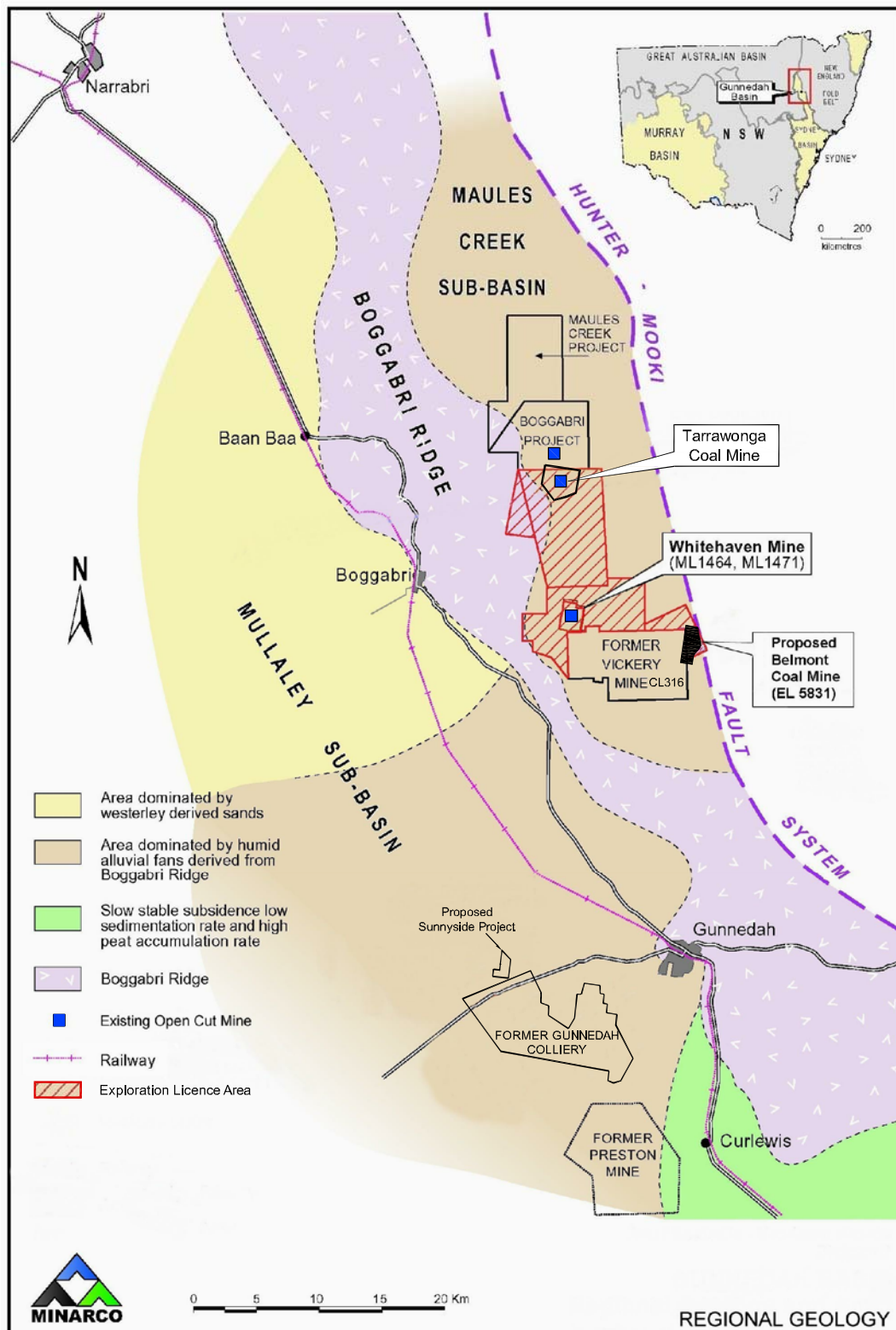


I:\SERVER\RW\CL\584\58401\CAD\584Base_Groundwater 28.DWG



(b) Locality Diagram
 Gunnedah Basin

Figure 28
 PROPOSED AND
 EXISTING MINES

Source: The Coal Industry Profile 2000 by Dept. of Mineral Resources, NSW.

Note: A Colour Version of this figure is available on the project CD

The increasing volume of water entering the open cut over the first 4 to 5 years of operation (see **Table 14**) is expected due to the steeper hydraulic gradient caused by the increase in area and depth of the open cut. This ultimately decreases during the final few years of the Project as the hydraulic gradient decreases following a local lowering of the groundwater table (see **Figures 26 and 27**) and decrease in the area of the open cut mine exposed. It is also worthy of note that the inflows predicted for each stage of the open cut mine are likely to be an overestimate of the actual likely inflows. This is due to the methodology adopted for the prediction of groundwater inflow, which assumes that the bulk of material for each stage is removed instantaneously, rather than by progressive excavation. This provides for an artificially high initial discharge of water to the open cut void.

When comparing the predicted inflow of groundwater to open cut against likely evaporation, the model predicts that there may be a small surplus of water accumulating in the open cut area during the Year 1 to 3 and Year 4 to 5 periods. However, given that the model is likely to provide an overestimate of mine in-flows, little water would accumulate within the void, as is the case with other coal mines in the area.

A Water Access Licence (WAL) is required for the interception of the groundwater table during operations. The predicted maximum groundwater make during operations is 2.24ML/day, or potentially 817.6ML/year. This groundwater make is termed incidental water make by DWE and an incidental water make licence is required. As the site is not situated within a Water Sharing Plan there is no volume restriction placed on the licence.

An incidental water make licence is subjected to fees and charged by the DWE. The incidental water make licence is issued for the life of the Project, is relinquished at the Project completion and is not transferable.

9.2 Criteria for the Assessment of Groundwater Impact

The parameter adopted to assess groundwater impact is the percentage reduction in saturated thickness predicted at bores surrounding the Project Site. This parameter represents the reduction of standing water within each monitoring or extraction bore. A typically accepted change in saturated thickness is 10% and is considered to be representative of variation from seasonal fluctuations. Comparisons between water table fluctuations observed in 2002 and in 2007 indicate variations in standing water level of up to 9%. This is comparable with the 10% adopted change in saturated thickness.

Impacts on saturated thickness have been adopted to provide trigger levels to identify bores that are predicted to be impacted, and for which further evaluation will then be undertaken. A trigger level of 10% reduction in saturated thickness has been adopted to represent variations that are outside naturally occurring seasonal fluctuations. Note that this evaluation does not consider the available drawdown within the bore as this can vary from saturated thickness depending on the location of the pump within the well. Therefore, evaluation of available drawdown for bores identified by the above trigger levels will be undertaken as part of the baseline monitoring programme outlined in a Water Management Plan. Further evaluation also includes a determination of yield.

9.3 Assessment of Impacts

9.3.1 Groundwater Bores

The impacts on the groundwater regime surrounding the Project Site from the Project were assessed using the calibrated groundwater model.

Modelling predicts that a 2m drawdown in the water table occurs up to 5km from the extent of mining. A decrease in the water table of in excess of 11m may occur at the Project Site boundary.

The predicted loss in saturated thickness was calculated for bores surrounding the Project Site (see **Table 13**). A loss in saturated thickness of 10% was considered to represent a loss outside of naturally occurring variations and is the adopted trigger criteria for the evaluation of bore impact.

Losses exceeding the adopted trigger criteria were observed at bores located on the 'Belmont', 'Glenroc', 'Surrey', 'Roseberry', 'Carlton' and 'Yarrari' Properties. With the exception of part of the 'Roseberry' property and the 'Carlton' and 'Surrey' properties, these properties are owned by the Proponent and are considered project related. The 'Roseberry' property is also considered project related by virtue of conditions in the contract of sale of that portion of the property on or immediately adjacent to the Project Site. Further discussion of impact on the bores on project related properties is not required. Losses above the adopted trigger criteria are predicted at the 'Carlton' (10% reduction) and 'Surrey' (16% reduction) properties and discussions with these site owners will be held by the Proponent in relation to the implementation of mitigation measures (see **Section 9.4**). At all other registered bores the predicted loss in saturated thickness is less than 10%.

At the completion of the Project, the Project Site is to be rehabilitated for a final long-term land use. Modelling predicts that a 75% recovery of the water table is achieved within approximately seven years. The remaining 25% recovery is predicted to occur over a significant timeframe (approximately 100 years) and therefore, when assessing impacts, it should be considered that only a 75% recovery occurs.

9.3.2 Impact on Groundwater Dependent Ecosystems

The Project is predicted to impact on groundwater within the alluvium and fractured rock aquifer. The depth to groundwater in the aquifer at the Project Site and surrounds is in the order of 34m. Groundwater from within this aquifer has not been observed to form perched water tables or springs on or surrounding the Project Site and is also unlikely to recharge the alluvium aquifer located to the north and south of the Project Site. Groundwater dependent ecosystems are therefore not likely impacted from drawdown effects within the hard rock aquifer. The DWE advised that tree roots have been recorded within bores in region to a depth of 30m, suggesting some degree of groundwater dependence. GCNRC (2007a) advises, however, that the vegetation communities found in and adjacent to the Project Site, most notably within Vickery State Forest are highly unlikely to set roots at these depths and as such would not be dependant on groundwater (recorded to be >30m below surface in 2002 and 2007).

