview gauges removed. Quirindi Rd gauge relocated. New gauge installed at "Marengo"**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Danny Young - Group Environmental Manager

Report Number: **2600 1204**
Workorder No. **136**
Date Issued: 17th December 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	4-Nov-09	04-Dec-09	12:25	30	200	Clear	Clear	Insects, Plant Material	2.8	0.0496	1.3	0.0225	0.0271
WC5 - Railway View	4-Nov-09	04-Dec-09	12:40	30	300	Clear	Clear	Insects	0.9	0.0165	0.6	0.0105	0.0060
WC7 - Patterson	4-Nov-09	04-Dec-09	12:15	30	250	Clear	Clear	Insects	0.9	0.0162	0.6	0.0106	0.0056
WC8 - Plain View	4-Nov-09	04-Dec-09	12:55	30	200	Clear	Clear	Insects	0.7	0.0131	0.5	0.0081	0.0050
Marengo	4-Nov-09	04-Dec-09	13:05	30	250	Clear	Clear	Insects, Bird Droppings	0.6	0.0108	0.4	0.0078	0.0030

Notes:
*** Dust gauges installed and removed by ALS Coal**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Danny Young - Group Environmental Manager

Report Number: **26001222 - 198**

Date Issued: 14th January 2009

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	4-Dec-09	04-Jan-10	11:35	31	2500	Clear	Clear	Insects, Plant Material	1.4	0.0254	1.0	0.0185	0.0069
WC5 - Railway View	4-Dec-09	04-Jan-10	11:40	31	2500	Clear	Clear	Insects	1.0	0.0180	0.8	0.0138	0.0042
WC7 - Patterson	4-Dec-09	04-Jan-10	11:20	31	2500	Clear	Clear	Insects	1.5	0.0269	1.1	0.0207	0.0062
WC8 - Plain View	4-Dec-09	04-Jan-10	11:55	31	2500	Clear	Clear	Insects, Bird Droppings	1.4	0.0259	1.1	0.0193	0.0066
Marengo	4-Dec-09	04-Jan-10	12:20	31	2500	Clear	Clear	Insects, Bird Droppings	1.4	0.0250	1.1	0.0209	0.0041

Notes:
*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Danny Young - Group Environmental Manager

Report Number: **26001234 - 286**

Date Issued: 8th February 2010

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	4-Jan-10	02-Feb-10	15:45	29	200	Clear	Clear	Insects, Plant Material	2.1	0.0360	1.0	0.0164	0.0196
WC5 - Railway View	4-Jan-10	02-Feb-10	15:05	29	300	Clear	Clear	Insects	0.9	0.0157	0.6	0.0106	0.0051
WC7 - Patterson	4-Jan-10	02-Feb-10	14:50	29	300	Slightly Turbid	Clear	Insects, Bird Droppings	2.0	0.0341	1.1	0.019	0.0151
WC8 - Plain View	4-Jan-10	02-Feb-10	14:17	29	800	Slightly Turbid	Clear	Insects, Plant Material	2.1	0.0353	1.4	0.0246	0.0107
Marengo	4-Jan-10	02-Feb-10	14:40	29	400	Slightly Turbid	Clear	Insects	1.2	0.0208	0.6	0.0106	0.0102

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Danny Young - Group Environmental Manager

Report Number: **26001247 - 400**

Date Issued: 9th March 2010

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	2-Feb-10	02-Mar-10	16:20	28	1800	Clear	Nil	Insects, Plant Material	2.0	0.0333	1.5	0.0240	0.0093
WC5 - Railway View	2-Feb-10	02-Mar-10	16:30	28	1800	Clear	Nil	Insects	1.5	0.0252	1.1	0.0175	0.0077
WC7 - Patterson	2-Feb-10	02-Mar-10	16:15	28	1500	Clear	Nil	Insects	1.5	0.0240	0.8	0.0134	0.0106
WC8 - Plain View	2-Feb-10	02-Mar-10	16:50	28	2100	Clear	Nil	Insects	2.1	0.0354	1.4	0.0227	0.0127
Marengo	2-Feb-10	02-Mar-10	17:02	28	1800	Clear	Nil	Insects, Plant Material	3.3	0.0540	2.3	0.0383	0.0157

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

Certificate of Analysis

Origin: Werris Creek Coal Pty Ltd

Project: Werris Creek Mine

Description: Dust Deposition Samples

Report To: Mr. Danny Young - Group Environmental Manager

Report Number: **26001260 - 474**

Date Issued: 8th April 2010

Copy To: File

ALS ACIRL Pty Ltd
Units 1-4, Lot 6 Industrial Cl
Muswellbrook NSW 2333
Ph: (02) 6542 2400
Fax: (02) 6541 5342

Sample ID	Date Installed	Date Removed	Sampling Time	Days Exposed	Volume Collected (mL approx.)	Appearance	Colour	Observations	Insoluble Matter (g/m^2/month)	Insoluble Matter (g)	Ash Residue (g/m^2/month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	2-Mar-10	30-Mar-10	15:40	28	200	Clear	Clear	Insects	1.7	0.0274	1.1	0.0174	0.0100
WC5 - Railway View	2-Mar-10	30-Mar-10	16:15	28	200	Clear	Clear	Insects, Plant Material	1.2	0.0194	0.6	0.0107	0.0087
WC7 - Patterson	2-Mar-10	30-Mar-10	15:59	28	250	Clear	Clear	Insects	50.0	0.8240	48.9	0.8067	0.0173
WC8 - Plain View	2-Mar-10	30-Mar-10	16:40	28	250	Clear	Clear	Insects	3.1	0.0515	2.6	0.0421	0.0094
Marengo	2-Mar-10	30-Mar-10	16:50	28	280	Clear	Clear	Insects	1.1	0.0178	0.6	0.0094	0.0084

Notes:

*** Dust gauges installed and removed by ALS ACIRL**
*** Samples analysed in accordance with AS3580.10.1 Parts 8.2 and 8.3**
*** Samples analysed as received**
*** This report replaces any previous report bearing the same report number**

Reported By:

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunendah

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	2600 1013 - 00
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	26-Oct-10
Report To:	Mr. Lynden Cini	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8159656	06-Apr-09	1439	30.4	20	-
WCHV1	Marquette	8159658	12-Apr-09	1439	12.2	8	-
WCHV1	Marquette	8176759	18-Apr-09	1439	39.8	26	-
WCHV1	Marquette	8176768	24-Apr-09	1439	16.7	11	-
WCHV1	Marquette	8176774	30-Apr-09	1439	37.3	24	-
WCHV2	Patterson	8159652	06-Apr-09	1439	29.4	19	-
WCHV2	Patterson	8159661	12-Apr-09	1439	14.5	10	-
WCHV2	Patterson	8176756	18-Apr-09	1439	36.7	24	-
WCHV2	Patterson	8176767	24-Apr-09	1439	20.4	13	-
WCHV2	Patterson	8176777	30-Apr-09	1439	18.5	12	-
WCHV3	Ryan	8159654	06-Apr-09	1439	21.5	14	-
WCHV3	Ryan	8159659	12-Apr-09	1439	10.0	7	-
WCHV3	Ryan	8176758	18-Apr-09	1439	31.2	20	-
WCHV3	Ryan	8176771	24-Apr-09	1439	21.7	14	-
WCHV3	Ryan	8176776	30-Apr-09	1439	12.9	8	-
WCHV4	Eurunderee	8159655	06-Apr-09	1439	23.8	16	-
WCHV4	Eurunderee	8159657	12-Apr-09	1440	11.0	7	-
WCHV4	Eurunderee	8176760	18-Apr-09	1439	30.1	19	-
WCHV4	Eurunderee	8176769	24-Apr-09	1439	17.2	11	-
WCHV4	Eurunderee	8176773	30-Apr-09	1439	18.5	12	-
WCTSP	Ryan	8159653	06-Apr-09	1440	64.9	-	41
WCTSP	Ryan	8159660	12-Apr-09	1440	21.0	-	13
WCTSP	Ryan	8176757	18-Apr-09	1439	71.5	-	45
WCTSP	Ryan	8176770	24-Apr-09	1439	51.0	-	32
WCTSP	Ryan	8176775	30-Apr-09	1439	35.6	-	22

Notes:

1. Samples collected by Gerard Gleeson - ALS ACIRL Gunnedah
3. Determined in accordance with AS3580.9.6
4. Sampling times and flow rates as per field data
5. Weather data - ex Bureau of Meteorology - Scone.
6. Samples analysed as received.

Reported By. _____

Gerard Gleeson - Environmental Coordinator

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	2600 1025 - 00
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	8th July 2009
Report To:	Mr. Lynden Cini	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8176955	06-May-09	1439	43.7	28	-
WCHV1	Marquette	8176958	12-May-09	1440	32.7	21	-
WCHV1	Marquette	8208301	18-May-09	1439	43.4	28	-
WCHV1	Marquette	8170259	24-May-09	1440	14.6	9	-
WCHV1	Marquette	8175913	30-May-09	1439	22.2	14	-
WCHV2	Patterson	8176952	06-May-09	1439	19.2	12	-
WCHV2	Patterson	8099141	12-May-09	1439	47.6	30	-
WCHV2	Patterson	8208304	18-May-09	1440	34.2	22	-
WCHV2	Patterson	8170262	24-May-09	1439	15.4	10	-
WCHV2	Patterson	8175916	30-May-09	1440	7.9	5	-
WCHV3	Ryan	8176954	06-May-09	1439	28.0	18	-
WCHV3	Ryan	8176959	12-May-09	1439	19.8	13	-
WCHV3	Ryan	8208303	18-May-09	1439	24.5	16	-
WCHV3	Ryan	8170261	24-May-09	1439	8.9	6	-
WCHV3	Ryan	8175915	30-May-09	1441	7.7	5	-
WCHV4	Eurunderee	8176956	06-May-09	1439	7.2	5	-
WCTSP	Ryan	8176953	06-May-09	1439	37.2	-	23
WCTSP	Ryan	8176960	12-May-09	1439	63.9	-	40
WCTSP	Ryan	8208302	18-May-09	1439	49.3	-	31
WCTSP	Ryan	8170260	24-May-09	1439	24.6	-	15
WCTSP	Ryan	8175914	30-May-09	1439	18.0	-	11

Notes:

1. Samples collected by Gerard Gleeson - ALS ACIRL Gunnedah
3. Determined in accordance with AS3580.9.6
4. Sampling times and flow rates as per field data
5. Weather data - ex Bureau of Meteorology - Scone.
6. Samples analysed as received.

Reported By. _____

Gerard Gleeson - Environmental Coordinator

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	2600 1032 - 00
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	28th July 2009
Report To:	Mr. Lynden Cini	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8169761	05-Jun-09	1440	2.6	2	-
WCHV1	Marquette	8184354	11-Jun-09	1439	2.4	2	-
WCHV1	Marquette	8184364	17-Jun-09	1440	18.4	12	-
WCHV1	Marquette	8184372	23-Jun-09	1434	15.6	10	-
WCHV1	Marquette	8180771	29-Jun-09	1440	21.6	14	-
WCHV2	Patterson	8169758	05-Jun-09	1440	3.6	2	-
WCHV2	Patterson	8184351	11-Jun-09	1439	6.6	4	-
WCHV2	Patterson	8184365	17-Jun-09	1440	5.0	3	-
WCHV2	Patterson	8184376	23-Jun-09	1440	11.5	7	-
WCHV2	Patterson	8180777	29-Jun-09	1440	4.1	3	-
WCHV3	Ryan	8169760	05-Jun-09	1440	3.0	2	-
WCHV3	Ryan	8184353	11-Jun-09	1439	2.1	1	-
WCHV3	Ryan	8184367	17-Jun-09	1440	2.5	2	-
WCHV3	Ryan	8184375	23-Jun-09	1439	9.4	6	-
WCHV3	Ryan	8180776	29-Jun-09	1441	4.3	3	-
WCTSP	Ryan	8169759	05-Jun-09	1441	7.0	-	4
WCTSP	Ryan	8184352	11-Jun-09	1439	5.8	-	4
WCTSP	Ryan	8184366	17-Jun-09	1440	9.4	-	6
WCTSP	Ryan	8184374	23-Jun-09	1439	27.7	-	17
WCTSP	Ryan	8180775	29-Jun-09	1440	9.9	-	6

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Scone.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	2600 1045 - 00
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	14-Aug-09
Report To:	Mr. Lynden Cini	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8180790	05-Jul-09	1439	4.8	3	-
WCHV1	Marquette	8180796	11-Jul-09	1439	14.5	9	-
WCHV1	Marquette	8176127	17-Jul-09	1439	5.2	3	-
WCHV1	Marquette	8176139	23-Jul-09	1439	28.3	18	-
WCHV1	Marquette	8176147	29-Jul-09	1439	7.0	4	-
WCHV2	Patterson	8180787	05-Jul-09	1439	4.5	3	-
WCHV2	Patterson	8180797	11-Jul-09	1439	10.2	6	-
WCHV2	Patterson	8176121	17-Jul-09	1439	7.3	5	-
WCHV2	Patterson	8176142	23-Jul-09	1439	25.4	16	-
WCHV2	Patterson	8176150	29-Jul-09	1439	14.0	9	-
WCHV3	Ryan	8180789	05-Jul-09	1441	1.1	1	-
WCHV3	Ryan	8180793	11-Jul-09	1439	5.6	4	-
WCHV3	Ryan	8176129	17-Jul-09	1439	5.0	3	-
WCHV3	Ryan	8176141	23-Jul-09	1439	27.5	18	-
WCHV3	Ryan	8176148	29-Jul-09	1439	3.8	2	-
WCHV4	Eurunderee	8176145	29-Jul-09	1439	10.7	7	-
WCTSP	Ryan	8180788	05-Jul-09	1439	7.4		5
WCTSP	Ryan	8099720	11-Jul-09	1439	23.5		14
WCTSP	Ryan	8176128	17-Jul-09	1440	11.9		7
WCTSP	Ryan	8176140	23-Jul-09	1439	72.8		45
WCTSP	Ryan	8176148	29-Jul-09	1439	23.4		14

Notes:
1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Scone.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	**2600 1057 - 00**
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	18-Sep-09
Report To:	Mr. Lynden Cini	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8184576	04-Aug-09	1442	18.4	12	-
WCHV1	Marquette	8253531	10-Aug-09	1439	25.3	16	-
WCHV1	Marquette	7559607	16-Aug-09	1440	31.9	20	-
WCHV1	Marquette	8181403	22-Aug-09	1440	9.1	6	-
WCHV1	Marquette	52899	28-Aug-09	1440	30.5	21	-
WCHV2	Patterson	8184580	04-Aug-09	1440	15.1	10	-
WCHV2	Patterson	8253548	10-Aug-09	1440	46.5	30	-
WCHV2	Patterson	7559610	16-Aug-09	1439	37.4	24	-
WCHV2	Patterson	7559666	22-Aug-09	1441	35.1	23	-
WCHV2	Patterson	52898	28-Aug-09	1440	32.7	22	-
WCHV3	Ryan	8184578	04-Aug-09	1439	11.8	7	-
WCHV3	Ryan	8253550	10-Aug-09	1440	19.7	13	-
WCHV3	Ryan	7559609	16-Aug-09	1440	29.9	19	-
WCHV3	Ryan	7559667	22-Aug-09	1439	33.3	22	-
WCHV3	Ryan	52897	28-Aug-09	1440	33.0	22	-
WCHV4	Eurunderee	8184575	04-Aug-09	1439	17.8	11	-
WCHV4	Eurunderee	8184579	10-Aug-09	1440	25.9	16	-
WCHV4	Eurunderee	7559606	16-Aug-09	1440	36.4	23	-
WCHV4	Eurunderee	8181402	22-Aug-09	1441	7.6	5	-
WCHV4	Eurunderee	52900	28-Aug-09	1440	30.5	21	-
WCTSP	Ryan	8184577	04-Aug-09	1440	26.0	-	16
WCTSP	Ryan	8253549	10-Aug-09	1440	39.6	-	25
WCTSP	Ryan	7559608	16-Aug-09	1440	51.2	-	32
WCTSP	Ryan	8181401	22-Aug-09	1439	64.1	-	41
WCTSP	Ryan	52896	28-Aug-09	1440	69.8	-	46

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Scone.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	**26001068-01**
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	
Report To:	Mr. Lynden Cini	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	52317	03-Sep-09	1440	32.3	21	-
WCHV1	Marquette	8244766	09-Sep-09	1439	3.1	2	-
WCHV1	Marquette	8244779	15-Sep-09	1441	40.5	27	-
WCHV1	Marquette	8244780	21-Sep-09	1439	19.5	13	-
WCHV1	Marquette	8171449	27-Sep-09	1440	47.6	31	-
WCHV2	Patterson	52888	03-Sep-09	1440	34.0	22	-
WCHV2	Patterson	8244770	09-Sep-09	1440	2.0	1	-
WCHV2	Patterson	8244775	15-Sep-09	1441	42.8	28	-
WCHV2	Patterson	8171439	21-Sep-09	1439	22.1	14	-
WCHV2	Patterson	8253741	27-Sep-09	1440	54.6	35	-
WCHV3	Ryan	52314	03-Sep-09	1440	29.1	19	-
WCHV3	Ryan	8244768	09-Sep-09	1440	<0.1	<1	-
WCHV3	Ryan	8244776	15-Sep-09	1440	41.4	27	-
WCHV3	Ryan	8171437	21-Sep-09	1439	13.7	9	-
WCHV3	Ryan	8171447	27-Sep-09	1440	39.5	26	-
WCHV4	Eurunderee	52316	03-Sep-09	1440	31.2	20	-
WCHV4	Eurunderee	8244767	09-Sep-09	1439	<0.1	<1	-
WCHV4	Eurunderee	8244778	15-Sep-09	1440	123.4	81	-
WCHV4	Eurunderee	8171436	21-Sep-09	1439	11.8	8	-
WCHV4	Eurunderee	8171450	27-Sep-09	1440	45.6	29	-
WCTSP	Ryan	52315	03-Sep-09	1440	44.0	-	27
WCTSP	Ryan	8244769	09-Sep-09	1439	10.1	-	6
WCTSP	Ryan	8244777	15-Sep-09	1442	81.3	-	52
WCTSP	Ryan	8171438	21-Sep-09	1439	118.6	-	78
WCTSP	Ryan	8171448	27-Sep-09	1441	117.0	-	74

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Scone.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin: Werris Creek Coal Pty Ltd
Project ID: Werris Creek TSP and PM10
Sample Description: High Volume Air Sampler Filters

Report Number: 26001101 - 00
Date Reported: 6th November 2009

Report To: Mr. Lynden Cini
Copy To: File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8252407	03-Oct-09	1440	51.8	33	-
WCHV1	Marquette	8252419	09-Oct-09	1440	28.5	18	-
WCHV1	Marquette	8184760	15-Oct-09	1439	16.4	11	-
WCHV1	Marquette	8236375	21-Oct-09	1439	42.4	28	-
WCHV1	Marquette	8245133	27-Oct-09	1439	8.3	5	-
WCHV2	Patterson	8252406	03-Oct-09	1440	57.0	37	-
WCHV2	Patterson	8252418	09-Oct-09	1439	4.3	3	-
WCHV2	Patterson	8184759	15-Oct-09	1439	9.9	7	-
WCHV2	Patterson	8236371	21-Oct-09	1439	44.0	29	-
WCHV2	Patterson	8245134	27-Oct-09	1439	5.2	3	-
WCHV3	Ryan	8252409	03-Oct-09	1440	47.7	31	-
WCHV3	Ryan	78062	09-Oct-09	1439	10.4	5	-
WCHV3	Ryan	8184762	15-Oct-09	1439	25.1	17	-
WCHV3	Ryan	8236372	21-Oct-09	1440	83.7	55	-
WCHV3	Ryan	8245135	27-Oct-09	1439	1.2	1	-
WCHV4	Eurunderee	8252408	03-Oct-09	1439	44.5	29	-
WCHV4	Eurunderee	8252420	09-Oct-09	1439	1.8	1	-
WCHV4	Eurunderee	8184763	15-Oct-09	1439	0.4	<1	-
WCHV4	Eurunderee	8236374	21-Oct-09	1439	9.8	5	-
WCHV4	Eurunderee	8245137	27-Oct-09	1799	0.2	<1	-
WCTSP	Ryan	8252410	03-Oct-09	1440	112.3	-	71
WCTSP	Ryan	78064	09-Oct-09	1439	53.1	-	33
WCTSP	Ryan	8184761	15-Oct-09	1440	122.8	-	79
WCTSP	Ryan	8236373	21-Oct-09	1439	209.9	-	134
WCTSP	Ryan	8245136	27-Oct-09	1439	9.1	-	6

Notes:
1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. **Inconsistent flow observed at WCHV4. Unit is to be serviced and repaired**
4. Sampling times and flow rates as per field data
5. Weather data - ex Bureau of Meteorology - Gunnedah
6. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin: Werris Creek Coal Pty Ltd
Project ID: Werris Creek TSP and PM10
Sample Description: High Volume Air Sampler Filters

Report Number: 26001131-01
Date Reported:

Report To: Mr. Lynden Cini
Copy To: File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Marquette	8245148	02-Nov-09	1439	41.5	28	-
WCHV1	Marquette	8236330	08-Nov-09	1439	8.4	6	-
WCHV1	Marquette	8236338	14-Nov-09	1441	32.8	22	-
WCHV1	Marquette	8236346	20-Nov-09	1284	77.0	59	-
WCHV1	Cintra	8264601	26-Nov-09	1440	56.5	38	-
WCHV2	Patterson	8245144	02-Nov-09	1439	18.3	12	-
WCHV2	Patterson	8236329	08-Nov-09	1440	11.9	8	-
WCHV2	Patterson	8236334	14-Nov-09	1439	27.2	18	-
WCHV2	Patterson	8236347	20-Nov-09	1439	48.7	33	-
WCHV2	Patterson	52266	26-Nov-09	1439	47.7	32	-
WCHV3	Ryan	8245145	02-Nov-09	1439	26.1	17	-
WCHV3	Ryan	8236333	08-Nov-09	1439	8.4	6	-
WCHV3	Ryan	8236336	14-Nov-09	1440	15.1	10	-
WCHV3	Ryan	8236349	20-Nov-09	1439	46.6	32	-
WCHV3	Ryan	52268	26-Nov-09	1440	40.8	28	-
WCHV4	Eurunderee	8245147	02-Nov-09	1079	4.3	3	-
WCHV4	Eurunderee	8236331	08-Nov-09	1440	3.2	2	-
WCHV4	Eurunderee	8236337	14-Nov-09	2198	11.6	4	-
WCHV4	Eurunderee	-	20-Nov-09	-	-	-	-
WCHV4	Eurunderee	-	26-Nov-09	-	-	-	-
WCTSP	Ryan	8245146	02-Nov-09	1439	61.7	-	40
WCTSP	Ryan	8236332	08-Nov-09	1439	18.6	-	12
WCTSP	Ryan	8236335	14-Nov-09	1439	36.9	-	24
WCTSP	Ryan	8236348	20-Nov-09	1439	78.8	-	52
WCTSP	Ryan	52267	26-Nov-09	1440	67.0	-	44

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Scone.
5. Samples analysed as received.
6. Eurunderee sampler currently under repair
7. Marquette Sampler relocated to "Cintra".

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	26001204 - 174
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	17th January 2010
Report To:	Mr. Danny Young	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Cintra	8264612	02-Dec-09	1439	26.5	17	-
WCHV1	Cintra	8264622	08-Dec-09	1439	102.0	70	-
WCHV1	Cintra	8264636	14-Dec-09	1440	77.2	51	-
WCHV1	Cintra	8292104	20-Dec-09	1439	32.1	21	-
WCHV1	Cintra	8264650	26-Dec-09	1441	22.3	15	-
WCHV2	Patterson	8264611	02-Dec-09	1440	11.6	7	-
WCHV2	Patterson	8264621	08-Dec-09	1440	66.2	46	-
WCHV2	Patterson	8264635	14-Dec-09	1440	63.8	43	-
WCHV2	Patterson	8292105	20-Dec-09	1439	28.8	19	-
WCHV2	Patterson	8264649	26-Dec-09	1441	21.6	14	-
WCHV3	Ryan	8264613	02-Dec-09	1440	10.2	7	-
WCHV3	Ryan	8264623	08-Dec-09	1439	84.6	58	-
WCHV3	Ryan	8264637	14-Dec-09	1440	59.5	40	-
WCHV3	Ryan	8292102	20-Dec-09	1439	29.4	19	-
WCHV3	Ryan	8264648	26-Dec-09	1441	21.0	14	-
WCTSP	Ryan	8264614	02-Dec-09	1440	37.5	-	24
WCTSP	Ryan	8264624	08-Dec-09	1439	200.2	-	134
WCTSP	Ryan	8264638	14-Dec-09	1440	106.8	-	71
WCTSP	Ryan	8292103	20-Dec-09	1439	56.2	-	37
WCTSP	Ryan	8264647	26-Dec-09	1441	135.1	-	89

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Gunnedah.
5. Samples analysed as received.
6. Harvest activities in progress during December.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

Accreditation #15784. Site #11423

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	26001222 - 216
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	16th February 2010
Report To:	Mr. Danny Young	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Cintra	8292910	01-Jan-10	1439	15.7	10	-
WCHV1	Cintra	8292922	07-Jan-10	1441	23.0	15	-
WCHV1	Cintra	8291402	13-Jan-10	1441	39.7	27	-
WCHV1	Cintra	8291422	19-Jan-10	1440	29.9	20	-
WCHV1	Cintra	8263735	25-Jan-10	1440	48.7	33	-
WCHV2	Cintra	8263743	31-Jan-10	1440	26.7	18	-
WCHV2	Patterson	8292909	01-Jan-10	1439	17.5	12	-
WCHV2	Patterson	8292921	07-Jan-10	1443	22.5	15	-
WCHV2	Patterson	8291401	13-Jan-10	1440	34.7	24	-
WCHV2	Patterson	8291419	19-Jan-10	1440	27.8	18	-
WCHV2	Patterson	8263732	25-Jan-10	1439	45.2	31	-
WCHV3	Patterson	8263747	31-Jan-10	1440	24.3	16	-
WCHV3	Ryan	8292912	01-Jan-10	1440	15.7	10	-
WCHV3	Ryan	8292924	07-Jan-10	1439	21.4	14	-
WCHV3	Ryan	8291404	13-Jan-10	1439	34.9	24	-
WCHV3	Ryan	8291421	19-Jan-10	1440	39.5	26	-
WCHV3	Ryan	8263733	25-Jan-10	1439	42.3	29	-
WCHV4	Ryan	8263746	31-Jan-10	1439	20.6	14	-
WCHV4	Eurunderee	8263744	31-Jan-10	1439	24.7	16	-
WCTSP	Ryan	8292911	01-Jan-10	1439	16.9	-	11
WCTSP	Ryan	8292923	07-Jan-10	1441	36.0	-	23
WCTSP	Ryan	8291403	13-Jan-10	1440	66.1	-	44
WCTSP	Ryan	8291420	19-Jan-10	1440	112.0	-	72
WCTSP	Ryan	8263734	25-Jan-10	1439	70.9	-	47
WCTSP	Ryan	8263745	31-Jan-10	1441	35.1	-	23

Notes:

1. Samples collected by ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Gunnedah.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	26001234 - 381
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	9th March 2010
Report To:	Mr. Danny Young	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Cintra	8293010	06-Feb-10	1439	11.6	8	-
WCHV1	Cintra	8293003	12-Feb-10	1440	37.8	26	-
WCHV1	Cintra	8290951	18-Feb-10	1439	20.6	14	-
WCHV1	Cintra	8271491	24-Feb-10	1442	28.7	19	-
WCHV2	Patterson	8293009	06-Feb-10	1442	15.8	11	-
WCHV2	Patterson	8293002	12-Feb-10	1439	34.1	23	-
WCHV2	Patterson	8290955	18-Feb-10	1442	19.5	13	-
WCHV2	Patterson	8290957	24-Feb-10	1440	24.1	16	-
WCHV3	Ryan	8290963	06-Feb-10	1440	16.3	11	-
WCHV3	Ryan	8293004	12-Feb-10	1440	31.8	21	-
WCHV3	Ryan	8290952	18-Feb-10	1440	14.5	10	-
WCHV3	Ryan	8271493	24-Feb-10	1440	17.5	12	-
WCHV4	Eurunderee	8290961	06-Feb-10	1442	37.5	22	-
WCHV4	Eurunderee	8293006	12-Feb-10	1441	38.2	23	-
WCHV4	Eurunderee	8290954	18-Feb-10	1445	124.2	73	-
WCHV4	Eurunderee	8271492	24-Feb-10	1442	27.9	17	-
WCTSP	Ryan	8290962	06-Feb-10	1448	24.4	-	16
WCTSP	Ryan	8293005	12-Feb-10	1441	68.5	-	45
WCTSP	Ryan	8290953	18-Feb-10	1439	32.1	-	21
WCTSP	Ryan	8290958	24-Feb-10	1441	43.3	-	28

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Gunnedah.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

ALS ACIRL Pty Ltd

(ABN 66 003 451 876)
Units 1-4, Lot 6 Industrial Cl, Muswellbrook 2333
Ph: (02) 6542 2400 Fax (02) 6543 3234

Sample Origin:	Werris Creek Coal Pty Ltd	**Report Number:**	26001247 - 448
Project ID:	Werris Creek TSP and PM10		
Sample Description:	High Volume Air Sampler Filters	**Date Reported:**	9th April 2010
Report To:	Mr. Danny Young	**Copy To:**	File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m^3)	TSP (µg/m3)
WCHV1	Cintra	8213075	02-Mar-10	1440	24.0	16	-
WCHV1	Cintra	8213083	08-Mar-10	1439	35.6	24	-
WCHV1	Cintra	8213361	14-Mar-10	1441	11.7	8	-
WCHV1	Cintra	8213374	20-Mar-10	1441	39.8	26	-
WCHV1	Cintra	8213388	26-Mar-10	1439	44.3	29	-
WCHV2	Patterson	8213074	02-Mar-10	1440	18.7	12	-
WCHV2	Patterson	8213082	08-Mar-10	1439	19.0	13	-
WCHV2	Patterson	8213365	14-Mar-10	1441	8.1	5	-
WCHV2	Patterson	8213373	20-Mar-10	1442	38.8	26	-
WCHV2	Patterson	8213382	26-Mar-10	1441	37.0	25	-
WCHV3	Ryan	8213077	02-Mar-10	1440	12.2	8	-
WCHV3	Ryan	8213084	08-Mar-10	1439	18.1	12	-
WCHV3	Ryan	8213362	14-Mar-10	1440	8.1	5	-
WCHV3	Ryan	8213376	20-Mar-10	1441	42.9	28	-
WCHV3	Ryan	8213389	26-Mar-10	1439	75.6	50	-
WCHV4	Eurunderee	8213078	02-Mar-10	1441	23.2	15	-
WCHV4	Eurunderee	8213086	08-Mar-10	1439	28.7	19	-
WCHV4	Eurunderee	8213364	14-Mar-10	1445	12.7	8	-
WCHV4	Eurunderee	8213377	20-Mar-10	1441	39.8	25	-
WCHV4	Eurunderee	8213391	26-Mar-10	1439	42.3	27	-
WCTSP	Ryan	8213076	02-Mar-10	1440	25.0	-	16
WCTSP	Ryan	8213085	08-Mar-10	1439	58.5	-	38
WCTSP	Ryan	8213363	14-Mar-10	1442	18.3	-	12
WCTSP	Ryan	8213375	20-Mar-10	1440	91.2	-	59
WCTSP	Ryan	8213390	26-Mar-10	1439	202.4	-	131

Notes:

1. Samples collected by - ALS ACIRL Gunnedah
2. Determined in accordance with AS3580.9.6
3. Sampling times and flow rates as per field data
4. Weather data - ex Bureau of Meteorology - Gunnedah.
5. Samples analysed as received.

Reported By: _____

Gerard Gleeson - Laboratory Operations Manager
ALS ACIRL Gunnedah

			pH Value	Electrical Conductivity @ 25°C	Suspended Solids (SS)	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P	Reactive Phosphorus as P	Oil & Grease	Total Organic Carbon
Date	Dam	Purpose	pH Unit	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
6/05/2009	SB2	Quarterly	8.58	376	17	<0.01	0.02	0.02	0.4	0.4	0.01	<0.01	<5	
6/05/2009	SB6	Quarterly	8.24	493	12	0.09	6.08	6.17	1.4	7.6	<0.01	<0.01	<5	
6/05/2009	SB9	Quarterly	8.14	164	100	<0.01	0.64	0.64	0.3	0.9	0.05	0.02	<5	
6/05/2009	SB10	Quarterly	8.12	214	47	<0.01	0.09	0.09	0.6	0.7	0.08	0.02	<5	
6/05/2009	SD4	Quarterly	9.07	270	10	<0.01	<0.01	<0.01	1.1	1.1	0.13	0.1	<5	
6/05/2009	SD5	Quarterly	9.03	329	29	<0.01	<0.01	<0.01	1.3	1.3	0.08	0.02	<5	
6/05/2009	VWD1	Quarterly	8.4	1080	5	0.04	3.97	4	0.9	4.9	<0.01	<0.01	<5	
6/05/2009	VWD2	Quarterly	7.9	1220	20	0.28	6.24	6.52	2.6	9.1	0.02	<0.01	<5	
26/08/2009	SB2	Quarterly	8.16	389	6	<0.01	0.01	0.01	0.5	0.6	0.01	<0.01	<10	
26/08/2009	SB6	Quarterly	7.63	835	88	0.03	0.01	0.04	23.2	23.2	1.12	<0.01	<10	
26/08/2009	SB9	Quarterly	7.78	177	107	0.02	0.65	0.67	1.2	1.8	0.22	<0.01	<10	
26/08/2009	SB10	Quarterly	7.88	282	60	0.01	<0.01	0.02	3.5	3.5	0.32	0.07	<10	
26/08/2009	SD4	Quarterly	8.7	252	16	<0.01	<0.01	<0.01	1	1	0.1	<0.01	<10	
26/08/2009	SD5	Quarterly	8.71	372	312	<0.01	<0.01	<0.01	3.6	3.6	0.33	<0.01	<10	
26/08/2009	VWD1	Quarterly	8.29	977	14	0.01	1.67	1.68	1.2	2.9	<0.01	<0.01	<10	
26/08/2009	VWD2	Quarterly	8.48	932	257	<0.01	0.04	0.04	0.6	0.6	0.04	<0.01	<10	
10/11/2009	SB2	Quarterly	---	---	---	---	---	0.02	1.4	1.4	0.13	---	<5	
10/11/2009	SB6	Quarterly	7.61	1980	92	<0.01	0.06	0.06	9.7	9.8	1.09	0.32	<5	
10/11/2009	SB9	Quarterly	7.95	179	128	<0.01	0.22	0.22	3.1	3.3	0.4	0.02	<5	
10/11/2009	SB12	Quarterly	8.24	639	160	<0.01	<0.01	<0.01	1.1	1.1	0.1	0.03	<5	
10/11/2009	SD4	Quarterly	9.16	241	48	<0.01	<0.01	<0.01	1.4	1.4	0.1	0.01	<5	
10/11/2009	SD5	Quarterly	8.65	458	136	<0.01	0.03	0.03	3.5	3.6	0.24	<0.01	<5	
10/11/2009	VWD1	Quarterly	8.27	1010	12	0.01	2.42	2.44	1	3.4	0.04	<0.01	<5	
6/01/2010	SB9	Discharge	7.41	122	30								<5	9
6/01/2010	WCD	Discharge	8.16	668	54								<5	4
6/01/2010	WCU	Discharge	7.87	1270	18								<5	13
6/01/2010	QCD	Discharge	7.71	687	10								<5	5
8/02/2010	SB2	Non-Rout	8.02	413	44								<5	
8/02/2010	SB9	Non-Rout	8.21	142	38								5	
15/02/2010	SB2	Non-Rout	8	338	30	0.01	0.09	0.1	0.9	1	0.12	0.04	<5	
15/02/2010	SB9	Discharge	7.9	129	138	<0.01	0.1	0.1	1.4	1.5	0.18	<0.01	<5	
15/02/2010	SB10	Non-Rout	7.93	180	464	0.02	1.6	1.62	2.8	4.4	0.32	0.11	<5	
15/02/2010	WCD	Discharge	7.82	118	62	0.04	3.87	3.91	1.9	5.8	0.11	0.05	<5	

			pH Value	Electrical Conductivity @ 25°C	Suspended Solids (SS)	Nitrite as N	Nitrate as N	Nitrite + Nitrate as N	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P	Reactive Phosphorus as P	Oil & Grease	Total Organic Carbon
Date	Dam	Purpose	pH Unit	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
15/02/2010	WCU	Discharge	7.84	1110	18	<0.01	<0.01	<0.01	0.6	0.6	0.25	0.22	<5	
15/02/2010	QCD	Discharge	7.82	861	10	<0.01	0.02	0.02	0.3	0.3	0.1	0.1	<5	
23/02/2010	SB2	Quarterly	7.99	338	5	<0.01	<0.01	<0.01	0.6	0.6	0.13	0.02	<5	
23/02/2010	SB6	Quarterly	7.61	350	11	2.36	7.45	9.82	3.9	13.7	0.07	<0.01	<5	
23/02/2010	SB9	Quarterly	7.92	134	113	<0.01	0.01	0.01	1.8	1.8	0.24	<0.01	<5	
23/02/2010	SB10	Quarterly	7.68	189	48	0.03	1.03	1.06	1.3	2.4	0.25	0.09	<5	
23/02/2010	SD4	Quarterly	8.86	238	21	<0.01	<0.01	<0.01	1.3	1.3	0.05	<0.01	<5	
23/02/2010	SD5	Quarterly	8.89	269	22	0.01	<0.01	<0.01	1.7	1.7	0.28	0.18	<5	
23/02/2010	VWD1	Quarterly	8.03	1070	5	0.06	1.87	1.93	1.3	3.2	<0.01	<0.01	<5	
23/02/2010	VWD2	Quarterly	8.06	979	3	0.06	2.13	2.2	0.9	3.1	<0.01	<0.01	<5	
9/03/2010	SB9	Non-Rout	8.09	160	10									

MW1

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	44.11	6.5	1240	6.3	7.0	0.1	0.08
Jul-05	49.10	6.8	1190	6.1	5.9	0.1	0.03
Aug-05	Sampling Suspended - Managers Request						
Sep-05	Sampling Suspended - Managers Request						
Oct-05	Sampling Suspended - Managers Request						
Nov-05	Sampling Suspended - Managers Request						
Dec-05	Sampling Suspended - Managers Request						
Jan-06	Sampling Suspended - Managers Request						
Feb-06	Sampling Suspended - Managers Request						
Mar-06	Sampling Suspended - Managers Request						
Apr-06	Sampling Suspended - Managers Request						
Jul-06	Sampling Suspended - Managers Request						
Nov-06	52.00	7.0	1230	6.3	6.7	0.05	0.01
Jan-07	51.05	6.7	1250	6.7	6.9	0.10	0.04
Apr-07	52.40	6.9	730	6.6	7.0	0.09	0.03
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	51.48	Pump Disconnected					
Oct-07	Pump Failed. Site to be re-sampled in November 2007						
Nov-07	51.00	No sample obtained					
Jan-08	50.91	No sample obtained, no access					
Apr-08	50.92	No sample obtained, no access					
Jul-08	51.07	No sample obtained, no access					
Oct-08	51.35	7.2	1250	7.2	7.9	0.11	0.04
Jan-09	51.16	6.6	1240	6.6	8.2	0.1	0.04
Apr-09	No sample taken - contract change over						
Jun-09	50	6.8	1280	N/T	10.2	0.01	0.04
Aug-09	51.94	7	1230	Testing for these analytes not undertaken			
Nov-09	51.62	6.86	1254	Testing for these analytes not undertaken			
Feb-10	52.03	7.65	1289	7.37	7.1	0.03	0.05

MW2

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	24.2	No access					
Jul-05	24.0	7.1	940	5.4	5.3	0.14	0.06
Aug-05	24.9	6.8	940	5.8	5.5	0.90	0.14
Sep-05	25.0	6.9	990	5.5	5.2	0.08	0.06
Oct-05	25.2	7.1	1030	5.7	5.8	0.22	0.08
Nov-05	25.5	6.9	1050	6.3	6.4	0.14	0.12
Dec-05	25.9	7.3	990	6.2	6.6	0.20	0.12
Jan-06	25.9	7.2	1010	7.0	6.5	0.06	0.04
Feb-06	26.3	7.0	1020	5.9	7.0	0.10	0.04
Mar-06	31.3	7.1	990	6.6	6.9	0.12	0.08
Apr-06	26.4	7.3	1200	6.4	6.9	0.29	0.05
Jul-06	26.7	7.1	1000	6.9	7.2	0.08	0.05
Oct-06	27.3	7.0	1010	6.9	7.3	0.08	0.02
Jan-07	27.6	6.9	1020	7.2	7.4	0.12	0.05
Apr-07	27.9	7.0	1020	6.8	7.4	0.11	0.05
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	28.1	6.8	1030	7.0	7.6	0.08	0.03
Nov-07	27.2	7.2	970	5.5	7.0	0.40	0.09
Jan-08	27.2	7.3	1020	7.6	7.4	0.15	0.05
Apr-08	27.22	7.1	1020	7.4	7.9	0.09	0.06
Jul-08	27.48	7.2	1020	6	7.5	0.06	0.05
Oct-08	N/A	7.1	1010	7.4	8	0.08	0.07
Jan-09	N/A	7.1	970	5.6	6.8	0.07	0.05
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.2	930	N/T	7.6	0.02	0.03
Aug-09	N/A	7.5	980	Testing for these analytes not undertaken			
Nov-09	26.35	6.7	1020	Testing for these analytes not undertaken			
Feb-10	26.55	7.57	1027	6.07	7.1	0.03	0.05

MW3

Note: Pumping of this bore for washing vehicles may effect depth to ground readings.

