

11 November 2008

Mark Mignanelli
Department of Water and Energy
GPO Box 2213
Level 3, 26 Honeysuckle Drive
Newcastle NSW 2309

Dear Mark,

RE: HVO SOUTH COAL PROJECT – RESPONSE TO DWE SUBMISSIONS

The Department of Planning (DoP) has provided Coal & Allied (CNA) with copies of all the Department of Water and Energy's (DWE) submissions regarding the Hunter Valley Operations (HVO) South Coal Project.

The correspondence that has been received from DWE is listed below and provided as Attachment A:

1. DWE letter regarding adequacy review dated 6 November 2007
2. DWE letter regarding public display dated 25 February 2008
3. DWE letter regarding issues from Environmental Assessment (EA) dated 21 April 2008
4. DWE letter to DoP dated 6 June 2008
5. DWE letter regarding continued issues from EA dated 30 July 2008

CNA has attempted to understand and address the concerns raised by the DWE during the preparation of the HVO South Coal Project. The attached Table 1 documents the various meetings and discussions that CNA has undertaken with representatives from DWE, regarding the HVO South Coal Project to assist and respond to DWE's issues.

Throughout this communication process CNA has committed to conducting further studies to assist with obtaining data to better understand the likely hydrogeological conditions that result from opencut mining next to a water course. A summary of these investigative studies and the results that are available at this time are included as Attachment B. We apologise for the extended time that it has taken to provide this information.

The purpose of this letter is to address and consolidate CNA's submissions with respect to the issues raised by DWE in relation to the HVO South Coal Project Part 3A Application.

To understand DWE's concerns CNA has endeavoured to consider all of the NSW water legislation and guidelines that may be relevant to its operations and determine its legal application to HVO's future mining operations. We understand that by virtue of the *Environmental Planning and Assessment Act 1979* not all water legislation and guidelines in NSW apply to Part 3A Project Application. A detailed description of the relevance of the legislation is provided in Attachment C.

This letter only relates to those issues raised by DWE regarding the HVO South Coal Project. Other issues raised by DWE in relation to the application of the water legislation and guidelines do not appear to be specifically related to the HVO South Coal Project and will therefore be responded to as part of the relevant water licensing process for Carrington Pit and North Pit.

Coal & Allied Operations Pty Ltd

ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia

PO Box 315 Singleton NSW 2330 Australia

Telephone +61 2 6570 0300 Facsimile +61 2 6570 0377

In summary, CNA understands that DWE's specific issues with respect to the HVO South Coal Project relate to three key legislative documents which are:

1. The *Hunter Regulated River Water Sharing Plan (HRRWSP) 2004*;
2. The *Draft Stream / Aquifer Guidelines for Management of Stream / Aquifer Systems in Coal Mining Developments April 2005*, that references the 150m buffer zone for mining operations and the Hunter River; and
3. The *Draft Hunter Unregulated River Sharing Plan (HURWSP) 2008*.

It is important to note that all the existing pits with the exception of the Cheshunt (Barry) Pit were consented prior to 2000. Figure 1 identifies these approved opencut pits. This figure also indicates the location of the 150m buffer zone.

The approved opencut pits include:

- Cheshunt Pit – approved in 1998 and in progress; located on the southern side of the Hunter River
- Riverview Pit – approved 1998 and in progress; located on the southern side of Cheshunt Pit
- Cheshunt (Barry) Pit – approved in 2005 and in progress; located on the southern side of the Hunter River
- South Lemington Pit 1 – approved 1999 and in progress; located on the eastern side of Wollombi Brook
- South Lemington Pit 2 – approved 1999 but not yet commenced; located on the western side of Wollombi Brook

CNA recognises the application to the HRRWSP to our future mine expansions. The HVO South Coal Project seeks approval for extensions to the Cheshunt, Riverview Pits and South Lemington Pit 1. Refer to Figure 2 for the proposed extension areas. These extensions will be considered in respect to the HRRWSP. CNA seek to work with DWE to achieve outcomes that are consistent with this plan.

CNA has attempted to document the interpretation of the application of these 3 key documents to the HVO Coal Project Part 3A Application. This information is presented as Attachments D, E and F.

Although the data is not complete CNA believe the studies and investigations conducted to date as outlined above indicate CNA's commitment to work with DWE to resolve any outstanding issues. CNA request the opportunity to meet with DWE to discuss any of the information provided in order to better understand any outstanding issues that DWE believe have not been adequately addressed.

A separate response has been provided to the DoP in relation to the DWE correspondence of 30 July 2008. A copy of this response is provided in Attachment G.

If you have any questions in relation to this letter, please do not hesitate to contact me on (07) 3361 4131 or Anna.McMullen@rtca.riotinto.com.au.

Yours sincerely,



Anna McMullen
Manager – Project Approvals

Enclosed:

Table 1	DWE Communication Register
Figure 1	Approved HVO South Opencut Pits
Figure 2	HVO South Coal Project – Proposed Extension Areas
Attachment A	Copy of DWE correspondence
Attachment B	Overview of Works Related to Hunter Valley Operations – South Coal Project B1 Draft Coal & Allied Operations Pty Ltd Hunter Valley Operations Cheshunt Trial Resistivity Report (2008) B2 Coal & Allied Operations Pty Ltd Hunter Valley Operations Glider Pit Resistivity Report (2006) Figure B1 Installation of data loggers within the monitoring bores (2008) B3 Coffey Preliminary Groundwater Modelling Study Cheshunt Pit HVO South Coal Project (2008)
Attachment C	Applicable NSW Water Legislation, Plans and Guidelines
Attachment D	Application of Hunter Regulated River Water Sharing Plan D1 Summary of legal advice on the application of the Water Sharing Plan on its operations
Attachment E	Application of Draft Stream/Aquifer Guidelines for Management of Stream/Aquifer Systems in Coal Mining Developments
Attachment F	Application of Hunter Unregulated River Water Sharing Plan
Attachment G	CNA Letter of Response to DoP dated 15 September 2008

Table 1 DWE Communication Register

Date	Method of Discussion	Participants	Discussion Topics
11 Apr 2006	Meeting with DWE	DWE RTCA ERM	- HVO South Coal Project overview, background and groundwater assessment approach; - Opportunities for consolidated approach to water management and licensing; - Key DWE issues to be considered; - Collation of groundwater data and information sharing; and - Post closure monitoring
11 Jul 2006	Planning Focus Meeting at HVO Corporate Centre	DoP DWE DPI-MR DECC SSC RTCA ERM	- Presentations describing the HVO South Coal Project - Feedback from agencies - Tour of HVO South area - Request for all agencies prepare a list of issues and matters to be addressed in EA report
5 Sept 2006	Meeting with DWE	DWE - Brian Gardoll, Mark Mignanelli RTCA - Rory Gordon, Anna McMullen, David Mitchell Rio Tinto - Ashley Creighton DPI-MR - Mark Nolan	- ERM groundwater modelling methodology and presentation of Stage 1 Report; - Overview of peer review of modelling comments; and - Interactions with surrounding mines.
22 Mar 2007	Meeting with DoP	DoP DWE DECC DPI-MR RTCA	- HVO South Coal Project update; - Consultation summary; - Proposed management plans; - HVO South Coal Project timing; and - Update on modification to HVO South groundwater modelling approach.
28 Mar 2007	Meeting with DWE	DWE RTCA ERM	- General update on HVO South Coal Project; - Discussion of groundwater modelling results; and - Approach to reporting
3 Oct 2007	Pre-submission meeting at DWE	DWE RTCA ERM DoP DECC	Presentation on HVO South Coal Project preliminary results of environmental assessment;
12 Dec 2007	Meeting with DWE	DWE - Fergus Hancock ERM - Luke Stewart Stefen Chartins RTCA - Ruth Kinal, Anna McMullen	Discussion with DWE to ensure groundwater modelling has covered DWE concerns.
14 Apr 2008	Meeting with DWE	DWE- Fergus Hancock RTCA - Lloyd Townley, Anna McMullen JP Environmental - John Pola	- Overview of HVO South Coal Project groundwater modelling results - Discussion on issues raised in DWE letters Nov 2006 and Feb 2007

Figure 1
Approved HVO South Opencut Pits

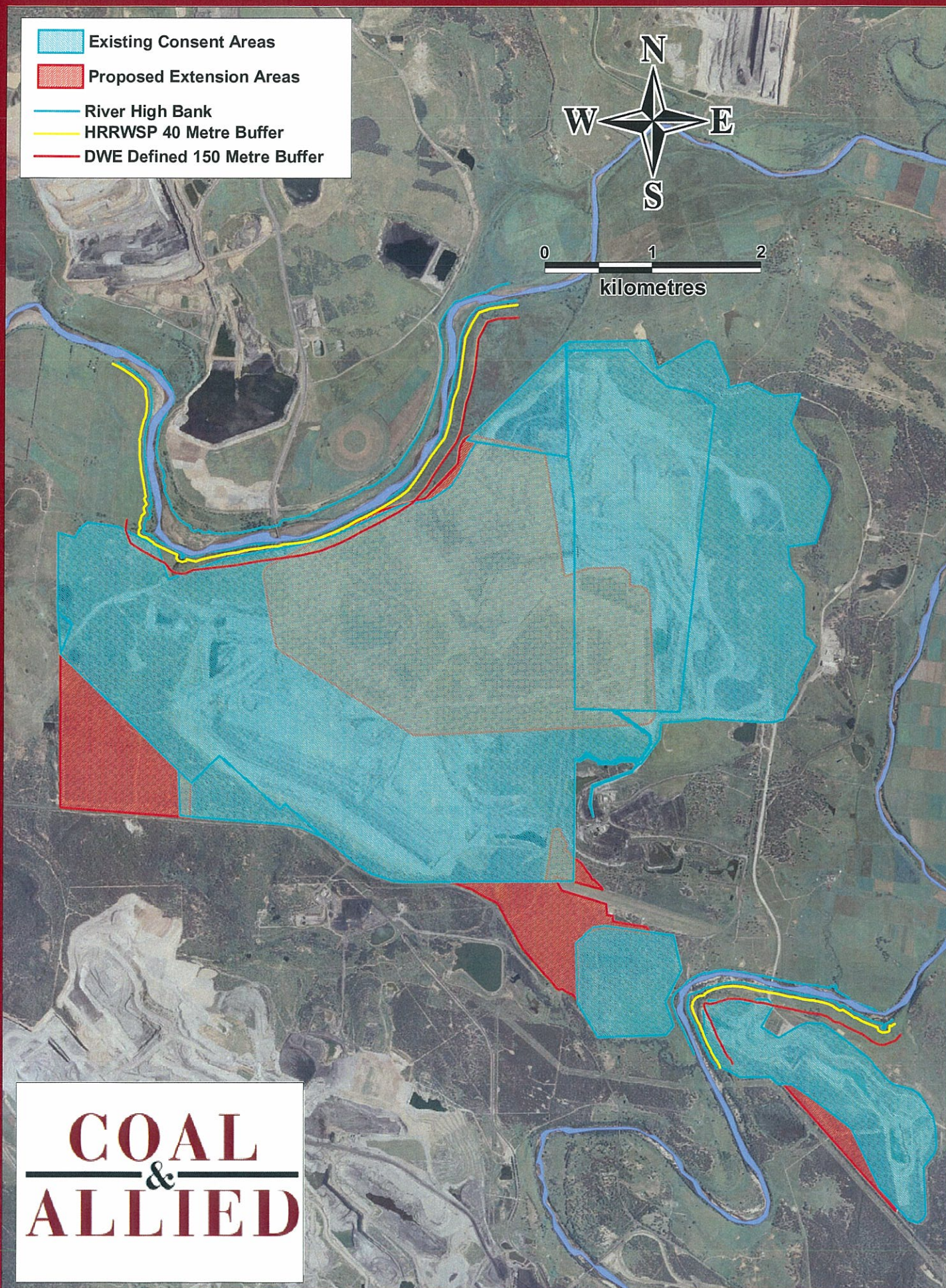
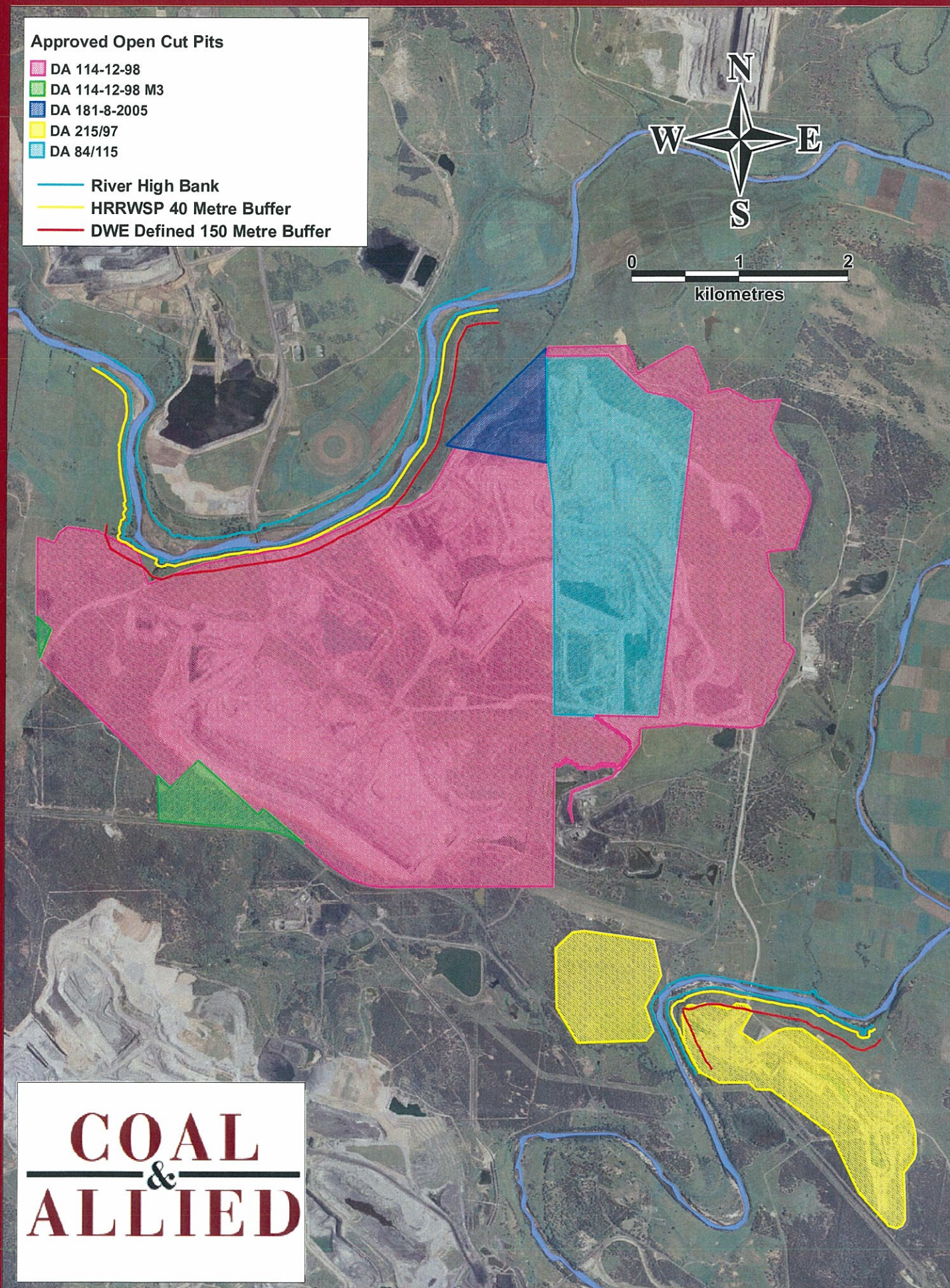


Figure 2
HVO South Coal Project – proposed Extension Areas



Attachment A
Copy of DWE Correspondence



NSW Government

DEPARTMENT OF WATER AND ENERGY

Contact: Fergus Hancock
Phone: (02) 4904 2532
Fax: (02) 4904 2503
Email: Fergus.Hancock@dnr.nsw.gov.au

**Director – Major Development Assessment
Extractive Industries Unit
GPO Box 39
Sydney NSW 2001**

File: HV_Ops_Sth_toa_61107.doc

6 November 2007

Attn. Michael Moore

Dear Mr Moore

**Subject: Test of Adequacy Rio Tinto Coal and Allied Hunter Valley South
extension MP06_0261**

The Department of Water and Energy (DWE) has completed its test of adequacy for the Environmental Assessment (EA) relating to the proposed extension to Rio Tinto Coal and Allied (RTCA) Hunter Valley Operations South.

DWE submitted its requirements for consideration in developing Director General's Requirements (DGR) on 7 August 2006. Within that submission, RTCA was informed of the Hunter Regulated River Water Sharing Plan (HRRWSP). The HRRWSP is a statutory planning instrument in force under the Water Management Act 2000 (WMA), possessing mandatory powers over water access rights throughout the regulated Hunter River system. Although the statutory framework presented in the Environmental Assessment mentions the HRRWSP, it is not considered in the ground or surface water impact section of the EA document. No operating principles or rules under the HRRWSP are considered in the Environmental Assessment. The acceptability of the proposed deepening of the Cheshunt pit, and encroachment within the defined 150 metre minimum setback buffer between the mining operations and the Hunter River has not been adequately assessed, though it was identified as a critical issue in DWE's submission to the Department of Planning. Inadequate justification for reduction in the 150 metre buffer, imposed on RTCA in its 2002 development consent, is presented. In addition, the groundwater impact assessment appears to consider only the loss of contributing basal hard rock seepage to the Hunter River, with no quantification of loss of flow due to seepage loss through fracture zones or along the Bowfield or Warkworth seams.

The EA does not consider potential failure of the 100 metre buffer zone barrier to effectively isolate the mine pit from the Hunter River. Considering the critical nature of the Hunter River as water supply source for environmental share, town water supply, electricity generation, industrial supply, irrigation, stock and domestic and basic rights requirements, the lack of long term impact assessment is not acceptable.

The EA does not consider loss of flow in Wollombi Brook due to open cut and highwall augur mining in terms of existing embargoes on surface and connected alluvial ground waters, under Sections 22BA and 113A of the Water Act 1912 (WA). The EA lacks any discussion or justification for extractive operations under Wollombi Brook, and excavation into the connected

alluvium to Wollombi Brook, nor the consequential impacts on environmental water requirements and other water users.

DWE does not consider the EA complies with Director General's Requirements issued by the Department of Planning on 25 January 2007. Therefore, the EA should not be placed on exhibition until RTCA can provide sufficient assurance that the statutory provisions of the HRRWSP, embargoes in force under the WA, and adequate protection to legal entitlements to regulated river water users, including environmental share of regulated river water is provided.

Yours sincerely



Mark Mignanelli
Manager, Major Projects, Mines Assessment and Planning



NSW Government
Department of Water & Energy

Michael Moore
Senior Environmental Planning Officer
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001

25 February 2008

Dear Michael

Contact: Mark Mignanelli
Phone: 4904 2549
Fax: 4904 2501
Email: mmignanelli@dnr.nsw.gov.au

Our ref: ER6923B
Your ref: S02/02690
File: 9045938-1

Subject: Hunter Valley Operations South Coal Project

Project Application No. 06_0261

Thank you for your letter dated 12 February 2008, notifying that Coal & Allied Operations Pty Ltd, lodged an application and Environmental Assessment (EA) for the Hunter Valley South Coal Project, under Part 3A of the *Environmental Planning and Assessment Act 1979* (EPAA). I understand the EA will be on public exhibition from Friday 15 February until Monday 17 March. The Department of Water and Energy (DWE) intends to review the EA and provide a formal response.

I have attached for your information and records, DWE's Test of Adequacy (ToA) response to this proposal. As you will be aware, based on assessment of the EA referred at the ToA stage, DWE objected to the Department of Planning (DoP) placing the EA on public exhibition.

DWE's objection relates to the lack of justification for the proposal by the applicant, the encroachment of mining activity within an established 150 meter minimum setback buffer, and the inadequate consideration of the potential mining induced impacts to the Hunter Regulated River and its highly connected alluvium. Furthermore, the EA did not consider loss of flow from the Wollombi Brook due to open cut and highwall augur mining, in terms of existing embargoes on surface and highly connected alluvial ground waters.

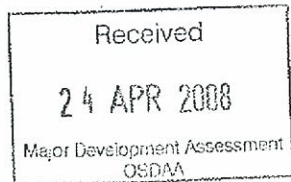
The Hunter River is a primary water supply source for town water supply, electricity generation, industrial supply, irrigation, stock and domestic and basic rights requirements, and environmental share. DWE consider the potential long-term impacts to the Hunter River based on the current Hunter Valley Operations South Coal Project proposal as not acceptable.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'M. Mignanelli', with a stylized, cursive script.

Mark Mignanelli
Manager, major Projects, Mining Assessments and Planning
Water Management Division

Cc: Anna McMullen – Hunter Valley Operations South Coal Project



NSW Government

DEPARTMENT OF WATER AND ENERGY

Contact: Mark Mignanelli
Phone: (02) 4904 2549
Fax: (02) 4904 2503
Email: Mark.Mignanelli@dnr.nsw.gov.au

**Director – Major Development Assessment
Extractive Industries Unit
GPO Box 39
Sydney NSW 2001**

File: HV_Ops_Sth_ER6923B.doc

21 April 2008

Attn. David Kitto

Dear Mr Kitto

Subject: Rio Tinto Coal and Allied Hunter Valley South extension MP06_0261

The Department of Water and Energy (DWE) submitted its objection to the expansion of Rio Tinto Coal and Allied (RTCA) Hunter Valley South extension in response to test of adequacy on 31 October 2007, and re-iterated that objection on 25 February 2008.

DWE cannot accept the conclusions presented in the EA related to predicted impacts upon the Hunter River water source. DWE objects to the proposed encroachment into the existing 150 metre buffer width between RTCA Hunter Valley South operations and the Hunter River regulated water source.

DWE does not consider the EA complies with Director General's Requirements issued by the Department of Planning on 25 January 2007, and is of the opinion that the EA should not have been placed on public exhibition until RTCA satisfactorily addressed the statutory provisions of the Hunter Regulated River Water Sharing Plan, embargoes in force under the Water Act 1912, and protection of the existing legal entitlements for regulated river water users, including basic landholder rights and the environment.

Considering the critical nature of the Hunter River as a primary water supply source for environmental share, town water supply, electricity generation, industrial supply, irrigation, stock and domestic and basic rights requirements, DWE does not consider the risk posed by the extension to the Hunter River acceptable. Furthermore, the EA did not consider the loss of flow from Wollombi Brook due to open cut and highwall augur mining, in terms of existing embargoes on surface and highly connected alluvial groundwaters

Yours sincerely

Mark Mignanelli
Manager, Major Projects, Mines Assessments and Planning



NSW Government

DEPARTMENT OF WATER AND ENERGY

Contact: Mark Mignanelli
Phone: (02) 4904 2549
Fax: (02) 4904 2503
Email: Mark.Mignanelli@dnr.nsw.gov.au

**Director – Major Development Assessment
Extractive Industries Unit
GPO Box 39
Sydney NSW 2001**

File: HV_Ops_Sth_ER6923B_010508.doc

6 June 2008

Attn. Howard Reed

Dear Howard

**Subject: Proposed Rio Tinto Coal and Allied Hunter Valley South extension
MP06_0261**

The Department of Water and Energy (DWE) has completed its review of the Environmental Assessment (EA) and supplementary information relating to the proposed extension to Rio Tinto Coal and Allied (RTCA) Hunter Valley Operations South.

DWE reviewed the groundwater model developed by ERM, which revised the 1998 and 2004 groundwater model developed by Mackie Environmental Research (MER). The 2004 MER model was developed specifically to satisfy DWE that mining within the 150 metre buffer to the Hunter River would not cause unacceptable impacts upon the regulated Hunter River water source, governed under the Hunter Regulated River Water Sharing Plan (HRRWSP). The model was developed as a consequence of the 2002 development consent for Hunter Valley Operations South (Cheshunt) pit, which prohibited mining excavation within the 150 metre buffer zone.

RTCA obtained development consent to extend the Cheshunt and Riverview pits, permitting encroachment into a zone in proximity to the Hunter River in 1998, to which a further area, called "Barry Corner" was added in August 2005. The Department's assessment of the EIS concluded that an unacceptable loss of river flow, and an unacceptable risk of damage to the Hunter River and the near-river groundwater system existed for a barrier of 100 metres between mining operations and the river. The Department requested that the buffer zone be extended to a minimum of 150m, with a development consent condition stating:

"Retain a buffer zone to the mine workings, of a minimum of 150 meters, or less if otherwise agreed by DLWC, from the boundary of the Hunter River system comprising the river banks and adjacent alluvium excepting the area of Hobden Gully".

The groundwater model and assessment developed for the EA presents several scenarios relating to variables such as changes in river height, variations in saturated hydraulic conductivity within each stratum and rainfall/recharge relationships. This attempts to provide a range of outputs from the model, as a result of unknown conditions within the alluvium and hard rock strata underlying the connected alluvium. The number of assumptions which must be incorporated into any modelling exercise result in resulting pit seepage estimates which vary significantly. The resulting connectivity between the mine pit and the regulated river and its

highly connected alluvial groundwater source may be significantly greater and hence have greater impacts than predicted in the EA.

Additional assumptions in the groundwater model include the potential connectivity between coal seams subcropping beneath the connected Hunter River alluvium and the mine pit. As coal seams dip from the north east to south west, highwall seepage along bedding planes and in cleating/fractures in coal seams will report into the mine pit. Should existing fracture networks dilate or propagate further into the highwall barrier, seepage loss from the regulated river system will increase, leading to a permanent, irreversible change in hydraulic and hydrologic conditions extending to the regulated Hunter River. In addition MER's 2004 model recommended further investigation of the area between the 'Barry corner' and the limit of Hobden Gully, where the Mt Arthur seam may be highly weathered and more conducive to seepage loss from the base of alluvium.

RTCA notified DWE that an inadvertent intrusion into the 150 metre buffer zone occurred in January 2007, encountering alluvial groundwater prior to excavation being halted. DWE directed RTCA to halt any further excavation and provide satisfactory evidence that breach of conditions of Water Act licence 20BL170010 had not occurred. The nature of the incident highlights the sensitivity of mining encroachment to the connected Hunter alluvium, the uncertainty of ground conditions within the buffer zone, and

Where a direct, or indirect connection is established between a fully committed water source and mining operations, no mechanism is available to account for loss of account water under statutory water sharing arrangements. All water regulated under the HRRWSP is fully accounted, and cannot be extracted, intercepted or taken by another party except under licence through a nominated work. Statutory compliance action will be taken against parties which breach the operating rules of any proclaimed water sharing plan and compensation to impacted water rights holder will be sought. Considering the variation of water availability within the HRRWSP area under available water determinations, purchase of existing entitlements will not satisfy the rules of the HRRWSP. DWE emphasises under no account may a direct connection between the regulated river and the mining operation be permitted. Indirect connectivity, leading to flow loss from the regulated river, must not exceed background conditions.

DWE notes that inquiries into mining planning and regulatory failures are occurring in Queensland and Victoria, where mining intrusion into riverine corridors has occurred. This has resulted in highwall failure and collapse, surface flow loss and impacts on water users and the environment. The potential for hydrologic-geomechanical coupling is not well understood within the mining industry, but where saturation occurs, planar or defect movement has occurred in New South Wales and may occur where mining proceeds into saturated conditions. This must not be permitted on the Hunter River; DWE notes that the temporary dewatering of the Mt Arthur seam asserted by RTCA occurred at the end of an extended drought period when seepage loss through the cleated coal was at a minimum. RTCA has not presented any evidence regarding groundwater behaviour since June 2007 when rainfall recharge of the Hunter alluvium commenced.

DWE notes RTCA's contention that precedent has been established with regard to mining in close proximity to rivers. An application to license Lemington South pit has not been accepted by DWE due to its proximity to Wollombi Brook and lack of assurance that connectivity would not be established by mining through the Wollombi alluvium. DWE disputes RTCA assertions that embargoes in force under Sections 22BA and 113A of the Water Act 1912 do not apply to the proposal. Loss of minimum low flow in Wollombi Brook must be prevented. DWE does not accept that any assurance may be provided that Wollombi Brook minimum low flows will be protected should mining proceed within agreed setback protection zone, currently set at 150 metres from the banks of or edge of connected alluvium.

Retain a buffer zone to the mine workings, of a minimum of 150 meters from the boundary of the Hunter River system comprising the river banks and adjacent alluvium, excepting the area of Hobden Gully to the mining operation.

In addition, RTCA has not presented collated results from alluvial groundwater monitoring within the connected Hunter River alluvium, nor underlying coal seams, some of which subcrop beneath the alluvium, in spite of requests from DWE. The currently defined setback cannot be tested, nor its adequacy verified until such information is provided. DWE requests that the following conditions be included in the project approval.

1. RTCA must provide annual reporting of alluvial and hard rock buffer groundwater levels, within interpreted drawdown levels resulting from existing and/or ongoing mining operations, including Cheshunt, Riverview Lemington and Lemington South pits, to DWE, with accounting for any drawdown loss of alluvial groundwater or river flows
2. Any induced loss of alluvial groundwater or regulated or unregulated river flows resulting from mining operations must accounted for in accordance with any rules in force under water sharing plans for the Hunter River regulated water source, or Wollombi Brook or other unregulated river or alluvial ground water sources.

If you wish to discuss anything in this correspondence, please contact me on the above number.

Yours sincerely



Mark Mignanelli
Manager, Major Projects, Mines Assessments and Planning



NSW Government

DEPARTMENT OF WATER AND ENERGY

Contact: Fergus Hancock
Phone: (02) 4904 2532
Fax: (02) 4904 2503
Email: Fergus.Hancock@dnr.nsw.gov.au

**Director, Major Projects Assessments
NSW Department of Planning
GPO Box 39
SYDNEY NSW 2001**

File: ER6923B

Attn. David Kitto

30 July 2008

Dear Mr Kitto

Subject: Rio Tinto Coal Australia - Hunter Valley South extension

The Department of Water and Energy (DWE) has reviewed the document provided by Coal and Allied Pty Ltd; "Hunter Valley Operations South Coal Project - Response to Submissions Report" and submits the following response.

The regulated Hunter River is governed under the Hunter Regulated River Water Sharing Plan (HRRWSP). A basic tenet of all water sharing plans across NSW is the prohibition of transfer of water between water sources. In accordance with this policy, the HRRWSP does not recognise the transfer of regulated river water to another water source. It is clear within the response made by Rio Tinto Coal Australia (RTCA), that this basic requirement within the HRRWSP is either not understood or simply at odds with their operational desires.

As noted in the response, RTCA has not demonstrated that current operations in the Hunter Valley Operations South (Riverview-Cheshunt pits) can guarantee isolation of the regulated Hunter River and its alluvium from the mining operation. Despite repeated requests from DWE, RTCA has not submitted monitoring reports or developed response mechanisms to account for surface flow loss, or loss of saturated head in connected alluvium. This consistent inability to provide information and develop response mechanisms as requested, reduces DWE's confidence that interception of surface flow and/or connected alluvial groundwater as a result of mining operations will be appropriately accounted for and reported by RTCA.

