



**WERRIS CREEK COAL PTY LTD**

**ENVIRONMENTAL MONITORING**

**REPORT**

**August, September & October 2010**

This Environmental Monitoring Report covers the period 1<sup>st</sup> August 2010 to 31<sup>st</sup> October 2010 for the Werris Creek No.2 Coal Mine Community Consultative Committee.

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

**Note:** Monitoring results with any non compliance of monitoring criteria are highlighted in **yellow**.

## CONTENTS

<b>1.0</b>	<b>METEOROLOGY.....</b>	<b>3</b>
1.1	WEATHER STATION AVAILABILITY .....	3
<b>2.0</b>	<b>AIR QUALITY .....</b>	<b>3</b>
2.1	HVAS (PM10) .....	3
2.1.1	Monitoring Data Results .....	3
2.1.2	Discussion - Compliance / Non Compliance .....	3
2.2	DEPOSITED DUST .....	3
2.2.1	Monitoring Data Results .....	3
2.2.2	Discussion - Compliance / Non Compliance .....	4
2.3	AIR QUALITY COMPLAINTS .....	4
<b>3.0</b>	<b>NOISE.....</b>	<b>4</b>
3.1	OPERATIONAL NOISE.....	4
3.1.1	Monitoring Data Results .....	4
3.1.2	Discussion - Compliance / Non Compliance .....	5
3.2	NOISE COMPLAINTS .....	5
<b>4.0</b>	<b>BLAST .....</b>	<b>5</b>
4.1	BLAST MONITORING .....	6
4.1.1	Monitoring Data Results .....	6
4.1.2	Discussion - Compliance / Non Compliance .....	6
4.2	BLAST COMPLAINTS .....	6
<b>5.0</b>	<b>WATER.....</b>	<b>6</b>
5.1	GROUND WATER.....	6
5.1.1	Monitoring Data Results .....	6
5.1.2	Discussion - Compliance / Non Compliance .....	7
5.2	SURFACE WATER .....	7
5.2.1	Monitoring Data Results .....	7
5.2.2	Discussion - Compliance / Non Compliance .....	7
5.3	SURFACE WATER DISCHARGES .....	7
5.3.1	Monitoring Data Results .....	7
5.3.2	Discussion - Compliance / Non Compliance .....	7
5.4	WATER COMPLAINTS.....	7
<b>6.0</b>	<b>COMPLAINTS SUMMARY.....</b>	<b>8</b>
<b>7.0</b>	<b>GENERAL .....</b>	<b>8</b>

## APPENDICES

Appendix 1.....	Dust Monitoring Results – PM10
Appendix 2.....	Dust Monitoring Results – Deposited Dust
Appendix 3.....	Noise Monitoring Results
Appendix 4.....	Blasting Monitoring Results
Appendix 5.....	Groundwater Monitoring Results
Appendix 6.....	Surface Water Monitoring Results
Appendix 7.....	Discharge Monitoring Results

## 1.0 METEOROLOGY

### 1.1 WEATHER STATION AVAILABILITY

Weather data was available for 99.9% of August 2010.

Weather data was available for 79.6% of September 2010 due to relocation of entire meteorology station from nearby to Council Quarry to Overburden Emplacement Area RL445m level.

Weather data was available for 99.9% of October 2010.

## 2.0 AIR QUALITY

### 2.1 HVAS (PM10)

High Volume Air Sample (HVAS) monitoring for particulate matter less than 10 micron in size (PM10) and total suspended particulate (TSP) matter is conducted at five sites listed below.

- WCHV1 – “Cintra” PM10
- WCHV2 – “Tonsley Park” PM10
- WCHV3 – “Railway View” PM10
- WCHV4 – “Eurunderee” PM10
- WCHV5 – “Railway View” TSP

Sampling is scheduled for 24 hours every 6 days in accordance with Department of Environment, Climate Change and Water (DECCW) guidelines and results are reported as micro grams per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of air sampled.

#### 2.1.1 Monitoring Data Results

The monthly average results for the last three months are provided in the table below, however see HVAS monitoring data under **Appendix 1** for individual results.

Monitor Location	August ( $\mu\text{g}/\text{m}^3$ )	September ( $\mu\text{g}/\text{m}^3$ )	October ( $\mu\text{g}/\text{m}^3$ )	Criteria ( $\mu\text{g}/\text{m}^3$ )
WCHV1	17.0	7.8	8.0	30
WCHV2	17.8	6.4	6.2	30
WCHV3	18.8	7.0	8.0	30
WCHV4	14.8	5.2	5.6	30
WCHV5	30.4	21.8	30.2	90

#### 2.1.2 Discussion - Compliance / Non Compliance

All 6 day PM10 24 hour average results were below the short term 24 hour impact criteria of  $50\mu\text{g}/\text{m}^3$ .

All PM10 sites monthly averages are below the long term impact annual criteria of  $30\mu\text{g}/\text{m}^3$ .

The TSP site is below the long term impact annual criteria of  $90\mu\text{g}/\text{m}^3$ .

### 2.2 DEPOSITED DUST

Deposited dust monitoring is for particulate matter generally greater than 30 micron in size which readily settles out of the air and is monitored at six locations.

- WC2 – “Cintra”
- WC5 – “Railway View”
- WC7 – “Tonsley Park”
- WC8 – “Plain View”
- WC9 – “Marengo”
- WC10 – “Mountain View”

Sampling is scheduled monthly in accordance with DECCW guidelines and results are reported as grams per metre squared per month ( $\text{g}/\text{m}^2/\text{month}$ ).

### 2.2.1 Monitoring Data Results

The monthly results for the last three months are provided in the table below; however **Appendix 2** has more information on Deposited Dust Monitoring Results.

Monitor Location	August (g/m <sup>2</sup> /month)	September (g/m <sup>2</sup> /month)	October (g/m <sup>2</sup> /month)	Criteria (g/m <sup>2</sup> /month)
WC2	0.5	1.4*	6.6*	3.6
WC5	0.9	0.6	0.5	3.6
WC7	0.6	0.5	0.9	3.6
WC8	0.9	0.8	0.6	3.6
WC9	0.3	0.5	0.9	3.6
WC10**	0.7	0.7	0.9	3.6

\* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

\*\* – WC10 Mountain View new dust deposition gauge installed in August 2010

### 2.2.2 Discussion - Compliance / Non Compliance

All dust deposition gauges were below the monthly amenity criteria of 3.6g/m<sup>2</sup>/month. However there were two samples for WC2 - Cintra for September and October 2010 that has been excluded due to excessive organic material contamination.

### 2.3 AIR QUALITY COMPLAINTS

There were two dust related complaints for the period both received on the 24<sup>th</sup> September 2010. The day in particular was quite hazy in the morning with the preceding couple of days weather conditions being very calm. It is probable that a build up dust levels occurred in the Quipolly Creek valley over a number of days with no wind to flush the air shed around the mine. Several inspections on the day did not identify any excessively dusty activities on the site, also the LPSC quarry was operating and later on using a water cart to control trafficable dust. There was no specific HVAS data runs on that date, the closest was on 22<sup>nd</sup> September with PM10 values between 8 and 15ug/m<sup>3</sup> and TSP at 65ug/m<sup>3</sup> with no exceedance of dust criteria during September 2010. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 3.0 NOISE

### 3.1 OPERATIONAL NOISE

Monthly attended noise monitoring undertaken at the following locations:

- "Almawille"
- "Glenara"
- "Marengo" (project related)
- "Tonsley Park"
- "Cintra" (project related)
- "Bojba"

Three sets of measurements are made at each location; one during the day time period (before 6pm); one during the evening period (from 6pm – 10pm) and one at night (after 10pm).

The noise emission criterion for WCC is 35dB(A) unless otherwise subject to a current, legally binding agreement between WCC and the occupant of the affected residential property.

WCC environmental protection license (EPL) conditions indicate that compliance with noise emission criteria is not applicable under atmospheric conditions where wind speeds are greater than 3m/s and/or there is a temperature inversion greater than +3°C/100m.

#### 3.1.1 Monitoring Data Results

The three summary tables of the noise results from August, September and October below present noise levels only from Werris Creek Coal operations (not ambient noise); however see Monthly Noise Monitoring Reports under **Appendix 3** for more detail.

20<sup>th</sup> August 2010

Location	Day	Evening	Night	Criteria
"Almawillee"	Barely audible	29 <sup>#</sup>	Inaudible <sup>#</sup>	35
"Glenara"	Inaudible	<30 <sup>#</sup>	Barely audible <sup>#</sup>	35
"Cintra"*	<30*	30* <sup>#</sup>	33* <sup>#</sup>	35
"Marengo"*	35*	40* <sup>#</sup>	38* <sup>#</sup>	35
"Tonsley Park"	Inaudible	Inaudible <sup>#</sup>	32 <sup>#</sup>	35
"Bojba"	Inaudible	33 <sup>#</sup>	Inaudible <sup>#</sup>	35

\* - Project Related Property; # - Temperature Inversion &gt;3°C/100m

17<sup>th</sup> September 2010

Location	Day	Evening	Night	Criteria
"Almawillee"	30	25	<20	35
"Glenara"	34	28	30	35
"Cintra"*	34*	25*	27*	35
"Marengo"*	27*	37*	38*	35
"Tonsley Park"	Inaudible	32	32	35
"Bojba"	Inaudible	27	31	35

\* - Project Related Property; # - Temperature Inversion &gt;3°C/100m

27<sup>th</sup> October 2010

Location	Day	Evening	Night	Criteria
"Almawillee"	32	Barely audible <sup>#</sup>	Inaudible <sup>#</sup>	35
"Glenara"	25	<b>36</b>	Inaudible <sup>#</sup>	35
"Cintra"*	40*	38* <sup>#</sup>	41* <sup>#</sup>	35
"Marengo"*	30*	32* <sup>#</sup>	40*	35
"Tonsley Park"	28	40 <sup>#</sup>	36 <sup>#</sup>	35
"Bojba"	Inaudible	33 <sup>#</sup>	Barely audible	35

Yellow Bold – WCC mining related noise exceedance; \* - Project Related Property; # - Temperature Inversion &gt;3°C/100m

### 3.1.2 Discussion - Compliance / Non Compliance

There was one noise non-compliance for October recording **36dB(A)** during the evening period at "Glenara" due to mining related noise. Both attended and continuous noise monitors confirm that the exceedance was minor in nature, short term and isolated with no other breaches of noise criteria recorded on the 27<sup>th</sup> October. DECCW have responded stating that "DECCW accepts that Werris Creek Coal have diligently implemented a range of noise management protocols in an attempt to appropriately manage noise impacts on the receptors located to the south of the mine site. These protocols are likely to have significantly reduced either the magnitude and/or duration of impacts at the time the exceedance was observed during routine noise monitoring. Given the minor nature of the exceedance, and the diligent approach that Werris Creek Coal is taking with respect to this issue, the DECCW does not intend to take any further action with respect this matter on this occasion". Werris Creek Coal is going to negotiate a private agreement with the "Glenara" owners. Also during October monitoring, elevated noise results were recorded at "Tonsley Park" due to Werris Creek Coal's operations under adverse environmental conditions (temperature inversions >3°C/100m).