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	Site Not Sampled - Managers Request						
Aug-05	16.73	6.9	2360	3.8	4.0	0.06	0.04
Sep-05	15.66	7.7	2610	2.3	2.5	0.44	0.18
Oct-05	16.95	7.7	2940	0.83	2.0	2.30	0.28
Nov-05	7.76	7.0	2770	2.8	3.8	1.70	0.16
Dec-05	15.33	7.3	2530	3.2	3.6	0.27	0.27
Jan-06	15.35	7.4	900	2.2	2.2	0.06	0.02
Feb-06	16.45	7.3	2620	2.7	3.6	0.22	0.08
Mar-06	15.53	7.1	2410	4.0	4.2	0.06	0.04
Apr-06	14.85	7.8	1700	6.4	8.5	0.98	0.37
Jul-06	14.95	7.0	2400	3.8	3.9	0.44	0.08
Oct-06	15.34	7.4	2830	1.1	2.1	0.66	0.2
Jan-07	14.95	7.0	2670	2.4	2.8	0.37	0.18
Apr-07	16.32	7.0	2480	4.1	4.4	0.10	0.07
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	15.33	7.1	2450	3.9	4.6	0.09	0.05
Nov-07	14.7	7.4	2330	0.54	3.6	1.5	0.29
Jan-08	14.94	7.4	2130	0.28	3.7	0.5	0.39
Apr-08	16.19	7.5	2710	1.3	2.6	0.4	0.11
Jul-08	14.61	7.8	2500	0.7	1.7	0.18	0.15
Oct-08	16.38	7.2	1480	0.13	2.2	1.9	0.14
Jan-09	14.13	7.5	2280	0.27	2.3	2.3	0.06
Apr-09	No sample taken - contract change over						
Jun-09	No access						
Aug-09	N/A	8.1	890	Testing for these analytes not undertaken			
Nov-09	N/A	8.04	840	Testing for these analytes not undertaken			
Feb-10	N/A	8.36	1742	0.54	0.7	<0.01	0.01

MW4

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	Site Not Sampled - Managers Request						
Aug-05	8.94	7.9	820	0	0.66	0.08	0.06
Sep-05	8.40	7.6	910	0	0.74	0.26	0.02
Oct-05	8.52	7.8	1010	0.01	0.71	0.34	0.06
Nov-05	7.90	7.4	1020	0	4.40	3.50	0.24
Dec-05	7.89	7.0	560	1.20	1.30	0.14	0.14
Jan-06	8.19	8.0	1090	0.07	21.00	1.10	0.94
Feb-06	8.33	7.5	1280	0.02	40.00	1.90	1.80
Mar-06	9.27	7.4	1310	0.08	41.00	2.50	2.30
Apr-06	Piezo Blocked, additional bore drilled MW4B						
Jul-06	Borehole blocked for sampling						
Jan-07	8.94	Bore hole blocked for sampling					
Apr-07	Borehole blocked for sampling						
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	Borehole blocked for sampling						
Nov-07	8.52	Borehole blocked for sampling					
Jan-08	Borehole blocked for sampling						
Apr-08	Borehole blocked for sampling						
Jul-08	Borehole blocked for sampling						
Oct-08	Borehole blocked for sampling						
Jan-09	Borehole blocked for sampling						
Apr-09	No sample taken - contract change over						
Jun-09	8.78	7.2	4110	N/T	546	26.3	20.5
Aug-09	Not sampled due to contamination						
Nov-09	Not sampled due to contamination						
Feb-10	Not sampled due to contamination						

MW4B

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05							
Jul-05							
Aug-05							
Sep-05							
Oct-05							
Nov-05							
Dec-05							
Jan-06							
Feb-06							
Mar-06							
Apr-06							
Jul-06	7.88	7.2	1000	<0.2	69.0	6.6	3.40
Nov-06	9.71	6.7	2670	Sample contaminated			
Jan-07	9.03	Dry					
Apr-07	9.63	7.2	1040	3.40	34.0	0.08	0.04
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	9.49	7.0	910	0.04	1.8	0.04	0.02
Nov-07	9.39	7.4	810	0.03	0.34	0.8	<0.01
Jan-08	9.51	Very slow recharge of bore					
Apr-08	9.14	8.0	1040	0.03	6.8	0.82	0.12
Jul-08	9.35	7.9	930	<0.1	6.5	0.03	<0.01
Oct-08	9.62	Dry					
Jan-09	9.48	Dry					
Apr-09	No sample taken - contract change over						
Jun-09	9.88	7.9	990	Testing for these analytes not undertaken			
Aug-09	9.86	7.5	1070	Testing for these analytes not undertaken			
Nov-09	9.97	7.42	1080	Testing for these analytes not undertaken			
Feb-10	10.24	7.7	1078	1.45	2.2	0.02	<0.01

MW5

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	8.70	6.8	2310	1.2	1.4	0.18	0.02
Nov-05	8.64	6.9	2320	0	0.33	0.16	0.04
Dec-05	8.55	7.5	2160	0	0.51	0.28	0.09
Jan-06	8.56	7.3	1850	3.00	3.7	0.50	0.04
Feb-06	8.38	7.1	2280	0.01	1.9	0.26	0.04
Mar-06	8.30	7.2	2260	0.01	1.7	0.26	0.08
Apr-06	8.33	7.4	1900	<0.01	5.1	1.05	0.05
Jul-06	8.40	7.3	2230	<0.2	2.8	0.16	0.02
Oct-06	8.43	7.2	2180	<0.01	2.0	0.17	0.03
Jan-07	8.63	6.6	2640	2.0	2.0	0.02	0.06
Apr-07	9.74	6.9	2630	2.0	2.2	0.13	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	8.62	6.9	2690	2.0	2.3	0.03	<0.01
Nov-07	8.47	7.0	2620	2.2	2	0.32	<0.01
Jan-08	8.41	7.0	2740	2.2	2.2	0.05	0.01
Apr-08	8.17	6.9	2720	2.3	2.2	0.12	0.01
Jul-08	8.12	6.9	2920	2.3	2.4	0.22	<0.01
Oct-08	7.88	6.8	2780	2.4	2.7	0.04	0.03
Jan-09	7.39	7	2630	1.7	2.6	0.02	0.04
Apr-09	No sample taken - contract change over						
Jun-09	No access						
Aug-09	8.6	7.4	2150	Testing for these analytes not undertaken			
Nov-09	8.77	7	2660	Testing for these analytes not undertaken			
Feb-10	9.04	7.41	2440	0.97	14.5	0.72	0.73

MW6

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	10.00	6.9	1960	3.3	3.7	0.10	0.08
Nov-05	9.99	6.9	2000	2.1	2.5	3.30	0.08
Dec-05	9.95	7.2	1840	2.8	3.2	2.00	0.14
Jan-06	9.88	7.2	1880	3.3	3.6	0.36	0.04
Feb-06	9.89	7.0	1920	2.6	3.5	0.42	0.10
Mar-06	9.81	7.0	1880	2.8	3.3	0.32	0.08
Apr-06	9.91	7.3	1600	3.1	3.9	0.23	0.04
Jul-06	10.18	7.0	1920	3.6	3.9	0.60	0.24
Oct-06	10.53	7.0	1890	3.5	4.0	0.20	0.07
Jan-07	10.68	6.9	1930	4.0	4.0	0.06	0.13
Apr-07	10.93	6.9	1970	4.1	4.3	0.14	0.06
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	11.70	6.8	1950	4.0	4.3	0.06	0.03
Nov-07	11.1	7.1	1930	4.3	4.2	0.05	0.04
Jan-08	11.51	7.0	1960	4.2	4.1	0.05	0.04
Apr-08	10.94	7.1	1930	3.4	4.0	0.33	0.05
Jul-08	10.94	7.0	2060	3.8	3.9	0.77	0.09
Oct-08	11.14	7.2	1960	4.4	5.3	0.23	0.1
Jan-09	10.87	7	1940	3.6	4.2	0.08	0.05
Apr-09	No sample taken - contract change over						
Jun-09	11.67	7	2060	N/T	4.9	0.03	0.04
Aug-09	11.83	7.2	1930	Testing for these analytes not undertaken			
Nov-09	12.11	7.61	1973	Testing for these analytes not undertaken			
Feb-10	12.32	7.54	1990	3.36	3.9	0.46	0.06

MW7

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus reactive mg/L
Jun-05	4.83	6.0	490	1.3	1.5	0.14	0.12
Jul-05	4.44	6.9	490	1.3	1.5	0.12	0.07
Aug-05	4.47	7.0	520	1.4	1.4	0.08	0.08
Sep-05	4.44	6.8	520	1.4	1.4	0.12	0.08
Oct-05	4.36	7.1	540	1.3	1.5	0.24	0.10
Nov-05	4.44	6.8	530	1.5	1.4	0.16	0.10
Dec-05	4.38	6.8	520	1.2	1.3	0.26	0.14
Jan-06	4.38	7.5	890	2.2	2.4	0.10	0.02
Feb-06	4.42	6.8	500	1.0	1.3	0.12	0.80
Mar-06	4.56	6.9	510	1.1	1.3	0.10	0.80
Apr-06	4.51	7.0	380	0.98	1.1	0.12	0.07
Jul-06	4.35	6.9	520	1.4	1.4	0.10	0.08
Oct-06	4.39	7.1	510	1.1	1.2	0.09	0.03
Jan-07	4.73	6.7	530	1.3	1.4	0.15	0.07
Apr-07	4.60	6.7	550	1.4	1.6	0.12	0.06
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	4.41	6.3	540	1.4	1.6	0.07	0.04
Nov-07	4.36	7.2	520	1.4	1.3	0.37	0.05
Jan-08	4.35	6.8	520	1.4	1.2	0.52	0.06
Apr-08	4.45	7	530	1.1	1.5	0.52	0.07
Jul-08	4.41	6.8	540	1.3	1.3	0.69	0.06
Oct-08	4.35	7	520	1.3	1.5	0.09	0.07
Jan-09	4	8.1	510	1.1	1.5	0.1	0.07
Apr-09	No sample taken - contract change over						
Jun-09	4.28	6.9	510	N/T	1.7	0.02	0.04
Aug-09	4.43	7.7	520	Testing for these analytes not undertaken			
Nov-09	4.27	7.91	590	Testing for these analytes not undertaken			
Feb-10	4.42	7.79	561	1.36	1.4	0.06	0.05

MW8

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	Site Not Sampled - Managers Request						
Aug-05	14.35	6.8	1160	4.5	4.2	0.04	0.01
Sep-05	13.78	6.8	1190	3.8	3.7	0.10	0.04
Oct-05	13.29	7.0	1190	3.4	3.6	0.08	0.06
Nov-05	13.42	6.9	1190	3.5	3.6	0.08	0.06
Dec-05	13.65	7.3	1170	3.2	3.0	0.24	0.11
Jan-06	13.63	7.3	880	2.1	2.2	0.08	0.02
Feb-06	14.33	7.2	1210	3.6	4.3	0.08	0.06
Mar-06	14.55	6.9	1180	4.1	4.2	0.24	0.04
Apr-06	14.93	7.3	1290	4.0	4.4	0.14	0.03
Jul-06	15.75	7.0	1470	5.4	5.2	2.8	0.03
Oct-06	16.60	7.0	790	1.5	1.6	0.09	0.02
Jan-07	17.35	7.1	1650	6.4	6.7	0.07	0.03
Apr-07	18.71	7.1	1700	6.2	7.1	0.04	0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	17.87	6.8	1730	6.6	7.2	0.02	<0.01
Nov-07	15.9	7.0	1300	5.4	5.5	1.1	0.01
Jan-08	17.6	7.0	1320	4.6	4.5	1	0.01
Apr-08	14.6	7.2	820	1.5	1.7	0.08	0.06
Jul-08	15.79	7.3	1170	3.7	3.8	0.03	0.01
Oct-08	N/A	7.3	1210	4.1	4.3	0.04	0.03
Jan-09	N/A	7.1	1040	2.9	3.4	0.04	0.03
Apr-09	No sample taken - contract change over						
Jun-09	14.67	7.2	1250	N/T	5.6	<0.01	<0.01
Aug-09	15.58	7.6	1240	Testing for these analytes not undertaken			
Nov-09	N/A	7.04	1402	Testing for these analytes not undertaken			
Feb-10	17.05	7.64	1467	5.24	5.8	<0.01	<0.01

MW9

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	13.78	6.7	1230	17.0	18.0	0.04	0.02
Nov-05	13.53	6.9	1160	9.2	9.0	0.12	0.10
Dec-05	12.55	7.4	1080	14.0	15.0	0.26	0.09
Jan-06	11.72	7.2	2080	25.0	24.0	0.54	0.10
Feb-06	12.86	7.2	980	9.7	11.0	0.12	0.08
Mar-06	13.06	7.2	960	10.0	11.0	0.08	0.06
Apr-06	13.42	7.3	1100	9.2	12.0	0.22	0.33
Jul-06	13.95	7.2	990	8.9	9.6	0.19	0.04
Oct-06	14.46	7.2	970	7.8	8.4	0.10	0.03
Jan-07	14.84	6.8	1120	14.0	14.0	0.07	0.02
Apr-07	14.67	6.9	1120	12.0	12.0	0.04	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	14.25	6.9	1040	8.3	8.9	0.45	<0.01
Nov-07	13.8	7.0	1070	11	10	0.03	<0.01
Jan-08	12.88	7.1	940	6.4	6.2	0.02	<0.01
Apr-08	13.8	Pump Failure					
Jul-08	14.05	7	1010	8.2	8.5	0.04	<0.01
Oct-08	12.89	7	870	4.2	4.5	0.03	0.03
Jan-09	12.55	7.2	770	5.3	6.2	0.02	0.04
Apr-09	No sample taken - contract change over						
Jun-09	14.68	7.2	860	N/T	8.8	<0.01	<0.01
Aug-09	15.17	7.2	900	Testing for these analytes not undertaken			
Nov-09	15.41	7.17	905	Testing for these analytes not undertaken			
Feb-10	14.3	7.78	885	2.55	3.2	0.04	<0.01

MW10

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	17.00	6.8	2120	22	24	0.04	0.02
Jul-05	17.29	6.9	2070	23	23	0.08	0.01
Aug-05	14.26	7.1	2030	23	23	0.04	0
Sep-05	17.75	6.8	2240	23	22	0.06	0.04
Oct-05	17.28	7.1	2210	22	23	0.08	0.04
Nov-05	18.31	6.8	2180	25	25	0.08	0.04
Dec-05	17.32	7.4	2180	23	23	0.24	0.08
Jan-06	17.61	7.1	2050	25	23	0.12	0.02
Feb-06	17.66	7.1	2060	22	24	0.08	0.06
Mar-06	17.5	7.1	2090	23	24	0.04	0.04
Apr-06	17.95	7.2	1800	23	27	0.07	0.01
Jul-06	17.46	7.4	1970	24	25	3.70	0.03
Oct-06	17.38	7.1	2040	22	24	0.06	0.01
Jan-07	17.25	7.2	2040	23	24	0.09	0.02
Apr-07	18.20	7.6	1920	23	24	0.06	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	17.38	7.2	1970	22	23	0.02	<0.01
Nov-07	17.80	7.6	1890	24	24	0.01	<0.01
Jan-08	18.76	7.3	1950	24	24	0.01	<0.01
Apr-08	17.91	7.4	1850	21	23	0.02	0.02
Jul-08	17.85	7.3	2300	24	24	0.05	<0.01
Oct-08	N/A	7.8	1810	20	22	0.04	0.03
Jan-09	N/A	7.5	1920	20	23	0.02	0.02
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.5	1670	N/T	18.8	<0.01	<0.01
Aug-09	N/A	7.3	1940	Testing for these analytes not undertaken			
Nov-09	18.86	7.3	2007	Testing for these analytes not undertaken			
Feb-10	18.43	7.48	1875	20.9	21.4	<0.01	<0.01

MW11

N/A - no access

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	N/A	7.4	1230	0.08	0.31	0.08	0.01
Aug-05	N/A	7.6	1210	0	0.65	0.02	0.01
Sep-05	N/A	7.4	1770	16	17.0	0.08	0.04
Oct-05	N/A	7.6	1430	13	14.0	0.24	0.06
Nov-05	N/A	7.5	1430	12	13.0	0.10	0.06
Dec-05	N/A	7.4	2170	24	22.0	0.20	0.07
Jan-06	N/A	7.4	2070	25	23.0	0.08	0.04
Feb-06	N/A	7.4	1390	11	13.0	0.12	0.08
Mar-06	N/A	7.5	1370	12	13.0	0.06	0.06
Apr-06	Sampling postponed due to unsafe access following wet weather						
Jul-06	N/A	7.4	1840	22	22.0	0.18	0.04
Oct-06	N/A	7.5	1600	16	17.0	0.06	0.02
Jan-07	N/A	7.4	1380	14	14.0	0.09	0.05
Apr-07	N/A	7.4	1380	14	15.0	0.13	0.02
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	N/A	7.5	1370	13	13.0	0.05	0.01
Nov-07	N/A	7.4	1290	13	13.0	0.04	0.02
Jan-08	N/A	7.6	1350	13	13	0.06	0.03
Apr-08	N/A	7.5	1300	10	12	0.05	0.03
Jul-08	N/A	Pump Failure					
Oct-08	N/A	7.6	1230	11	12	0.06	0.05
Jan-09	N/A	7.6	1190	7.5	8.7	0.05	0.04
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.5	1270	N/T	14	<0.01	0.02
Aug-09	N/A	7.7	1580	Testing for these analytes not undertaken			
Nov-09	N/A	7.5	1365	Testing for these analytes not undertaken			
Feb-10	N/A	7.62	1410	12.1	12.8	<0.01	<0.01

MW12

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	7.89	6.6	880	1.8	2.0	0.10	0.10
Jul-05	7.96	7.1	870	1.8	2.0	1.00	0.03
Aug-05	7.73	7.2	850	1.8	1.8	0.06	0.03
Sep-05	7.42	7.1	900	1.8	1.8	0.14	0.06
Oct-05	7.11	7.3	930	1.9	2.0	0.22	0.08
Nov-05	7.12	7.0	940	2.6	2.1	0.16	0.08
Dec-05	6.93	7.4	930	2.0	2.2	2.30	0.12
Jan-06	6.97	7.2	910	2.2	2.5	0.10	0.04
Feb-06	7.02	7.2	940	1.8	2.3	0.10	0.06
Mar-06	7.16	7.3	910	2.1	2.2	0.08	0.08
Apr-06	7.29	7.4	1000	2.0	2.1	2.50	0.05
Jul-06	7.64	7.2	970	2.4	2.5	0.13	0.06
Oct-06	8.02	7.2	920	2.3	2.4	0.07	0.02
Jan-07	8.16	7.2	940	2.3	2.4	0.20	0.06
Apr-07	8.70	7.1	930	2.4	2.5	0.16	0.04
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	8.55	6.9	930	2.3	2.5	0.05	0.02
Nov-07	7.64	7.3	910	2.4	2.6	0.18	0.02
Jan-08	7.78	7.3	950	2.3	2.2	0.21	0.05
Apr-08	7.78	7.3	930	2.1	2.4	0.31	0.04
Jul-08	7.32	7.3	930	2.1	2.3	0.08	0.03
Oct-08	Pump Failure						
Jan-09	No access						
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.1	500	N/T	2	<0.01	0.03
Aug-09	N/A	7.6	570	Testing for these analytes not undertaken			
Nov-09	N/A	7.56	529	Testing for these analytes not undertaken			
Feb-10	N/A	7.78	602	0.96	1.1	0.03	0.04

MW13

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	5.38	6.9	1050	3.4	3.5	0.10	0.07
Aug-05	5.23	6.6	1110	4.4	3.7	0.12	0.05
Sep-05	5.01	6.6	1210	3.9	3.8	0.12	0.08
Oct-05	5.08	6.8	1260	3.9	4.0	0.26	0.10
Nov-05	5.04	6.6	1240	4.0	4.0	0.14	0.10
Dec-05	4.20	7.0	1150	3.5	3.9	0.38	0.14
Jan-06	4.21	7.3	920	2.2	2.3	0.12	0.04
Feb-06	5.27	6.7	1190	3.2	3.8	0.14	0.08
Mar-06	5.76	6.7	1120	3.6	3.7	0.08	0.08
Apr-06	5.24	6.8	900	3.4	3.6	0.16	0.05
Jul-06	5.17	6.7	1120	3.6	3.6	0.10	0.07
Oct-06	5.33	6.7	1030	3.0	3.2	0.09	0.05
Jan-07	5.63	6.6	920	2.6	2.8	0.14	0.08
Apr-07	5.74	6.6	860	2.4	2.6	0.11	0.06
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	5.77	6.8	790	2.2	2.4	0.07	0.05
Nov-07	5.35	6.9	750	2.3	2.2	0.09	0.06
Jan-08	5.42	7.0	790	2.4	2.3	0.07	0.06
Apr-08	4.95	6.8	840	2.5	2.9	0.12	0.07
Jul-08	4.98	6.6	1120	2.6	2.8	0.14	0.07
Oct-08	4.63	6.9	1000	3.2	3.4	0.11	0.07
Jan-09	4.18	7	930	2.8	3.1	0.07	0.06
Apr-09	No sample taken - contract change over						
Jun-09	4.7	6.8	1050	N/T	4.4	0.02	0.04
Aug-09	5.63	7.3	880	Testing for these analytes not undertaken			
Nov-09	5.6	7.46	912	Testing for these analytes not undertaken			
Feb-10	5.37	7.79	840	2.03	2.1	0.06	0.06

MW14

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	16.02	6.8	1080	22.0	22.0	2.40	0.02
Nov-05	15.93	6.9	1130	20.0	22.0	0.12	0.06
Dec-05	15.57	7.4	1150	18.0	19.0	0.28	0.10
Jan-06	15.32	7.1	2080	26.0	24.0	0.32	0.04
Feb-06	14.23	7.2	1080	12.0	16.0	0.24	0.08
Mar-06	15.28	7.3	1050	14.0	15.0	0.10	0.06
Apr-06	15.47	7.5	900	11.0	17.0	0.60	0.05
Jul-06	15.88	7.3	1030	6.9	11.0	0.17	0.06
Oct-06	16.17	7.3	1010	4.0	6.9	0.09	0.04
Jan-07	16.46	6.9	1060	15.0	15.0	0.14	0.04
Apr-07	16.41	7.0	1080	19.0	21.0	0.07	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	16.23	6.9	1070	21.0	22.0	0.06	0.04
Nov-07	15.9	7.1	1050	20.0	18.0	0.65	0.01
Jan-08	15.69	7.2	1080	20.0	20.0	0.60	0.03
Apr-08	13.9	7.0	960	20.0	20.0	0.54	0.01
Jul-08	16.0	6.9	1130	18.0	19.0	0.2	<0.01
Oct-08	15.69	6.9	1080	14	16	0.06	0.04
Jan-09	14.78	7	1080	16	18	0.1	0.03
Apr-09	No sample taken - contract change over						
Jun-09	16.41	7.1	1140	N/T	16.6	0.07	0.06
Aug-09	16.81	7.2	1140	Testing for these analytes not undertaken			
Nov-09	16.35	7.04	1260	Testing for these analytes not undertaken			
Feb-10	16.54	7.74	1310	15.3	16.8	0.09	<0.01

GeoTerra

WERRIS CREEK COAL PTY LTD

SURFACE WATER AND GROUNDWATER 2009 / 2010 MONITORING ANNUAL REVIEW

Werris Creek, NSW

WRC3-R3B

31 May 2010

GeoTerra Pty Ltd **ABN 82 117 674 941**

77 Abergeldie Street Dulwich Hill NSW 2203

Phone: 02 9560 6583 Fax: 02 9560 6584 Mobile 0417 003 502 Email: geoterra@iinet.net.au

WRC3-R3B (31 MAY, 2010)

GeoTerra

Werris Creek Coal Pty Ltd
1435 Quirindi Road
WERRIS CREEK NSW 2341

Attention: Andrew Wright

Andrew,

RE: 2009/10 Surface Water and Groundwater Monitoring Annual Review

Please find enclosed a copy of the above mentioned report.

Yours faithfully

GeoTerra Pty Ltd

Andrew Dawkins (AuSIMM CP-Env)

Managing Geoscientist

Distribution: Original GeoTerra Pty Ltd
1 electronic copy Werris Creek Coal Pty Ltd

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TABLE OF CONTENTS

1. INTRODUCTION

This document provides a review of groundwater and surface water monitoring at the Werris Creek Coal Mine that has been conducted since 5 May 2004 at private bore and piezometer locations MW1 - MW14, piezometers P1, P2 and P3, as well as surface water locations within Quipolly Creek and Werris Creek.

This report covers the annual monitoring period up to 31 March 2010.

The review is prepared in accordance with the Development Consent DA172-7-2004 (Condition 36 - Schedule 4 Independent Review of Monitoring). The consent condition states that;

"The Applicant shall provide to the Department an annual review and report on surface and groundwater monitoring and observable trends. The report is to be completed by a suitably qualified and independent hydrogeologist, whose appointment has been approved by the Director-General."

A subsequent approval from the Department of Planning indicated the review should address;

- *Any trends or impacts in the quality or quantity of alluvial groundwater resources associated with Quipolly Creek;*
- *Any evidence of movement of groundwater through the low permeability layer at the base of the mine's coal seam aquifers to the underlying local and regional aquifers;*
- *Any trends in groundwater quality or availability in private groundwater bores in the vicinity of the mine, and;*
- *A comparison of any trends in water monitoring against trigger levels contained in the mine's Groundwater Contingency Plan and surface water impact assessment criteria in the mine's Surface Water Monitoring Program.*

1.1 Mining Progress

The mine commenced operation on 11 April, 2005 and has been excavated to approximately RL 280m, or 130m below surface as of March 2010, compared to 108m in April 2009.

1.2 Rainfall

Monthly total rainfall for the mine site is shown in **Figure 1**.

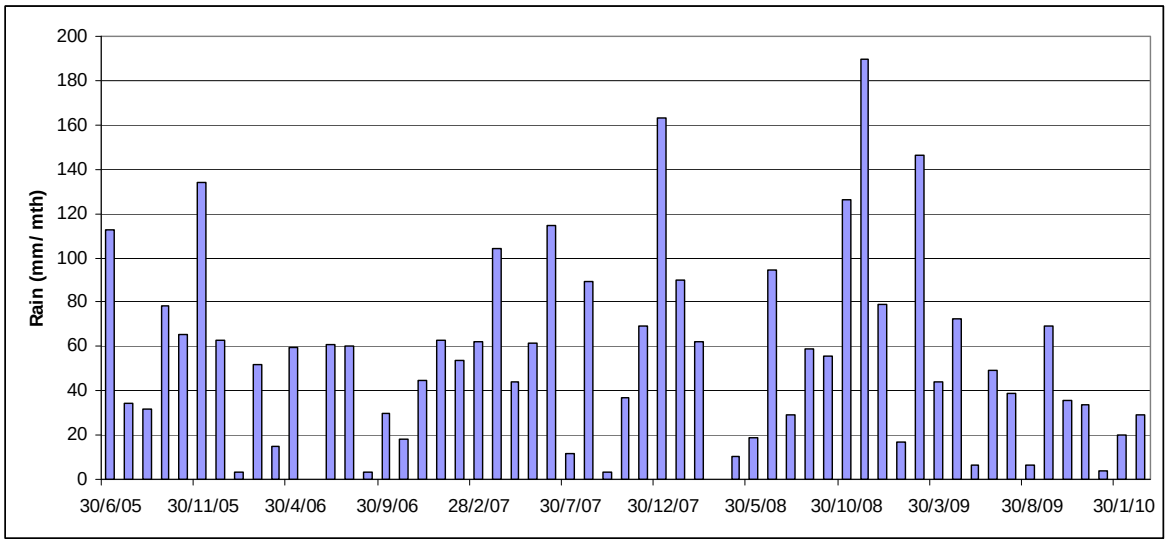

Figure 1 Monthly Rainfall

2. GENERAL GROUNDWATER DESCRIPTION

Groundwater within the vicinity of the Werris Creek Coal Mine is contained within three principal aquifers;

- Permian Coal Measures;
- Werrie Basalt; and
- Quaternary sediments.

The Permian coal measures comprise a closed basin surrounded by weathered basalt and low permeability claystone. Flow rates and storage capacities are small within the coal measures aquifer with groundwater flow calculated to be approximately 1m/year flowing from north to south.

Within this aquifer, groundwater generally occurs at between 10m and 30m below the surface, with the water being a calcium - bicarbonate geochemical type.

To the south of the Permian coal measures, groundwater occurs within the Werrie Basalt aquifer at between 8m (MW4) and 52.4m (MW1) below natural ground level. This aquifer is recharged by direct infiltration of rainfall and also from runoff from the surrounding Carboniferous sandstone ridges which drive the flow of groundwater south towards Quipolly Creek. Based on the average permeability and gradient, groundwater flow within the Werrie Basalt is calculated to approximate 3m/year. Minimal flow is expected to occur between the Permian coal measures and Werrie Basalt as the upper layers of weathered basalt effectively form an impermeable barrier between the two water-bearing strata. The water within the Werrie Basalt aquifer is a sodium- bicarbonate type.

Within the Quipolly Creek Valley to the south of the mine, groundwater occurs at approximately 4.4m (MW7) to 8.7m (MW12) below surface level within high permeability quaternary alluvial sediments. This aquifer is recharged through direct infiltration of rainfall, and from the upper catchment of the Quipolly Creek to the east, with groundwater flow to the west at an estimated rate of 150m/year. Water within the alluvial aquifer is a

sodium - bicarbonate type.

Minor interaction between the Werrie Basalt and this alluvial aquifer would be expected as south-flowing groundwater within the basalt strata meets the westerly-flowing groundwater of alluvial sediments.

Based on groundwater modelling (RCA Australia, 2009) a 0.2m drawdown envelope was anticipated to extend approximately 0.5km north, 1km south, 2km west and 0.25km east of the mine void. The 0.1m cone of depression extent was modelled to intersect along approximately 1.25km of Quipolly Creek at the maximum predicted drawdown.

3. MONITORING PROGRAM AND TRIGGER LEVELS

3.1 Groundwater Level

The approved Site Water Management Plan for the Werris Creek Coal Mine (GSS Environmental, 2009) and the Groundwater Contingency Plan for the Werris Creek Coal Mine (Werris Creek Coal, 2005) identify nine groundwater monitoring bores shown on **Drawing 1** that were selected to enable assessment of groundwater level and water quality impacts (if any) on local groundwater aquifers as a consequence of mining and associated activities.

Table 1 reproduces details on the “approved” monitoring frequency, parameters and sampling method for each site.

Notwithstanding the frequency of sampling identified in **Table 1**, WCC during its first year of operation initiated sampling on a more frequent basis in order to gain an understanding of natural variability and response times. This was achieved through monitoring additional private landholder bores at Sites MW10 to MW13 and assessing their groundwater chemistry and water level fluctuations, as well as installing a pressure transducer logger array to monitor standing water levels in MW-7 between September 2005 and April 2006.

The MW7 logger was re-established in May 2010 and will be reported in the next year’s annual report.

Groundwater level monitoring also commenced via a bore drilled into the decommissioned underground workings to the north of the pit in December 2007.

Table 1 Groundwater Monitoring Programme

MONITORING BORE	PARAMETER	UNITS	METHOD
QUARTERLY			
MW-1 *2, MW-2 *2, MW-3 *2, MW-4 *2, MW-5 *2, MW-6 *2, MW-7, MW-8 and MW-9	Standing water level	m	In-situ
	pH		In-situ
	EC		In-situ
	Total Nitrogen		Representative Sample
	Nitrate Nitrogen		Representative Sample
	Total Phosphorus		Representative Sample
	Reactive Phosphorus		Representative Sample
ANNUALLY			
MW-1 *2, MW-2 *2, MW-3 *2, MW-4 *2, MW-5 *2, MW-6 *2, MW-7, MW-8, and MW-9	Oil and Grease	mg/L	Representative Sample
	TPH	mg/L	Representative Sample
	Arsenic	mg/L	Representative Sample
	Cadmium	mg/L	Representative Sample
	Chromium	mg/L	Representative Sample
	Nickel	mg/L	Representative Sample
	Lead	mg/L	Representative Sample
	Copper	mg/L	Representative Sample
	Manganese	mg/L	Representative Sample
	Zinc	mg/L	Representative Sample
	Sodium	mg/L	Representative Sample
	Potassium	mg/L	Representative Sample
	Calcium	mg/L	Representative Sample
	Chloride	mg/L	Representative Sample
	Sulphate	mg/L	Representative Sample
	Total Alkalinity	mg/L	Representative Sample
	Conductivity	uS/cm	Representative Sample

Note:

*1 As presented in the approved Site Water Management Plan

*2 Parameters highlighted in bold are those identified in EPL12290, where the frequency of monitoring and parameters may be varied by DECCW once the variability of the groundwater quality is established

Table 2 presents groundwater level and chemistry trigger levels as agreed with DWE (currently called NSW Office of Water) at Tamworth.

The trigger levels are assessed against a benchmark of the natural conditions which have been or are currently being established through the baseline monitoring program.

Table 2 Trigger Levels and Benchmarks

Parameter	Measure	Benchmark	Trigger Level
Standing Water Level	Saturated Thickness	Natural Conditions	15% Reduction
Chemistry	EC	Natural Conditions	15% Increase
	pH	Natural Conditions	15% Increase or Decrease

In the event that monitoring indicates a trigger has been reached or is being approached, WCC are required to commission a hydrogeologist to review the data, with the outcomes of that review, including any recommendations, being subject to discussion and agreement with the DWE hydrogeologists.

If the saturated thickness trigger level is achieved in any bore, WCC are required to notify the affected landowner(s) and, if WCC's and NOW's hydrogeologists are of the opinion that the reduction is a consequence of mining, initiate mitigation measures.

An independent authority may also be used where a dispute arises as to the cause of the change, given that groundwater supply and quality can be affected by non-mining related factors such as bore siltation, aquifer depletion by large scale agricultural users, bacterial infection, fertilizer contamination etc.

3.1.1 Groundwater Quality

With respect to groundwater chemistry, WCC recognises that a change in the beneficial use of the water should not occur as a consequence of its mining or mining-related activities.

Groundwater is primarily used for irrigation and watering of livestock, and therefore the ANZECC 2000 irrigation and livestock guidelines will be used as trigger levels as shown in **Table 3**.

A trigger of pH or EC will initially lead to an increase in the analytes monitored and/or frequency of sampling to confirm the magnitude and extent of the change in water chemistry and to verify that the change is a consequence of mining.

Table 3 Groundwater Assessment Criteria

Analyte	ANZECC Guideline Levels*	
	Agricultural Irrigation mg/L	Livestock mg/L
Arsenic (total)	0.1	0.5
Cadmium	0.01	0.01
Chromium (Total)	-	-
Chromium (VI)	0.1	1
Copper	0.2	0.4
Lead	2	0.1
Manganese	0.2	-
Mercury (total)	0.002	0.002
Nickel	0.2	1
Zinc	5/2	20
Calcium	-	1000
Conductivity (µs/cm)	1900 – 4500@	2000 – 5000#
Magnesium	230 – 460@	-
Chloride	350 – 700@	-
Sulphate	-	1 000
Total Petroleum Hydrocarbons	<0.01^	

@ For moderately tolerant crops

Poultry – sheep value / long term trigger value

^ There are no guidelines for this parameter but as levels of this are not naturally occurring in the area, the trigger level should be set at typical detection limits.

- No published values

Source: NEPM Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater ANZECC

3.2 Groundwater Mitigation Measures

3.2.1 Groundwater Quantity

If monitoring identifies a reduction in a bore's saturated thickness in excess of a trigger level which is a consequence of mining, WCC will enter into negotiations with the affected landowners to formulate an agreement which provides for one or a combination of:

- re-establishment of saturated thickness in the affected bore(s) through bore deepening;
- establishment of additional bores to provide a yield at least equivalent to the affected bore prior to mining;
- provision of access to alternative sources of water; and
- monetary compensation to reflect water extraction costs as a consequence of lowering pumps or installation of additional or alternative pumping equipment.

3.3 Surface Water Monitoring

The Surface Water Monitoring Plan (The Plan) was prepared in compliance with Consent *Condition 4(3)* of DA 172-7-2004 and the General Terms of Approval (GTAs) of the Department of Environment and Climate Change and Water (DECCW).

In regard to Werris Creek and Quipolly Creek, the monitoring plan addresses the surface water impact assessment criteria and a program to monitor surface water flows and quality upstream and downstream of the confluence of the northern catchment into Werris Creek and the southern catchment into Quipolly Creek.

The location of all surface water and groundwater monitoring points are presented on **Drawing 1**, whilst **Table 4** identifies the monitoring point locations, type of monitoring point along with a brief description (where relevant) of the location.

Table 4 Surface Water Monitoring Locations

EPA Identification No.	Type of Monitoring Point	Description of Location
WC-U, WC-D, QC-U, QC-D	Water Quality Monitoring	Upstream and downstream of the confluence of the northern catchment into Werris Creek and the southern catchment into Quipolly Creek

Table 5 presents the parameters to be monitored, frequency of monitoring and sampling methods.

Table 5 Werris Creek and Quipolly Creek Monitoring Parameters

Pollutant	Unit of measure	Frequency	Sampling Method
Total Suspended Solids	mg/L	Within 12 hours after any overflow from a sediment dam(s) on the premises occurring.	Grab sample
Grease & Oil	mg/L		Grab sample
pH			Grab sample
Conductivity	µS/cm		Grab sample
Total Phosphorus	mg/L		Grab sample
Reactive Phosphorus	mg/L		Grab sample
Total Nitrogen	mg/L		Grab sample
Nitrate Nitrogen	mg/L		Grab sample
Note: The frequency of monitoring and the pollutant/s to be monitored may be varied by DECCW once the variability of the water quality is established.			

3.3.1 Surface Water Assessment Criteria

The surface water assessment criteria for Werris Creek and Quipolly Creek as outlined in the SWMP (**Table 6)** is for pH to be within the pH 6.5 to 8.5 range, whilst the monitored values for all other parameters will be plotted to identify any trends over time.

Table 6 Assessment Criteria

Pollutant	Unit of measure	50% concentration limit	90% concentration limit	3DGM concentration limit	100% concentration limit
Total Suspended Solids	mg/L	20	35	-	50
Grease & Oil	mg/L	-	-	-	10
pH		-	-	-	6.5 – 8.5

DECCW will be notified in the event of increasing levels of any parameter or exceedances of ANZECC guideline levels for agricultural use (NEPM, 1999).

4. GROUNDWATER MONITORING RESULTS

4.1 Quipolly Creek Alluvium

Groundwater monitoring conducted between 1st April 2009 and 31st March 2010 (with reference to monitoring conducted since June 2005) in Wells MW7 and MW13 and Bore MW12 as shown in **Figures 2** to **4** indicate the following.

4.1.1 Groundwater Level

During the monitoring period the groundwater level at;

- MW7 has fallen from 4.0mbgl to 4.42 metres below ground level (mbgl), although it is still within the range observed since June 2005
- MW12 has not been monitored because access inside the well has been blocked
- MW13 has fallen from 4.63mbgl to 5.37mbgl, although it is still within the range observed since June 2005

Even though MW13 fell from 4.18mbgl to 5.63mbgl between April and August 2009, then recovered to 5.37mbgl in February 2010, no sustained fall in groundwater levels of greater than 15% compared to the baseline "natural" condition has occurred in the Quipolly Creek Alluvial aquifer in the 2009/2010 monitoring period.

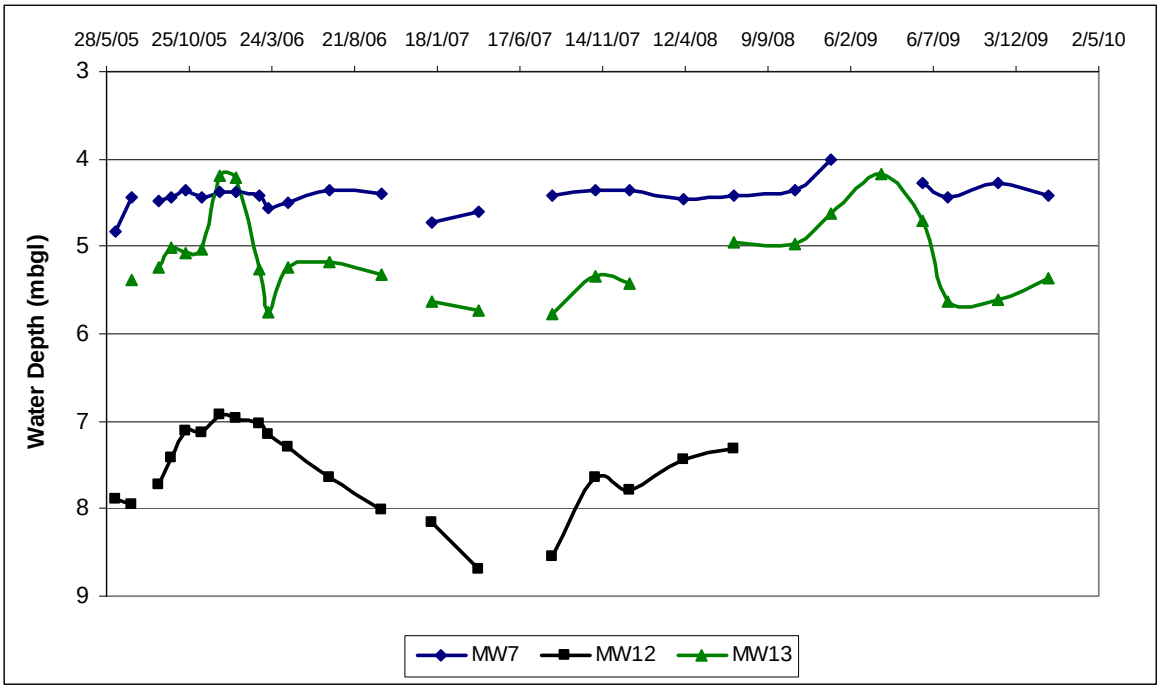

Figure 2 MW7, MW12 and MW13 Standing Water Level

4.1.2 Electrical Conductivity

The Quipolly Creek alluvium has a salinity range between 380µS/cm and 1260µS/cm.

During the monitoring period, salinity in;

- MW7 and MW12 has remained essentially unchanged to slightly reduced, and
- MW13 has become less saline (930 - 840µS/cm).

All samples are within the ANZECC (Agriculture Irrigation and Livestock) criteria.