Further to this evaluation, Schedule 4 of the Water Sharing Plan states *'There are no high priority groundwater dependent ecosystems identified and scheduled at the commencement of this Plan'*, (WSP 2003).

9.3.3 Impact on Water Quality

Groundwater is utilised at sites surrounding the Project Site for the purpose of irrigation and stock watering. Changes to water quality can occur as a result of significant movement in the water table resulting in oxidation of some compounds and changes to the chemical composition.

Oxidation of pyritic compounds within the coal seams may occur and could result in a decrease of groundwater pH and subsequent release of metals. Further protection of water quality is discussed in **Section 10**.

9.4 Mitigation Measures

The focus on the mitigation measures relevant to the Belmont Coal Project relate principally to the replacement of the quantity of water that is predicted to be “lost” by a landowner as a result of groundwater drawdown caused by the Project.

The principal mitigation measure recommended is the deepening of existing bores to intercept groundwater lower in the aquifer to re-instate the previous yield. In some cases, it may be necessary to drill a new groundwater bore. Confidence in this prediction of bore yield restoration is provided by geological information for the area which has identified the presence of significant depth of hard rock that would be unaffected by the Project.

Modelling has indicated that impact on bores outside of those owned by the Proponent would be restricted to single bores on the ‘Surrey’ and ‘Carlton’ properties.

9.5 Summary of Residual Impacts

The results of the modelling analysis indicate that a 2m drawdown of the water table will occur up to 5km from the limit of open cut mining over the life of the Project. Groundwater bores located on properties owned by the Proponent, and the Carlton and Surrey properties are located within this zone of impact and are predicted to be impacted above the trigger criteria of a 10% reduction in saturated thickness. Discussions with the owners of these properties will be held by the Proponent in relation to the implementation of mitigation measures.

If required, the predicted impacts would be substantially mitigated through the installation of additional or deeper groundwater bores at the impacted properties to replace any loss in yield from groundwater bores arising from the Project. Geological information for the Project Site and surrounds indicates that suitable aquifers occur within the fractured rock and are present at depths able to supply supplementary water supply.

10 PROTECTION OF GROUNDWATER

10.1 Groundwater Management Plan

A Groundwater Management Plan would be prepared for the management of groundwater as part of a Site Water Management Plan for the Project following receipt of Project Approval. The Groundwater Management Plan would include details on existing conditions, predicted impacts, baseline and model validation monitoring and a contingency plan in the event of impacts greater than those predicted.

10.2 Groundwater Monitoring

Monitoring of groundwater would incorporate the measurement of groundwater levels in selected bores.

Monitoring would comprise the following components.

1. Baseline measurement of saturated thickness and yield on selected bores located within 3.5km of the Project Site boundaries. Additional baseline measurement locations may be determined following approval of the Project and include considerations such as permissibility of access, predicted impact, proximity of other bores at similar pump heights, water quality measurements etc.
2. Installation of monitoring wells around the perimeter of the Project Site and installation of continuous data loggers in four permanent monitoring wells. **Figure 29** identifies potential locations for the four monitoring wells. Data loggers are to be downloaded every quarter to allow for evaluation of water table trends.
3. Quarterly water quality monitoring of pH and electrical conductivity is also recommended in all eight of the permanent monitoring wells.
4. Evaluation and monitoring of any additional bores that are identified to be impacted and make good any proven deleterious impacts on available drawdown and yield in both groundwater bores and springs.

The frequency of monitoring and range of analytes measured should be reviewed at least biennially to ensure the data being collected is meaningful in the ongoing monitoring of impacts of the Project.

11 DIRECTOR-GENERAL'S REQUIREMENTS

Table 16 records where each of the groundwater-related Director-Generals requirements in the Environmental Assessment are addressed in the report. **Table 16** similarly identifies where each of the issues raised by the various Government Agencies are addressed.

Table 16
Coverage of Environmental Assessment Requirements and Environmental Issues

Aspect	Policy/Methodology	Section
Groundwater		
	<ul style="list-style-type: none"> • <i>Guidelines for Fresh and Marine Water Quality</i> (ANZECC) • The various <i>State Groundwater Policy</i> documents (DWE) • Any Water Sharing Plan under the <i>Water Management Act 2000</i> applicable to the site • <i>Approved Methods for the Sampling and Analysis of Water Pollutants in NSW</i> (DEC) • <i>NSW Groundwater Dependent Ecosystem Policy</i> (DWE) 	<p>Section 5.6</p> <p>Section 2</p> <p>Section 2</p> <p>Section 5.6</p> <p>Section 2</p>

12 ASSESSMENT AGAINST DIPNR REQUIREMENTS AND STATE GROUNDWATER POLICY DOCUMENTS

The Project Site is not located within an embargoed groundwater resource area and therefore application for a groundwater licence is sought under Part 5 of the *Water Act 1912*. **Table 17** identifies the key principles of the *Water Act 1912* and the *Water Management Act 2000*, and directs the reader to the relevant section within this document.

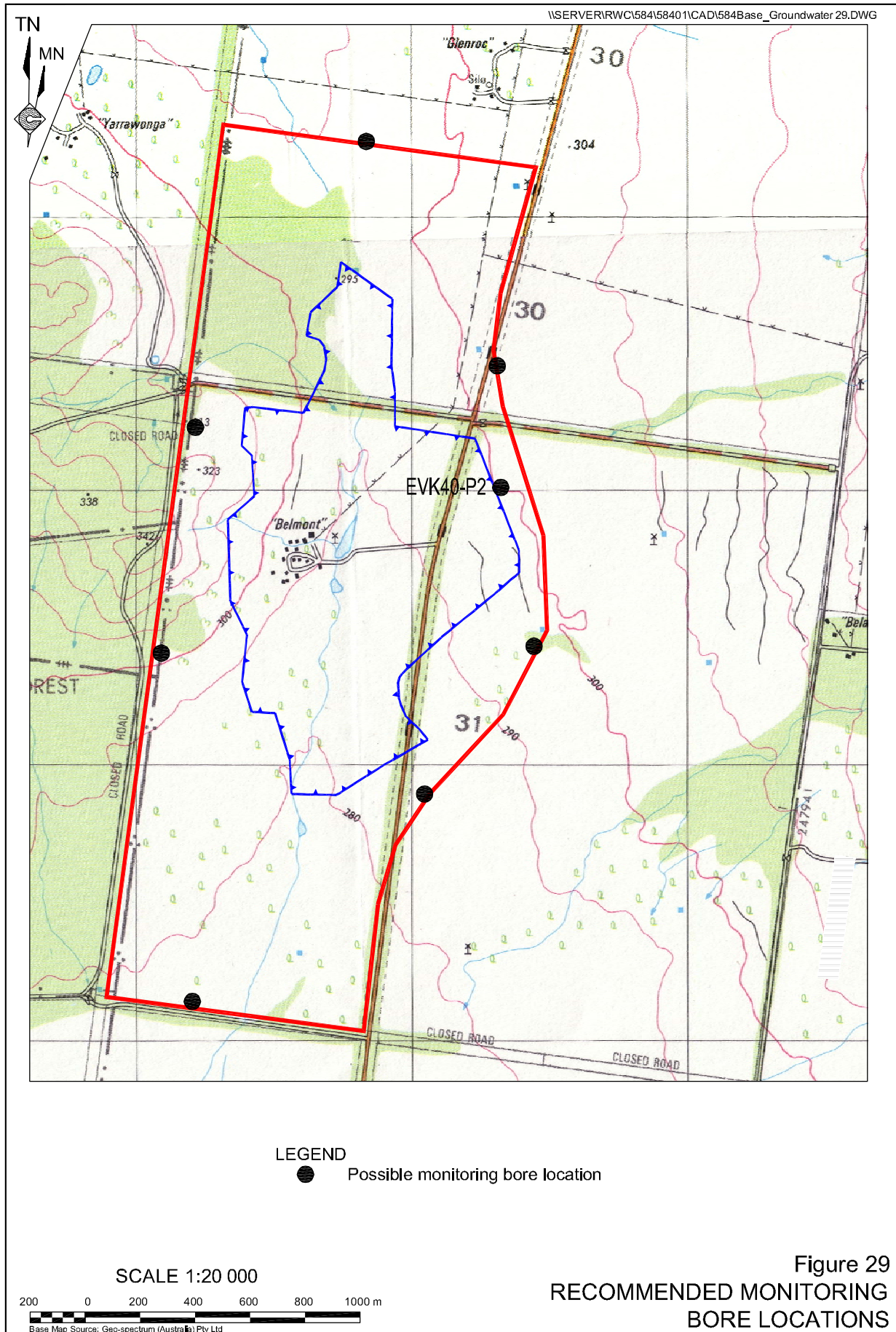


Figure 29
RECOMMENDED MONITORING
BORE LOCATIONS

Note: A Colour Version of this figure is available on the project CD

Table 17
Assessment of Proposal in Accordance with the relevant Acts

Principle	Comments
Identification of the relevant groundwater system	Section 5.8 details the groundwater system that will be encountered by the Project.
Evaluation of the impact on the groundwater system	A hydrogeological study has been completed. The impact assessment is presented in Section 9.
Evaluation of the incidental water make by the proposal	The hydrogeological study undertaken included a prediction of incidental water make and is presented in Section 9.1.3.
Measures to ensure the protection of groundwater quality during the Project operations	A Water Management Plan would be developed for use during operations and is outlined in Section 10.1 . Groundwater monitoring is proposed as part of this assessment as detailed in Section 10.2.
Evaluation of impact on groundwater dependent ecosystems.	There are no groundwater dependent ecosystems identified at the Project Site and surrounds. Further details are presented in Section 8.3.2 .