### 3.2 NOISE COMPLAINTS

There was one complaint related to 'general' noise from Werris Creek Coal operations on 13<sup>th</sup> August 2010 forwarded on by the owners of "Rosehill" property. Specific actions taken in relation to this complaint are outlined in **Section 6**.

## 4.0 BLAST

Blast monitoring is undertaken at "Glenala", "Milbank", "Werris Creek", "Tonsley Park", "Greenslopes and Banool" and "Cintra". Compliance limits for blasting overpressure is 115dB(L) (and up to 120dB(L) for only 5% of blasts) and vibration is 5mm/s (and up to 10mm/s for only 5% of blasts). During the period a total of 25 blasts were fired by the blasting contractor, Orica Mining Services.

## 4.1 BLAST MONITORING

### 4.1.1 Monitoring Data Results

A summary table of blasting results from August, September and October are provided below; however see blasting results database under **Appendix 4** for more detail.

Month	# of Blasts	Overpressure		Vibration	
		Max dB(L)	Location	Max mm/s	Location
August	8	114.7	Glenara	1.49	Cintra*
September	8	112.0	Cintra*	1.17	Cintra*
October	9	113.7	Cintra*	1.12	Cintra*
<b>TOTAL/MAX</b>	25	114.7	Glenara	1.49	Cintra*

\* Indicates project related properties not subject to blasting criteria

### 4.1.2 Discussion - Compliance / Non Compliance

All blasts complied with licence limits with no blast overpressure levels above 115dB(L) and no blast vibration levels greater than 5mm/s. A number of blast monitors did not trigger during the period due to the overpressure and/or vibration levels from the blast being below the trigger level of the monitor. No blasts were missed.

## 4.2 BLAST COMPLAINTS

There were three complaints related to blasting from Werris Creek Coal operations. The first complaint was received from the residents at "Glenara" on 25<sup>th</sup> August from a wedge shot recording 114.7dB(A) at their property. The higher than expected overpressure level was due to minimal confinement of the blast energy that can occur with thin wedge shots. The other two complaints were from a Kurrara Street resident on the 13<sup>th</sup> and 18<sup>th</sup> October 2010. A number of actions have been undertaken in relation to this resident with a structural inspection completed and every blast now being monitored at this residence. The blast levels on the 13<sup>th</sup> October did not trigger the monitor and therefore were within compliance, however Werris Creek Coal did not blast on 18<sup>th</sup> October as that day was a Sunday and the mine does not operate on Sundays. Specific actions taken in relation to these complaints are outlined in **Section 6**.

## 5.0 WATER

Groundwater monitoring was undertaken on the 8<sup>th</sup> and 9<sup>th</sup> September 2010. Surface water monitoring was undertaken on the 19<sup>th</sup> August 2010. There were four surface water discharge events during the period.

### 5.1 GROUND WATER

Groundwater monitoring is undertaken to monitor if there are any impacts on groundwater quality and levels as a result of the Werris Creek Coal mine. WCC monitor 41 groundwater bores and piezometers in the vicinity of the mine, with the key aquifers being Quipolly Creek Alluvium (MW12 upstream and MW7 downstream) and Werrie Basalt (MW5 south and MW14 north).

#### 5.1.1 Monitoring Data Results

Brief summary of groundwater monitoring results is provided below with detailed monitoring data outlined in **Appendix 5**.

Site	pH	EC	Dip	Change
<b>Quipolly Creek Alluvium</b>				
MW7	7.01	535	4.15	Significant winter rain has raised water level by ~0.4m since May.
MW12	7.17	505	7.59	Significant winter rain has raised water level by ~1.9m since May.
<b>Werrie Basalt</b>				
MW5	7.33	1902	8.41	Significant winter rain has raised water level by ~0.8m and freshen water quality since May.
MW14	7.01	1220	15.88	Significant winter rain has raised water level by ~0.9m and freshen water quality since May.

### 5.1.2 Discussion - Compliance / Non Compliance

During the period between July 2010 and September 2010, the WCC weather station has recorded 214.6mm of rain, which is approximately one third of the annual rainfall for the region. This heavy rainfall has resulted in substantial rise of the groundwater levels measured in both the Quipolly Creek Alluvium and Werrie Basalt aquifers as noted in the table above.

## 5.2 SURFACE WATER

Surface water monitoring is undertaken at key dirty and void water dams to monitor for potential contamination issues due to mining while the water is still onsite.

### 5.2.1 Monitoring Data Results

Summary of surface water quality monitoring results is provided below with detailed monitoring data outlined in **Appendix 6**.

Site	pH	EC	TSS	O&G	Change
SB2	8.05	363	38	<5	pH and EC decreased due to fresh runoff from substantial rainfall. TSS increased.
SB9	7.66	131	295	<5	pH and EC decreased due to fresh runoff from substantial rainfall. TSS increased.
SB10	7.65	190	365	<5	pH and EC decreased due to fresh runoff from substantial rainfall. TSS increased.
VWD1	8.13	1010	16	<5	pH increase and EC decrease due to increase in pit dewatering due to rainfall.
VWD2	8.56	8.39	16	<5	pH increase and EC decrease due to increase in pit dewatering due to rainfall.

### 5.2.2 Discussion - Compliance / Non Compliance

Onsite surface water monitoring results were within the criteria of Site Water Management Plan response plan. No issues with onsite water quality.

## 5.3 SURFACE WATER DISCHARGES

### 5.3.1 Monitoring Data Results

A wet weather discharge event occurred from both SB2 and SB9 on 12<sup>th</sup> August after 40.4mm fell between 10<sup>th</sup> and 15<sup>th</sup> August 2010. WCC undertook a controlled surface water discharge with 1.7ML pumped out of SB9 starting on 28<sup>th</sup> September 2010. A wet weather discharge event occurred from SB2 on 25<sup>th</sup> October 2010 after 28.0mm fell between 23<sup>rd</sup> and 25<sup>th</sup> October 2010. A summary of discharge monitoring results is provided below with detailed monitoring data outlined in **Appendix 7**.

Date	Site	pH	EC	TSS	O&G	Compliance
12/8/2010	SB2	7.52	389	6	<5	Compliant – Rain event >39.2mm and water quality within criteria
12/8/2010	SB9	7.63	121	73	<5	Compliant – Rain event >39.2mm and water quality within criteria
28/9/2010	SB9	8.24	133	42	10	Compliant – Controlled discharge with water quality within criteria
25/10/2010	SB2	8.27	417	16	<5	Compliant – Rain event <39.2mm but water quality within criteria
<b>Criteria</b>		<b>8.5</b>	<b>N/A</b>	<b>50</b>	<b>10</b>	

### 5.3.2 Discussion - Compliance / Non Compliance

All surface water discharge results were within WCC Environmental Protection Licence 12290 criteria and there were no impacts on water quality monitored in Quipolly and Werris Creeks' as a result of the discharge events.

## 5.4 WATER COMPLAINTS

There were no water related complaints during the period.

## 6.0 COMPLAINTS SUMMARY

There were nine complaints received during the reporting period and the details are summarized below. In total there were 10 issues raised – four relating to lighting, three relating to blasting, two relating to dust and one relating noise. Six of the issues have been raised by the one complainant in Werris Creek including all four lighting issues raised.

### Lighting Complaints

Since the overburden emplacement dump height increased above RL410m in February to the top level of RL445m, one Werris Creek resident has made a total of seven complaints relating to lights including four during this period. Each complaint has been investigated with a review of the lighting plant locations undertaken. Werris Creek Coal has had to raise awareness with both Open Cut Examiners and operators since February that now lights on the upper levels of the overburden emplacement area are visible at night from the higher aspects of Werris Creek town. This has led to the development of a site rule that night time dumping above RL430m requires all lighting plants to be oriented westwards towards the ridge line where there are no neighbouring properties. This site rule eliminates any direct off site lighting impacts in light beams, however lighting plants and the indirect glow are still visible at night to certain residents within Werris Creek that prior to February would not have seen these lights.

Date	#	Complaint
13/08/10	67	Owners of "Rosehill" on Paynes Road passed on a complaint from their tenant leasing the property regarding general noise from the mine. The Environmental Officer met with the property owners and they were comfortable with the noise management measures being implemented by the mine.
25/08/10	68	"Glenara" residents complained about excessive blast noise from WCC shot #325/326. Environmental Officer meet with residents and explained that the levels recorded of 114.7dBL were louder than expected but within compliance levels, however there was a strong north westerly wind at the time that was likely to have enhanced the overall noise impact.
26/08/10	69	Resident from Punyarra St complained about lighting shining towards her house on the southern edge of Werris Creek. The Environmental Officer met with her and she was disappointed that the lighting issue had been repeated. A review of lighting plant locations was undertaken with a lighting plant reorientated.
24/9/2010	70	Dust complaint from "anonymous" resident of Werris Creek irate about the huge amounts of dust over the mine blowing towards Werris Creek
24/9/2010	71	Dust complaint from "Hazeldene" residents of Quipolly that has been blowing from the mine for the last 3 days resulting in his partner and step son having asthma attacks.
5/10/2010	72	Lighting complaint from Kurrara St resident of Werris Creek regarding two mine lights shining into her lounge room. A review of lights was undertaken with a light relocated and another re-orientated which according to the resident improved the situation but was still a problem.
13/10/2010	73	Lighting and blasting complaint from Kurrara St resident of Werris Creek regarding lights shining at her house and blast shook her house last week. The blast results were within compliance levels. A review of lighting impact towards the house identified that no lights were shining at the house but the lights were visible. As the lights are not shining directly at her house, there is not much more the mine can do in the short term to improve her amenity as the mine was operating in accordance with approvals.
18/10/2010	74	Blasting complaint from Kurrara St resident of Werris Creek regarding a blast on Sunday that shook her house. No mining activities including blasting were undertaken on the weekend and neither Zeolitte nor the Council quarry was operating that day.
26/10/2010	75	Lighting complaint from Kurrara St resident of Werris Creek regarding two mine lights shining at her house. A review of lighting plants resulted in one light being relocated.