No sustained rise of greater than 15% change in salinity was monitored in 2009/2010

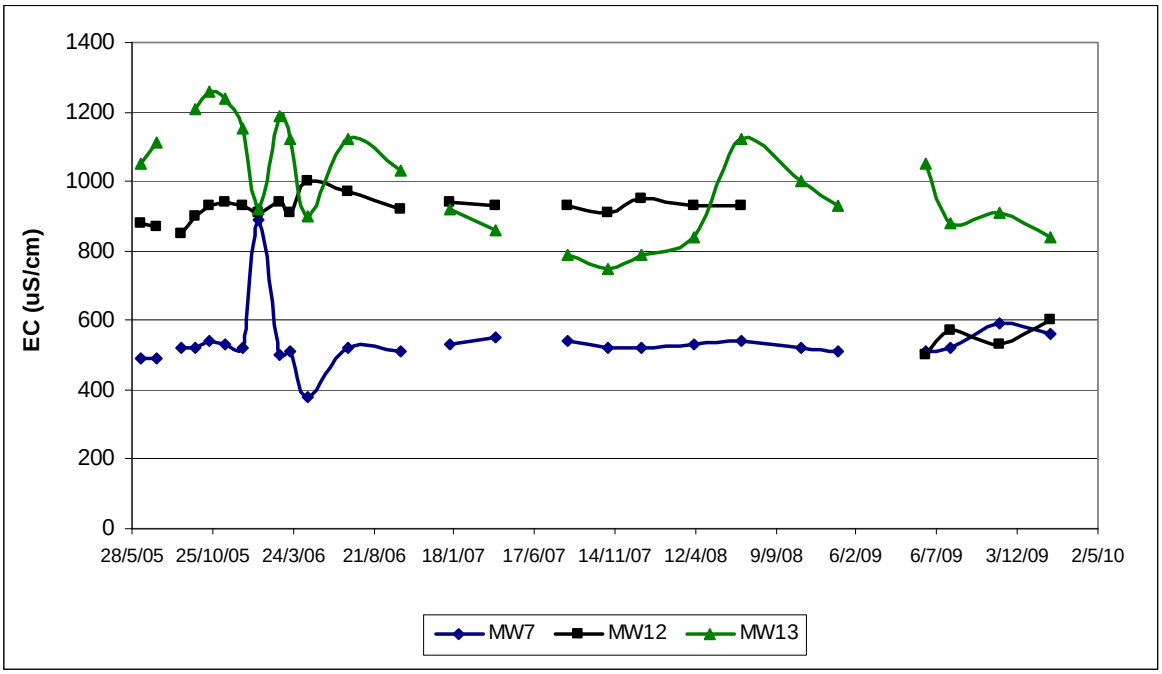

Figure 3 MW7, MW12 and MW13 Electrical Conductivity

4.1.3 pH

During the monitoring period, groundwater pH in the Quipolly Creek alluvium within

- MW7 became more acidic, and changed from pH 8.10 to 7.79
- MW12 became more alkaline, and changed from pH 7.3 to 7.78, and
- MW13 became more alkaline, and changed from pH 7.0 to 7.79.

It should be noted that pH is measured in a logarithmic scale, and therefore adherence to the ANZECC 2000 criteria range is a more appropriate than using a numerical change of more / less than 15%.

All samples are within the ANZECC criteria of 6.5 to 8.5.

No sustained rise or fall in pH was monitored during the 2009/2010 monitoring period

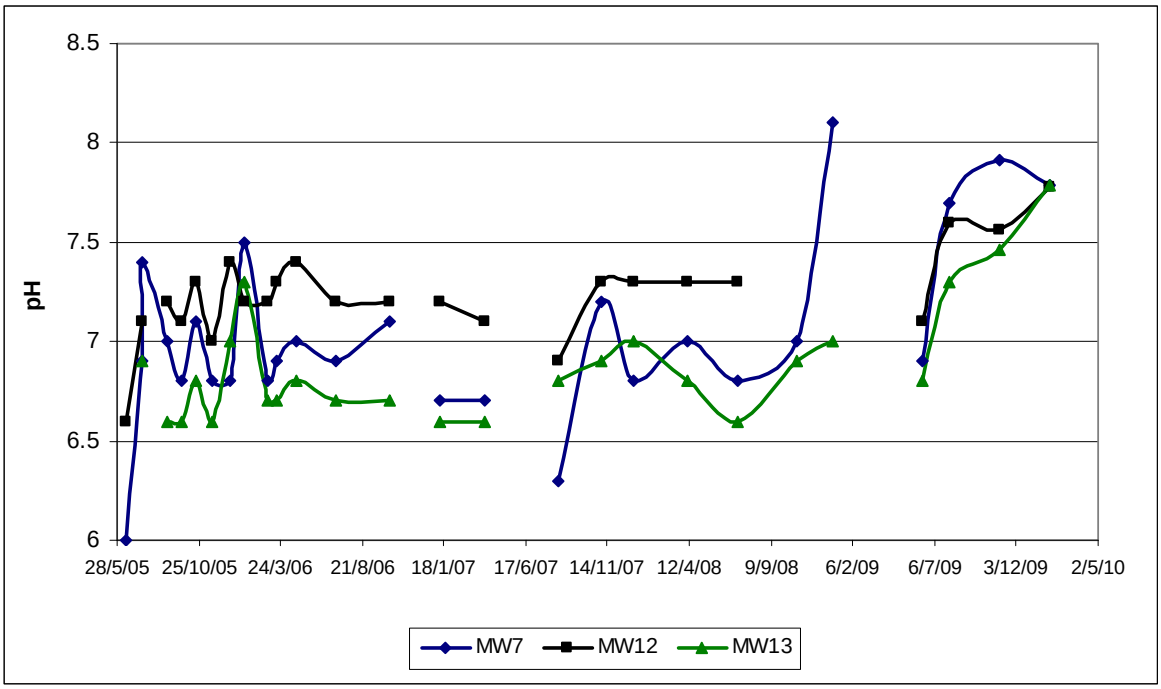

Figure 4 MW7, MW12 and MW13 pH

4.1.4 Laboratory Analyses

Groundwater from MW7 and MW13 generally exceeded the ANZECC Agricultural Irrigation Long Term Trigger Value for Total Phosphorous (0.05mg/L), but did not exceed the Short Term Trigger Value (0.8 – 1.2mg/L) in the last year, with no general significant rising or falling trend in Total Phosphorous as shown in **Figure 5** .

MW12 did not exceed either Total Phosphorous criteria.

MW7 and MW13 are located within paddocks with intensive agriculture whilst MW12 is located in a dryland horse grazing paddock (A. Wright, pers comm.).

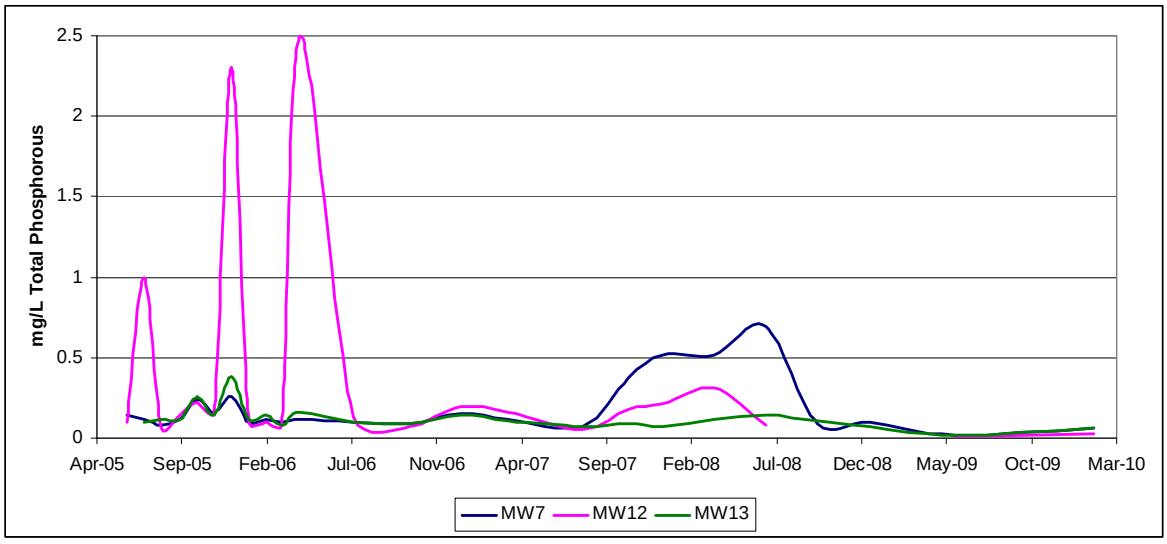

Figure 5 MW7, MW12 and MW13 Total Phosphorous

As pre mining Total Phosphorous monitoring data is not available for the subject bore and wells, it is not possible with current data to comment on the pre mining status of Total Phosphorous within the Quipolly Creek aquifer.

The ANZECC Agricultural Irrigation Long Term Trigger Value for Total Nitrogen (5mg/L) and the Short Term Trigger Value (25 – 125mg/L) were not exceeded during the monitoring period.

No other ANZECC 2000 (Agricultural Irrigation or Livestock) criteria or trigger values have been exceeded in the monitoring period.

Total Phosphorous Agricultural Irrigation LTV is generally exceeded in MW7 and MW13, however the STV was not exceeded during the 2009/2010 monitoring period.

4.1.5 Summary

No Quipolly Creek Alluvial Aquifer groundwater quality or quantity trigger values (as outlined in the Groundwater Contingency Plan for the Werris Creek Coal Mine) have been attained or exceeded in the 2009 / 2010 monitoring period.

4.2 Werrie Basalt and Currabubula Formation Private Bores

The results of groundwater monitoring of private bores in the vicinity of the mine extracting from the Werrie Basalt (MW8) and the Currabubula Formation (MW11) are presented in sections 4.3.1 to 4.3.5. Plots of the data are shown in **Figures 5** to **7**.

The bores are on the following properties as shown in **Table 7**.

Table 7 Private Bores

BORE	PROPERTY	EXTRATION FORMATION	DISTANCE TO MINE (km)
MW8	Roseneath	Werrie Basalt	4.5
MW11	Turnbulls Gap	Currabubula Fm	7.2

4.2.1 Groundwater Level

The measured groundwater level in MW8 has fallen over the monitoring period from 14.07mbgl to 17.05mbgl, although it is still within its historical range since June 2005.

Standing water levels in MW11 are not monitored as it is not possible to obtain readings with the current bore set up.

No sustained fall in groundwater levels of greater than 15% compared to the "natural" baseline range have occurred in the private bores during the 2009/2010 monitoring period.

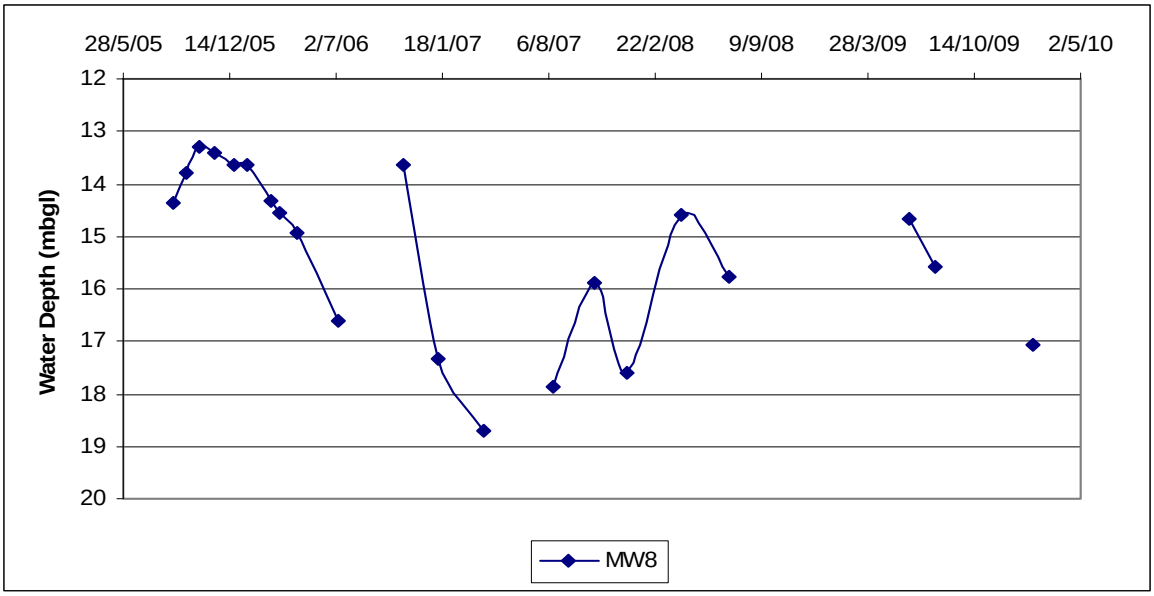

Figure 6 MW8 Standing Water Level

4.2.2 Electrical Conductivity

MW8 in the Werrie Basalt has a salinity range between 790 - 1730µS/cm, whilst MW11 in the Currabubula Formation ranges from 580 - 2170µS/cm.

During the monitoring period, salinity has risen in;

- MW8 from 1040 - 1467µS/cm, although it is still within the range observed since August 2005, and
- MW11 from 1190 - 1410µS/cm, although it is still within the range observed since August 2005.

All samples are within the ANZECC (Agriculture Irrigation and Livestock) criteria.

No sustained rise of greater than 15% change in comparison to the baseline "natural" range since August 2005 was monitored during the 2009/2010 monitoring period.

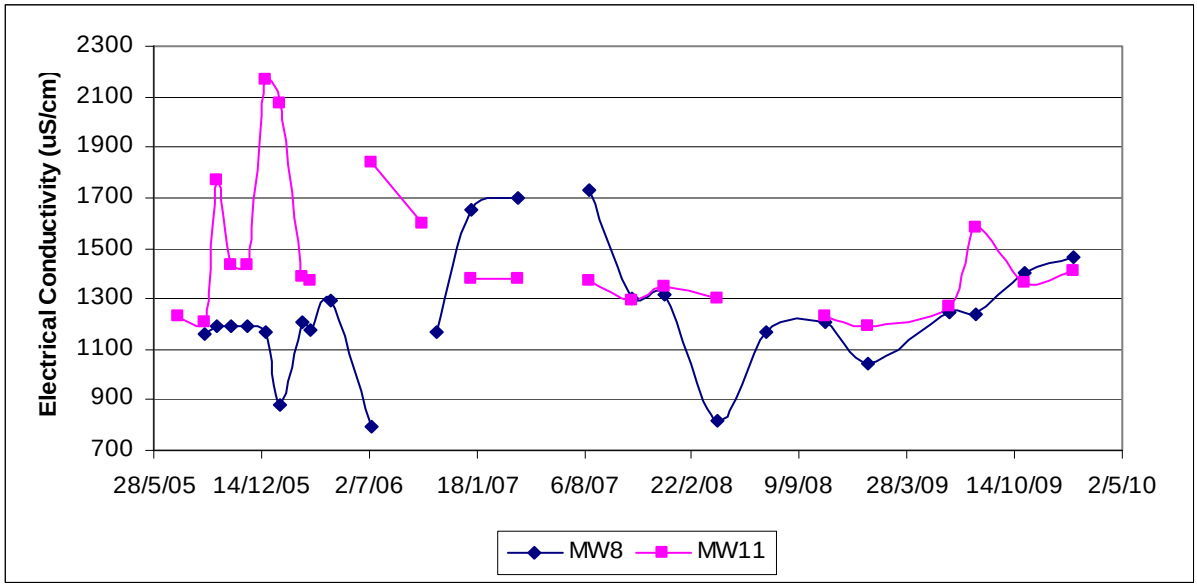

Figure 7 MW8 and MW11 Electrical Conductivity

4.2.3 pH

Groundwater pH in the Werrie Basalt and Currabubula Formation private bores during the monitoring period ranged from pH 6.8 to 7.7.

MW8 had an indistinct trend, whilst MW11 exhibited a very gradual rise in alkalinity over the monitoring period.

All samples are within the ANZECC criteria of 6.5 to 8.5.

No sustained rise or fall of greater than 15% change in pH was monitored during the 2009/2010 monitoring period

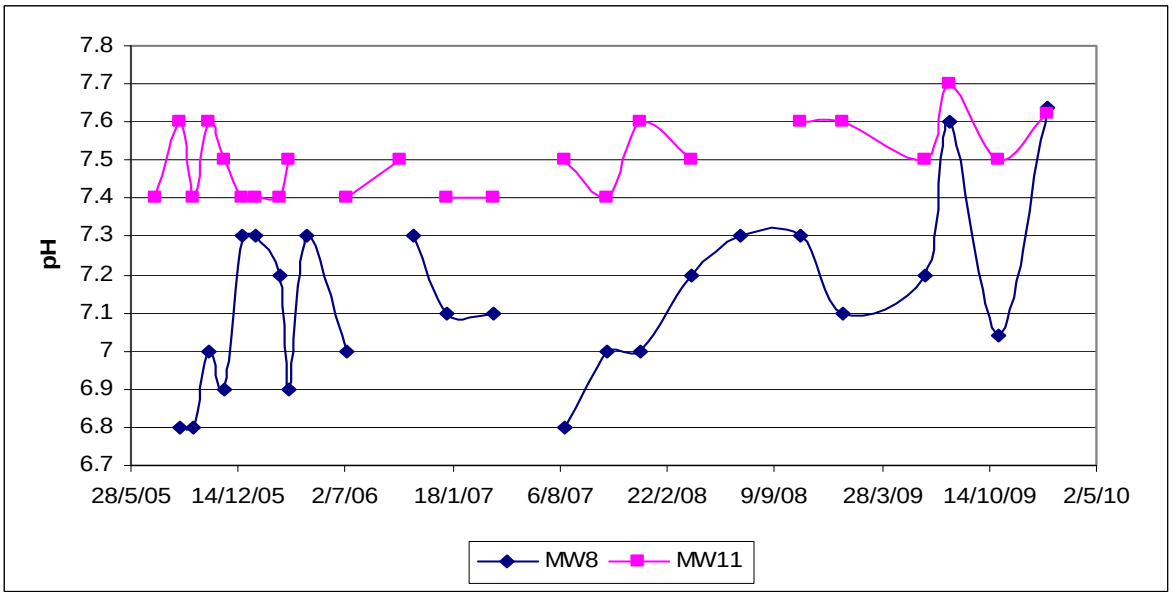

Figure 8 MW 8 and MW11 pH

4.2.4 Laboratory Analyses

During the monitoring period, MW8 exceeded the Total Nitrogen LTV, but not the short term trigger value (STV) with 5.6mg/L in June 2009 and 5.8 mg/L in February 2010.

MW11 generally had Total Nitrogen above the LTV (8.7 – 14.0mg/L).

As shown in **Figure 9**, Total Nitrogen since June 2005 has been relatively static, although variable in MW8, whilst Total Nitrogen in MW11 has been essentially falling since July 2006 and has been historically above the Total Nitrogen LTV since September 2005.

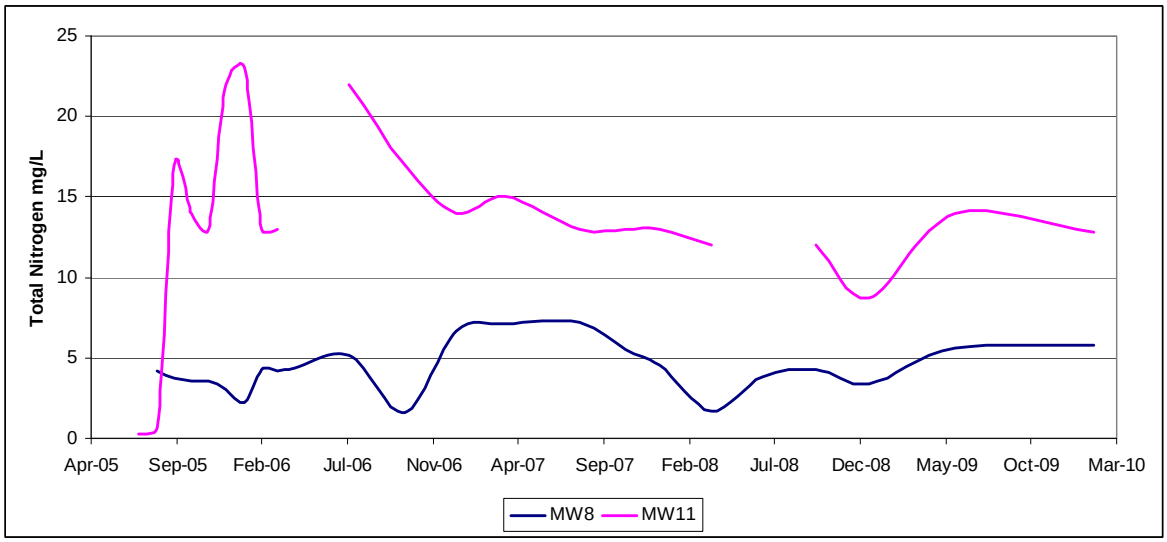

Figure 9 MW 8 and MW11 Total Nitrogen

During the monitoring period, MW8 has been below the Total Phosphorous Long Term Trigger Value Agriculture / Irrigation criteria (LTV), whilst Total Phosphorous in MW11 did not exceed the LTV.

Total Nitrogen levels can exceed the Agriculture / Irrigation LTV, however the STV was not exceeded in MW8 or MW11 during the 2009/2010 monitoring period.

4.2.5 Summary

No private bore groundwater quality or quantity trigger values (as outlined in the Groundwater Contingency Plan for the Werris Creek Coal Mine) have been attained or exceeded in the 2009 / 2010 monitoring period.

4.3 Werris Creek Coal Mine Piezometers

Groundwater monitoring of WCC piezometers in the Werrie Basalt (MW1, 2, 3, 4, 5, 6, 9, 10 and 14) shown in **Figure 8** indicates the following results and trends.

4.3.1 Regional Groundwater Levels

During the monitoring period, groundwater levels in the mine piezometers and bores in the Werris Creek Basalt;

- fell in MW1 from 51.16 – 52.03
- rose in MW2 since the last reading in July 2008 (due to no available analyses between July 2008 and November 2009) from 27.48 to 26.55mbgl
- were not measured in MW3 after January 2009 due to sealing of the bore access following installation of a pump for use in washing mine vehicles
- were not measured in MW4 due to the blocking of the bore in April 2006 by a dead snake
- fell from 9.48 – 10.24mbgl in MW4B
- fell from 7.39 – 9.04mbgl in MW5
- fell from 10.87 – 12.32mbgl in MW6
- fell from 12.55 – 14.3mbgl in MW9
- fell since the last reading in July 2008 (due to no available analyses between July 2008 and November 2009) from 17.85 – 18.43mbgl in MW10, and
- fell from 14.78 – 16.54mbgl in MW14

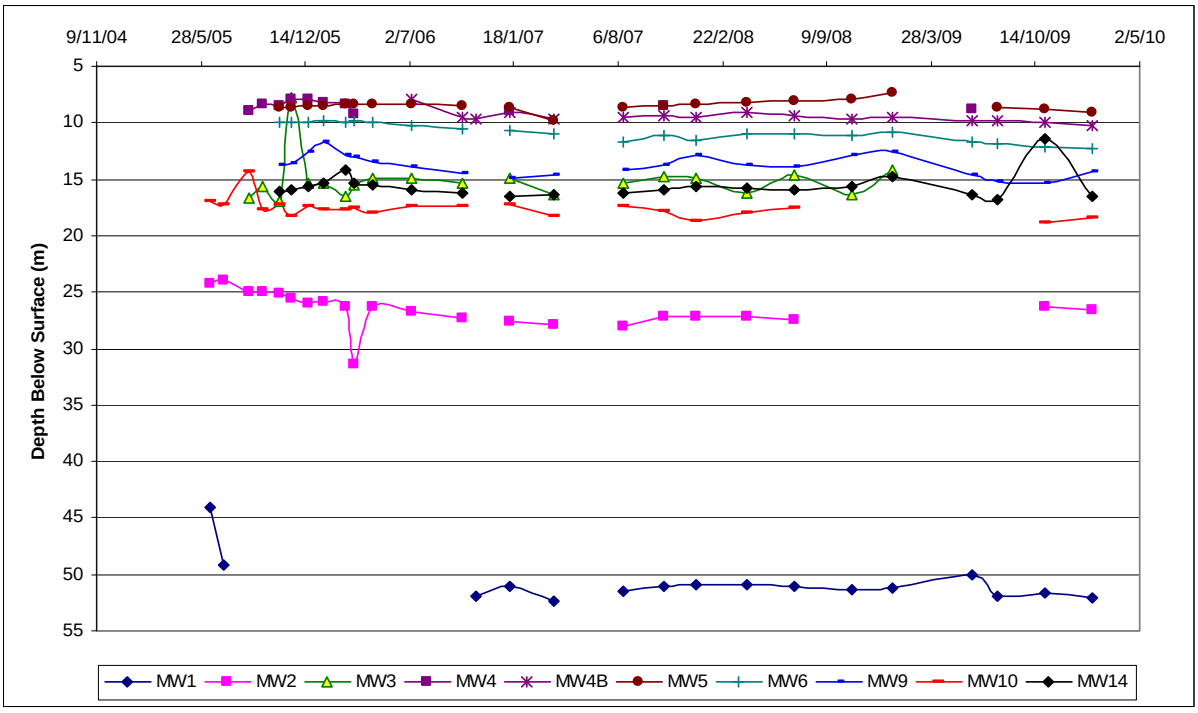

Figure 10 MW1, 2, 3, 4, 4B, 5, 6, 9, 10 and MW14 Standing Water Level

No sustained fall in groundwater levels of greater than 15% compared to the "natural" baseline range have occurred in the WCC piezometers during the 2009/2010 monitoring period, although MW6 may be showing a longer term water level reduction. However, MW4 and MW5, which are located between MW6 and the open cut, are not showing the same trend

4.3.2 Groundwater Flow From the Coal Measures to Underlying Basalt Aquifers

All of the bores and piezometers originally described within the Environmental Impact Statement for the coal mine that were suitable for monitoring the potential flow of groundwater through the base of the coal seam to the underlying local and regional aquifers were removed through excavation of the Werris Creek Open Cut.

In accordance with the DoP's directive that the mine should monitor;

- *any evidence of movement of groundwater through the low permeability layer at the base of the mine's coal seam aquifers to the underlying local and regional aquifers;*

A bore into the underground workings to the north of the open cut has been monitoring groundwater levels in the underground since December 2007.

The mine installed three piezometers adjacent to the active mine area in August 2008 to monitor standing water levels in aquifers underneath the coal seam. Locations of the bores are shown in **Drawing 1**.

A cross section through Piezometers P1 and P3 is shown in **Figure 9**.

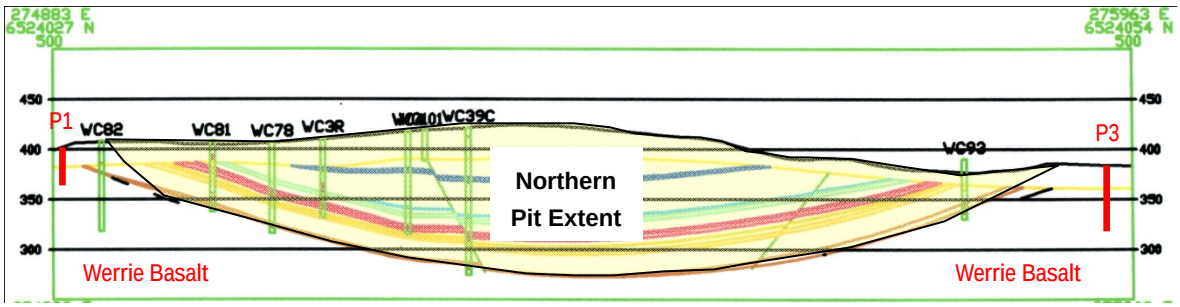

Figure 11 P1 to P3 Cross Section

As shown in **Figure 12**, monitoring of groundwater levels since December 2007 within the old underground workings initially showed dewatering of the workings from 45.2mbgl to 55.8mbgl up to October 2008, which has since recovered and is essentially flat lining at around 52.2 mbgl.

During the monitoring period, the water level in piezometer:

- P1 rose from 23.3 to 20.9mbgl, fell back to 24mbgl, then rose again to 20.75mbgl
- P2 has fallen from 18.7 to 20.75mbgl, and
- P3 fell from 28.1 to 29.53mbgl, before the logging equipment was removed from the piezometer as it was mined through in late November 2009

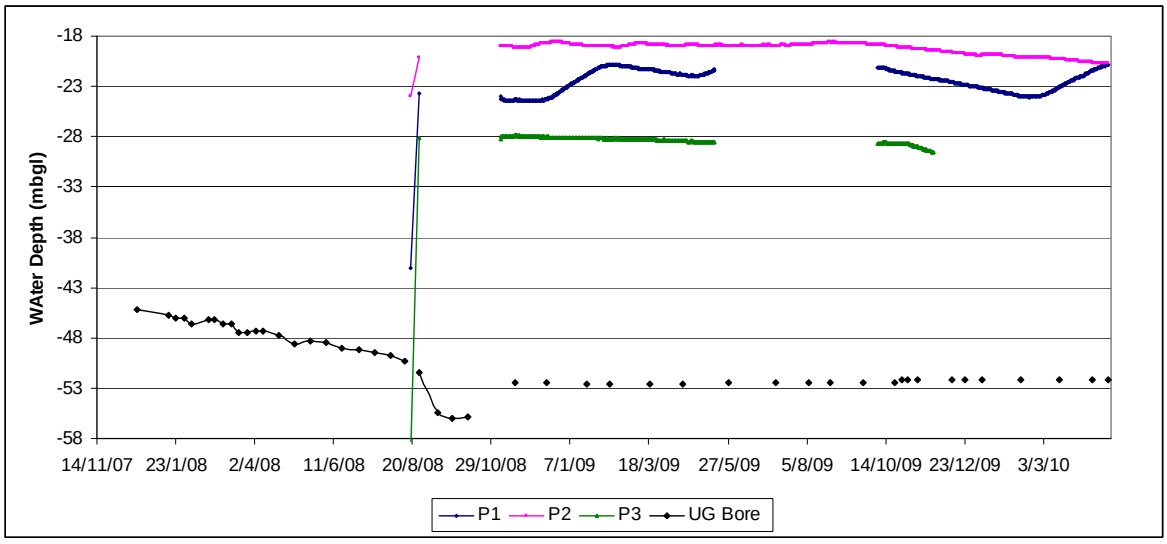

Figure 12 P1, P2 and P3 Standing Water Level

Rainfall data shown in **Figure 1** indicates there has been a reduction in rainfall recharge throughout 2009, which has been observed in the general water level reduction in the Werris Creek Coal and private bore monitoring bore suite.

As a result, with the current data, the proportional contribution from the open cut depressurisation and the lack of recharge can not be conclusively ascertained in the P1 to P3 water level reductions.

It should also be noted that the P1 has recovered to above its installation water level.

Ongoing monitoring is being used to assess water level changes as the pit progresses to the north.

4.3.3 Electrical Conductivity

As shown in **Figure 13**, the WCC piezometers have a salinity range of approximately 560µS/cm to 2940µS/cm, with one outlier reading in MW4 at 4110 µS/cm.

During the monitoring period, salinity has;

- remained around 1280µS/cm in MW1
- risen from 970 – 1027µS/cm in MW2
- fallen from 2280 - 1742µS/cm in MW3
- peaked at 4110µS/cm in a one off sample at MW4 in June 2009
- risen from 930µS/cm in July 2008 to 1078µS/cm in MW4B
- fallen from 2630 – 2440µS/cm in MW5
- risen from 1940 – 1990µS/cm in MW6
- risen from 770 – 885µS/cm in MW9
- fallen from 1920 – 1875µS/cm in MW10, and
- risen from 1080 – 1310µS/cm in MW14

In general the salinities have slightly risen during the monitoring period due to the lack of fresh meteoric recharge to the aquifers as a result of the lower rainfall throughout 2009.

All samples are within the ANZECC (Agriculture Irrigation and Livestock) criteria.

No sustained rise of greater than 15% change in salinity has been monitored in the 2009 / 2010 monitoring period apart from MW4, which was no longer regularly sampled after March 2006 due to a dead snake being found in the piezometer.

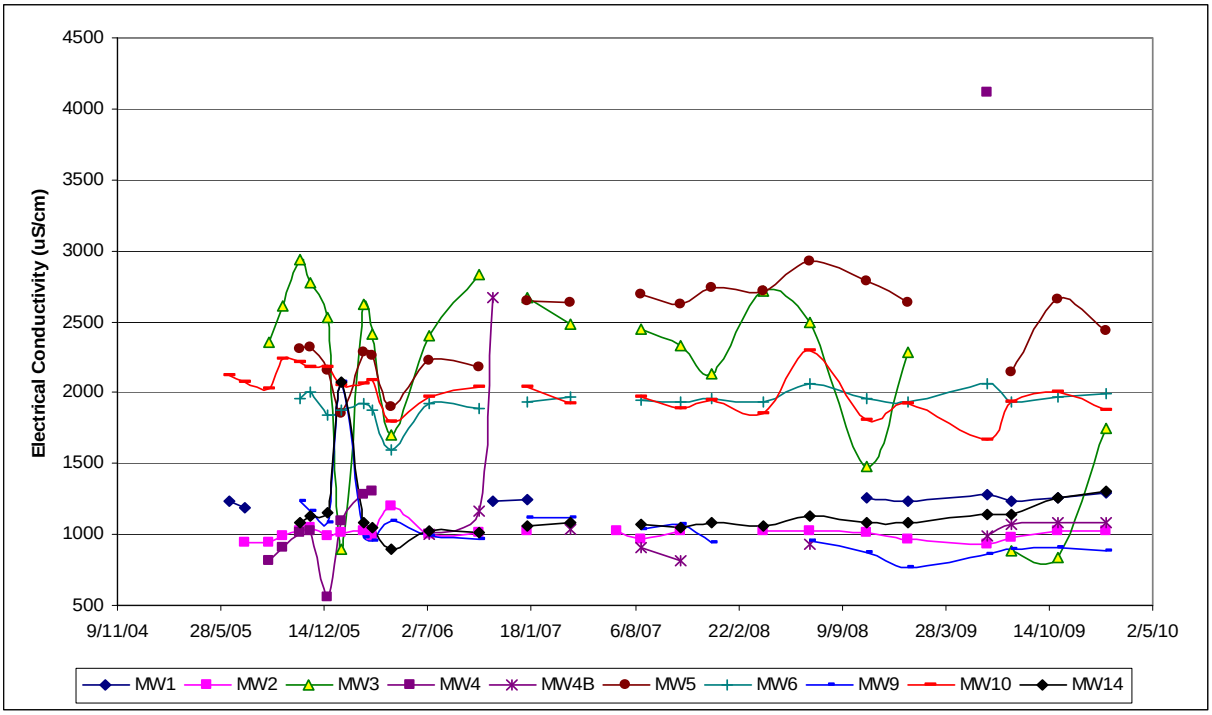

Figure 13 MW1, 2, 3, 4, 5, 6, 9, 10 and MW14 Electrical Conductivity

4.3.4 pH

Figure 14 indicates that groundwater pH in the Werrie Basalt ranges from approximately 6.45 to 8.4, and, as a group, has shown no distinctive changes in the monitoring period.

All samples are within the ANZECC criteria of 6.5 to 8.5.

No sustained rise or fall of greater than 15% change in pH has been monitored in the 2009 / 2010 monitoring period.

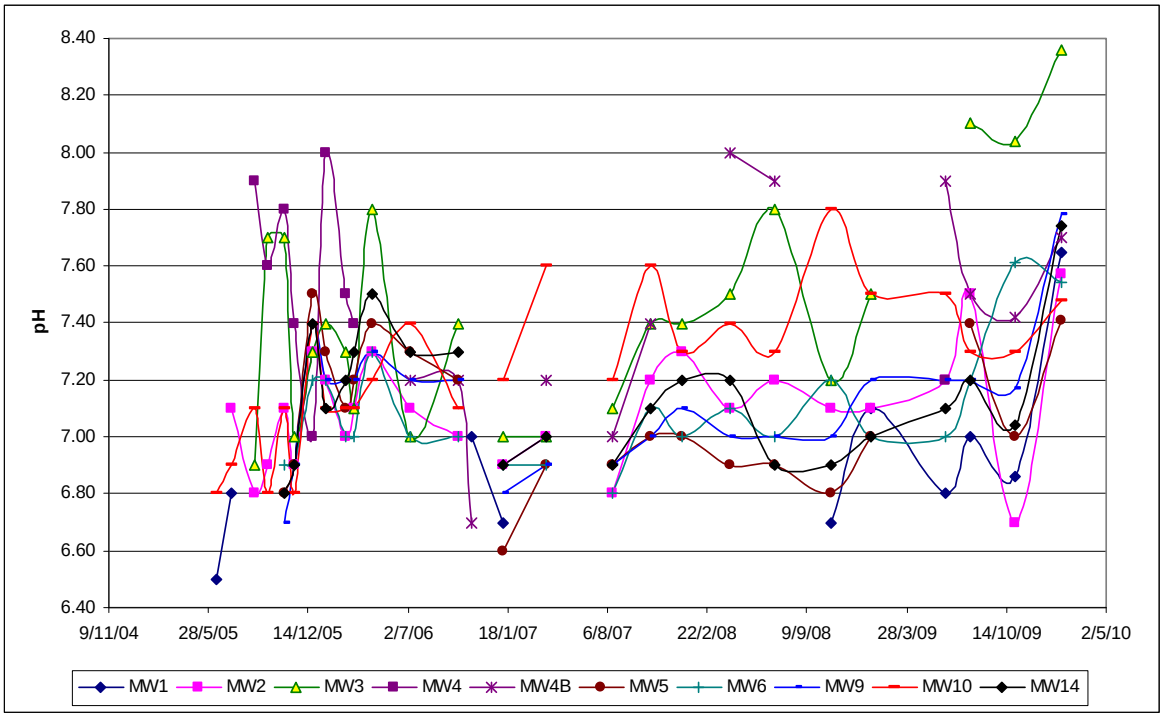

Figure 14 MW4B, 5, 6, 9 and MW14 pH

4.3.5 Laboratory Analyses

During the monitoring period;

- Total Nitrogen in MW1 has ranged from 7.1 – 10.2mg/L which exceeds the LTV but not the STV for Agricultural Irrigation
- MW4 had Total Nitrogen (546 mg/L) and Total Phosphorous (26.3mg/L) above both the LTV and STV criteria in a one off sample in June 2009. It should be noted that this bore was abandoned from regular monitoring after a dead snake was found in April 2006, with monitoring transferred to MW4B
- MW5 had Total Nitrogen (14.5mg/L) and Total Phosphorous (0.72mg/L) above the LTV but below the STV criteria in February 2010. The February reading has been the highest to date
- MW6 had Total Phosphorous above the LTV (0.08 – 0.46mg/L) but below the STV criteria
- MW7 Total Phosphorous above the LTV (0.06 – 0.1mg/L) but below the STV criteria
- MW9 had Total Nitrogen above the LTV but below the STV (3.2 – 8.8mg/L)
- MW10 had Total Nitrogen above the LTV but below the STV Agriculture / Irrigation criteria (18.8 – 23mg/L).
- MW14 had Total Nitrogen above the LTV criteria (8.7 – 14mg/L).

As pre mining Total Phosphorous and Total Nitrogen monitoring data is not available for the subject bores, it is not possible to comment on the pre mining status of Total Phosphorous within the Werrie Basalt.

All bores, except for MW4 were within their “natural” baseline historical range for Total Nitrogen and Total Phosphorous.

Total Phosphorous and Total Nitrogen Agriculture / Irrigation LTV can be exceeded in most samples, however the STV was not exceeded except for MW3, however it has reached the same level of 2.3mg/L Total Phosphorous in October 2005.

4.3.6 Summary

No WCC piezometer groundwater quality or quantity trigger values, as outlined in the Groundwater Contingency Plan for the Werris Creek Coal Mine, have been attained or exceeded in the 2009 / 2010 monitoring period.

5. SURFACE WATER

Two monitored surface water discharges occurred in the 2009 / 2010 monitoring period into Quipolly Creek as shown in **Table 8** from discharge point SB9, however no criteria were exceeded for any parameters between the upstream and downstream monitoring locations except for;

- Total Phosphorous at QCD (0.1mg/L) on 15/2/2010 compared to no sample at QCU as QCU was dry at that time,

Although monitoring was conducted in Werris Creek on 6/1/2010 and 15/2/2010 at the same time as the Quipolly Creek monitoring, no water was discharged from the mine into Werris Creek during either event. As a result, the water quality monitored in Werris Creek is not influenced by mine discharges on those dates.

Table 8 Water Discharge into Local Creeks

Discharge	pH	Electrical Conductivity (uS/cm)	Nitrate mg/L as N	Oil and Grease mg/L	Reactive P (mg/L)	Total N mg/L	Total P mg/L	TSS mg/L
CRITERIA	**6.5 - 8.5**	**1900-4500[a] 2000-5000[b]**	**6.77**	**10**	**-**	**5.0[ltv] 25 – 125[stv]**	**0.05[ltv] 0.8-12[stv]**	**50**
6/1/2010								
WCU	7.87	1270	-	<5	-	-	-	18
WCD	8.16	668	-	<5	-	-	-	**54**
QCU	-	-	-	-	-	-	-	-
QCD	7.71	687	-	<5	-	-	-	10
15/2/2010								
WCU	7.84	1110	<0.01	<5	0.22	0.6	**0.25**	18
WCD	7.82	118	3.87	<5	0.05	**5.8**	**0.11**	**62**
QCU	-	-	-	-	-	-	-	-
QCD	7.82	861	0.02	<5	0.1	5.0	**0.1**	10

NOTES: a - agricultural irrigation criteria b - livestock criteria

ltv – irrigation long term trigger value stv – irrigation short term trigger value

underlined values exceed the relevant criteria

No downstream surface water discharges to Quipolly Creek exceeded the Surface Water Assessment Criteria compared to the upstream value as Quipolly Creek (upstream) was dry at both times, although the Total Phosphorous ANZECC 2000 Agriculture / Irrigation LTV was exceeded at QCD on 15/2/2010.

It should be noted that the compliance criteria only apply to the licensed dam discharge sites, and that the creek monitoring is not linked to the compliance limits and is undertaken as due diligence by the mine to demonstrate the potential impact, or lack of, from the discharges.