In all discussions with RTCA and correspondence to both RTCA and the Department of Planning (DoP), DWE have reiterated the significant risk associated with any reduction of the existing 150 metre buffer zone between the mine pit and the Hunter River. The potential impacts to all water users in Zone 1 of the HRRWSP, which would result from permanent increase of induced seepage flow from the regulated Hunter River water source and connected alluvium into the mine pit, has not been addressed in the RTCA response.

In addition, DWE does not accept the assertion that Lemington South extension is not to be accounted for in the framework of the draft Hunter Unregulated and Alluvial Water Sharing Plan (HUAWSP). DWE has not accepted an application from RTCA to license the existing Lemington South pit, which is intercepting seepage flow loss from Wollombi Brook. DWE has directed RTCA to:

1. fully account for the existing level of flow loss from Wollombi Brook;
2. purchase and transfer existing licensed entitlement to make up for all loss of flow in Wollombi Brook associated with mining operations; and
3. devise prevention mechanisms to isolate the unregulated river and alluvium from the mine pit.

RTCA have not complied with DWE's directions and none of the above information has been provided. DWE refused to countenance extension of the pit closer to Wollombi Brook, which was aligned less than 100 metres from Wollombi Brook in the application. DWE notes that significant differences exist between the Part 5 Water Act application which has not been accepted by DWE and the configuration of mining in the Environmental Assessment. RTCA has not provided any explanation as to the difference between the two.

DWE does not accept that approving the major project application can occur whilst these issues are not resolved and will not support approval for the project whilst continuing to wait for RTCA to provide further information to address its key concerns.

However, in the interest of progressing the overall project DWE suggests that the major project application could be supported if the following conditions are incorporated into the Minister's consent conditions:

1. **No excavation may occur within 150 metres of the Hunter River or its connected alluvium.**
2. **No excavation may occur within 150 metres of the Wollombi Brook or its connected alluvium.**
3. **Rio Tinto Coal Australia must comply with the operating rules of the Hunter Regulated River Water Sharing Plan, and Hunter Unregulated and Alluvium Water Sharing Plan when enacted.**
4. **Rio Tinto Coal Australia must submit an annual report which quantifies volumes of seepage into the mining operations and fully accounts for any and all interception of flow from the Hunter Regulated River and alluvium into mine works, and Wollombi Brook Unregulated River.**
5. **Rio Tinto Coal Australia must develop trigger mechanisms to the satisfaction of DWE, for exceptional reporting related to increased seepage flow into mine works.**
6. **Rio Tinto Coal Australia must present mechanisms to the satisfaction of DWE, which fully isolate the mining operation from the regulated Hunter River, and prevent induced ingress of alluvial groundwater to the mining excavation.**

If you require any clarification of the above, please contact Fergus Hancock on (02) 4904 2532.

Yours faithfully



Mark Mignanelli
Manager Major Projects, Mines Assessments and Planning

**Coal & Allied
Operations Pty Ltd**
Hunter Valley Operations
Cheshunt Trial Resistivity
Report

Groundsearch Australia Pty. Limited

16 June 2008

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DISCLAIMER

The data used in this report were obtained using Advanced Geosciences Sting R1, 56 channel AC resistivity system which was operated by Earth Technology Solutions Pty Ltd. The interpretations given in this report are based on judgement and experience of ETS's personnel. They are provided for Coal & Allied Operations Pty Ltd's sole use in accordance with a specified brief. As such, they do not necessarily address all aspects of ground conditions and behaviour on the subject site. The responsibility of Groundsearch Australia is solely to Coal & Allied Operations Pty Ltd and it is not intended that any third party rely on this report. This report shall not be reproduced either wholly or in part without the written permission of Groundsearch Australia Pty. Limited.

For and on behalf of Groundsearch Australia Pty. Limited

**John
Lea**

Digitally signed by John Lea
DN: cn=John Lea, c=AU,
o=Groundsearch Australia
Pty. Limited,
email=johnlea@groundsearch.com.au
Date: 2008.06.16 14:54:52
+10'00'

John Lea B.Sc. (Hons) MAusIMM (CP) MMICA
Principal Geologist and Director
16 June 2008

Executive Summary

A three stage, surface resistivity imaging survey was completed over a portion of the Cheshunt area during 2006 and 2007 to trial the application of the surface resistivity method to delineate the vertical and horizontal boundaries between alluvial sediments and Permian coal measures.

The Schlumberger Resistivity Array surface resistivity imaging trial has been successfully completed. The inverted subsurface resistivity models have been derived for each profile completed.

No geological feature has been identified in the Barry's Flats area that would act as a hydraulic barrier between the Cheshunt mining area and the Hunter River.

Hydraulic connection might occur via various permeable features such as palaeochannels and structural features in the coal measures.

The water table in the Barry's Flat alluvium are expected to rise away from the Hunter River and flowlines are expected to be in a northeasterly direction.

The groundwater gradients in the Cheshunt mining area are expected to fall in a southwesterly direction due to aquifers' dip direction and aquifer depressurisation resulting from mine dewatering. Therefore, the predominant groundwater flowlines are expected to be in a southwesterly direction.

1.0 Introduction

A surface resistivity survey was carried out using an Advanced Geosciences Sting R1, 56 channel AC resistivity system to investigate the method's ability to investigate the nature of the sedimentary material beneath the Billabong and its surrounding area.

Subsequent modelling of the measured apparent resistivity values was carried out using EarthImager 2D specialist resistivity modelling software, to reconstruct the subsurface resistivity distribution.

2.0 Methodology

The surface resistivity imaging method determines the subsurface resistivity distribution by making measurements at points along the ground surface. From these measurements, true resistivity of the subsurface can be estimated.

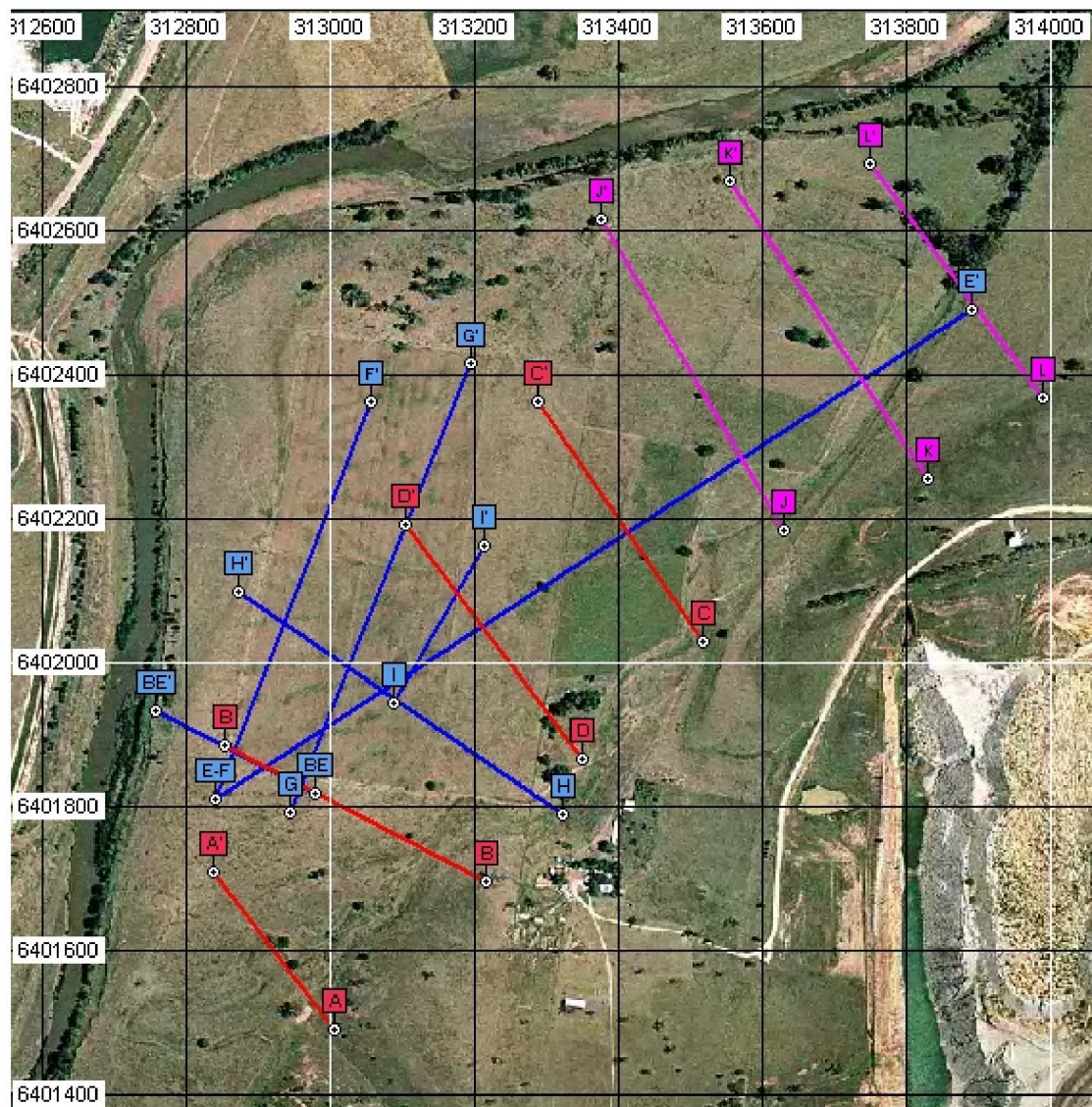
Three resistivity surveys, totaling 12 separate lines and 6,280 metres, were completed and the position of the survey lines shown in Figure 1.

Table 1.

Survey line data

Survey line ID	Start (AMG)	Finish (AMG)	Length (M)
Line A - A'	313000/6401490	312839/6401709	280
Line B - B'	313217/6401695	312854/6401886	520
Line C - C'	313519/6402029	313289/6402362	410
Line D - D'	313351/6401866	313103/6402192	410
Line E - E'	312841/6401811	313892/6402490	1255
Line F - F'	312841/6401811	313058/6402362	540
Line G - G'	312943/6401791	313196/6402417	675
Line H - H'	313324/6401790	313872/6402099	520
Line I - I'	313088/6401943	313215/6402163	260
Line J - J'	313631/6402183	313376/6402615	500
Line K - K'	313829/6402256	313555/6402669	500
Line L - L'	313990/6402368	313750/6402693	410
		Total	6280

Figure 1. Resistivity survey lines locations



Survey pegs were placed at the ends of the resistivity profiles and at a number of intermediate points where a change in slope of the ground surface occurred. Their locations were picked up by a surveyor following completion of the resistivity field work.

Apparent resistivity measurements were made by injecting current into the ground through two current electrodes and measuring the resultant voltage difference at two

potential electrodes using an Advanced Geosciences Sting R1, 56 channel AC resistivity system with Swift smart cable electrode system. Electrodes were deployed at 5m intervals along a linear array, over various lengths per electrode array. The array was “rolled along” to ensure full data coverage for profiles longer than 275m.

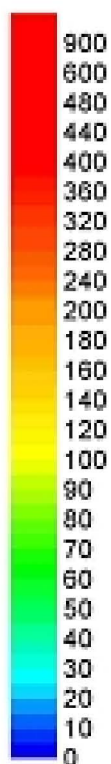
The Schlumberger Resistivity Array was used, which involves the input of current through an outer pair of electrodes, and the measurement of resistance through a second inner pair of electrodes. The electrode separations were expanded to achieve a range of investigation up to a maximum depth of approximately 30m.

3.0 Results

Inversion modelling of the measured apparent resistivity values was carried out using EarthImager 2D specialist resistivity modelling software without assumptions of the resistivity distribution within the subsurface.

The modelled 2-dimensional distribution of earth resistivities beneath each of the resistivity profiles which best fit the field data is shown in following figures.

Resistivity
(ohmm)



The yellow and red zones (100 to >900 ohmm) represent recent alluvial, coarse sands and gravels and, Permian coal measures.

The green-coloured, medium resistivity zones (40 to 95 ohmm) appear to represent relatively coarse sediments such as silts, sands and gravels that will have higher permeability that can provide hydraulic connectivity between mining operations and the Hunter River.

The blue-coloured, low resistivity zones (0 to 30 ohmm) in appear to represent fine-grained, clayey alluvium – low vertical permeability.

It is expected that the water table may rise slightly away from the river. Therefore, the higher resistivity values (red) in the shallow, gravel areas near the river reflect “dry” sediments compared with the lower values for the “moist” clays (blue) in current watercourse – Figure 2.

Figure 2. Interpreted locations of resistivity zones within unconsolidated sediments

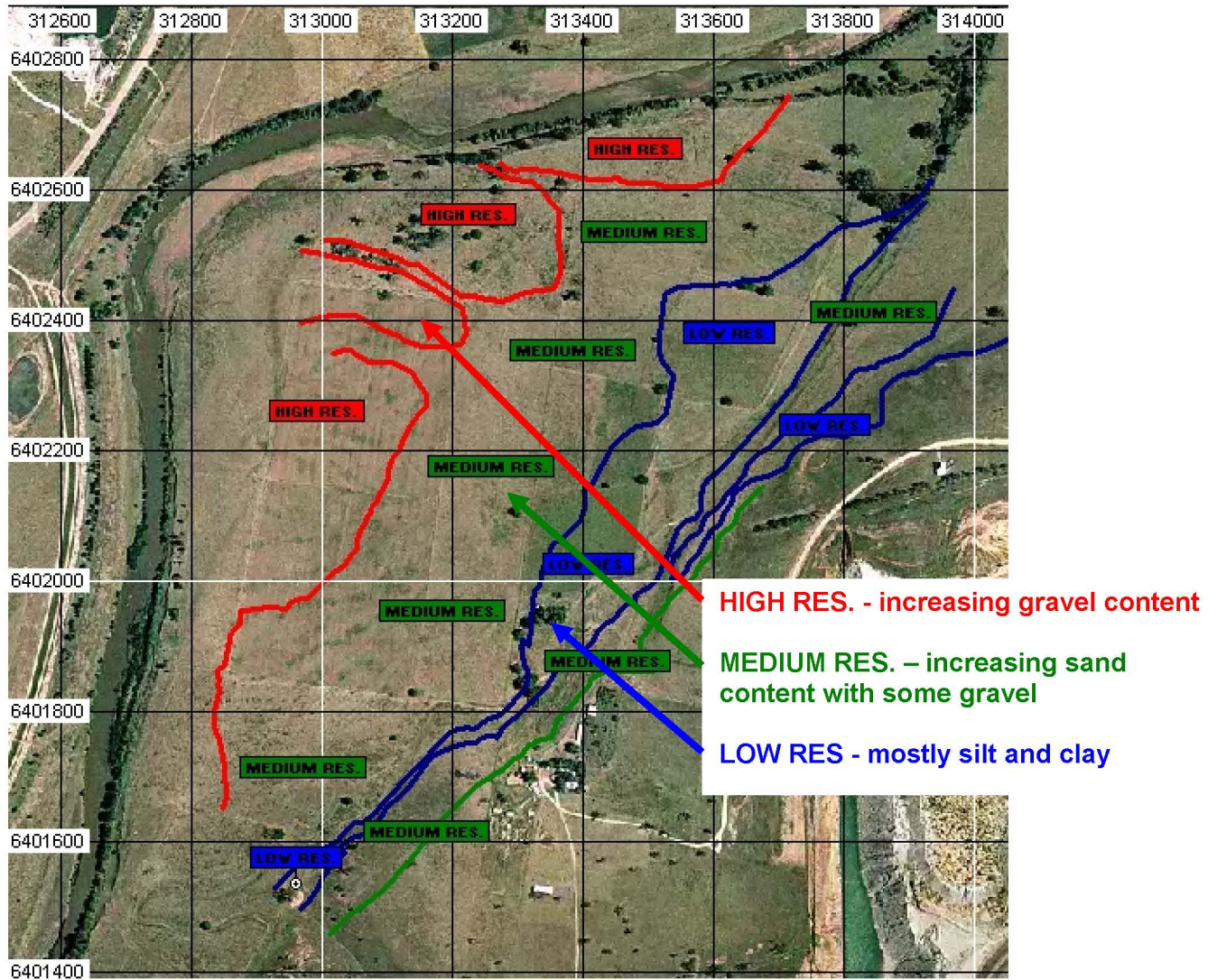
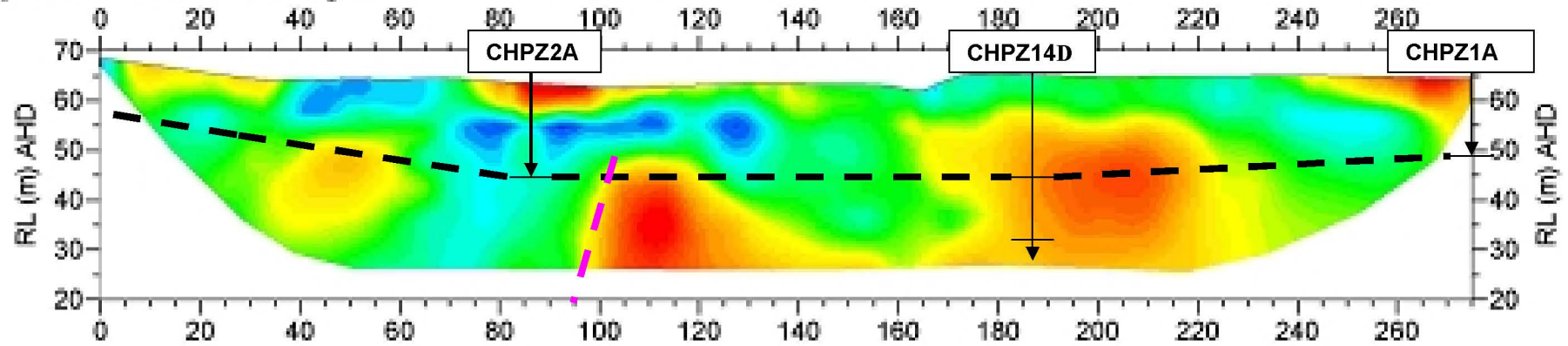


Figure 3. Stage I Line A-A' modelled resistivity profiles

Interpreted Resistivity Model - Line A



Line A-A' trends NW and the data indicate:

- shallow, low permeability zone between 40m and 60m which represents silt and clay within a current watercourse,
- shallow, gravel zone between 70m and 120m which represents a palaeowatercourse,
- shallow, gravel zone between 240m and 275m which represents a palaeowatercourse,
- deep, gravel zone between 160m and 220m
- deep, low resistivity zone between 60m and 140m which may represent clays which might act as an aquitard,
- deep, low resistivity zone between 60m and 90m which may represent a fracture zone or zone of increased weathering
- three large high resistivity anomalies deeper than 15 metres which probably represent Permian coal measures. The dashed line delineates the estimated limit of unconsolidated material.

Three piezometer sites are situated close to or on Line A. Their locations are shown in Figure 2 and geological descriptions are provided in Figure3.

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- CHPZ2A contains unconsolidated materials to 15.50M and the borehole is terminated in the Fairford Claystone,
- CHPZ14D contains unconsolidated materials to 17.80M, interbedded tuff and coal to 27.00M, siltstone to 34.00M. Other coal seams occur from 39.50 to 46.00M,
- CHPZ1A contains unconsolidated materials to 17.00M and the borehole is terminated in the Fairford Claystone.

Figure 4. Line A-A' piezometer geological data

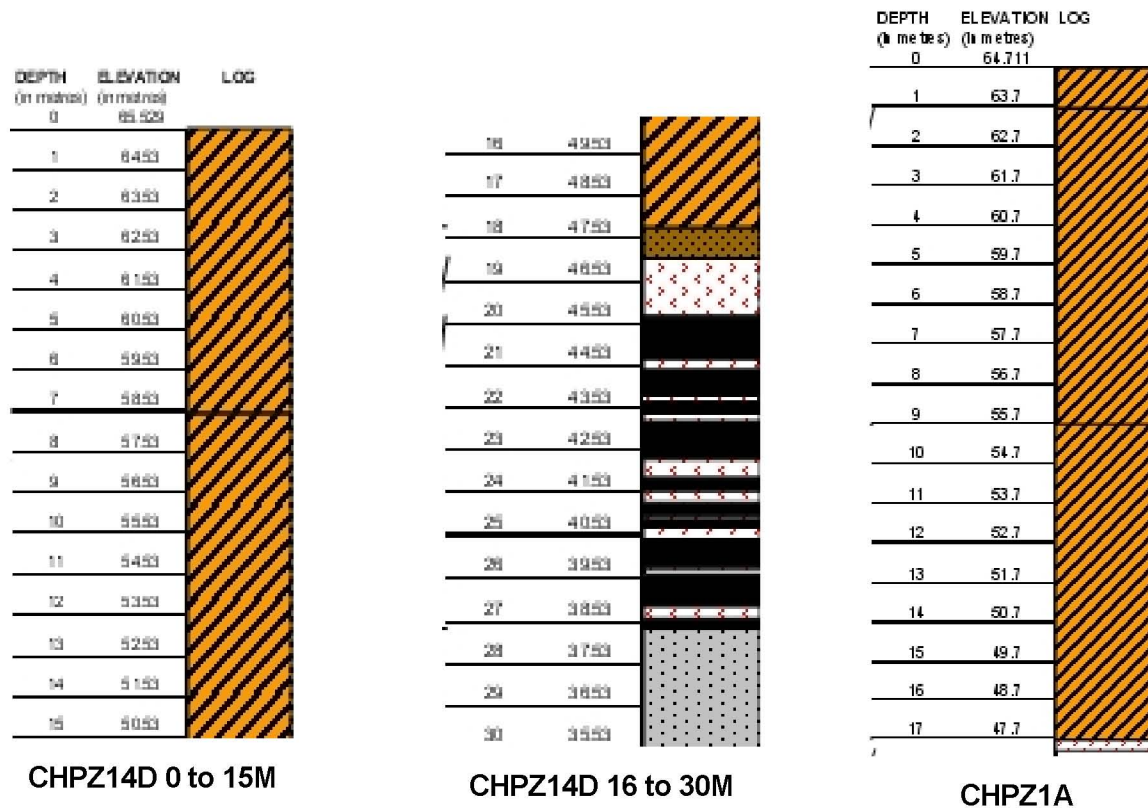
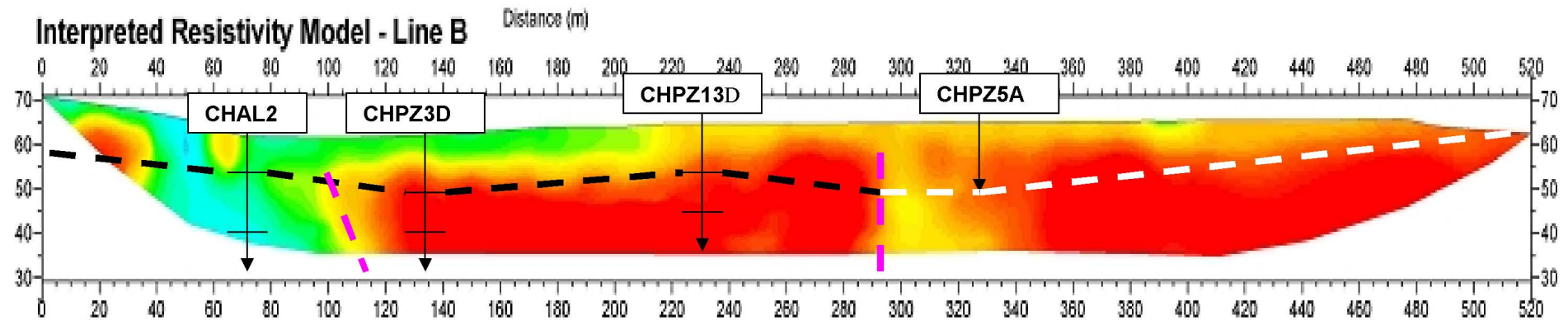


Figure 5. Stage I Line B-B' modelled resistivity profiles



Line B-B' trends NW and the data indicate:

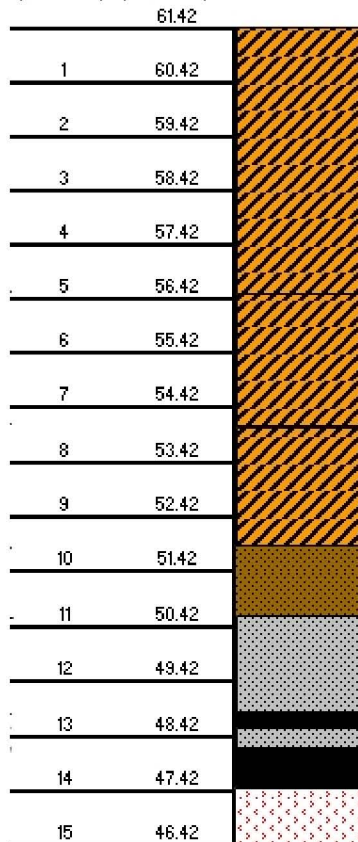
- shallow, low permeability zone between 40m and 60m which represents a current watercourse,
- shallow, silt/sand zone between 70m and 210m,
- shallow coarse sand/gravel zone between 210m and 500m,
- deep, low resistivity zone between 40m and 80m which may represent a fracture zone or zone of increased weathering. Another zone of relatively low resistivity between 290m and 320m
- a large high resistivity zone from 120m and deeper than 15m that probably represent Permian coal measures. The dashed line delineates the estimated limit of unconsolidated material – white section is less certain.

Four drilling sites are situated close to or on Line B. Their locations are shown in Figure 4 and geological descriptions are provided in Figures 5a and 5b.

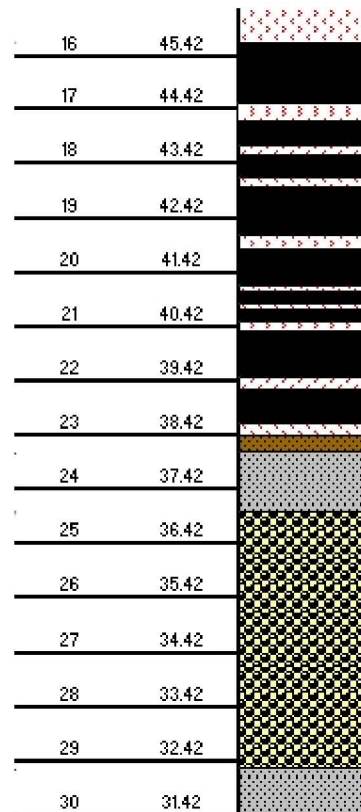
- CHAL2 contains unconsolidated materials to 9.50M, interbedded tuff, siltstone and coal to 22.50M, conglomerate and siltstone to 30.00M. Other coal seams occur from 35.00 to 41.00M,
- CHPZ3D contains unconsolidated materials to 13.00M, interbedded tuff, siltstone and coal to 23.00M, carbonaceous shale, sandstone and siltstone to 30.00M. Other coal seams occur from 32.50 to 42.00M,
- CHPZ13D contains unconsolidated materials to 13.60M, interbedded tuff, siltstone and coal to 23.20M, sandstone and siltstone to 30.00M. Other coal seams occur from 37.20 to 43.30M,
- CHPZ5A contains unconsolidated materials to 15.50M and is terminated in gravel.