## 7.0 GENERAL

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

Regards  
Andrew Wright  
Environmental Officer

**Appendix 1 – PM10 Dust Monitoring Data.**



# ALS ACIRL Pty Ltd



(ABN 66 003 451 876)  
Units 1-4, Lot 6 Industrial Ct, 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:** 26001309 - 958

**Date Reported:** 6/8/10

**Report To:** Mr. Danny Young

**Copy To:** File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m <sup>3</sup> )	TSP (µg/m <sup>3</sup> )
WCHV1	Cintra	8349499	30/07/2010	1439	22.3	14	-
WCHV1	Cintra	8353402	5/08/2010	1439	26.6	17	-
WCHV1	Cintra	8334292	11/08/2010	1439	24.8	16	-
WCHV1	Cintra	8342005	17/08/2010	1439	35.6	22	-
WCHV1	Cintra	8342041	23/08/2010	1439	25.4	16	-
WCHV2	Patterson	8349500	30/07/2010	1439	25.0	16	-
WCHV2	Patterson	8353401	5/08/2010	1439	29.4	19	-
WCHV2	Patterson	8334291	11/08/2010	1439	26.0	17	-
WCHV2	Patterson	8342004	17/08/2010	1439	32.6	21	-
WCHV2	Patterson	8342042	23/08/2010	1439	25.3	16	-
WCHV3	Ryan	8349461	30/07/2010	1439	20.6	13	-
WCHV3	Ryan	8353404	5/08/2010	1439	39.1	25	-
WCHV3	Ryan	8334293	11/08/2010	1519	25.2	16	-
WCHV3	Ryan	8342006	17/08/2010	1439	36.4	23	-
WCHV3	Ryan	8334279	23/08/2010	1439	26.8	17	-
WCHV4	Eurunderee	8349463	30/07/2010	1439	21.8	14	-
WCHV4	Eurunderee	8353405	5/08/2010	1439	22.4	14	-
WCHV4	Eurunderee	8334295	11/08/2010	1439	23.9	15	-
WCHV4	Eurunderee	8342008	17/08/2010	1439	27.3	17	-
WCHV4	Eurunderee	8342017	23/08/2010	1439	23.1	14	-
WCTSP	Ryan	8349462	30/07/2010	1439	23.2	-	15
WCTSP	Ryan	8353403	5/08/2010	1439	90.1	-	56
WCTSP	Ryan	8334294	11/08/2010	1439	30.1	-	19
WCTSP	Ryan	8342007	17/08/2010	1439	67.3	-	41
WCTSP	Ryan	8334280	23/08/2010	1439	33.3	-	21

**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.
- Nata Accreditation applies to gravimetric determinations only. Does not apply to volumetric calculations

**Reported By:**

Tammy Tomkins  
Environmental Supervisor



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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:** 2600 1309 - 1041

**Date Reported:** 28/9/10

**Report To:** Mr. Danny Young

**Copy To:** File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 ( $\mu\text{g}/\text{m}^3$ )	TSP ( $\mu\text{g}/\text{m}^3$ )
WCHV1	Cintra	9342044	29-Aug-10	1439	8.9	6	-
WCHV1	Cintra	8339433	04-Sep-10	1439	6.4	4	-
WCHV1	Cintra	8339412	10-Sep-10	1439	3.0	2	-
WCHV1	Cintra	100002	16-Sep-10	1439	8.6	6	-
WCHV1	Cintra	8339445	22-Sep-10	1430	32.3	21	-
WCHV2	Patterson	8342043	29-Aug-10	1439	14.5	9	-
WCHV2	Patterson	8339439	04-Sep-10	1439	7.3	5	-
WCHV2	Patterson	8339413	10-Sep-10	1439	1.3	1	-
WCHV2	Patterson	100001	16-Sep-10	1439	5.2	3	-
WCHV2	Patterson	8339444	22-Sep-10	1439	22.4	14	-
WCHV3	Ryan	8342045	29-Aug-10	1439	8.1	5	-
WCHV3	Ryan	8339441	04-Sep-10	1439	5.5	4	-
WCHV3	Ryan	8339411	10-Sep-10	1439	3.1	2	-
WCHV3	Ryan	100004	16-Sep-10	1439	11.0	7	-
WCHV3	Ryan	8339446	22-Sep-10	1439	26.1	17	-
WCHV4	Eurunderee	8342047	29-Aug-10	1439	8.6	5	-
WCHV4	Eurunderee	8339442	04-Sep-10	1439	4.9	3	-
WCHV4	Eurunderee	8339429	10-Sep-10	1439	3.7	2	-
WCHV4	Eurunderee	100005	16-Sep-10	1439	8.2	5	-
WCHV4	Eurunderee	8339448	22-Sep-10	1439	18.2	11	-
WCTSP	Ryan	8342046	29-Aug-10	1439	15.9	-	10
WCTSP	Ryan	8339440	04-Sep-10	1439	18.3	-	12
WCTSP	Ryan	8339430	10-Sep-10	1439	21.8	-	14
WCTSP	Ryan	100003	16-Sep-10	1439	39.7	-	25
WCTSP	Ryan	8339447	22-Sep-10	1439	76.6	-	48

**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.

Nata Accreditation applies to gravimetric determinations only.  
Does not apply to volumetric calculations

**Reported By:**

Tammy Tomkins  
Environmental Supervisor



WORLD RECOGNISED ACCREDITATION

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Accreditation #15784. Site #11423



# ALS ACIRL Pty Ltd

(ABN 66 003 451 876)

Units 1-4, Lot 6 Industrial Ct, Muswellbrook 2333  
Ph: (02) 6542 2400 Fax (02) 6543 3234



**Sample Origin:** Werris Creek Coal Pty Ltd **Report Number:** 6800-4368-01  
**Project ID:** Werris Creek TSP and PM10  
**Sample Description:** High Volume Air Sampler Filters **Date Reported:** 4th November 2010  
**Report To:** Mr. Danny Young **Copy To:** File

Sampler ID	Location	Filter Number	Run Date	Run Time (Minutes)	Deposit (mg)	PM10 (µg/m <sup>3</sup> )	TSP (µg/m <sup>3</sup> )
WCHV1	Cintra	8369278	28-Sep-10	1439	28.5	19	-
WCHV1	Cintra	8369258	04-Oct-10	1439	8.8	6	-
WCHV1	Cintra	8338270	10-Oct-10	1439	4.5	3	-
WCHV1	Cintra	8346131	16-Oct-10	1439	3.9	2	-
WCHV1	Cintra	8369602	22-Oct-10	1439	14.9	10	-
WCHV2	Patterson	8369276	28-Sep-10	1439	22.1	14	-
WCHV2	Patterson	8369257	04-Oct-10	1439	5.7	4	-
WCHV2	Patterson	8338269	10-Oct-10	1439	7.2	5	-
WCHV2	Patterson	8346133	16-Oct-10	1439	-0.7	0	-
WCHV2	Patterson	8369601	22-Oct-10	1439	11.6	8	-
WCHV3	Ryan	8369280	28-Sep-10	1439	24.4	16	-
WCHV3	Ryan	8369259	04-Oct-10	1439	8.1	5	-
WCHV3	Ryan	8346116	10-Oct-10	1439	0.5	0	-
WCHV3	Ryan	8346134	16-Oct-10	1439	5.6	4	-
WCHV3	Ryan	8369605	22-Oct-10	1439	22.7	15	-
WCHV4	Eurunderee	8369261	28-Sep-10	1439	20.1	13	-
WCHV4	Eurunderee	8343111	04-Oct-10	1439	5.8	4	-
WCHV4	Eurunderee	8346118	10-Oct-10	1439	1.3	1	-
WCHV4	Eurunderee	8346136	16-Oct-10	1439	2.2	1	-
WCHV4	Eurunderee	8369603	22-Oct-10	1439	14.7	9	-
WCTSP	Ryan	8369279	28-Sep-10	1439	65.2	-	42
WCTSP	Ryan	8369260	04-Oct-10	1439	19.0	-	12
WCTSP	Ryan	8346117	10-Oct-10	1439	19.2	-	12
WCTSP	Ryan	8346135	16-Oct-10	1439	31.5	-	20
WCTSP	Ryan	8369604	22-Oct-10	1439	103.2	-	65

- 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: \_\_\_\_\_

Helen Hayes - Operations Manager  
ALS ACIRL Gunnedah/Muswellbrook



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Accreditation #15784. Site #11423

**Appendix 2 – Deposited Dust Monitoring Data.**

## 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:** 26001298 - 910

**Date Issued:** 30 August 2010

**Copy To:** File

ALS ACIRL Pty Ltd  
Units 1-4, Lot 6 Industrial Ct  
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 <sup>2</sup> /month)	Insoluble Matter (g)	Ash Residue (g/m <sup>2</sup> /month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	20-Jul-10	19-Aug-10	9:55	30	2500	Clear	Clear	Insects	0.5	0.0095	0.3	0.0051	0.0044
WC5 - Railway View	20-Jul-10	19-Aug-10	10:30	30	2500	Clear	Clear	Insects	0.9	0.0154	0.5	0.0084	0.0070
WC7 - Patterson	20-Jul-10	19-Aug-10	10:40	30	2500	Clear	Clear	Insects	0.6	0.0106	0.3	0.006	0.0046
WC8 - Plain View	20-Jul-10	19-Aug-10	11:15	30	2500	Clear	Clear	Broken Funnel, Glass in bottle	0.9	0.0157	0.5	0.009	0.0067
Marengo	20-Jul-10	19-Aug-10	12:45	30	2500	Clear	Clear	Insects, Plant Material	0.3	0.0058	0.2	0.0034	0.0024
Mountain View	20-Jul-10	19-Aug-10	11:30	30	2500	Clear	Clear	Insects	0.7	0.0125	0.4	0.0074	0.0051

### 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
- \* NATA accreditation only applies to gravimetric determinations.

**Reported By:**

A handwritten signature in black ink, appearing to read 'T. Tomkins'.

Tammy Tomkins  
Environmental Supervisor



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Site #11423

## 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:** 26001309 - 1013

**Date Issued:** 30 September 2010

**Copy To:** File

ALS ACIRL Pty Ltd  
Units 1-4, Lot 6 Industrial CI  
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 <sup>2</sup> /month)	Insoluble Matter (g)	Ash Residue (g/m <sup>2</sup> /month)	Ash Residue (g)	Combustible Matter (g)
WC2 - Cintra	19-Aug-10	17-Sep-10	9:30	29	1000	Clear	Clear	Insects, Plant Material	1.4	0.0236	0.5	0.0078	0.0158
WC5 - Railway View	19-Aug-10	17-Sep-10	10:10	29	1000	Clear	Clear	Insects, Plant Material	0.6	0.0104	0.4	0.0062	0.0042
WC7 - Patterson	19-Aug-10	17-Sep-10	9:05	29	900	Clear	Clear	Insects, Plant Material	0.5	0.0093	0.3	0.0045	0.0048
WC8 - Plain View	19-Aug-10	17-Sep-10	11:20	29	1000	Clear	Clear	Insects, Plant Material	0.8	0.0135	0.5	0.0080	0.0055
Marengo	19-Aug-10	17-Sep-10	11:55	29	1000	Clear	Clear	Insects, Plant Material	0.5	0.0081	0.3	0.0049	0.0032
Mountain View	19-Aug-10	17-Sep-10	11:30	29	1000	Clear	Clear	Insects, Plant Material	0.7	0.0113	0.4	0.0074	0.0039

**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
- \* NATA accreditation only applies to gravimetric determinations.