6. CONCLUSIONS

Surface water and groundwater level and water quality monitoring up to 31st March 2010 has shown no significant exceedance of trigger values or ANZECC 2000 Agricultural or Irrigation criteria except in MW4, where nutrient levels were exceeded in June 2009 due to a dead snake in the bore that was first identified in April 2006, and as a result, monitoring was transferred to MW4B.

Groundwater levels were generally falling due to the lack of rainfall recharge, and no distinctive regional groundwater depressurisation due to operation of the mine is observed.

There is no observable differentiation with existing data between the Quipolly Creek aquifer and Werrie Basalt or Currabubula Formation Total Phosphorous or Total Nitrogen values to indicate that agricultural use of fertilisers is affecting the Quipolly Creek aquifer.

No investigation of the cause of groundwater level reduction or groundwater / surface water quantity or quality exceedances is required.

No discharge from the mine to Werris Creek occurred during the monitoring period.

Total Phosphorous marginally exceeded the Long Term Trigger Value for Agricultural Irrigation, but not the Short Term Trigger Value at the downstream Quipolly Creek sampling site during the 15/2/2010 discharge event. At the time the upstream sample site was dry.

It should be noted that the mine's compliance criteria only apply to the licensed dam discharge sites, and that the creek monitoring results are not linked to those criteria.

7. REFERENCES

ANZECC, 2000 An Introduction to the Australian and New Zealand Guidelines For Fresh and Marine Water Quality

Geoterra, 2009 Werris Creek Coal Pty Ltd Surface Water and Groundwater 2008/2009 Monitoring Annual Review

GSS Environmental, 2009 Site Water Management Plan, Werris Creek Coal Mine

RW Corkery & Co, 2005 Site Water Management Plan for the Werris Creek Coal Mine, April 2005

RCA Australia, 2004 Groundwater Assessment, Werris Creek Coal Mine

RCA Australia, 2009 Proposed Modification to the Werris Creek Coal Mine Groundwater Impact Assessment

Soil Services, 2004 Surface Water Assessment, Proposed Werris Creek Coal Mine

Werris Creek Coal, 2005 Groundwater Contingency Plan for the Werris Creek Coal Mine

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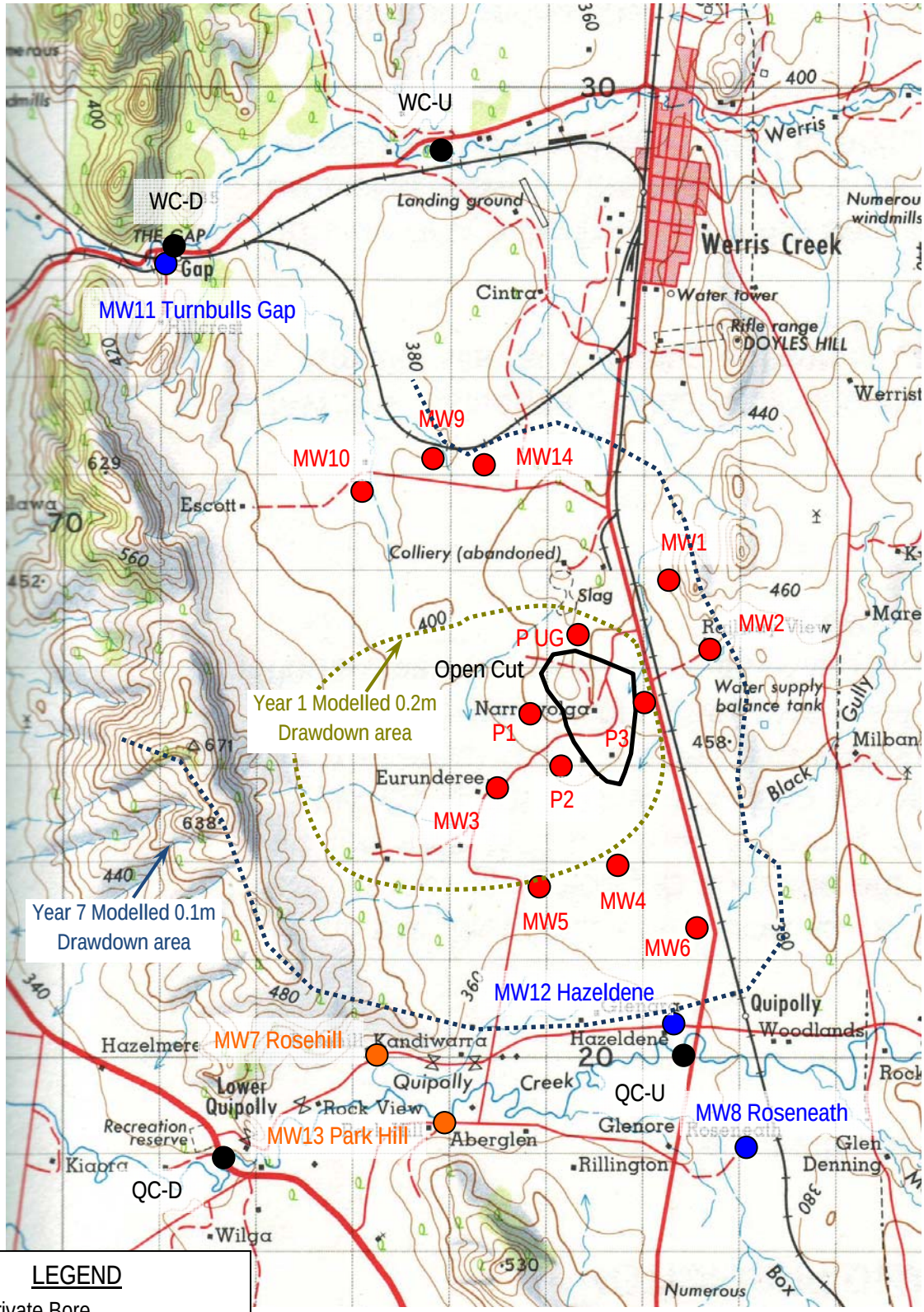

Project	WCC3-R3	WERRIS CREEK COAL PTY LTD	GeoTerra
Drawn	A Dawkins	WERRIS CREEK COAL MINE	
Date	25 May 2010	Monitoring Locations	DRAWING 1
Scale (approx)	2008		

APPENDIX A
BORE AND PIEZOMETER DATA SUMMARY

GeoTerra

Werris Bore	Creek Property	Coal Mine GW No.	Type	Purpose	Total Depth	Install Date	Install SWL	Flow Depth mbgl	Yield L/sec	Slotted Depth
Quipolly Ck	**Alluvium**									
MW7	Rosehill	966349	Well	Stk Dom	N.A	N.A		N.A	N.A	N.A
MW12	Hazeldene	35072	Bore	Stock	12.1	N.A	N.A	N.A	N.A	N.A
MW13	Parkhill	60408	Well	irrigaton	5.5	1965		N.A	N.A	N.A
Werrie	**Basalt**									
P1	WCC Pty Ltd	N.A.	Piezoe	Monitoring	42	2008		35	N.A.	39-42
P2	WCC Pty Ltd	N.A.	Piezo	Monitoring	25	2008		25	N.A	22-25
P3	WCC Pty Ltd	N.A.	Piezo	Monitoring	61	2008		60	N.A	58-61
MW1	Hillview	966036	Bore	Stk Dom	63	2003	49	59.5 - 60	1.26	54-60
MW2	Railway View	966127	Bore	Stk Dom	65.5	2003	26.2	47.3 - 47.6 / 54.9 - 55.2	0.37 / 0.37	45-56
MW3	Eurunderee	965729	Bore	Stk Dom	39.6	2002	15.2	36.5 - 36.8	0.6	36-38.5
MW4	WCC Pty Ltd	N.A.	Bore	Monitoring		2005				
MW5	WCC Pty Ltd	N.A.	Piezo	Monitoring	28	2005	8.7	24-27	N.A	22-28
MW6	WCC Pty Ltd	N.A.	Piezo	Monitoring	16	2005	10	12-13	N.A	Oct-16
MW8	Roseneath	902638	Bore	Stk Dom	42.7	1995	16.4	22.9-23.2 / 35.1-35.4	0.31 / 0.31	22.5-36
MW9	WCC Pty Ltd	N.A.	Piezo	Monitoring	28	2005	13.78	26-28	N.A	24-27
MW10	Turnbulls	965745	Bore	Domestic	22	2002	14-18	15.3-15.6 / 19.8-20.2	1.26	15-21
MW14	WCC Pty Ltd	N.A.	Piezo	Monitoring	26	2005	16.02	20-26	N.A	22-25
	Currabubula Fm									
MW11	Turnbulls Gap		Bore							

APPENDIX B
FIELD GROUNDWATER AND SURFACE WATER DATA

MW1

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	44.11	6.5	1240	6.3	7.0	0.1	0.08
Jul-05	49.10	6.8	1190	6.1	5.9	0.1	0.03
Aug-05	Sampling Suspended - Managers Request						
Sep-05	Sampling Suspended - Managers Request						
Oct-05	Sampling Suspended - Managers Request						
Nov-05	Sampling Suspended - Managers Request						
Dec-05	Sampling Suspended - Managers Request						
Jan-06	Sampling Suspended - Managers Request						
Feb-06	Sampling Suspended - Managers Request						
Mar-06	Sampling Suspended - Managers Request						
Apr-06	Sampling Suspended - Managers Request						
Jul-06	Sampling Suspended - Managers Request						
Nov-06	52.00	7.0	1230	6.3	6.7	0.05	0.01
Jan-07	51.05	6.7	1250	6.7	6.9	0.10	0.04
Apr-07	52.40	6.9	730	6.6	7.0	0.09	0.03
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	51.48	Pump Disconnected					
Oct-07	Pump Failed. Site to be re-sampled in November 2007						
Nov-07	51.00	No sample obtained					
Jan-08	50.91	No sample obtained, no access					
Apr-08	50.92	No sample obtained, no access					
Jul-08	51.07	No sample obtained, no access					
Oct-08	51.35	7.2	1250	7.2	7.9	0.11	0.04
Jan-09	51.16	6.6	1240	6.6	8.2	0.1	0.04
Apr-09	No sample taken - contract change over						
Jun-09	50	6.8	1280	N/T	10.2	0.01	0.04
Aug-09	51.94	7	1230	Testing for these analytes not undertaken			
Nov-09	51.62	6.86	1254	Testing for these analytes not undertaken			
Feb-10	52.03	7.65	1289	7.37	7.1	0.03	0.05

MW2

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	24.2	No access					
Jul-05	24.0	7.1	940	5.4	5.3	0.14	0.06
Aug-05	24.9	6.8	940	5.8	5.5	0.90	0.14
Sep-05	25.0	6.9	990	5.5	5.2	0.08	0.06
Oct-05	25.2	7.1	1030	5.7	5.8	0.22	0.08
Nov-05	25.5	6.9	1050	6.3	6.4	0.14	0.12
Dec-05	25.9	7.3	990	6.2	6.6	0.20	0.12
Jan-06	25.9	7.2	1010	7.0	6.5	0.06	0.04
Feb-06	26.3	7.0	1020	5.9	7.0	0.10	0.04
Mar-06	31.3	7.1	990	6.6	6.9	0.12	0.08
Apr-06	26.4	7.3	1200	6.4	6.9	0.29	0.05
Jul-06	26.7	7.1	1000	6.9	7.2	0.08	0.05
Oct-06	27.3	7.0	1010	6.9	7.3	0.08	0.02
Jan-07	27.6	6.9	1020	7.2	7.4	0.12	0.05
Apr-07	27.9	7.0	1020	6.8	7.4	0.11	0.05
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	28.1	6.8	1030	7.0	7.6	0.08	0.03
Nov-07	27.2	7.2	970	5.5	7.0	0.40	0.09
Jan-08	27.2	7.3	1020	7.6	7.4	0.15	0.05
Apr-08	27.22	7.1	1020	7.4	7.9	0.09	0.06
Jul-08	27.48	7.2	1020	6	7.5	0.06	0.05
Oct-08	N/A	7.1	1010	7.4	8	0.08	0.07
Jan-09	N/A	7.1	970	5.6	6.8	0.07	0.05
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.2	930	N/T	7.6	0.02	0.03
Aug-09	N/A	7.5	980	Testing for these analytes not undertaken			
Nov-09	26.35	6.7	1020	Testing for these analytes not undertaken			
Feb-10	26.55	7.57	1027	6.07	7.1	0.03	0.05

MW3

Note: Pumping of this bore for washing vehicles may effect depth to ground readings.

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	Site Not Sampled - Managers Request						
Aug-05	16.73	6.9	2360	3.8	4.0	0.06	0.04
Sep-05	15.66	7.7	2610	2.3	2.5	0.44	0.18
Oct-05	16.95	7.7	2940	0.83	2.0	2.30	0.28
Nov-05	7.76	7.0	2770	2.8	3.8	1.70	0.16
Dec-05	15.33	7.3	2530	3.2	3.6	0.27	0.27
Jan-06	15.35	7.4	900	2.2	2.2	0.06	0.02
Feb-06	16.45	7.3	2620	2.7	3.6	0.22	0.08
Mar-06	15.53	7.1	2410	4.0	4.2	0.06	0.04
Apr-06	14.85	7.8	1700	6.4	8.5	0.98	0.37
Jul-06	14.95	7.0	2400	3.8	3.9	0.44	0.08
Oct-06	15.34	7.4	2830	1.1	2.1	0.66	0.2
Jan-07	14.95	7.0	2670	2.4	2.8	0.37	0.18
Apr-07	16.32	7.0	2480	4.1	4.4	0.10	0.07
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	15.33	7.1	2450	3.9	4.6	0.09	0.05
Nov-07	14.7	7.4	2330	0.54	3.6	1.5	0.29
Jan-08	14.94	7.4	2130	0.28	3.7	0.5	0.39
Apr-08	16.19	7.5	2710	1.3	2.6	0.4	0.11
Jul-08	14.61	7.8	2500	0.7	1.7	0.18	0.15
Oct-08	16.38	7.2	1480	0.13	2.2	1.9	0.14
Jan-09	14.13	7.5	2280	0.27	2.3	2.3	0.06
Apr-09	No sample taken - contract change over						
Jun-09	No access						
Aug-09	N/A	8.1	890	Testing for these analytes not undertaken			
Nov-09	N/A	8.04	840	Testing for these analytes not undertaken			
Feb-10	N/A	8.36	1742	0.54	0.7	<0.01	0.01

MW4

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	Site Not Sampled - Managers Request						
Aug-05	8.94	7.9	820	0	0.66	0.08	0.06
Sep-05	8.40	7.6	910	0	0.74	0.26	0.02
Oct-05	8.52	7.8	1010	0.01	0.71	0.34	0.06
Nov-05	7.90	7.4	1020	0	4.40	3.50	0.24
Dec-05	7.89	7.0	560	1.20	1.30	0.14	0.14
Jan-06	8.19	8.0	1090	0.07	21.00	1.10	0.94
Feb-06	8.33	7.5	1280	0.02	40.00	1.90	1.80
Mar-06	9.27	7.4	1310	0.08	41.00	2.50	2.30
Apr-06	Piezo Blocked, additional bore drilled MW4B						
Jul-06	Borehole blocked for sampling						
Jan-07	8.94	Bore hole blocked for sampling					
Apr-07	Borehole blocked for sampling						
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	Borehole blocked for sampling						
Nov-07	8.52	Borehole blocked for sampling					
Jan-08	Borehole blocked for sampling						
Apr-08	Borehole blocked for sampling						
Jul-08	Borehole blocked for sampling						
Oct-08	Borehole blocked for sampling						
Jan-09	Borehole blocked for sampling						
Apr-09	No sample taken - contract change over						
Jun-09	8.78	7.2	4110	N/T	546	26.3	20.5
Aug-09	Not sampled due to contamination						
Nov-09	Not sampled due to contamination						
Feb-10	Not sampled due to contamination						

MW4B

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05							
Jul-05							
Aug-05							
Sep-05							
Oct-05							
Nov-05							
Dec-05							
Jan-06							
Feb-06							
Mar-06							
Apr-06							
Jul-06	7.88	7.2	1000	<0.2	69.0	6.6	3.40
Nov-06	9.71	6.7	2670	Sample contaminated			
Jan-07	9.03	Dry					
Apr-07	9.63	7.2	1040	3.40	34.0	0.08	0.04
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	9.49	7.0	910	0.04	1.8	0.04	0.02
Nov-07	9.39	7.4	810	0.03	0.34	0.8	<0.01
Jan-08	9.51	Very slow recharge of bore					
Apr-08	9.14	8.0	1040	0.03	6.8	0.82	0.12
Jul-08	9.35	7.9	930	<0.1	6.5	0.03	<0.01
Oct-08	9.62	Dry					
Jan-09	9.48	Dry					
Apr-09	No sample taken - contract change over						
Jun-09	9.88	7.9	990	Testing for these analytes not undertaken			
Aug-09	9.86	7.5	1070	Testing for these analytes not undertaken			
Nov-09	9.97	7.42	1080	Testing for these analytes not undertaken			
Feb-10	10.24	7.7	1078	1.45	2.2	0.02	<0.01

MW5

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	8.70	6.8	2310	1.2	1.4	0.18	0.02
Nov-05	8.64	6.9	2320	0	0.33	0.16	0.04
Dec-05	8.55	7.5	2160	0	0.51	0.28	0.09
Jan-06	8.56	7.3	1850	3.00	3.7	0.50	0.04
Feb-06	8.38	7.1	2280	0.01	1.9	0.26	0.04
Mar-06	8.30	7.2	2260	0.01	1.7	0.26	0.08
Apr-06	8.33	7.4	1900	<0.01	5.1	1.05	0.05
Jul-06	8.40	7.3	2230	<0.2	2.8	0.16	0.02
Oct-06	8.43	7.2	2180	<0.01	2.0	0.17	0.03
Jan-07	8.63	6.6	2640	2.0	2.0	0.02	0.06
Apr-07	9.74	6.9	2630	2.0	2.2	0.13	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	8.62	6.9	2690	2.0	2.3	0.03	<0.01
Nov-07	8.47	7.0	2620	2.2	2	0.32	<0.01
Jan-08	8.41	7.0	2740	2.2	2.2	0.05	0.01
Apr-08	8.17	6.9	2720	2.3	2.2	0.12	0.01
Jul-08	8.12	6.9	2920	2.3	2.4	0.22	<0.01
Oct-08	7.88	6.8	2780	2.4	2.7	0.04	0.03
Jan-09	7.39	7	2630	1.7	2.6	0.02	0.04
Apr-09	No sample taken - contract change over						
Jun-09	No access						
Aug-09	8.6	7.4	2150	Testing for these analytes not undertaken			
Nov-09	8.77	7	2660	Testing for these analytes not undertaken			
Feb-10	9.04	7.41	2440	0.97	14.5	0.72	0.73

MW6

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	10.00	6.9	1960	3.3	3.7	0.10	0.08
Nov-05	9.99	6.9	2000	2.1	2.5	3.30	0.08
Dec-05	9.95	7.2	1840	2.8	3.2	2.00	0.14
Jan-06	9.88	7.2	1880	3.3	3.6	0.36	0.04
Feb-06	9.89	7.0	1920	2.6	3.5	0.42	0.10
Mar-06	9.81	7.0	1880	2.8	3.3	0.32	0.08
Apr-06	9.91	7.3	1600	3.1	3.9	0.23	0.04
Jul-06	10.18	7.0	1920	3.6	3.9	0.60	0.24
Oct-06	10.53	7.0	1890	3.5	4.0	0.20	0.07
Jan-07	10.68	6.9	1930	4.0	4.0	0.06	0.13
Apr-07	10.93	6.9	1970	4.1	4.3	0.14	0.06
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	11.70	6.8	1950	4.0	4.3	0.06	0.03
Nov-07	11.1	7.1	1930	4.3	4.2	0.05	0.04
Jan-08	11.51	7.0	1960	4.2	4.1	0.05	0.04
Apr-08	10.94	7.1	1930	3.4	4.0	0.33	0.05
Jul-08	10.94	7.0	2060	3.8	3.9	0.77	0.09
Oct-08	11.14	7.2	1960	4.4	5.3	0.23	0.1
Jan-09	10.87	7	1940	3.6	4.2	0.08	0.05
Apr-09	No sample taken - contract change over						
Jun-09	11.67	7	2060	N/T	4.9	0.03	0.04
Aug-09	11.83	7.2	1930	Testing for these analytes not undertaken			
Nov-09	12.11	7.61	1973	Testing for these analytes not undertaken			
Feb-10	12.32	7.54	1990	3.36	3.9	0.46	0.06

MW7

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	4.83	6.0	490	1.3	1.5	0.14	0.12
Jul-05	4.44	6.9	490	1.3	1.5	0.12	0.07
Aug-05	4.47	7.0	520	1.4	1.4	0.08	0.08
Sep-05	4.44	6.8	520	1.4	1.4	0.12	0.08
Oct-05	4.36	7.1	540	1.3	1.5	0.24	0.10
Nov-05	4.44	6.8	530	1.5	1.4	0.16	0.10
Dec-05	4.38	6.8	520	1.2	1.3	0.26	0.14
Jan-06	4.38	7.5	890	2.2	2.4	0.10	0.02
Feb-06	4.42	6.8	500	1.0	1.3	0.12	0.80
Mar-06	4.56	6.9	510	1.1	1.3	0.10	0.80
Apr-06	4.51	7.0	380	0.98	1.1	0.12	0.07
Jul-06	4.35	6.9	520	1.4	1.4	0.10	0.08
Oct-06	4.39	7.1	510	1.1	1.2	0.09	0.03
Jan-07	4.73	6.7	530	1.3	1.4	0.15	0.07
Apr-07	4.60	6.7	550	1.4	1.6	0.12	0.06
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	4.41	6.3	540	1.4	1.6	0.07	0.04
Nov-07	4.36	7.2	520	1.4	1.3	0.37	0.05
Jan-08	4.35	6.8	520	1.4	1.2	0.52	0.06
Apr-08	4.45	7	530	1.1	1.5	0.52	0.07
Jul-08	4.41	6.8	540	1.3	1.3	0.69	0.06
Oct-08	4.35	7	520	1.3	1.5	0.09	0.07
Jan-09	4	8.1	510	1.1	1.5	0.1	0.07
Apr-09	No sample taken - contract change over						
Jun-09	4.28	6.9	510	N/T	1.7	0.02	0.04
Aug-09	4.43	7.7	520	Testing for these analytes not undertaken			
Nov-09	4.27	7.91	590	Testing for these analytes not undertaken			
Feb-10	4.42	7.79	561	1.36	1.4	0.06	0.05
30/04/2010	4.48						
17/05/2010	4.67						

MW8

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	Site Not Sampled - Managers Request						
Aug-05	14.35	6.8	1160	4.5	4.2	0.04	0.01
Sep-05	13.78	6.8	1190	3.8	3.7	0.10	0.04
Oct-05	13.29	7.0	1190	3.4	3.6	0.08	0.06
Nov-05	13.42	6.9	1190	3.5	3.6	0.08	0.06
Dec-05	13.65	7.3	1170	3.2	3.0	0.24	0.11
Jan-06	13.63	7.3	880	2.1	2.2	0.08	0.02
Feb-06	14.33	7.2	1210	3.6	4.3	0.08	0.06
Mar-06	14.55	6.9	1180	4.1	4.2	0.24	0.04
Apr-06	14.93	7.3	1290	4.0	4.4	0.14	0.03
Jul-06	15.75	7.0	1470	5.4	5.2	2.8	0.03
Oct-06	16.60	7.0	790	1.5	1.6	0.09	0.02
Jan-07	17.35	7.1	1650	6.4	6.7	0.07	0.03
Apr-07	18.71	7.1	1700	6.2	7.1	0.04	0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	17.87	6.8	1730	6.6	7.2	0.02	<0.01
Nov-07	15.9	7.0	1300	5.4	5.5	1.1	0.01
Jan-08	17.6	7.0	1320	4.6	4.5	1	0.01
Apr-08	14.6	7.2	820	1.5	1.7	0.08	0.06
Jul-08	15.79	7.3	1170	3.7	3.8	0.03	0.01
Oct-08	N/A	7.3	1210	4.1	4.3	0.04	0.03
Jan-09	N/A	7.1	1040	2.9	3.4	0.04	0.03
Apr-09	No sample taken - contract change over						
Jun-09	14.67	7.2	1250	N/T	5.6	<0.01	<0.01
Aug-09	15.58	7.6	1240	Testing for these analytes not undertaken			
Nov-09	N/A	7.04	1402	Testing for these analytes not undertaken			
Feb-10	17.05	7.64	1467	5.24	5.8	<0.01	<0.01

MW9

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	13.78	6.7	1230	17.0	18.0	0.04	0.02
Nov-05	13.53	6.9	1160	9.2	9.0	0.12	0.10
Dec-05	12.55	7.4	1080	14.0	15.0	0.26	0.09
Jan-06	11.72	7.2	2080	25.0	24.0	0.54	0.10
Feb-06	12.86	7.2	980	9.7	11.0	0.12	0.08
Mar-06	13.06	7.2	960	10.0	11.0	0.08	0.06
Apr-06	13.42	7.3	1100	9.2	12.0	0.22	0.33
Jul-06	13.95	7.2	990	8.9	9.6	0.19	0.04
Oct-06	14.46	7.2	970	7.8	8.4	0.10	0.03
Jan-07	14.84	6.8	1120	14.0	14.0	0.07	0.02
Apr-07	14.67	6.9	1120	12.0	12.0	0.04	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	14.25	6.9	1040	8.3	8.9	0.45	<0.01
Nov-07	13.8	7.0	1070	11	10	0.03	<0.01
Jan-08	12.88	7.1	940	6.4	6.2	0.02	<0.01
Apr-08	13.8	Pump Failure					
Jul-08	14.05	7	1010	8.2	8.5	0.04	<0.01
Oct-08	12.89	7	870	4.2	4.5	0.03	0.03
Jan-09	12.55	7.2	770	5.3	6.2	0.02	0.04
Apr-09	No sample taken - contract change over						
Jun-09	14.68	7.2	860	N/T	8.8	<0.01	<0.01
Aug-09	15.17	7.2	900	Testing for these analytes not undertaken			
Nov-09	15.41	7.17	905	Testing for these analytes not undertaken			
Feb-10	14.3	7.78	885	2.55	3.2	0.04	<0.01

MW10

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	17.00	6.8	2120	22	24	0.04	0.02
Jul-05	17.29	6.9	2070	23	23	0.08	0.01
Aug-05	14.26	7.1	2030	23	23	0.04	0
Sep-05	17.75	6.8	2240	23	22	0.06	0.04
Oct-05	17.28	7.1	2210	22	23	0.08	0.04
Nov-05	18.31	6.8	2180	25	25	0.08	0.04
Dec-05	17.32	7.4	2180	23	23	0.24	0.08
Jan-06	17.61	7.1	2050	25	23	0.12	0.02
Feb-06	17.66	7.1	2060	22	24	0.08	0.06
Mar-06	17.5	7.1	2090	23	24	0.04	0.04
Apr-06	17.95	7.2	1800	23	27	0.07	0.01
Jul-06	17.46	7.4	1970	24	25	3.70	0.03
Oct-06	17.38	7.1	2040	22	24	0.06	0.01
Jan-07	17.25	7.2	2040	23	24	0.09	0.02
Apr-07	18.20	7.6	1920	23	24	0.06	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	17.38	7.2	1970	22	23	0.02	<0.01
Nov-07	17.80	7.6	1890	24	24	0.01	<0.01
Jan-08	18.76	7.3	1950	24	24	0.01	<0.01
Apr-08	17.91	7.4	1850	21	23	0.02	0.02
Jul-08	17.85	7.3	2300	24	24	0.05	<0.01
Oct-08	N/A	7.8	1810	20	22	0.04	0.03
Jan-09	N/A	7.5	1920	20	23	0.02	0.02
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.5	1670	N/T	18.8	<0.01	<0.01
Aug-09	N/A	7.3	1940	Testing for these analytes not undertaken			
Nov-09	18.86	7.3	2007	Testing for these analytes not undertaken			
Feb-10	18.43	7.48	1875	20.9	21.4	<0.01	<0.01

MW11

N/A - no access

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	N/A	7.4	1230	0.08	0.31	0.08	0.01
Aug-05	N/A	7.6	1210	0	0.65	0.02	0.01
Sep-05	N/A	7.4	1770	16	17.0	0.08	0.04
Oct-05	N/A	7.6	1430	13	14.0	0.24	0.06
Nov-05	N/A	7.5	1430	12	13.0	0.10	0.06
Dec-05	N/A	7.4	2170	24	22.0	0.20	0.07
Jan-06	N/A	7.4	2070	25	23.0	0.08	0.04
Feb-06	N/A	7.4	1390	11	13.0	0.12	0.08
Mar-06	N/A	7.5	1370	12	13.0	0.06	0.06
Apr-06	Sampling postponed due to unsafe access following wet weather						
Jul-06	N/A	7.4	1840	22	22.0	0.18	0.04
Oct-06	N/A	7.5	1600	16	17.0	0.06	0.02
Jan-07	N/A	7.4	1380	14	14.0	0.09	0.05
Apr-07	N/A	7.4	1380	14	15.0	0.13	0.02
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	N/A	7.5	1370	13	13.0	0.05	0.01
Nov-07	N/A	7.4	1290	13	13.0	0.04	0.02
Jan-08	N/A	7.6	1350	13	13	0.06	0.03
Apr-08	N/A	7.5	1300	10	12	0.05	0.03
Jul-08	N/A	Pump Failure					
Oct-08	N/A	7.6	1230	11	12	0.06	0.05
Jan-09	N/A	7.6	1190	7.5	8.7	0.05	0.04
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.5	1270	N/T	14	<0.01	0.02
Aug-09	N/A	7.7	1580	Testing for these analytes not undertaken			
Nov-09	N/A	7.5	1365	Testing for these analytes not undertaken			
Feb-10	N/A	7.62	1410	12.1	12.8	<0.01	<0.01

MW12

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	7.89	6.6	880	1.8	2.0	0.10	0.10
Jul-05	7.96	7.1	870	1.8	2.0	1.00	0.03
Aug-05	7.73	7.2	850	1.8	1.8	0.06	0.03
Sep-05	7.42	7.1	900	1.8	1.8	0.14	0.06
Oct-05	7.11	7.3	930	1.9	2.0	0.22	0.08
Nov-05	7.12	7.0	940	2.6	2.1	0.16	0.08
Dec-05	6.93	7.4	930	2.0	2.2	2.30	0.12
Jan-06	6.97	7.2	910	2.2	2.5	0.10	0.04
Feb-06	7.02	7.2	940	1.8	2.3	0.10	0.06
Mar-06	7.16	7.3	910	2.1	2.2	0.08	0.08
Apr-06	7.29	7.4	1000	2.0	2.1	2.50	0.05
Jul-06	7.64	7.2	970	2.4	2.5	0.13	0.06
Oct-06	8.02	7.2	920	2.3	2.4	0.07	0.02
Jan-07	8.16	7.2	940	2.3	2.4	0.20	0.06
Apr-07	8.70	7.1	930	2.4	2.5	0.16	0.04
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	8.55	6.9	930	2.3	2.5	0.05	0.02
Nov-07	7.64	7.3	910	2.4	2.6	0.18	0.02
Jan-08	7.78	7.3	950	2.3	2.2	0.21	0.05
Apr-08	7.78	7.3	930	2.1	2.4	0.31	0.04
Jul-08	7.32	7.3	930	2.1	2.3	0.08	0.03
Oct-08	Pump Failure						
Jan-09	No access						
Apr-09	No sample taken - contract change over						
Jun-09	N/A	7.1	500	N/T	2	<0.01	0.03
Aug-09	N/A	7.6	570	Testing for these analytes not undertaken			
Nov-09	N/A	7.56	529	Testing for these analytes not undertaken			
Feb-10	N/A	7.78	602	0.96	1.1	0.03	0.04

MW13

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Sampled - Managers Request						
Jul-05	5.38	6.9	1050	3.4	3.5	0.10	0.07
Aug-05	5.23	6.6	1110	4.4	3.7	0.12	0.05
Sep-05	5.01	6.6	1210	3.9	3.8	0.12	0.08
Oct-05	5.08	6.8	1260	3.9	4.0	0.26	0.10
Nov-05	5.04	6.6	1240	4.0	4.0	0.14	0.10
Dec-05	4.20	7.0	1150	3.5	3.9	0.38	0.14
Jan-06	4.21	7.3	920	2.2	2.3	0.12	0.04
Feb-06	5.27	6.7	1190	3.2	3.8	0.14	0.08
Mar-06	5.76	6.7	1120	3.6	3.7	0.08	0.08
Apr-06	5.24	6.8	900	3.4	3.6	0.16	0.05
Jul-06	5.17	6.7	1120	3.6	3.6	0.10	0.07
Oct-06	5.33	6.7	1030	3.0	3.2	0.09	0.05
Jan-07	5.63	6.6	920	2.6	2.8	0.14	0.08
Apr-07	5.74	6.6	860	2.4	2.6	0.11	0.06
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	5.77	6.8	790	2.2	2.4	0.07	0.05
Nov-07	5.35	6.9	750	2.3	2.2	0.09	0.06
Jan-08	5.42	7.0	790	2.4	2.3	0.07	0.06
Apr-08	4.95	6.8	840	2.5	2.9	0.12	0.07
Jul-08	4.98	6.6	1120	2.6	2.8	0.14	0.07
Oct-08	4.63	6.9	1000	3.2	3.4	0.11	0.07
Jan-09	4.18	7	930	2.8	3.1	0.07	0.06
Apr-09	No sample taken - contract change over						
Jun-09	4.7	6.8	1050	N/T	4.4	0.02	0.04
Aug-09	5.63	7.3	880	Testing for these analytes not undertaken			
Nov-09	5.6	7.46	912	Testing for these analytes not undertaken			
Feb-10	5.37	7.79	840	2.03	2.1	0.06	0.06
17/05/2010	5.6						

MW14

Sample Date	Depth to Ground - metres	pH -field	Electrical Conductivity uS/cm - field	Nitrates_ mg N/L	Total Nitrogen_ mg/L	Total Phosphorus mg/L	Phosphorus - reactive mg/L
Jun-05	Site Not Installed						
Jul-05	Site Not Installed						
Aug-05	Site Not Installed						
Sep-05	Site Not Installed						
Oct-05	16.02	6.8	1080	22.0	22.0	2.40	0.02
Nov-05	15.93	6.9	1130	20.0	22.0	0.12	0.06
Dec-05	15.57	7.4	1150	18.0	19.0	0.28	0.10
Jan-06	15.32	7.1	2080	26.0	24.0	0.32	0.04
Feb-06	14.23	7.2	1080	12.0	16.0	0.24	0.08
Mar-06	15.28	7.3	1050	14.0	15.0	0.10	0.06
Apr-06	15.47	7.5	900	11.0	17.0	0.60	0.05
Jul-06	15.88	7.3	1030	6.9	11.0	0.17	0.06
Oct-06	16.17	7.3	1010	4.0	6.9	0.09	0.04
Jan-07	16.46	6.9	1060	15.0	15.0	0.14	0.04
Apr-07	16.41	7.0	1080	19.0	21.0	0.07	<0.01
Jul-07	Sampling postponed due to unsafe access following wet weather						
Aug-07	16.23	6.9	1070	21.0	22.0	0.06	0.04
Nov-07	15.9	7.1	1050	20.0	18.0	0.65	0.01
Jan-08	15.69	7.2	1080	20.0	20.0	0.60	0.03
Apr-08	13.9	7.0	960	20.0	20.0	0.54	0.01
Jul-08	16.0	6.9	1130	18.0	19.0	0.2	<0.01
Oct-08	15.69	6.9	1080	14	16	0.06	0.04
Jan-09	14.78	7	1080	16	18	0.1	0.03
Apr-09	No sample taken - contract change over						
Jun-09	16.41	7.1	1140	N/T	16.6	0.07	0.06
Aug-09	16.81	7.2	1140	Testing for these analytes not undertaken			
Nov-09	16.35	7.04	1260	Testing for these analytes not undertaken			
Feb-10	16.54	7.74	1310	15.3	16.8	0.09	<0.01

		6/01/2010	6/01/2010	6/01/2010		15/02/2010	15/02/2010	15/02/2010
		WCD	WCU	QCD		WCD	WCU	QCD
		Discharge	Discharge	Discharge		Discharge	Discharge	Discharge
pH Value	pH Unit	8.16	7.87	7.71		7.82	7.84	7.82
Electrical Conductivity @ 25°C	µS/cm	668	1270	687		118	1110	861
Suspended Solids (SS)	mg/L	54	18	10		62	18	10
Nitrite as N	mg/L					0.04	<0.01	<0.01
Nitrate as N	mg/L					3.87	<0.01	0.02
Nitrite + Nitrate as N	mg/L					3.91	<0.01	0.02
Total Kjeldahl Nitrogen as N	mg/L					1.9	0.6	0.3
Total Nitrogen as N	mg/L					5.8	0.6	0.3
Total Phosphorus as P	mg/L					0.11	0.25	0.1
Reactive Phosphorus as P	mg/L					0.05	0.22	0.1
Oil & Grease	mg/L	<5	<5	<5		<5	<5	<5
Total Organic Carbon	mg/L	4	13	5				

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Fauna Monitoring Werris Creek November 2009

1.0 Introduction

Eight plots, including a "rehabilitated" plot were sampled. The samplings were conducted between 2 and 4 November 2009. There is however some confusion between Plots 1, 2 and 4[1] in the previous report but it does not affect the result of any of the surveys. The mislabeling have been corrected in this report. The other plot numbers are as previously supplied.

It is noteworthy that the monitoring plots that have been set up for flora sampling and have not been standardized to a regular size. The fauna sampling plots based on the locations of these plots have been to a standardized an equivalent 100mx100m plots.

Plot 2 the long narrow grassland plot was cleared soon after this sample in February 2009 was taken and Plot 1 was scheduled for clearing in February 2010. Plots 3, 6 and 7 were also scheduled for clearing in the next 12 months as part of the mine extension. These monitoring plots are expected to be replaced in future with other similar plots in the Biodiversity Offset Areas.

In this late Spring samples the following factors that would have affected the results adversely should be noted:

i) In general, the season has been preceded by over 12 months of below average rainfall and last summer was severe, hot and dry,

ii) The fauna has already been affected by last summer's adverse conditions and,

iii) Plot 1 had been progressively isolated and the surrounding habitat patch quality diminished with the progression of the mine in the last nine months.

2.0 Methods

The following methods were used to sample the respective fauna groups. The sampling is influenced by the late hot Spring timing and the relatively thick ground cover that have resulted from the improvement of vegetation growth from the increased rain before last summer.

Daytime maximums were in the mid-30ºC during the sampling and night time minimums were above 20ºC. Although the weather was generally clear with light winds and cloud cover which increased to gusty winds on the evening of the 3 November 2009 proceeding a cool change.

[1] Plot 4 (the woodland plot) was assigned Plot 1; Plot 1 (the fenced woodland plot) was assigned Plot 2 and Plot 2 (the long narrow grassland plot) was assigned Plot 4 in the last report.

2.1 Birds and Mammals

Each plot was traversed on foot along its length ten times at approximately 10 metre intervals to cover an area equivalent to 1000sq m (ie 100mX100m).

Signs of mammals and birds including tissue remains and droppings as well as activities of occupation and use were noted.

Species that occurred within sight and hearing distance of the plots were also recorded.

Spotlight transects were conducted along access tracks on the mining lease for the nocturnal species and bats were sampled using Anabat ultrasonic bat recording equipments.

Ultrasonic bat call recorders were placed in the Woodland habitats on Plot 1 and Plot 4. Due to the mobility of these species and close proximity of various plots, not all plots were sampled independently for these wholly aerial based samples. Excessively high winds caused the analysis of the recording from Plot 6 to be abandoned as it recorded no reliable call sequence.

Callback broadcasts were conducted near Plot 1, Plot 4 and Plot 6.

2.2 Reptiles and Amphibians

Signs of reptiles and amphibians on each plot were determined in the manner as described for birds. On each transect the ground and vegetation was closely examined, any timber or other debris on the ground was lifted (where possible) and standing dead timber checked to locate any reptiles or frogs.

In addition to the nocturnal spotlight searches, the various dams and other suitable habitat on the mining lease were visited during daylight hours to record the species present.

3.0 Results

The following is a summary of the results of the eight monitoring samples. Species present on the various plots are indicated with a dash (" - ") in the column.

3.1 Birds

The bird species recorded during this monitoring sample are marked against the list submitted in the Werris Creek Coal Mine proposal report.

Status: All the native birds are protected and the listed vulnerable species are marked with "V". The only exotic species is marked with "#".

~ = A species recorded during a previous pre-start inspection. This parrot is nomadic in this part of its distribution range.

^ = Species not recorded previously on the Werris Creek site in the EIS survey.