Figure 6a. Line B-B' piezometer geological data

DEPTH ELEVATION LOG
(in metres) (in metres)

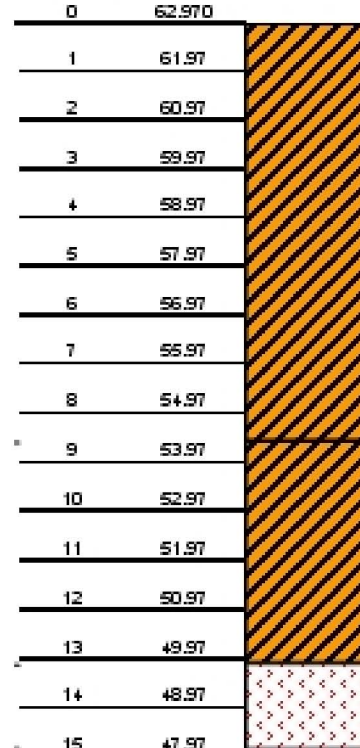


CHAL2 0 to 15M

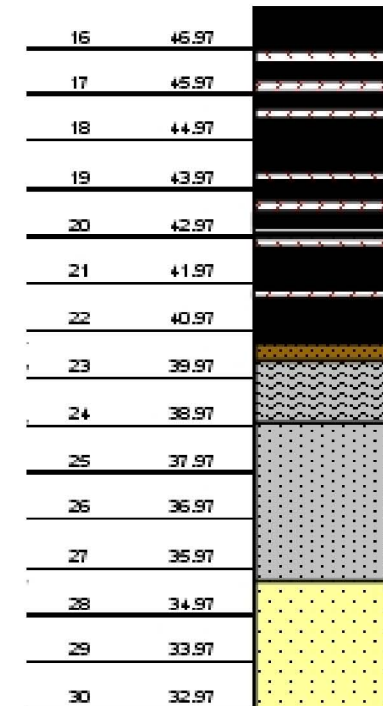


CHAL2 16 to 30M

DEPTH ELEVATION LOG
(in metres) (in metres)



CHPZ3D 0 to 15M



CHPZ3D 16 to 30M

Figure 6b. Line B-B' piezometer geological data

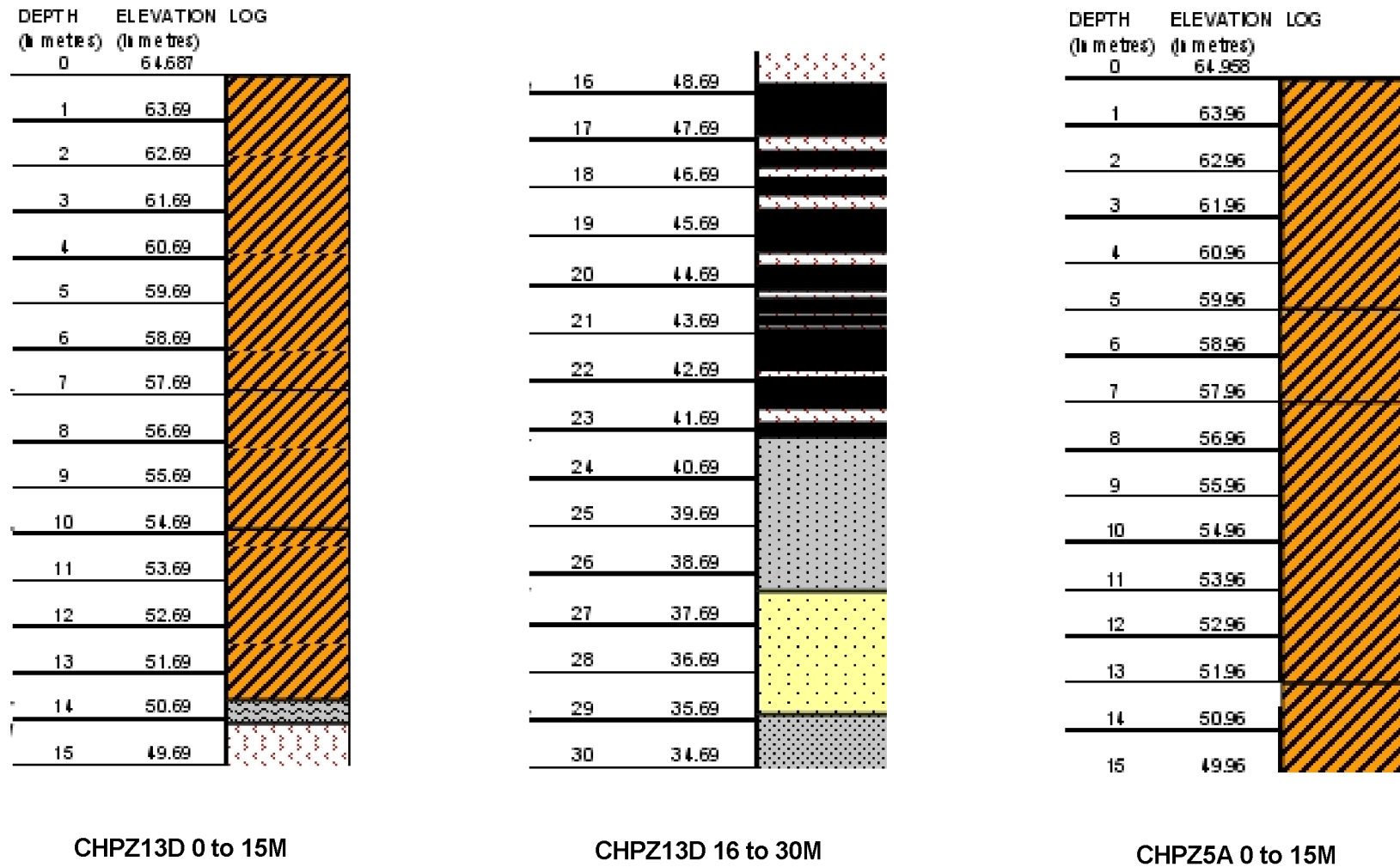
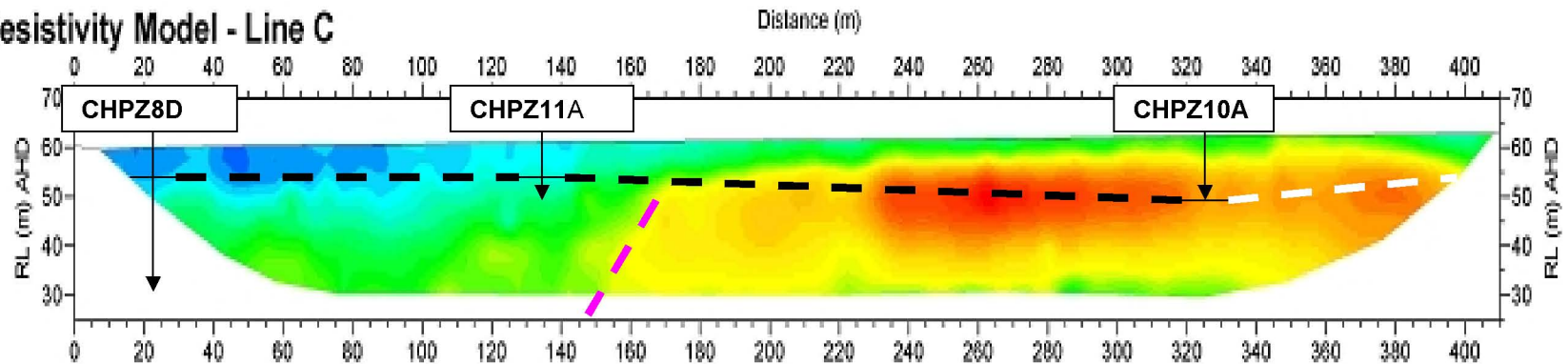


Figure 7. Stage I Line C-C' modelled resistivity profiles

Interpreted Resistivity Model - Line C



Line C-C' trends and the data indicate:

- shallow (<10m), low permeability zone between 0 and 145m which represents clayey soil associated with a current watercourse,
- green-coloured, medium resistivity zones (40 to 95 ohmm) may represent coarser sediments such as sands or increased weathering within the rock, underlying the low permeability zone between 0 and 145m,
- a high resistivity zone from 150m to the end of Line C that lies beneath a shallow medium resistivity zone. This region probably comprises sand and gravel over coal. The dashed line delineates the estimated limit of unconsolidated material – white section is less certain.

Three drilling sites are situated close to or on Line B. Their locations are shown in Figure 6 and geological descriptions are provided in Figure 7.

- CHPZ8D contains unconsolidated materials to 7.90M, coal and tuff to 9.00M, sandstone and siltstone to 19.00M. Other coal seams occur from 19.00 to 30.40M,
- CHPZ11A contains unconsolidated materials to 10.00M and tuff to a TD of 12.00M,
- CHPZ10A contains unconsolidated materials to 12.80M and coal to a TD of 13.00M.

Figure 8. Line C-C' piezometer geological data

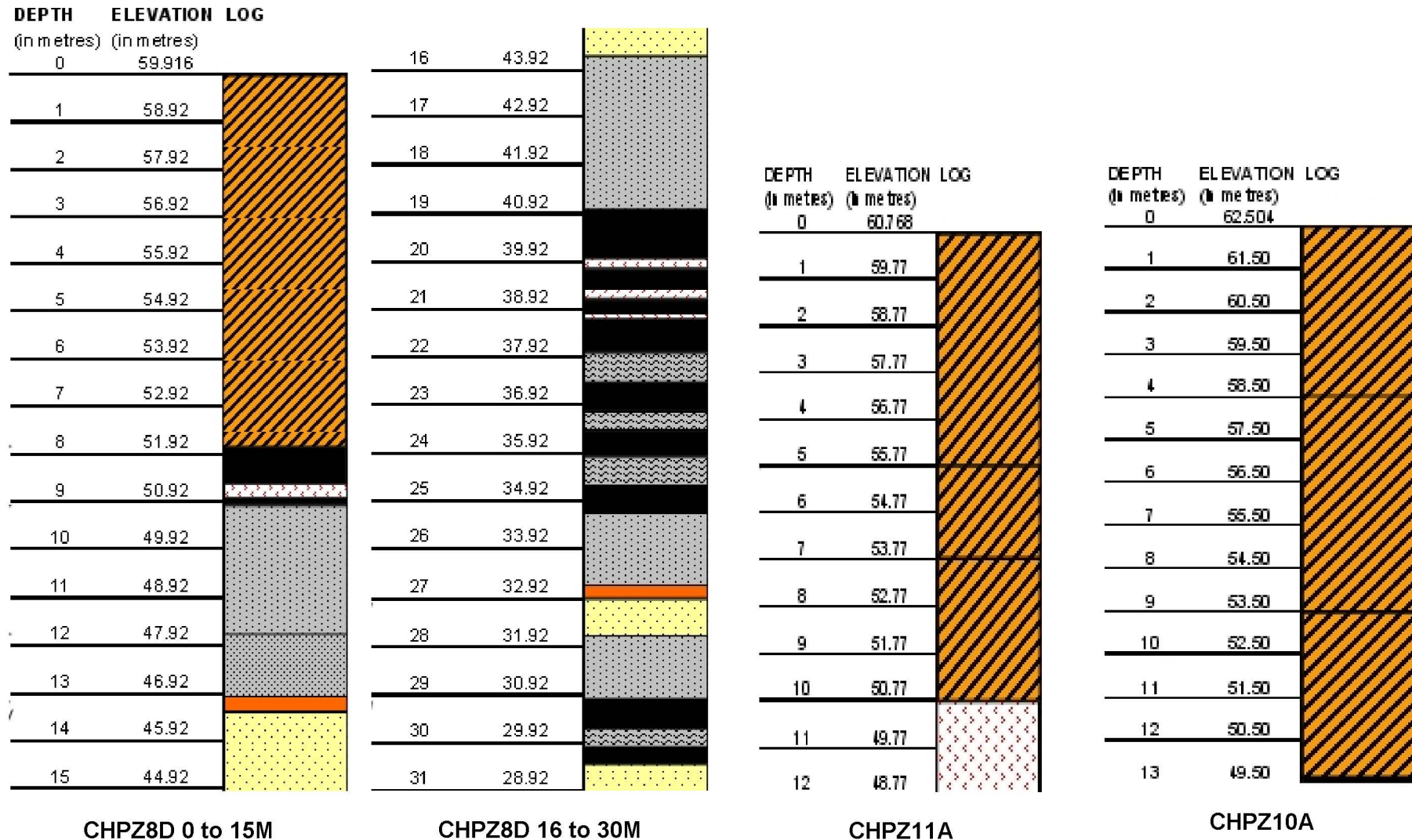
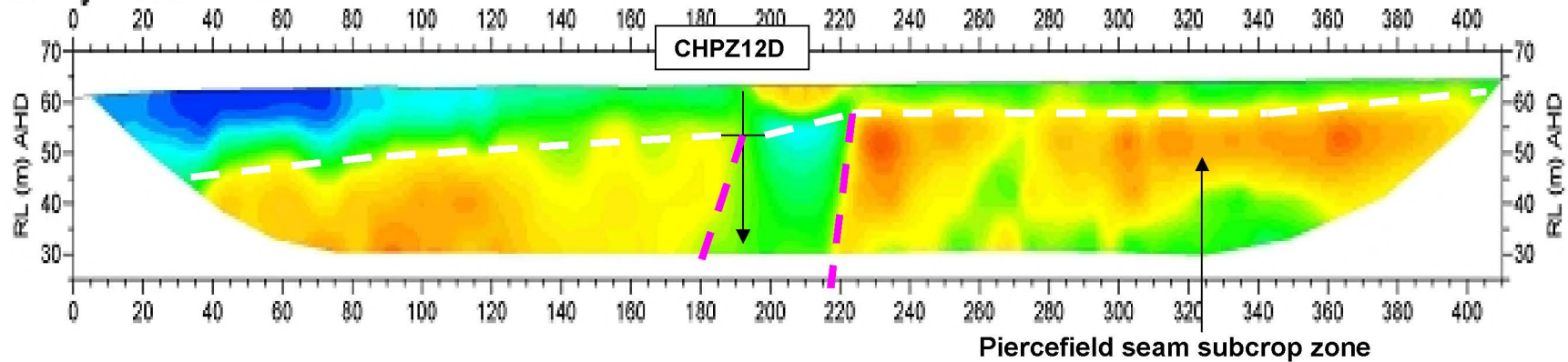


Figure 9. Stage I Line D-D' modelled resistivity profiles

Interpreted Resistivity Model - Line D



Line D-D' trends approximately NW and the data indicate:

- shallow, low permeability zone between 0 and 120m which represents clayey soil associated with a current watercourse,
- medium resistivity zones (40 to 95 ohmm) appear to represent coarser sediments such as sands, underlying the low permeability zone between 0 and 120m. It forms a shallow thin veneer from 120 to 195m and from 225m to end of Line D. An anomalous high resistivity zone of coarse sand/gravel occurs between 185 and 225m,
- a high resistivity zone from 30m to 185m underlying the medium resistivity zone. It possible comprises gravel over coal measures. The dashed line delineates the estimated limit of unconsolidated material,
- deep, low resistivity zone between 185m and 220m may represent a fracture zone or zone of increased weathering
- Piercefield seam subcrop zone between 220m and the end of the line.

One drilling site is situated close to or on Line D. Its location is shown in Figure 8 and geological descriptions are provided in Figure 9.

- CHPZ12D contains unconsolidated materials to 7.90M, coal and tuff to 9.00M, sandstone and siltstone to 19.00M. Other coal seams occur from 19.00 to 30.40M.

Figure 10. Line D-D' piezometer geological data

DEPTH ELEVATION LOG
(in metres) (in metres)

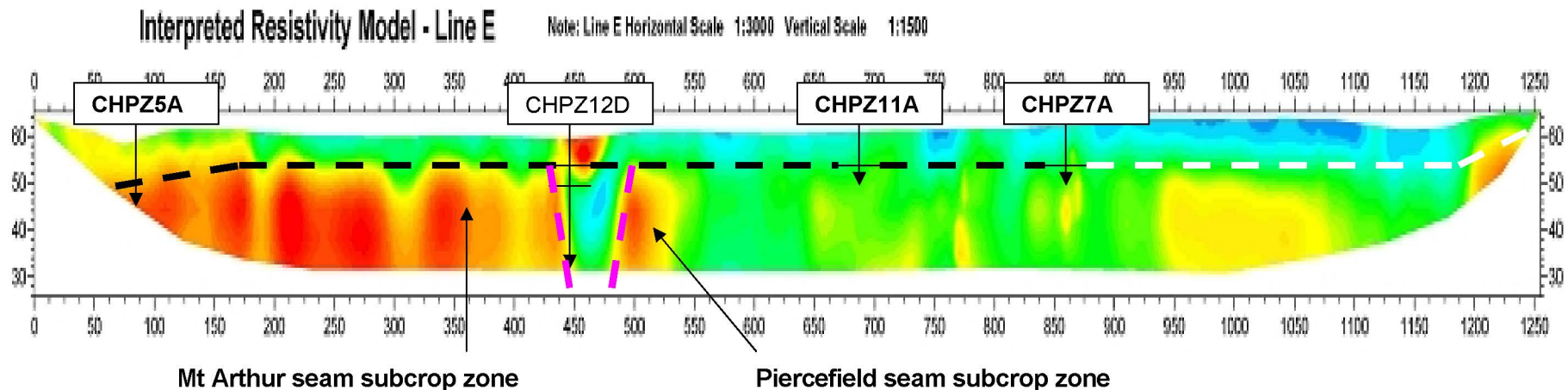
0	63.235	
1	62.24	
2	61.24	
3	60.24	
4	59.24	
5	58.24	
6	57.24	
7	56.24	
8	55.24	
9	54.24	
10	53.24	
11	52.24	
12	51.24	
13	50.24	
14	49.24	
15	48.24	

CHPZ12D 0 to 15M

16	47.24	
17	46.24	
18	45.24	
19	44.24	
20	43.24	
21	42.24	
22	41.24	
23	40.24	
24	39.24	
25	38.24	
26	37.24	
27	36.24	
28	35.24	
29	34.24	
30	33.24	
31	32.24	

CHPZ12D 16 to 30M

Figure11. Stage II Line E-E' modelled resistivity profiles



Line E-E' trends approximately NNE, it is perpendicular to strike and the data indicate:

- shallow, low permeability zone between 500m and 1175m which represents clayey soil,
- medium resistivity zones (40 to 95 ohmm) appear to represent coarser sediments such as sands, underlying a shallow low permeability zone of silt/ clay between 100m and 425m.
- thin, deep, sub-vertical, anomalous low resistivity zone occurs between 430m and 500m may represent a fracture zone or zone of increased weathering beneath a shallow high resistivity zone of coarse sand/gravel,
- deep high resistivity zone from 30m to 430m possibly comprises gravel over coal measures. The dashed line delineates the estimated limit of unconsolidated material – white section is less certain,
- Mt Arthur seam subcrop zone at approximately 350m.
- Piercefield seam subcrop zone between 500m and 550m.

Four drilling sites are situated close to or on Line E-E'. The locations are shown in Figure 10 and geological descriptions are provided in Figure 11.

- CHPZ5A contains unconsolidated materials to 15.50M and is terminated in gravel,

- CHPZ12D contains unconsolidated materials to 7.90M, coal and tuff to 9.00M, sandstone and siltstone to 19.00M. Other coal seams occur from 19.00 to 30.40M,
- CHPZ11A contains unconsolidated materials to 10.00M and tuff to a TD of 12.00M,
- CHPZ7A contains unconsolidated materials to 11.00M and siltstone to a TD of 11.30M.

Figure 12. Line E-E' piezometer geological data

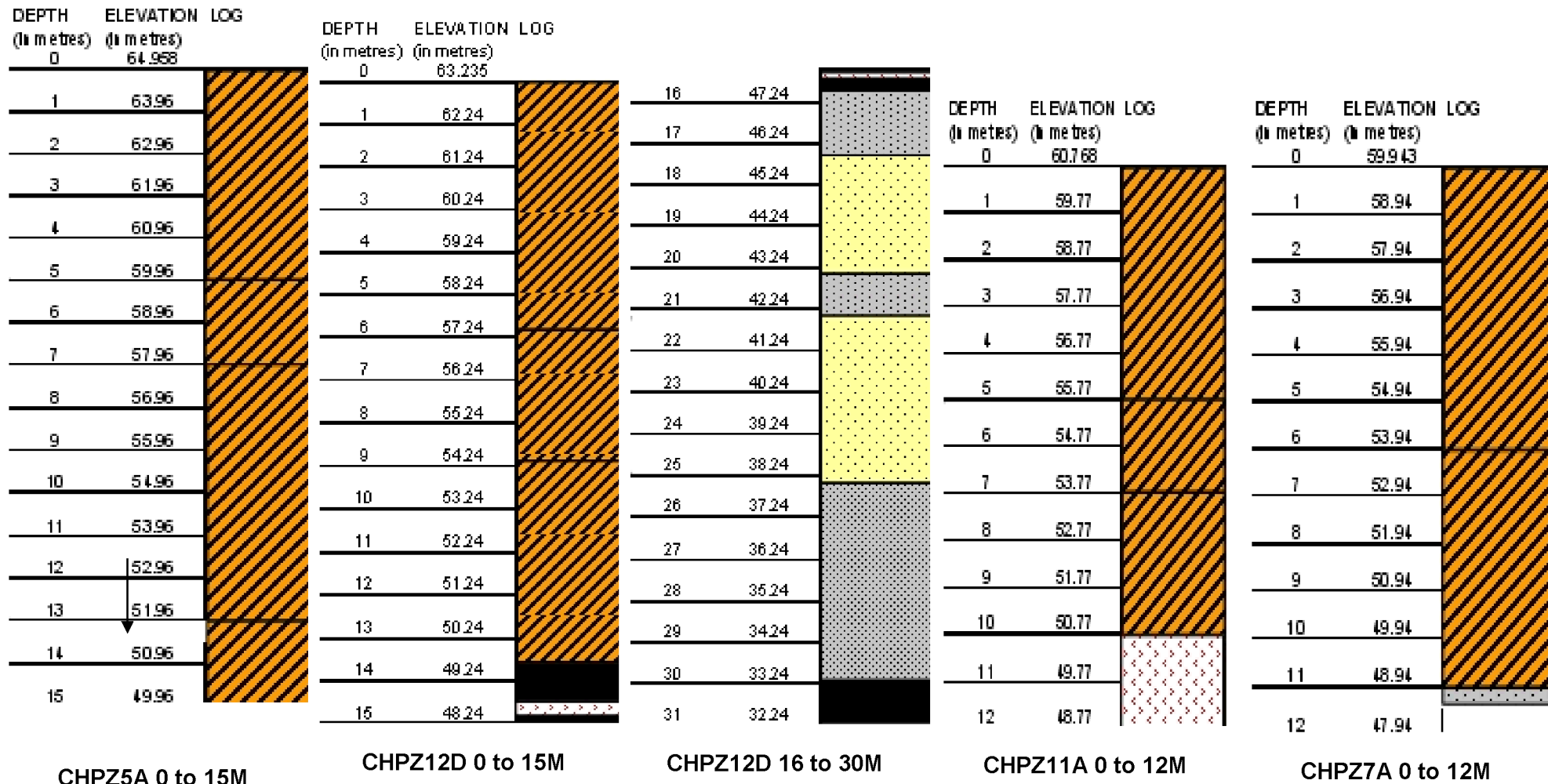
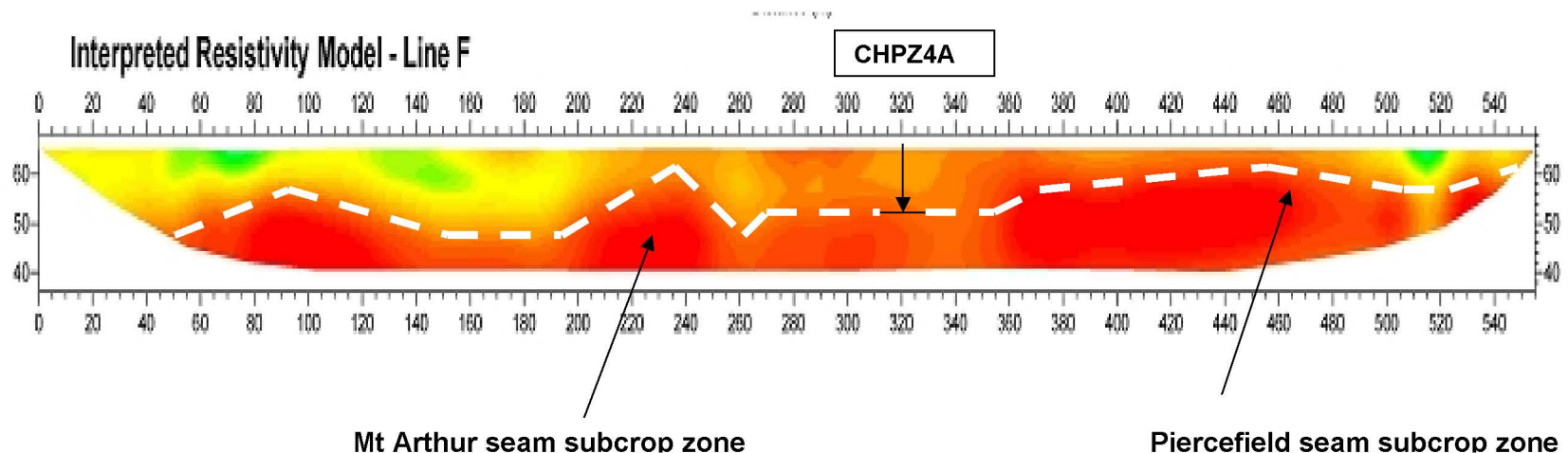


Figure 13. Stage II Line F-F' modelled resistivity profile



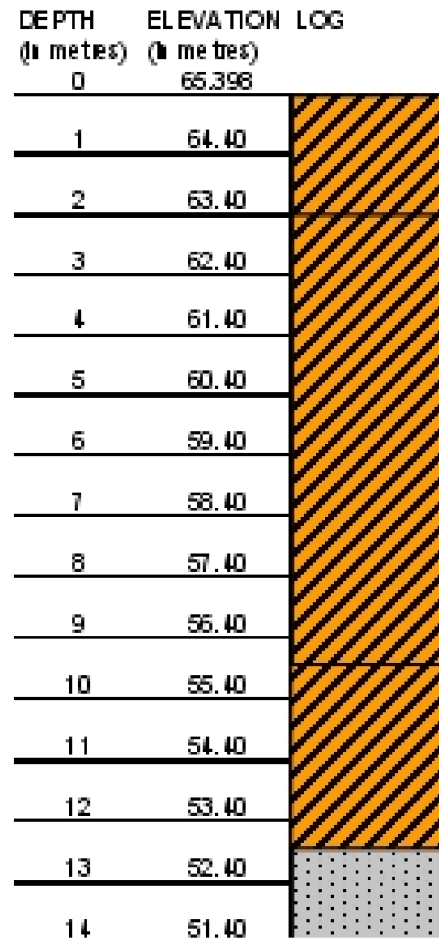
Line F-F' trends approximately NNE and the data indicate:

- three shallow isolated, green-coloured, medium resistivity zones (40 to 95 ohmm) between 50m to 85m, 120m to 160m, and 505m to 525m. These appear to represent palaeochannels comprising sediments such as silts and sands. The remainder of the shallow/near surface is of higher resistivity indicating coarse sand and gravel.
- a high resistivity zone from approximately 30m to the end of the line possibly comprises gravel over coal measures. The dashed line delineates the estimated limit of unconsolidated material – white section is less certain,
- Piercefield coal seam subcrop from 200m to 240m,
- Mt Arthur coal seam subcrop from 360m to 460m.

One drilling site is situated close to or on Line F-F'. Its location is shown in Figure 12 and geological descriptions are provided in Figure 13.

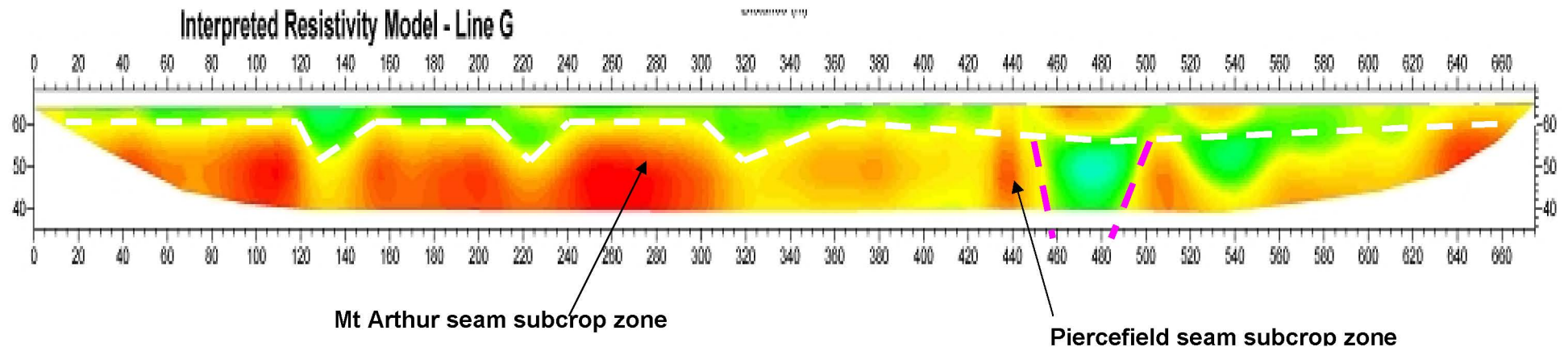
- CHPZ4A contains unconsolidated materials to 12.40M and siltstone to 14.00M.

Figure 14. Line F-F' piezometer geological data



CHPZ4A 0 to 14M

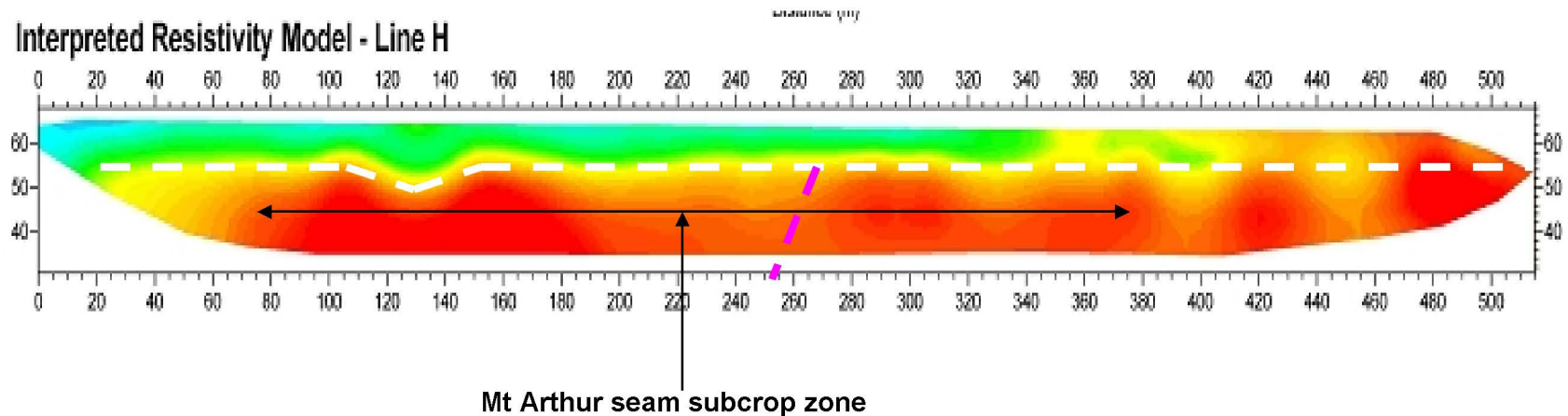
Figure 15. Stage II Line G-G' modelled resistivity profile



Line G-G' is sub-parallel to Line F-F' trends approximately NNE and the data indicate:

- Shallow, green-coloured, medium resistivity zones (40 to 95 ohmm) between 0m and 430m, and 550m and 620m, indicative of silt and sand,
- Shallow high resistivity zones from 430m to 550m and from 620m to end of line. These appear to be sand/gravel sediments associated with palaeochannels,
- A deeper, blue and green-coloured, low to medium resistivity anomaly (40 to 95 ohmm) between 450m and 490m which may represent a fracture zone or zone of increased weathering . This feature does not appear in Line F-F',
- Mt Arthur coal seam subcrop from 240m to 300m,
- Piercefield coal seam subcrop from 420m to 440m.

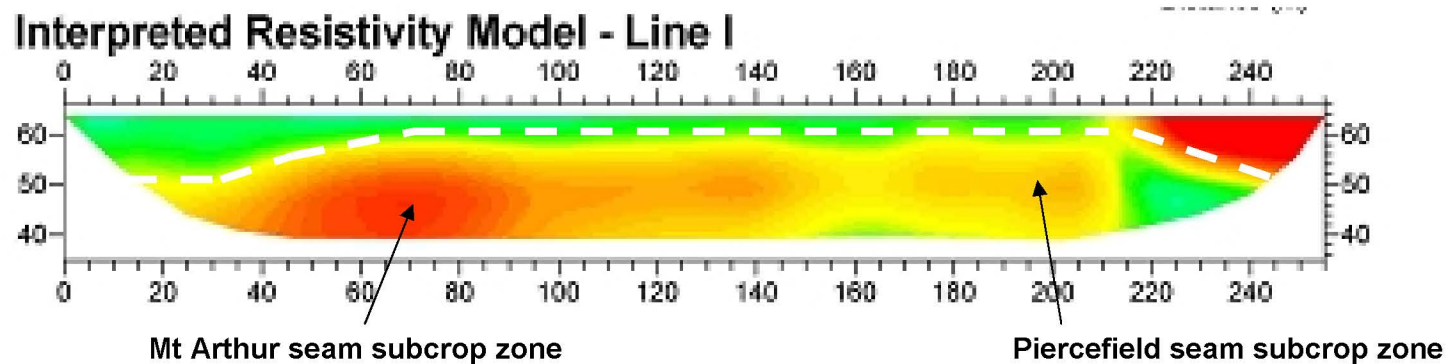
Figure 16. Stage II Line H-H' modelled resistivity profile



Line H-H' trends approximately NNW and the data indicate:

- Shallow, blue and green-coloured, low to medium resistivity anomaly (40 to 95 ohmm) between 0 and 380m. It indicates a layer of recent clayey and sandy sediments overlying Permian coal measures,
- Shallow high resistivity zone from 380m to end of line indicative of sand/gravel
- Mt Arthur seam subcrop zones between 80 and 380M.