**Reported By:**

  
\_\_\_\_\_  
Tammy Tomkins  
Environmental Supervisor



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Accreditation #15784  
Site #11423

## 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:** 26001319 - 1132

**Date Issued:** 2 November 2010

**Copy To:** File

ALS ACIRL Pty Ltd  
Units 1-4, Lot 6 Industrial CI  
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 <sup>2</sup> /month)	Insoluble Matter (g)	Ash Residue (g/m <sup>2</sup> /month)	Ash Residue (g)	Combustible Matter (g)
<b>Glenarro</b>													
<b>WC2 - Cintra</b>	17-Sep-10	19-Oct-10	9:20	32	800	Clear	Clear	Insects, bird droppings	6.6	0.1237	1.3	0.0252	0.0985
<b>WC5 - Railway View</b>	17-Sep-10	19-Oct-10	10:15	32	900	Clear	Clear	Insects, bird droppings	0.5	0.0102	0.3	0.0062	0.0040
<b>WC6 - Plain View</b>	17-Sep-10	19-Oct-10	9:35	32	900	Clear	Clear	Insects	0.9	0.0165	0.5	0.0086	0.0079
<b>WC7 - Patterson</b>	17-Sep-10	19-Oct-10	9:10	32	600	Clear	Clear	Insects, bird droppings, plant material	0.6	0.0104	0.3	0.0061	0.0043
<b>Marengo</b>	17-Sep-10	19-Oct-10	11:05	32	800	Clear	Clear	Insects, bird droppings	0.9	0.0165	0.4	0.007	0.0095
<b>Mountain View</b>	17-Sep-10	19-Oct-10	10:45	32	700	Clear	Clear	Insects, bird droppings	0.9	0.0175	0.6	0.0122	0.0053

**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:**

  
Eric Martin  
Manager



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Site #11423

**Appendix 3 – Noise Monitoring Results.**



27 August 2010

Ref: 04035/3657

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: AUGUST 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Friday 20 August 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 from the west south west during the day and evening monitoring periods. During the night the wind stayed from the west south west but decreased in speed to be calm by the end of the survey.

Temperature data from the mine operated weather station indicated that there was a temperature inversion throughout the all of the evening and night monitoring periods. The temperature inversion or lapse data is extrapolated from the 2m and 10m temperature gauges on the weather station tower.

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<sub>eq</sub> (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 – 20 August 2010 (Day)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	5:43 pm	39	n/a	4.5/WSW	Traffic (37), birds (36), <b>WCC barely audible</b>
Glenara	5:25 pm	35	n/a	3.1/WSW	Traffic (34), birds & insects (25), <b>WCC inaudible</b>
Cintra	4:00 pm	37	n/a	4.9/WSW	Wind (33), traffic (32), birds & insects (30), <b>WCC (&lt;30)</b>
Marengo	4:42 pm	39	n/a	3.6/WSW	<b>WCC (35)</b> , wind (34), cattle (31), traffic (30)
Tonsley Park	4:20 pm	43	n/a	3.6/WSW	Wind (33), traffic (38), train (37), <b>WCC inaudible</b>
Fletcher	5:07 pm	55	n/a	4.0/WSW	Traffic (54), track works (47), <b>WCC inaudible</b>

Table 2 WCC Noise Monitoring Results – 20 August 2010 (Evening)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	9:30 pm	35	>3	4.5/WSW	Frogs (34), <b>WCC (29)</b>
Glenara	9:22 pm	39	>3	4.9/WSW	Traffic (35), planes (33), insects (32), <b>WCC (&lt;30)</b>
Cintra	7:55 pm	44	>3	6.3/WSW	Wind (41), plane (36), traffic (35), <b>WCC (30)</b>
Marengo	8:40 pm	41	>3	4.9/WSW	<b>WCC (40)</b> , wind (35), train (30)
Tonsley Park	8:17 pm	48	>3	5.8/WSW	Train (46), wind (43), traffic (40), <b>WCC inaudible</b>
Fletcher	9:01 pm	46	>3	5.8/WSW	Traffic (46), insects (34), <b>WCC (33)</b>

Table 3 WCC Noise Monitoring Results – 20 August 2010 (Night)					
Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	11:27 pm	32	>3	2.7/WSW	Frogs (32), <b>WCC inaudible</b>
Glenara	12:48 am	33	>3	Calm	Traffic (31), frogs (29), <b>WCC barely audible</b>
Cintra	10:04 pm	35	>3	3.1/WSW	<b>WCC (33)</b> , wind (29), frogs (28)
Marengo	10:40 am	39	>3	3.1/WSW	<b>WCC (38)</b> , wind (32)
Tonsley Park	10:18 pm	35	>3	4.0/WSW	Traffic (32), <b>WCC (32)</b>
Fletcher	10:58 pm	58	>3	2.7/WSW	Trains (58), traffic (47), <b>WCC inaudible</b>

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 Marengo monitoring location during the evening and night monitoring periods. Marengo is a project related residence.

Data from those times where WCC operations were audible were 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 Lmax 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**

Author:

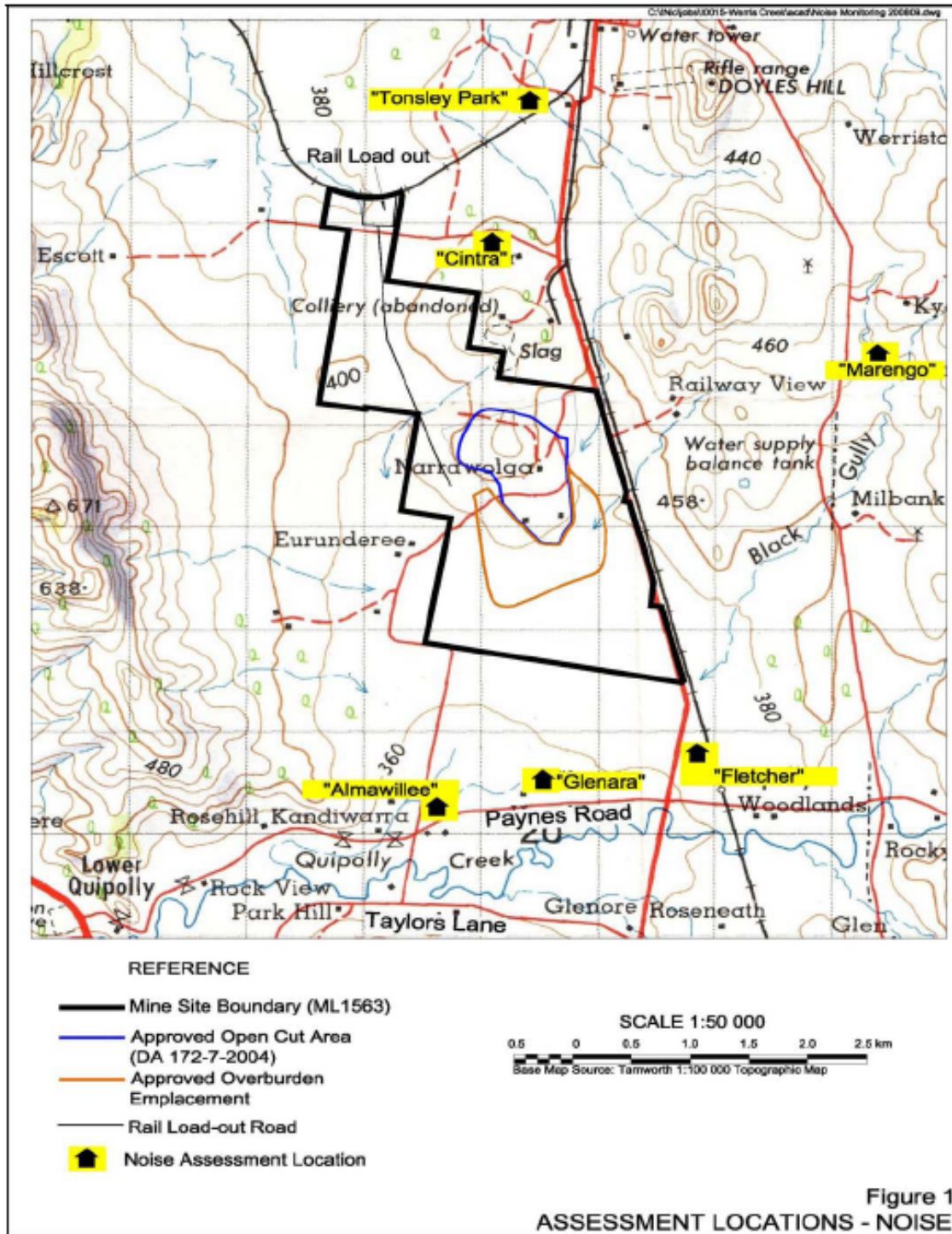


Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant





28 September 2010

Ref: 04035/3696

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: SEPTEMBER 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Friday 17 September 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.

The mine operated automatic weather station was not functioning during the period of the survey. Meteorological data used in this report was, therefore, obtained from a hand held weather station with measurements made at approximately 2m above ground level.

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<sub>eq</sub> (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 September 2010 (Day)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	4:45 pm	36	n/a	1/N	Traffic (33), WCC (30), birds (29)
Glenara	4:27 pm	39	n/a	1/N	Traffic (35), WCC (34), birds (33)
Cintra	3:05 pm	35	n/a	0.5/NW	WCC (34), birds & insects (28)
Marengo	3:47 pm	32	n/a	0.5/NW	Birds & insects (29), WCC (27), cattle (25)
Tonsley Park	3:25 pm	34	n/a	0.5/NW	Train noise (34), birds & insects (25), WCC inaudible
Fletcher	4:09 pm	46	n/a	1/N	Traffic (46), WCC inaudible

Table 2  
WCC Noise Monitoring Results – 17 September 2010 (Evening)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	8:47 pm	30		<0.5/NW	Frogs (26), WCC (25), insects (23)
Glenara	8:31 pm	34		<0.5/NW	Traffic (32), WCC (28), insects (24)
Cintra	9:10 pm	30		<0.5/NW	Traffic (28), WCC (25), insects (20)
Marengo	7:53 pm	38		<0.5/NW	WCC (37), insects (30)
Tonsley Park	7:20 pm	39		Calm	Traffic (37), WCC (32), domestic noise (31)
Fletcher	8:14 pm	45		<0.5/NW	Traffic (45), WCC (27)

Table 3  
WCC Noise Monitoring Results – 17 September 2010 (Night)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	11:32 pm	33		Calm	Birds (33), WCC (<20)
Glenara	11:15 am	36		Calm	Traffic (35), WCC (30), insects (20)
Cintra	10:00 pm	31		<0.5/NW	WCC (27), traffic (27), insects (24)
Marengo	10:37 am	38		Calm	WCC (38), insects (23)
Tonsley Park	10:17 pm	38		Calm	Traffic (36), WCC (32)
Fletcher	10:58 pm	48		Calm	Traffic (48), birds (35), WCC (31)

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 Marengo monitoring location during the evening and night monitoring periods. Marengo is a project related residence.