13 CONCLUSION

A three dimensional model domain has been developed to predict the extent of impact from the proposed Belmont Coal Project. Modelling has predicted that a 2m drawdown in the water table will occur up to 5km from the limit of open cut mining.

A loss in saturated thickness above the adopted trigger criteria of 10% was exceeded only at bores located on project related properties and bores GW052956 and GW020461 on the 'Surrey' and 'Carlton' properties. Importantly, it would be possible for the Proponent to mitigate predicted loss in saturated thickness through the installation of new and/or deeper groundwater bores if required. Available geological information for the Project Site and surrounds indicates that a suitable groundwater aquifer is present at depth within fractured rock.

14 REFERENCES

ANZECC (2000), Australian and New Zealand Guidelines for Fresh and Marine Water Quality, October 2000.

Beckett, J, Belford Dome Resource Consultants Pty Ltd, Personal Correspondence, March 2007, August 2007.

BOM (2005): Bureau of Meteorology website, www.bom.gov.au.

Department of Natural Resources (WSP 2003): Water Sharing Plan for the Upper and Lower Namoi Groundwater Sources.

DPI (2007) Department of Primary Industries web site; <http://www.agric.nsw.gov.au>.

Fetter (1994): Applied Hydrogeology, Third Edition, Prentice Hall.

Freeze, A, Cherry, J, (1979): Groundwater, Prentice Hall.

NSW State Government: Water Act, 1912, last revised 1 July 2005.

NSW State Government: Water Management Act, 2000, last revised 15 January 2007.

RCA (2002): Groundwater Assessment, Proposed Belmont Mine near Boggabri.

US Geological Survey (2000): Modflow 2000.

Whitehaven Coal Mining Pty Ltd (2002): Conceptual Project Plan for the Proposed Belmont Open Cut Coal Mine Development, Near Boggabri.

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APPENDICES

(No. of pages excluding this page = 35)

- Appendix 1: Permeability Test Results (3 pages)**
- Appendix 2: Laboratory Report Sheets (31 pages)**
- Appendix 3: Comment on Geological Logs of EVK95 and EVK96 – Belford Dome Resource Consultants Pty Ltd (1 page)**

Note: All Appendices are only included on the Project CD.

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Appendix 1

Permeability Test Results

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PIEZOMETER TEST

CLIENT: R W Corkery **DATE:** 28/02/2007
PROJECT: Groundwater Study **RCA ref:** 5971
LOCATION: Belmont Property, Boggabri **CLIENT REF:**

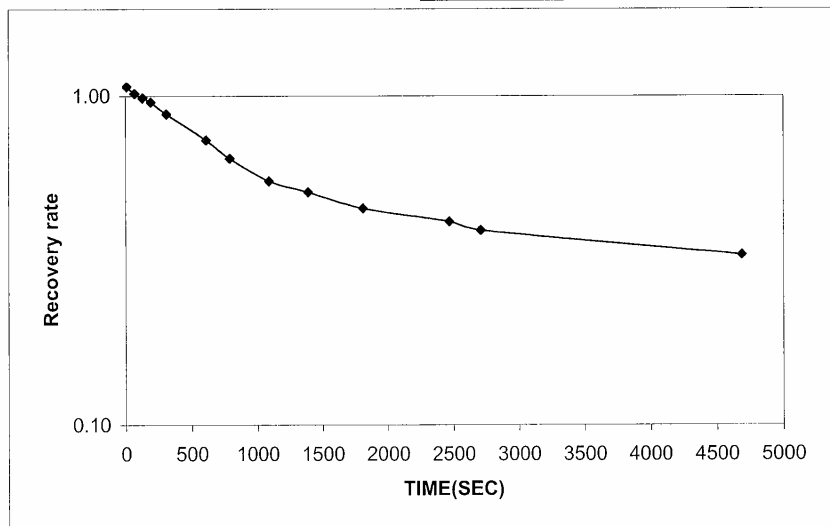
BORE DETAILS

Bore No.
 Piezometer length (L) 3 m
 Piezometer radius (r) 0.025 m
 Bore radius (R) 0.05 m
 Depth of piezometer 51 m
 Static water level 37.6 m
 Lag time T_0 2700 sec
 (37% recovery)
 Stick up 1 m

TEST METHOD: Rising head

Results

Time (sec)	Depth to water (m)	Change in level (m)	h/H
Static	37.60		
0	44.86	7.26	1.00
60	44.51	6.91	0.95
120	44.31	6.71	0.92
180	44.11	6.51	0.90
300	43.59	5.99	0.83
600	42.58	4.98	0.69
780	41.98	4.38	0.60
1080	41.34	3.74	0.52
1380	41.06	3.46	0.48
1800	40.69	3.09	0.43
2460	40.42	2.82	0.39
2700	40.25	2.65	0.37
4680	39.83	2.23	0.31



Based on Hvorslev method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

Calculated Permeability

1.6E-07 m / sec

RCA Australia	Tested by: MC/MT	28/02/2007
Office: Newcastle	Checked by: FR	Date: 4/4/07



PIEZOMETER TEST

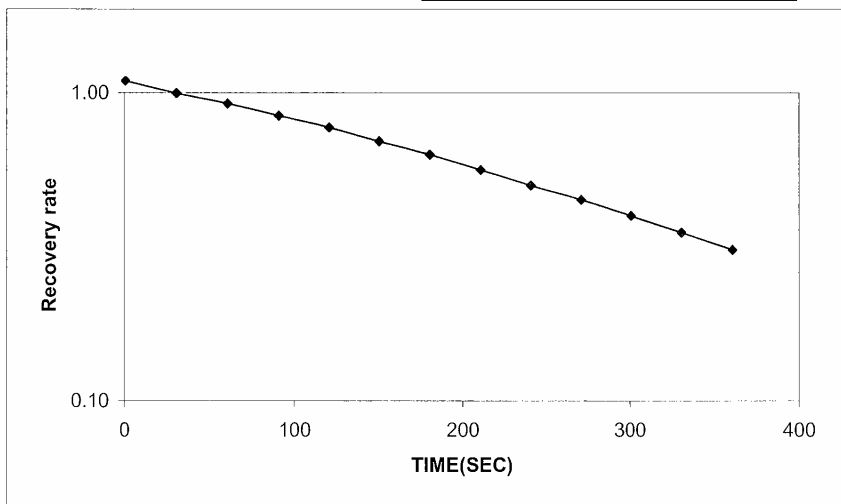
CLIENT: R W Corkery **DATE:** 26/03/2007
PROJECT: Groundwater Study **RCA ref:** 5971
LOCATION: Belmont Property, Boggabri **CLIENT REF:**

BORE DETAILS

Bore No. EVK40-P2
 Piezometer length (L) 1.5 m
 Piezometer radius (r) 0.025 m
 Bore radius (R) 0.05 m
 Depth of piezometer 85 m
 Static water level 33.65 m
 Lag time T_o 300 sec
 (37% recovery)
 Stick up 0.28 m

TEST METHOD: Falling head

Results			
Time (sec)	Depth to water (m)	Change in level (m)	h/H
Static	33.65		
0	18.12	-15.53	1.00
30	19.50	-14.15	0.91
60	20.56	-13.09	0.84
90	21.68	-11.97	0.77
120	22.71	-10.94	0.70
150	23.79	-9.86	0.63
180	24.73	-8.92	0.57
210	25.69	-7.96	0.51
240	26.56	-7.09	0.46
270	27.28	-6.37	0.41
300	28	-5.65	0.36
330	28.67	-4.98	0.32
360	29.27	-4.38	0.28
420	29.86	-3.79	0.24
480	30.77	-2.88	0.19
540	31.53	-2.12	0.14
600	32.11	-1.54	0.10
660	32.54	-1.11	0.07
720	32.86	-0.79	0.05
780	33.08	-0.57	0.04
840	33.24	-0.41	0.03
900	33.33	-0.32	0.02
960	33.4	-0.25	0.02



Based on Hvorslev method

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

Calculated Permeability

2.4E-06 m / sec

RCA Australia	Tested by: MC	Date: 26/03/07
Office: Newcastle	Checked by: FR	Date: 4/4/07