Common Name	Scientific Name	P1	P2	P3	P4	P5	P6	P7	R1	Lease
1. Chenonetta jubata	Australian Wood Duck			-						
2. Anas superciliosa	Pacific Black Duck									
3. Egretta novaehollandiae	White-faced Heron									-
4. Falco peregrinus	Peregrine Falcon									
5. Falco cenchroides	Nankeen Kestrel							-		
6. Vanellus miles	Masked Lapwing									
7. Geopelia striata	Peaceful Dove									
8. Cacatua roseicapilla	Galah	-	-	-	-	-			-	
9. Cacatua galerita	Sulphur-crested Cockatoo							-		-
10. Glossopsitta pusilla	Little Lorikeet									
11. Platycercus eximius	Eastern Rosella	-	-	-	-	-	-	-		
12. Psephotus haematonotus	Red-rumped Parrot			-						-
13. Psephotus varius	Mulga Parrot									
14. Ninox novaeseelandiae	Southern Boobook									
15. Dacelo novaeguineae	Laughing Kookaburra									-
16. Eurystomus orientalis	Dollarbird						-			
17. Pardalotus punctatus	Spotted Pardalote									
18. Pardalotus striatus	Striated Pardalote									
19. Acanthiza pusilla	Brown Thornbill									
20. Acanthiza chrysorrhoa	Yellow-rumped Thornbill									
21. Acanthiza lineata	Striated Thornbill									
22. Philemon corniculatus	Noisy Friarbird									
23. Manorina melanocehrla	Noisy Miner	-		-	-	-		-		
24. Melanodryas cucullata	Hooded Robin (V)									
25. Rhipidura lecophrys	Willy Wagtail									-
26. Coracina novaehollandiae	Black-faced Cuckoo-strike									
27. Cracaticus nigrogulsris	Pied Butcherbird									
28. Gymnorhina tibicen	Australian Magpie		-		-				-	
29. Strepera graculina	Pied Currawong									
30. Corvus coronoides	Australian Raven									
31. Corvus bennetti	Little Crow									
32. Hirundo nigricans	Tree Martin									
33. Sturunus vulgaris	Common Starling #		-	-	-			-	-	
34. Threskiomis molucca	Australian White Ibis									
35. Artamus cyanopterus	Dusky Woodswallow									
36. Coturnix pectoralis	Stubble Quail									
37. Podargus strigoides	Tawny Frogmouth									
38. Cacatua leadbeateri~	Pink Cockatoo (V)									
39. Poliocephalus poliocephalus	Hoary-headed Grebe									
40. Elanus axillaris	Black-shouldered Kite				-					
41. Phalacrocorax sulcirostris	Little Pied Cormorant									
42. Glossopsitta concinna	Musk Lorikeet									
*43. Barnardius zonarius^*	Australian Ringneck									
*44. Cracaticus torquatus^*	Grey Butcherbird				-					
*45. Acridotheres tristis^*	Common Myna#									
*46. Tyto alba^*	Barn Owl									-
*47. Ocyphaps histrionic^*	Crested Pigeon					-				
*48. Anthus novaeseelandiae^*	Richard's Pipit									
*49. Columba livia^*	Domestic Pigeon#				-					
*50. Falco berigoga^*	Brown Falcon									
*51. Hieraaetus morphonoides^*	Little Eagle									
*52. Grallina cyanoleuca^*	Magpie-lark									
*53. Malurus assimilis^*	Variegated Wren			-						
*54. Cheramoeca leucstrunum^*	White-backed Swallow			-						-
*55. Coturnix australis^*	Brown Quail	-		-						

56. Anas platyrhynchos^	Mallard#		-							
57. Anthus novaeseelandiae^	Richard's Pipit									-
58. Hirundo neoxena^	Welcome Swallow									-
59. Malurus cyaneus^	Superb Fairy-wren									-

A general cumulative increase in the number of species recorded since the original sample for this mine's EIS has been discussed in the previous report and bears no need for repetition here.

There was again, an obvious seasonal drop in the numbers and variety of parrots with only the robust generalist, such as Galahs, Eastern Rosellas and Red-rumped Parrots remaining common in the area. There is a noticeable increase in the occurrences of the Common Starlings. Richard's Pipit, as species what strive in flat open country has showed in presence next to the rehabilitated areas.

3.2 Mammals

The mammal species recorded during this monitoring sample are marked against the list submitted in the Werris Creek Coal Mine proposal report.

Status: P = Protected, U = Unprotected, # = Exotic, + = Listed Threatened Process

^ = Species not recorded on the Werris Creek site before the mine commenced.

Scientific Name	Common Name	Status	P1	P2	P3	P4	P5	P6	P7	R1	Lease
1. Tachyglossus aculeatus	Short-beak Echidna	P									
2. Felis catus	Feral Cat +#	U									-
3. Canis (Lupus) familiaris	Farm Dog #	U									
4. Vulpes vulpes	European Red Fox +#	U								-	-
5. Trichosurus vulpecula	Brush-tailed Possum	P									
6. Macropus robustus	Euro	P	-							-	-
7. Macropus rufogriseus	Red-necked Wallaby	P									
8. Macropus giganteus	Grey Kangaroo	P	-		-	-	-	-	-		-
9. Bos taurus	Domestic Cattle #	U			-				-		
10. Oryctolagus cuniculus	European Rabbit +#	U			-	-	-	-			-
11. Rattus rattus	Black Rat #	U									
12. Mus domesticus	House Mouse #	U									
13. Lepus europaeus^	Hare #	U		-							-
14. Sus scrofa^	Feral Pig #	U									

The non-volant mammal fauna is indicative for an area that had been agricultural land and is still surrounded by farmlands with long agricultural land use histories. Nevertheless a number of interesting observations is noteworthy.

There were more hares than rabbits observed in the lease although rabbit faecal pellets were more frequently encountered in the monitoring plots. A Feral Cat and Red Fox was observed in the rehabilitated area and Cattle were grazing freely around Plots 3 and Plot 7.

Fewer Eastern Gray Kangaroos were observed compared to those that were around in the same area in February this year but this is a highly mobile species that will congregate in different areas selectively depending often on local microclimatic conditions.

It is however interesting to note a large male Euro has taken up resident in the rehabilitated area in the vicinity of Plot R1.

3.3 Bats

The following bats were recorded in the various plots during these monitoring samples. The species recorded are marked against the list of species recorded during the project proposal survey. Because of their aerial mobility the sampling for bats is not plot based. The locations with reference to plots are merely indicative to cover the whole lease.

Common Name	Scientific Name	Status	Plot 1	Plot 4
			8.8hrs	10.7hrs
1. Mormopterus sp 4	Undescribed Little Mastiff-bat @ 25KHz	P	-	-
2. Mormopterus sp 3	Undescribed Little Mastiff-bat @ 30KHz	P	-	-
3. Chalinolobus gouldii	Gould's Wattled Bat	P	-	-
4. Miniopterus schreibersii	Large (Common) Bentwing Bat	V		
5. Scotorepens balstoni	Western Broad-nosed Bat	P		
6. Vespadelus darlingtoni	Large Forest Bat	P		-
7. Tadarida (Nyctinomus) australis	White-striped Mastiff-bat	P	-	-
8. Nyctophilus spp	Long-eared Bats	P		
9. Vespadelus vulturnus	Little Forest Bat	P	-	-
10. Vespadelus regulus	Southern Forest Bat	P		
*11. Scotorepens greyii^*	Little Broad-nosed Bat	P		
*12. Chalinolobus mario^*	Chocolate Wattled Bat	P		
*13. Saccolaimus flaviventris^*	Yellow-bellied Sheath-tail Bat	V		
*14. Chalinolobus picatus^*	Little Pied Bat	V	-	

Comments on differentiating *Nyctophilus* species are in the previous report and bear no repetition here. The lack of recording of any recognizable call sequence is puzzling but may reflect the rareness of this species in severe drought and/or ground cover conditions. This species hunts larger insects (mostly moths) by sound at ground level rather than by echolocation.

The listed vulnerable *Miniopterus schreibersii* was not recorded in neither the February or this sampling. A second listed vulnerable species. *Saccolaimus flaviventrus,* first recorded on the site last year was no recorded on this site.

The detection of a third listed vulnerable, *Chalinolobus picatus,* that was not previously recorded on the site is significant as this is closed to its eastern distribution limits. It would appear that this species in the last year may be moving into what would be less semi-arid areas during unusually dry periods as the aridity increase with lower than normal rainfall.

The progressive rehabilitation in the Werris Creek Coal Mine could probably warrant, in future, targeting the rehabilitated areas for comparison with controls in the Biodiversity Offset Areas.

3.4 Reptiles

The following reptiles, all protected species, were recorded on the various plots marked against a list of species that were recorded during the mine proposal survey.

Scientific Name	**Common Name**	P1	P2	P3	P4	P5	P6	P7	R1	Lease
1. Underwoodisaurus milii	Thick-tailed Gecko									
2. Strophurus williamsi	Eastern Spiny-tailed Gecko									
3. Demansia psammophis	Yellow-faced Whip Snake						-			
4. Delma plebeia	Leaden Delma									
5. Cryptoblepharus pulcher+	Wall Lizard (Skink)	-			-	-		-	-	

6.	*Anomalopus leuckartii*	Two-clawed Worm-skink (Burrowing Skink)									
7.	*Menetia greyii*	Common Dwarf Skink									
8.	*Eulamprus (Egernia) striolata*	Tree Crevice-skink	-		-	-			-		
9.	*Gehyra variegata*	Variegated (Common) Dtella						-			
10.	*Morethia boulengeri*	South-eastern Morethia Skink	-		-	-		-		-	
11.	*Eulamprus tenuis*	Bar-sided (Forest-)skink									
12.	*Ctenotus robustus*	Eastern Striped (Robust) Ctenotus					-				-
13.	*Ramphotyphlops wiedii*	Brown-snouted Blind Snake									
14.	*Chelodina longicollis*	Eastern Snake-necked Turtle									
15.	*Strophurus intermedius*	Southern Spiny-tailed Gecko									-
16.	*Pseudonaja textilis*^	Eastern Brown Snake									
17.	*Oedura robusta*^	Robust Gecko									
18.	*Carlia tetradactyla*^	Southern Rainbow Skink				-					
19.	*Delma inornata*^	Plain Snake-lizard						-			
20.	*Anomalopus leuckartii*^	Burrowing Skink						-	-		
21.	*Pogona barbata*^	Eastern bearded Dragon						-			

+ This species has previously been misidentified as *C. virgatus* its eastern parapatric species.

^ = Species not recorded previously on the Werris Creek site in the EIS survey.

No reptile was recorded on the Grassland plots (Plot 2) and the rehabilitate plot (R1) now has two skink species recorded in it. In the Woodland plots (Plot 4 and Plot 6) where the grass ground cover has started to open up having deteriorated over winter after seeding.

Four other species that have not been recorded previously were added in the reptile list during this sample.

3.5 Amphibians

No frog or frog activity was recorded in any of the plots on the Werris Creek site during these monitoring samples. Most of the dams had no sign of frog activity in them – calls or egg masses. However, the following species had been recorded on the site during the original mine proposal survey except for the species marked with "^" below.

Scientific Name	**Common Name**	**Presence Recorded**
1. Limnodynastes tasmaniensis	Spotted Marsh Frog	
2. Neobatrachus sudelli	Sudell's Frog	
3. Limnodynastes salmini	Salmon-striped Frog	
4. Limnodynastes dumerilli	Eastern Banjo Frog	
5. Litoria peronii	Peron's Tree Frog	-
6. Litoria caerulea	Green Tree Frog	
7. Uperoleia laevigata	Smooth Toadlet	
8. Litoria rubella	Desert Tree Frog	-
9. Litoria verreauxii^	Whistling Tree Frog	-

Three species were recorded during this survey between Plot 6 and explosive dump, and around the homestead at "Old Colliery" including the swimming pool. The Whistling Tree Frog, albeit a common species, was not recorded in the original EIS survey.

The dry and extreme conditions over the last year have decimated the frogs in this mining lease. The progression of the mine up to this point has not impact on much of the lower areas surrounding the current mine pit.

4.0 Comments

The general decline in fauna diversity and richness has been commented in each of the sub-sections above. The reason for this is most likely the extreme in climatic conditions that adversely affected the fauna as postulated in the introduction.

With the modifications and extension of the Werris Creek Coal Mine, this fauna monitoring program has been complicated by the necessity to replace over half of the monitoring plots.

No conclusions can therefore be drawn, at this stage, from the results obtained to date, regarding the effectiveness of the fauna safeguards and ameliorative measures that were put in place since the operation of this mine began.

5.0 Recommendations

Five monitoring plots, including two native grassland plots are replaced by equivalent plots in the Biodiversity Offset Area.

Twenty randomly placed roof tiles be placed in Plot 5[2] and the two native grassland replacement plots to augment the habitat and assist in the sampling of reptiles, especially for the skinks.

Dr Leong Lim
Principal Ecologist November 2009

CES

[2] Notwithstanding that this is an Open Woodland plot, there is very little ground habitat structure due to the rocky substrate in this plot. It can benefit from the augmentation with 20 randomly placed roof tile.

Date fired	Time Fired	Werris Creek Coal Blasting Results							
		Glenala		Railway View		Old Colliery		Escott Road	
		Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
1/04/2009	13:10	-	-	0.33	110.3	0.93	113.6	-	-
6/04/2009	16:36	-	-	0.2	110.4	-	-	1.88	113.8
17/04/2009	14:04	-	-	1.84	112.1	-	-	-	-
24/04/2009	13:17	-	-	3.31	110.8	0.65	107	-	-
1/05/2009	13:17	-	-	0.65	110.7	1.11	109.3	-	-
4/05/2009	13:17	-	-	0.1	110.8	1.16	114.4	0.69	108.3
5/05/2009	13:08	-	-	0.67	111	0.4	106.4	-	-
8/05/2009	13:21	-	-	0.75	100.2	0.48	101	0.43	98.5
14/05/2009	13:06	-	-	1.54	114.8	1.08	112.2	1.37	89.7
15/05/2009	13:16	-	-	1.12	112.8	0.86	109.4	-	-
22/05/2009	13:07	-	-	0.1	109.1	1.21	113.3	0.87	113.8
5/06/2009	13:07	-	-	1.39	122.1	0.08	112.2	-	-
5/06/2009	13:07	-	-	1.39	122.1	0.08	112.2	-	-
16/06/2009	13:11	-	-	0.52	107.4	0.28	99.8	-	-
17/06/2009	13:05	-	-	1.16	113.7	0.79	113.2	-	-
23/06/2009	14:24	-	-	2.59	81.2	2.01	106	-	-
23/06/2009	14:24	-	-	2.59	81.2	2.01	106	-	-

Date fired	Time Fired	Werris Creek Coal Blasting Results									
		Glenala		Railway View		Old Colliery		Escott Road		Marengo	
		Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
1/07/2009	13:04	-	-	1.68	113.3	1.41	105.5	1.57	84.7		
6/07/2009	13:22	-	-	1.12	107	0.43	110	-	-		
7/07/2009	13:03	-	-	1.19	104.1	0.43	107.3	-	-		
8/07/2009	13:11	-	-	0.58	113	0.43	110.3	-	-		
9/07/2009	13:04	-	-	-	-	0.35	111.2	-	-		
15/07/2009	13:10	-	-	1.49	100.7	1.51	113.3	-	-		
16/07/2009	12:43	-	-	1.29	112.5	1.23	88.9	-	-		
20/07/2009	13:10	-	-	0.6	100.7	0.28	95	-	-		
21/07/2009	13:08	-	-	1.42	104.1	2.24	113.5	-	-		
23/07/2009	13:13	0.07	113	0.67	113.6	0.8	114.3	-	-		
27/07/2009	13:02	-	-	0.8	81.2	0.85	82.9	-	-		
29/07/2009	13:10	-	-	0.32	85.2	0.7	99.8	-	-		
30/07/2009	13:02	0.35	102.8	1.32	112	1.76	104.5	-	-		
5/08/2009	13:11	0.47	99.8	0.94	112.7	0.9	113.9	-	-		
6/08/2009	13:02	-	-	0.35	109.1	0.31	112.6	0.43	88.9		
11/08/2009	16:37	1.82	103	3.23	104.4	2.8	106.9	1.12	103.2		
14/08/2009	13:11	-	-	0.87	108	2.44	114.8	2.29	105.2	0.55	105.2
18/08/2009	10:14	-	-	-	-	0.39	86.8	-	-	-	-
25/08/2009	9:10	-	-	0.37	108.9	2.29	113.5	0.31	101.1	0.55	102.7
19/08/2009	13:10	-	-	0.65	96	-	-	-	-	-	-
24/08/2009	15:19	-	-	-	-	-	-	-	-	-	-
26/08/2009	13:17	-	-	0.5	112.3	1.18	112.3	-	-	-	-
28/08/2009	13:07	-	-	0.66	100	0.65	108	0.53	104.9	-	-

Date fired	Time Fired	Werris Creek Coal Blasting Results									
		Glenala		Railway View		Old Colliery		Escott Road		Marengo	
		Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
1/09/2009	13:27	-	-	0.7	113.2	1	112.8	-	-	-	-
9/09/2009	13:12	-	-	0.4	98.1	0.45	99.8	-	-	-	-
3/09/2009	13:11	0.07	110.8	2.44	100.2	0.78	104.5	0.92	113.3	-	-
9/09/2009	13:12	-	-	0.4	98.1	0.45	99.8	-	-	-	-
11/09/2009	13:08	-	-	1.17	98.1	0.3	99.8	-	-	-	-
24/09/2009	9:21	0.07	110.6	1.29	107.6	1.56	113.3	0.36	103.6	0.47	113.4
16/09/2009	13:19	-	-	1.72	107.6	0.55	116.6	0.59	114.5	-	-
18/09/2009	13:48	-	-	0.65	99.2	1.08	111.4	0.33	104.9	-	-
18/09/2009	13:48	-	-	0.65	99.2	1.08	111.4	0.33	104.9	-	-
22/09/2009	13:13	-	-	0.82	92	0.65	110.8	-	-	0.1	107.4
25/09/2009	13:11	-	-	2.39	97.4	2.01	108.5	0.61	102.7	-	-
7/10/2009	15:03	-	-	2.29	111.3	0.08	125.8	1.02	110.5	-	-
1/10/2009	16:12	-	-	1.79	107.4	1.81	116.9	0.25	100.6	-	-
2/10/2009	13:05	-	-	0.35	95.1	0.31	111.7	-	-	-	-
8/10/2009	13:10	-	-	0.77	98.1	0.88	112.3	1.45	109.9	-	-

Date fired	Time Fired	Werris Creek Coal Blasting Results - New Locations							
		Glenala		Marengo		Thonsley Park		Cintra	
		Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
12/10/2009	13:30	-	-	0.5	94.2	0.33	101	0.59	107.2
13/10/2009	13:12	-	-	-	-	-	-	-	-
15/10/2009	9:08	-	-	-	-	-	-	0.46	99.2
19/10/2009	13:08	-	-	0.52	109.5	-	-	0.51	112.9
29/10/2009	13:14	-	-	-	-	-	-	-	-
20/10/2009	13:04	-	-	-	-	-	-	-	-
21/10/2009	13:11	-	-	-	-	-	-	-	-
22/10/2009	13:10	-	-	-	-	-	-	0.64	101.4
30/10/2009	13:14	0.1	113	0.5	101.2	0.6	104.9	0.71	107.5

Date fired	Time Fired	Werris Creek Coal Blasting Results - New Locations							
		Glenala		Marengo		Thonsley Park		Cintra	
		Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
4/11/2009	13:07	-	-	-	-	-	-	0.48	110.7
5/11/2009	13:18	-	-	0.45	107.1	0.4	98.5	0.61	103.2
13/11/2009	13:00	-	-	0.1	112.6	-	-	0.43	104.5
10/11/2009	13:11	-	-	-	-	-	-	-	-
17/11/2009	13:12	-	-	0.55	106.7	0.5	108.2	0.76	110.7
20/11/2009	13:38	-	-	0.78	99.2	0.89	98.1	0.89	101.1
24/11/2009	13:20	-	-	-	-	-	-	-	-
26/11/2009	13:17	-	-	0.93	110.9	0.89	103.1	1.2	108
30/11/2009	13:15	-	-	-	-	-	-	-	-
1/12/2009	13:25	-	-	-	-	-	-	-	-
17/12/2009	9:35	-	-	0.42	102.8	0.84	105.6	0.73	102.4
8/12/2009	13:11	-	-	-	-	0.63	110	0.99	104.9
7/12/2009	13:09	-	-	-	-	-	-	0.84	107.7
14/12/2009	13:16	-	-	0.45	102	-	-	0.38	100.6
18/12/2009	13:07	-	-	0.82	106.8	0.71	105.6	0.97	108.8
22/12/2009	11:54	-	-	-	-	-	-	-	-
8/01/2010	13:16	-	-	-	-	0.73	109.1	0.76	114.5
8/01/2010	13:16	-	-	-	-	0.73	109.1	0.76	114.5
12/01/2010	13:07	-	-	1.1	102.8	-	-	1.12	101.1
15/01/2010	13:16	-	-	0.5	102	0.73	98.9	0.76	103.2
19/01/2010	13:17	-	-	0.57	105.2	0.73	106.2	1.47	112.1
22/01/2010	13:19	-	-	0.7	109.5	0.66	113	0.84	113
22/01/2010	13:19	-	-	0.7	109.5	0.66	113	0.84	113
27/01/2010	13:20	-	-	0.47	106.2	0.45	104.1	0.84	109.2

Date fired	Time Fired	Werris Creek Coal Blasting Results - New Locations							
		Glenala		Marengo		Thonsley Park		Cintra	
		Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)	Vib (mm/s)	OP (dB)
4/02/2010	13:12	-	-	0.85	101.7	0.63	99.6	1.27	102.2
1/02/2010	13:13	-	-	0.52	106.2	0.65	104.7	0.94	111.1
5/02/2010	13:10	-	-	-	-	0.66	103.3	1.07	110.1
11/02/2010	13:11	-	-	-	-	-	-	-	-
10/02/2010	13:18	-	-	0.42	104.3	0.63	107.1	0.87	111.6
11/02/2010	13:11	-	-	-	-	-	-	-	-
12/02/2010	13:12	-	-	-	-	-	-	-	-
17/02/2010	13:38	-	-	0.5	103.7	0.81	107.9	1.32	111.8
22/02/2010	16:58	-	-	-	-	-	-	0.51	106.1
24/02/2010	13:13	-	-	0.5	98.9	0.58	96.4	0.43	99.2
26/02/2010	13:06	-	-	0.5	105.9	0.58	106.2	0.79	113.2
2/03/2010	13:16	-	-	-	-	-	-	-	-
4/03/2010	13:15	-	-	0.45	98.9	0.55	94.6	0.6	113
5/03/2010	13:05	-	-	-	-	-	-	0.63	112.3
9/03/2010	13:29	-	-	-	-	-	-	-	-
11/03/2010	13:14	-	-	0.62	109.5	0.4	112	0.16	114.3
12/03/2010	13:12	-	-	-	-	0.58	104.1	1	111.1
16/03/2010	13:20	-	-	0.82	97.1	0.48	97.7	0.66	100.8
17/03/2010	13:22	-	-	0.1	112.2	0.1	112.6	0.13	113.7
19/03/2010	13:11	-	-	1	105.9	0.7	100.6	0.84	108.4
23/03/2010	13:46	-	-	0.92	94.8	0.68	94.6	0.84	95.4

29 April 2009

Ref: 04035/3077

Mr. Lynden Cini
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1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: APRIL 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the afternoon of Monday 27th April and finishing in the morning of Tuesday 28th April 2009. Noise measurement locations for the attended noise survey are listed below:

Location R2: Zeolite Australia
Location R3: Cintra
Location R4: Old Colliery*
Location R5: Mountain View
Location R6: Hillview*
Location R7: Railway View*
Location R8: Hazeldene
Location R10: Escott

* Hillview, Railway View and Old Colliery are mine owned residences.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

The afternoon of March 11 was cool and clear with a gusty breeze from the west north west. The wind continued gusty from the west north west throughout the evening. Wind speeds dropped off during the night and were more from the north north west.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. Data from the weather station showed strong winds during the day and evening. Observations (and measurements with a hand held anemometer) made at the time of the monitoring indicated wind speeds at ground level were lower than this. The data showed strong temperature inversion conditions were present from early evening and persisted throughout the survey.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 27 April 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	3:52 pm	39	n/a	4.9 m/s NNW	Insects/birds (37), wind (32), WCC inaudible
Cintra	4:10 pm	38	n/a	4.9 m/s W	Insects/birds (37), wind (32), traffic (28), WCC inaudible
Old Colliery	3:15 pm	39	n/a	4.0 m/s W	Wind (35), insects/birds (34), traffic (33), WCC inaudible
Mountain View	5:28 pm	43	n/a	2.2 m/s WNW	Birds/insects (43), wind (31), WCC (<30)
Hillview	4:27 pm	55	n/a	4.9 m/s WNW	Traffic (55), WCC (37), birds (37), wind (30)
Railway View	4:40 pm	46	n/a	3.1 m/s WNW	Traffic (44), WCC (42), birds (30)
Hazeldene	5:10 pm	37	n/a	3.1 m/s WNW	Traffic (34), wind (30), birds/insects (27), WCC inaudible
Escott	3:24 am	35	n/a	3.1 m/s WSW	Insects/birds (33), wind (30), train (28), WCC inaudible

Table 2
WCC Noise Monitoring Results – 27 April 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	8:20 pm	30	n/a	3.6 m/s WNW	Wind (28), insects (25), WCC inaudible
Cintra	8:37 pm	29	n/a	3.1 m/s WNW	Wind (27), insects (22), traffic (22), WCC inaudible
Old Colliery	7:40 pm	35	n/a	4.5 m/s WNW	Traffic (35), WCC barely audible
Mountain View	9:42 pm	30	n/a	3.1 m/s WNW	Insects (28), WCC (25)
Hillview	8:45 pm	50	n/a	2.7 m/s WNW	Traffic (50), WCC (34), insects (30)
Railway View	9:03 pm	51	n/a	2.7 m/s NW	Train (49), WCC (46)
Hazeldene	9:25 pm	31	n/a	2.7 m/s WNW	Traffic (30), WCC (24)
Escott	8:02 pm	32	n/a	4.0 m/s WNW	Plane (32), insects (25), WCC inaudible

Table 3 WCC Noise Monitoring Results – 27/28 April 2009 (night)					
Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	10:35 pm	26	>+3	2.2 m/s WNW	Bats (23), wind (23), WCC inaudible
Cintra	10:52 pm	33	>+3	1.7 m/s NW	Dogs (32), traffic (25), WCC inaudible
Old Colliery	10:00 pm	35	>+3	2.7 m/s NW	Traffic (34), birds (28), WCC (27)
Mountain View	12:33 am	28	>+3	3.1 m/s WNW	WCC (27), traffic (21)
Hillview	11:10 pm	42	>+3	2.2 m/s WNW	Traffic (42), WCC (32)
Railway View	12:10 am	44	>+3	2.2 m/s WNW	Train (43), WCC (37)
Hazeldene	12:50 am	38	>+3	2.9 m/s NW	Traffic (38), WCC (30), insects (27)
Escott	10:18 pm	26	>+3	2.7 m/s WNW	Birds (24), dogs (20), WCC inaudible

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Railway View during each of the day, evening and night monitoring periods and at Hillview during the day. Railway View and Hillview are mine owned properties.

The mine noise at each of these receivers was from general mine emissions including haul truck engine revs, dozer tracks, noise from the shovel and general mine hum.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. At the time of the day measurements at Railway View and Hillview wind speeds were in excess of 3m/s. Throughout the entire night time period the average inversion strength was >+3° C/100m (as extrapolated from data recorded by the mine operated weather station).

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed 45 dB(A) Lmax between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine. During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any monitoring location.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

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1 June 2009

Ref: 04035/3118

Mr. Lynden Cini
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RE: MAY 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the afternoon of Thursday 28th May and finishing in the morning of Friday 29th May 2009. Noise measurement locations for the attended noise survey are listed below:

Location R2:	Zeolite Australia
Location R3:	Cintra
Location R4:	Old Colliery*
Location R5:	Mountain View
Location R6:	Hillview*
Location R7:	Railway View*
Location R8:	Hazeldene
Location R10:	Escott

* Hillview, Railway View and Old Colliery are mine owned residences.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

The afternoon of May 28 was mild and cloudy with a light to moderate breeze from the west to west north west. The wind shifted to the south and south eats during the evening and night. Wind speeds dropped off during the night.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data showed strong temperature inversion conditions were present from mid evening and persisted throughout the survey.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 28 May 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	3:13 pm	39	n/a	1.3 m/s NW	Zeolite Australia (38), WCC (34)
Cintra	3:30 pm	38	n/a	0.4 m/s W	WCC (36), insects/birds (34)
Old Colliery	2:35 pm	35	n/a	2.2 m/s W	Insects/birds (31), traffic (30), WCC (30)
Mountain View	5:00 pm	35	n/a	2.2 m/s SSW	Birds/insects (35), traffic (21), WCC inaudible
Hillview	3:48 pm	57	n/a	0.9 m/s WNW	Train (57), birds (42), traffic (40), WCC (36)
Railway View	4:17 pm	46	n/a	0.4 m/s WNW	Traffic (44), WCC (42), birds (30)
Hazeldene	4:41 pm	42	n/a	1.8 m/s SSW	Traffic (40), birds/insects (37), WCC inaudible
Escott	2:55 am	35	n/a	1.3 m/s WNW	Plane (34), WCC (27), insects/birds (25)

Table 2
WCC Noise Monitoring Results – 28 May 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	8:17 pm	33	n/a	1.8 m/s SE	WCC (32), birds & insects (25),
Cintra	8:35 pm	34	n/a	2.2 m/s SSE	WCC (33), birds & insects (26)
Old Colliery	7:40 pm	40	n/a	1.3 m/s S	Insects (38), WCC (32), traffic (31)
Mountain View	9:44 pm	30	n/a	0.9 m/s SSE	WCC (30), insects (20),
Hillview	8:53 pm	56	n/a	2.2 m/s SSE	Traffic (56), WCC (31), birds & insects (30)
Railway View	9:10 pm	47	n/a	2.2 m/s SE	WCC (47), insects (25)
Hazeldene	9:29 pm	30	n/a	1.8 m/s SE	WCC (29), farm animals (22)
Escott	8:00 pm	32	n/a	1.8 m/s SSE	Plane (30), WCC (28), insects (20)

Table 3 WCC Noise Monitoring Results – 28/29 May 2009 (night)					
Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	10:38 pm	35	>+3	0.9 m/s S	WCC (34), traffic (28)
Cintra	10:55 pm	33	>+3	1.3 m/s S	WCC (31), traffic (29), insects (26)
Old Colliery	10:02 pm	44	>+3	Calm	WCC (41), birds & insects (39),
Mountain View	12:47 am	35	>+3	0.9 m/s SSE	WCC (34), insects (30)
Hillview	11:07 pm	43	>+3	1.5 m/s S	WCC (42), traffic (40),
Railway View	12:10 am	46	>+3	1.8 m/s SSE	WCC (46)
Hazeldene	12:30 am	47	>+3	0.9 m/s SE	Train (47), WCC (35), insects (27)
Escott	10:21 pm	35	>+3	0.4 m/s SE	WCC (34), train (25), insects (23)

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Railway View during each of the day, evening and night monitoring periods and at Cintra during the day and Old Colliery and Hillview at night.

Railway View, Old Colliery and Hillview are mine owned properties. The residence at Cintra is the subject of an agreement with the mine in respect to noise.

The mine noise at Railway View, Hillview and Old Colliery was from general mine emissions including haul truck engine revs, dozer tracks, noise from the shovel and general mine hum. At Cintra the noise was from a dozer working on the stockpile at the rail loading facility.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Throughout the entire night time period the average inversion strength was >+3° C/100m (as extrapolated from data recorded by the mine operated weather station).

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed 45 dB(A) Lmax between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC exceeded the sleep disturbance criterion at Old Colliery, Hillview and Railway View. The Lmax noise levels were attributable to impact noises and loud engine revs. All of these three residences are mine owned.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

18 June 2009

Ref: 04035/3121

Mr. Lynden Cini
Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: JUNE 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the afternoon of Tuesday 9th June and finishing in the morning of Wednesday 10th June 2009. Noise measurement locations for the attended noise survey are listed below:

Location R2: Zeolite Australia
Location R3: Cintra
Location R4: Old Colliery*
Location R5: Mountain View
Location R6: Hillview*
Location R7: Railway View*
Location R8: Hazeldene
Location R10: Escott

* Hillview, Railway View and Old Colliery are mine owned residences.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

The afternoon of June 9 was cool and clear with winds from the west to west north west. Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The data showed strong temperature inversion conditions were present throughout the night section of the survey.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 9 and 10 June 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	5:12 pm	42	n/a	6.3 m/s W	Wind (40), birds (36), WCC (30)
Cintra	5:30 pm	45	n/a	5.8 m/s W	Wind (44), insects/birds (38), WCC inaudible
Old Colliery	4:35 pm	45	n/a	6.3 m/s W	Insects/birds (44), wind (35), WCC (35)
Mountain View	8:40 am	42	n/a	2.2 m/s SSW	Insects/birds (39), wind (38), traffic (30), WCC inaudible
Hillview	8:22 am	65	n/a	4.5 m/s WNW	Train (65), traffic (45), insects/birds (35), WCC (30)
Railway View	8:03 am	52	n/a	4.9 m/s WNW	WCC (51), birds (44)
Hazeldene	8:22 am	40	n/a	4.9 m/s WNW	Traffic (38), insects/birds (34), WCC inaudible
Escott	4:55 pm	38	n/a	4.0 m/s WNW	Wind (35), insects/birds (32) plane (30), WCC inaudible

Table 2
WCC Noise Monitoring Results – 9 June 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	8:18 pm	38	n/a	5.4 m/s WNW	Wind (35), birds & insects (32), plane (30), WCC faintly audible
Cintra	8:35 pm	41	n/a	4.9 m/s WNW	Wind (40), birds & insects (36), WCC inaudible
Old Colliery	7:40 pm	40	n/a	3.6 m/s WNW	Insects (35), wind (35), WCC (33)
Mountain View	9:44 pm	40	n/a	5.4 m/s W	Wind (39), WCC (35)
Hillview	8:54 pm	43	n/a	6.3 m/s W	Wind (39), WCC (39), traffic (35)
Railway View	9:11 pm	52	n/a	7.2 m/s WNW	WCC (51), wind (42)
Hazeldene	9:28 pm	43	n/a	5.8 m/s W	Wind (39), WCC (38), insects (32)
Escott	8:01 pm	33	n/a	4.5 m/s WNW	WCC (30), planes (28), wind (25)

Table 3
WCC Noise Monitoring Results – 9 and 10 June 2009 (night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	10:37 pm	38	>+3	4.2 m/s WNW	Wind (37), insects (31), WCC inaudible
Cintra	10:55 pm	35	<+3	4.2 m/s WNW	Wind (35), WCC inaudible
Old Colliery	10:01 pm	38	<+3	4.5 m/s WNW	Wind (36), WCC (32), insects (32), traffic (25)
Mountain View	12:50 am	38	<+3	4.9 m/s WNW	Wind (38), WCC (32)
Hillview	11:12 pm	46	>+3	4.0 m/s WNW	Traffic (46), WCC (35)
Railway View	12:15 am	50	>+3	4.9 m/s WNW	WCC (49), wind (40)
Hazeldene	12:33 am	41	>+3	5.4 m/s WNW	Wind (39), WCC (37)
Escott	10:20 pm	33	>+3	4.5 m/s WNW	Wind (32), WCC (27)

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Railway View during each of the day, evening and night monitoring periods, at Hillview during the evening and Hazeldene during the evening and night.

Railway View and Hillview are mine owned properties.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m. Throughout the entire night time period the average inversion strength was generally >+3° C/100m (as extrapolated from data recorded by the mine operated weather station) and wind speeds measured at the 10m tower were greater than 3m/s.

Each of the elevated noise levels recorded at Hazeldene were when wind speeds were greater than 3m/s. The night time measurement also occurred at a time when the met station data showed there was a >+3° C/100m temperature gradient.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

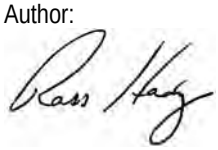
In addition to the operational noise, the noise from WCC must not exceed 45 dB(A) Lmax between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC exceeded the sleep disturbance criterion at Railway View. The Lmax noise levels were attributable to loud engine revs. This residence is mine owned and unoccupied.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

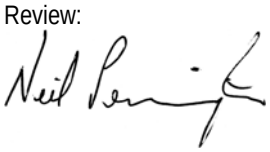
Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge
Acoustical Consultant

Review:



Neil Pennington
Acoustical Consultant

3 August 2009

Ref: 04035/3205

Mr. Lynden Cini
Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: JULY 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the morning of Wednesday 29th July and finishing in the morning of Thursday 30th July 2009. Noise measurement locations for the attended noise survey are listed below:

Location R2: Zeolite Australia
Location R3: Cintra
Location R4: Old Colliery*
Location R5: Mountain View
Location R6: Hillview*
Location R7: Railway View*
Location R8: Hazeldene
Location R10: Escott

* Hillview, Railway View and Old Colliery are mine owned residences.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report was supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The afternoon of July 29 was mild with light winds from the south east. Wind speeds dropped off significantly during the evening and night to be calm. Temperature data from the mine operated weather station indicated a strong temperature inversion active from early afternoon.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the maximum levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 29 July 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	3:52 pm	37	n/a	2.2 m/s SW	WCC (34), Zeolite Aus (34), birds (28)
Cintra	4:10 pm	50	n/a	0.9 m/s SE	Birds (50), WCC (33)
Old Colliery	3:15 pm	44	n/a	1.3 m/s SE	WCC (44), birds (30)
Mountain View	5:25 pm	35	n/a	0.4 m/s SE	Birds (35), WCC barely audible (est. <25)
Hillview	4:28 pm	49	n/a	0.4 m/s SE	Traffic (46), WCC (43), birds (35)
Railway View	4:45 pm	50	n/a	0.9 m/s SE	WCC (49) traffic (44)
Hazeldene	5:06 pm	38	n/a	0.4 m/s SE	Traffic (34), birds (34), WCC (33)
Escott	3:35 pm	35	n/a	1.3 m/s SE	Birds & dogs (33), WCC (31)

Table 2
WCC Noise Monitoring Results – 29 July 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	8:29 pm	42	> +3	2.2 m/s SW	WCC (42)
Cintra	8:46 pm	42	> +3	1.3 m/s W	Train (33), insects (29), traffic (25), WCC (<25)
Old Colliery	9:42 pm	53	> +3	0.9 m/s W	WCC (53)
Mountain View	7:30 pm	37	> +3	0.4 m/s SE	Distant traffic (36), train (28), WCC inaudible
Hillview	9:04 pm	60	> +3	2.2 m/s N	Train (60), WCC (47)
Railway View	9:23 pm	48	> +3	Calm	WCC (45), traffic (45), insects (35)
Hazeldene	7:47 pm	43	> +3	Calm	Traffic (42), WCC (32), sheep (30)
Escott	8:12 pm	43	> +3	1.3 m/s W	Horses (42), WCC (35), insects (28)

Table 3
WCC Noise Monitoring Results – 29 and 30 July 2009 (night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	10:37 pm	42	> +3	Calm	WCC (42), insects (25)
Cintra	10:55 pm	41	> +3	Calm	WCC (41)
Old Colliery	10:00 pm	47	> +3	Calm	WCC (47)
Mountain View	12:15 am	34	> +3	Calm	WCC (32), distant traffic (30)
Hillview	11:12 pm	50	> +3	0.4 m/s SE	Traffic (47), WCC (46)
Railway View	12:55 am	52	> +3	Calm	WCC (52), traffic (40)
Hazeldene	12:32 am	45	> +3	Calm	Traffic (44), insects & animals (35), WCC (33)
Escott	10:20 pm	36	> +3	Calm	WCC (36)

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Old Colliery, Railway View and Hillview during each of the day, evening and night monitoring periods, at Zeolite Australia during the evening and night and at Cintra and Escott during the night. At Old Colliery, Railway View and Hillview the noise was attributable to all general open cut mine noise including engine revs, haul truck noise, dozer tracks etc. At Zeolite Australia, Cintra and Escott whilst noise from the open cut operation was a contributor to the overall measured levels, the most significant contributor was noise from the rail loading facility. This included noise from the loader, the train on the rail loop and from the dozers working on the coal stockpile.

Railway View, Hillview, Old Colliery and Escott are mine owned properties. The mine has an agreement with the landowners at Cintra and Zeolite Australia in regards to elevated noise levels. The agreement allows for an additional 5 dB(A) Leq (15 min) over the noise criterion.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from the mine operated weather station showed a temperature inversion of greater than +3° C/100m active throughout the late afternoon of July 29 and continuing until the morning of July 30. The elevated noise levels at Zeolite Australia and Cintra were, therefore, measured under non compliant atmospheric conditions.

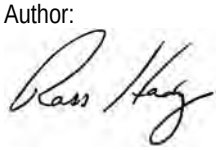
Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed 45 dB(A) Lmax between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine. During the night time measurement circuit Lmax noise from WCC exceeded the sleep disturbance criterion at Old Colliery, Railway View and Hilview. The Lmax noise levels were attributable to loud engine revs and impacts. All of these residences are mine owned. At Mountain View the Lmax from impact noise was 45 dB(A) and at Hazeldene the Lmax from engine revs was 44 dB(A).

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

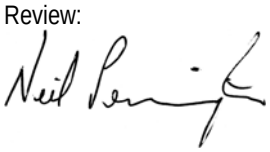
Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:



Ross Hodge
Acoustical Consultant

Review:



Neil Pennington
Acoustical Consultant

19 August 2009

Ref: 04035/3221

Mr. Lynden Cini
Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: AUGUST 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the morning of Monday 17th August and finishing in the morning of Tuesday 18th August 2009. Noise measurement locations for the attended noise survey are listed below:

Location R2: Zeolite Australia
Location R3: Cintra
Location R4: Old Colliery*
Location R5: Mountain View
Location R6: Hillview*
Location R7: Railway View*
Location R8: Hazeldene
Location R10: Escott*

* Hillview, Railway View, Old Colliery and Escott are mine owned residences.

Noise levels were also measured at "Marengo" to the west of Railway View. This location was not listed as a receiver in the EIS for the mine and, therefore, is not noted with an R prefix.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that during the day time monitoring period winds were gusty from the south west. Wind speeds dropped off during the evening and night and turned from a southerly direction.