Data from those times where WCC operations were audible were 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 Lmax 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

Author:

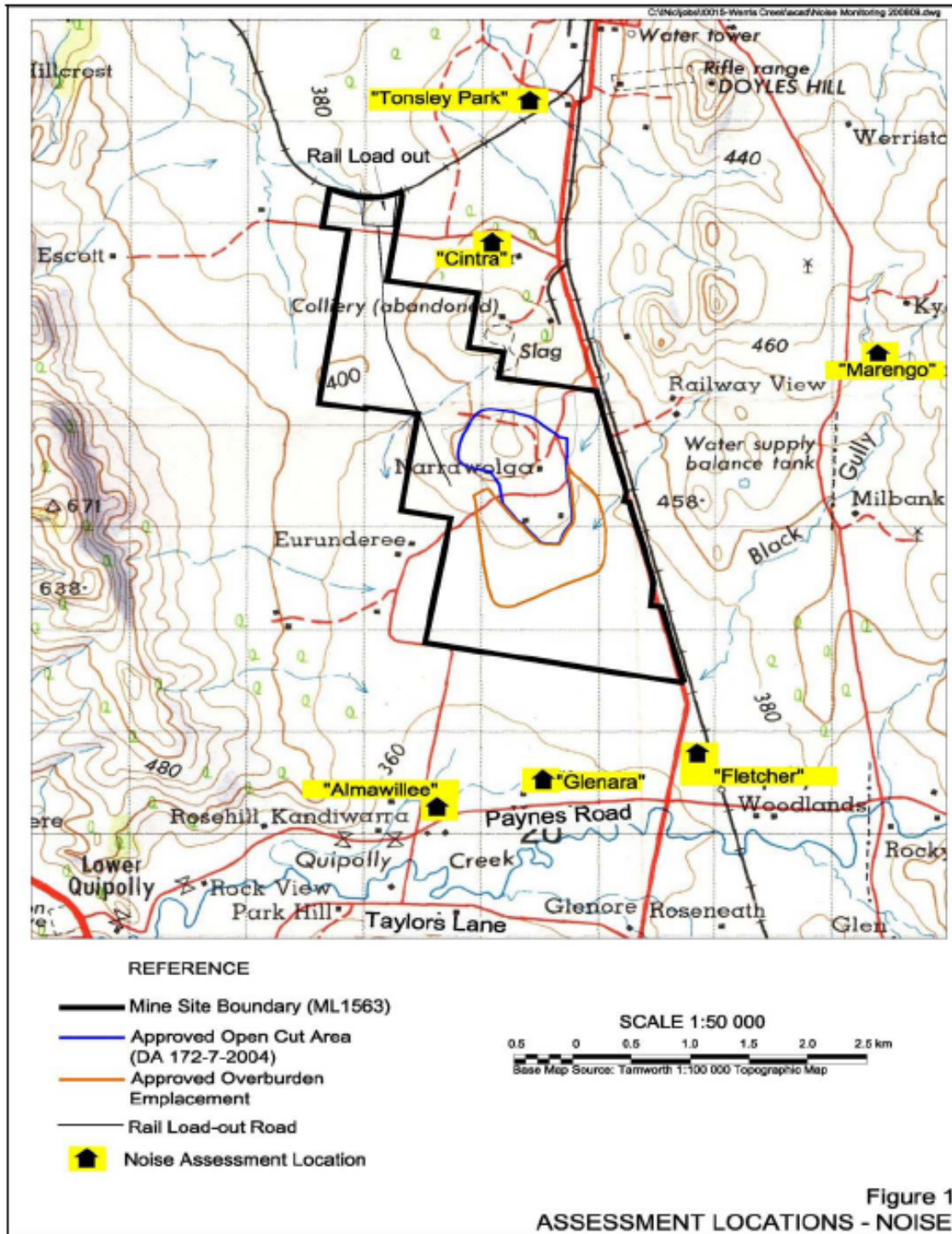


Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant





2 November 2010

Ref: 04035/3756

Werris Creek Coal  
1435 Werris Creek – Quirindi Road  
Werris Creek NSW 2341

## RE: OCTOBER 2010 NOISE MONITORING RESULTS

This letter report presents the results of noise compliance monitoring conducted for the Werris Creek Coal Mine (WCC) on Wednesday 27 October 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 data shows that winds were light to moderate from the north to north west during the day, dropping to calm in the evening before a southerly change came through at the start of the night time monitoring period. The data showed a mild temperature inversion for most of the evening and night.

The total measured  $L_{eq}$  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 – 27 October 2010 (Day)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	3:30 pm	41	n/a	3.6/N	Birds & insects (40), WCC (32), plane (30)
Glenara	3:48 pm	30	n/a	3.6/NW	Traffic (27), WCC (25), birds & insects (22)
Cintra	5:18 pm	41	n/a	4.0/NW	WCC (40), birds & insects (34), traffic (30)
Marengo	4:35 pm	39	n/a	4.0/WNW	Birds & insects (38), WCC (30), traffic (28)
Tonsley Park	4:58 pm	38	n/a	4.5/NNW	Frogs & insects (37), traffic (28), WCC (28)
Fletcher	4:05 pm	48	n/a	3.1/NNW	Traffic (46), train (42), birds & insects (38), WCC inaudible

Table 2  
WCC Noise Monitoring Results – 27 October 2010 (Evening)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	7:50 pm	37	>3	Calm	Traffic (34), birds & insects (32), frogs (31), WCC barely audible
Glenara	8:08 pm	40	<3	Calm	Traffic (36), WCC (36), insects (32)
Cintra	9:44 pm	38	>3	0.4/NW	WCC (38), insects (28)
Marengo	8:58 pm	40	>3	Calm	Frogs & insects (39), WCC (32)
Tonsley Park	9:25 pm	44	>3	Calm	Frogs & insects (41), WCC (40), traffic (35)
Fletcher	9:44 pm	49	>3	Calm	Traffic (49), WCC (33)

Table 3  
WCC Noise Monitoring Results – 27 October 2010 (Night)

Location	Time	dB(A),Leq	Inversion °C/ 100m	Wind speed/ direction	Identified Noise Sources
Almawillee	11:30 pm	32	>3	6.3/SSW	Traffic (31), insects (26), WCC inaudible
Glenara	12:38 am	30	>3	7.2/S	Traffic (30), WCC inaudible
Cintra	11:03 pm	42	>3	4.0/SSW	WCC (41), traffic (36), insects (30)
Marengo	10:15 am	41	0	3.1/SW	WCC (40), frogs & insects (35)
Tonsley Park	10:43 pm	43	>3	2.7/S	Traffic (40), frogs & insects (39), WCC (36)
Fletcher	12:55 pm	34	<3	5.4/S	Traffic (34), insects (23), WCC barely audible

The results shown in Tables 1-3 indicate that, under the operational and atmospheric conditions at the time, noise emission from WCC were higher than the criterion of 35 dB(A) at the Cintra monitoring locations during the day, evening and night monitoring periods and at Tonsley Park during the evening and night, at Glenara during the evening and Marengo at night.

Cintra and Marengo are project related residences.

The noise at Cintra and Tonsley Park was related to emissions from the train loading facility including train noise, dozer tracks and trucks hauling coal. At Marengo and Glenara the noise was attributed to general mining hum with occasional individual noise sources discernable from haul trucks and excavators.

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 indicated that all of the elevated noise levels at Tonsley Park were measured whilst there was a temperature inversion of greater than +3° C/100m in place.

Data from those times where WCC operations were audible were 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 Lmax 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

Author:

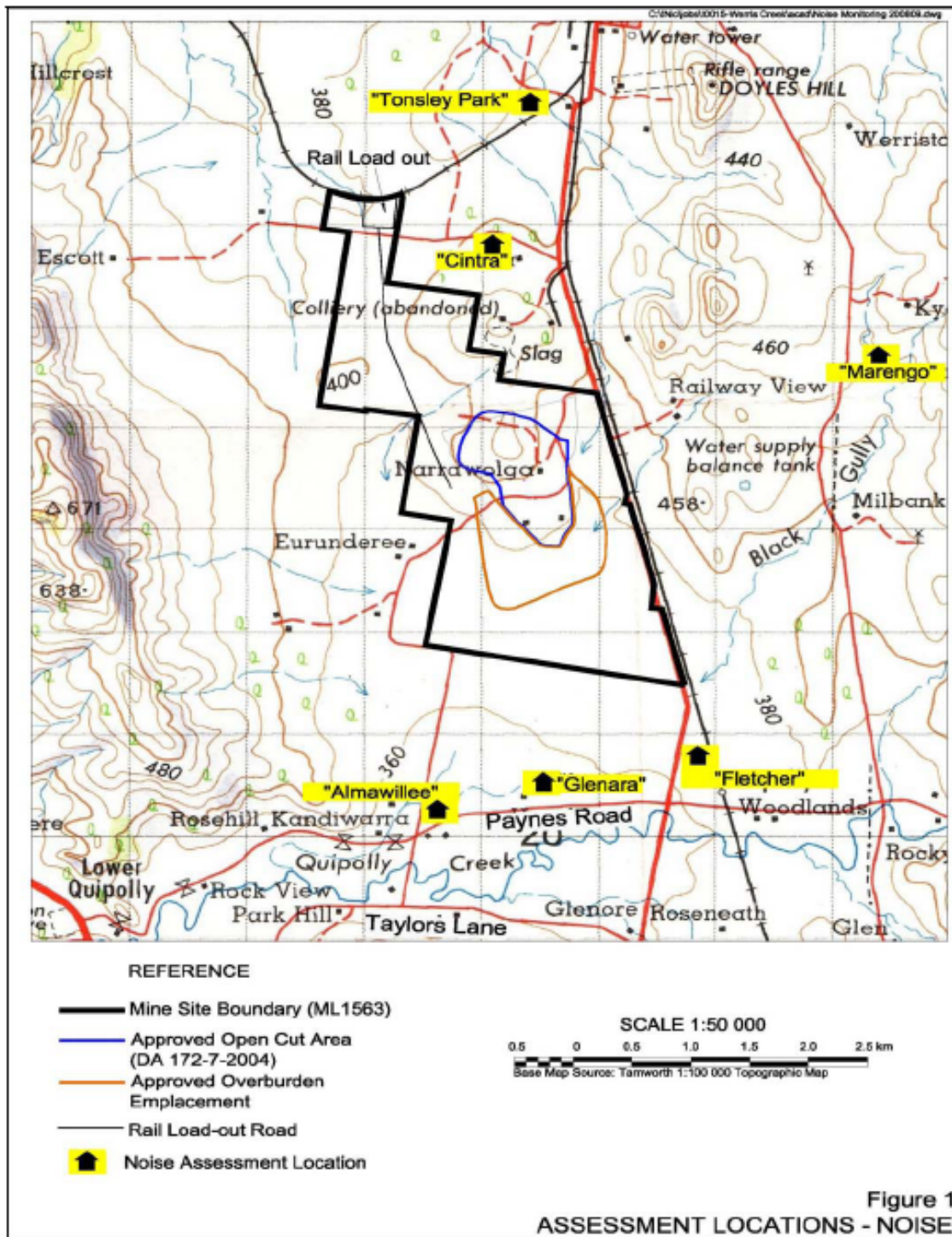


Ross Hodge  
Acoustical Consultant

Review:



Neil Pennington  
Acoustical Consultant



**Appendix 4 – Blasting Monitoring Data.**

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											COMPLIANCE	
					Glenala		Marengo		Tonsley Park		Cintra		Werris Creek		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)	Vib (mm/s)	OP (dB)			
318	2/08/2010	13:18	Strip 13	OB	NT	NT	0.42	104.9	0.83	109.7	1.49	114.3	NT	NT	10	120	
320	4/08/2010	13:21	Strip 13	OB	NT	NT	0.07	112.2	NT	NT	0.08	113.2	NT	NT	10	120	
321	6/08/2010	14:02	Strip 10	OB	NT	NT	NT	NT	0.4	101.8	0.62	108.4	NT	NT	10	120	
322	12/08/2010	13:12	Strip 9	IB	NT	NT	NT	NT	0.4	100.6	0.52	104.6	NT	NT	10	120	
323	17/08/2010	13:22	Strip 10	OB	NT	NT	NT	NT	0.6	100.6	0.67	106.4	NM	NM	10	120	
324	23/08/2010	13:14	Strip 9	IB	NT	NT	NT	NT	0.57	103.1	0.35	96.8	NT	NT	10	120	
325	25/08/2010	13:23	Strip 9	IB	0.1	114.7	NT	NT	NT	NT	0.07	113.7	NT	NT	10	120	
326	25/08/2010	13:23	Strip 10	WE	0.1	114.7	NT	NT	NT	NT	0.07	113.7	NT	NT	10	120	
<b>TOTALS</b>	<b>AUGUST</b>	<b># BLAST</b>	<b>8</b>	<b>HIGHEST</b>	<b>0.1</b>	<b>114.7</b>	<b>0.42</b>	<b>112.2</b>	<b>0.83</b>	<b>109.7</b>	<b>1.49</b>	<b>114.3</b>	<b>-</b>	<b>-</b>	<b>10</b>	<b>120</b>	

**KEY**  
NT - Not Triggered  
NM - Not Monitored

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Marengo		Tonsley Park		Cintra		Werris Creek		COMPLIANCE	
					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)	Vib (mm/s)	OP (dB)
327	3/09/2010	13:12	Strip 9	IB	NT	NT	NM	NM	NT	NT	0.42	111.3	NT	NT	10	120
328	8/09/2010	13:12	Strip 10	IB	NT	NT	NM	NM	1.05	105.7	1.17	111.7	NT	NT	10	120
329	7/09/2010	13:43	Strip 9	IB	NT	NT	NM	NM	NT	NT	NT	NT	NT	NT	10	120
330	15/09/2010	13:10	Strip 9	IB	NT	NT	NM	NM	0.53	105.7	0.92	110.2	NT	NT	10	120
331	21/09/2010	12:36	Strip 10	IB	NT	NT	NM	NM	0.55	103.7	0.9	108.4	NT	NT	10	120
332	24/09/2010	13:12	Strip 9	IB	NT	NT	NM	NM	0.68	107.2	1	110.9	NT	NT	10	120
333	24/09/2010	13:12	Strip 9	IB	NT	NT	NM	NM	0.68	107.2	1	110.9	NT	NT	10	120
334	30/09/2010	13:13	Strip 10	THRU	NT	NT	NM	NM	0.5	105.3	1.15	112	NT	NT	10	120
<b>TOTALS</b>	<b>SEPTEMBER</b>	<b># BLAST</b>	<b>8</b>	<b>HIGHEST</b>	-	-	-	-	<b>1.05</b>	<b>107.2</b>	<b>1.17</b>	<b>112</b>	-	-	<b>10</b>	<b>120</b>

**KEY**  
NT - Not Triggered  
NM - Not Monitored

Shot number	Date fired	Time Fired	Location	Type	Werris Creek Coal Blasting Results											
					Glenala		Marengo		Tonsley Park		Cintra		Werris Creek		COMPLIANCE	
					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)	Vib (mm/s)	OP (dB)
335	7/10/2010	14:35	Strip 10	IB	NT	NT	NM	NM	0.63	106	1	112	NT	NT	10	120
336	12/10/2010	13:12	Strip 10	IB	NT	NT	NM	NM	0.6	93.3	1.12	99.6	NT	NT	10	120
337	11/10/2010	13:16	Strip 9	WE	NT	NT	NM	NM	NT	NT	NT	NT	NT	NT	10	120
338	13/10/2010	13:12	Strip 10	IB	NT	NT	NM	NM	NT	NT	NT	NT	NT	NT	10	120
339	22/10/2010	13:19	Strip 11	OB	NT	NT	NM	NM	0.6	113.3	0.9	107.5	NT	NT	10	120
340	25/10/2010	13:16	Strip 9	IB	NT	NT	NM	NM	0.5	106.8	0.7	113.7	NT	NT	10	120
341	27/10/2010	13:15	Strip 10	OB	NT	NT	NM	NM	0.97	105.8	0.62	112.1	NT	NT	10	120
342	26/10/2010		Strip 10	IB	NT	NT	NM	NM	0.4	87.2	0.9	113.3	NT	NT	10	120
343	29/10/2010	13:44	Strip 9	IB	NT	NT	NM	NM	NT	NT	NT	NT	NT	NT	10	120
<b>TOTALS</b>	<b>OCTOBER</b>	<b># BLAST</b>	<b>9</b>	<b>HIGHEST</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>0.97</b>	<b>113.3</b>	<b>1.12</b>	<b>113.7</b>	<b>-</b>	<b>-</b>	<b>10</b>	<b>120</b>

**KEY**  
NT - Not Triggered  
NM - Not Monitored

**Appendix 5 – Groundwater Monitoring Data.**

FIELD SAMPLING SHEET - SURFACE & GROUND WATERS

CLIENT: WERRIS CREEK COAL PTY LTD

ADDRESS/OFFICE:

QUOTATION No:  
ACIRL LABORATORY:

PROJECT ID: WERRIS CREEK COAL QUARTERLY GROUNDWATERS

SAMPLER NAME: B. Phillips / M. Steele

SITE: WERRIS CREEK MINE AND SURROUNDINGS



Reportables / Analytes	Sample ID Information			Bore Data		Sampling Data			Field Tests			Field Observations			Comments
	Sample ID / Bore ID	Date	Time (24hr)	Standing Water Level (m)	Bore depth (m)	Stick up (m)	Purge Type	Purge Volume (L)	Pump Set Depth (m)	EC - field (µS/cm)	pH - field (pH units)	Temp - field (°C)	Appearance	Odor	
MW1	8/9/10	9:50	52:17	0.27			Bail		1235	6.71	19.4	Clear	Nil	Clear	(Hillview)
MW2	8/9/10	10:10	25:38	0.3			Tap		924	7.50	19.5	Clear	Nil	Clear	(Railview) Ryons.
MW3	9/9/10	12:15	✓	0.95			Tap		25.0	7.98 <sup>ms</sup>	17.2	Clear	Nil	Clear	(Pump over bore (Rundown))
MW4	9-9-10	14:20	10:38	0.64			Bail		1021	7.58	19.0	Turbid	Nil	Clear	Bail Turbid / smelly
MW5	9-9-10	14:40	8:41	1.17			Bail		1962	7.33	19.5	Clear	Nil	Clear	Bailed.
MW6	8/9/10	14:00	12:68	1.05			Bail		1966	7.13	20.6	Turbid	Nil	Brown	No venue access / muddy / (Andersons) from well.
MW7	8/9/10	11:30	4:15				Bail		535	7.01	20.1	Clear	Nil	Clear	(Roseneath) from Pump.
MW8	8/9/10	10:40	14:33	0.02			Tap		1153	7.36	19.2	Clear	Nil	Clear	Nil constant EC.
MW9	9/9/10	11:55	13:69	1.07			Pump	90	8.01	7.30	21.7	Clear	Nil	Clear	Nil constant EC.
MW10	8/9/10	13:40	17:18	0.2			Tap		1275	8.00	15.3	Clear	Nil	Clear	from tap.
MW11	9/9/10	9:55	✓				Tap		1227	7.37	15.2	Clear	Nil	Clear	Pump over bore
MW12	8/9/10	12:50	7:59	0.45					505	7.17	16.2	Clear	Nil	Clear	(Hazeldean)
MW13	8/9/10	11:55	4:44	0.42					720	7.04	19.5	Clear	Nil	Clear	from wells.
MW14	9/9/10	11:25	15:88	1.04			Pump	98	1220	7.01	22.5	Clear	Nil	Clear	Nil constant EC.
MW15	8/9/10	11:00	4:69	0.50			Bail		1004	7.23	19.5	Clear	Nil	Clear	(Windmill) vent.
MW16	8/9/10	12:35	4:43	0.2			Tap		1035	7.18	17.9	Clear	Nil	Clear	Bail shed around side.
MW17A	8/9/10	12:16	3:59	0.4			Tap		962	7.02	21.6	Clear	Nil	Clear	N83 / from Pump.
MW17B	8/9/10	12:20	9:73	0.5					238	8.54	18.9	Clear	Nil	Clear	from Tank.
P1	9/9/10	13:50	20:58	0.92			Pump	100	1720	6.55	21.3	Turbid	Nil	Clear	Nil
P2	9-9-10	14:00	20:20	1.01			Bail		1065	7.28	19.8	Turbid	Nil	Light Brown	Bailed from bore.