PIEZOMETER TEST

CLIENT: R W Corkery **DATE:** 26/03/2007
PROJECT: Groundwater Study **RCA ref:** 5971
LOCATION: Belmont Property, Boggabri **CLIENT REF:**

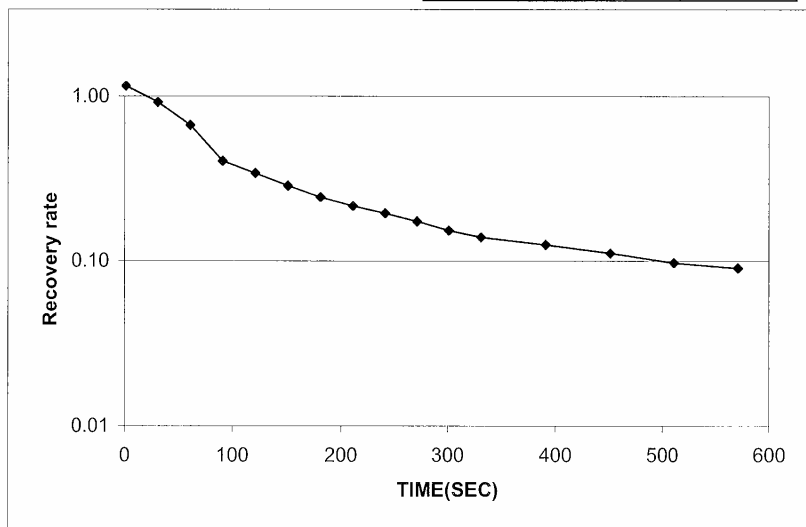
BORE DETAILS

Bore No. EVK40-P1
 Piezometer length (L) 3 m
 Piezometer radius (r) 0.025 m
 Bore radius (R) 0.05 m
 Depth of piezometer 94 m
 Static water level 33.82 m
 Lag time T_0 85 sec
 (37% recovery)
 Stick up 0.46 m

TEST METHOD: Falling head

Results

Time (sec)	Depth to water (m)	Change in level (m)	h/H
Static	33.82		
0	32.16	-1.66	1.00
30	32.50	-1.32	0.80
60	32.86	-0.96	0.58
90	33.24	-0.58	0.35
120	33.33	-0.49	0.30
150	33.41	-0.41	0.25
180	33.47	-0.35	0.21
210	33.51	-0.31	0.19
240	33.54	-0.28	0.17
270	33.57	-0.25	0.15
300	33.6	-0.22	0.13
330	33.62	-0.2	0.12
390	33.64	-0.18	0.11
450	33.66	-0.16	0.10
510	33.68	-0.14	0.08
570	33.69	-0.13	0.08



Based on Hvorslev method

$$K = \frac{r^2 \ln(L/R)}{2LT_0}$$

Calculated Permeability

5.0E-06 m / sec

RCA Australia	Tested by: MC	Date: 26/03/07
Office: Newcastle	Checked by: FR	Date: 4/4/07

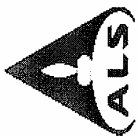
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Appendix 2

Laboratory Report Sheets

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ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney	Page	: 1 of 4
Contact	: MR MATT CLARK	Contact	: Victor Kedicioglu	Work Order	: ES0703486
Address	: P O BOX 175 CARRINGTON NSW AUSTRALIA 2294	Address	: 277-288 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: mattc@rca.com.au	E-mail	: Victor.Kedicioglu@alsenviro.com		
Telephone	: 49029200	Telephone	: 61-2-8784 8555		
Facsimile	: 49029299	Facsimile	: 61-2-8784 8500		
Project	: 5971	Quote number	: SY/099/06		
Order number	: 5971	Date received	: 16 Mar 2007		
C-O-C number	: - Not provided -	Date issued	: 26 Mar 2007		
Site	: - Not provided -	No. of samples	: - Received : 5		
			: - Analysed : 4		

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825	This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.	
This document is issued in accordance with NATA's accreditation requirements.	Signatory	Position
Accredited for compliance with ISO/IEC 17025.	Ankit Joshi Celine Conceicao	Inorganics - NATA 825 (10911 - Sydney) Inorganics - NATA 825 (10911 - Sydney)



WORLD RECOGNISED
ACCREDITATION



Page Number : 2 of 4
Client : ROBERT CARR & ASSOCIATES P/L
Work Order : ES0703486

Comments

This report for the ALSE reference ES0703486 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Analytical Results for Samples Submitted
- Surrogate Recovery Data

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In-house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insufficient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QW/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting, * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **ES0703486**

EK057G: It has been noted that Nitrite is greater than NOX for sample ID (EYK40-P1), however this difference is within the limits of experimental variation.



Page Number : 3 of 4
Client : ROBERT CARR & ASSOCIATES P/L
Work Order : ES0703486

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID:			
				EA005: pH	EA010P: Conductivity by PC Titrator	EA040-P1	EA064
				Sample Matrix Type / Description :	Sample Date / Time :		
				WATER	16 Mar 2007		
				15:00			
				Laboratory Sample ID :	ES0703486-001	ES0703486-002	ES0703486-003
				ES0703486-001	ES0703486-002	ES0703486-003	ES0703486-004
EA005: pH				6.98	7.69	7.42	7.64
EA010P: Conductivity by PC Titrator			0.01 pH Unit	297	1600	2340	2020
ED037P: Alkalinity by PC Titrator			1 µS/cm	<1	<1	<1	<1
Hydroxide Alkalinity as CaCO ₃	DIMO-210-001		1 mg/L	<1	<1	<1	<1
Carbonate Alkalinity as CaCO ₃	3812-32-6		1 mg/L	143	492	904	790
Bicarbonate Alkalinity as CaCO ₃	71-52-3		1 mg/L	143	492	904	790
Total Alkalinity as CaCO ₃			1 mg/L	143	492	904	790
ED040F: Dissolved Major Anions							
Sulphate as SO ₄ 2-	14808-79-8		1 mg/L	3	39	59	74
ED093F: Dissolved Major Cations							
Magnesium	7439-95-4		1 mg/L	4	23	23	19
Sodium	7440-23-5		1 mg/L	22	341	574	486
Potassium	7440-09-7		1 mg/L	28	5	8	8
EG020F: Dissolved Metals by ICP-MS							
Aluminium	7429-90-5		0.01 mg/L	0.03	<0.01	0.01	<0.01
Arsenic	7440-38-2		0.001 mg/L	0.001	<0.001	0.001	<0.001
Manganese	7439-96-5		0.001 mg/L	0.179	0.043	0.061	0.252
Iron	7439-89-6		0.05 mg/L	<0.05	<0.05	<0.05	<0.05
EK057G: Nitrite as N by Discrete Analyser							
Nitrite as N			0.010 mg/L	0.037	0.015	0.013	0.025
EK058G: Nitrate as N by Discrete Analyser							
Nitrate as N	14797-55-8		0.010 mg/L	0.101	<0.010	0.525	1.58
EK059G: NOX as N by Discrete Analyser							
Nitrite + Nitrate as N			0.010 mg/L	0.138	<0.010	0.538	1.60

A Complete Analytical Report



ALS Environmental

Page Number : 4 of 4
Client : ROBERT CARR & ASSOCIATES P/L
Work Order : ES0703486

Surrogate Control Limits

- No surrogates present on this report.

A Complete Business Method Company

Report version: GCS/MS 3.02

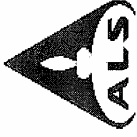
CHAIN OF CUSTODY DOCUMENTATION

CLIENT: <u>RCA Australia</u> POSTAL ADDRESS: <u>92 Hill St Carrington NSW 2204</u> SEND REPORT TO: <u>Matt Clark</u> SEND INVOICE TO: <u>Deanne White</u> DATA NEEDED BY: <u>7 days</u> REPORT NEEDED BY: <u>7 days</u> PROJECT ID: <u>5971</u> QUOTE NO.: <u>5/097/06</u> P.O. NO.: <u>5971</u> COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		Australian Laboratory Services Pty Ltd LABORATORY BATCHING SAMPLERS: <u>MC</u> PHONE: <u>49024200</u> FAX: <u>49024200</u> E-MAIL: <u>mail@australianlab.com.au</u> REPORT FORMAT: <u>HARD</u> DISK: <u></u> BULLETIN BOARD: <u></u> E-MAIL: <u>X</u> QC LEVEL: <u></u> QCS1: <u></u> QCS2: <u></u> QCS3: <u></u> QCS4: <u></u>	
ANALYSIS REQUIRED Nitrate Nitrite Sulfate Sulfide Chloride Fluoride Phosphate Ammonia Alkalinity pH/EC		ANALYSIS REQUIRED Nitrate Nitrite Sulfate Sulfide Chloride Fluoride Phosphate Ammonia Alkalinity pH/EC	
SAMPLE DATA SAMPLE ID: <u>EUK 25</u> MATRIX: <u>H₂O</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> <u>EUK 40 - P1 (2)</u> MATRIX: <u>H₂O</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> <u>EUK 40 - P2 (5)</u> MATRIX: <u>H₂O</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> <u>EUK 61</u> MATRIX: <u>H₂O</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> <u>EUK 64</u> MATRIX: <u>H₂O</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u>		CONTAINER DATA TYPE & PRESERVATIVE: <u>Various</u> NO. <u>4</u> PH <u></u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u>	
RELINQUISHED BY: <u>Matt Clark</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> NAME: <u>Matt Clark</u> OF: <u>RCA Australia</u> NAME: <u>Kate Kelly</u> OF: <u>ALS Newcastle</u>		RECEIVED BY: <u>Kate Kelly</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> NAME: <u>Kate Kelly</u> OF: <u>ALS Newcastle</u> NAME: <u>Sally Step</u> OF: <u>ALS Newcastle</u>	
METHOD OF SHIPMENT: <u>CONSIGNMENT NOTE NO.</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u> DATE: <u>16/3/07</u> TIME: <u>10:30</u>		TRANSPORT CO. NAME: <u></u> DATE: <u>16/3/07</u> TIME: <u>10:30</u>	