Temperature data from the mine operated weather station indicated a strong temperature inversion (>+3^{O}C/100m) active from early evening. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 17 August 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	3:55 pm	48	n/a	5.8 m/s SW	Wind (47), birds (40), Zeolite Australia (30), WCC inaudible
Cintra	4:12 pm	47	n/a	6.7 m/s SW	Wind (46), birds (40), WCC (<30)
Old Colliery	4:50 pm	46	n/a	5.6 m/s SW	WCC (46), birds (32)
Mountain View	5:44 pm	51	n/a	4.9 m/s SW	Birds (51), traffic (30), WCC inaudible
Hillview	4:30 pm	58	n/a	6.3 m/s SW	Traffic (58), WCC (44), birds (40)
Railway View	5:07 pm	52	n/a	5.6 m/s SW	WCC (50), traffic (49),
Hazeldene	5:27 pm	35	n/a	4.5 m/s SW	Birds & insects (32), traffic (32), WCC inaudible
Escott	3:37 pm	48	n/a	5.8 m/s SW	Dogs (48),, wind (35), WCC inaudible
Marengo	3:06 pm	41	n/a	6.3 m/s SW	Birds & insects (39), wind (35), WCC (est. <30)

Table 2
WCC Noise Monitoring Results – 17 August 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	7:37 pm	38	> +3	6.5 m/s SW	Wind (36), insects (32), WCC inaudible
Cintra	7:55 pm	39	> +3	3.5 m/s SSW	WCC (37), insects (32)
Old Colliery	9:40 pm	49	> +3	2.9 m/s S	WCC (49), insects (34)
Mountain View	7:07 pm	32	> +3	7.0 m/s S	WCC (31), insects (24)
Hillview	9:02 pm	74	> +3	2.7 m/s S	Train (74), traffic (50), WCC (44), insects (35)
Railway View	9:20 pm	56	> +3	2.6 m/s S	WCC (56)
Hazeldene	6:50 pm	29	> +3	6.9 m/s S	WCC (29)
Escott	7:20 pm	30	> +3	7.0 m/s SW	Dogs & insects (30), WCC barely audible (est. <25)
Marengo	8:25 pm	40	> +3	3.8 m/s SE	WCC (39), insects (32)

Table 3 WCC Noise Monitoring Results – 17 and 18 August 2009 (night)					
Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	10:37 pm	41	> +3	2.0 m/s S	WCC (39), wind (37)
Cintra	10:55 pm	44	> +3	3.1 m/s S	Train (42), WCC (39), insects (34)
Old Colliery	10:01 pm	47	> +3	3.1 m/s SSW	WCC (47)
Mountain View	1:17 am	31	> +3	0.9 m/s SSE	Insects (30), WCC (25)
Hillview	11:12 pm	52	> +3	3.6 m/s S	Traffic (50), WCC (47)
Railway View	1:40 am	57	> +3	1.8 m/s SSE	Train (56), WCC (51)
Hazeldene	1:00 am	36	> +3	2.2 m/s S	Traffic (32), sheep (31), insects (30), WCC inaudible
Escott	10:20 pm	37	> +3	2.0 m/s S	WCC (34), dogs (34)
Marengo	12:35 am	40	> +3	2.6 m/s S	WCC (38), frogs & insects (34)

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Old Colliery, Hillview and Railway View during each of the day, evening and night monitoring periods, and at Cintra and Marengo during the evening and night.

Railway View and Hillview are mine owned properties. The mine has an agreement with the landowner at Cintra in regards to elevated noise (to a level 5 dB(A) above the operational noise criterion).

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from the mine operated weather station showed a temperature inversion of greater than +3° C/100m active throughout the evening and night of August 17 and continuing until the morning of August 18. The elevated noise levels at each of the locations detailed were, therefore, measured under non compliant atmospheric conditions.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC exceeded the sleep disturbance criterion at Old Colliery, Railway View and Hillview. The Lmax noise levels were attributable to loud engine revs. All three residences are mine owned and Old Colliery and Railway View are unoccupied.

At Marengo loud revs were measured at an Lmax level of 45 dB(A) which is equal to the sleep disturbance criterion. This occurred under the above detailed temperature inversion conditions. The

sleep disturbance criterion is applicable at the bedroom window of a residence. It is not known where the bedrooms are in the residence at Marengo.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

21 September 2009

Ref: 04035/3269

Mr. Lynden Cini
Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: SEPTEMBER 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the morning of Tuesday 1st September and finishing in the morning of Wednesday 2nd September 2009. Noise measurement locations for the attended noise survey are listed below:

Location R2: Zeolite Australia
Location R3: Cintra
Location R4: Old Colliery*
Location R5: Mountain View
Location R6: Hillview*
Location R7: Railway View*
Location R8: Hazeldene
Location R10: Escott*

* Hillview, Railway View, Old Colliery and Escott are mine owned residences.

Noise levels were also measured at "Marengo" to the west of Railway View. This location was not listed as a receiver in the EIS for the mine and, therefore, is not noted with an R prefix. The gates to Old Colliery were locked during the survey and, as this residence is mine owned, the monitoring was not carried out there.

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that during the day time monitoring period winds were light and from varying directions. During the evening the wind shifted to a general southerly direction before dropping to calm during the night.

Temperature data from the mine operated weather station indicated a strong temperature inversion (>+3^{O}C/100m) active from early evening. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 1 September 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	3:10 pm	41	n/a	1.8 m/s SW	Birds (40), Zeolite Australia (33), WCC (30)
Cintra	3:27 pm	42	n/a	1.8 m/s WNW	Birds (40), WCC (38)
Mountain View	5:06 pm	36	n/a	0.9 m/s SE	Cattle (34), birds (32), WCC barely audible
Hillview	3:45 pm	48	n/a	1.3 m/s WSW	Traffic (48), WCC (35), birds (20)
Railway View	4:05 pm	47	n/a	1.3 m/s SSW	Traffic (44), WCC (43), cattle (33)
Hazeldene	5:25 pm	42	n/a	1.8 m/s NW	Traffic (41), birds (34), WCC barely audible (est. <25)
Escott	2:50 pm	29	n/a	2.7 m/s SW	Birds (26), WCC (24), traffic (22)
Marengo	4:40 pm	32	n/a	0.4 m/s SE	Birds & insects (31), WCC (25)

Table 2
WCC Noise Monitoring Results – 1 September 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	8:55 pm	29	> +3	1.3 m/s SSE	WCC (29)
Cintra	9:12 pm	39	> +3	0.9 m/s SSE	WCC (39)
Mountain View	7:25 pm	29	> +3	1.3 m/s N	Traffic (29), cattle (25), WCC (<20)
Hillview	9:27 pm	50	> +3	1.3 m/s SE	WCC (48), traffic (47)
Railway View	9:45 pm	50	> +3	1.3 m/s SE	Traffic (49), WCC (44)
Hazeldene	7:43 pm	35	> +3	0.9 m/s NW	Traffic (32), WCC (32)
Escott	8:37 pm	32	> +3	1.3 m/s S	WCC (30), insects (28)
Marengo	8:07 pm	35	> +3	0.9 m/s SW	WCC (32), train (31), frogs & insects (27)

Table 3 WCC Noise Monitoring Results – 1 and 2 September 2009 (night)					
Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Zeolite Australia	10:25 pm	33	> +3	Calm	WCC (33)
Cintra	10:42 pm	35	> +3	0.9 m/s SSW	WCC (31), insects & dogs (30), traffic (30)
Mountain View	12:52 am	34	> +3	Calm	WCC (33), insects (26)
Hillview	11:00 pm	54	> +3	0.4 m/s SSW	Traffic (51), WCC (51)
Railway View	11:20 am	55	> +3	Calm	WCC (55)
Hazeldene	12:35 am	37	> +3	Calm	Traffic (35), WCC (33), insects (30)
Escott	10:07 pm	30	> +3	Calm	WCC (30)
Marengo	1:25 am	32	> +3	Calm	WCC (30), frogs & insects (27)

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Railway View during each of the day, evening and night monitoring periods, at Cintra during the day and evening and Hillview during the evening and night.

At Railway View and Hillview the noise was due to all emissions from the open cut operations including
Haul truck engine revs, shovel and dozer tracks etc. At Cintra the noise was attributable to the dozers working on the coal stockpile at the rail load out facility.

Railway View and Hillview are mine owned properties. The mine has an agreement with the landowner at Cintra in regards to elevated noise (to a level 5 dB(A) above the operational noise criterion).

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from the mine operated weather station showed a temperature inversion of greater than +3° C/100m active throughout the evening and night of September 1 and continuing until the morning of September 2. During the evening and night time periods the elevated noise levels at each of the locations detailed were, therefore, measured under non compliant atmospheric conditions.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC exceeded the sleep disturbance criterion at Railway View and Hillview. The Lmax noise levels were attributable to loud engine revs and dozer tracks. Both residences are mine owned.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

21 October 2009

Ref: 04035/3316

Mr. Lynden Cini
Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: OCTOBER 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the evening of Wednesday 14th October and finishing in the morning of Thursday 15th October 2009. Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

"Almawillee"
"Glenara"
"Marengo"
"Tonsley Park"
"Cintra"
"Fletcher"

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that throughout all monitoring period winds were moderate generally from the west to north.

Temperature data from the mine operated weather station indicated a mild to strong temperature inversion (>+3^{O}C/100m) active from early evening. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 14 October 2009 (evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:43 pm	35	> +3	3.1 m/s WSW	Insects (34), traffic (30), **WCC inaudible**
Glenara	9:00 pm	30	< +3	2.7 m/s W	**WCC (26)**, traffic (25), plane (25), insects (22)
Cintra	8:20 pm	33	< +3	3.6 m/s WSW	Insects (32), traffic (30), **WCC (23)**
Marengo	9:43 pm	33	> +3	2.7 m/s W	**WCC (31)**, insects (25), traffic (25)
Tonsley Park	7:57 pm	31	> +3	2.7 m/s WSW	Traffic (28), insects (28), **WCC inaudible**
Fletcher	9:18 pm	30	> +3	2.7 m/s W	Insects (26), traffic (25), **WCC (24)**

Table 2
WCC Noise Monitoring Results – 14/15 October 2009 (night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:58 am	26	> +3	1.8 m/s WNW	**WCC (25)**, insects (20)
Glenara	12:40 am	26	> +3	2.2 m/s NW	**WCC (26)**, traffic (20)
Cintra	10:06 pm	32	> +3	2.2 m/s WNW	Wind in trees (30), dog (26), traffic (25), **WCC barely audible**
Marengo	11:03 pm	34	> +3	1.8 m/s WNW	**WCC (32)**, train (30), insects (20)
Tonsley Park	10:28 pm	30	> +3	2.2 m/s WNW	Train (26), traffic (22), **WCC (22)**, insects (20)
Fletcher	11:30 pm	56	> +3	2.2 m/s WNW	Train (56) traffic (40), **WCC inaudible**

Table 3
WCC Noise Monitoring Results – 15 October 2009 (day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:59 am	35	n/a	4 m/s WNW	Birds & insects (34), **WCC (28)**
Glenara	8:41 am	39	n/a	3.6 m/s WNW	Traffic (36), insects (35), **WCC (30)**
Cintra	7:23 am	43	n/a	3.6 m/s NW	**WCC (40)**, birds & insects (37), traffic (37)
Marengo	8:02 am	42	n/a	2.2 m/s NNW	**WCC (40)**, insects (35), cattle (30)
Tonsley Park	7:04 am	48	n/a	3.6 m/s N	Traffic (48), **WCC barely audible**
Fletcher	8:23 am	39	n/a	3.1 m/s WNW	Traffic (38), birds (30), **WCC barely audible**

The results in **Tables 1, 2** and **3** show received noise levels in excess of 35 dB(A) Leq (15 min) noise criterion were recorded at Marengo and Cintra during the day time monitoring period.

At Marengo the noise was due to all emissions from the open cut operations including haul truck engine revs, shovel and dozer tracks etc. At Cintra the noise was attributable to the dozers working on the coal stockpile at the rail load out facility.

The mine has an agreement with the landowner at Cintra in regards to elevated noise (to a level 5 dB(A) above the operational noise criterion).

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from the mine operated weather station showed that at the time of the monitoring at Cintra the wind speed was greater than 3m/s and, therefore, the elevated noise levels at this time was measured under non compliant atmospheric conditions.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any receivers.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

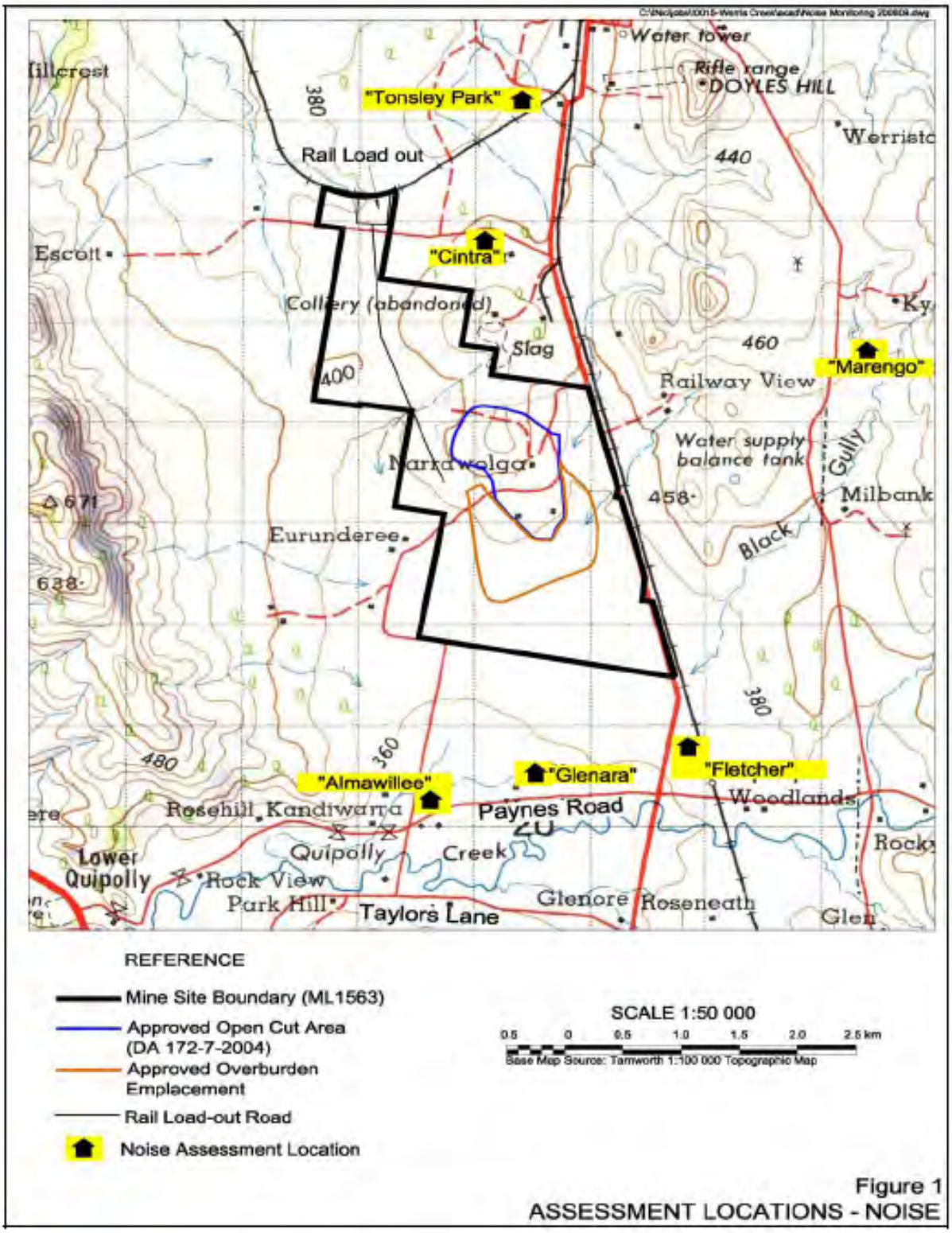


Figure 1
ASSESSMENT LOCATIONS - NOISE

1 December 2009

Ref: 04035/3316

Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: NOVEMBER 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the evening of Wednesday 25th November and finishing in the morning of Thursday 26th November 2009. Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

"Almawillee"
"Glenara"
"Marengo"
"Tonsley Park"
"Cintra"
"Fletcher"

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that throughout all monitoring period winds were light to gentle and varying in direction from West north west to the east.

Temperature data from the mine operated weather station indicated a mild to strong temperature inversion (>+3^{O}C/100m) active throughout parts of the evening and night time monitoring periods. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 25 November 2009 (Day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	5:45 pm	42	n/a	2.2/SSW	Birds & insects (42), traffic (30), WCC barely audible
Glenara	5:28 pm	41	n/a	1.8/WNW	Birds (41), traffic (26), WCC inaudible
Cintra	4:51 pm	35	n/a	1.3/SSE	Insects & birds (35), traffic (29), WCC (25)
Marengo	4:00 pm	31	n/a	2.7/WSW	Insects (28), WCC (26), plane (22)
Tonsley Park	4:31 pm	38	n/a	4.0/SE	Traffic (36), insects (33), WCC inaudible
Fletcher	5:10 pm	32	n/a	2.2/WNW	Birds & insects (30), traffic (28), WCC inaudible

Table 2
WCC Noise Monitoring Results – 25 November 2009 (Evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:42 pm	38	>+3	4.0/SE	Insects (34), domestic noise (34), WCC (30)
Glenara	9:25 pm	40	+2	4.2/SE	Traffic (40), insects (30), WCC inaudible
Cintra	8:50 pm	39	>+3	4.9/SE	Traffic (34), WCC (33), cattle (33)
Marengo	7:55 pm	35	>+3	3.1/SE	Insects & frogs (35), WCC barely audible
Tonsley Park	8:30 pm	49	+1	5.4/SE	Insects (49), traffic (35), WCC (30)
Fletcher	9:08 pm	32	>+3	4.2/SE	Birds & insects (32), WCC inaudible

Table 3
WCC Noise Monitoring Results – 25/26 November 2009 (Night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	11:42 pm	37	>+3	0.9/NE	Insects (31), traffic (31), irrigators (30), WCC (30)
Glenara	11:23 pm	35	>+3	1.3/E	Insects (31), traffic (30), WCC (29)
Cintra	11:08 pm	33	>+3	2.6/E	WCC (30), insects (28), traffic (26)
Marengo	10:26 pm	40	>+3	3.1/ENE	Wind (38), insects (35), WCC inaudible
Tonsley Park	10:47 pm	44	>+3	4.0/ENE	Insects (44), traffic (35), WCC inaudible
Fletcher	10:05 pm	36	+2	2.7/ESE	Traffic (34), insects (32), WCC inaudible

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC did not exceed the criterion of 35 dB(A) at any monitoring location during any monitoring period.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any receivers.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

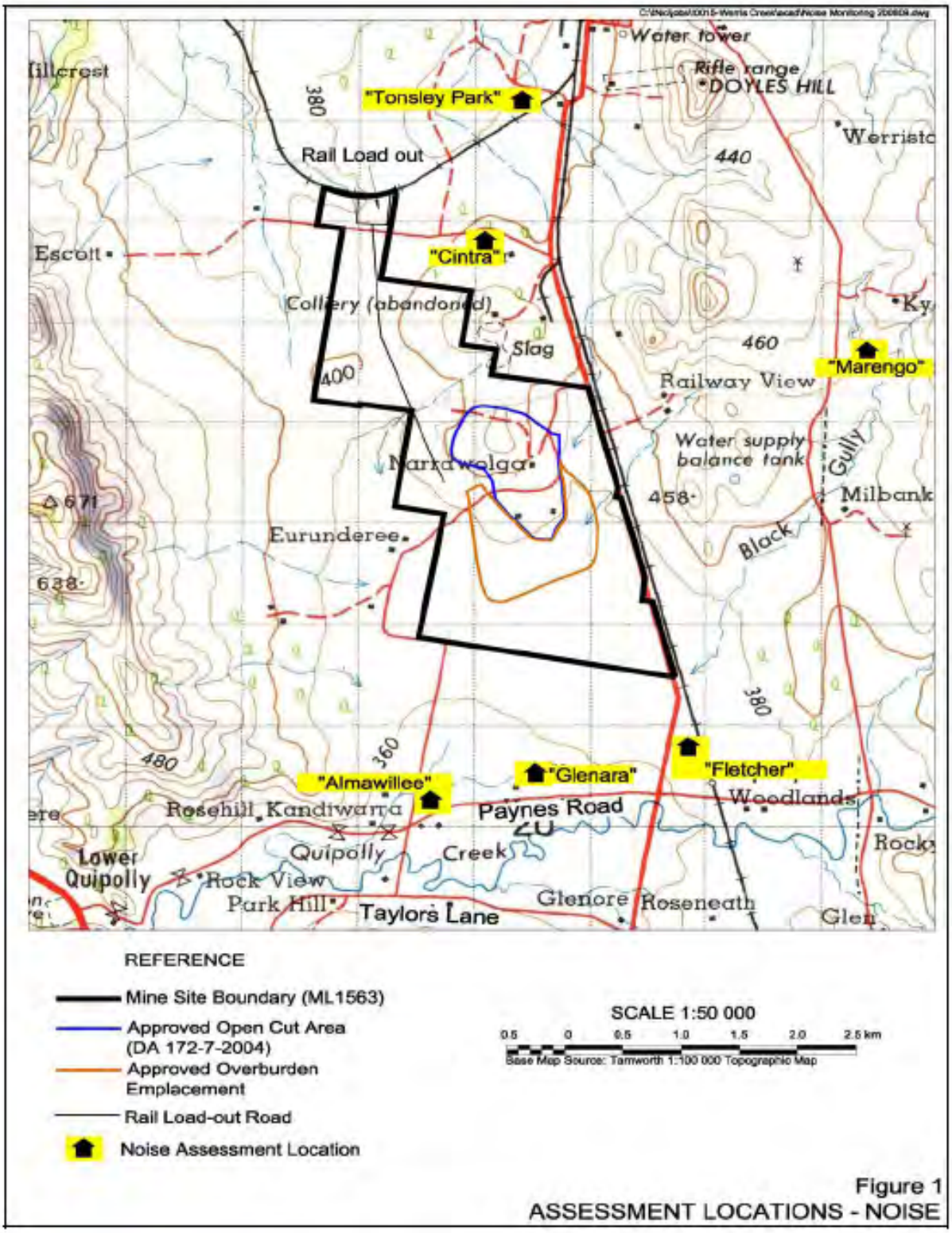


Figure 1
ASSESSMENT LOCATIONS - NOISE

16 December 2009

Ref: 04035/3364

Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: DECEMBER 2009 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the evening of Thursday 10th December and finishing in the morning of Friday 11th December 2009. Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

"Almawillee"
"Glenara"
"Marengo"
"Tonsley Park"
"Cintra"
"Fletcher"

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that winds were light from the north to north west during the evening and night of December 10 and variable from the north to the south during the morning of December 11.

Temperature data from the mine operated weather station indicated a mild to strong temperature inversion (>+3^{O}C/100m) active during all of the evening and night time monitoring periods. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 11 December 2009 (Day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:02 am	37	n/a	3.1/S	Insects (37), traffic (30), WCC barely audible (<25)
Glenara	8:44 am	45	n/a	2.7/S	Birds (45), WCC (<25)
Cintra	7:12 am	41	n/a	0.9/NNE	WCC (40), insects & birds (33)
Marengo	8:06 am	33	n/a	0.9/NE	Birds &insects (31), WCC (27), plane (26)
Tonsley Park	7:35 am	39	n/a	1.8/NW	Insects (35), train (35), WCC (32)
Fletcher	8:26 am	45	n/a	2.2/SSE	Birds (44), traffic (39), WCC inaudible

Table 2
WCC Noise Monitoring Results – 10 December 2009 (Evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:00 pm	38	>+3	1.8/N	Domestic noise (35), insects (33), WCC (30)
Glenara	8:42 pm	35	>+3	2.2/N	Traffic (32), insects (29), WCC (29)
Cintra	7:25 pm	41	>+3	1.8/N	Traffic (39), Insects (34), WCC inaudible
Marengo	8:04 pm	35	>+3	2.7/N	Insects & frogs (35), WCC barely audible
Tonsley Park	7:40 pm	32	>+3	0.9/N	Traffic (31), insects (25), WCC inaudible
Fletcher	8:25 pm	43	>+3	3.6/N	Traffic (43), insects (33), WCC (<25)

Table 3
WCC Noise Monitoring Results – 10 December 2009 (Night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	11:45 pm	38	>+3	2.2/N	Frogs & insects (37), traffic (28), WCC inaudible
Glenara	11:29 pm	35	>+3	2.7/NNW	Traffic (32), insects (31), WCC (25)
Cintra	11:09 pm	34	>+3	2.9/NW	Traffic (32) insects (27), WCC inaudible
Marengo	10:27 pm	39	>+3	4.0/NW	Traffic (35), insects (34), WCC (32)
Tonsley Park	10:50 pm	39	>+3	2.6/NW	Insects (39), traffic (29), WCC inaudible
Fletcher	10:05 pm	37	>+3	3.6/NW	Traffic (36), WCC (28), insects (25)

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC only exceeded the criterion of 35 dB(A) at the monitoring location at Cintra during the day time monitoring period. A train was being loaded at the time and the noise at Cintra was due to emissions from the dozer working on the coal stockpile, trucks arriving and departing the rail loading facility and the train being loaded. WCC has an agreement in place with the owner of Cintra in regards to elevated noise levels.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any receivers.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

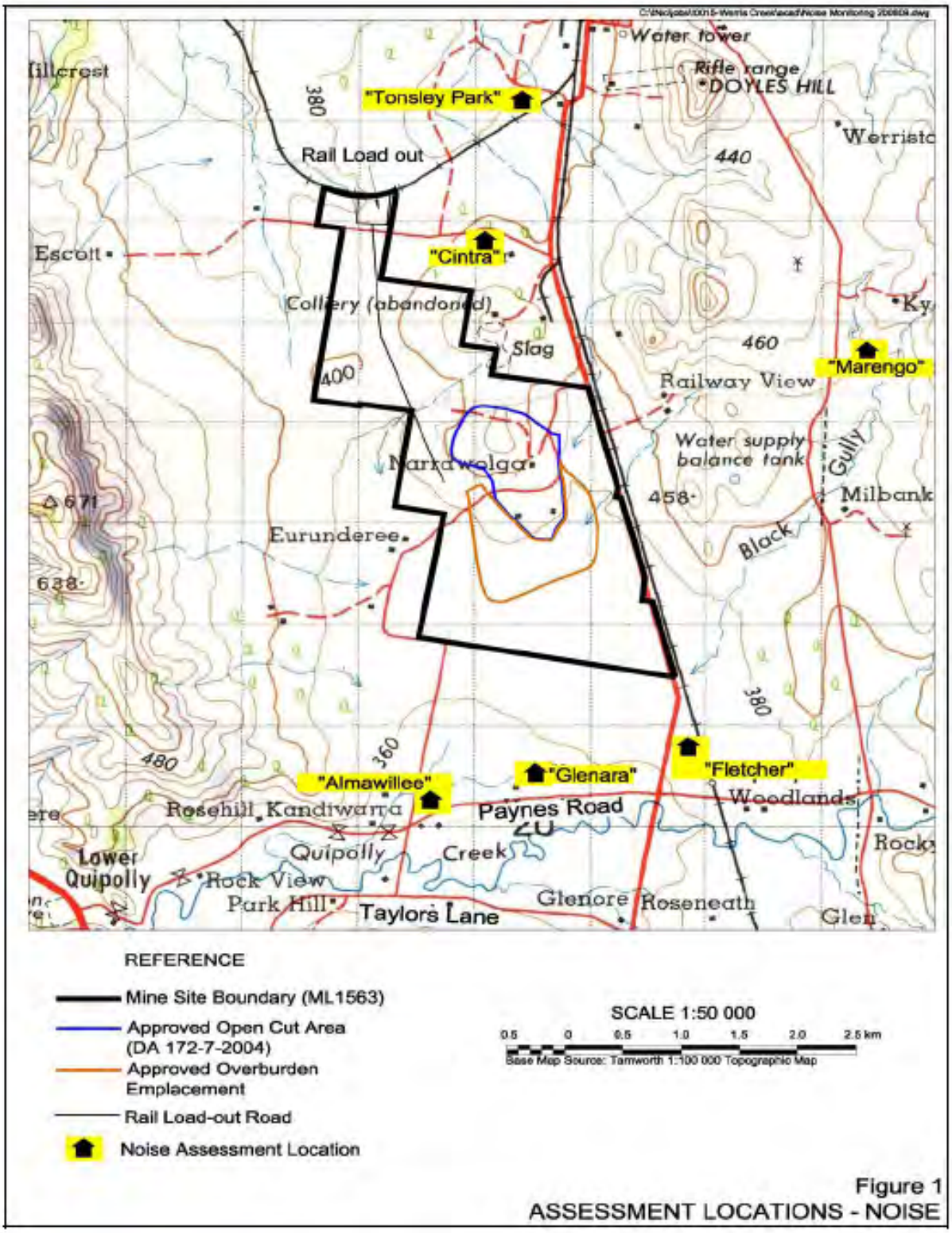


Figure 1
ASSESSMENT LOCATIONS - NOISE

25 January 2010

Ref: 04035/3408

Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: JANUARY 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the evening of Tuesday 19th January 2010 and finishing in the morning of Wednesday 20th January 2010. Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

"Almawillee"
"Glenara"
"Marengo"
"Tonsley Park"
"Cintra"
"Fletcher"

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that winds were light to gentle form the south west during the day dropping off during the evening of January 19. At night the conditions were calm.

Temperature data from the mine operated weather station indicated a mild to strong temperature inversion (>+3^{O}C/100m) active during all of the evening and night time monitoring periods. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 19 January 2010 (Day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	2:36 pm	42	n/a	2.7/WSW	Insects (40), wind (38), WCC barely audible (<25)
Glenara	2:53 pm	45	n/a	3.6/WSW	Birds (43), wind (39), WCC (31)
Cintra	4:23 pm	45	n/a	4.5/SW	Insects & birds (43), WCC (38), wind (36)
Marengo	3:38 pm	46	n/a	4.9/WSW	Insects (45), wind (40), WCC barely audible (<25)
Tonsley Park	4:03 pm	43	n/a	4.5/SW	Insects (43), WCC (32)
Fletcher	3:14 pm	43	n/a	6.3/SW	Traffic (43), birds & insects (40), WCC inaudible

Table 2
WCC Noise Monitoring Results – 19 January 2010 (Evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	7:20 pm	44	Lapse	3.1/SW	Insects & birds (43), traffic (36), WCC inaudible
Glenara	7:38 pm	36	>+3	1.3/SW	Insects (35), traffic (30), WCC barely audible
Cintra	9:11 pm	37	>+3	1.3/SW	WCC (35), insects (32)
Marengo	8:22 pm	36	>+3	0.9/SW	Insects (33), WCC (33)
Tonsley Park	8:50 pm	49	>+3	Calm	Insects (49), WCC (30)
Fletcher	7:57 pm	44	>+3	1.3/SW	Traffic (42), insects (38), WCC (est. <25)

Table 3
WCC Noise Monitoring Results – 20 January 2010 (Night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	1:16 am	31	>+3	Calm	WCC (30), insects (25)
Glenara	12:55 am	33	>+3	Calm	WCC (30), traffic (29), insects (25)
Cintra	1:47 am	31	>+3	Calm	WCC (30), insects (25)
Marengo	2:30 am	40	>+3	Calm	WCC (39), traffic (30), insects (20)
Tonsley Park	2:09 am	35	>+3	Calm	WCC (32), train (30), insects (27)
Fletcher	2:54 am	32	>+3	Calm	WCC (30), traffic (26)

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC where higher than the criterion of 35 dB(A) at the Cintra monitoring location during the day and at the Marengo monitoring location during the night.

The elevated noise at Cintra during was mainly as a result of emissions from the dozer working on the coal stockpile and trucks arriving and departing the rail loading facility. WCC has an agreement in place with the owner of Cintra in regards to elevated noise levels.

The elevated noise at Marengo was as a result of a number of noises from the mine including mine hum, revving and dumping noise from haul trucks and engine noise.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from the mine operated weather station showed a temperature inversion of greater than +3° C/100m active throughout the evening and night of January 19 and continuing until the morning of January 20. The elevated noise level when the monitoring was carried out at Marengo was, therefore, measured under non compliant atmospheric conditions.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any receivers. The maximum noise from the mine at Marengo during the night time measurement was 45 dB(A) Lmax.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

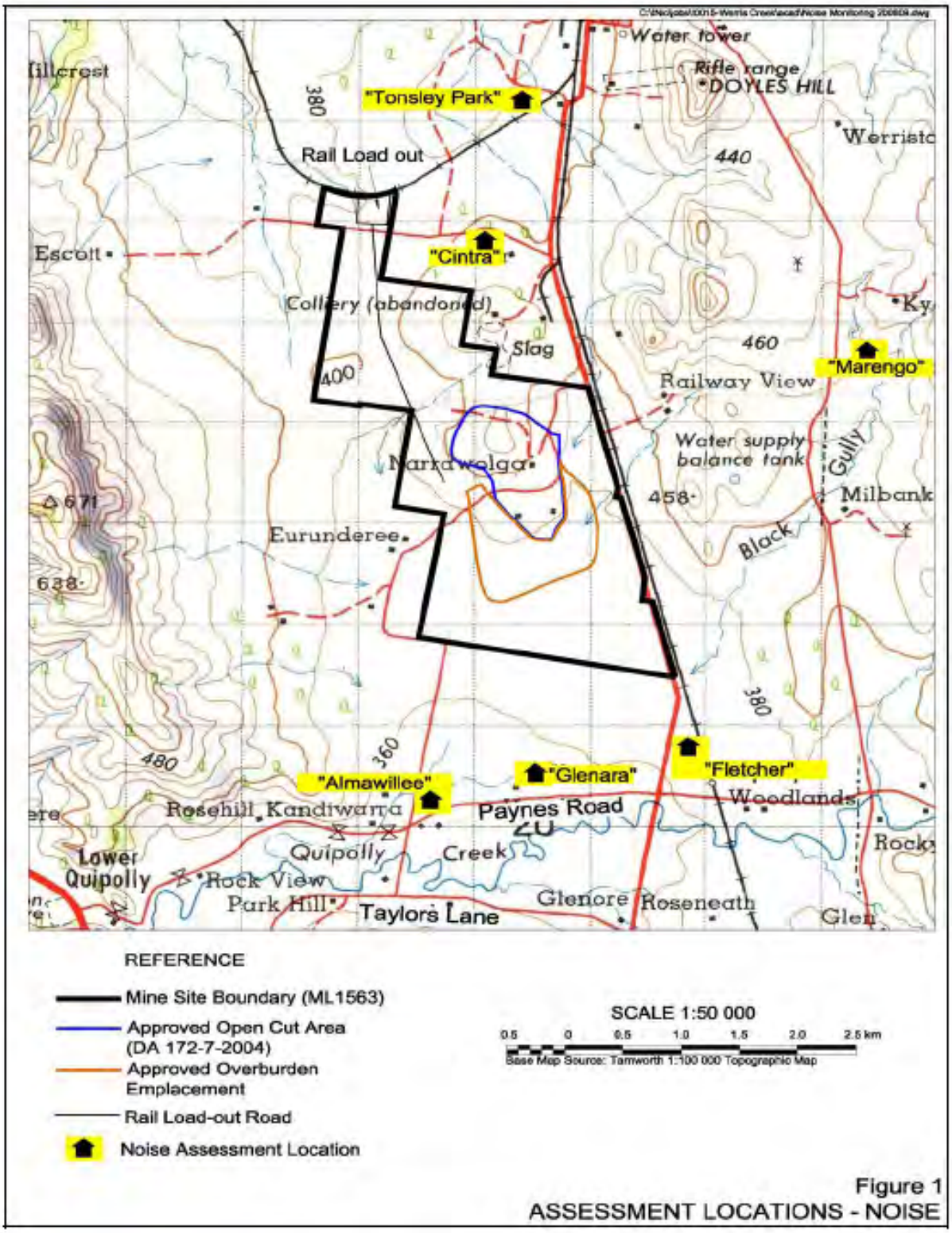


Figure 1
ASSESSMENT LOCATIONS - NOISE

1 March 2010

Ref: 04035/3456

Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: FEBRUARY 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) commencing in the afternoon of Tuesday 23rd February 2010 and finishing in the early morning of Wednesday 24th February 2010. Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

"Almawillee"
"Glenara"
"Marengo"
"Tonsley Park"
"Cintra"
"Fletcher"

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that winds were light from the west to north west during the day. Wind speeds and direction were variable in the evening before turning to be from the south at night.

Temperature data from the mine operated weather station indicated a weak temperature inversion (<+3^{O}C/100m) at times during the evening and night time monitoring periods. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 23 February 2010 (Day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:43 am	36	n/a	0.9/NNW	Birds & insects (34), WCC (30), farm noise (28)
Glenara	10:00 am	43	n/a	0.9/N	Birds & insects (43), WCC (32)
Cintra	11:10 am	43	n/a	3.3/WNW	Insects & birds (40), WCC (40)
Marengo	11:35 am	33	n/a	2.9/WNW	Birds & insects (32), horse (25), WCC (22)
Tonsley Park	10:49 am	45	n/a	2.2/WNW	Birds & insects (42), wind (40), train (37), WCC (<30)
Fletcher	10:26 am	38	n/a	3.1/W	Traffic (37), birds & insects (30), WCC (28)

Table 2
WCC Noise Monitoring Results – 23 February 2010 (Evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	6:05 pm	49	Lapse	0.4/S	Birds & insects (49), WCC inaudible
Glenara	6:21 pm	37	+2	0.9/S	Birds & insects (37), WCC barely audible (est. <20)
Cintra	7:30 pm	40	+1	4.0/NW	Birds & insects (38), WCC (37)
Marengo	7:55 pm	35	Lapse	3.5/N	Birds & insects (33), WCC (30)
Tonsley Park	7:05 pm	39	Lapse	4.9/WNW	Birds & insects (38), WCC (30)
Fletcher	6:40 pm	48	Lapse	1.1/SW	Train (46), traffic (41), birds & insects (35), WCC (30)

Table 3
WCC Noise Monitoring Results – 24 February 2010 (Night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	2:45 am	37	>+3	3.6/S	Insects & frogs (37), WCC inaudible
Glenara	2:28 am	38	+1	2.7/S	Insects (32), traffic (31), WCC inaudible
Cintra	12:55 am	38	+1	2.7/S	WCC (37), insects (32)
Marengo	1:47 am	31	Lapse	2.7/S	Insects (31), WCC barely audible (est. <20)
Tonsley Park	1:19 am	40	Lapse	2.7/S	Insects (38), WCC (30), traffic (33)
Fletcher	2:10 am	32	Lapse	2.7/S	WCC (30), traffic (26)

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC where higher than the criterion of 35 dB(A) at the Cintra monitoring location during the day, evening and night.

The elevated noise at Cintra during was mainly as a result of emissions from dozers working on the coal stockpile and trucks arriving and departing the rail loading facility. Cintra is now a project related residence.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any receivers. The maximum noise from the mine at Marengo during the night time measurement was 45 dB(A) Lmax.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

Ross Hodge
Acoustical Consultant

Review:

Neil Pennington
Acoustical Consultant

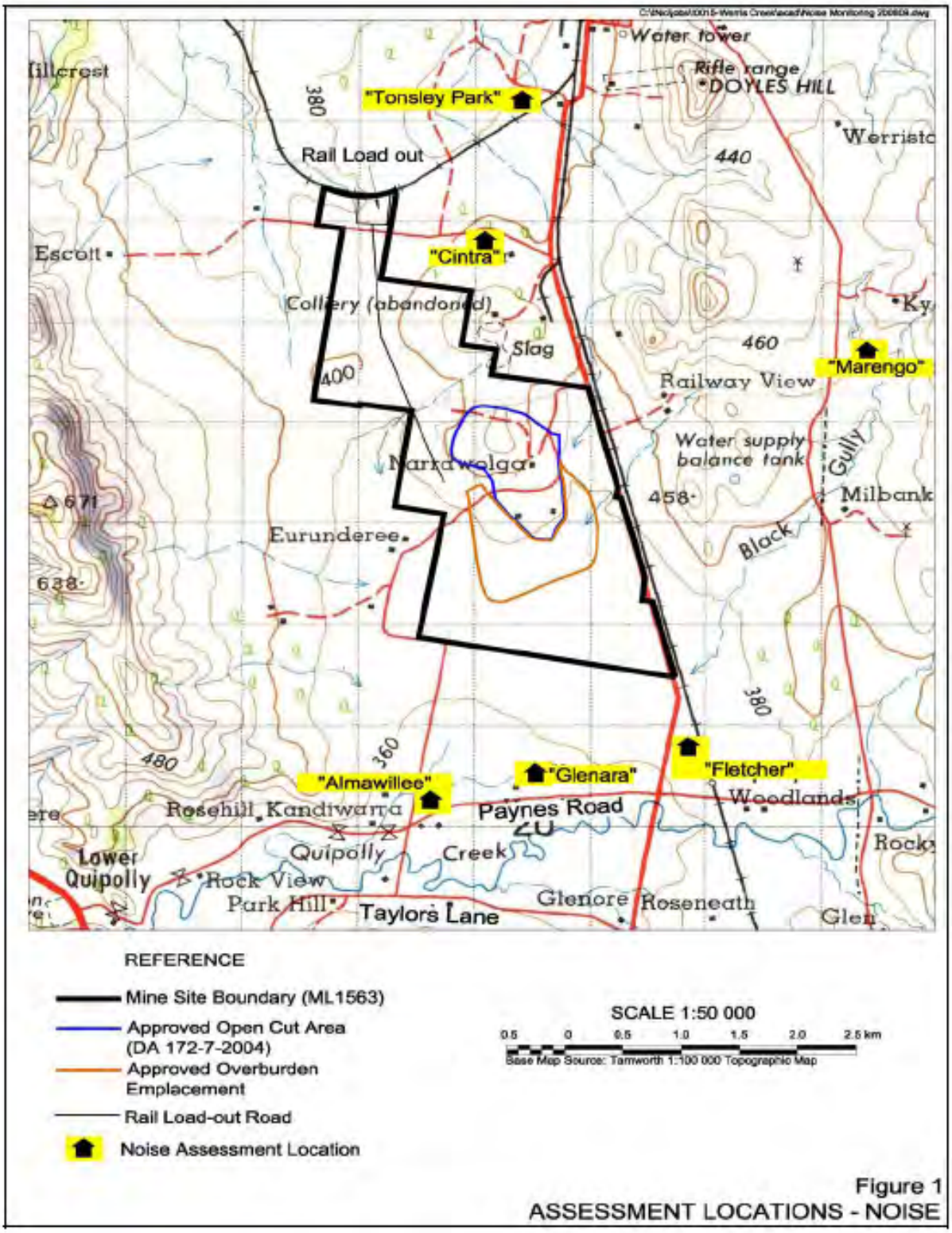


Figure 1
ASSESSMENT LOCATIONS - NOISE

29 March 2010

Ref: 04035/3480

Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: MARCH 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) during the afternoon and evening of Tuesday 9th March 2010 and the evening and early morning of Tuesday 23rd and Wednesday 24th March 2010. The monitoring commenced on March 9 but instrument failure caused the survey to be curtailed. The remainder of the monitoring was completed at the next available opportunity on March 23.