*[Handwritten signature]*

*[Handwritten mark]*



## Environmental Division

### CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1018191</b>	Page	: 1 of 5
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 09-SEP-2010
C-O-C number	: ----	Issue Date	: 15-SEP-2010
Sampler	: BP	No. of samples received	: 12
Site	: ----	No. of samples analysed	: 12
Quote number	: SY/261/10		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

#### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ashesh Patel	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

#### Environmental Division Sydney

Part of the **ALS Laboratory Group**

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A Campbell Brothers Limited Company



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER

Client sample ID  
 Client sampling date / time

Compound	CAS Number	LOR	Unit	MW1	MW2	MW6	MW7	MW8
				08-SEP-2010 09:50	08-SEP-2010 10:10	08-SEP-2010 14:00	08-SEP-2010 11:30	08-SEP-2010 10:40
				ES1018191-001	ES1018191-002	ES1018191-003	ES1018191-004	ES1018191-005
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	6.85	7.27	7.19	7.10	7.19
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1210	903	1840	503	1120
<b>EK055G: Ammonia as N by Discrete Analyser</b>								
Ammonia as N	7664-41-7	0.01	mg/L	----	0.01	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.02	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	8.60	5.14	4.58	1.67	4.01
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	8.60	5.14	4.60	1.67	4.01
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.3	0.7	0.5	0.2
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>								
^ Total Nitrogen as N	----	0.1	mg/L	9.2	5.4	5.3	2.2	4.2
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.13	0.15	0.57	0.09	0.16
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.05	0.07	0.11	0.08	0.02



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	MW10	MW12	MW13	MW15	MW16
				Client sampling date / time	08-SEP-2010 13:40	08-SEP-2010 12:50	08-SEP-2010 11:55	08-SEP-2010 11:00	08-SEP-2010 12:35
Compound	CAS Number	LOR	Unit	ES1018191-006	ES1018191-007	ES1018191-008	ES1018191-009	ES1018191-010	
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	7.92	7.23	7.05	7.19	7.06	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	1280	488	695	990	1030	
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	13.3	1.25	3.32	1.42	20.2	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	13.3	1.25	3.32	1.42	20.2	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	0.3	<0.1	0.4	3.1	
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>									
^ Total Nitrogen as N	----	0.1	mg/L	14.3	1.6	3.3	1.8	23.3	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.16	0.04	0.12	0.12	0.15	
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	0.05	0.04	0.09	0.09	0.12	



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	MW17A	MW17B			
			Client sampling date / time	08-SEP-2010 12:10	08-SEP-2010 12:20	----	----	----
Compound	CAS Number	LOR	Unit	ES1018191-011	ES1018191-012	----	----	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.16	8.38	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	937	2330	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	0.01	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	1.20	0.22	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	1.20	0.24	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.1	0.8	----	----	----
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.3	1.0	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.12	0.03	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.09	0.03	----	----	----



Environmental Division

**CERTIFICATE OF ANALYSIS**

<b>Work Order</b>	<b>: ES1018269</b>	<b>Page</b>	: 1 of 5
<b>Client</b>	<b>: ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	<b>: A WRIGHT</b>	<b>Contact</b>	: Charlie Pierce
<b>Address</b>	<b>: 5-7 TALBOT RD GUNNEDAH NSW 2380</b>	<b>Address</b>	: 277-289 Woodpark Road Smithfield NSW Australia 2164
<b>E-mail</b>	<b>: awright@whitehavencoal.com.au</b>	<b>E-mail</b>	: sydney.enviro.services@alsglobal.com
<b>Telephone</b>	<b>: 02 6742 0058</b>	<b>Telephone</b>	: +61-2-8784 8555
<b>Facsimile</b>	<b>: 02 6742 0068</b>	<b>Facsimile</b>	: +61-2-8784 8500
<b>Project</b>	<b>: WERRIS CREEK GROUNDWATER</b>	<b>QC Level</b>	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
<b>Order number</b>	<b>: ----</b>	<b>Date Samples Received</b>	: 10-SEP-2010
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	: 16-SEP-2010
<b>Sampler</b>	<b>: BP/MS</b>	<b>No. of samples received</b>	: 10
<b>Site</b>	<b>: ----</b>	<b>No. of samples analysed</b>	: 10
<b>Quote number</b>	<b>: SY/261/10</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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- Analytical Results



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Accredited for compliance with ISO/IEC 17025.

**Signatories**

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- TDS by method EA-015 may bias high due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	MW3	MW4	MW4	MW9	MW11
				Client sampling date / time	09-SEP-2010 12:15	09-SEP-2010 14:20	09-SEP-2010 14:40	09-SEP-2010 11:55	09-SEP-2010 09:55
Compound	CAS Number	LOR	Unit	ES1018269-001	ES1018269-002	ES1018269-003	ES1018269-004	ES1018269-005	ES1018269-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit	6.73	7.47	7.45	7.34	7.44	7.44
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	28	1000	1740	773	1210	1210
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.24	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	0.42	1.48	0.04	2.81	10.6	10.6
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	0.42	1.48	0.28	2.81	10.6	10.6
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1.0	10.6	1.0	0.7	0.7
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>									
^ Total Nitrogen as N	----	0.1	mg/L	0.4	2.5	10.9	3.8	11.3	11.3
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.03	0.32	0.97	0.07	0.05	0.05
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	0.02	0.05	0.86	0.02	0.04	0.04



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				MW14	P1	P2	SPOIL	DUNMORE DAM
				09-SEP-2010 11:25	09-SEP-2010 13:50	09-SEP-2010 14:00	09-SEP-2010 15:00	09-SEP-2010 15:00
				Client sampling date / time	Client sampling date / time	Client sampling date / time	Client sampling date / time	Client sampling date / time
Compound	CAS Number	LOR	Unit	ES1018269-006	ES1018269-007	ES1018269-008	ES1018269-009	ES1018269-010
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.15	6.68	7.31	7.86	7.47
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	1170	1650	1040	1090	110
<b>EA015: Total Dissolved Solids</b>								
^ Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	----	----	----	704	208
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	1	mg/L	----	----	----	14	110
<b>ED037P: Alkalinity by PC Titrator</b>								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	----	----	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	----	----	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	----	----	----	288	33
Total Alkalinity as CaCO3	----	1	mg/L	----	----	----	288	33
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	----	2	10
<b>ED045G: Chloride Discrete analyser</b>								
Chloride	16887-00-6	1	mg/L	----	----	----	139	11
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	----	----	----	85	1
Magnesium	7439-95-4	1	mg/L	----	----	----	15	2
Sodium	7440-23-5	1	mg/L	----	----	----	97	16
Potassium	7440-09-7	1	mg/L	----	----	----	14	3
<b>EG020T: Total Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	----	----	----	0.001	----
Barium	7440-39-3	0.001	mg/L	----	----	----	0.130	----
Beryllium	7440-41-7	0.001	mg/L	----	----	----	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	----	----	----	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L	----	----	----	0.001	----
Chromium	7440-47-3	0.001	mg/L	----	----	----	<0.001	----
Copper	7440-50-8	0.001	mg/L	----	----	----	0.002	----
Manganese	7439-96-5	0.001	mg/L	----	----	----	0.017	----
Nickel	7440-02-0	0.001	mg/L	----	----	----	0.002	----
Lead	7439-92-1	0.001	mg/L	----	----	----	<0.001	----
Vanadium	7440-62-2	0.01	mg/L	----	----	----	<0.01	----
Zinc	7440-66-6	0.005	mg/L	----	----	----	0.007	----
Iron	7439-89-6	0.05	mg/L	----	----	----	<0.05	----
<b>EG035T: Total Recoverable Mercury by FIMS</b>								
Mercury	7439-97-6	0.0001	mg/L	----	----	----	<0.0001	----



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	MW14	P1	P2	SPOIL	DUNMORE DAM
				Client sampling date / time	09-SEP-2010 11:25	09-SEP-2010 13:50	09-SEP-2010 14:00	09-SEP-2010 15:00	09-SEP-2010 15:00
Compound	CAS Number	LOR	Unit	ES1018269-006	ES1018269-007	ES1018269-008	ES1018269-009	ES1018269-010	ES1018269-010
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.01	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L	17.6	<0.01	4.25	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	17.6	<0.01	4.27	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	<0.1	1.5	----	----	----
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>									
^ Total Nitrogen as N	----	0.1	mg/L	18.6	<0.1	5.8	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	0.12	0.04	0.21	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.19	----	----	----
<b>EN055: Ionic Balance</b>									
^ Total Anions	----	0.01	meq/L	----	----	----	9.71	1.17	1.17
^ Total Cations	----	0.01	meq/L	----	----	----	10.1	1.00	1.00
^ Ionic Balance	----	0.01	%	----	----	----	1.81	----	----

**Appendix 6 – Surface Water Monitoring Data.**



## Environmental Division

### CERTIFICATE OF ANALYSIS

Work Order	: ES1016812	Page	: 1 of 5
Client	: ACIRL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK SURFACE-WATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 20-AUG-2010
C-O-C number	: ----	Issue Date	: 27-AUG-2010
Sampler	: BP	No. of samples received	: 11
Site	: ----	No. of samples analysed	: 11
Quote number	: SY/261/10		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

#### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Inorganics
Charlie Pierce	Laboratory Manager	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

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When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

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^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB6	SB9	SB10	VWD1
				Client sampling date / time	19-AUG-2010 14:35	19-AUG-2010 13:20	19-AUG-2010 13:40	19-AUG-2010 13:55	19-AUG-2010 14:25
Compound	CAS Number	LOR	Unit		ES1016812-001	ES1016812-002	ES1016812-003	ES1016812-004	ES1016812-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.05	7.69	7.66	7.65	8.13
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		363	476	131	190	1010
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	1	mg/L		38	20	295	365	16
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.01	11.8	0.40	0.87	1.32
<b>EK059G: NOX as N by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.01	12.1	0.40	0.87	1.32
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.0	4.3	1.1	0.7	1.1
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>									
^ Total Nitrogen as N	----	0.1	mg/L		1.0	16.4	1.5	1.6	2.4
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.26	0.08	0.38	0.28	0.52
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.09	<0.01	0.16	0.17	0.04
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				VWD2	BGD	QCU	QCD	WCU
				19-AUG-2010 14:10	19-AUG-2010 12:10	19-AUG-2010 12:20	19-AUG-2010 11:50	19-AUG-2010 09:40
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1016812-006	ES1016812-007	ES1016812-008	ES1016812-009	ES1016812-010
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.56	7.78	8.13	7.80	7.85
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	839	159	285	468	618
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	1	mg/L	16	37	10	18	8
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	4.53	0.02	0.24	0.03	0.53
<b>EK059G: NOX as N by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	4.61	0.06	0.25	0.18	0.53
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.6	2.6	0.9	1.1	1.1
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>								
^ Total Nitrogen as N	----	0.1	mg/L	7.2	2.7	1.2	1.3	1.6
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.91	0.52	0.18	0.15	0.26
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.01	0.37	0.09	0.14	0.12
<b>EP020: Oil and Grease (O&amp;G)</b>								
^ Oil & Grease	----	5	mg/L	<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	WCD				
			Client sampling date / time	19-AUG-2010 09:20	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1016812-011	----	----	----	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.20	----	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	811	----	----	----	----
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	1	mg/L	28	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.54	----	----	----	----
<b>EK059G: NOX as N by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.56	----	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	----	----	----	----
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.2	----	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.53	----	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.20	----	----	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
^ Oil & Grease	----	5	mg/L	<5	----	----	----	----