Environmental Division
 Sydney
 Work Order
ES0703486
 Telephone: 61-2-8784 8555

NOTES
 *All As N, Mg, Fe

AUSTRALIAN LABORATORY SERVICES P/L



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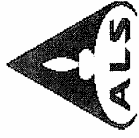
INTERPRETIVE QUALITY CONTROL REPORT

Client :	ROBERT CARR & ASSOCIATES P/L	Laboratory :	Environmental Division Sydney	Page :	1 of 5
Contact :	MR MATT CLARK	Contact :	Victor Kedicioglu	Work order :	ES0703486
Address :	P O BOX 175 CARRINGTON NSW AUSTRALIA 2294	Address :	277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No. :	
Project :	5971	Quote number :	SY/099/06	Date received :	16 Mar 2007
Order number :	5971	E-mail :	Victor.Kedicioglu@alsenviro.com	Date issued :	26 Mar 2007
C-O-C number :	- Not provided -	Telephone :	61-2-8784 8555	No. of samples	
Site :	- Not provided -	Facsimile :	61-2-8784 8500	Received	5
E-mail :	mattc@rca.com.au			Analysed	4
Telephone :	49029200				
Facsimile :	49029299				

This Interpretive Quality Control Report was issued on 26 Mar 2007 for the ALS work order reference ES0703486 and supersedes any previous reports with this reference. This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

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ALS Environmental

QUALITY CONTROL REPORT

Client : ROBERT CARR & ASSOCIATES P/L	Laboratory : Environmental Division Sydney	Page : 1 of 6
Contact : MR MATT CLARK	Contact : Victor Kedicioglu	Work order : ES0703486
Address : P O BOX 175 CARRINGTON NSW AUSTRALIA 2294	Address : 277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No. :
Project : 5971	Quote number : SY/099/06	Date received : 16 Mar 2007
Order number : 5971	E-mail : mattc@rca.com.au	Date issued : 26 Mar 2007
C-O-C number : - Not provided -	Telephone : 49029200	No. of samples Received : 5
Site : - Not provided -	Facsimile : 49029299	Analysed : 4

This final report for the ALSE work order reference ES0703486 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

EK057G: It has been noted that Nitrite is greater than NOx for sample ID (EV40-P1), however this difference is within the limits of experimental variation.

ALSE - Excellence in Analytical Testing

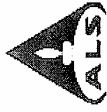
NATA Accredited Laboratory - 825

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This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory Ankit Joshi Celine Conceicao	Department Inorganics - NATA 825 (10911 - Sydney) Inorganics - NATA 825 (10911 - Sydney)
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ALS Environmental

Page Number : 2 of 6
 Issue Date : 26 Mar 2007

Work Order : ES0703486
 ALS Quote Reference : SY099106

Client : ROBERT CARR & ASSOCIATES PIL
 Project : 5971

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term Laboratory Duplicate refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity. Anomalous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process (i.e. Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference, * indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QM/EN38 and are dependent on the magnitude of results in comparison to the level of reporting. Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EA005: pH						
EA005: pH - (QC Lot: 376099)						
ES0703486-001	EVK25	pH Value	0.01 pH Unit	6.98	7.00	0.3
EA010P: Conductivity by PC Titrator						
EA010P: Conductivity by PC Titrator - (QC Lot: 376737)						
ES0703472-001	Anonymous	Electrical Conductivity @ 25°C	1 µS/cm	124	123	0.0
ES0703472-010	Anonymous	Electrical Conductivity @ 25°C	1 µS/cm	182	184	0.8
ED037P: Alkalinity by PC Titrator						
ED037P: Alkalinity by PC Titrator - (QC Lot: 376736)						
ES0703472-001	Anonymous	Hydroxide Alkalinity as CaCO3	1 mg/L	<1	<1	0.0
		Carbonate Alkalinity as CaCO3	1 mg/L	<1	<1	0.0
		Bicarbonate Alkalinity as CaCO3	1 mg/L	8	10	16.7
		Total Alkalinity as CaCO3	1 mg/L	8	10	16.7
ES0703472-010	Anonymous	Hydroxide Alkalinity as CaCO3	1 mg/L	<1	<1	0.0
		Carbonate Alkalinity as CaCO3	1 mg/L	<1	<1	0.0
		Bicarbonate Alkalinity as CaCO3	1 mg/L	3	4	26.8
		Total Alkalinity as CaCO3	1 mg/L	3	4	26.8
ED040F: Dissolved Major Anions						
ED040F: Dissolved Major Anions - (QC Lot: 376334)						
ES0703465-001	Anonymous	Sulphate as SO4 2-	1 mg/L	5	5	0.0
ES0703472-004	Anonymous	Sulphate as SO4 2-	1 mg/L	8	9	0.0
ED040F: Dissolved Major Anions - (QC Lot: 376336)						
ES0703486-002	EYK40-P1	Sulphate as SO4 2-	1 mg/L	39	37	5.4
ED093F: Dissolved Major Cations						
ED093F: Dissolved Major Cations - (QC Lot: 376335)						
ES0703465-001	Anonymous	Magnesium	1 mg/L	2	2	0.0
		Sodium	1 mg/L	10	10	0.0

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Page Number : 3 of 6
Issue Date : 26 Mar 2007

Work Order : ES0703486
ALS Quote Reference : SY09906

Client : ROBERT CARR & ASSOCIATES P/L
Project : 5971

Matrix Type: WATER Laboratory Sample ID Client Sample ID Analyte name LOR Original Result Duplicate Result RPD

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
ED093F: Dissolved Major Cations - continued						
ED093F: Dissolved Major Cations - (QC Lot: 376335) - continued						
ES0703486-001	Anonymous	Potassium	1 mg/L	<1	<1	0.0
ES0703472-004	Anonymous	Magnesium	1 mg/L	2	2	0.0
		Sodium	1 mg/L	16	16	0.0
		Potassium	1 mg/L	1	1	0.0
ED093F: Dissolved Major Cations - (QC Lot: 376337)						
ES0703486-002	EVK40-P1	Magnesium	1 mg/L	23	22	4.5
		Sodium	1 mg/L	341	342	0.4
		Potassium	1 mg/L	5	5	0.0
ES0703528-006	Anonymous	Magnesium	1 mg/L	1140	1130	0.6
		Sodium	1 mg/L	8470	8370	1.2
		Potassium	1 mg/L	468	465	0.6
EG020F: Dissolved Metals by ICP-MS						
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 376088)						
EP0701034-007	Anonymous	Aluminium	0.01 mg/L	1.70	1.64	3.1
		Arsenic	0.001 mg/L	<0.001	<0.001	0.0
		Manganese	0.001 mg/L	0.009	0.009	0.0
		Iron	0.05 mg/L	0.54	0.52	2.7
		Aluminium	0.01 mg/L	0.01	<0.01	0.0
		Arsenic	0.001 mg/L	0.082	0.081	0.0
		Manganese	0.001 mg/L	0.083	0.082	3.3
		Iron	0.05 mg/L	0.42	0.36	15.7
EK057G: Nitrite as N by Discrete Analyser						
EK057G: Nitrite as N by Discrete Analyser - (QC Lot: 376209)						
ES0703486-001	EVK25	Nitrite as N	0.010 mg/L	0.037	0.043	15.0
EK059G: NOX as N by Discrete Analyser						
EK059G: NOX as N by Discrete Analyser - (QC Lot: 377939)						
ES0703458-001	Anonymous	Nitrite + Nitrate as N	0.010 mg/L	19.3	18.9	2.1
ES0703610-002	Anonymous	Nitrite + Nitrate as N	0.010 mg/L	<0.010	<0.010	0.0

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Page Number : 4 of 6
 Issue Date : 26 Mar 2007

Work Order : ES0703486
 ALS Quote Reference : SY090906

Client : ROBERT CARR & ASSOCIATES P/L
 Project : 5971

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of Reporting.

Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits Low	Dynamic Recovery Limits High
EA010P: Conductivity by PC Titrator						
EA010P: Conductivity by PC Titrator - (QC Lot: 376737)		µS/cm	µS/cm	%	%	%
Electrical Conductivity @ 25°C	1 µS/cm	***	2000	102	86.3	112
	1 µS/cm	<1	***	***	***	***
ED037P: Alkalinity by PC Titrator						
ED037P: Alkalinity by PC Titrator - (QC Lot: 376736)		mg/L	mg/L	%	%	%
Total Alkalinity as CaCO3	1 mg/L	***	200	87.6	80.2	108
ED040F: Dissolved Major Anions						
ED040F: Dissolved Major Anions - (QC Lot: 376334)		mg/L	mg/L	%	%	%
Sulphate as SO4 2-	1 mg/L	***	150	96.4	82.9	114
	1 mg/L	<1	1	***	***	***
ED040F: Dissolved Major Anions - (QC Lot: 376336)		mg/L	mg/L	%	%	%
Sulphate as SO4 2-	1 mg/L	***	150	97.7	82.9	114
	1 mg/L	<1	1	***	***	***
ED093F: Dissolved Major Cations						
ED093F: Dissolved Major Cations - (QC Lot: 376335)		mg/L	mg/L	%	%	%
Magnesium	1 mg/L	***	50	95.1	82.7	114
	1 mg/L	<1	***	***	***	***
Potassium	1 mg/L	***	50	104	84.3	118
	1 mg/L	<1	***	***	***	***
Sodium	1 mg/L	***	50	83.8	77.4	113
	1 mg/L	<1	***	***	***	***
ED093F: Dissolved Major Cations - (QC Lot: 376337)		mg/L	mg/L	%	%	%
Magnesium	1 mg/L	***	50	98.6	82.7	114
	1 mg/L	<1	***	***	***	***

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Work Order : ES0703486
ALS Quote Reference : SY099106

Client : ROBERT CARR & ASSOCIATES P/L
Project : 5971

Page Number : 5 of 6
Issue Date : 26 Mar 2007

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Matrix Type: WATER

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits Low	High
ED093F: Dissolved Major Cations - continued						
ED093F: Dissolved Major Cations - (QC Lot: 376337) - continued						
Potassium	1 mg/L	mg/L	mg/L	%	%	%
	1 mg/L	<1	50	97.3	84.3	118
	1 mg/L	<1	*****	*****	*****	*****
Sodium	1 mg/L	<1	*****	*****	*****	*****
	1 mg/L	*****	50	108	77.4	113
	1 mg/L	*****	*****	*****	*****	*****
EG020F: Dissolved Metals by ICP-MS						
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 378088)						
Aluminium	0.01 mg/L	mg/L	mg/L	%	%	%
	0.01 mg/L	<0.01	0.5	96.6	70	130
	0.001 mg/L	<0.001	*****	*****	*****	*****
Arsenic	0.001 mg/L	<0.001	0.1	96.6	70	130
	0.05 mg/L	<0.05	*****	*****	*****	*****
Iron	0.05 mg/L	<0.05	0.5	84.3	70	130
	0.001 mg/L	*****	0.1	85.9	70	130
	0.001 mg/L	<0.001	*****	*****	*****	*****
EK057G: Nitrite as N by Discrete Analyser						
EK057G: Nitrite as N by Discrete Analyser - (QC Lot: 376209)						
Nitrite as N	0.01 mg/L	mg/L	mg/L	%	%	%
	0.010 mg/L	<0.010	0.96	92.7	86.6	131
	0.010 mg/L	<0.010	*****	*****	*****	*****
EK059G: NOX as N by Discrete Analyser						
EK059G: NOX as N by Discrete Analyser - (QC Lot: 377939)						
Nitrite + Nitrate as N	0.01 mg/L	mg/L	mg/L	%	%	%
	0.010 mg/L	<0.010	0.96	108	76.9	122
	0.010 mg/L	<0.010	*****	*****	*****	*****



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Page Number : 6 of 6
 Issue Date : 26 Mar 2007

Work Order : ES0703486
 ALS Quote Reference : SY099/06

Client : ROBERT CARR & ASSOCIATES P/L
 Project : 5871

Quality Control Report - Matrix Spikes (MS)

The quality control term **Matrix Spike (MS)** refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs), "ideal" recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: **LOR = Limit of Reporting**, **RPD = Relative Percent Difference**.
 * Indicates failed QC

Matrix Type: WATER

Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results		Recovery Limits	
					Sample Result	Spike Recovery MS	Static Limits Low	Static Limits High
EG020F: Dissolved Metals by ICP-MS								
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 376088)								
Arsenic	EP0701034-007	Anonymous	0.001 mg/L	mg/L	mg/L	%	%	%
Manganese			0.001 mg/L	0.2	<0.001	102	70	130
				0.2	0.009	107	70	130
EK057G: Nitrite as N by Discrete Analyser								
EK057G: Nitrite as N by Discrete Analyser - (QC Lot: 376209)								
Nitrite as N	ES0703486-001	EVK25	0.01 mg/L	mg/L	mg/L	%	%	%
				0.60	0.037	93.2	70	130
EK059G: NOx as N by Discrete Analyser								
EK059G: NOx as N by Discrete Analyser - (QC Lot: 377939)								
Nitrite + Nitrate as N	ES0703466-001	Anonymous	0.01 mg/L	mg/L	mg/L	%	%	%
				0.60	19.3	* Not Determined	70	130



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Page Number : 2 of 5
Issue Date : 26 Mar 2007

Work Order : ES0703486
ALS Quote Reference : SY099006

Client : ROBERT CARR & ASSOCIATES P/L
Project : 5971

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: WATER

Method Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation		Analysis	
		Date extracted	Due for extraction	Date analysed	Due for analysis
EA005: pH Clear Plastic Bottle - Natural EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	20 Mar 2007	16 Mar 2007 Fail by 4 days
EA010-P: Conductivity by PC Titrator Clear Plastic Bottle - Natural EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	21 Mar 2007	13 Apr 2007 Pass
ED037-P: Alkalinity by PC Titrator Clear Plastic Bottle - Natural EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	21 Mar 2007	30 Mar 2007 Pass
ED040-F: Major Anions - Filtered Clear Plastic Bottle - Natural EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	21 Mar 2007	13 Apr 2007 Pass
ED093-F: Major Cations - Filtered Clear Plastic Bottle - Natural EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	21 Mar 2007	13 Apr 2007 Pass
EG020A-F: Dissolved Metals by ICP-MS - Suite A Clear Plastic Bottle - Nitric Acid; Filtered EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	23 Mar 2007	12 Sep 2007 Pass
EK057-G: Nitrite as N by Discrete Analyser Clear Plastic Bottle - Natural EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	20 Mar 2007	18 Mar 2007 Fail by 2 days
EK059-G: Nitrite and Nitrate as N (NOx) by Discrete Analyser Clear Plastic Bottle - Sulphuric Acid EVK40-P1, EVK25, EVK61	16 Mar 2007	----	----	23 Mar 2007	13 Apr 2007 Pass



ALS Environmental

Page Number : 3 of 5
Issue Date : 26 Mar 2007

Work Order : ES0703466
ALS Quote Reference : SY099105

Client : ROBERT CARR & ASSOCIATES P/L
Project : 5971

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Method	Quality Control Sample Type	Count		Rate (%)		Quality Control Specification	Frequency of Quality Control Samples
		QC	Regular	Actual	Expected		
Matrix Type: WATER							
Laboratory Duplicates (DUP)							
EA005: pH	Conductivity by PC Titrator	1	4	25.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EA010-P: Alkalinity by PC Titrator	Conductivity by PC Titrator	2	20	10.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED037-F: Major Anions - Filtered	Major Anions - Filtered	3	31	9.7	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED040F: Major Cations - Filtered	Major Cations - Filtered	4	38	10.5	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG020A-F: Dissolved Metals by ICP-MS - Suite A	Dissolved Metals by ICP-MS - Suite A	2	20	10.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK057G: Nitrite as N by Discrete Analyser	Nitrite as N by Discrete Analyser	1	5	20.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser	Nitrite and Nitrate as N (NOx) by Discrete Analyser	2	20	10.0	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)							
EA010-P: Conductivity by PC Titrator	Conductivity by PC Titrator	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED037-F: Alkalinity by PC Titrator	Alkalinity by PC Titrator	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED040F: Major Anions - Filtered	Major Anions - Filtered	2	31	6.5	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED093F: Major Cations - Filtered	Major Cations - Filtered	2	38	5.3	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG020A-F: Dissolved Metals by ICP-MS - Suite A	Dissolved Metals by ICP-MS - Suite A	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK057G: Nitrite as N by Discrete Analyser	Nitrite as N by Discrete Analyser	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser	Nitrite and Nitrate as N (NOx) by Discrete Analyser	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)							
EA010-P: Conductivity by PC Titrator	Conductivity by PC Titrator	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED040F: Major Anions - Filtered	Major Anions - Filtered	2	31	6.5	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
ED093F: Major Cations - Filtered	Major Cations - Filtered	2	38	5.3	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG020A-F: Dissolved Metals by ICP-MS - Suite A	Dissolved Metals by ICP-MS - Suite A	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK057G: Nitrite as N by Discrete Analyser	Nitrite as N by Discrete Analyser	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser	Nitrite and Nitrate as N (NOx) by Discrete Analyser	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)							
EG020A-F: Dissolved Metals by ICP-MS - Suite A	Dissolved Metals by ICP-MS - Suite A	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK057G: Nitrite as N by Discrete Analyser	Nitrite as N by Discrete Analyser	1	5	20.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK059G: Nitrite and Nitrate as N (NOx) by Discrete Analyser	Nitrite and Nitrate as N (NOx) by Discrete Analyser	1	20	5.0	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement



Page Number : 4 of 5
Issue Date : 28 Mar 2007

Work Order : ES0703486
ALS Quote Reference : SY099006

Client : ROBERT CARR & ASSOCIATES P/L
Project : 5971

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the Quality Control Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QW/EN138 (in the absence of specific USEPA limits). Flagged outliers on control limits for organics tests may be within the NEPM specified data quality objective or recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
				Nitrite + Nitrate as N	ND	****	MS recovery not determined, background level greater than or equal to 4x spike level.