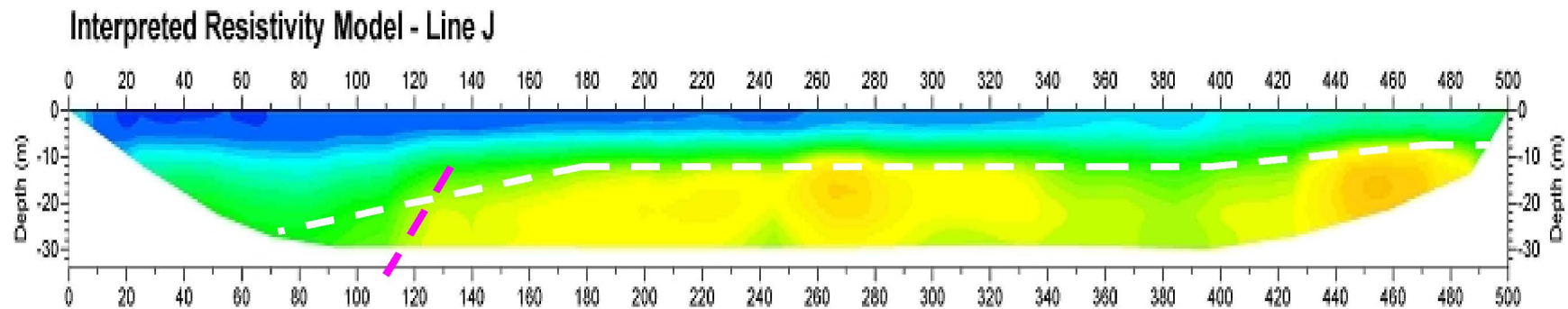
Figure 17. Stage II Line I-I' modelled resistivity profile



Line I-I' trends approximately NNE and the data indicate:

- Shallow, green-coloured, medium resistivity zone (40 to 95 ohmm) between 0 and 210m. It indicates a veneer of recent clayey and sandy sediments overlying Permian coal measures,
- Mt Arthur seam subcrop zones between 40m and 90m,
- Piercefield seam subcrop zone between 180m and 200m,
- High resistivity anomaly from 210m to the end of the line which could represent a gravel-filled palaeochannel.

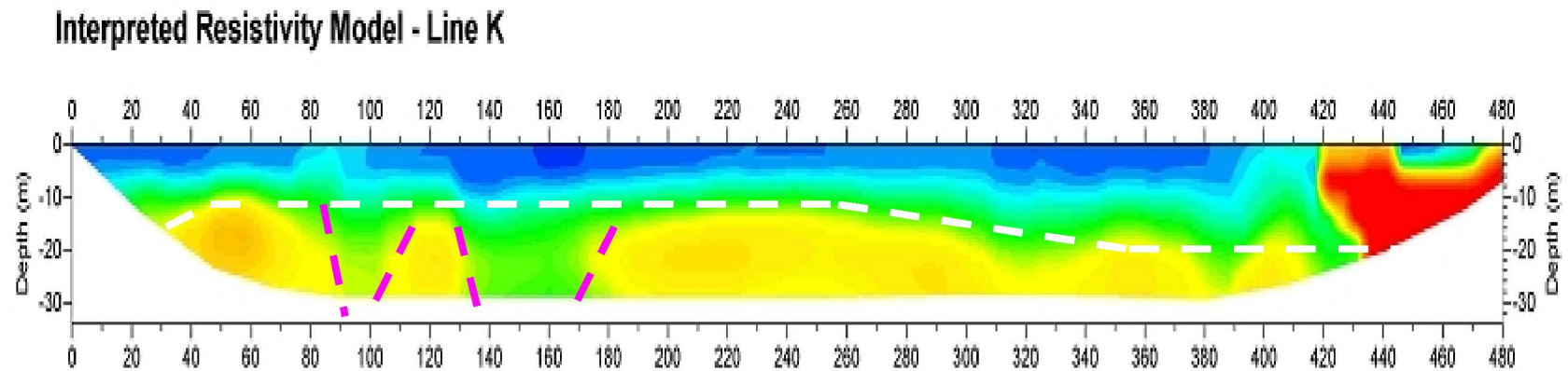
Figure 18. Stage III Line J-J' modelled resistivity profile



Line J-J' trends approximately NW and the data indicate:

- Shallow, blue-coloured, low resistivity zone (40 to 95 ohmm) between 0 and 390m. It indicates a veneer of recent clay overlying medium resistivity silty/sandy sediments,
- Permian coal measures from 115m to the end of the line.

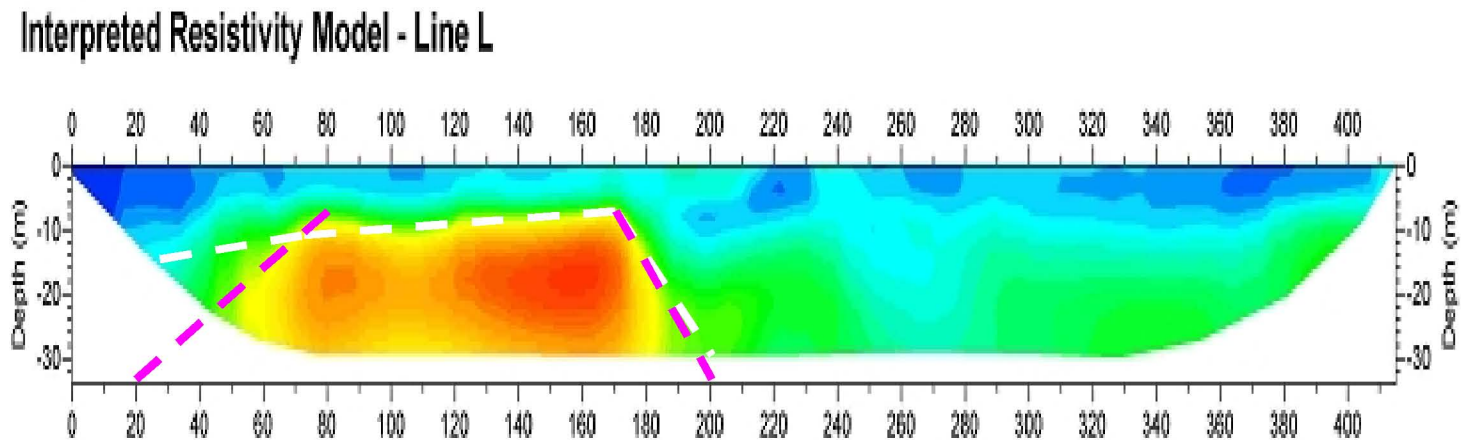
Figure 19. Stage III Line K-K' modelled resistivity profile



Line K-K' trends approximately NW and the data indicate:

- Shallow, blue-coloured, low resistivity zone (40 to 95 ohmm) between 0 and 420m. It indicates a veneer of recent clayey overlying medium resistivity sandy sediments,
- Permian coal measures from 115m to the end of the line,
- High resistivity anomaly from 420m to the end of the line which could represent a gravel-filled palaeochannel.

Figure 20. Stage III Line L- L' modelled resistivity profile



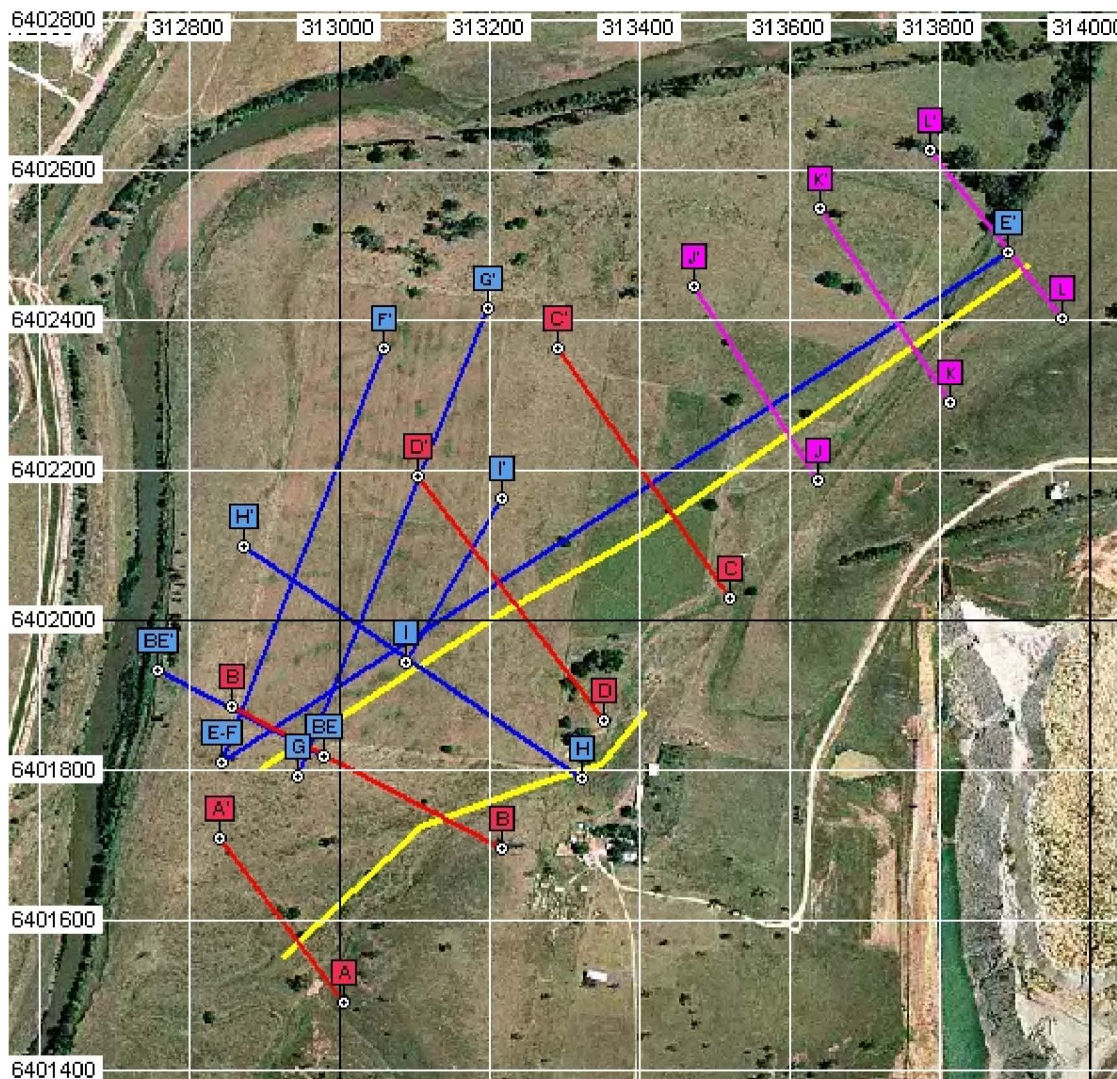
Line L-L' trends approximately NW and the data indicate:

- Shallow, blue-coloured, low resistivity zone (40 to 95 ohmm) along the entire line, indicating a veneer of recent clays overlying medium resistivity silty/sandy sediments,
- Permian coal measures from 45m to 180m,
- Thick, recent fine to medium-grained sediments from 200m to the end of the line.

Two major subsurface structural zones are evident in the profiles as deep, high resistivity zones situated within the Permian coal measures. They are aligned approximately parallel to the Permian coal measures dip direction. Figure 21 shows their location and the features are identified as solid yellow lines and as magenta dashed lines on line profiles.

The zones probably extend to the Hunter River and could act as higher permeability, hydraulic conduits for northeasterly groundwater movement across the southeastern portion of the Barry's Flats area.

Figure 21. Survey lines and location of major subsurface structural zones



4.0 CONCLUSIONS

The surface resistivity imaging survey has been successfully completed with inverted subsurface resistivity models derived for each data line.

The limits of interpreted, shallow low, medium and high resistivity zones projected onto the current topographic surface - Figure 2.

The data indicate:

- increases in the energy of the depositional environment during the pro-grading episodes of the Hunter River in a northwesterly direction with time. The higher resistivity values (red) in the shallow, gravel areas near the river reflect “dry” sediments in increased volumes of coarse sands, and,
- “moist” clays (blue lower values) in current watercourse in the southeast of the Barry’s Flat area.

No geological feature has been identified in the Barry’s Flats area that would act as a hydraulic barrier between the Cheshunt mining area and the Hunter River.

However, hydraulic connection can occur via:

- surface flow,
- recent, medium and high permeability alluvial sediments,
- permeable Permian, coal seam subcrop zones,
- secondary permeability features in Permian rocks, including faults and associated jointing.

The groundwater gradients in the Barry’s Flat alluvium are expected to rise away from the Hunter River and flowlines are expected to be in a northeasterly direction.

The groundwater gradients in the Cheshunt mining area are expected to decrease in a southwesterly direction due to aquifers’ dip direction and aquifer depressurisation resulting from mine dewatering. Therefore, the predominant groundwater flowlines are expected to be in a southwesterly direction.

**Coal & Allied
Operations Pty Ltd
Hunter Valley Operations
Glider Pit Resistivity
Survey Report**

Groundsearch Australia Pty. Limited

3 November 2006

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DISCLAIMER

The data used in this report were obtained using Advanced Geosciences Sting R1, 56 channel AC resistivity system which was operated by Earth Technology Solutions Pty Ltd. The interpretations given in this report are based on judgement and experience of ETS's and Groundsearch's personnel. They are provided for Coal & Allied Operations Pty Ltd's sole use in accordance with a specified brief. As such, they do not necessarily address all aspects of ground conditions and behaviour on the subject site. The responsibility of Groundsearch Australia is solely to Coal & Allied Operations Pty Ltd and it is not intended that any third party rely on this report. This report shall not be reproduced either wholly or in part without the written permission of Groundsearch Australia Pty. Limited.

For and on behalf of Groundsearch Australia Pty. Limited

John Lea B.Sc. (Hons) MAusIMM (CP) MMICA
Principal Geologist and Director
3 November 2006

Executive Summary

A surface resistivity imaging survey was completed over a portion of the proposed Glider Pit area on 14 and 15 June 2006 to trial the application of the surface resistivity method to delineate the vertical and horizontal boundaries between alluvial sediments and Permian coal measures.

The surface resistivity imaging trial has been successfully completed, and inverted subsurface resistivity models have been derived for each profile completed.

A second survey was completed on 21 and 22 August 2006 to provide additional data to enable the interpretation of the limit of Wollombi Brook alluvium and a detailed resistivity depth sounding at one location.

1.0 Introduction

The southern extent of the proposed Glider Pit depends on the limit of the alluvium that might connect hydraulically the coal workings with the Wollombi Brook.

A 2005 desktop study showed that a conclusive delineation of the extent of alluvium is not possible using the available drilling data.

Therefore, the surface resistivity trial was planned using an Advanced Geosciences Sting R1, 56 channel AC resistivity system which was operated by Earth Technology Solutions Pty Ltd.

Subsequent modelling of the measured apparent resistivity values was carried out using EarthImager 2D specialist resistivity modelling software, to reconstruct the subsurface resistivity distribution.

2.0 Methodology

The surface resistivity imaging method determines the subsurface resistivity distribution by making measurements at points along the ground surface. From these measurements, true resistivity of the subsurface can be estimated.

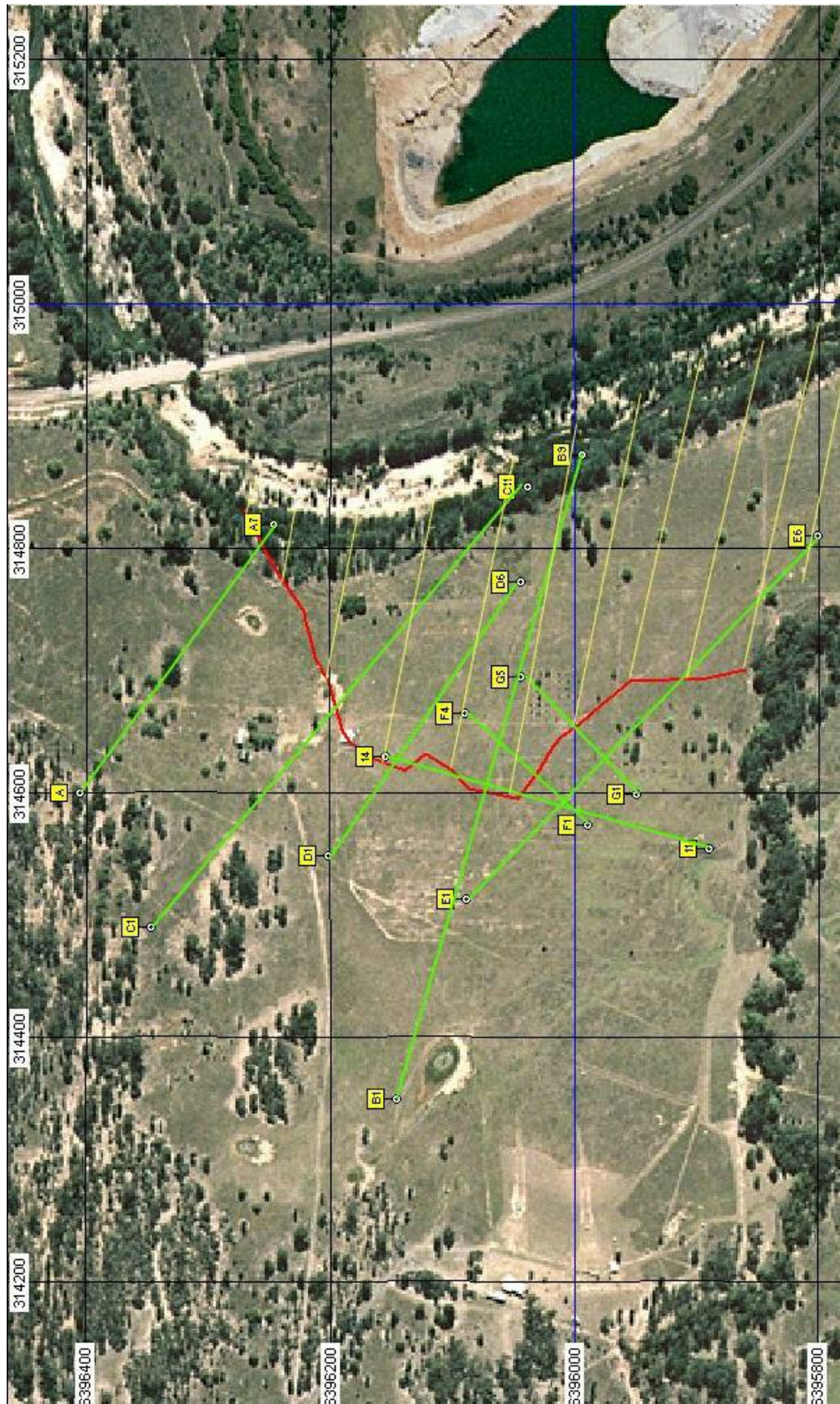
Nine resistivity profiles were completed in two separate surveys on 14 and 15 June and 21 and 22 August 2006 – Figure 1.

The survey data for the position of the survey lines are provided in Table 1.

Table 1. Survey line data

Line	Peg / Position (Dist)	Easting	Northing	RL
Line A	Start (0m)	314600	6396404	82.3
	A7 / End (275m)	314819	6396245	60.9
Line B	B1 / Start (0m)	314349	6396146	68.1
	B9 / End (550m)	314876	6395994	61.5
Line C	C1 / Start (0m)	314489	6396346	76.2
	C11 / End (475m)	314849	6396038	61.3
Line D	D1 / Start (0m)	314548	6396201	70.4
	D6 / End (275m)	314773	6396044	66.5
Line E	E1 / Start (0m)	314513	6396089	68.6
	E6 / End (415m)	314810	6395800	68.2
Line F	F1 / Start (0m)	314574	6395989	67.2
	F4 / End (135m)	314665	6396089	68.7
Line G	G1 / Start (0m)	314599	6395950	53.5
	G5 / End (135m)	314695	6396045	55.2
Line H	H1 / Start (m)	314634	6395910	53.5
	H4 / End (135m)	314727	6396008	55.0
Line I	I1 / Start (0m)	314554	6395890	67.3
	I4 / End (275m)	314630	6396155	70.1

Figure 1.
Resistivity survey lines locations



The locations of lines A, B and C were chosen to extend from boreholes which had indicated no alluvial cover, to the edge of the Wollombi Brook where available drilling data indicates a maximum alluvium thickness. The resistivity lines were positioned to extend past boreholes where possible, to allow calibration of the geophysical results.

The remaining lines were chosen to provide additional data for the interpretation of limit of the alluvium.

Pegs or sprayed markers were placed at the ends of the resistivity profiles and at a number of intermediate points where a change in slope of the ground surface occurred. These points were picked up by a surveyor following completion of the resistivity field work.

Apparent resistivity measurements were made by injecting current into the ground through two current electrodes and measuring the resultant voltage difference at two potential electrodes using an Advanced Geosciences Sting R1, 56 channel AC resistivity system with Swift smart cable electrode system. Electrodes were deployed at 5m intervals along a linear array, over various lengths per electrode array. The array was "rolled along" to ensure full data coverage for profiles longer than 275m.

The Schlumberger Resistivity Array was used, which involves the input of current through an outer pair of electrodes, and the measurement of resistance through a second inner pair of electrodes. The electrode separations were expanded to achieve a range of investigation up to a maximum depth of approximately 30m.

Inversion modelling of the measured apparent resistivity values was carried out using EarthImager 2D specialist resistivity modelling software without assumptions of the resistivity distribution within the subsurface.

3.0 Results

The modelled 2-dimensional distribution of earth resistivities beneath each of the resistivity profiles which best fit the field data is shown in Figures 2 and 3.

Figure 2. Stage 1 modelled resistivity profiles – not to scale

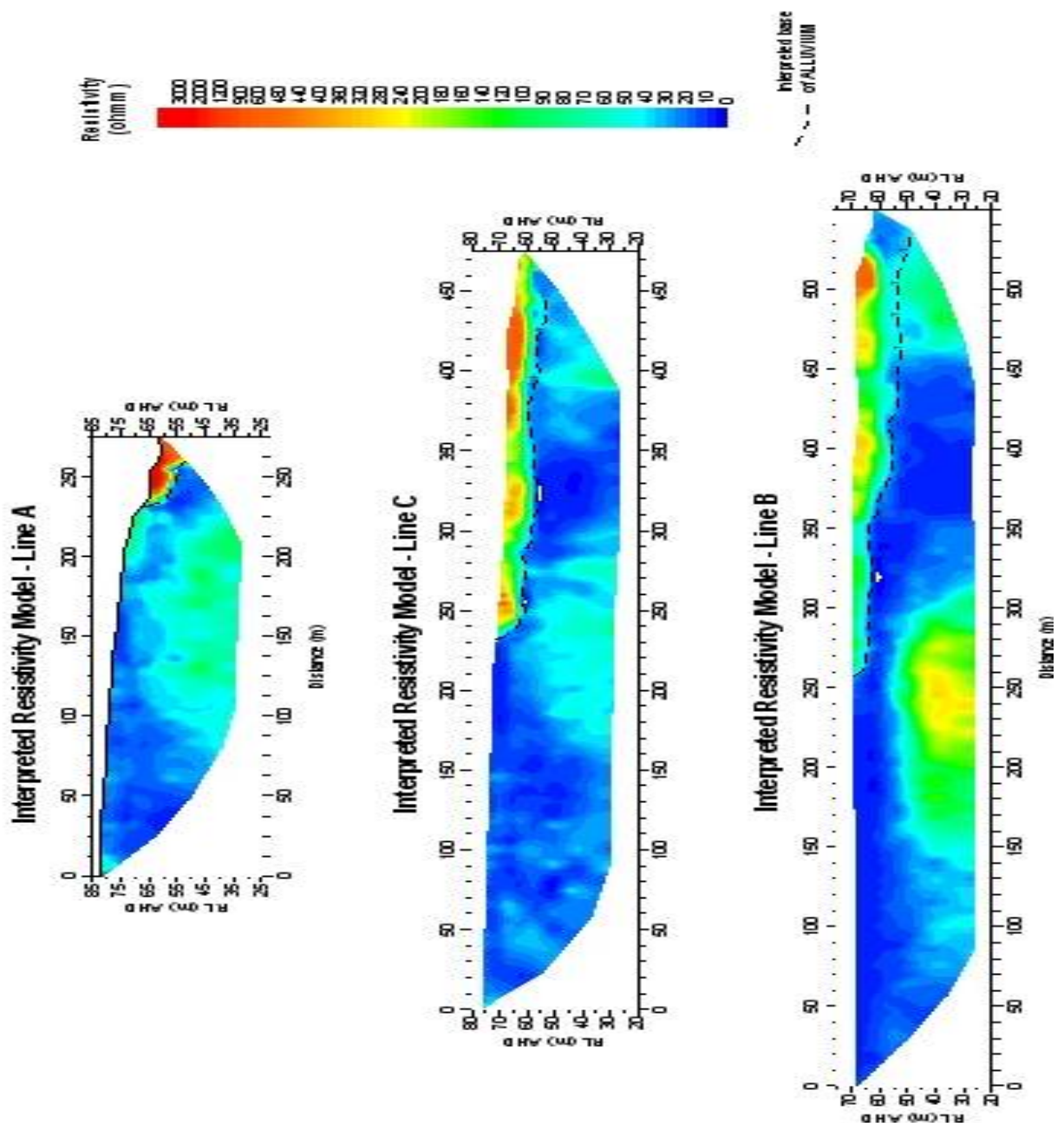
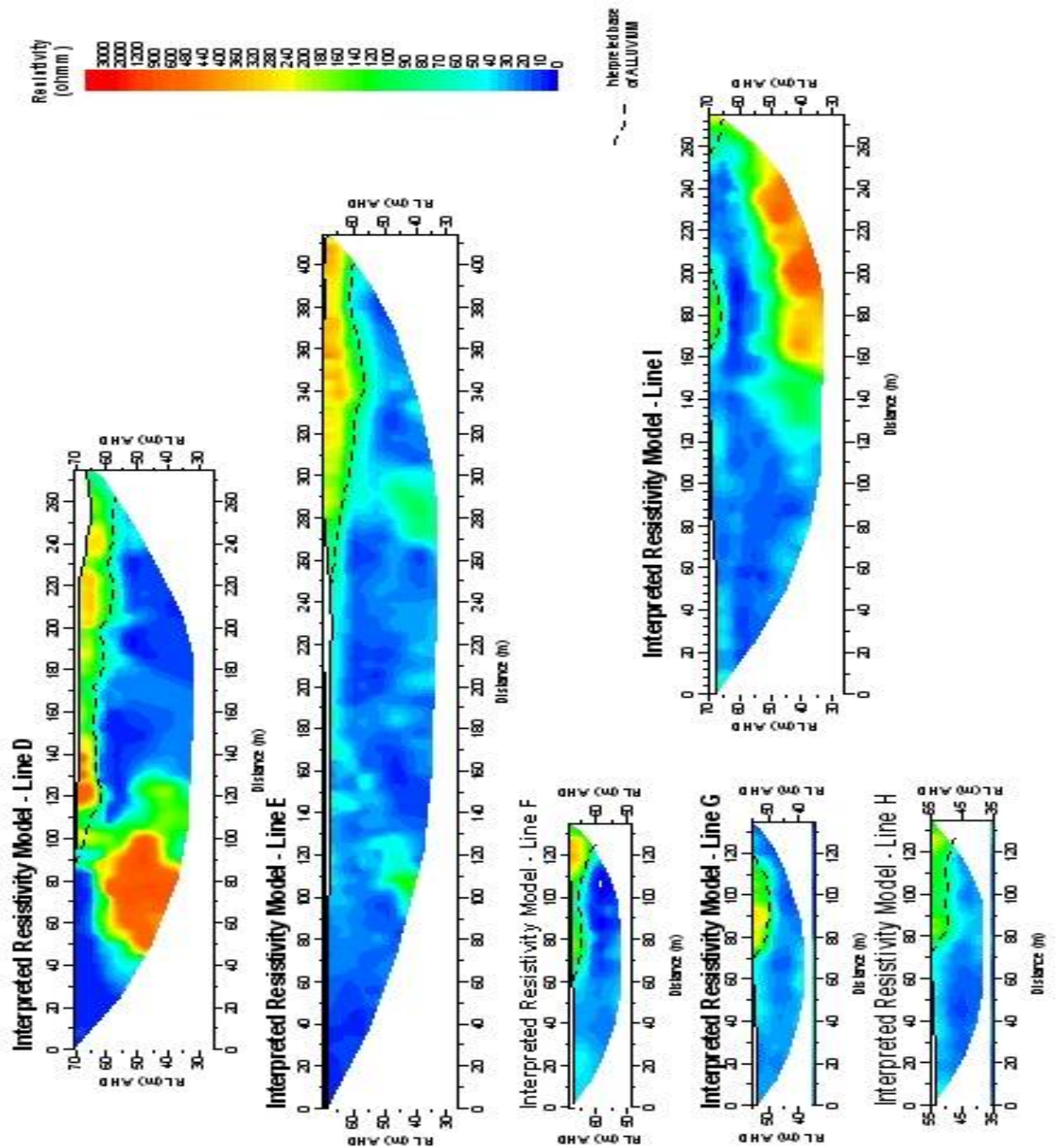


Figure3. Stage 2 modelled resistivity profiles – not to scale



Relatively high resistivity (100 to 500 Ohmm) are observed in the shallow zone of alluvial sediments compared with the relatively conductive (10 to 50 Ohmm) coal measures. The contact between these two units is well away from the Wollombi Brook but the profiles adjacent to the brook show a more complex resistivity distribution and the base of the alluvium appears more poorly defined.

The limit of the alluvium is shown as the red line and its areal extent is indicated by the yellow striped area in Figure 1.

The higher resistivity values that occur in the lower, central portions might represent mining-induced anomalies associated with the abandoned Mt Arthur coal seam workings.