Noise measurement locations for the attended noise survey are as defined in the Werris Creek Coal Pty Ltd *"Noise Management Protocol"*. The locations are listed below and attached in **Figure 1**:

"Almawillee"
"Glenara"
"Marengo"
"Tonsley Park"
"Cintra"
"Fletcher"

Three sets of measurements were made over the "circuit", one during the day time period (before 6 pm), one during the evening period (from 6 pm – 10 pm) and one at night (after 10 pm). WCC activities were audible at some monitoring locations throughout the survey.

Meteorological data used in this report were supplied by the mine from their automatic weather station. Wind speeds and direction have been determined as the arithmetic average of the measurements over the monitoring period. The weather station showed that winds were gentle to moderate from the west to north west on March 9. During the evening of March 23 the winds were light from the south east to south west. At night conditions were calm.

Temperature data from the mine operated weather station indicated a temperature inversion of $<+3^{O}C/100m$ throughout the all of the evening and night monitoring periods. Temperature inversion strength is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

Noise emission levels were measured with a Brüel & Kjær Type 2260 Precision Sound Analyser. This instrument has Type 1 characteristics as defined in AS1259-1982 "Sound Level Meters". Calibration of the instrument was confirmed with a Brüel & Kjær Type 4231 Sound Level Calibrator Prior to and at the completion of measurements.

The total measured Leq is shown in the tables below. Where the noise from WCC was audible the Bruel & Kjaer "*Evaluator*" analysis software was used to quantify the contributions of the mine and other significant noise sources to the overall.

The noise criterion for the operational phase of the WCC project is **35 dB(A) $L_{eq\ (15\ min)}$** for all operating times. Mine noise from WCC is shown in bold type. Where noise from WCC is listed as inaudible, this means the noise levels from the mine were at least 10 dB below the minimum level during the measurement and not measurable.

Table 1
WCC Noise Monitoring Results – 9 March 2010 (Day)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:43 pm	33	n/a	3.1/WNW	Birds & insects (31), farm noise (26), WCC (<25)
Glenara	4:59 pm	35	n/a	3.6/WNW	Wind (31), birds & insects (30), traffic (30), WCC (<25)
Cintra	4:18 pm	44	n/a	3.6/W	WCC (40), wind (40), insects & birds (35)
Marengo	5:43 pm	35	n/a	4.0/WNW	Birds & insects (31), WCC (30), farm noise (30), wind (28)
Tonsley Park	3:55 pm	36	n/a	3.6/NW	Wind (36), WCC barely audible (<28)
Fletcher	5:20 pm	43	n/a	3.6/W	Traffic (43), WCC inaudible

Table 2
WCC Noise Monitoring Results – 9 & 23 March 2010 (Evening)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:39 pm*	40	>+3	2.7/SE	Insects (40), WCC barely audible
Glenara	8:22 pm*	37	>+3	2.2/SE	Insects (37), WCC inaudible
Cintra	7:35 pm	38	>+3	3.1/SW	WCC (37), birds & insects (31)
Marengo	8:30 pm	37	>+3	2.2/SW	Birds & insects (36), WCC (30), traffic (25)
Tonsley Park	7:55 pm	47	>+3	2.7/SW	Birds & insects (47), traffic (33), WCC (32)
Fletcher	7:15 pm	44	>+3	3.1/SW	Traffic (44), birds & insects (34), WCC inaudible

* March 23

Table 3
WCC Noise Monitoring Results – 24 March 2010 (Night)

Location	Time	dB(A),Leq	Inversion ^{O}C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	12:30 am	34	>+3	Calm	WCC (33), insects (26)
Glenara	12:47 am	36	>+3	0.4/NW	WCC (34), dogs (30), insects (26)
Cintra	2:47 am	34	>+3	Calm	WCC (33), insects (26)
Marengo	1:47 am	32	>+3	Calm	WCC (29), insects (28)
Tonsley Park	2:16 am	32	>+3	Calm	Railway works (30), insects (28), WCC inaudible
Fletcher	1:09 am	34	>+3	Calm	WCC (34), insects (23)

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC where higher than the criterion of 35 dB(A) at the Cintra monitoring location during the day and evening of March 9.

The elevated noise at Cintra during was mainly as a result of emissions from dozers working on the coal stockpile and trucks arriving and departing the rail loading facility. Cintra is now a project related residence.

WCC environmental licence conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where winds speeds are higher than 3m/s and/or there is a temperature inversion of greater than +3° C/100m.

Data from those times where WCC operations were audible was analysed using the *"Evaluator"* software. This analysis showed the noise did not contain any tonal, impulsive or low frequency components as per definitions in the NSW Industrial Noise Policy.

In addition to the operational noise, the noise from WCC must not exceed **45 dB(A) Lmax** between the hours of 10 pm and 7 am. This is to minimise the potential for sleep disturbance as a result of individual loud noises from the mine.

During the night time measurement circuit Lmax noise from WCC did not exceed the sleep disturbance criterion at any receivers.

We trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276.

Yours faithfully,
SPECTRUM ACOUSTICS PTY LIMITED

Author:

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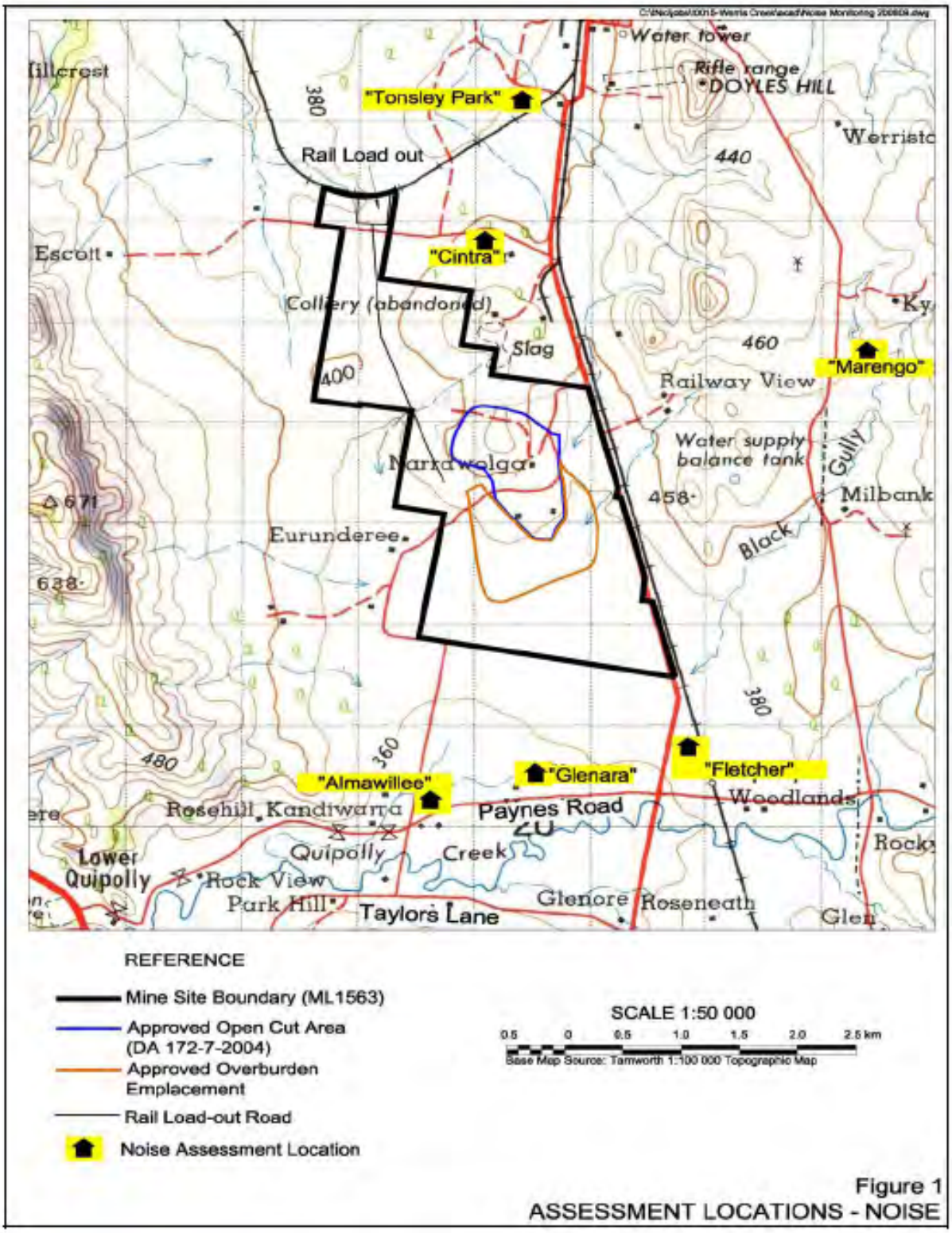

Figure 1
ASSESSMENT LOCATIONS - NOISE

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/04/2009	21.5	29.4	17.1	68.2	84.0	45.0	0.2	6699.0	5.6	10.7	0.9	15.1	29.5	1016.4	1019.4	1014.3	175.6	917.0	0.0
2/04/2009	22.3	29.5	17.1	64.0	85.0	43.0	0.0	6313.0	3.7	6.7	0.9	17.2	29.3	1019.9	1021.4	1018.0	175.8	1031.0	0.0
3/04/2009	22.4	30.6	15.7	65.3	86.0	41.0	0.0	6349.0	1.3	4.5	0.0	16.1	30.3	1018.9	1021.4	1015.9	158.1	828.0	0.0
4/04/2009	20.5	25.7	15.5	75.1	89.0	54.0	32.6	7273.0	1.7	4.0	0.0	15.6	25.9	1018.2	1020.1	1016.1	151.6	889.0	0.0
5/04/2009	19.7	27.5	12.9	68.5	92.0	32.0	0.2	6565.0	1.5	3.1	0.0	12.8	26.8	1017.8	1020.5	1015.1	234.6	861.0	0.0
6/04/2009	19.5	26.3	13.6	70.0	91.0	46.0	0.0	6791.0	2.2	6.3	0.0	13.7	26.1	1018.3	1022.0	1016.5	232.6	883.0	0.0
7/04/2009	18.1	25.7	12.6	70.1	88.0	46.0	0.0	6835.0	2.7	6.7	0.0	12.8	25.4	1023.2	1026.4	1021.3	228.4	981.0	0.0
8/04/2009	17.0	24.0	11.0	65.5	88.0	35.0	0.0	6325.0	2.0	4.5	0.0	10.7	23.4	1025.8	1027.6	1023.9	238.4	913.0	0.0
9/04/2009	17.3	25.2	9.7	61.1	86.0	30.0	0.0	5837.0	0.9	3.1	0.0	9.9	24.2	1024.4	1026.6	1022.0	227.9	845.0	0.0
10/04/2009	19.2	25.7	12.2	63.1	86.0	38.0	0.0	6000.0	0.7	2.7	0.0	12.2	25.3	1024.1	1025.8	1021.9	177.4	872.0	0.0
11/04/2009	20.5	25.2	16.5	64.0	82.0	50.0	0.0	6133.0	1.0	3.6	0.0	16.6	25	1025.2	1027.1	1023.5	131.6	625.0	0.0
12/04/2009	18.6	21.3	16.4	78.5	92.0	66.0	4.0	7642.0	1.0	2.7	0.0	16.5	21.2	1024.6	1026.4	1023.2	79.7	569.0	0.0
13/04/2009	16.7	18.0	15.8	90.4	93.0	81.0	31.4	8886.0	1.0	3.1	0.0	15.8	18.3	1021.8	1023.9	1019.4	33.7	283.0	0.0
14/04/2009	18.6	23.9	13.6	81.6	93.0	63.0	0.2	7948.0	1.2	3.1	0.0	13.7	24.3	1016.8	1019.3	1014.0	139.5	540.0	0.0
15/04/2009	19.2	25.7	11.1	66.0	93.0	31.0	0.0	6288.0	1.4	4.9	0.0	11.5	25.1	1015.2	1016.8	1013.0	221.5	807.0	0.0
16/04/2009	18.6	25.9	10.3	59.0	83.0	34.0	0.0	5283.0	0.8	2.7	0.0	10.3	25.1	1016.1	1017.8	1014.3	213.0	761.0	0.0
17/04/2009	18.6	27.1	11.3	70.1	88.0	46.0	1.6	5748.0	1.0	4.9	0.0	11.4	26.2	1016.5	1019.0	1014.8	196.5	753.0	0.0
18/04/2009	16.5	22.4	10.9	64.2	84.0	40.0	0.2	6127.0	3.1	6.7	0.0	11.1	21.3	1019.8	1021.0	1018.2	204.0	830.0	0.0
19/04/2009	15.9	20.6	11.8	68.8	87.0	53.0	0.0	6728.0	4.9	10.7	0.4	11	19.8	1019.4	1020.8	1017.7	169.5	889.0	0.0
20/04/2009	15.3	20.2	12.8	68.4	87.0	48.0	0.2	6745.0	6.2	10.7	3.1	9.9	19.4	1019.3	1020.8	1017.8	153.8	841.0	0.0
21/04/2009	16.2	21.9	11.6	66.2	81.0	48.0	0.0	6500.0	5.2	8.9	0.4	11.5	21.1	1020.8	1023.1	1018.9	187.4	828.0	0.0
22/04/2009	15.3	22.1	8.6	69.8	88.0	49.0	0.0	6784.0	3.7	8.5	0.0	8.7	21.2	1022.9	1024.9	1020.8	200.5	859.0	0.0
23/04/2009	15.8	23.2	8.8	68.7	90.0	41.0	0.0	6578.0	1.2	3.1	0.0	8.7	22.2	1020.5	1023.2	1018.0	203.8	730.0	0.0
24/04/2009	16.4	23.4	10.6	70.9	87.0	45.0	2.0	6764.0	1.6	8.9	0.0	10.4	22.9	1013.9	1017.9	1009.4	125.5	604.0	0.0
25/04/2009	17.0	22.1	11.8	64.4	88.0	45.0	0.0	6223.0	3.8	7.2	0.0	10.7	21	1010.4	1012.0	1008.4	184.8	822.0	0.0
26/04/2009	15.5	18.7	10.2	54.7	65.0	44.0	0.0	5264.0	4.6	8.0	1.8	9.4	17.6	1011.6	1015.7	1009.5	99.1	522.0	0.0
27/04/2009	12.2	18.5	6.7	54.5	70.0	36.0	0.0	5123.0	2.8	5.8	0.0	5.2	16.6	1018.4	1021.4	1015.4	162.9	941.0	0.0
28/04/2009	14.5	21.1	8.6	53.1	70.0	38.0	0.0	5075.0	3.0	5.4	0.0	8.8	19.3	1021.3	1023.2	1019.4	150.0	792.0	0.0
29/04/2009	12.7	18.7	6.9	63.0	82.0	45.0	0.0	5959.0	0.9	4.0	0.0	6.9	17.7	1021.5	1023.3	1019.8	105.5	489.0	0.0
30/04/2009	11.3	17.6	5.3	66.5	83.0	46.0	0.0	6399.0	1.7	5.4	0.0	5.5	16.1	1022.3	1024.8	1020.4	155.0	755.0	0.0
Monthly	17.4	30.6	5.3	67.1	93.0	30.0	72.6	193184.0	2.4	10.7	0.0	5.2	30.3	1019.5	1027.6	1008.4	170.6	1031.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/05/2009	12.4	21.2	4.8	63.0	90.0	31.0	0.0	5894.0	0.7	3.1	0.0	4.8	19.3	1025.2	1027.4	1023.2	179.2	716.0	0.0
2/05/2009	13.9	21.8	7.3	56.6	82.0	29.0	0.0	5336.0	1.0	2.2	0.0	7.4	20.2	1025.3	1027.3	1023.5	191.2	729.0	0.0
3/05/2009	13.7	21.9	5.8	64.5	85.0	33.0	0.0	6104.0	1.2	5.8	0.0	5.9	19.9	1027.2	1029.1	1025.5	170.6	783.0	0.0
4/05/2009	14.2	22.7	6.8	63.7	90.0	34.0	0.0	6037.0	0.9	4.0	0.0	6.9	20.2	1029.0	1030.7	1027.2	181.1	679.0	0.0
5/05/2009	13.9	22.0	7.3	68.5	88.0	41.0	0.0	6592.0	2.4	7.6	0.0	7.4	20.8	1030.1	1032.2	1028.2	176.0	712.0	0.0
6/05/2009	14.5	22.5	7.2	66.1	91.0	35.0	0.0	6308.0	0.6	2.7	0.0	7.3	21.3	1027.8	1030.3	1024.9	181.2	665.0	0.0
7/05/2009	14.7	22.3	8.4	63.9	87.0	38.0	0.0	6019.0	0.6	3.1	0.0	8.4	20.6	1025.7	1027.7	1023.3	161.9	710.0	0.0
8/05/2009	13.6	21.4	6.6	64.5	84.0	34.0	0.0	6109.0	1.4	5.4	0.0	6.7	19.7	1026.8	1028.9	1025.2	174.6	667.0	0.0
9/05/2009	13.2	21.2	6.4	64.8	91.0	36.0	0.0	6163.0	1.0	3.6	0.0	6.4	19.4	1024.5	1027.0	1021.5	170.4	659.0	0.0
10/05/2009	12.7	20.3	6.8	67.1	83.0	41.0	0.0	6430.0	3.1	8.5	0.0	6.4	19.1	1024.2	1026.7	1022.6	169.4	649.0	0.0
11/05/2009	12.3	20.3	5.9	61.8	82.0	33.0	0.0	5868.0	1.3	4.0	0.0	6.1	18.4	1024.6	1026.7	1022.2	169.0	634.0	0.0
12/05/2009	12.1	19.9	4.8	62.5	88.0	33.0	0.0	5966.0	0.9	3.1	0.0	4.8	17.9	1021.9	1024.3	1019.6	164.6	633.0	0.0
13/05/2009	12.2	19.9	4.3	54.0	82.0	29.0	0.0	5005.0	1.3	4.9	0.0	4.3	17.9	1019.1	1021.4	1017.1	163.1	630.0	0.0
14/05/2009	11.7	19.3	2.4	53.5	80.0	34.0	0.0	4958.0	2.0	4.9	0.0	2.5	17.6	1018.9	1020.8	1017.2	164.4	624.0	0.0
15/05/2009	12.3	19.8	3.5	56.3	82.0	35.0	0.0	5290.0	2.1	5.4	0.0	3.5	17.8	1019.5	1021.8	1017.5	162.3	625.0	0.0
16/05/2009	14.0	20.3	9.1	56.5	73.0	43.0	0.0	5456.0	3.5	5.8	0.4	6.4	19	1018.6	1020.8	1016.1	145.3	703.0	0.0
17/05/2009	11.9	19.0	5.2	63.9	87.0	38.0	0.0	6224.0	0.5	1.8	0.0	5.2	17.3	1020.6	1022.2	1018.5	152.8	608.0	0.0
18/05/2009	13.8	21.1	6.8	63.2	82.0	44.0	0.0	6028.0	2.4	5.8	0.0	4.5	19.8	1023.7	1026.0	1021.7	93.9	536.0	0.0
19/05/2009	14.2	17.7	12.3	70.8	87.0	58.0	1.4	6654.0	1.1	4.5	0.0	12.3	17.1	1022.2	1024.8	1019.2	36.3	286.0	0.0
20/05/2009	14.6	17.9	11.7	70.6	87.0	54.0	2.8	6637.0	3.1	7.2	0.4	9.7	17.2	1018.8	1020.8	1017.5	43.5	208.0	0.0
21/05/2009	14.8	16.7	12.4	68.4	86.0	58.0	0.4	6587.0	6.7	10.3	3.6	10.2	16	1017.6	1018.9	1016.4	46.2	219.0	0.0
22/05/2009	16.3	20.3	13.8	61.5	75.0	50.0	0.0	6011.0	7.5	11.6	3.6	10.9	18.9	1017.1	1019.0	1015.0	130.5	790.0	0.0
23/05/2009	16.2	22.1	11.3	67.6	87.0	47.0	0.0	6558.0	5.0	9.4	0.9	10.2	20.9	1020.0	1023.0	1018.4	155.0	752.0	0.0
24/05/2009	15.3	21.2	10.2	62.8	80.0	42.0	0.0	5983.0	2.6	6.3	0.0	10.3	19.9	1024.9	1027.1	1022.8	150.0	687.0	0.0
25/05/2009	13.6	21.6	8.1	65.4	86.0	40.0	0.0	6137.0	0.7	3.1	0.0	8.3	20.3	1025.9	1028.3	1024.2	137.3	761.0	0.0
26/05/2009	13.9	20.8	8.0	65.0	82.0	45.0	0.0	6088.0	0.6	2.7	0.0	7.9	19.3	1024.1	1026.1	1022.6	123.9	665.0	0.0
27/05/2009	13.7	21.4	6.6	68.2	90.0	46.0	0.0	6425.0	0.6	2.7	0.0	6.6	19.9	1022.1	1024.0	1020.4	134.8	715.0	0.0
28/05/2009	13.6	19.6	7.2	73.8	87.0	53.0	0.0	7095.0	1.0	2.2	0.0	7.6	18.4	1021.8	1023.3	1020.7	93.4	491.0	0.0
29/05/2009	12.8	19.2	9.7	76.4	92.0	50.0	2.0	7462.0	2.6	6.7	0.0	7.8	18.1	1022.9	1025.4	1021.3	117.5	652.0	0.0
30/05/2009	11.3	17.2	7.3	73.3	86.0	53.0	0.0	7151.0	3.4	8.9	0.0	6.3	16.2	1027.9	1031.6	1024.7	150.4	622.0	0.0
31/05/2009	12.2	18.2	6.4	68.4	90.0	43.0	0.0	6607.0	2.3	5.4	0.0	5.4	17.1	1031.9	1033.7	1030.3	88.7	540.0	0.0
Monthly	13.5	22.7	2.4	64.7	92.0	29.0	6.6	191182.0	2.1	11.6	0.0	2.5	21.3	1023.6	1033.7	1015.0	141.2	790.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/06/2009	13.3	18.1	9.3	62.2	75.0	43.0	0.0	5875.0	1.6	4.0	0.0	9.4	16.5	1030.9	1033.1	1029.1	64.1	400.0	0.0
2/06/2009	13.0	17.6	10.2	79.6	89.0	57.0	6.2	7582.0	1.6	4.9	0.0	9.6	16.8	1028.9	1030.9	1027.1	58.0	432.0	0.0
3/06/2009	14.8	20.2	10.7	69.0	89.0	48.0	0.0	6492.0	1.6	5.4	0.0	10.8	19.2	1024.9	1027.4	1022.8	110.2	538.0	0.0
4/06/2009	13.8	18.8	9.8	82.9	92.0	63.0	4.8	8009.0	0.9	3.6	0.0	9.8	18.4	1020.9	1023.9	1018.1	97.2	651.0	0.0
5/06/2009	12.4	17.9	6.9	74.4	93.0	42.0	0.2	7147.0	1.4	4.5	0.0	6.9	16.8	1018.3	1019.9	1016.5	124.3	724.0	0.0
6/06/2009	10.0	16.9	3.6	70.5	91.0	43.0	0.0	6614.0	1.0	4.0	0.0	3.8	15.3	1016.5	1019.2	1014.0	137.4	613.0	0.0
7/06/2009	11.5	15.7	8.7	74.8	91.0	58.0	10.6	7165.0	3.1	7.2	0.0	7.9	15	1013.6	1015.9	1011.6	95.4	727.0	0.0
8/06/2009	11.6	16.0	9.7	75.6	84.0	58.0	1.4	7321.0	3.3	6.7	1.3	8.3	14.7	1015.9	1017.6	1014.2	69.3	452.0	0.0
9/06/2009	9.9	14.2	6.9	71.6	89.0	47.0	0.0	6978.0	4.0	7.2	0.9	4.4	13.1	1017.5	1019.1	1015.9	94.8	667.0	0.0
10/06/2009	8.0	11.4	4.0	63.6	84.0	42.0	0.6	6171.0	4.1	5.8	1.8	2.4	10.3	1020.7	1024.2	1017.7	151.4	705.0	0.0
11/06/2009	5.0	11.6	-2.0	67.8	90.0	38.0	0.0	6411.0	1.7	3.6	0.0	-3.5	10.3	1025.2	1026.9	1023.8	150.2	598.0	0.0
12/06/2009	6.0	15.6	-1.7	65.8	92.0	36.0	0.0	6117.0	0.4	1.8	0.0	-2.4	14	1026.2	1029.0	1024.3	147.5	585.0	0.0
13/06/2009	9.4	17.3	3.2	56.4	79.0	32.0	0.0	4965.0	1.6	5.4	0.0	3.3	15	1021.4	1024.5	1019.0	137.5	622.0	0.0
14/06/2009	11.2	18.1	6.1	60.8	84.0	36.0	2.2	5458.0	1.9	4.9	0.0	5.1	15.8	1017.8	1019.4	1015.2	90.1	648.0	0.0
15/06/2009	11.7	17.6	6.4	69.9	88.0	52.0	0.2	6412.0	1.6	4.0	0.0	6.7	16.6	1016.2	1018.4	1014.3	122.2	603.0	0.0
16/06/2009	9.4	16.4	2.5	73.5	90.0	48.0	0.0	6948.0	1.6	7.6	0.0	2.6	15.2	1021.8	1026.0	1017.9	135.2	576.0	0.0
17/06/2009	11.6	16.9	8.1	74.8	91.0	58.0	0.0	7060.0	3.2	6.7	0.0	7.2	15.7	1026.9	1028.4	1025.3	139.3	674.0	0.0
18/06/2009	10.8	16.8	6.2	73.6	89.0	53.0	0.0	7087.0	2.8	6.3	0.0	5.4	15.7	1028.2	1029.9	1026.5	103.6	626.0	0.0
19/06/2009	11.8	17.7	7.4	73.2	87.0	52.0	0.0	7115.0	2.9	7.2	0.0	6.7	16.2	1027.5	1029.0	1025.7	93.5	474.0	0.0
20/06/2009	14.3	20.7	9.1	64.9	83.0	46.0	0.0	6244.0	3.0	8.0	0.4	8.6	19.1	1025.4	1027.6	1022.9	98.0	723.0	0.0
21/06/2009	13.9	17.7	10.3	78.5	90.0	63.0	3.8	7569.0	1.5	6.7	0.0	10.4	17.4	1023.2	1025.5	1021.3	69.6	332.0	0.0
22/06/2009	12.8	17.6	8.4	82.8	93.0	63.0	12.6	8044.0	1.0	4.0	0.0	8.6	16.9	1021.5	1023.3	1020.4	100.7	572.0	0.0
23/06/2009	11.6	19.6	4.3	73.3	93.0	43.0	0.4	6961.0	0.6	4.0	0.0	4.6	18.7	1021.1	1023.4	1019.4	143.8	569.0	0.0
24/06/2009	11.2	18.7	4.1	66.8	90.0	41.0	0.4	5170.0	2.3	7.2	0.0	3.9	17.8	1018.4	1020.9	1015.6	124.5	636.0	0.0
25/06/2009	9.8	15.5	3.3	61.3	82.0	45.0	0.0	0.0	1.7	4.0	0.0	2.7	14.3	1018.0	1019.9	1016.6	117.5	600.0	0.0
26/06/2009	9.7	16.1	3.4	67.9	87.0	42.0	0.0	0.0	0.9	4.0	0.0	3.4	14.7	1014.4	1016.7	1012.0	108.3	595.0	0.0
27/06/2009	10.5	13.5	8.2	86.4	92.0	75.0	5.8	0.0	0.8	2.7	0.0	8.3	13.2	1009.6	1012.3	1007.3	54.9	304.0	0.0
28/06/2009	10.9	13.7	9.2	85.1	93.0	71.0	0.2	0.0	2.2	4.5	0.4	7.6	13.4	1011.1	1015.0	1009.5	58.8	360.0	0.0
29/06/2009	11.0	15.7	7.7	73.1	86.0	56.0	0.0	0.0	2.2	4.0	0.4	7.3	14.8	1017.3	1019.3	1014.8	127.4	614.0	0.0
30/06/2009	12.4	18.3	6.7	67.8	87.0	49.0	0.0	0.0	1.9	5.4	0.0	6.8	17.3	1017.4	1020.8	1014.2	142.0	618.0	0.0
Monthly	11.1	20.7	-2.0	71.6	93.0	32.0	49.4	160915.0	1.9	8.0	0.0	-3.5	19.2	1020.6	1033.1	1007.3	108.9	727.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/07/2009	14.2	20.1	8.7	51.7	69.0	34.0	0.0	0.0	3.8	8.0	0.4	8.2	18.8	1012.9	1015.2	1010.4	134.3	556.0	0.0
2/07/2009	10.8	16.5	3.7	53.1	75.0	37.0	0.0	0.0	3.4	6.7	0.9	3.6	14.4	1014.7	1017.0	1013.1	129.5	632.0	0.0
3/07/2009	9.5	12.8	6.6	63.1	79.0	45.0	0.8	0.0	5.1	8.0	1.8	4.4	11.5	1013.8	1017.6	1011.3	98.0	515.0	0.0
4/07/2009	7.3	13.5	1.3	70.8	89.0	46.0	0.0	0.0	2.4	4.9	0.4	-0.4	12.3	1018.8	1021.4	1016.2	149.0	690.0	0.0
5/07/2009	8.5	14.3	3.4	72.4	90.0	45.0	0.0	0.0	1.4	3.6	0.0	3.3	13.1	1021.0	1022.5	1019.7	134.3	629.0	0.0
6/07/2009	7.4	15.0	0.7	72.9	90.0	45.0	0.0	0.0	0.8	3.6	0.0	0.7	13.8	1022.5	1024.5	1021.3	117.3	678.0	0.0
7/07/2009	9.2	16.1	4.5	70.5	86.0	44.0	0.0	0.0	2.2	6.7	0.0	3.2	14.4	1023.9	1026.8	1021.7	76.0	572.0	0.0
8/07/2009	9.4	16.9	3.4	63.0	86.0	33.0	0.0	0.0	2.0	4.9	0.0	3.6	14.9	1028.2	1030.7	1026.2	150.3	589.0	0.0
9/07/2009	9.0	15.6	2.3	70.5	87.0	50.0	0.0	0.0	2.7	7.2	0.0	1.2	14.3	1029.4	1031.1	1028.1	132.6	678.0	0.0
10/07/2009	9.8	16.7	4.3	70.0	89.0	42.0	0.0	0.0	2.6	7.2	0.0	3.2	15.3	1026.3	1028.9	1023.2	157.1	715.0	0.0
11/07/2009	8.2	16.4	1.3	70.2	90.0	41.0	0.0	0.0	0.5	1.8	0.0	1.1	14.9	1022.3	1025.0	1019.9	120.1	592.0	0.0
12/07/2009	11.4	19.0	3.1	62.8	85.0	41.0	1.8	0.0	1.8	5.4	0.0	3.4	17.6	1017.6	1020.2	1014.6	137.8	604.0	0.0
13/07/2009	9.7	11.1	8.7	83.6	88.0	75.0	3.8	0.0	2.6	4.5	0.4	6.3	10.9	1013.3	1014.8	1011.4	21.8	144.0	0.0
14/07/2009	8.4	12.2	6.9	83.6	90.0	61.0	5.4	0.0	3.0	5.4	0.9	4.1	11.5	1012.9	1014.2	1010.9	52.1	692.0	0.0
15/07/2009	7.8	12.3	4.7	82.4	91.0	61.0	8.0	0.0	1.6	3.6	0.0	3.5	11.4	1013.2	1014.9	1011.5	79.9	365.0	0.0
16/07/2009	7.4	11.2	4.7	84.1	92.0	66.0	0.4	0.0	1.4	3.6	0.0	2.8	10.6	1015.8	1018.8	1014.0	74.9	784.0	0.0
17/07/2009	6.8	12.5	1.2	70.5	86.0	44.0	0.2	0.0	1.1	3.6	0.0	0	11.8	1022.2	1025.3	1018.5	89.3	656.0	0.0
18/07/2009	8.2	15.7	1.1	76.2	93.0	45.0	0.2	0.0	0.9	3.1	0.0	1.2	14.3	1024.7	1027.0	1023.0	158.8	615.0	0.0
19/07/2009	8.7	15.0	2.1	68.3	89.0	41.0	0.0	0.0	1.4	3.6	0.0	2.6	13.6	1026.0	1028.0	1024.2	162.0	623.0	0.0
20/07/2009	9.3	17.3	2.0	62.7	86.0	34.0	0.0	0.0	1.3	5.4	0.0	0.9	15.3	1027.6	1031.0	1026.0	164.7	630.0	0.0
21/07/2009	13.9	20.8	7.2	59.4	68.0	45.0	0.0	0.0	2.3	6.7	0.0	6.7	19.6	1023.7	1026.7	1020.3	149.3	619.0	0.0
22/07/2009	15.0	18.7	13.3	72.5	89.0	60.0	9.4	0.0	3.8	7.6	1.3	10	18.3	1017.0	1020.8	1013.6	63.8	497.0	0.0
23/07/2009	11.3	15.3	4.9	68.4	88.0	42.0	0.2	2890.0	3.5	6.7	0.4	4.9	14.2	1018.5	1024.0	1014.2	161.6	747.0	0.0
24/07/2009	8.0	15.7	1.3	73.9	89.0	50.0	0.0	7027.0	1.2	4.0	0.0	0.2	14.4	1026.8	1028.9	1023.7	161.1	747.0	0.0
25/07/2009	9.2	16.7	2.9	67.4	88.0	41.0	0.0	6258.0	0.6	2.7	0.0	2.9	15.3	1027.0	1030.3	1023.9	167.9	641.0	0.0
26/07/2009	11.8	16.9	5.3	67.5	88.0	54.0	8.4	6374.0	2.2	5.8	0.0	5.6	15.9	1020.0	1024.0	1015.5	77.0	457.0	0.0
27/07/2009	9.5	15.0	3.9	71.4	91.0	49.0	0.0	6770.0	1.6	4.5	0.0	3.9	14	1020.5	1025.2	1015.6	160.3	690.0	0.0
28/07/2009	8.2	14.7	0.3	71.6	90.0	52.0	0.2	6790.0	0.8	3.1	0.0	-0.2	13.5	1027.0	1029.0	1024.9	167.1	745.0	0.0
29/07/2009	8.7	14.8	1.4	71.5	91.0	49.0	0.0	6690.0	0.9	3.6	0.0	1.1	13.6	1028.1	1029.5	1026.8	145.9	691.0	0.0
30/07/2009	8.9	15.7	1.3	70.3	91.0	47.0	0.0	6749.0	1.0	4.5	0.0	1.8	14.3	1027.1	1029.3	1024.6	164.8	704.0	0.0
31/07/2009	8.6	12.7	2.2	72.6	87.0	62.0	0.0	6880.0	1.8	3.6	0.0	1.5	12.1	1026.0	1027.5	1024.6	76.5	671.0	0.0
Monthly	9.5	20.8	0.3	70.0	93.0	33.0	38.8	56428.0	2.0	8.0	0.0	-0.4	19.6	1021.6	1031.1	1010.4	123.7	784.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/08/2009	8.4	15.8	1.7	70.7	91.0	45.0	0.0	6564.0	0.9	3.1	0.0	1.8	14.5	1028.1	1030.0	1026.6	177.9	663.0	0.0
2/08/2009	8.8	17.6	1.1	65.9	91.0	34.0	0.0	6157.0	0.7	3.1	0.0	0.9	16	1028.7	1031.3	1027.2	178.8	672.0	0.0
3/08/2009	9.3	17.0	1.7	62.9	81.0	45.0	0.0	5648.0	1.3	3.6	0.0	1.3	15.3	1026.5	1028.4	1024.8	180.1	672.0	0.0
4/08/2009	10.3	17.8	3.5	62.6	85.0	38.0	0.0	5737.0	1.1	4.0	0.0	3.7	15.8	1024.0	1025.8	1021.5	170.7	664.0	0.0
5/08/2009	9.5	17.6	2.2	64.7	88.0	37.0	0.0	6026.0	0.8	3.1	0.0	2.4	15.6	1024.4	1026.0	1023.0	170.4	673.0	0.0
6/08/2009	10.7	19.2	3.7	60.3	85.0	32.0	0.0	5542.0	0.8	4.0	0.0	3.8	17.2	1024.4	1027.1	1022.2	179.4	666.0	0.0
7/08/2009	12.9	21.3	6.5	55.9	76.0	33.0	0.0	5131.0	3.7	7.6	0.0	5.9	19.2	1020.5	1022.9	1016.7	147.2	683.0	0.0
8/08/2009	8.5	15.4	1.4	59.6	86.0	31.0	0.0	5596.0	1.9	5.8	0.0	1.5	13.6	1023.1	1025.3	1021.8	187.0	690.0	0.0
9/08/2009	9.3	18.2	1.3	58.7	85.0	30.0	0.0	5411.0	0.9	4.5	0.0	1.3	16.1	1022.4	1024.4	1020.6	185.0	704.0	0.0
10/08/2009	13.3	20.5	5.9	46.8	62.0	34.0	0.0	4198.0	1.9	4.9	0.0	5.1	18.8	1020.9	1022.8	1019.4	145.4	646.0	0.0
11/08/2009	15.4	19.9	11.8	56.6	78.0	48.0	2.4	5256.0	3.8	8.0	0.0	9.3	19.1	1016.9	1020.4	1013.4	91.4	655.0	0.0
12/08/2009	12.9	17.7	8.4	55.9	72.0	47.0	0.4	4885.0	1.6	4.5	0.0	7.3	16.1	1015.4	1018.3	1013.4	99.0	507.0	0.0
13/08/2009	11.6	19.1	2.9	57.5	86.0	35.0	0.0	5262.0	1.4	4.9	0.0	3	17.4	1018.0	1020.4	1016.1	197.1	717.0	0.0
14/08/2009	10.7	18.4	3.6	62.6	85.0	40.0	0.0	5752.0	0.9	4.0	0.0	3.7	16.8	1021.1	1023.1	1019.1	198.1	737.0	0.0
15/08/2009	10.9	19.6	2.8	58.8	87.0	30.0	0.0	5380.0	0.8	2.7	0.0	2.9	17.3	1022.4	1024.8	1021.0	200.4	722.0	0.0
16/08/2009	15.1	24.2	3.7	45.6	77.0	26.0	0.0	4088.0	1.8	5.4	0.0	3.7	23.1	1019.5	1022.6	1015.9	197.4	711.0	0.0
17/08/2009	16.9	22.4	8.9	55.9	76.0	33.0	0.0	3807.0	4.2	7.6	0.4	7.5	21.2	1018.7	1026.0	1014.9	195.0	711.0	0.0
18/08/2009	10.3	18.9	1.3	48.2	75.0	27.0	0.0	4434.0	1.0	3.1	0.0	1.3	16.2	1028.0	1031.0	1025.4	206.1	738.0	0.0
19/08/2009	11.8	20.3	4.1	50.3	79.0	27.0	0.0	4571.0	1.1	4.0	0.0	4.2	18.2	1027.8	1030.7	1025.5	202.6	743.0	0.0
20/08/2009	14.5	22.8	6.7	45.9	64.0	32.0	0.0	4121.0	1.7	5.8	0.0	6.8	20.2	1020.9	1025.3	1017.2	168.2	789.0	0.0
21/08/2009	18.0	25.3	8.2	47.1	74.0	29.0	0.0	4386.0	3.7	8.9	0.0	8.3	24.6	1012.6	1017.9	1008.0	173.7	784.0	0.0
22/08/2009	16.8	20.7	12.2	57.3	80.0	35.0	0.4	5479.0	2.5	6.3	0.4	11.7	19.5	1013.3	1016.1	1009.9	112.3	689.0	0.0
23/08/2009	20.7	28.4	12.9	50.1	75.0	32.0	0.0	4654.0	1.6	4.5	0.0	13.1	27.4	1013.0	1015.9	1010.2	162.3	756.0	0.0
24/08/2009	21.5	26.6	15.8	47.0	71.0	34.0	0.8	4289.0	2.6	5.4	0.0	15.8	25.9	1009.2	1011.2	1006.9	118.1	930.0	0.0
25/08/2009	17.4	22.7	11.4	36.1	53.0	20.0	0.2	3389.0	5.3	8.9	1.8	10.7	22.2	1012.4	1016.6	1006.4	215.6	773.0	0.0
26/08/2009	13.8	20.6	7.3	38.0	52.0	25.0	0.0	3497.0	2.9	5.8	0.0	6.6	18.2	1019.7	1022.6	1016.8	222.9	787.0	0.0
27/08/2009	13.8	23.1	3.7	40.5	70.0	21.0	0.0	3637.0	1.3	4.0	0.0	3.8	20.4	1020.9	1023.7	1018.2	224.9	789.0	0.0
28/08/2009	16.2	23.7	6.6	33.6	55.0	21.0	0.0	2936.0	1.3	3.6	0.0	6.7	22.2	1018.6	1021.7	1015.8	224.1	789.0	0.0
29/08/2009	19.9	25.2	12.5	46.6	65.0	32.0	0.6	4212.0	3.7	8.5	0.4	12.7	24.9	1010.5	1016.1	1005.7	70.0	416.0	0.0
30/08/2009	13.8	17.4	8.2	50.3	80.0	29.0	1.8	4803.0	4.0	6.7	0.0	8.6	16.2	1015.9	1024.7	1010.1	204.5	845.0	0.0
31/08/2009	10.3	17.7	1.4	49.9	79.0	33.0	0.0	4671.0	1.9	4.5	0.0	1.6	15.6	1022.2	1024.6	1019.8	225.3	792.0	0.0
Monthly	13.3	28.4	1.1	53.0	91.0	20.0	6.6	149519.0	2.0	8.9	0.0	0.9	27.4	1020.0	1031.3	1005.7	175.2	930.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/09/2009	11.7	20.3	3.1	52.5	80.0	31.0	0.0	4757.0	1.0	3.6	0.0	3.2	17.9	1024.1	1026.7	1022.0	232.5	801.0	0.0
2/09/2009	13.9	22.8	5.2	48.0	75.0	23.0	0.0	4405.0	0.9	3.6	0.0	5.3	20.6	1023.7	1026.3	1021.4	231.0	799.0	0.0
3/09/2009	15.0	20.9	10.3	60.1	81.0	34.0	1.4	5506.0	2.1	5.8	0.0	10.3	19.2	1021.5	1023.5	1019.5	107.9	781.0	0.0
4/09/2009	14.5	18.2	11.5	76.1	90.0	63.0	19.4	7219.0	2.7	9.4	0.0	8.9	17.9	1017.9	1021.1	1015.2	91.3	835.0	0.0
5/09/2009	14.5	20.9	7.2	68.5	91.0	45.0	0.0	6524.0	1.5	3.6	0.0	7.4	19.7	1017.5	1019.6	1015.7	183.7	1005.0	0.0
6/09/2009	13.5	21.6	4.9	61.1	85.0	34.0	0.0	5488.0	1.3	4.5	0.0	5.1	20	1018.0	1021.2	1015.6	245.1	833.0	0.0
7/09/2009	12.6	16.7	8.3	78.4	90.0	64.0	22.8	7399.0	2.9	6.3	0.0	8.8	16.4	1012.0	1015.7	1008.7	38.7	342.0	0.0
8/09/2009	12.1	18.1	5.3	71.9	92.0	43.0	1.0	6900.0	2.7	6.3	0.0	4.7	16.8	1013.1	1016.1	1010.9	201.3	968.0	0.0
9/09/2009	11.7	17.8	6.6	61.5	83.0	37.0	0.0	5744.0	3.2	6.3	0.0	4	16.1	1016.6	1019.0	1014.9	213.6	953.0	0.0
10/09/2009	12.0	19.5	3.6	56.6	87.0	32.0	0.0	5197.0	1.9	5.8	0.0	3.8	17.7	1020.2	1023.4	1017.9	254.6	873.0	0.0
11/09/2009	12.4	21.0	3.6	52.1	84.0	23.0	0.0	4664.0	0.7	2.7	0.0	3.6	19	1024.9	1027.1	1023.3	257.2	867.0	0.0
12/09/2009	15.6	24.8	6.1	47.1	71.0	27.0	0.0	4089.0	0.5	2.2	0.0	6.2	24	1026.2	1028.9	1023.9	253.2	855.0	0.0
13/09/2009	18.8	26.5	10.3	41.3	58.0	27.0	0.0	3561.0	2.6	5.8	0.0	9.7	25.2	1024.0	1026.9	1021.6	248.5	839.0	0.0
14/09/2009	19.8	27.3	11.3	41.2	65.0	27.0	0.0	3578.0	1.5	4.5	0.0	11.8	26	1021.1	1023.5	1019.2	248.7	842.0	0.0
15/09/2009	19.0	26.7	10.2	53.9	84.0	31.0	0.0	4909.0	1.0	3.6	0.0	10.3	25.6	1019.5	1021.7	1017.3	218.9	868.0	0.0
16/09/2009	21.8	29.6	13.9	45.5	69.0	28.0	0.0	4110.0	1.7	4.5	0.0	14.1	28.3	1019.7	1022.0	1017.4	244.8	836.0	0.0
17/09/2009	22.7	29.1	15.8	78.4	90.0	64.0	0.0	3904.0	3.4	5.8	0.9	16.1	28	1019.1	1022.3	1016.3	247.0	851.0	0.0
18/09/2009	19.7	25.8	13.4	50.3	83.0	27.0	2.8	4716.0	2.3	4.0	0.4	13.4	25	1019.1	1020.8	1017.4	253.3	883.0	0.0
19/09/2009	17.4	25.2	8.6	53.4	85.0	27.0	0.0	5104.0	1.9	5.4	0.0	8.4	24.2	1018.5	1021.0	1015.3	266.1	888.0	0.0
20/09/2009	19.0	27.4	8.1	49.2	79.0	29.0	0.0	4535.0	1.4	7.2	0.0	8.7	26	1016.6	1019.3	1013.7	262.8	875.0	0.0
21/09/2009	18.6	26.7	11.7	59.4	79.0	31.0	0.2	5603.0	2.2	6.7	0.0	11.7	25.4	1014.4	1016.1	1011.7	142.1	791.0	0.0
22/09/2009	18.4	23.1	14.8	73.7	88.0	57.0	19.4	7011.0	4.5	12.1	0.4	14.9	23.3	1008.5	1012.4	1001.6	54.4	392.0	0.0
23/09/2009	13.8	19.3	10.8	63.9	88.0	43.0	2.0	6081.0	6.6	10.7	1.3	8.3	19.4	1008.8	1015.9	1000.2	83.7	542.0	0.0
24/09/2009	14.5	20.6	8.6	55.7	80.0	34.0	0.0	5306.0	3.4	5.8	0.0	7.1	18.8	1017.5	1019.5	1015.7	274.2	1060.0	0.0
25/09/2009	16.0	23.8	5.6	48.8	82.0	28.0	0.0	4499.0	2.2	4.9	0.0	5.7	22.6	1015.6	1019.6	1009.9	275.9	906.0	0.0
26/09/2009	16.4	20.3	10.6	33.4	52.0	24.0	0.0	3155.0	6.4	8.9	3.6	8.7	18.2	1010.4	1014.6	1005.4	230.8	915.0	0.0
27/09/2009	10.9	15.9	6.7	42.6	61.0	28.0	0.0	4065.0	5.0	8.5	1.8	3.6	13.7	1014.7	1016.9	1012.5	276.7	995.0	0.0
28/09/2009	11.1	17.7	5.0	49.2	65.0	37.0	0.0	4675.0	3.6	6.3	0.0	2.2	15.7	1014.2	1015.8	1011.7	245.8	1017.0	0.0
29/09/2009	13.0	21.4	3.8	50.9	82.0	27.0	0.0	4700.0	1.4	4.0	0.0	3.9	19.2	1016.8	1019.2	1014.7	287.0	931.0	0.0
30/09/2009	15.4	24.2	6.0	41.7	69.0	21.0	0.0	3693.0	1.1	4.9	0.0	6.1	22.7	1019.7	1022.1	1017.7	284.7	932.0	0.0
Monthly	15.5	29.6	3.1	55.6	92.0	21.0	69.0	151097.0	2.5	12.1	0.0	2.2	28.3	1017.8	1028.9	1000.2	215.2	1060.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar RAE	Solar RAE	Solar RAE
1/10/2009	20.8	30.1	10.0	31.4	56.0	16.0	0.0	6.7	1.7	4.9	0.0	10	28.4	1016.4	1020.2	1012.5	287.9	918.0	0.0
2/10/2009	22.8	32.3	15.8	40.7	71.0	24.0	0.6	7.0	3.7	8.0	0.0	16.2	30.1	1010.4	1014.4	1006.4	230.4	1041.0	0.0
3/10/2009	16.6	22.1	12.1	67.8	82.0	49.0	0.8	4.0	3.6	7.2	0.9	10.6	21.4	1011.8	1017.5	1006.9	181.0	994.0	0.0
4/10/2009	15.0	21.5	10.8	70.0	85.0	47.0	2.6	3.5	2.8	8.9	0.0	9.7	20	1018.6	1021.0	1016.7	170.3	1047.0	0.0
5/10/2009	15.3	23.2	10.2	67.8	89.0	39.0	1.0	4.7	1.7	6.7	0.0	10.3	21.9	1019.4	1021.5	1017.1	274.6	1078.0	0.0
6/10/2009	14.5	22.6	5.8	59.2	91.0	32.0	0.2	5.0	1.3	4.5	0.0	5.9	21.2	1020.0	1023.0	1017.4	302.1	1033.0	0.0
7/10/2009	12.5	17.7	7.6	45.0	73.0	23.0	0.0	6.2	3.8	7.6	0.0	7.4	15.3	1017.9	1020.7	1016.1	272.7	1103.0	0.0
8/10/2009	12.1	20.0	3.4	51.4	79.0	29.0	0.0	5.9	3.1	6.7	0.0	3.4	17.7	1021.3	1025.1	1019.0	305.9	992.0	0.0
9/10/2009	12.4	19.8	5.2	55.7	80.0	32.0	0.0	5.8	4.0	10.7	0.0	5.2	17.7	1025.6	1027.9	1023.2	284.0	1138.0	0.0
10/10/2009	14.1	22.4	6.1	55.7	82.0	31.0	0.0	5.1	2.5	6.3	0.0	6.5	20.6	1027.0	1029.9	1024.1	253.0	1144.0	0.0
11/10/2009	14.8	22.8	10.6	62.3	86.0	38.0	1.8	3.9	2.5	7.6	0.0	9	21.7	1022.1	1025.9	1018.4	183.3	1073.0	0.0
12/10/2009	17.8	25.9	9.6	61.9	87.0	34.0	0.2	4.8	2.2	5.8	0.0	9.7	25.2	1013.1	1018.4	1008.1	224.3	930.0	0.0
13/10/2009	19.1	24.6	13.8	42.4	78.0	23.0	0.4	7.9	5.1	9.8	0.9	12.8	23.6	1006.3	1008.6	1003.8	270.2	906.0	0.0
14/10/2009	17.5	21.9	12.9	35.9	48.0	27.0	0.0	7.1	5.2	11.2	1.8	12.5	19.9	1008.5	1014.2	1006.0	198.0	1086.0	0.0
15/10/2009	16.9	23.6	9.5	39.0	56.0	26.0	0.0	7.8	4.4	8.9	0.0	8.8	22.3	1013.2	1015.4	1010.3	308.9	1092.0	0.0
16/10/2009	13.9	19.7	8.2	41.5	70.0	21.0	0.0	6.9	3.8	8.5	0.0	7.4	16.8	1017.3	1021.8	1014.0	315.7	1084.0	0.0
17/10/2009	14.1	22.4	3.3	45.0	73.0	23.0	0.0	5.1	1.1	4.0	0.0	3.4	20.6	1022.8	1024.8	1021.1	291.1	994.0	0.0
18/10/2009	15.8	23.6	7.6	49.1	79.0	27.0	0.0	4.4	1.4	3.6	0.0	7.1	22.3	1026.1	1027.8	1024.0	228.6	1143.0	0.0
19/10/2009	18.5	25.9	10.0	48.1	78.0	29.0	0.0	5.5	1.1	3.1	0.0	10.1	24.8	1026.3	1028.9	1023.7	297.3	1046.0	0.0
20/10/2009	21.6	29.9	12.5	41.2	70.0	24.0	0.0	6.8	1.7	4.5	0.0	12.6	28.2	1023.4	1026.3	1020.1	314.9	978.0	0.0
21/10/2009	23.8	32.3	13.6	34.6	60.0	18.0	0.0	7.3	1.6	5.8	0.0	13.7	30.3	1021.5	1024.4	1019.0	315.6	985.0	0.0
22/10/2009	24.0	32.4	14.5	34.3	55.0	20.0	0.0	6.2	1.8	6.3	0.0	14.9	30.3	1020.7	1023.0	1018.9	254.1	954.0	0.0
23/10/2009	23.7	33.9	16.3	38.2	54.0	19.0	0.4	7.1	2.4	7.2	0.0	16.5	31.9	1019.0	1021.7	1015.6	258.8	1159.0	0.0
24/10/2009	23.0	31.4	13.3	31.0	61.0	12.0	0.0	8.4	2.8	6.7	0.0	13.5	28.8	1017.4	1019.5	1014.7	308.6	1124.0	0.0
25/10/2009	19.6	28.8	11.4	39.7	77.0	20.0	0.4	6.1	2.5	10.7	0.0	10.7	27.1	1015.0	1017.1	1012.1	234.3	1394.0	0.0
26/10/2009	14.6	15.7	13.5	83.9	90.0	77.0	21.2	1.4	4.4	9.4	0.0	9.6	15.6	1018.5	1023.6	1015.0	34.9	154.0	0.0
27/10/2009	17.4	22.9	13.1	68.0	81.0	53.0	0.0	4.2	4.1	7.2	0.9	10.7	22.1	1024.6	1026.4	1022.5	173.4	740.0	0.0
28/10/2009	19.7	27.7	11.7	63.1	88.0	40.0	0.0	6.0	1.9	5.8	0.0	11.8	26.7	1023.9	1026.8	1020.9	315.8	1030.0	0.0
29/10/2009	19.5	26.7	13.7	68.3	89.0	41.0	0.6	4.1	1.3	5.4	0.0	13.8	26.1	1023.5	1025.4	1020.9	211.9	1231.0	0.0
30/10/2009	18.7	27.3	8.2	74.8	91.0	45.0	5.0	4.1	1.4	5.8	0.0	8.6	26.9	1023.4	1024.8	1020.8	229.0	1082.0	0.0
31/10/2009	20.4	27.6	12.6	62.9	92.0	34.0	0.2	6.7	2.2	5.4	0.0	12.6	26.8	1023.4	1025.2	1021.3	330.1	1072.0	0.0
Monthly	17.8	33.9	3.3	51.9	92.0	12.0	35.4	175.5	2.7	11.2	0.0	3.4	31.9	1019.3	1029.9	1003.8	253.6	1394.0	0.0