- For all matrices, no RPD recovery outliers occur for the duplicate analysis.
- For all matrices, no method blank result outliers occur.
- For all matrices, no laboratory spike recoveries breaches occur.

Surrogates

- For all matrices, no surrogate recovery outliers occur.

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation		Analysis	
		Date extracted	Due for extraction	Date analysed	Due for analysis
EA005: pH Clear Plastic Bottle - Natural EWK25, EWK61,	16 Mar 2007	****	****	20 Mar 2007	16 Mar 2007
EK057G: Nitrite as N by Discrete Analyser Clear Plastic Bottle - Natural EWK25, EWK61,	16 Mar 2007	****	****	20 Mar 2007	18 Mar 2007

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- No frequency outliers occur.



ALS Environmental

Page Number : 5 of 5
Issue Date : 28 Mar 2007

Work Order : ES0703486
ALS Quote Reference : SY0909/06

Client : ROBERT CARR & ASSOCIATES P/L
Project : 5971

Method Reference Summary

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: WATER

Method Reference Summary

Analytical Methods.

- EA005 : pH - APHA 21st ed.**, 4500 H+ B. pH of water samples is determined by SE either manually or by automated pH meter. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
- EA010-P : Conductivity by PC Titrator - APHA 21st ed.**, 2510 This procedure determines conductivity by automated ISE. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
- ED037-P : Alkalinity by PC Titrator - APHA 21st ed.**, 2320 B. This procedure determines alkalinity by both manual measurement and automated measurement (e.g. PC Titrator) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
- ED040F : Major Anions - Filtered - APHA 21st ed.**, 3120 Sulphur and Silicon content is determined by ICP/AES and reported as Sulphate after conversion by gravimetric factor.
- ED093F : Major Cations - Filtered - APHA 21st ed.**, 3120; USEPA SW 846 - 6010. The ICPAES technique ionises filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
- EG020A-F : Dissolved Metals by ICP-MS - Suite A - (APHA 21st ed.**, 3125; USEPA SW846 - 6020. ALS QM/LEN/EG020); The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
- EK057G : Nitrite as N by Discrete Analyser - APHA 21st ed.**, 4500 NO3- B. SEAL Method 2-018-1-L February 2003. Nitrite is determined by direct colourimetry by SEAL. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
- EK058G : Nitrate as N by Discrete Analyser - APHA 21st ed.**, 4500 NO3-F. SEAL Method 2-018-1-L February 2003. Nitrate is reduced to nitrite by way of a cadmium reduction column followed by quantification by SEAL. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
- EK059G : Nitrite and Nitrate as N (NOx) by Discrete Analyser - APHA 21st ed.**, 4500 NO3- F. SEAL Method 2-018-1-L February 2003. Combined oxidised Nitrogen (NO2+NO3) is determined by Cadmium Reduction and direct colourimetry by SEAL. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)



ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney	Page	: 1 of 4
Contact	: MR MATT CLARK	Contact	: Victor Kedicioglu	Work Order	: ES0704333
Address	: P.O. BOX 175 CARRINGTON NSW AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: mattc@rca.com.au	E-mail	: Victor.Kedicioglu@alsenviro.com		
Telephone	: 49029200	Telephone	: 61-2-8784 8555		
Facsimile	: 49029299	Facsimile	: 61-2-8784 8500		
Project	: rebatch of ES0703486	Quote number	: SY099/06	Date received	: 4 Apr 2007
Order number	: - Not provided -			Date issued	: 5 Apr 2007
C-O-C number	: - Not provided -			No. of samples	: Received : 4
Site	: - Not provided -			Analysed	: : 4

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NATA Accredited Laboratory 825	Signature Ankit Joshi	Department Inorganics - NATA 825 (10911 - Sydney)
This document is issued in accordance with NATA's accreditation requirements.	This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.	
Accredited for compliance with ISO/IEC 17025.		





Page Number : 2 of 4
Client : ROBERT CARR & ASSOCIATES P/L
Work Order : ES0704333

ALS Environmental

Comments

This report for the ALSE reference ES0704333 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Analytical Results for Samples Submitted
- Surrogate Recovery Data

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In-house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insufficient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QW/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number; LOR = Limit of Reporting. * indicates failed Surrogate Recoveries.



Page Number : 3 of 4
 Client : ROBERT CARR & ASSOCIATES P/L
 Work Order : ES0704333

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID :			
				Sample Matrix Type / Description :	Sample Date / Time :	Sample ID	Sample ID
ED045G: Chloride Discrete analyser	16887-00-6	1.0	mg/L	EVK25 WATER 16 Mar 2007 15:00	EVK40-P1 WATER 16 Mar 2007 15:00	EVK61 WATER 16 Mar 2007 15:00	EVK64 WATER 16 Mar 2007 15:00
Chloride				ES0704333-001	ES0704333-002	ES0704333-003	ES0704333-004
				16.8	226	289	204



ALS Environmental

Page Number : 4 of 4
Client : ROBERT CARR & ASSOCIATES P/L
Work Order : ES0704333

Surrogate Control Limits

- No surrogates present on this report.

ALS Environmental

Report version: COMR 3.02

Frank Ferraro

WSL *Green*

Fadi *4/4/07* *9:30am*

From: Ken Reid
Sent: Tuesday, 3 April 2007 5:08 PM
To: Fadi Soro
Cc: Samples Sydney
Subject: FW: ES0703486

Fadi,

Could you organise for yet another rebatch?

As per below?

Regards,

Ken Reid

Manager

ALS Laboratory Group

Environmental Division

Newcastle, Australia

Phone: +61 2 4968 9433

Mobile: +61 409 745 891

Fax: +61 2 4968 0349

www.alsglobal.com <<http://www.alsglobal.com/>>



From: Matt Clark [<mailto:mattc@rca.com.au>]
Sent: Tuesday, 3 April 2007 4:39 PM
To: Ken Reid
Subject: ES0703486

Ken,

Can the following water samples of the above work order be analysed for chloride please:

- EVK25; (1)
- EVK40-P1; (2)
- EVK61; and (3)
- EVK64. (4)

Looking forward to report on Thursday afternoon as discussed.

Cheers,

Matthew Clark

Environmental Scientist

RCA Australia

Ph: (02) 49 029 214

Fax: (02) 49 029 299

Mobile: 0438 576 324

Email: matto@rca.com.au <<mailto:matto@rca.com.au>>

Visit our website at: www.rca.com.au <<http://www.rca.com.au>>

.....
This e-mail has been swept by mimesweeper
through the ALS North America gateway.
.....



ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client :	ROBERT CARR & ASSOCIATES P/L	Laboratory :	Environmental Division Sydney	Page :	1 of 5
Contact :	MATT CLARK	Contact :	Victor Kedicioglu	Work order :	ES0704333
Address :	P O BOX 175 CARRINGTON NSW AUSTRALIA 2294	Address :	277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No. :	
Project :	rebatch of ES0703486	Quote number :	SY/099/06	Date received :	4 Apr 2007
Order number :	- Not provided -	E-mail :	Victor.Kedicioglu@alsenviro.com	Date issued :	5 Apr 2007
C-O-C number :	- Not provided -	Telephone :	61-2-8784 8555	No. of samples	
Site :	- Not provided -	Facsimile :	61-2-8784 8500	Received	4
E-mail :	mattc@rca.com.au			Analysed	4
Telephone :	49029200				
Facsimile :	49029299				

This Interpretive Quality Control Report was issued on 5 Apr 2007 for the ALS work order reference ES0704333 and supersedes any previous reports with this reference. This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

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ALS Environmental

Page Number : 2 of 5
 Issue Date : 5 Apr 2007

Work Order : ES0704333
 ALS Quote Reference : SY099/06

Client : ROBERT CARR & ASSOCIATES P/L
 Project : rebatch of ES0703488

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: WATER

Method Container / Client Sample ID(s)	Date Sampled		Extraction / Preparation		Analysis	
	Date extracted	Due for extraction	Date analysed	Due for analysis	Pass?	Pass?
ED045G: Chloride by Discrete Analyser Clear Plastic Bottle - Natural EV/K25, EV/K61, <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
EV/K40-P1, EV/K64			5 Apr 2007	13 Apr 2007		Pass
		16 Mar 2007				



Page Number : 3 of 5
 Issue Date : 5 Apr. 2007

Work Order : ES0704333
 ALS Quote Reference : SY/09/06

Client : ROBERT CARR & ASSOCIATES P/L
 Project : rebatch of ES0703486

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Quality Control Sample Type Method	QC	Count Regular	Rate (%)		Quality Control Specification
			Actual	Expected	
Laboratory Duplicates (DUP) ED045G: Chloride by Discrete Analyser	2	15	13.3	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS) ED045G: Chloride by Discrete Analyser	2	15	13.3	10.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB) ED045G: Chloride by Discrete Analyser	1	15	6.7	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS) ED045G: Chloride by Discrete Analyser	1	15	6.7	5.0	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER

Frequency of Quality Control Samples



ALS Environmental

Page Number : 4 of 5
Issue Date : 5 Apr 2007

Work Order : ES0704333
ALS Quote Reference : SY0909/06

Client : ROBERT CARR & ASSOCIATES P/L
Project : rebatch of ES0703486

Interpretive Quality Control Report - Summary of Outliers

Outliers - Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWIEN/38 (in the absence of specific USEPA limits). Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- For all matrices, no RPD recovery outliers occur for the duplicate analysis.
- For all matrices, no method blank result outliers occur.
- For all matrices, no laboratory spike recoveries breaches occur.
- For all matrices, no matrix spike recoveries breaches occur.

Surrogates

- For all matrices, no surrogate recovery outliers occur.

Outliers - Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- No holding time outliers occur.

Outliers - Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- No frequency outliers occur.



Page Number : 5 of 5
Issue Date : 5 Apr 2007

Work Order : ES0704333
ALS Quote Reference : SY08906

Client : ROBERT CARR & ASSOCIATES P/L
Project : rebatch of ES0703486

Method Reference Summary

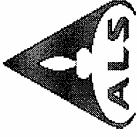
The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Matrix Type: WATER

Analytical Methods

ED045G : Chloride by Discrete Analyser - The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride in the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm. APHA 21st edition seal method 2 017-1-L april 2003

Method Reference Summary



ALS Environmental

QUALITY CONTROL REPORT

Client	: ROBERT CARR & ASSOCIATES P/L	Laboratory	: Environmental Division Sydney	Page	: 1 of 4
Contact	: MATT CLARK	Contact	: Victor Kedicicglu	Work order	: ES0704333
Address	: P O BOX 175 CARRINGTON NSW AUSTRALIA 2294	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No.	:
Project	: rebatch of ES0703486	Quote number	: SY/09/06	Date received	: 4 Apr 2007
Order number	: - Not provided -	E-mail	: victor.kedicicglu@alsenviro.com	Date issued	: 5 Apr 2007
C-O-C number	: - Not provided -	Telephone	: 61-2-8784 8555	No. of samples	:
Site	: - Not provided -	Facsimile	: 61-2-8784 8500	Received	: 4
E-mail	: mattc@rca.com.au			Analysed	: 4
Telephone	: 49029200				
Facsimile	: 49029299				

This final report for the ALSE work order reference ES0704333 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

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This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

NATA Accredited Laboratory - 825



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025

Signatory
Ankit Joshi

Department
Inorganics - NATA 825 (10911 - Sydney)



Page Number : 2 of 4
Issue Date : 5 Apr. 2007

Work Order : ES0704333
ALS Quote Reference : SY099006

Client : ROBERT CARR & ASSOCIATES P/L
Project : rebatch of ES0703486

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term Laboratory Duplicate refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.
 - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference
 • Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QM-EN38 and are dependent on the magnitude of results in comparison to the level of reporting: - Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Matrix Type: WATER

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
ED045G: Chloride Discrete analyser						
ES0704333-001						
ES0704333-001	E1W25	Chloride	1.0 mg/L	16.8	16.1	4.2
ES0704354-001	Anonymous	Chloride	1.0 mg/L	1660	1690	1.4



Page Number : 3 of 4
 Issue Date : 5 Apr 2007

Work Order : ES0704333
 ALS Quote Reference : SY/09/06

Client : ROBERT CARR & ASSOCIATES PIL
 Project : rebatch of ES0703486

ALS Environmental

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEMP specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of Reporting.

Matrix Type: WATER

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits Low	Dynamic Recovery Limits High
ED045G: Chloride Discrete analyser						
ED045G: Chloride Discrete analyser - (QC Lot: 3860095)		mg/L	mg/L	%	%	%
Chloride	1 mg/L	****	250	90.9	83.7	124
	1.0 mg/L	<1.0	****	****	****	****
	1 mg/L	****	50	105	83.7	124



Page Number : 4 of 4
 Issue Date : 5 Apr 2007

Work Order : ES0704333
 ALS Quote Reference : SY099006

Client : ROBERT CARR & ASSOCIATES P/L
 Project : rebatch of ES0703486

Quality Control Report - Matrix Spikes (MS)

The quality control term **Matrix Spike (MS)** refers to an in-laboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per Laboratory Data Quality Objectives (DQOs). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.

* Indicates failed QC

Matrix Type: WATER

Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results		Recovery Limits	
					Sample Result	Spike Recovery MS	Static Limits Low	Static Limits High
ED045G: Chloride Discrete analyser								
ED045G: Chloride Discrete analyser - (QC Lot: 386095)				mg/L	%	%	%	%
Chloride	ES0704333-001	EVK25	1 mg/L	250	16.8	105	70	130

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Appendix 3

Geological Logs of EVK95 and EVK96

Prepared by

Belford Dome Resource Consultants Pty Ltd

(No. of pages excluding this page = 1)

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Exploration bore hole EVK95 was drilled to depth of 115.6m, approximately 5m through the base of the Belmont Coal Seam. **Figure 4** of the main report identifies the location of EVK95 on the Project Site. **Plate 1** is a photograph of the core recovered from EVK95 at a depth of 114.5m below surface. This lithology starts approximately 0.15 metres below the base of the Belmont coal seam.



Plate 1
Core Photo of EVK95 at 114.5m

Exploration bore hole EVK96 was drilled to depth of 64m, approximately 6m through the base of the Belmont Coal Seam. **Figure 4** of the main report identifies the location of EVK96 on the Project Site. **Plate 2** is a photograph of the core recovered from EVK96 at a depth of 61m below surface. This lithology starts approximately 0.20 metres below the base of the Belmont coal seam.

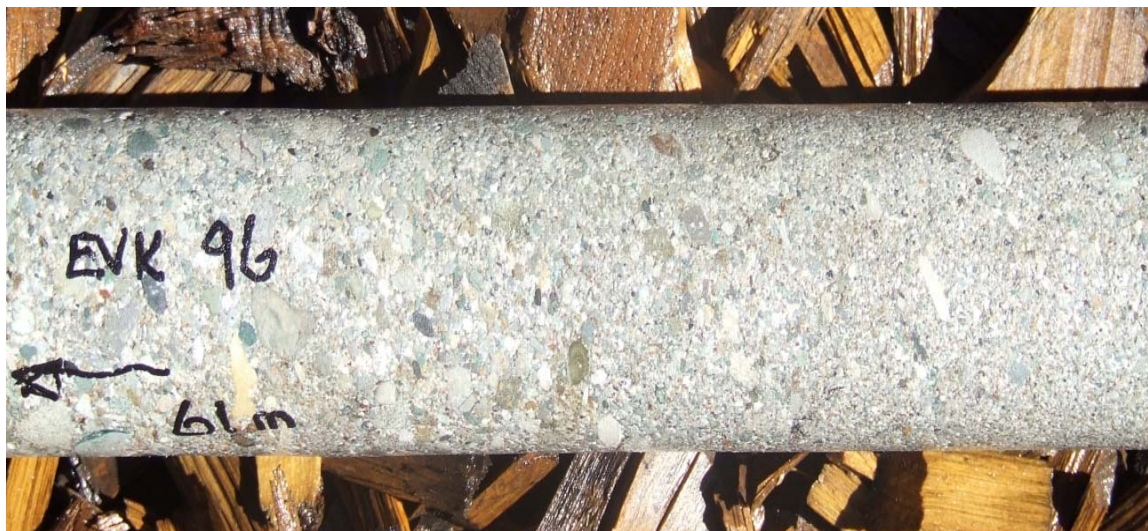


Plate 2
Core Photo of EVK96 at 61m

In both cases the core is described by Jeff Beckett, consultant geologist of Belford Dome Resource Consultants Pty Ltd, as interbedded sandstone, granule and pebble conglomerate with a clay matrix and secondary siderite cement. It is considered totally impermeable with virtually zero porosity due to the secondary cementing in the matrix.

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