## **Appendix 7 – Surface Water Discharge Monitoring Data**



## Environmental Division

### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	<b>: ES1016291</b>	<b>Page</b>	<b>: 1 of 4</b>
<b>Client</b>	<b>: ACIRL PTY LTD</b>	<b>Laboratory</b>	<b>: Environmental Division Sydney</b>
<b>Contact</b>	<b>: A WRIGHT</b>	<b>Contact</b>	<b>: Charlie Pierce</b>
<b>Address</b>	<b>: Unit 2, Lot 6 Industrial Close MUSWELLBROOK NSW, AUSTRALIA 2333</b>	<b>Address</b>	<b>: 277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	<b>: awright@whitehavencoal.com.au</b>	<b>E-mail</b>	<b>: sydney.enviro.services@alsglobal.com</b>
<b>Telephone</b>	<b>: +61 02 6542 2400</b>	<b>Telephone</b>	<b>: +61-2-8784 8555</b>
<b>Facsimile</b>	<b>: +61 02 6543 4121</b>	<b>Facsimile</b>	<b>: +61-2-8784 8500</b>
<b>Project</b>	<b>: WERRIS CREEK SURFACE WATER</b>	<b>QC Level</b>	<b>: NEPM 1999 Schedule B(3) and ALS QCS3 requirement</b>
<b>Order number</b>	<b>: ----</b>	<b>Date Samples Received</b>	<b>: 13-AUG-2010</b>
<b>C-O-C number</b>	<b>: ----</b>	<b>Issue Date</b>	<b>: 17-AUG-2010</b>
<b>Sampler</b>	<b>: BK</b>	<b>No. of samples received</b>	<b>: 7</b>
<b>Site</b>	<b>: ----</b>	<b>No. of samples analysed</b>	<b>: 7</b>
<b>Quote number</b>	<b>: SY/261/10</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Inorganics

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When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting



## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	SB9	SB10	QCU	QCD
				Client sampling date / time	12-AUG-2010 12:05	12-AUG-2010 11:45	12-AUG-2010 11:30	12-AUG-2010 13:45	12-AUG-2010 13:55
Compound	CAS Number	LOR	Unit		ES1016291-001	ES1016291-002	ES1016291-003	ES1016291-004	ES1016291-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		7.52	7.63	7.30	7.60	7.39
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		389	121	91	256	231
<b>EA025: Suspended Solids</b>									
Suspended Solids (SS)	----	1	mg/L		6	73	68	22	105
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		0.23	0.41	0.03	0.18	0.25
<b>EK059G: NOX as N by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		0.23	0.41	0.03	0.18	0.25
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.5	0.8	1.3	0.8	0.8
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.7	1.2	1.3	1.0	1.0
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.16	0.28	0.82	0.22	0.32
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.10	0.18	0.68	0.10	0.39
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5



## Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	WCU	WCD			
			Client sampling date / time	12-AUG-2010 12:25	12-AUG-2010 12:45	----	----	----
Compound	CAS Number	LOR	Unit	ES1016291-006	ES1016291-007	----	----	----
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	7.62	7.60	----	----	----
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	323	324	----	----	----
<b>EA025: Suspended Solids</b>								
Suspended Solids (SS)	----	1	mg/L	148	130	----	----	----
<b>EK057G: Nitrite as N by Discrete Analyser</b>								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.81	0.68	----	----	----
<b>EK059G: NOX as N by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.81	0.68	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.6	----	----	----
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.6	1.3	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.43	0.42	----	----	----
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.40	0.40	----	----	----
<b>EP020: Oil and Grease (O&amp;G)</b>								
^ Oil & Grease	----	5	mg/L	<5	<5	----	----	----



## Environmental Division

### CERTIFICATE OF ANALYSIS

Work Order	: <b>ES1019457</b>	Page	: 1 of 3
Client	: <b>ACIRL PTY LTD</b>	Laboratory	: Environmental Division Sydney
Contact	: A WRIGHT	Contact	: Charlie Pierce
Address	: 5-7 TALBOT RD GUNNEDAH NSW 2380	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: awright@whitehavencoal.com.au	E-mail	: sydney.enviro.services@alsglobal.com
Telephone	: 02 6742 0058	Telephone	: +61-2-8784 8555
Facsimile	: 02 6742 0068	Facsimile	: +61-2-8784 8500
Project	: WERRIS CREEK GROUNDWATER	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 29-SEP-2010
C-O-C number	: ----	Issue Date	: 05-OCT-2010
Sampler	: AW	No. of samples received	: 5
Site	: ----	No. of samples analysed	: 5
Quote number	: SY/261/10		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

#### Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Sarah Millington	Senior Inorganic Chemist	Inorganics



## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- **EK061G: Spike failed for TKN due to matrix interference.(confirmed by re-digestion and re-analysis).**



## Analytical Results

Sub-Matrix: WATER

				Client sample ID				
				SB9	MW24	TANK	MW25a	MW25b
				28-SEP-2010 08:00	28-SEP-2010 07:00	28-SEP-2010 07:00	28-SEP-2010 06:00	28-SEP-2010 06:00
				Client sampling date / time				
Compound	CAS Number	LOR	Unit	ES1019457-001	ES1019457-002	ES1019457-003	ES1019457-004	ES1019457-005
<b>EA005: pH</b>								
pH Value	----	0.01	pH Unit	8.24	7.01	7.13	6.96	6.94
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	----	1	µS/cm	133	2140	35	2170	2030
<b>EA015: Total Dissolved Solids</b>								
^ Total Dissolved Solids @180°C	GIS-210-010	1	mg/L	----	1240	17	1070	1000
<b>EA025: Suspended Solids</b>								
^ Suspended Solids (SS)	----	1	mg/L	42	----	----	----	----
<b>EK058G: Nitrate as N by Discrete Analyser</b>								
^ Nitrate as N	14797-55-8	0.01	mg/L	0.03	3.05	0.24	5.52	7.40
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>								
Nitrite + Nitrate as N	----	0.01	mg/L	0.03	3.05	0.24	5.52	7.40
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.5	0.6	0.2	1.3	0.8
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>								
^ Total Nitrogen as N	----	0.1	mg/L	1.5	3.6	0.4	6.8	8.2
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>								
Total Phosphorus as P	----	0.01	mg/L	0.36	0.01	0.02	<0.01	0.06
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>								
Reactive Phosphorus as P	----	0.01	mg/L	0.04	<0.01	<0.01	<0.01	<0.01
<b>EP020: Oil and Grease (O&amp;G)</b>								
Oil & Grease	----	5	mg/L	10	----	----	----	----



## Environmental Division

### CERTIFICATE OF ANALYSIS

<b>Work Order</b>	: <b>ES1021486</b>	<b>Page</b>	: 1 of 3
<b>Client</b>	: <b>ACIRL PTY LTD</b>	<b>Laboratory</b>	: Environmental Division Sydney
<b>Contact</b>	: <b>A WRIGHT</b>	<b>Contact</b>	: Charlie Pierce
<b>Address</b>	: <b>Unit 2, Lot 6 Industrial Close MUSWELLBROOK NSW, AUSTRALIA 2333</b>	<b>Address</b>	: <b>277-289 Woodpark Road Smithfield NSW Australia 2164</b>
<b>E-mail</b>	: <b>awright@whitehavencoal.com.au</b>	<b>E-mail</b>	: <b>sydney.enviro.services@alsglobal.com</b>
<b>Telephone</b>	: <b>+61 02 6542 2400</b>	<b>Telephone</b>	: <b>+61-2-8784 8555</b>
<b>Facsimile</b>	: <b>+61 02 6543 4121</b>	<b>Facsimile</b>	: <b>+61-2-8784 8500</b>
<b>Project</b>	: <b>WERRIS CREEK DISCHARGE SAMPLES</b>	<b>QC Level</b>	: <b>NEPM 1999 Schedule B(3) and ALS QCS3 requirement</b>
<b>Order number</b>	: ----	<b>Date Samples Received</b>	: <b>26-OCT-2010</b>
<b>C-O-C number</b>	: ----	<b>Issue Date</b>	: <b>29-OCT-2010</b>
<b>Sampler</b>	: <b>AW</b>	<b>No. of samples received</b>	: <b>5</b>
<b>Site</b>	: ----	<b>No. of samples analysed</b>	: <b>5</b>
<b>Quote number</b>	: <b>SY/261/10</b>		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

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<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ashesh Patel	Inorganic Chemist	Inorganics
Sarah Millington	Senior Inorganic Chemist	Inorganics

**Environmental Division Sydney**

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## General Comments

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## Analytical Results

Sub-Matrix: WATER

				Client sample ID	SB2	QCU	QCD	WCU	WCD
				Client sampling date / time	25-OCT-2010 15:00	25-OCT-2010 15:00	25-OCT-2010 15:00	25-OCT-2010 15:00	25-OCT-2010 15:00
Compound	CAS Number	LOR	Unit		ES1021486-001	ES1021486-002	ES1021486-003	ES1021486-004	ES1021486-005
<b>EA005: pH</b>									
pH Value	----	0.01	pH Unit		8.27	7.89	7.81	7.83	7.86
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm		417	370	924	549	587
<b>EA025: Suspended Solids</b>									
^ Suspended Solids (SS)	----	1	mg/L		16	20	7	136	200
<b>EK057G: Nitrite as N by Discrete Analyser</b>									
Nitrite as N	----	0.01	mg/L		<0.01	0.02	<0.01	0.38	<0.01
<b>EK058G: Nitrate as N by Discrete Analyser</b>									
^ Nitrate as N	14797-55-8	0.01	mg/L		<0.01	0.22	0.07	0.40	25.2
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L		<0.01	0.23	0.07	0.78	25.2
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		0.8	1.8	0.3	1.9	5.5
<b>EK062: Total Nitrogen as N (TKN + NOx)</b>									
^ Total Nitrogen as N	----	0.1	mg/L		0.8	2.0	0.4	2.7	30.7
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L		0.06	0.18	0.07	0.86	0.41
<b>EK071G: Reactive Phosphorus as P by discrete analyser</b>									
Reactive Phosphorus as P	----	0.01	mg/L		0.01	0.12	0.07	0.81	0.30
<b>EP020: Oil and Grease (O&amp;G)</b>									
^ Oil & Grease	----	5	mg/L		<5	<5	<5	<5	<5