	Average	Max	Min	Average	Max	Min	Rain	ET	Average	Max	Min	Minimum	Maximum	Average	Max	Min	Average	Max	Min
Date	Temp	Temp	Temp	%RH	%RH	%RH	mm	mm	WS	WS	WS	Wind Chill	Heat Index	Atm Pressure	Atm Pressure	Atm Pressure	Solar Rad	Solar Rad	Solar Rad
1/11/2009	22.0	30.8	13.8	45.8	73.0	23.0	0.0	7.1	1.6	6.3	0.0	14.1	29.2	1023.2	1026.0	1020.0	351.9	1045.0	0.0
2/11/2009	25.1	33.6	16.1	41.4	64.0	27.0	0.0	6.8	1.0	2.7	0.0	16.1	32.6	1020.3	1023.4	1017.1	336.6	1023.0	0.0
3/11/2009	27.4	34.7	18.8	34.1	62.0	17.0	0.0	9.6	3.2	7.2	0.0	18.8	33.1	1015.2	1018.4	1011.8	340.0	1039.0	0.0
4/11/2009	25.2	33.4	16.6	34.7	54.0	23.0	0.0	6.5	1.9	5.8	0.0	16.7	31.8	1014.1	1016.4	1012.5	248.3	1074.0	0.0
5/11/2009	21.2	29.7	15.6	60.9	82.0	31.0	0.0	5.4	3.5	8.0	0.0	14.4	28.5	1017.5	1021.4	1015.6	224.6	1031.0	0.0
6/11/2009	17.6	21.7	15.7	74.7	89.0	59.0	13.4	1.7	3.0	5.8	0.4	13.8	21.3	1023.9	1026.9	1020.4	48.5	256.0	0.0
7/11/2009	17.7	22.4	14.4	77.0	89.0	62.0	4.0	3.0	3.5	6.7	1.3	14.1	22.6	1027.9	1029.5	1026.1	131.7	569.0	0.0
8/11/2009	18.9	27.3	13.8	74.9	90.0	44.0	4.0	4.3	2.4	7.2	0.4	13.7	26.6	1028.1	1030.1	1025.9	232.4	1300.0	0.0
9/11/2009	20.7	28.2	13.4	62.3	89.0	35.0	0.0	6.6	2.6	8.0	0.0	13.5	27.4	1024.6	1027.8	1020.8	326.6	1211.0	0.0
10/11/2009	21.0	29.2	12.8	46.6	77.0	18.0	0.0	6.5	1.1	3.1	0.0	13.1	27.3	1022.4	1024.4	1019.7	360.8	1068.0	0.0
11/11/2009	23.3	32.4	13.7	42.5	74.0	20.0	0.0	7.6	1.8	5.4	0.0	13.8	30.5	1021.6	1024.5	1018.8	354.5	1046.0	0.0
12/11/2009	24.6	34.1	12.5	39.0	72.0	18.0	3.8	7.6	1.8	11.6	0.0	12.6	32.2	1019.2	1022.5	1014.8	352.2	1044.0	0.0
13/11/2009	23.3	30.3	16.7	56.4	76.0	39.0	1.4	8.1	3.7	7.6	0.0	16.7	30.2	1016.1	1019.2	1013.0	351.9	1052.0	0.0
14/11/2009	22.3	31.2	12.8	52.7	87.0	25.0	0.0	6.6	1.4	4.0	0.0	12.8	29.5	1015.0	1018.1	1011.6	353.9	1150.0	0.0
15/11/2009	26.2	35.3	15.3	37.4	60.0	21.0	0.0	7.6	1.5	4.5	0.0	15.5	33.6	1011.2	1013.8	1008.0	346.1	1036.0	0.0
16/11/2009	29.6	38.1	19.1	33.9	65.0	15.0	0.0	8.5	1.8	5.8	0.0	19.1	36.5	1007.0	1010.1	1003.1	349.4	1030.0	0.0
17/11/2009	28.4	37.7	18.2	77.0	89.0	62.0	0.0	9.3	3.1	8.0	0.0	17.3	36.2	1004.7	1009.9	1002.0	336.6	1035.0	0.0
18/11/2009	25.4	35.3	13.7	45.3	79.0	20.0	0.0	7.6	1.9	4.5	0.0	13.8	34	1010.0	1011.5	1007.9	355.3	1046.0	0.0
19/11/2009	30.3	39.6	19.8	39.3	69.0	21.0	0.0	7.7	1.9	8.9	0.0	19.8	38.8	1010.9	1013.3	1008.2	324.3	1039.0	0.0
20/11/2009	33.2	41.3	24.3	34.2	57.0	19.0	0.0	9.4	2.8	7.6	0.0	24.4	41.8	1010.2	1013.4	1006.1	335.1	1004.0	0.0
21/11/2009	34.1	40.8	26.4	29.0	47.0	18.0	0.0	11.4	4.4	7.2	0.4	26.8	40.4	1007.6	1010.1	1005.2	333.9	1002.0	0.0
22/11/2009	33.6	38.8	28.2	28.6	43.0	17.0	0.0	11.2	4.9	8.9	0.9	28.2	38.7	1007.6	1010.0	1005.7	284.3	1010.0	0.0
23/11/2009	26.5	33.0	18.3	46.1	66.0	31.0	0.0	21.3	6.0	12.5	0.4	14.9	33.3	1013.6	1020.6	1010.1	298.0	1046.0	0.0
24/11/2009	23.6	31.8	17.1	55.3	71.0	35.0	0.0	6.0	3.7	8.9	0.4	14.2	31.8	1020.7	1023.0	1018.2	230.5	1085.0	0.0
25/11/2009	26.6	35.7	16.9	50.1	84.0	24.0	0.0	7.6	1.9	5.4	0.0	17.1	34.6	1019.0	1022.3	1015.1	356.6	1047.0	0.0
26/11/2009	28.9	35.5	21.6	38.2	60.0	16.0	0.0	9.5	3.7	7.6	0.4	21.9	34.3	1014.0	1017.7	1009.2	346.0	1042.0	0.0
27/11/2009	26.2	33.5	20.3	53.5	89.0	23.0	6.8	8.2	3.4	6.7	0.0	20.3	32.3	1011.7	1014.3	1008.9	331.8	1141.0	0.0
28/11/2009	28.8	37.8	18.2	33.4	63.0	13.0	0.0	9.7	3.2	7.2	0.0	18.3	35.7	1006.6	1010.9	1001.5	321.5	1048.0	0.0
29/11/2009	25.3	30.6	19.1	24.7	40.0	17.0	0.0	11.1	5.0	9.4	0.9	19.4	28.6	1004.1	1007.3	1001.9	345.3	1015.0	0.0
30/11/2009	20.2	27.1	14.1	42.0	68.0	25.0	0.0	6.5	3.0	8.0	0.0	11.3	25.2	1008.6	1013.7	1006.5	252.2	1243.0	0.0
Monthly	25.2	41.3	12.5	47.0	90.0	13.0	33.4	239.7	2.8	12.5	0.0	11.3	41.8	1015.2	1030.1	1001.5	305.3	1300.0	0.0

Date	Average Temp	Max Temp	Min Temp	Average %RH	Max %RH	Min %RH	Rain mm	ET mm	Average WS	Max WS	Min WS	Minimum Wind Chill	Maximum Heat Index	Average Atm Pressure	Max Atm Pressure	Min Atm Pressure	Average Solar Rad	Max Solar Rad	Min Solar Rad
1/12/2009	18.1	25.7	13.1	54.9	73.0	32.0	0.0	96.0	5.2	7.6	2.7	10.8	24.7	1014.9	1020.2	1012.6	333.844	1121	0
2/12/2009	17.9	25.2	9.4	48.5	76.0	28.0	0.0	96.0	4.6	8.0	0.4	8.7	24.4	1020.7	1022.9	1018.5	374.708	1087	0
3/12/2009	21.1	30.8	10.0	39.9	77.0	15.0	0.0	96.0	1.1	3.1	0.0	10.1	28.6	1021.0	1024.0	1017.5	373.031	1079	0
4/12/2009	25.7	35.1	16.6	30.0	47.0	19.0	0.0	96.0	2.5	5.4	0.0	16.6	32.9	1016.3	1018.9	1012.9	335.094	1176	0
5/12/2009	26.5	36.2	15.7	38.5	81.0	12.0	0.0	96.0	3.4	7.6	0.0	15.8	34	1012.3	1014.5	1008.8	367.073	1162	0
6/12/2009	26.1	34.8	14.9	41.3	77.0	16.0	0.0	96.0	1.8	5.8	0.0	14.9	32.5	1013.4	1015.4	1011.1	367.635	1063	0
7/12/2009	29.8	38.9	20.0	34.1	69.0	11.0	0.0	96.0	3.5	7.6	0.0	20.1	35.9	1011.3	1014.1	1007.9	368.323	1065	0
8/12/2009	31.6	41.0	19.5	19.4	31.0	12.0	0.0	96.0	4.9	10.3	0.0	19.6	38.7	1005.8	1010.2	1000.8	314.500	1156	0
9/12/2009	29.7	38.3	19.9	23.5	45.0	13.0	0.0	96.0	3.6	8.0	0.0	20.1	36	1007.1	1009.6	1005.4	339.969	1053	0
10/12/2009	24.3	33.9	16.3	45.4	68.0	18.0	1.2	96.0	2.4	6.3	0.0	16.3	31.5	1011.1	1014.1	1008.5	143.156	928	0
11/12/2009	24.5	29.8	18.7	32.5	57.0	13.0	0.0	96.0	3.9	7.6	0.4	18.9	27.9	1014.3	1017.8	1010.4	373.260	1125	0
12/12/2009	23.3	31.9	12.7	28.6	49.0	16.0	0.0	96.0	1.4	4.0	0.0	13	29.4	1016.2	1018.9	1013.0	360.260	1064	0
13/12/2009	26.4	35.5	14.6	28.0	52.0	13.0	0.0	96.0	1.8	4.9	0.0	15	33.1	1014.7	1016.9	1011.7	375.688	1083	0
14/12/2009	26.1	35.1	19.2	50.3	72.0	28.0	0.0	96.0	4.0	8.9	0.9	19.1	34.6	1015.9	1019.5	1013.4	347.531	1085	0
15/12/2009	26.9	35.7	18.5	48.9	73.0	20.0	0.0	96.0	3.1	8.0	0.0	18.5	34.6	1018.0	1020.4	1014.6	303.969	1181	0
16/12/2009	28.7	37.1	21.0	44.8	68.0	23.0	0.0	96.0	2.9	8.5	0.0	21.1	36.5	1018.1	1021.0	1014.6	332.698	1142	0
17/12/2009	30.4	37.6	22.7	38.7	63.0	20.0	0.0	96.0	3.8	6.7	0.0	22.7	36.8	1015.3	1019.3	1011.1	361.302	1061	0
18/12/2009	24.3	31.2	18.3	56.0	85.0	32.0	2.8	96.0	3.2	9.4	0.4	17.3	30.1	1015.1	1018.0	1011.7	128.063	891	0
19/12/2009	24.1	32.4	16.5	53.3	89.0	21.0	0.0	96.0	1.8	5.4	0.0	16.6	31.1	1015.9	1018.1	1013.0	343.125	1176	0
Monthly	25.6	41.0	9.4	39.8	65.9	19.1	4.0	96.0	3.1	7.0	0.3	16.6	32.3	1014.6	1017.6	1011.4	328.6	1089	0.0

Date	Average Temp	Max Temp	Min Temp	Average %RH	Max %RH	Min %RH	Rain mm	ET mm	Average WS	Max WS	Min WS	Minimum Wind Chill	Maximum Heat Index	Average Atm Pressure	Max Atm Pressure	Min Atm Pressure	Average Solar Rad	Max Solar Rad	Min Solar Rad
6/01/2010	21.4	22.6	20.3	73.2	81.0	68.0	0.2	5.0	3.0	4.5	0.9	20.4	22.8	1015.9	1016.4	1015.4	0.000	0	0
7/01/2010	23.8	31.8	17.6	64.9	90.0	37.0	0.0	94.0	2.4	11.6	0.0	17.7	32.1	1015.5	1018.6	1013.0	289.245	1114	0
8/01/2010	24.7	32.2	17.9	60.6	87.0	37.0	0.0	96.0	1.6	4.9	0.0	18	32.6	1018.9	1020.8	1016.6	274.188	1213	0
9/01/2010	26.4	33.4	18.7	53.7	80.0	30.0	0.0	96.0	1.1	3.6	0.0	18.7	33.3	1019.1	1021.6	1016.4	368.927	1070	0
10/01/2010	27.9	36.5	21.1	49.3	68.0	27.0	0.0	96.0	1.9	8.9	0.0	21.2	37.3	1016.5	1019.2	1013.2	342.240	1057	0
11/01/2010	28.1	35.3	20.9	55.0	82.0	31.0	0.0	96.0	2.4	4.9	0.0	20.8	36.4	1015.1	1017.8	1012.5	358.771	1040	0
12/01/2010	29.4	35.9	21.8	53.2	80.0	34.0	0.0	96.0	1.3	3.1	0.0	21.8	38.1	1012.6	1015.4	1009.5	357.302	1041	0
13/01/2010	29.5	37.3	20.4	50.3	84.0	30.0	6.4	96.0	2.7	9.4	0.0	19.1	38.7	1011.4	1016.1	1008.2	346.438	1043	0
14/01/2010	24.8	32.2	19.8	69.0	88.0	48.0	2.6	96.0	3.0	8.5	0.0	17.1	35.2	1014.3	1017.1	1012.0	327.906	1101	0
15/01/2010	24.6	31.6	18.7	67.6	89.0	45.0	0.0	96.0	2.6	8.0	0.0	18.8	32.3	1015.5	1017.9	1013.1	297.917	1176	0
16/01/2010	23.3	32.1	18.3	69.8	86.0	46.0	3.0	96.0	1.4	11.2	0.0	18.3	32.8	1012.1	1015.2	1008.6	262.167	1165	0
17/01/2010	24.9	31.9	18.2	60.1	88.0	39.0	0.4	96.0	2.7	6.3	0.0	18.3	33.5	1006.7	1010.0	1002.3	306.990	1135	0
18/01/2010	20.0	24.8	15.0	35.5	54.0	23.0	0.0	96.0	3.7	8.0	0.0	15.1	23.9	1007.4	1011.4	1005.7	374.656	1084	0
19/01/2010	18.6	25.3	9.6	35.8	60.0	23.0	0.0	92.0	2.2	6.3	0.0	9.6	24.4	1011.9	1013.9	1010.3	386.793	1129	0
20/01/2010	21.9	32.1	10.2	37.6	66.0	18.0	0.0	96.0	1.2	3.6	0.0	10.3	29.8	1013.3	1015.8	1011.0	371.104	1076	0
21/01/2010	26.6	36.3	14.4	35.3	62.0	19.0	0.0	96.0	0.9	3.1	0.0	14.6	34.8	1012.7	1015.1	1010.3	363.823	1085	0
22/01/2010	29.8	37.6	21.1	35.9	54.0	22.0	0.0	96.0	2.1	8.5	0.0	21.2	37.3	1013.1	1015.5	1010.6	357.781	1054	0
23/01/2010	29.9	37.2	21.4	35.5	54.0	22.0	0.0	96.0	2.1	6.3	0.0	21.4	36.3	1011.7	1013.7	1008.9	360.740	1061	0
24/01/2010	28.0	37.3	17.9	50.0	83.0	26.0	0.0	96.0	2.8	5.8	0.0	18.1	37.8	1011.3	1013.6	1008.7	351.177	1036	0
25/01/2010	28.7	37.3	18.8	46.7	85.0	22.0	0.0	96.0	2.0	4.9	0.0	19	36.7	1011.8	1014.3	1009.7	329.542	1057	0
26/01/2010	30.4	37.7	20.7	34.7	52.0	22.0	0.0	96.0	2.8	6.3	0.0	20.7	38.1	1010.8	1013.3	1008.2	343.313	1027	0
27/01/2010	27.2	33.6	21.9	49.3	69.0	29.0	0.0	96.0	2.3	8.0	0.0	20.3	33	1011.7	1013.9	1008.7	133.313	784	0
28/01/2010	25.9	36.4	18.3	52.4	79.0	27.0	7.2	96.0	2.8	12.5	0.0	17.8	36.4	1009.7	1012.6	1004.7	292.583	1078	0
29/01/2010	22.7	31.4	18.9	71.7	88.0	37.0	0.4	96.0	1.7	8.9	0.0	18.5	31.2	1011.1	1014.7	1008.5	230.094	1056	0
30/01/2010	24.3	32.1	17.2	57.9	82.0	34.0	0.0	96.0	4.4	8.9	0.0	17.3	31.6	1015.4	1017.0	1013.3	325.323	1155	0
31/01/2010	24.5	32.8	17.9	58.6	81.0	36.0	0.0	96.0	3.3	8.0	0.0	18.1	33.2	1013.2	1016.1	1009.7	229.198	954	0
Monthly	25.7	37.7	9.6	52.4	75.8	32.0	20.2	92.3	2.3	7.1	0.0	18.2	33.4	1013.0	1015.7	1010.4	307.0	1030.4	0.0

Date	Average Temp	Max Temp	Min Temp	Average %RH	Max %RH	Min %RH	Rain mm	ET mm	Average WS	Max WS	Min WS	Minimum Wind Chill	Maximum Heat Index	Average Atm Pressure	Max Atm Pressure	Min Atm Pressure	Average Solar Rad	Max Solar Rad	Min Solar Rad
1/02/2010	23.7	30.1	18.8	53.7	70.0	40.0	0.0	96.0	4.8	9.4	0.4	18.7	30	1013.1	1014.7	1011.2	211.948	958	0
2/02/2010	22.9	29.2	17.6	53.4	70.0	38.0	0.0	96.0	5.3	9.4	0.4	17.7	28.9	1013.3	1014.8	1011.7	274.635	1189	0
3/02/2010	24.6	31.0	18.6	57.0	79.0	41.0	0.0	96.0	3.9	8.0	0.4	18.6	31.2	1011.5	1013.1	1009.2	187.646	933	0
4/02/2010	25.5	33.7	18.5	59.3	84.0	37.0	9.6	96.0	2.8	8.0	0.0	18.8	33.8	1010.4	1013.0	1006.1	262.604	1163	0
5/02/2010	25.4	32.3	20.3	65.2	90.0	40.0	19.2	96.0	2.0	5.8	0.0	20.3	33.2	1009.5	1012.3	1006.9	188.208	1178	0
6/02/2010	22.9	28.1	19.9	80.4	92.0	59.0	19.6	96.0	2.2	6.3	0.0	20	29.3	1013.7	1017.3	1010.6	173.302	1289	0
7/02/2010	23.9	28.6	21.4	73.4	84.0	50.0	0.0	96.0	2.5	5.4	0.4	21.4	29.4	1018.4	1020.4	1016.6	176.250	1005	0
8/02/2010	25.6	31.6	21.1	59.0	84.0	37.0	0.0	96.0	2.5	5.8	0.0	20.9	31.6	1020.2	1022.2	1017.5	306.177	1147	0
9/02/2010	24.3	31.3	17.6	60.6	77.0	41.0	0.0	93.0	2.0	7.2	0.0	17.6	32.3	1020.8	1022.8	1018.3	284.333	1114	0
10/02/2010	23.2	30.5	18.2	63.2	81.0	43.0	0.0	56.0	1.0	3.6	0.0	18.3	31	1020.8	1022.0	1019.0	364.857	1072	0
12/02/2010	27.9	33.7	22.1	54.4	75.0	38.0	7.2	49.0	3.2	7.6	0.0	21.4	33.9	1011.2	1014.0	1009.5	319.625	1109	0
13/02/2010	26.4	32.7	20.5	58.8	85.0	36.0	0.2	96.0	1.8	4.9	0.0	20.5	33.1	1010.8	1012.8	1008.3	202.646	1083	0
14/02/2010	25.2	29.4	21.1	68.1	91.0	50.0	32.2	96.0	3.4	7.2	0.0	21.1	30.4	1008.4	1009.9	1006.0	134.260	693	0
15/02/2010	23.2	28.6	20.8	75.8	91.0	52.0	3.4	96.0	1.8	3.6	0.0	20.8	29.8	1009.1	1011.3	1007.5	174.740	878	0
16/02/2010	22.8	29.3	15.5	62.9	90.0	39.0	0.0	96.0	2.5	7.6	0.0	15.5	29.5	1012.5	1014.8	1010.9	337.500	1030	0
17/02/2010	22.4	28.7	16.1	63.8	81.0	45.0	0.0	96.0	3.2	5.8	0.4	16.2	29.4	1015.4	1017.7	1013.7	331.063	1015	0
18/02/2010	20.8	26.7	14.2	58.4	81.0	41.0	0.0	96.0	4.6	7.6	1.3	13.9	26.2	1020.4	1024.0	1017.7	336.167	1025	0
19/02/2010	20.8	29.4	13.1	62.0	82.0	36.0	0.0	96.0	2.3	5.4	0.0	13.1	28.6	1022.6	1024.5	1020.1	287.750	1086	0
20/02/2010	23.5	30.4	15.2	55.8	86.0	31.0	0.0	96.0	0.7	2.2	0.0	15.3	30.1	1020.3	1022.8	1017.2	331.302	1042	0
21/02/2010	25.2	31.8	18.6	53.4	77.0	30.0	0.0	96.0	1.1	7.2	0.0	18.7	31.1	1018.9	1021.8	1016.2	312.281	1051	0
22/02/2010	25.9	32.9	19.7	52.7	73.0	35.0	0.0	96.0	1.3	3.6	0.0	19.8	32.6	1017.5	1020.5	1014.5	289.719	1003	0
23/02/2010	26.0	34.4	19.3	58.7	79.0	41.0	1.6	96.0	1.9	4.9	0.0	19.4	36.7	1015.3	1018.0	1012.6	272.417	1097	0
24/02/2010	22.6	29.1	17.9	64.7	81.0	48.0	0.0	96.0	3.0	6.7	0.0	18	29.4	1018.8	1022.2	1017.2	232.938	1132	0
25/02/2010	21.4	27.9	15.9	62.7	77.0	48.0	0.0	96.0	3.1	5.8	0.4	16.1	27.2	1023.7	1026.6	1021.9	187.531	887	0
26/02/2010	20.9	29.0	13.1	59.2	80.0	37.0	0.0	96.0	2.3	4.9	0.0	12.4	28.8	1024.7	1027.4	1021.3	308.958	1208	0
27/02/2010	23.0	30.1	14.6	55.4	83.0	34.0	0.0	96.0	1.1	3.6	0.0	15	29.8	1020.7	1023.3	1017.3	266.063	919	0
28/02/2010	25.2	30.4	19.8	55.7	74.0	37.0	0.0	96.0	1.1	4.9	0.0	20.1	30.3	1016.8	1019.3	1013.5	224.958	851	0
Monthly	23.9	30.4	18.1	61.0	81.4	40.9	3.4	92.7	2.5	6.0	0.1	18.1	30.7	1016.3	1018.6	1013.8	258.5	1042.9	0.0

Date	Average Temp	Max Temp	Min Temp	Average %RH	Max %RH	Min %RH	Rain mm	ET mm	Average WS	Max WS	Min WS	Minimum Wind Chill	Maximum Heat Index	Average Atm Pressure	Max Atm Pressure	Min Atm Pressure	Average Solar Rad	Max Solar Rad	Min Solar Rad
1/03/2010	20.1	24.6	17.7	74.0	90.0	59.0	4.4	96.0	4.8	8.9	0.0	15.7	24.8	1015.6	1016.8	1014.2	151.552	584	0
2/03/2010	18.3	21.9	15.7	60.6	71.0	49.0	0.0	96.0	6.6	8.5	4.0	12.2	21.3	1015.7	1017.2	1014.2	134.521	544	0
3/03/2010	20.9	28.1	15.3	60.6	78.0	43.0	0.0	96.0	4.7	7.6	0.9	13.8	28	1016.1	1017.2	1014.2	278.125	1043	0
4/03/2010	23.6	31.4	15.6	57.2	82.0	35.0	0.0	96.0	3.6	8.9	0.0	15.9	30.7	1013.5	1016.9	1009.9	303.781	984	0
5/03/2010	20.5	23.6	19.1	74.5	92.0	56.0	12.6	96.0	1.8	8.9	0.0	18.7	23.8	1011.4	1012.9	1009.7	70.375	324	0
6/03/2010	23.0	28.8	18.4	77.7	93.0	55.0	0.0	96.0	0.6	3.6	0.0	18.4	30.2	1012.8	1014.4	1011.3	149.719	777	0
7/03/2010	24.0	29.6	19.4	70.0	89.0	47.0	0.8	96.0	1.1	4.5	0.0	19.4	30.4	1013.0	1014.8	1010.4	150.448	816	0
8/03/2010	23.9	29.3	21.0	71.3	82.0	57.0	0.2	96.0	3.1	6.3	0.4	21.1	30.6	1014.0	1016.2	1012.3	173.240	760	0
9/03/2010	22.0	28.3	15.0	55.5	84.0	31.0	0.0	96.0	2.3	4.0	0.4	16.1	27.2	1017.5	1019.9	1015.6	304.156	973	0
10/03/2010	20.4	28.1	13.1	61.9	87.0	36.0	0.0	96.0	2.6	7.6	0.0	13.5	27.4	1021.4	1024.9	1019.4	295.542	956	0
11/03/2010	19.8	26.0	16.1	60.4	78.0	41.0	0.0	96.0	6.2	9.8	2.7	13.9	25.5	1028.2	1032.1	1024.5	284.198	1090	0
12/03/2010	19.2	26.9	12.8	54.3	71.0	33.0	0.0	96.0	4.3	7.6	0.4	12.8	25.8	1032.7	1034.5	1030.8	253.802	1058	0
13/03/2010	18.2	25.3	12.8	67.7	85.0	42.0	0.0	96.0	4.5	9.4	0.0	12.4	24.7	1032.5	1034.3	1029.6	205.583	1001	0
14/03/2010	19.4	26.6	13.1	63.8	87.0	39.0	0.0	96.0	2.9	6.7	0.0	12.4	25.8	1028.3	1032.0	1024.5	187.552	1187	0
15/03/2010	20.1	26.7	14.2	57.2	80.0	35.0	0.0	96.0	1.0	4.0	0.0	14.2	25.9	1024.8	1027.3	1021.7	212.781	870	0
16/03/2010	20.5	28.7	12.3	55.8	86.0	24.0	0.0	96.0	2.3	6.3	0.0	12.6	27.2	1023.1	1025.0	1020.8	270.385	923	0
17/03/2010	21.2	30.6	10.8	50.5	86.0	21.0	0.0	96.0	1.3	4.9	0.0	11	28.7	1025.2	1027.4	1023.1	281.760	919	0
18/03/2010	22.2	31.1	13.2	47.3	83.0	20.0	0.0	96.0	1.3	4.5	0.0	13.2	29.1	1025.3	1028.0	1022.1	275.073	903	0
19/03/2010	22.9	30.4	15.6	49.6	76.0	30.0	0.0	96.0	1.1	3.6	0.0	15.7	29.2	1023.3	1025.4	1020.9	267.552	883	0
20/03/2010	24.7	33.9	14.8	44.3	75.0	17.0	0.0	96.0	1.1	3.1	0.0	14.8	31.9	1021.7	1023.9	1018.9	263.490	860	0
21/03/2010	24.4	33.1	15.2	44.9	71.0	26.0	0.0	96.0	1.2	4.0	0.0	15.2	31.6	1019.9	1022.4	1016.5	251.302	868	0
22/03/2010	23.9	33.5	15.4	49.6	70.0	30.0	0.0	96.0	1.5	4.5	0.0	15.4	32.7	1018.1	1019.8	1015.6	238.323	927	0
23/03/2010	22.7	31.3	14.3	54.0	86.0	22.0	0.0	96.0	1.4	4.5	0.0	14.5	29.8	1019.0	1020.8	1017.3	249.177	921	0
24/03/2010	23.2	31.8	13.6	47.4	78.0	24.0	0.0	96.0	1.2	4.9	0.0	13.6	29.5	1020.3	1022.2	1018.1	245.667	837	0
25/03/2010	23.3	31.8	15.2	51.4	83.0	28.0	0.0	96.0	0.6	3.6	0.0	15.2	30.3	1021.6	1024.2	1019.0	237.510	808	0
26/03/2010	24.5	30.9	18.9	48.9	67.0	31.0	0.0	96.0	0.9	4.0	0.0	18.9	29.9	1020.8	1023.7	1018.2	216.240	859	0
27/03/2010	25.3	33.3	17.4	48.7	72.0	27.0	0.0	96.0	1.9	6.7	0.0	17.7	32.4	1019.7	1022.0	1017.0	227.240	849	0
28/03/2010	26.0	33.2	20.1	50.0	72.0	31.0	0.2	96.0	1.6	7.6	0.0	20.1	33	1018.1	1020.5	1014.4	226.229	824	0
29/03/2010	24.0	28.2	20.0	54.2	67.0	44.0	0.0	96.0	1.0	2.7	0.0	20.1	27.8	1019.1	1021.4	1017.3	133.406	704	0
30/03/2010	19.1	22.4	16.8	82.3	91.0	59.0	10.8	96.0	1.6	4.5	0.0	16.8	22.4	1019.1	1020.3	1017.3	42.458	206	0
31/03/2010	18.5	23.0	14.3	78.8	92.0	63.0	0.2	96.0	3.4	6.7	0.4	14.3	23.1	1018.9	1020.5	1017.2	137.948	986	0
Monthly	21.9	33.9	10.8	58.9	80.8	37.3	29.2	96.0	2.4	5.9	0.3	15.5	28.1	1020.3	1022.5	1017.9	216.7	846.6	0.0