4.0 Resistivity Depth Sounding

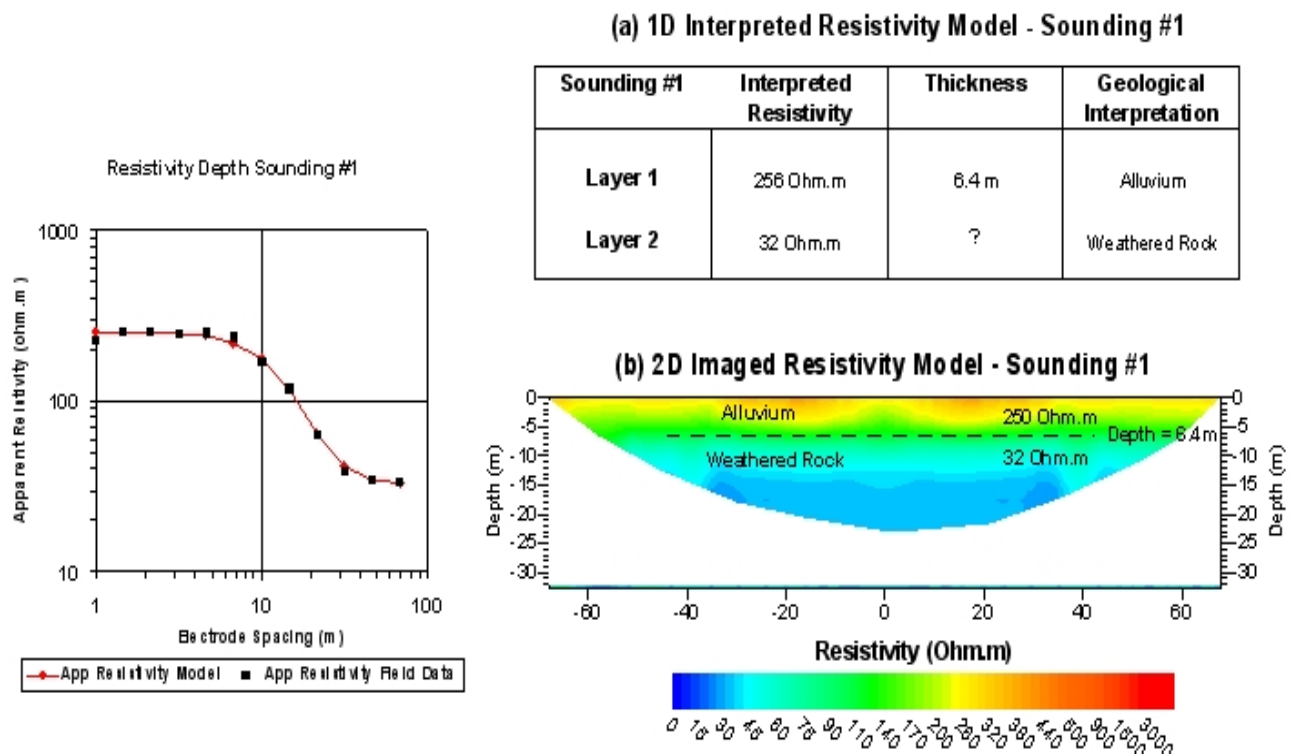
One, detailed depth sounding was carried out at location 314769E, 6396006N (see Figure 1) to acquire data to calculate the depth of the alluvium and investigate the nature of the weathered coal measures material. The interpreted results are shown in Figure 4.

The base of the alluvium is interpreted to be 6.4 mbgl but the base of weathering is at approximately 13.0 mbgl.

The method involved expanding the current and potential electrodes incrementally in a linear array about a midpoint for the resistivity depth sounding which provides detailed geoelectric data at an increasing effective depth.

A Sting R1 AC digital resistivity meter was used in "manual" mode, to complete a Schlumberger Array sounding using electrode "a" spacings of between 1.0m and 68.1m - a maximum current electrode separation of approximately 140 m in accordance with accepted practice.

Figure 4. Resistivity sounding model



5.0 CONCLUSIONS

The surface resistivity imaging survey has been successfully completed with inverted subsurface resistivity models derived for each data line.

In general, high resistivity values are observed in the alluvial sediments compared to the relatively conductive coal measures.

The limit of the Wollombi Brook alluvium is plotted in Figure 1.

**PRELIMINARY GROUNDWATER
MODELLING STUDY
CHESHUNT PIT
HVO SOUTH COAL PROJECT**

Rio Tinto Coal Australia

GEOTLCOV23511AA-AC
14 August 2008

14 August 2008

Rio Tinto Coal Australia
PO Box 315
Singleton NSW 2330

Attention: Ruth Kinal

Dear Ruth

RE: Preliminary Groundwater Modelling Study
Cheshunt Pit
HVO South Coal project

Coffey Geotechnics Pty Ltd is pleased to provide Rio Tinto Coal Australia with our report on the preliminary groundwater modelling study for the Cheshunt Pit of the HVO South Coal Project.

We draw your attention to the enclosed sheet entitled "Important Information about your Coffey Report" which should be read in conjunction with this report.

For and on behalf of Coffey Geotechnics Pty Ltd



Paul Tammetta

Associate Hydrogeologist

Distribution: Original held by Coffey Geotechnics Pty Ltd
1 copy held by Coffey Geotechnics Pty Ltd
3 hard copies and electronic copy to RTCA

Coffey Geotechnics Pty Ltd ABN 93 056 929 483
8/12 Mars Road Lane Cove West NSW 2066 Australia
PO Box 125 North Ryde NSW 1670 Australia
T (+61) (2) 9911 1000 F (+61) (2) 9911 1001 www.coffey.com/geotechnics

GEOTLCOV23511AA-AC

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1 INTRODUCTION

This report presents the results of a preliminary groundwater modelling study for the Cheshunt Pit of the Hunter Valley Operations (HVO) South Coal Project, located between Singleton and Muswellbrook, NSW. Mining operations of the HVO South Coal Project are conducted by Rio Tinto Coal Australia (RTCA). The location of the Cheshunt Lease is shown in Figure 1.

The purpose of the study was to develop an illustrative 2-dimensional numerical groundwater flow model (incorporating unsaturated zone flow) along a cross section at right angles to the Cheshunt pit highwall (and trending through the Hunter River channel), and use of the model to illustrate general flow processes that are occurring and to assess the variation with time of groundwater seepage into the pit.

The study is Stage 1 of an intended two-stage study whose aim is to assess potential groundwater leakage (and/or increase in leakage) from the Hunter River alluvium into the Cheshunt Pit caused by the following proposed modifications to the Cheshunt Pit mine plan:

- extending the Cheshunt pit highwall to within 100m of the alluvial boundary (as defined by regulatory agencies); and
- extending the depth of the pit by 80m (to the base of the Bayswater seam).

This Stage 1 work has been carried out by Coffey Geotechnics Pty Ltd (Coffey) at the request of RTCA, generally in accordance with our proposal dated 24 April 2008 (document No. GEOTLCOV23511AA). This report provides the results of illustrative modelling.

1.1 Scope of Work

The scope of work has comprised:

- A site visit and preliminary data review, with a focus on assessing aquifer parameters and water levels adopted in previous numerical simulations.
- Development of a 2-dimensional cross-sectional numerical groundwater flow model for the Cheshunt Pit. The location of the modelled cross section and the general site layout are shown in Figure 2.
- Adoption of the following aquifer hydraulic properties for use in the model:
 - hydraulic conductivities from previous investigations; and
 - aquifer storativities selected in the current study based on experience, hydraulic test results from similar rock types in the regional area, and published values.
- Running of the model in transient simulations (without model calibration) to illustrate model functioning and obtain indicative information on the variation of seepage into the pit with time.
- Reporting of results.

2 PRELIMINARY DATA REVIEW

2.1 Site Visit

An initial site visit to the Cheshunt Pit was conducted on 16 May 2008 by two Coffey hydrogeologists. The following observations were made during the site visit:

- Conspicuous jointing was observed in interburden clastic rocks.
- Inflow to the northern face of the Cheshunt Pit was minor with seepage limited to moist patches on the exposed face. In some areas the occurrence of low level seepage into the pit from the base of the Mt Arthur Seam was only indicated by iron staining. No running water was observed and no pooling of water was observed. Inflow to the northern face of the Cheshunt Pit was observed to be substantially lower than that reporting to the highwall of Barry's Pit.
- Ponding of water was seen at the toe of the highwall of Barry's Pit. Seepage to the highwall of Barry's Pit was observed to be preferentially occurring from a low zone corresponding to a syncline in the Mt Arthur seam with seepage water trickling from the face and draining to a pool adjacent to the face.
- No seepage was observed from alluvial sediments outcropping at the mine face.

2.2 Preliminary Data Review

A preliminary review and collation of available data was conducted to gain an understanding of groundwater conditions and the underlying stratigraphy. This included the collation of aquifer parameter data and consideration of:

- Pit geometry from the 3D geological resource model;
- The proposed final mine plan;
- Documented information on the Alluvial Lands Pit located north of the Hunter River;
- Previous investigation reports by Mackie Environmental Research (MER, 2004; 2005) and Environmental Resources Management Australia (ERM, 2008a; 2008b);
- Groundwater level monitoring data from site piezometers;
- Regional geological data; and
- Geotechnical data.

The results from the site visit and preliminary data review have been used to assess the site hydrogeological characteristics, discussed in the next section.

3 SITE HYDROGEOLOGY

3.1 Aquifers

The three main hydrogeological units at the site comprise mine spoil, alluvium associated with drainage channels, and hardrock consisting of Permian age coal measures. High permeability alluvium is associated with the Hunter River, the main drainage course in the area. Alluvium and spoil generally reside on top of coal measures rocks. Coal seams and bedding of clastic rocks in the coal measures dip downwards at approximately 2° to 3° to the south.

A subsurface groundwater barrier in the Hunter River alluvium (comprising a vertical bentonite cutoff wall keyed into bedrock) marks the edge of the former Alluvial Lands Pit (see Figure 1). The barrier was constructed between the Alluvial Lands Pit and the Hunter River to limit leakage of groundwater out of the alluvium and into the pit.

The former alluvial lands open cut pit is located to the North of the Hunter River and is now mostly backfilled with mine spoil (Figure 1). The edge of the this pit is approximately 500m northwest of the Cheshunt pit (on the other side of the Hunter River). The pit was excavated down to the base of the Vaux Seam. Mining operations are understood to still be occurring to the west in this pit. The central and southern tailings dams are located in the central northern parts of the backfilled pit.

The current Cheshunt Pit is located in the east of the Cheshunt Lease (adjacent to the Lemington and Barry's Pits). Figure 1 shows the final outline of the Cheshunt Pit.

Structure contours for the base of the alluvium have been assessed from borehole logs and illustrations presented in MMA (1992) and MER (1998) and are shown in Figure 2. Coarser grained, higher permeability alluvium (that is mostly below the alluvial water table and lies at the base of the main sequence) appears to extend slightly into Hobden Gully. It is likely that the Mt Arthur coal seam subcrops at the base of the alluvium hosting the Hunter River. This has been incorporated into the aquifer geometries adopted for the model.

3.2 Aquifer Hydraulic Properties

A significant number of hydraulic tests have been conducted in boreholes at the mine site. A database of interpreted hydraulic conductivity results from 121 hydraulic tests has been compiled. The database comprises:

- 21 laboratory tests of the vertical hydraulic conductivity of riverbed material from the Hunter River.
- 44 field tests (slug and constant discharge) for unconsolidated sediments in the main Hunter River channel and in tributaries.
- 28 packer tests of clastic interburden or overburden coal measures rocks.
- 28 packer tests of coal seams.

Figure 3 presents hydraulic test results as interpreted hydraulic conductivity (K) versus depth for the various hydrogeologic units in the vicinity of the Cheshunt Pit. The K distribution for coal measures sequences shows a weak relationship with depth (in contrast to the commonly observed strong trend of decreasing hydraulic conductivity with depth), possibly due to alteration of the native K of the coal measures through stress relaxation from pit excavation. In general, coal seams exhibit higher permeability than clastic interburden rocks.

The high permeability alluvial sequence in the main Hunter River Channel, and the low permeability silty alluvial sequences on the fringes and in tributaries, form two conspicuous groupings. The confluence of Hobden Gully and the Hunter River is a transition zone.

3.2.1 Vertical Anisotropy

Vertical anisotropy is defined here as the ratio of vertical hydraulic conductivity to horizontal hydraulic conductivity (K_v/K_h) at any point in the sub surface. This quantity varies in space (and, for ground disturbance, time) and is strongly dependent on the scale of observation. For fractured rocks with low matrix permeability K_v/K_h is strongly dependent on the distribution of sub horizontal and sub vertical defects (their density, and average continuity and aperture) and the thickness of overburden. For this reason field measurements of fractured rock anisotropy rarely correlate with an analytical assessment of anisotropy using individual homogeneous layers and conservation of flux equations.

For the Cheshunt Pit any groundwater leaking from alluvium will need to travel through coal measures rocks to enter the pit, and the Kv/Kh distribution of the coal measures is considered fundamental to quantifying groundwater inflows to the pit.

Published field measurements of Kv/Kh for similar rock types are available over measurement intervals which are similar to the vertical node spacing adopted in the model, minimising scaling issues. Assessment of this quantity is highly advanced in the petroleum industry and continuing studies for the Cheshunt Pit will seek to utilise this information where possible.

Published measurements of Kv/Kh over a scale of 2m to 3m in fractured laterally bedded clastic sedimentary rocks would suggest that Kv/Kh will usually fall within the range 0.001 to 1 (more typically 0.005 to 0.5) except in rare circumstances.

3.3 Groundwater Levels and Flow

Monitoring of groundwater levels at numerous piezometer nests at the mine has been conducted generally on a quarterly basis over the last few years.

Figures 4a and 4b present hydrographs at monitoring bores in the Alluvial Lands Pit spoil, and natural subsurface sequences, respectively, over the last few years. Locations of spoil monitoring bores (the DM series) are shown on Figures 1 and 2 and locations of other piezometers are shown on Figure 2. DM1 (which is screened within spoil), located about 1.5km north of DM3 (see Figure 1), may have limited hydraulic connection with the aquifer and measurements at this piezometer appear questionable. Water levels in the Alluvial Lands Pit spoil (Figure 4a) in the vicinity of the Cheshunt pit appear to be a function of:

- Recharge to the spoil groundwater, probably from the tailings dams, in the north of the spoil body indicated by hydrographs for DM2 (located about 1km north of DM3, near the central tailings dam), and DM3; and
- Drainage at the current operations in the west (and historically at the dewatering bore, DM6, used for the purposes of water management for the Alluvial Lands Pit working area).

Falling water levels in coal measures in the vicinity of the Cheshunt Pit (Figure 4b) appear to be arrested by recovering spoil water levels.

Figures 5a and 5b present the interpreted water tables and hydraulic head contours along Hydrogeological Cross-Sections A and B (see Figure 2), based on groundwater monitoring data and approximate pit floor and highwall locations. These figures show the variation in hydraulic head with depth in late 2007 at two contrasting locations.

At Section A, groundwater in the spoil appears to be recovering and might sustain a slight vertical gradient closer to the discharge face at the current operational area further northwest.

At Section B, the decrease in hydraulic head with increasing depth in coal measures underneath the alluvium approaches a near-unit gradient in proximity to the estimated position of the Cheshunt Pit highwall at the time of the water level measurements. Groundwater in the spoil of the Alluvial Lands Pit to the north of the river may be providing some seepage to the coal measures at the location of the cross-section.

3.4 Pit Groundwater Inflow

RTCA estimated the total water collection to a sump collecting water from the highwall of Barry's Pit to be about 0.5 ML/day over the month of July 2008 based on dewatering pump flow meter readings (RTCA, email dated 4 August 2008). This estimate includes surface runoff and evaporation of groundwater discharge on the pit floor and walls.

Modelled seepage rates for the Cheshunt pit reported in MER (2005) at 21 years range between 0.10 and to 0.22 m³/day/m. Assuming about 1km of pit face on the pit northern perimeter this equates to about 0.2 ML/day, comparable to the Barry's pit sump water collection.

During the field visit conducted by Coffey personnel, much less seepage was observed from the highwall of the Cheshunt Pit than was observed seeping to the Barry's Pit highwall.

4 MODEL DEVELOPMENT AND PARAMETERISATION

A 2-dimensional cross-sectional flow model simulating groundwater flow in the vertical plane has been developed for the modelling study. The model was developed using the SEEP/W software utilising a finite element algorithm that incorporates unsaturated zone flow and aquifer heterogeneity and anisotropy. The model has been used to conduct predictive simulations in transient mode.

4.1 Modelled Cross Section

A number of geological cross sections extracted from the Cheshunt Mine geological resource model were provided by RTCA. Section N2 was selected for model development and numerical simulation based on the following considerations:

- At Section N2 the Hunter River is in close proximity to Cheshunt pit.
- The dip of the Bayswater seam is relatively steep along this section.
- Pit stability modelling along this section is being conducted by others.
- Along Section N2 it is understood that the Mt Arthur seam may sub-crop beneath the Hunter River alluvium.

Figure 2 shows the position of Section N2 (the modelled cross-section) superimposed on the final pit outline. An illustration showing the stratigraphy along Section N2, used for developing the model mesh, is provided in Appendix B.

The distance between the edge of the pit and the 100m alluvial buffer line varies between nil in the northeast to about 64m in the southwest. At Section N2 this distance is about 30m.

4.1.1 Cross Section Construction

The geometry of the subsurface stratigraphy and the pit shape along Section N2 were assessed from the following data:

- Output from the RTCA 3D geological resource model;
- Regional geological maps;
- Assessed structure contours for the base of alluvium (see Figure 2);

- Supplied drawings of the final mine plan, surface topography, and the 100m and 150m buffer lines;
- The extent of the Alluvial Lands Pit as shown in Mitchell McCotter (1992);
- Groundwater level monitoring data.

4.2 Adopted Aquifer Properties

The model developed in this preliminary study has not been calibrated to field observations and is used in an illustrative capacity by adopting aquifer parameters used in previous modelling studies at the same site. Model calibration and more detailed predictive simulations will be conducted as part of Stage 2 studies.

4.2.1 Hydraulic Conductivity

A typical parameter set adopted for 2-dimensional cross-sectional modelling of the Cheshunt Pit in MER (2005) was selected for predictive transient simulations. This parameter set is listed in Table 1.

Table 1. Adopted Model Hydraulic Conductivities (MER, 2005)

Hydrogeological Unit	Kh* (m/s)	Kv/Kh^
Alluvium (Upper)	2.9×10^{-4}	1
Alluvium (Lower)	9.9×10^{-6}	1
Interburden (Upper)	1.6×10^{-8}	0.0014
Coal (Mt. Arthur seam)	4.8×10^{-7}	0.029
Interburden (lower)	2.7×10^{-9}	1.3×10^{-6}
Coal (Piercefield seam)	1.9×10^{-8}	4.1×10^{-4}
Interburden (sub Piercefield)	2.4×10^{-10}	0.048
Coal (Vaux seam)	1.4×10^{-8}	0.0011
Coal (Broonie seam)	3.5×10^{-8}	5.3×10^{-4}
Coal (Bayswater seam)	9.1×10^{-8}	0.0020
Interburden (sub Bayswater)	3.5×10^{-10}	1
Alluvial Lands Pit mine spoil	1.0×10^{-4}	1
Alluvial Lands bentonite cutoff wall	1.0×10^{-9}	1

* Kh denotes saturated lateral hydraulic conductivity

^ Kv/Kh denotes the ratio of saturated vertical hydraulic conductivity (Kv) to Kh.

4.2.2 Storativity

Aquifer storativity values have been selected based on experience, hydraulic test results from similar rock types in the regional area, and published values. Table 2 lists the adopted aquifer storativity values.

Table 2. Adopted Model Aquifer Storativities

SEEP/W Storage Term	Alluvium and Spoil	Rock (Coal Measures)
Volumetric water content at saturation (zero pressure head) *	0.1	0.01
Coefficient of volumetric compressibility (equivalent to the slope of the water content function over the positive pressure head range) ^	$1 \times 10^{-5} \text{ m}^{-1}$	$1 \times 10^{-5} \text{ m}^{-1}$

* Similar to drainable porosity or specific yield, and applies to drainage at the water table.

^ Similar to specific storage and applies to model nodes where the pressure head is greater than zero.

4.3 Boundary Conditions

For the illustrative model the following boundary conditions have been applied, based on the results of the preliminary data review (see Section 3):

- Northwest end of section: Specified head of 50mAHD in mine spoil of the Alluvial Lands Pit.
- Hunter River high permeability alluvium: Specified head of 56mAHD.
- Southeast end of section: No-flow boundary.

Diffuse rainfall recharge has not been incorporated.

4.4 Mining Schedules

The following two future mining scenarios were simulated:

- the pit highwall extending to the 150m set-back position from the alluvium. A transient model with 7 time periods was developed for this simulation.
- the pit highwall extending to the 100m set-back position. A transient model with 8 time periods was developed for this simulation.

The time length and pit excavation depth for each model time period were adopted from data provided by RTCA and from information embedded in the 3D geological resource model provided by RTCA. The transient modelling involved an initial steady state model to calculate starting groundwater levels, followed by transient simulation. Steady state simulation assumes zero change in aquifer storage.

The steady state model was run with the pit excavated to the base of the Mount Arthur seam as observed during the site visit by Coffey personnel on 16 May 2008. Tables 3a and 3b list the adopted excavation schedules for the two scenarios of the transient simulations.

The two final time periods in each scenario end at 33 months and 21 years from the start of simulation, respectively. These two time periods were included to obtain results comparable to results from the cross-sectional modelling reported in MER (2005).

In the 100m setback case the time required to excavate to the base of the Bayswater seam is reduced by two months because of the two months required at the start of the simulation for the additional excavation of the 50m buffer slice. The reduction from 14 to 12 months for Time Period 6 in the 100m setback case allows the long-term results for this case to be compared to the 150m setback case, and previous modelling.

Table 3a. Adopted Model Excavation Schedule for Mine at 150m Set Back Position (Model 1)

Time Period	Excavation Depth	Time (months)
0	Base of Mt Arthur Seam	NA (Steady State Model)
1	Base of Vaux Seam	7 (0 – 7)
2	Base of Broonie Seam 5A & 5C	6 (8 – 13)
3	Base of Broonie Seam 6 to 8A/C	4 (14 – 17)
4	Base of Bayswater Seam	2 (18 – 19)
5	Base of Bayswater Seam	14 (20 – 33)
6	Base of Bayswater Seam	219 (34 – 252) (21 years total)

Table 3b. Adopted Model Excavation Schedule for Mine at 100m Set Back Position (Model 2)

Time Period	Excavation Depth	Time (months)
0	Base of Mt Arthur Seam	NA (Steady State Model)
1	Base of Mt Arthur Seam, removal of 50m buffer slice	2 (0 – 2)
2	Base of Vaux Seam	7 (3 – 9)
3	Base of Broonie Seam 5A & 5C	6 (10 – 15)
4	Base of Broonie Seam 6 to 8A/C	4 (16 – 19)
5	Base of Bayswater Seam	2 (20 – 21)
6	Base of Bayswater Seam	12 (22 – 33)
7	Base of Bayswater Seam	219 (33 – 252) (21 years total)

The simulation time extends to 21 years to model long term seepage which is also able to be compared to modelling results reported in MER (2005).

5 RESULTS

5.1 Groundwater Inflows

Figure 6 shows the modelled seepage into the Cheshunt pit versus time over the first 33 months of the model simulation period. Groundwater inflow was calculated for various hydrogeologic unit combinations for the 150m setback (Model 1) and 100m setback (Model 2) cases. Table 4 lists a summary of results.

Model results indicate that the seepage into the pit does not reach equilibrium but changes in response to the excavation schedule and variations in the properties of aquifers as they are sequentially intersected as the pit deepens. Groundwater inflows to the pit increase little when the northern highwall is moved from the 150m set back position to the 100m position.

Table 4. Modelled Groundwater Inflow to the Cheshunt Pit

Elapsed Time (Months)		Inflow Source Zone	Inflow (m ³ /day/m width)		Total Inflow (m ³ /day/m width)	
Mine at 150m setback	Mine at 100m setback		Mine at 150m setback	Mine at 100m setback	Mine at 150m setback	Mine at 100m setback
Start (Steady state)	Start (Steady state)	Northern Pit Wall	0.014	0.014	0.014	0.015
		Pit Floor, with pit at 150m buffer line (Base of Mt Arthur)	0.000	0.001		
N/A	2	Northern Pit Wall	N/A	0.019	N/A	0.020
		Pit Floor, with pit at 100m buffer line (Base of Mt Arthur)		0.001		
7	9	Northern Pit Wall	0.035	0.036	0.076	0.074
		Pit Floor (Base of Vaux)	0.041	0.038		
13	15	Northern Pit Wall	0.103	0.103	0.222	0.116
		Pit Floor (Base of Broonie 5A & 5C)	0.118	0.013		
17	19	Northern Pit Wall	0.123	0.129	0.167	0.185
		Pit Floor (Base of Broonie 6 to 8A/C)	0.043	0.056		
19	21	Northern Pit Wall	0.155	0.155	0.274	0.264
		Pit Floor (Base of Bayswater)	0.119	0.109		
33	33	Northern Pit Wall	0.101	0.105	0.152	0.154
		Pit Floor (Base of Bayswater)	0.051	0.049		
252 (21 years)	252 (21 years)	Northern Pit Wall	0.049	0.051	0.063	0.063
		Pit Floor (Base of Bayswater)	0.014	0.013		

Salient groundwater inflow results are as follows:

- For the 100m setback model, groundwater inflow to the pit ranges between 0.01 and 0.26 m³/day/m over the first 33 months of simulation time, with an average inflow over the period of 0.15 m³/day/m.
- At 33 months the modelled seepage from the northern batters for the 100m set back position is 0.11 m³/day/m, about 4% higher than for the 150m setback position.
- At 21 years the modelled seepage from the northern batters for the 100m set back position is 0.05 m³/day/m, about 2% higher than for the 150m setback position.

- At 21 years the modelled seepage from the northern batters and pit floor for the 150m setback position is 0.06 m³/day/m. This compares to a range of between 0.08 and 0.10 m³/day/m modelled in MER (2005).
- At 21 years the modelled seepage from the northern batters and pit floor for the 100m setback position is 0.063 m³/day/m. This compares to a range of between 0.11 and 0.14 m³/day/m modelled in MER (2005).

5.2 Flow Budgets

Table 5 presents the proportions of cumulative groundwater inflow to the pit according to the sources of inflow, and the discharge zones for the inflow, for the 100m setback model over the first 33 months of the model simulation period. Over this period the average modelled groundwater inflow to the pit was 0.153 m³/day/m.

Table 5. Modelled Groundwater Flow Budgets for Model 2

Inflow	Flux (m ³ /day/m)	Proportion of Total	Outflow	Flux (m ³ /day/m)	Proportion of Total
From Spoil	0.00043	0.3 %	From Pit Highwall	0.090	59 %
From Alluvium	0.020	13 %	From Pit Floor	0.063	41 %
From Rock Storage	0.133	87 %			
TOTAL IN	0.153	100 %	TOTAL OUT	0.153	100 %

The highest contribution to pit inflow was made by release of water from storage in the coal measures rocks. Groundwater in the Hunter River alluvium comprised 13% of the pit inflow (transmitted through the coal measures). These results indicate that the groundwater system has not achieved equilibrium after 33 months of mining. Figure 7 shows the modelled rate of release of groundwater from coal measures storage versus time.

5.3 Hydraulic Heads

Modelled hydraulic heads versus time underneath the Hunter River alluvium in the Mt Arthur Seam and the interburden below the Mt Arthur Seam for both simulation cases are shown in Figure 8. Modelled heads in the Mt Arthur Seam fall by 1.1m over the first 19 months and then stabilise over the longer term. Modelled heads for the interburden below the Mt Arthur seam fall by about 0.09m over the first 19 months and then continue to decline at a low rate, without stabilising, indicating continued release of water from coal measures storage.

Figures showing the spatial hydraulic head distributions at the end of each time period for Model 2 (100m setback position) are presented in Figures A1 (Time Period 0) to A8 (Time Period 7) in Appendix A.

6 CONCLUSIONS

A 2-dimensional groundwater numerical flow model has been developed for the highwall of the Cheshunt Pit that fronts the Hunter River at the HVO South Coal project.

The model has been used with aquifer hydraulic parameters, and new boundary conditions, to illustrate groundwater flow processes and obtain a preliminary estimate of groundwater inflows to the pit. The aquifer hydraulic parameters adopted for use in the model have comprised:

- Hydraulic conductivities used in modelling reported in MER (2005); and
- Aquifer storativities selected in the current study based on experience, hydraulic test results from similar rock and sediment types in the regional area, and published values.

Modelling results using the illustrative model are consistent with previous studies (except where boundary conditions dictate otherwise) and indicate that the model (and the SEEP/W groundwater algorithm) is an effective tool for assessment of potential leakage from the Hunter River alluvial body into the Cheshunt pit based on various future scenarios. The modelling has shown that transient simulation will be essential in assessment of impacts as part of ongoing studies.

Ongoing (Stage 2) studies will incorporate:

- Assessment of the fundamental parameters K_v/K_h and storativity of the coal measures using published measurements, experience, and site-specific defect distribution data;
- Calibration of model parameters against measured water levels and flows, using the results of aquifer hydraulic testing as a guide; and
- Predictive simulations over a finer time scale.

7 REFERENCES

- Mitchell McCotter and Associates Pty Ltd. 1992. Environmental Impact Statement Prepared for Coal and Allied Operations Pty Ltd – Hunter Valley Mine Expansion of Mining. Report No. 91071.
- Environmental Resources Management Australia (ERM). 2008a. Hunter Valley Operations South Coal Project – Environmental Assessment Report. Report No. 0047820.
- Environmental Resources Management Australia (ERM). 2008b. Hunter Valley Operations South Coal Project – Environmental Assessment Report - Annex J: Groundwater Assessment Report. Report No. 0064832RP01.
- Mackie Environmental Research (MER). 2004. Assessment of River Leakage Within The Cheshunt Pit Buffer Zone. December.
- Mackie Environmental Research (MER). 2005. Assessment of River Leakage Within The Cheshunt Pit Buffer Zone, Amended Report. April.
- Mackie Martin and Associates Pty Ltd (MMA). 1992. Hunter Valley Mine Alluvial Floodplain Groundwater Studies. Report No. HVM928. August.

For and on behalf of Coffey Geotechnics Pty Ltd



Paul Tammetta

Associate Hydrogeologist

Important information about your **Coffey** Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report's recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by

earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.

Important information about your **Coffey** Report

Interpretation by other design professionals

Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report*

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue

Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

Rely on Coffey for additional assistance

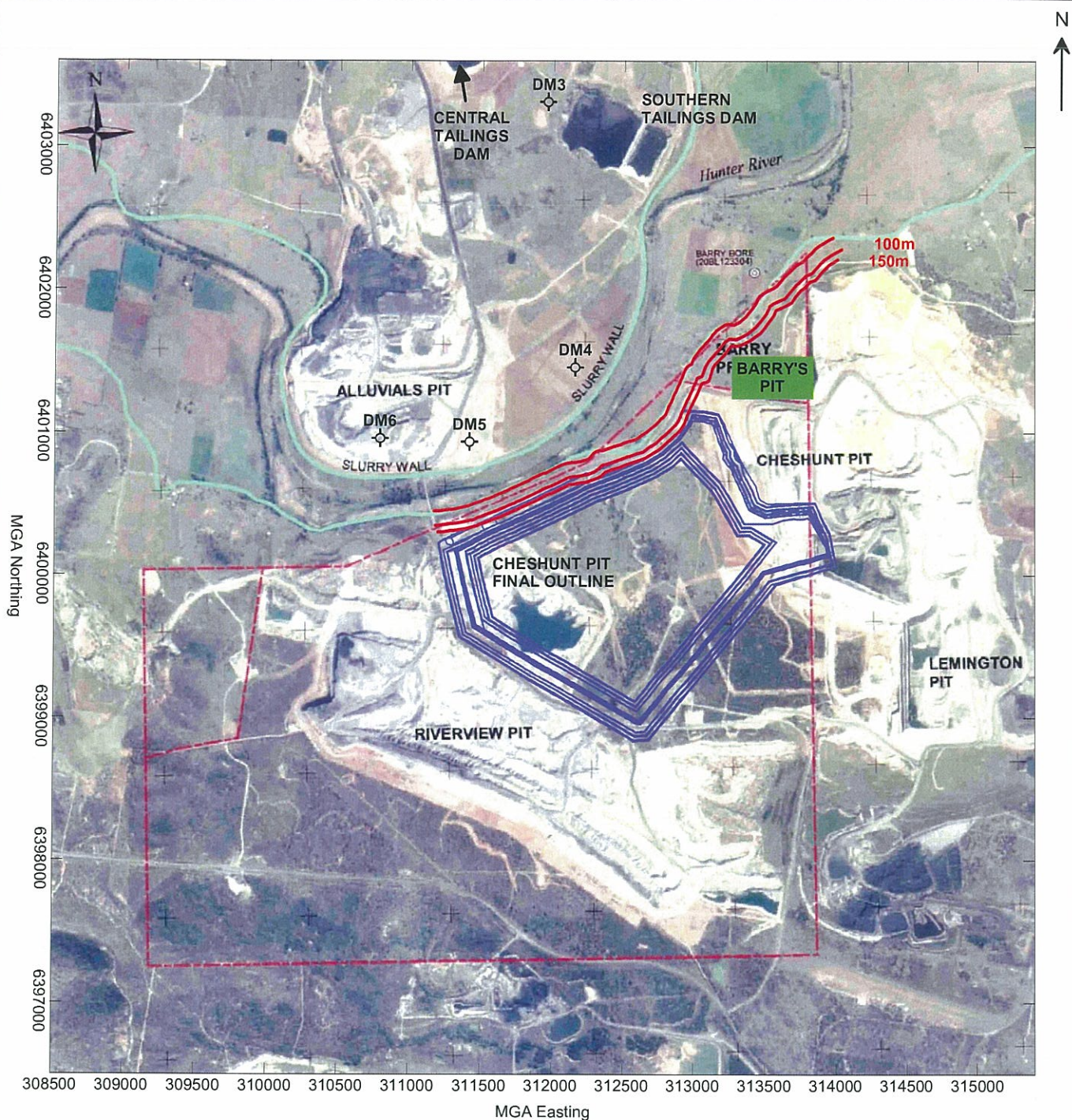
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

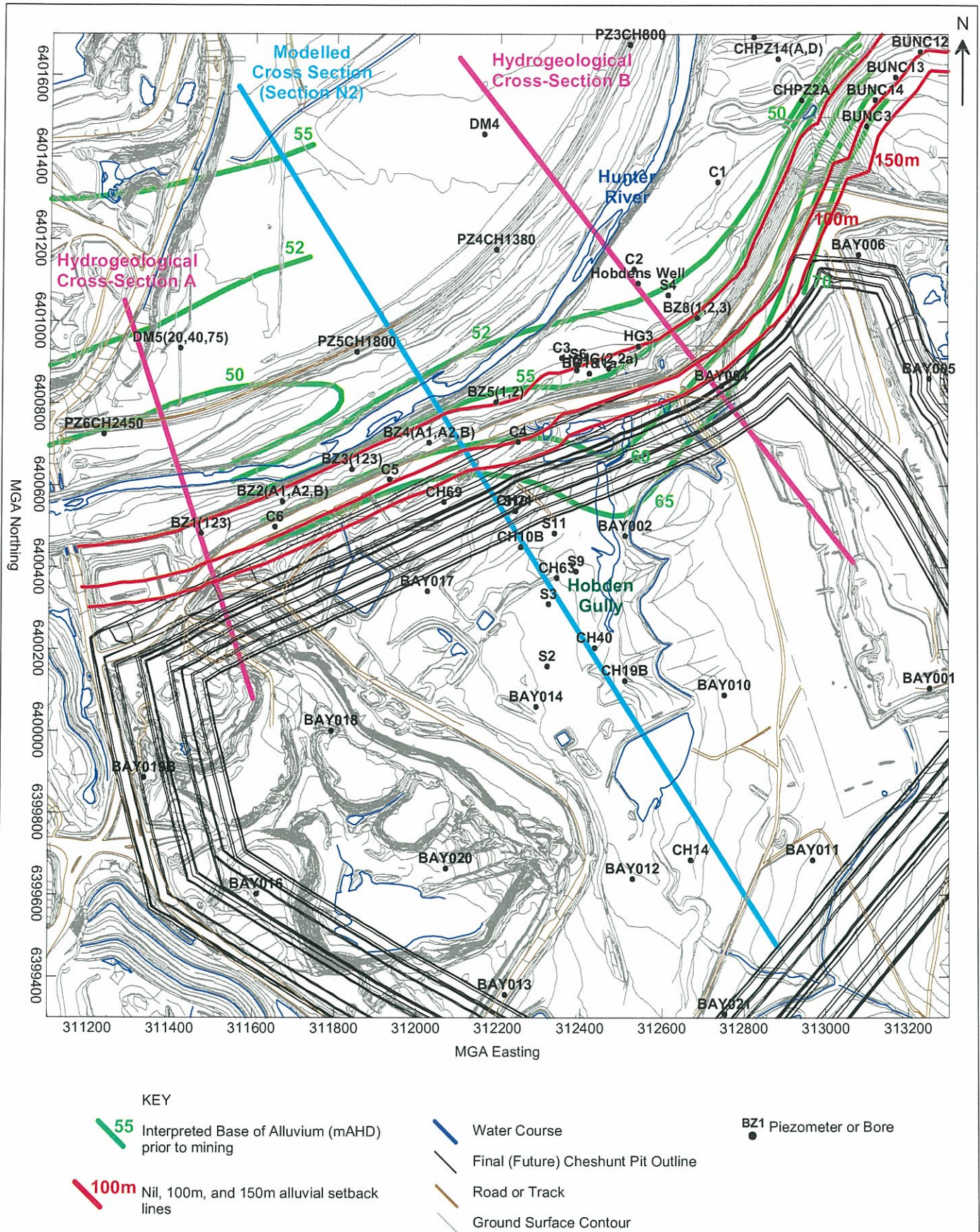
* For further information on this aspect reference should be made to "Guidelines for the Provision of Geotechnical information in Construction Contracts" published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.

Figures



After Figure 1 of MER (2005)

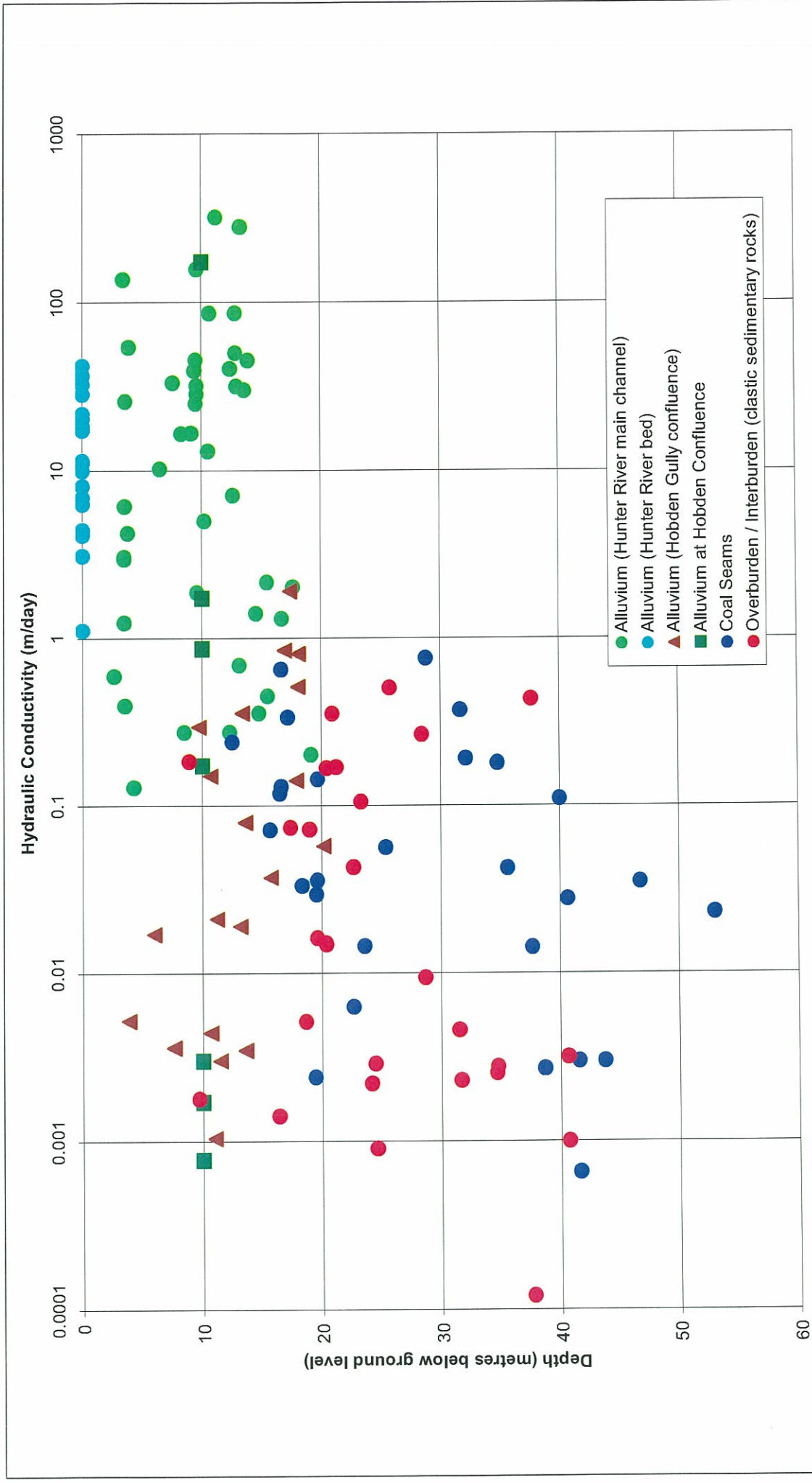
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approved	RJB		project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study	
date	12 Aug 2008		title:	REGIONAL LOCALITY MAP	
scale	1:40,000		project no:	GEOTLCOV23511AA-AC	figure no: FIGURE 1
original size	A4				



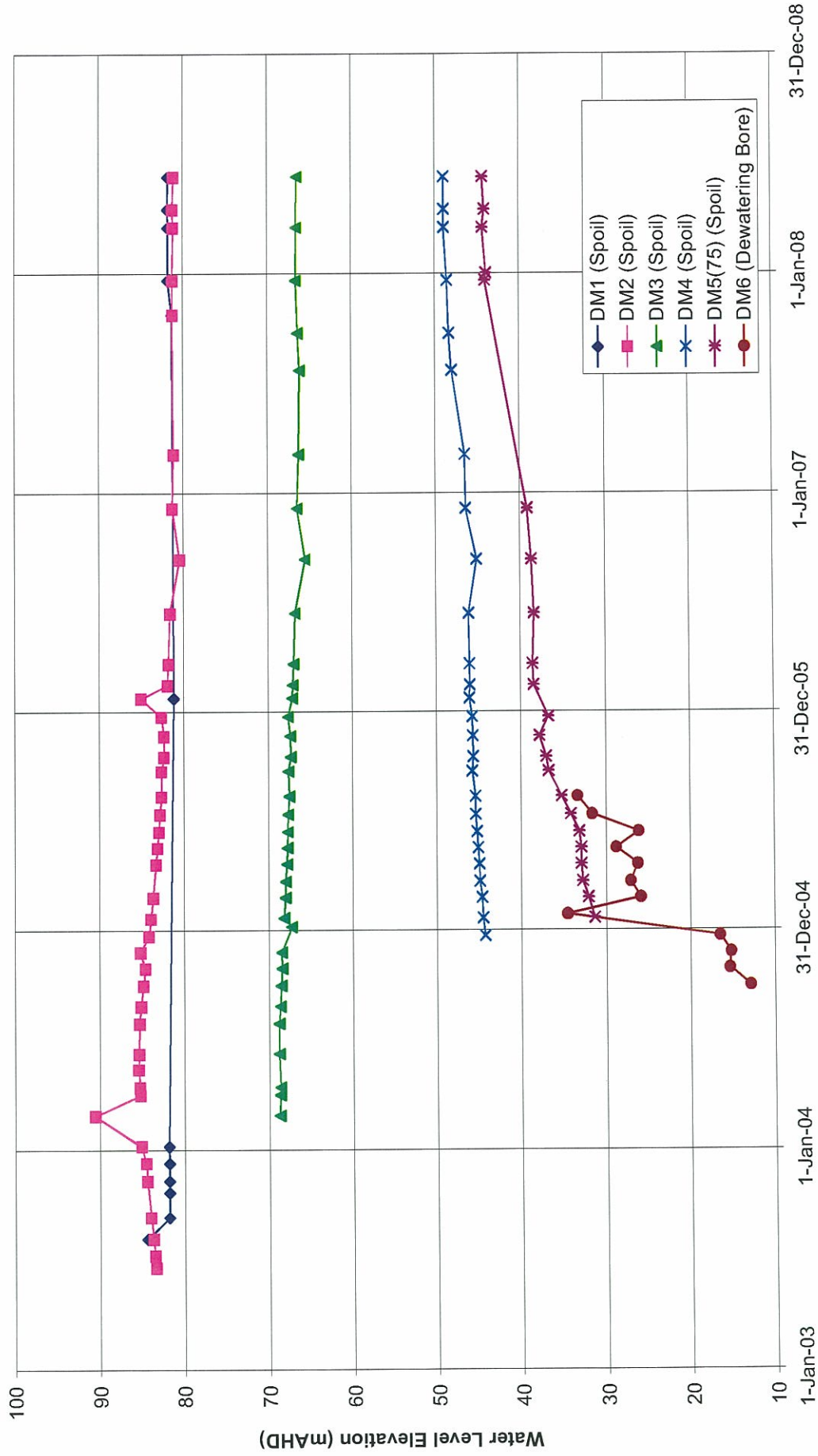
drawn	PT
approved	RJB
date	29 July 2008
scale	1:12,500
original size	A4

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THE EARTH

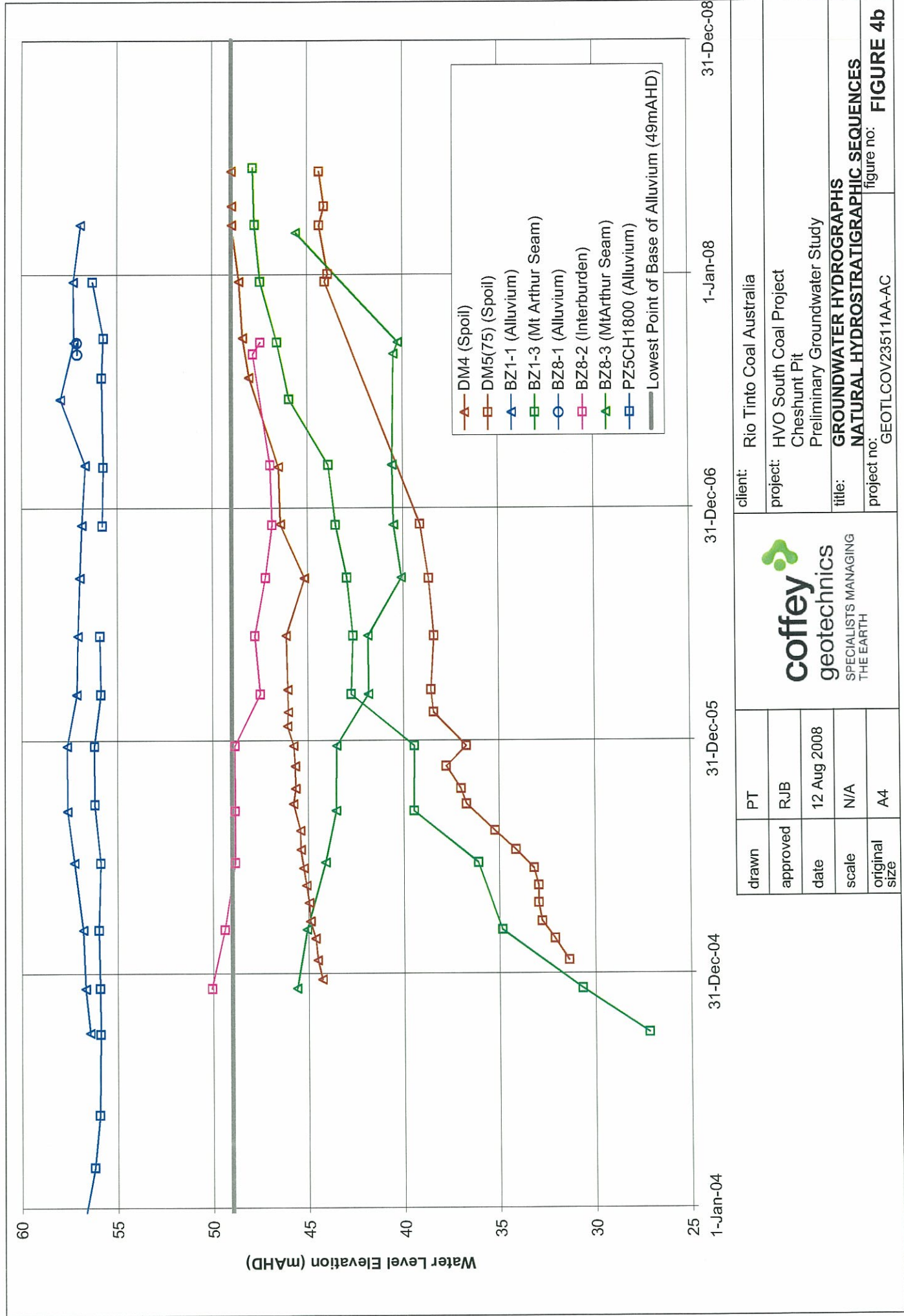
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project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
title:	SITE LAYOUT
project no:	GEOTLCOV23511AA-AC
figure no:	FIGURE 2



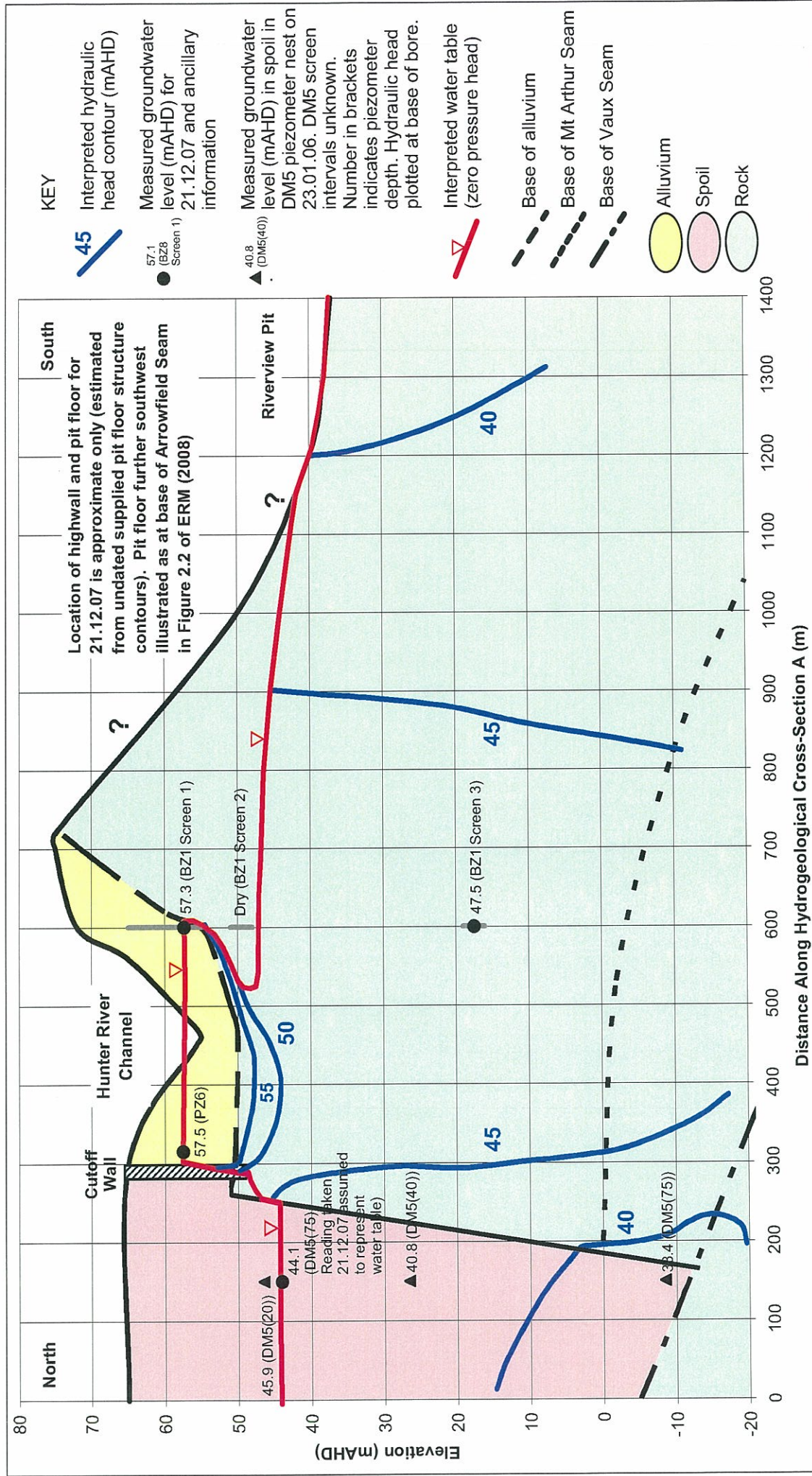
drawn	PT	client: Rio Tinto Coal Australia	
approved	RJB	project: HVO South Coal Project	
date	29 July 2008	Cheshunt Pit	
scale	N/A	Preliminary Groundwater Study	
original size	A4	title: HYDRAULIC CONDUCTIVITY VS DEPTH FOR ALLUVIUM AND ROCK AT HVO SOUTH COAL PROJECT	
		project no: GEOTLCOV23511AA-AC	figure no: FIGURE 3



drawn	PT	client: Rio Tinto Coal Australia
approved	RJB	project: HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
date	12 Aug 2008	title: GROUNDWATER HYDROGRAPHS
scale	N/A	project no: ALLUVIAL LANDS PIT SPOIL
original size	A4	figure no: FIGURE 4a



drawn	PT	client: Rio Tinto Coal Australia		
approved	RJB	project: HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study		
date	12 Aug 2008	title: GROUNDWATER HYDROGRAPHS NATURAL HYDROSTRATIGRAPHIC SEQUENCES		
scale	N/A	project no: GEOTLCOV23511AA-AC figure no: FIGURE 4b		
original size	A4			



NOTES:

- Hydraulic head contours and the water table are interpretations only, based on limited data and various assumptions. Other interpretations are possible.
- Structure contours for the base of the Mt Arthur Seam were estimated from ERM (2008b).
- Structure contours for the base of the Vaux Seam were estimated from MMA (1992).



client: Rio Tinto Coal Australia

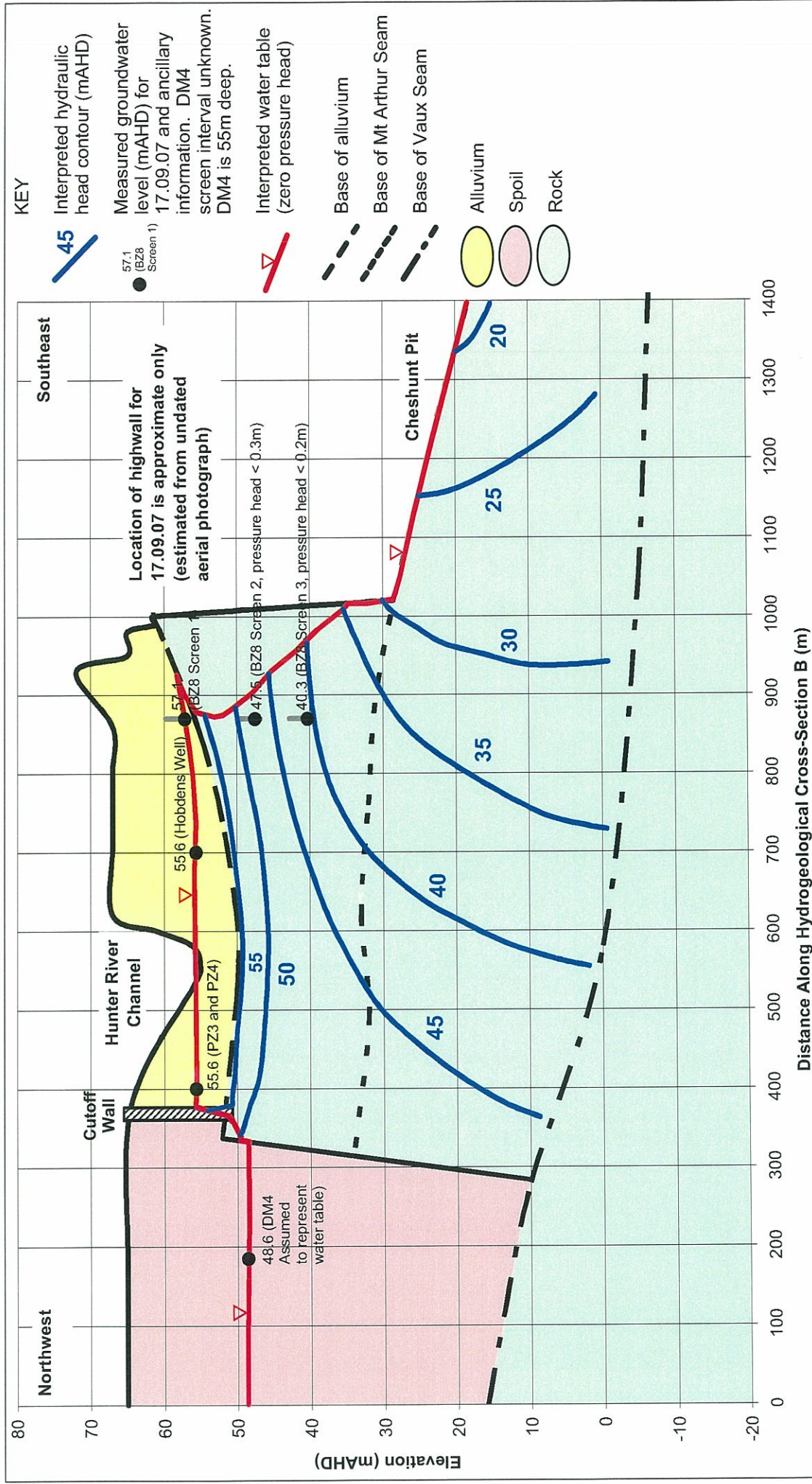
project: HVO South Coal Project
Cheshunt Pit
Preliminary Groundwater Study

title: **HYDROGEOLOGICAL CROSS-SECTION A**
(HYDRAULIC HEADS AT 21.12.07 & 23.01.06)

project no: GEOTLCOV23511AA-AC

drawn	PT
approved	RJB
date	11 Aug 2008
scale	N/A
original size	A4

figure no: **FIGURE 5a**



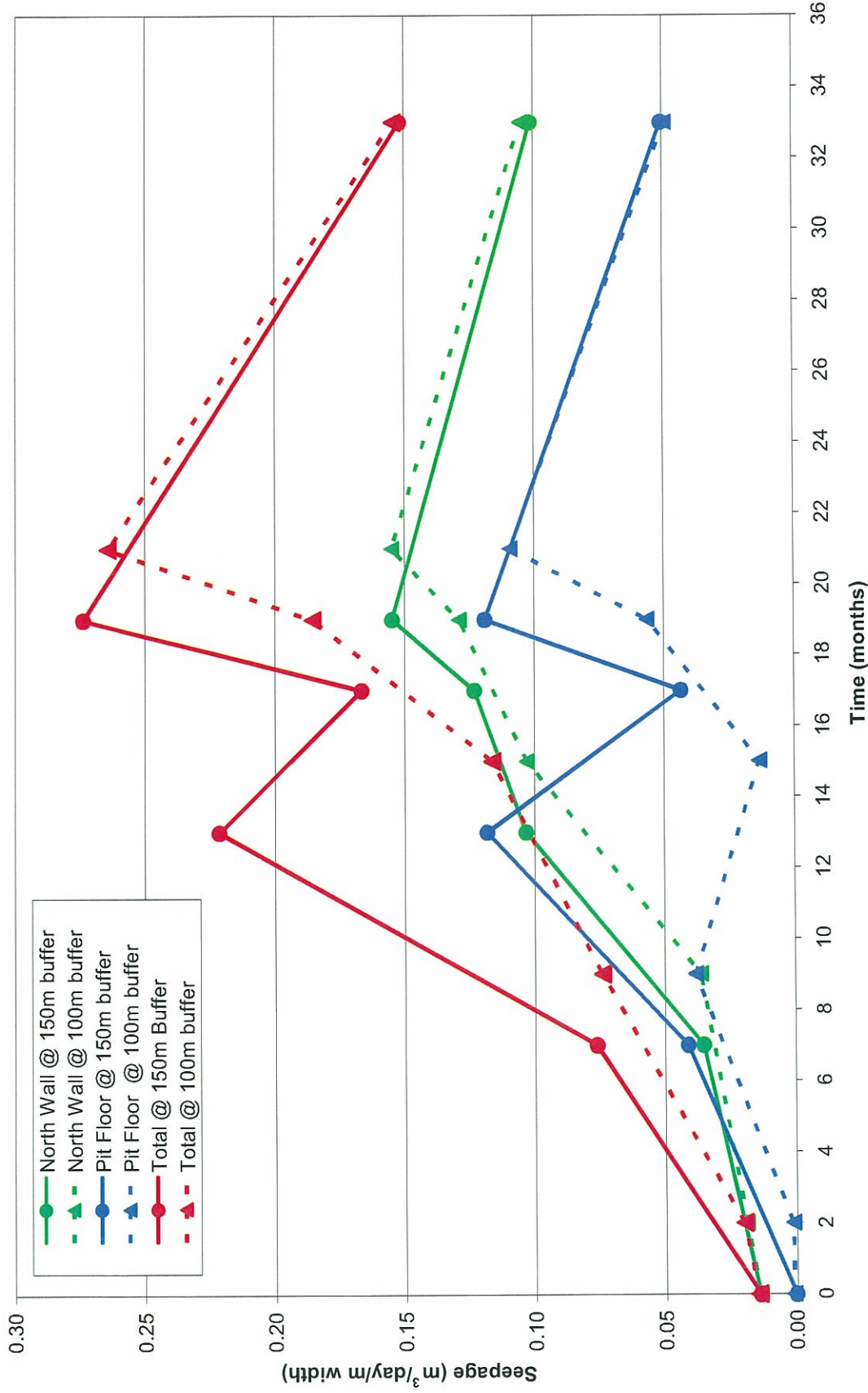
NOTES:

- Hydraulic head contours and the water table are interpretations only, based on limited data and various assumptions. Other interpretations are possible.
- Structure contours for the base of the Mt Arthur Seam were estimated from ERM (2008b).
- Structure contours for the base of the Vaux Seam were estimated from MMA (1992).



drawn	PT
approved	RJB
date	11 Aug 2008
scale	N/A
original size	A4

client:	Rio Tinto Coal Australia
project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
title:	HYDROGEOLOGICAL CROSS SECTION B (HYDRAULIC HEADS AT 17.09.07)
project no:	GEOTLCOV23511AA-AC
figure no:	FIGURE 5b

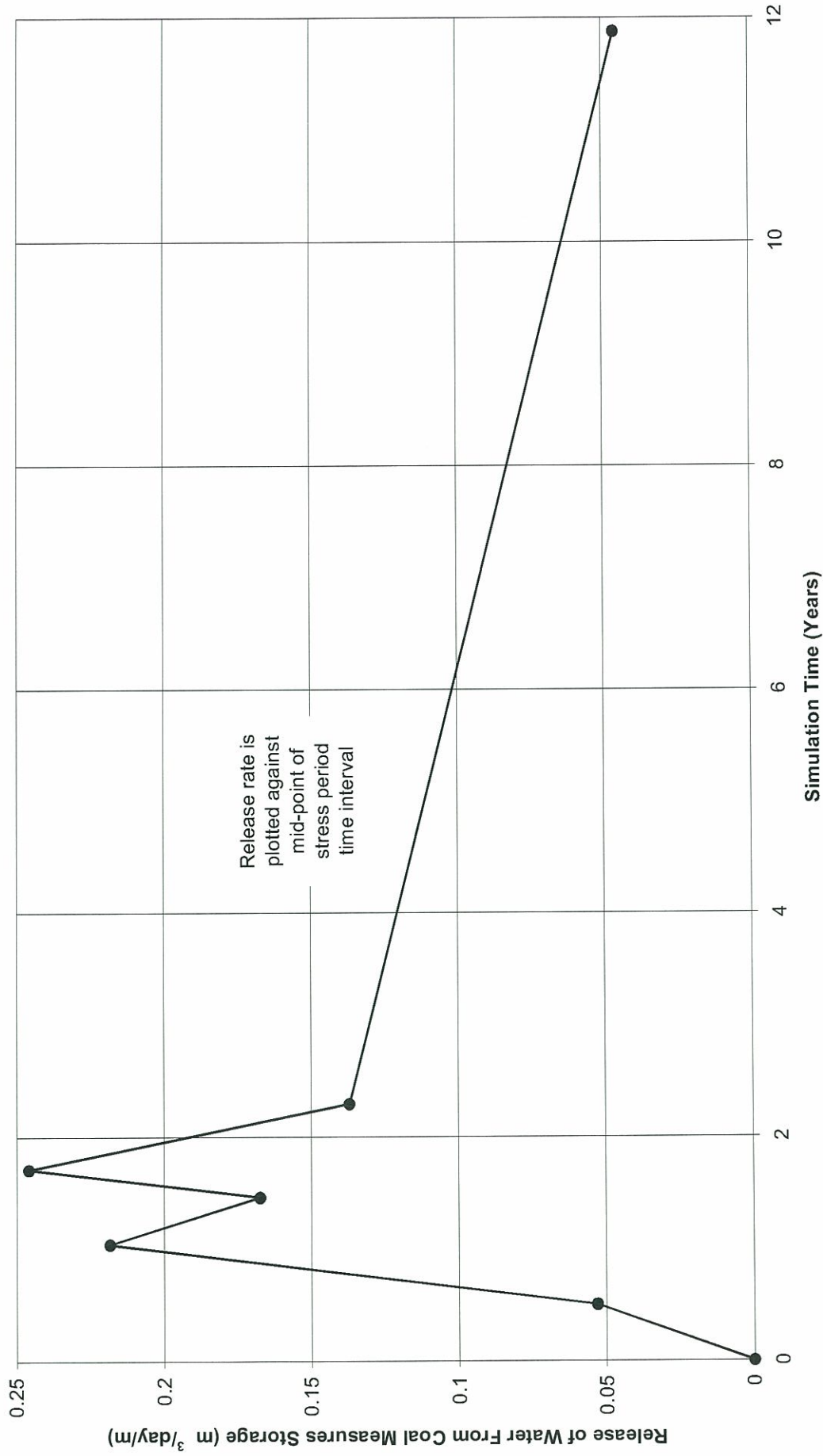


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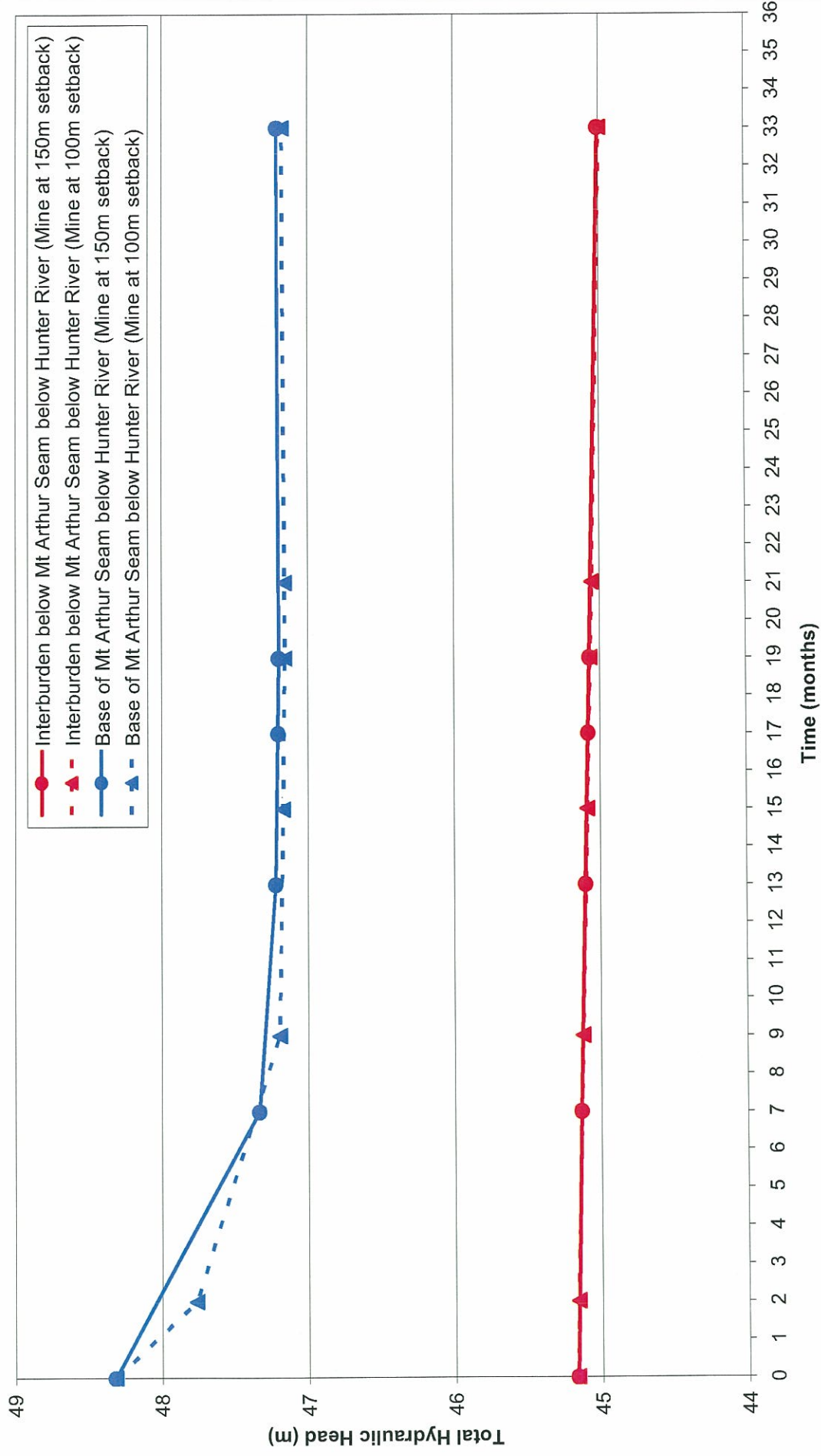
- Groundwater inflow from the pit floor is calculated for the floor interval (along the cross section) from the toe of the northern highwall to chainage 500m on the model cross sections (see Appendix A).
- Modelled seepage rates are plotted against the end of the stress period time interval.



drawn	JA	client:	Rio Tinto Coal Australia
approved	PT	project:	HVO South Coal Project
date	29 July 2008		Cheshunt Pit
scale	N/A		Preliminary Groundwater Study
original size	A4	title:	MODELLED GROUNDWATER INFLOWS VERSUS
			TIME FOR THE CHESHUNT PIT
		project no:	GEOTLCOV/23511AA-AC
		figure no:	FIGURE 6



drawn	PT	client: Rio Tinto Coal Australia	
approved	RJB	project: HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study	
date	12 Aug 2008	title: MODELLED DISCHARGE FROM COAL MEASURES STORAGE VERSUS TIME FOR THE CHESHUNT PIT	
scale	N/A	figure no: FIGURE 7	
original size	A4	project no: GEOTLCOV23511AA-AC	



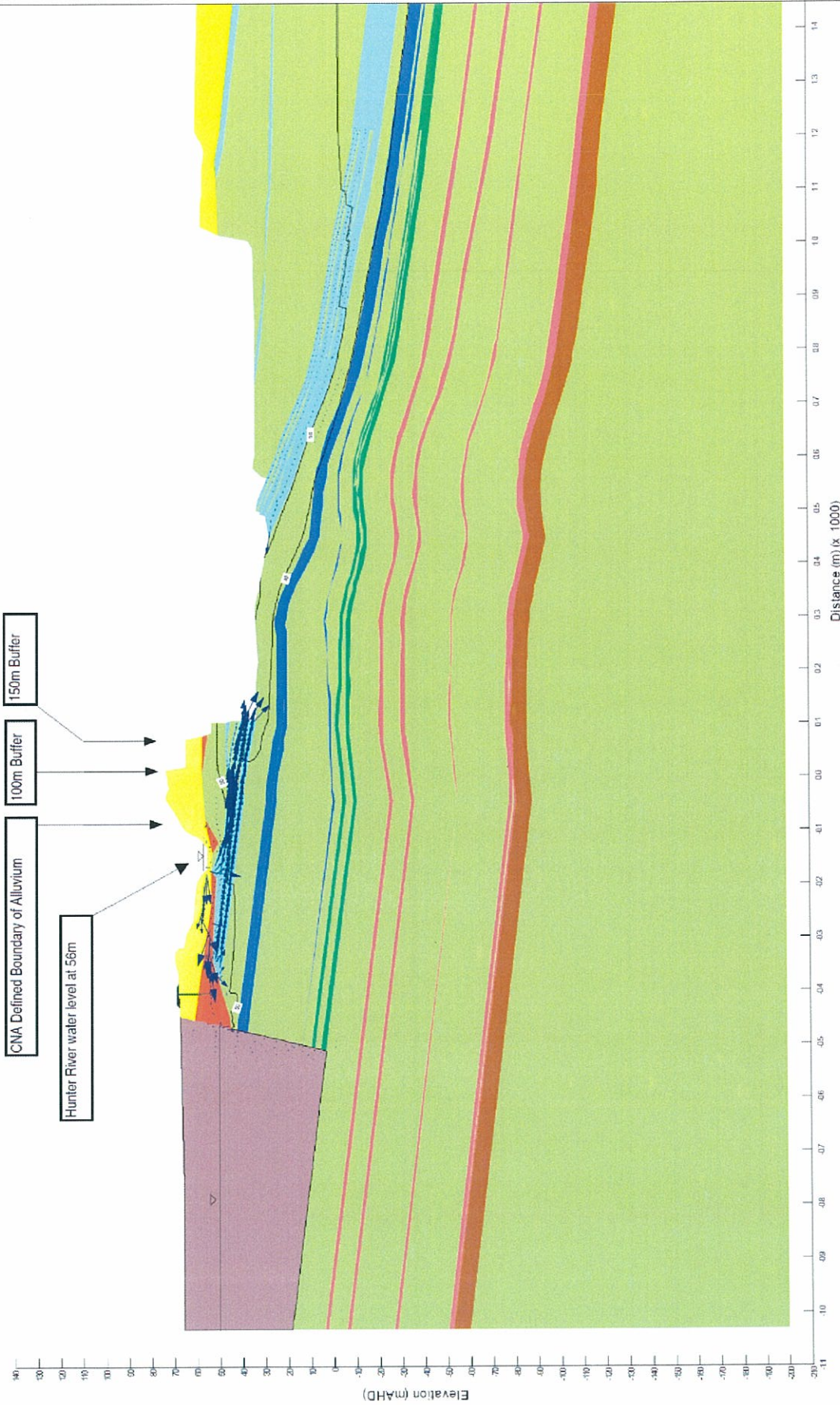
NOTES:

1. Modelled hydraulic heads are plotted against the end of the stress period time interval.

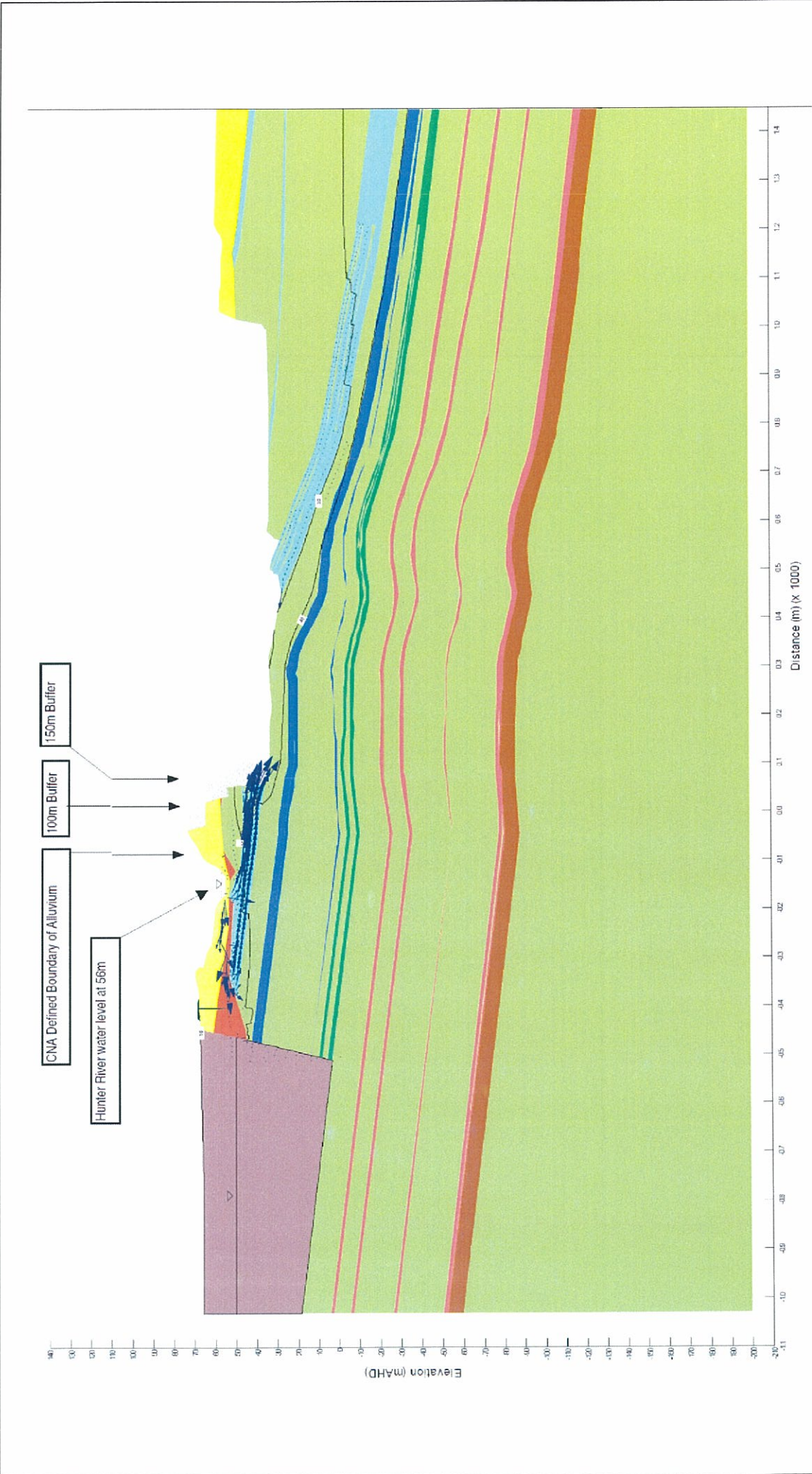
drawn approved date scale original size JA PT 29 July 2008 N/A A4	client: Rio Tinto Coal Australia project: HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study title: MODELLED HYDRAULIC HEADS VERSUS TIME FOR THE CHESHUNT PIT project no: GEOTLCOV23511AA-AC	
	coffey geotechnics SPECIALISTS MANAGING THE EARTH	
	figure no: FIGURE 8	

Appendix A

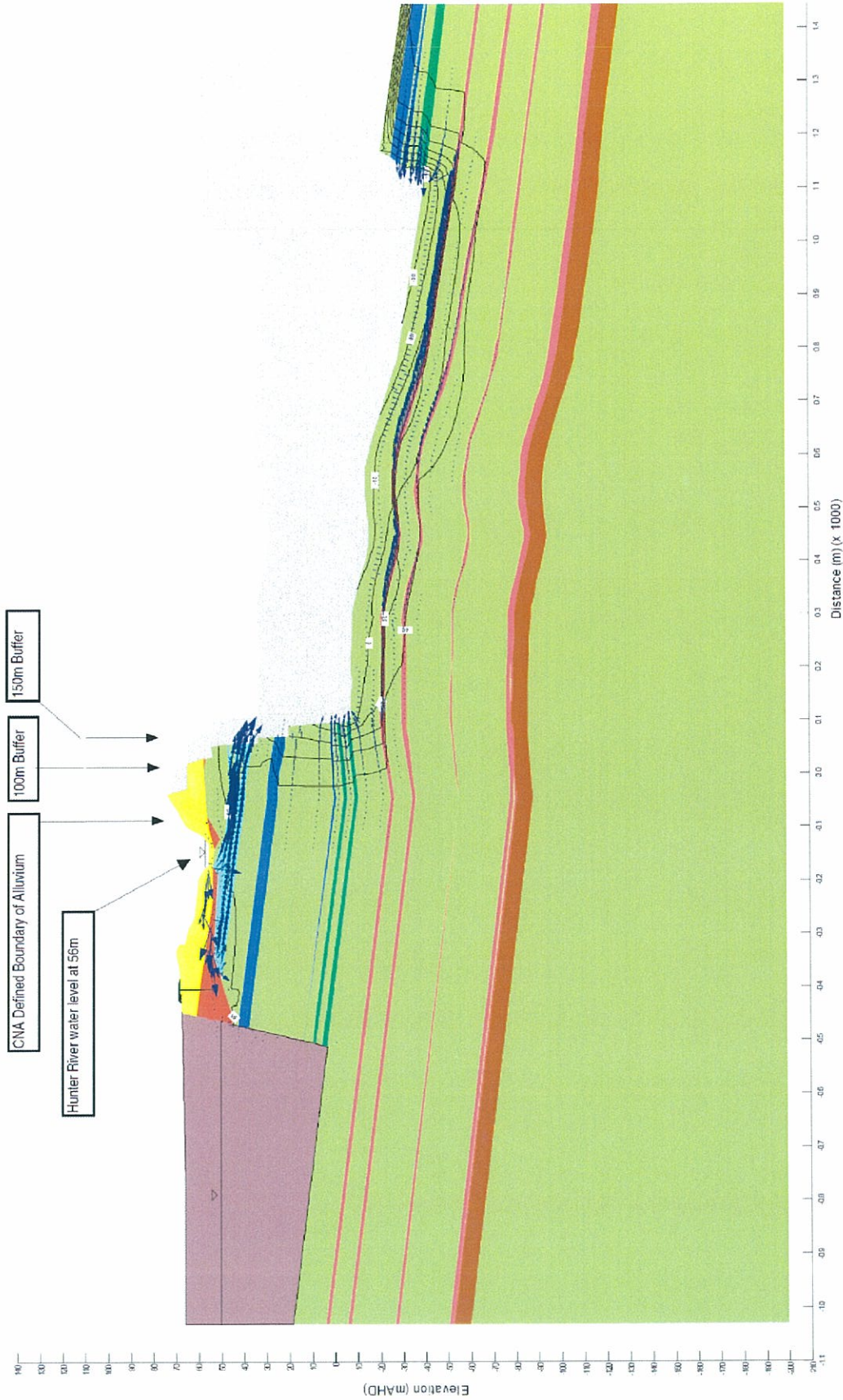
Modelled Hydraulic Head Contours (Transient Model 2)



		client: Rio Tinto Coal Australia	
drawn	JA	project: HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study	
approved	PT	title: MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK START (STEADY STATE - BASE OF MT ARTHUR)	
date	29 July 2008	project no: GEOTLCOV23511AA-AC	
scale	N/A	figure no: FIGURE A1	
original size	A4		



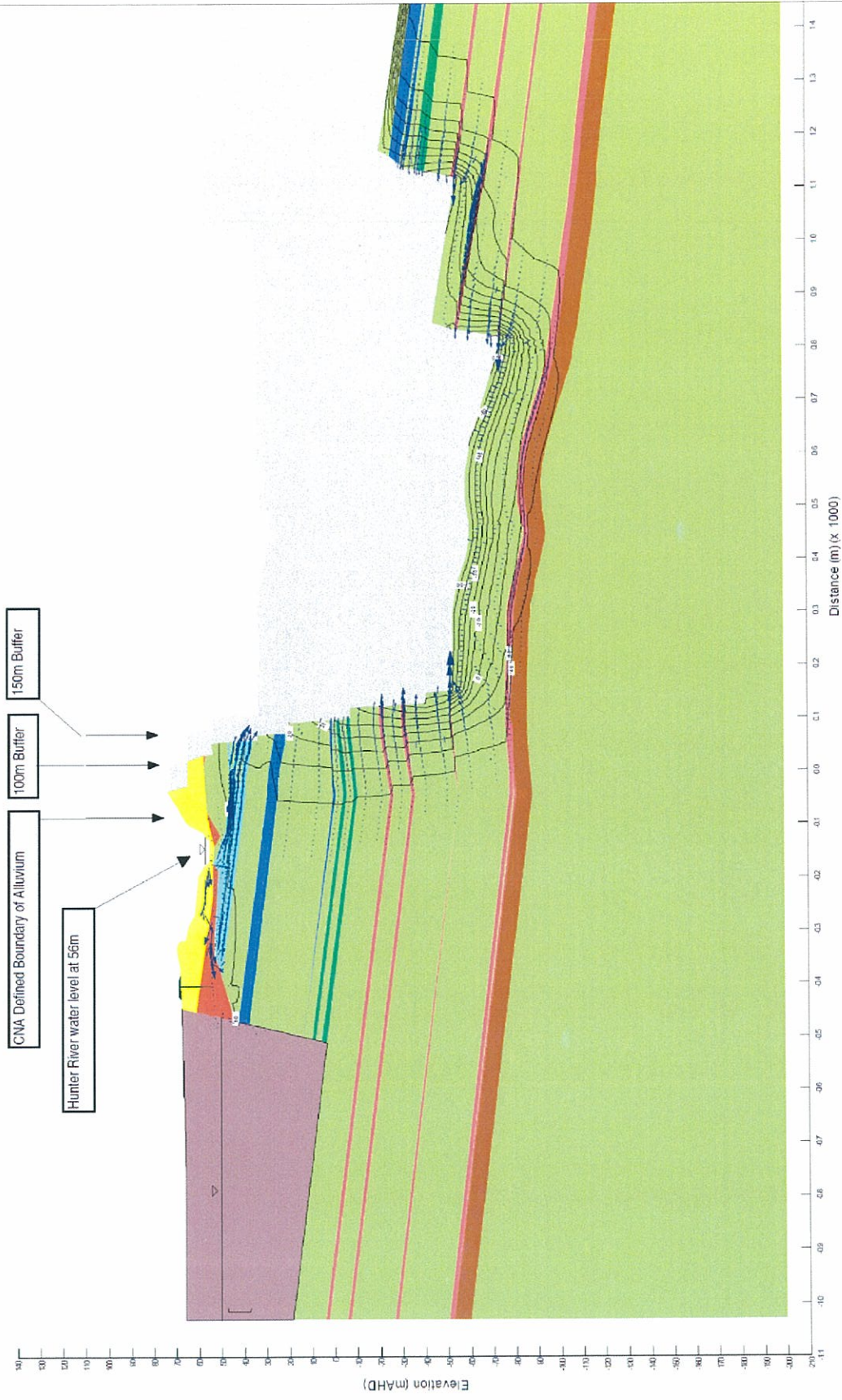
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approved	PT	project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
date	29 July 2008	title:	MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK 2 MONTHS (50m BUFFER SLICE REMOVED)
scale	N/A	project no:	GEOTLCOV23511AA-AC
original size	A4	figure no:	FIGURE A2



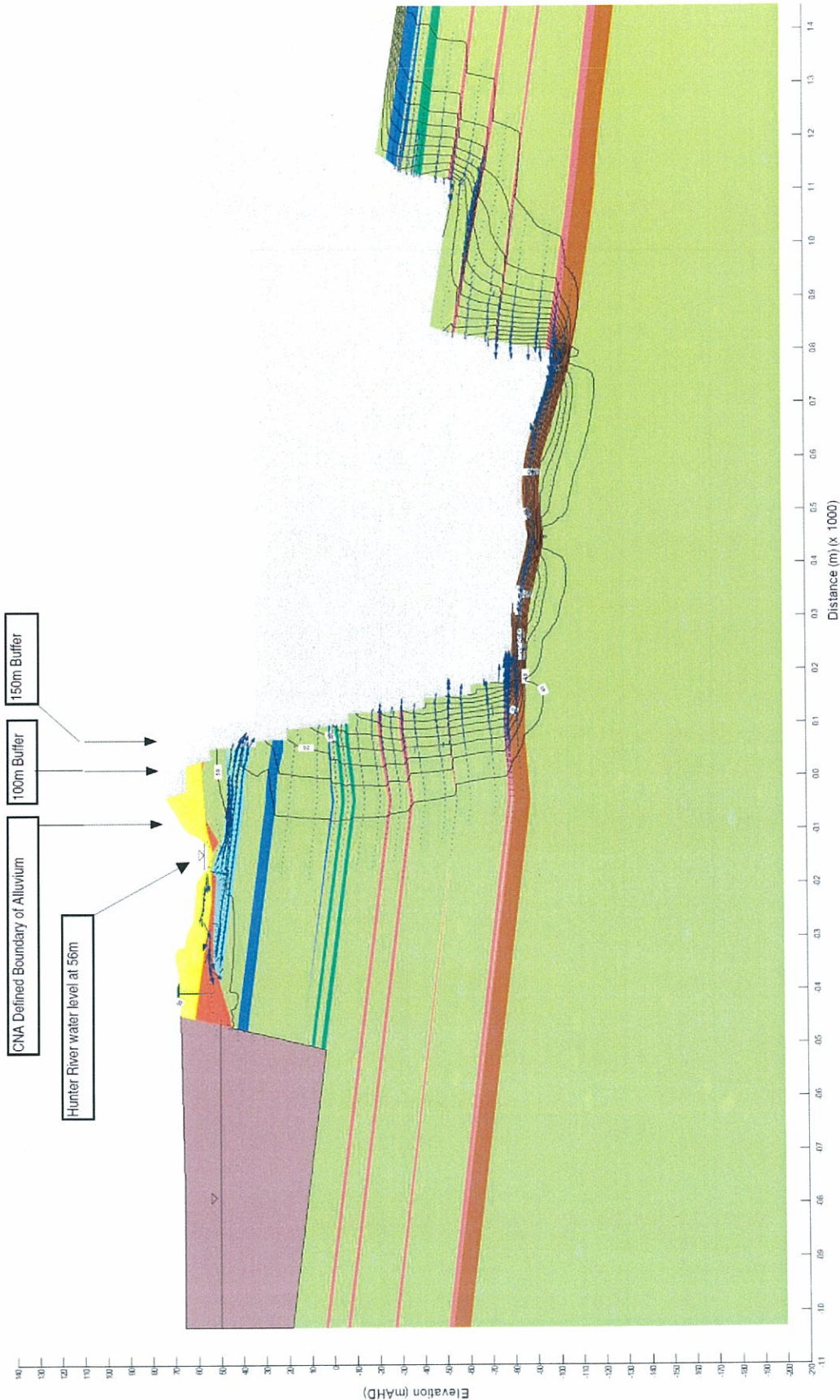
drawn	JA
approved	PT
date	29 July 2008
scale	N/A
original size	A4

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client:	Rio Tinto Coal Australia
project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
title:	MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK 9 MONTHS (BASE OF VAUX)
project no:	GEOTLCOV23511AA-AC
figure no:	FIGURE A3

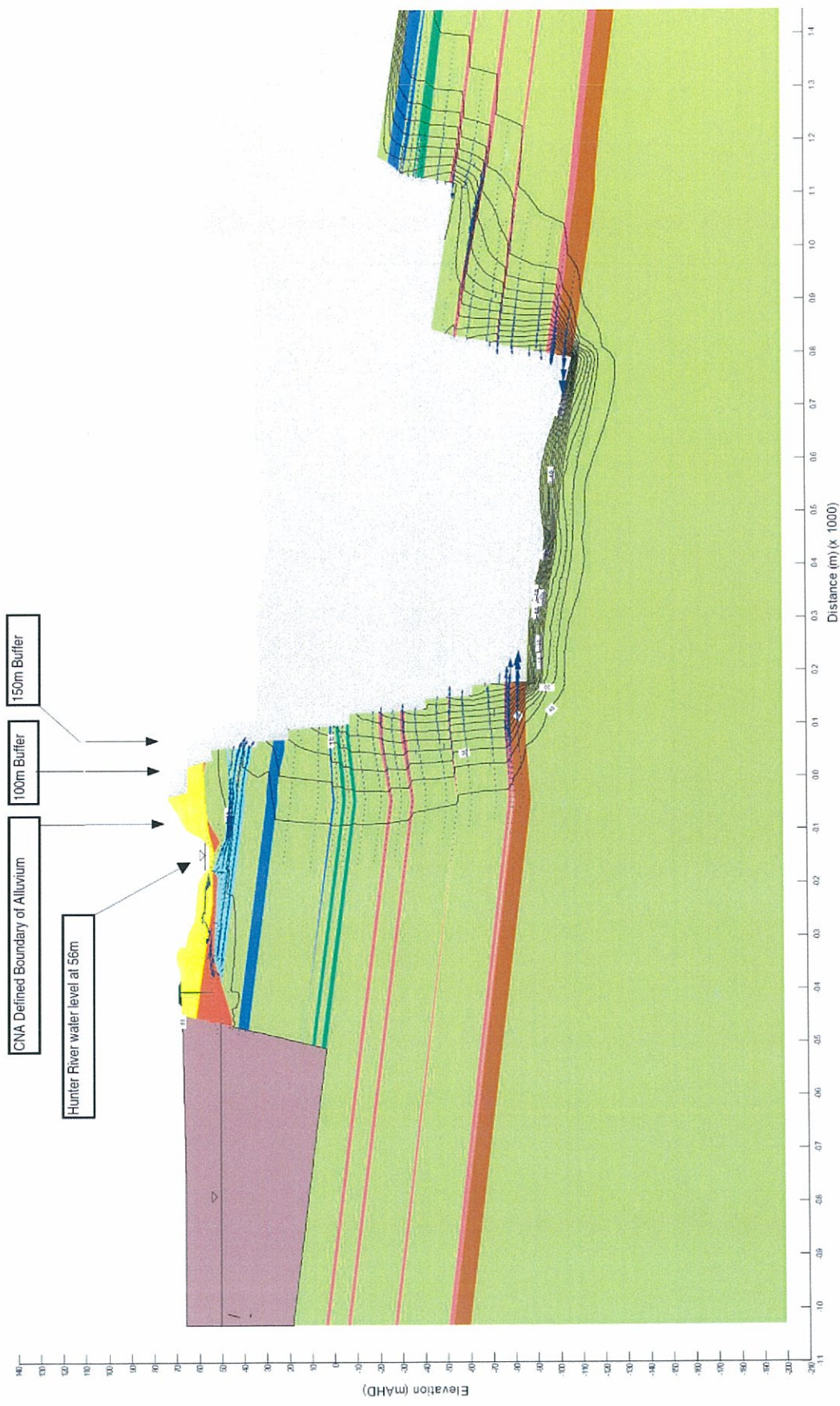


drawn	JA			client:	Rio Tinto Coal Australia
approved	PT			project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
date	29 July 2008			title:	MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK 13 MONTHS (BASE OF MIDDLE BROONIE)
scale	N/A			project no:	GEOTLCOV23511AA-AC
original size	A4			figure no:	FIGURE A4

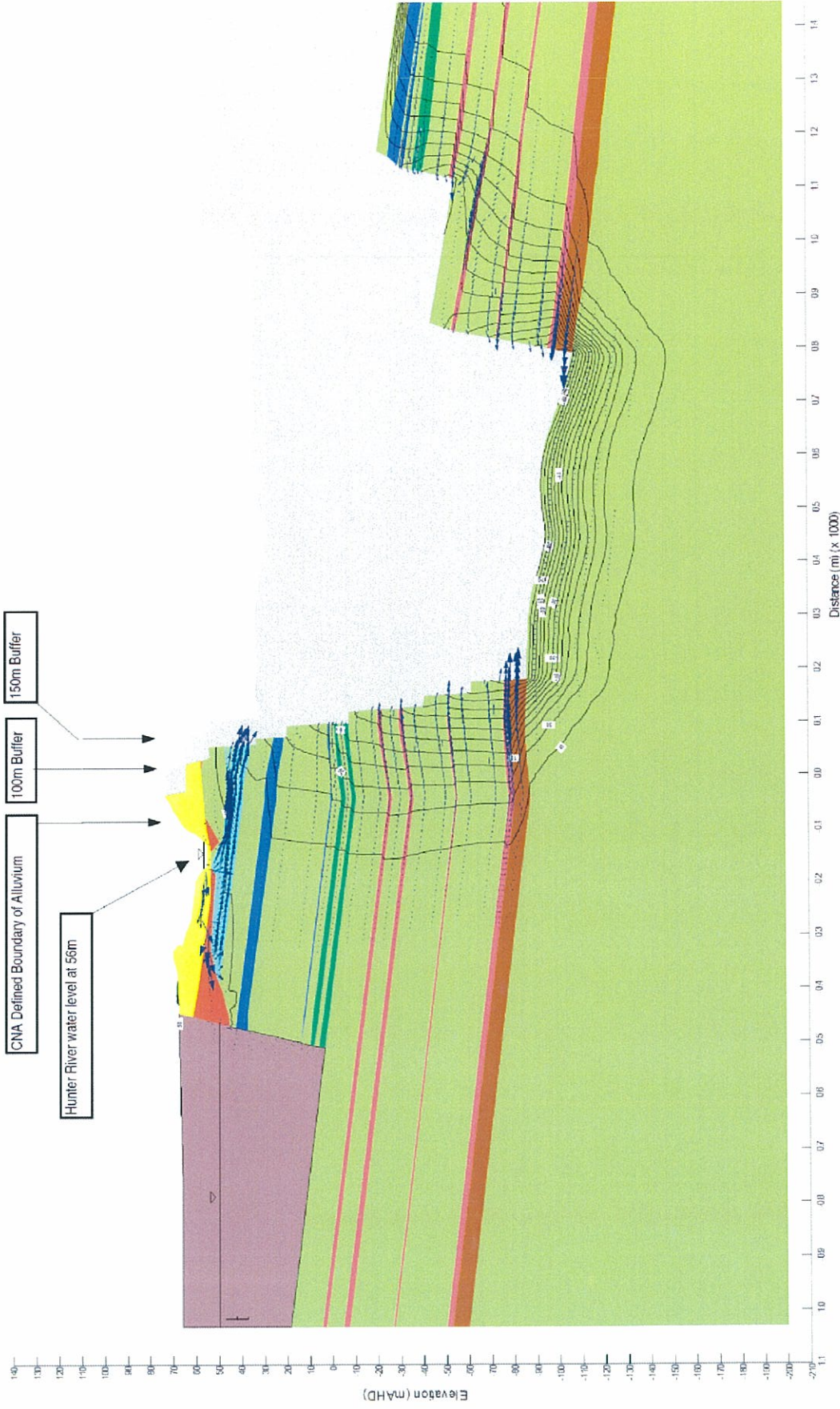


drawn	JA	client:	Rio Tinto Coal Australia
approved	PT	project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
date	29 July 2008	title:	MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK 19 MONTHS (BASE OF LOWER BROONIE)
scale	N/A	project no:	GEOTLCOV23511AA-AC
original size	A4	figure no:	FIGURE A5

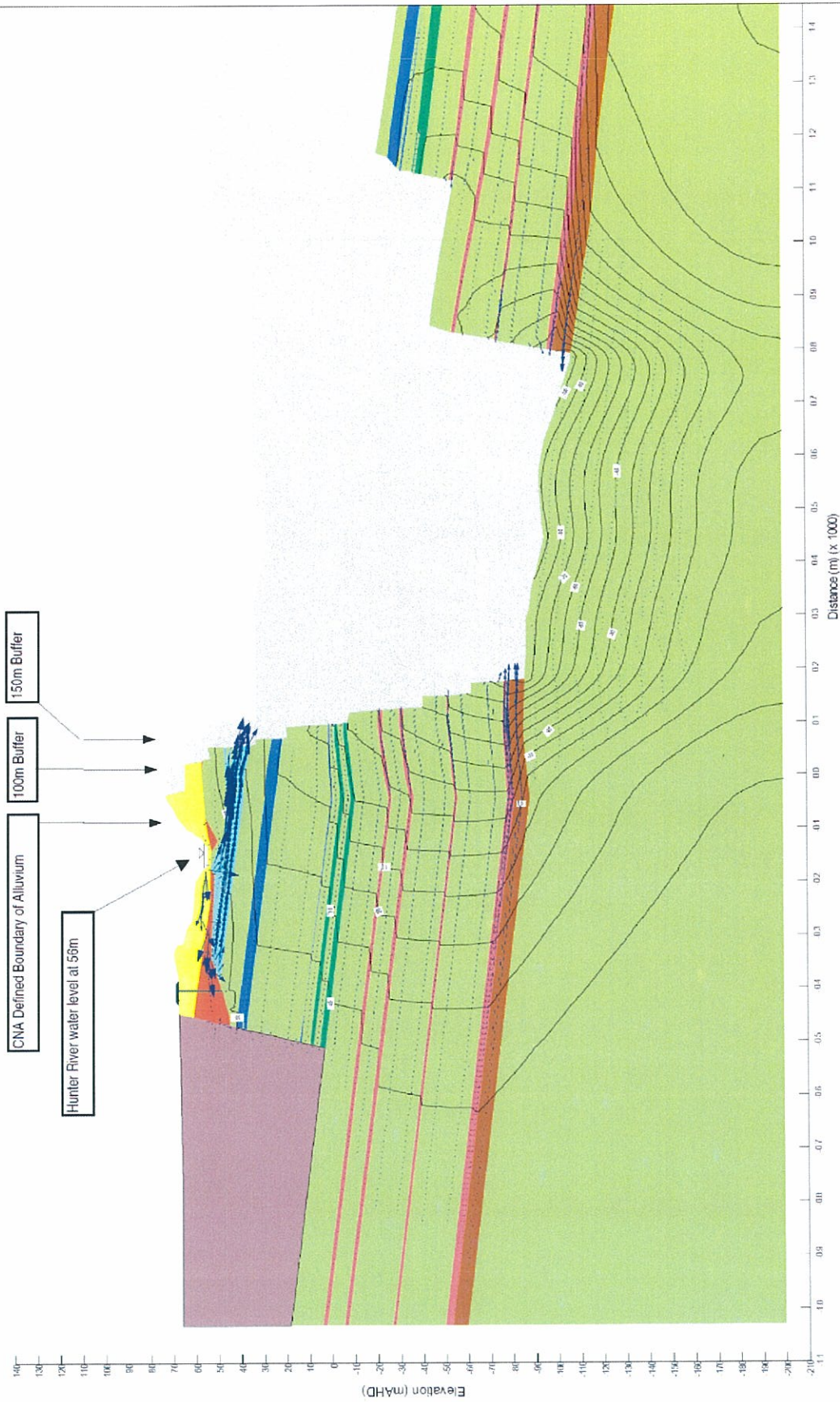




	drawn	JA	client:	Rio Tinto Coal Australia
	approved	PT	project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
	date	29 July 2008	title:	MODELLLED TOTAL HYDRAULIC HEAD - 100m SETBACK 21 MONTHS (BASE OF BAYS WATER)
	scale	N/A	project no:	GEOTLCOV23511AA-AC
	original size	A4	figure no:	FIGURE A6



drawn	JA	client:	Rio Tinto Coal Australia
approved	PT	project:	HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study
date	29 July 2008	title:	MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK 33 MONTHS (BASE OF BAYSWATER)
scale	N/A	project no:	GEOTLCOV23511AA-AC
original size	A4	figure no:	FIGURE A7



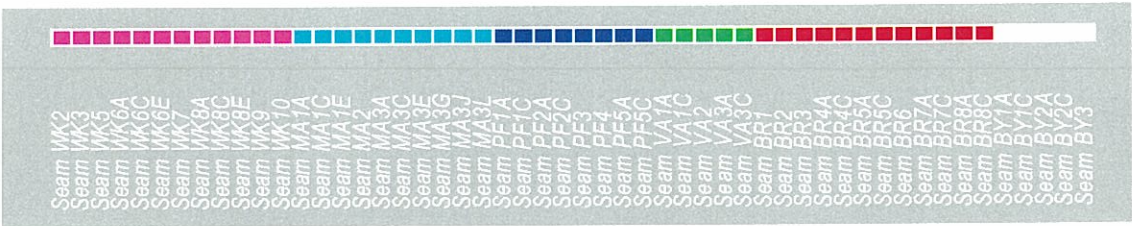
drawn JA approved PT date 29 July 2008 scale N/A original size A4	client: Rio Tinto Coal Australia	
	project: HVO South Coal Project Cheshunt Pit Preliminary Groundwater Study	
	title: MODELLED TOTAL HYDRAULIC HEAD - 100m SETBACK 21 YEARS (BASE OF BAYSWATER)	
	project no: GEOTLCOV23511AA-AC	
	figure no: FIGURE A8	

Appendix B

Geological Resource Model Stratigraphy of Cross-Section N2

**RIO TINTO COAL AUSTRALIA
CHESHUNT PIT
GEOLOGICAL RESOURCE MODEL
CROSS-SECTION N2**

KEY:



- NOTES:**
1. Cross section is 2,500m long (refer to Figure 2 for location).
 2. Vertical to horizontal scale = 1:4.

Attachment C

Summary of Relevant NSW Water Legislation, Plans and Guidelines

	Name of Act	Application to HVO South
1	<i>Water Act 1912</i>	The <i>Water Act 1912</i> is administered by Department of Water and Energy (DWE) and under this Act, a licence is required if water is extracted from a creek or if any waterways are proposed to be realigned. Water Access Licences will be applied for after Part 3A approval issued. Current licences to pump water from the Hunter River are expected to be adequate.
2	<i>Water Management Act 2000</i>	The <i>Water Management Act 2000</i> (WM Act) incorporates the provisions of various acts relating to the management of surface and groundwater in NSW, and provides a single statute for the regulation of water use and works that affect surface and groundwater, both marine and fresh. Parts of the <i>WM Act</i> commenced on 1 January 2001. Since 1 July 2004 the new licensing and approval system has been in effect in the areas of NSW covered by 36 operational water sharing plans. There is an operational water sharing plan for the 'Hunter Regulated River Water Source' which commenced on 1 July 2004. It regulates the Hunter River from Glenbawn Dam to Maitland. The HVO South Coal Project involves the continued extraction of water from the Hunter Regulated River Water Source which is subject to the Water Sharing Plan for the Hunter Regulated River Water Source 2003. The licensing provisions of the <i>WM Act</i> therefore apply to the Project to the extent that the Project involves the continued extraction of water from the Hunter Regulated River Water Source. There is no <i>EP&A Act</i> exemption from the requirement to hold a water access licence under the <i>WM Act</i> and <i>Water Management Regulations 2004</i>, and therefore an allocation for proposed water extraction under a water access licence will be required concurrently with or subsequent to the Part 3A approval process.

3	HRRWSP 2004	Under the <i>WM Act</i>, the <i>Water Sharing Plan for the Hunter Regulated River Water Source</i> (DIPNR, 2004) applies to the Hunter River from Glenbawn Dam to Maitland, and relates to the management of water access licences and allocations dependent upon available water determinations. The <i>Water Act</i>, <i>WM Act</i> and therefore the HRRWSP 2004, where they apply, regulate the licencing of water seepage into pit from hard rock aquifers and water seepage into pit from alluvial aquifers associated with the Hunter River. Legal advice obtained by CNA states: • The application of the HRRWSP is limited to water occurring naturally in the unconsolidated alluvial sediments within 40 metres of the highest bank of the Hunter River and any of its regulated river or tributaries. • The water source within the proposed HVO South Coal Project mine pits are not subject to the HRRWSP because the plans indicate that the pits are greater than 40 metres from the highest bank of the Hunter River.
4	HURWSP (Draft 2008)	The draft HURWSP was only released for public comment in March 2008. We understand that DWE does not envisage the gazettal of this WSP until 2009. This document does not currently apply in its draft form and is subject to change and will therefore be considered completely when it is enacted.
5	<i>Draft Stream/aquifer Guidelines for Management of Stream/aquifer Systems in Coal Mining Developments</i> (DIPNR, April 2005)	The DIPNR <i>Draft Stream/aquifer Guidelines for Management of Stream/aquifer Systems in Coal Mining Developments</i> (DIPNR, April 2005) reference a notification zone of 150 m between the highwall of opencut mining and streams or associated alluvial zones (buffer zone). Specific merit based assessments are required for any proposed reduction of this buffer zone. A merit assessment has been undertaken as part of the studies referenced in Attachment B. CNA understand that these Guidelines are only in draft form despite having been published in April 2005 and have no statutory force.
6	<i>Rivers and Foreshore Improvements Act 1948</i>	The Act was repealed by Schedule 7 to the Water Management Act 2000 No 92 with effect from 4 February 2008.

Attachment D
Application of the Hunter Regulated River Water Sharing Plan

DWE state in its letter of 30 July 2008 that *“the regulated Hunter River is governed under the Hunter Regulated River Water Sharing Plan (HRRWSP). A basic tenet of all water sharing plans across NSW is the prohibition of transfer of water between water sources. In accordance with this policy, the HRRWSP does not recognise the transfer of regulated river water to another source”*.

CNA has obtained legal advice on the application of the Water Sharing Plan on its operations. A summary of this advice is attached (Appendix D1) and states that:

- The application of the HRRWSP is limited to water occurring naturally in the unconsolidated alluvial sediments within 40 metres of the highest bank of the Hunter River and any of its regulated river or tributaries.
- The water source within the proposed HVO South Coal Project mine pits are not subject to the HRRWSP because the plans indicate that the pits are greater than 40 metres from the highest bank of the Hunter River.

Based on the interpretation provided by this legal advice, CNA believe that the HRRWSP does not apply to *water seepage* (if any) into a pit from hard rock aquifers and/or from alluvial aquifers associated with the Hunter River and its prescribed tributaries. However, as documented in the Statement of Commitments for the HVO South Coal Project EA (Page 380), CNA has committed to “Offset seepage to pits in accordance with regulatory requirements”.

The mechanisms to achieve these offsets may include the utilisation of exiting water supply licences held by CNA, the purchase of existing water licences if possible from the water market or other suitable arrangements. CNA is seeking to discuss appropriate mechanisms with DWE.

CNA expert consultants have undertaken modelling of predicted leakage and have endeavoured to investigate methods to monitor leakage across HVO South. The requests from DWE in relation to monitoring reports and response mechanisms to account for surface flow loss, or loss of saturated head in connected alluviums are being addressed through investigations into appropriate mechanisms to enable CNA to comply with the requests.

It is important to recognise that the HVO South Coal Project is requesting approval for ongoing operations at HVO South along with extensions to mining in the existing open cut mines. In many instances DWE is referencing requests in relation to existing approved operations that were approved and commenced prior to the WM Act and prior to the proclamation of the HRRWSP in 2004. These requests are therefore in relation to existing open cut mines. The existing licences will be required to be modified once the HVO South Coal Project is approved at which time DWE requests can be satisfied in further detail if required.

29 August 2008

AURORA PLACE 88 PHILLIP STREET SYDNEY
GPO BOX 521 SYDNEY NSW 2001 AUSTRALIA
DX 117 SYDNEY www.minterellison.com
TELEPHONE +61 2 9921 8888 FACSIMILE +61 2 9921 8123

BY E-MAIL: Anna.McMullen@riotinto.com

Anna McMullen
Environmental Coordinator – Project Approvals
Hunter Valley Services
Rio Tinto Coal Australia

Dear Anna,

Hunter Valley Operations - South Coal Project

1. Introduction

- 1.1 We refer to recent correspondence between Coal & Allied ('CNA'), the NSW Department of Planning ('DoP') and the NSW Department of Water and Energy ('DWE') in relation to the Hunter Valley Operations - South Coal Project ('HVO South') and its potential impact on the Hunter River and Wollombi Brook.
- 1.2 CNA has requested legal advice in relation to the application of the *Water Sharing Plan for the Hunter Regulated River Water Source 2003* ('**Hunter River Water Sharing Plan**') and the *Draft Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2008* ('**Draft Hunter Unregulated and Alluvial Water Sharing Plan**') on mining operations at HVO South.

2. Hunter River Water Sharing Plan

- 2.1 The Hunter River Water Sharing Plan commenced operation on the date of its proclamation on 1 July 2004 (see NSW Government Gazette No. 110, 1 July 2004).
- 2.2 All water sharing plans in NSW are made pursuant to the *Water Management Act 2000* ('**WM Act**'). In general, the WM Act and these water sharing plans govern activities associated with water sources in NSW.
- 2.3 Relevantly, the Dictionary in the WM Act defines *water source* as "*the whole or any part of:*
 - (a) *one or more rivers, lakes or estuaries, or*
 - (b) *one or more places where water occurs naturally on or below the surface of the ground,**and includes the coastal waters of the State.*"

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- 2.4 By virtue of clause 4 of the Hunter River Water Sharing Plan this plan only applies to a discrete body of water. Clause 4 is titled '*Area and waters to which this Plan applies*' and it limits the application of the Hunter River Water Sharing Plan in the following manner:

"(1) The water source in respect of which this Plan is made is:

- (a) between the banks of all rivers, from the upstream limit of Glenbawn Dam water storage downstream to the estuary of the Hunter River, and from the upstream limit of Glennies Creek Dam water storage downstream to the junction with the Hunter River; which at the date of commencement of this Plan have been declared by the Minister to be regulated rivers, and*
- (b) the unconsolidated alluvial sediments underlying the waterfront land of all rivers referred to in subclause (a), except those unconsolidated alluvial sediments within one metre of works taking water pursuant to licences issued under Part 5 of the Water Act 1912 or their equivalent aquifer access licences issued under the Act.*

Note. A regulated river is a river that has been declared by the Minister, by order published in the New South Wales Government Gazette, to be a regulated river.

Note. The regulated rivers referred to in subclause (1) are listed in Appendix 1.

Note. Waterfront land has the meaning defined in the Act.

...' [emphasis added]

- 2.5 Pursuant to section 5 of the WM Act, definitions in the Act are incorporated into the Hunter River Water Sharing Plan. Therefore, for the purposes of determining the application of the Hunter River Water Sharing Plan to mining operations at HVO South the term '*waterfront land*' is defined to mean:

- "(a) the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the highest bank of the river, or*
- (a1) the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or*
- (a2) the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the estuary, or*
- (b) if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the coastal waters,*

where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into 2 or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land."

[emphasis added]

- 2.6 In light of the above definition, the application of the Hunter River Water Sharing Plan is limited to water occurring naturally in the unconsolidated alluvial sediments within 40 metres of the highest bank of the Hunter River and any of its prescribed tributaries.
- 2.7 We understand and have assumed that all CNA open cut mine excavations at HVO South are *"generally greater than 40 metres from the highest bank of the Hunter River"*. Therefore, it appears that *'generally'* the HVO mine pits are not subject to the Hunter River Water Sharing Plan.
- 2.8 The sections set out above generally relate to the land (eg. river beds and waterfront land) over or through which this water source flows. However, Hunter River Water Sharing Plan does not purport to govern all water that has the potential to or once flowed through this water source. Water outside the boundary as described above in clause 4 of the Hunter River Water Sharing Plan is not governed by the Plan.
- 3. Draft Hunter Unregulated and Alluvial Water Sharing Plan**
- 3.1 In addition to the Hunter River Water Sharing Plan, DWE is proposing to introduce the Draft Hunter Unregulated and Alluvial Water Sharing Plan.
- 3.2 The Draft Hunter Unregulated and Alluvial Water Sharing Plan was on public exhibition between March 2008 and 2 May 2008. We note from a recent conversation with a representative from the Newcastle Office of DWE, that DWE proposes that the Draft Hunter Unregulated and Alluvial Water Sharing Plan be gazetted in March 2009 and commence operation on 1 July 2009. Accordingly, the commencement of this plan and its application to mining at HVO South remains uncertain.
- 3.3 Further, the WM Act provides that water sharing plans only take effect once proclaimed. There is also no requirement in the WM Act to consider draft water sharing plans before these plans are proclaimed. In addition, the final form of the Hunter Unregulated and Alluvial Water Sharing Plan may not reflect the current version of the plan that CNA is being asked to address at this point in time.

If you have any questions in relation to this letter please contact Penny Murray at this office.

Yours faithfully
MINTER ELLISON



Penny Murray
Partner

Contact: Kate Addinall Direct phone: +61 2 9921 4866 Direct fax: +61 2 9921 8287
Email: kate.addinall@minterellison.com
Partner responsible: Penny Murray Direct phone: +61 2 9921 4868
Our reference: BF:PXH:20-5526418

Attachment E

Application of Draft Stream/Aquifer Guidelines for Management of Stream/Aquifer Systems in Coal Mining Developments (DIPNR, April 2005)

The DWE in its letter of 30 July 2008 reiterates that there is a "significant risk" associated with any reduction of the existing 150 m buffer zone.

As far as CNA is aware this buffer zone is only referenced in the DIPNR *Draft Stream/Aquifer Guidelines for Management of Stream/Aquifer Systems in Coal Mining Developments* (DIPNR, April 2005) as a notification zone of 150 m between the highwall of open cut mining and streams or associated alluvial zones (buffer zone). CNA understand that these Guidelines are only in draft form despite having been published in April 2005 and have no statutory force. Nevertheless, CNA have considered the draft Guidelines and submit that the draft Guidelines permit or contemplate a reduction in the buffer zone if a require specific merit based assessment suggests it is acceptable. Hence in accordance with the draft Guidelines, CNA conducted a specific and detailed merit assessment to provide evidence of negligible impact to justify a reduction of the buffer zone.

To date there is no contrary evidence to CNA's expert evidence that suggests the risk is significant or that otherwise disagrees with the expert assessment.

The DWE state that they are concerned that the *"potential impacts to all water users in Zone 1 of the HRRWSP which would result from permanent increase of induced seepage flow from the regulated Hunter River water source and connected alluvium into the mine pit, have not been addressed in the RTCA response."*

The HVO South Coal Project EA Report has shown that the increase in leakage along the section of the Hunter River that adjoins HVO is minimal and accordingly CNA submit that this concern has already been addressed by CNA.

Furthermore, it is understood that the 150 m buffer zone referenced in the draft Guidelines was arbitrarily defined to be twice the width of a zone in which fracturing could in principle be induced by blasting, such width being assumed to be 75 m. CNA is not aware, despite diligent enquiries, of any evidence for this distance. As such, CNA is researching the foundation for the 150 m requirement and 75 m impact zone to assess the actual and likely fracturing from blasting. Outcomes of this research will be provided to both DoP and DWE when it is completed. This information should support the establishment of an evidence based and scientifically valid buffer zone.

CNA has also completed further geotechnical studies to assess the risk of wall failure within the zone between Cheshunt Pit and the Hunter River. Results of this study indicate that a suitable factor of safety against failure can be obtained under the current design and the conservative groundwater assumptions made. CNA consider the current pit wall design to be conservative, and are confident that the same conclusion with regard to stability would be reached if the buffer zone was reduced.

Attachment G
CNA Letter of Response to DoP dated 15 September 2008



15 September 2008

David Kitto
Department of Planning
GPO Box 39
SYDNEY NSW 2000
AUSTRALIA

Dear David,

RE: HVO SOUTH COAL PROJECT – RESPONSE TO SUBMISSIONS

The Hunter Valley Operations South Coal Project (MP 06_0108) Response to Submissions report was submitted to the Department of Planning (DoP) on the 10th of July, 2008 and forwarded at your request to the following on the 15th of July, 2008:

- Department of Climate Change (DECC);
- Department of Water and Energy (DWE);
- Department of Primary Industries;
- Department of Lands;
- Roads and Traffic Authority; and
- Singleton Shire Council.

As advised in your 4th of August 2008 letter, the DoP has reviewed the Response to Submissions Report and believes that in all but one instance, Coal & Allied (CNA) has addressed the matters raised in its letter (dated 10th of April 2008) in sufficient detail to enable the DoP's assessment of this project to proceed.

The DoP is seeking further information regarding the potential amenity impacts on the Hunter Valley Gliding Club (HVGC) members including consideration of the facilities being used for up to 72 hours at a time.

Coal & Allied Operations Pty Ltd
ABN 16 000 023 656
Lemington Road, Ravensworth via Singleton NSW 2330 Australia
PO Box 315 Singleton NSW 2330 Australia
Telephone +61 2 6570 0300 Facsimile +61 2 6570 0377

CNA acknowledges the DoP's request in regards to this issue. Consequently the results of the noise and air quality modelling undertaken for the HVO South Coal Project Environmental Assessment (EA) have been further reviewed. These results are provided with a discussion of the potential health impacts on the HVGC members. However the original mine plan that was assessed for the EA allowed for the mining of the western end of the HVGC airstrip and the relocation of the club facilities. This proposal will no longer proceed following discussions with the HVGC.

Instead CNA propose to mine around the HVGC owned land and the existing facilities will remain in the current location. As a result a new mine plan is required to be developed. This has provided an opportunity to revise the approach to mining and identify measures to minimise the potential amenity impacts to the HVGC members when they are in attendance at the club's facilities.

HVGC Amenity

As discussed with the DoP and DECC, although the HVGC is not approved as a permanent residential dwelling nor is it used as permanent residence, it is still occupied for up to 72 hours at any one time on various occasions.

For noise assessment purposes, it has been advised by the DECC and agreed by DoP that the appropriate amenity receiver category for the HVGC is an Active Recreation type of receiver. The recommended criterion in the DECC's Industrial Noise Policy (INP) for this receiver type includes an acceptable level of 55, with a maximum recommended of 60 dB(A)_{L_{eq,period}}. The upper target of 60dB(A) is the threshold for negotiation with the DECC in demonstrating that all reasonable and feasible noise mitigation has been adopted. Above this level, direct negotiation between the proponent and the receiver is required according to the INP.

For air quality assessment purposes, the DECC has advised that in accordance with the DECC 2005 guideline, *Approved Methods and Guidance for Modelling and Assessment of Air Pollutants in NSW*, the HVGC should be categorised as a Sensitive Receiver. (Refer copy of email correspondence 28th of July, 2008 attached). DECC criteria for a Sensitive Receiver has been considered below.

In accordance with DECC's suggestion, CNA propose to develop an Amenity Management Plan for HVGC to manage potential issues at the HVGC in view of the fact that the HVGC land is not continuously occupied and to further reduce the risk of adverse impacts on the amenity of the HVGC members.

The Amenity Management Plan for HVGC will include a number of components as detailed following.

1 A risk assessment will be conducted to identify:

- those parts of HVGC's land requiring additional mitigation measures such as areas where the potential health impacts may occur at the HVGC ie club house and where the caravans are located;
- likely and scheduled times of occupation and high intensity use of HVGC land e.g. gliding regattas.

- weather conditions when gliding activities do not occur; and
 - weather conditions and mining operations that would have the greatest potential to generate impacts on users of the HVGC land.
- 2 The planned modification to the mine plan which will exclude the HVGC owned land will take into consideration the results of the risk assessment. As a consequence future mining activities will be sensitive to potential significant impacts on the amenity of users of the HVGC.
 - 3 Notification regime between CNA and HVGC in relation to mining activities and gliding activities.
 - 4 Further air quality and noise modelling will be conducted reflecting the modified mine plan.
 - 5 The modelling results will be used to modify mining operations where the modelling indicates the air quality and noise levels will occur above the agreed criteria.
 - 6 Management measures will be developed to ensure the mining activities are conducted in a way that ensures air quality and noise emissions are at an acceptable level.

Investigation of Management Options

Flexibility in activities will be key in the development of management options. Options will consider equipment used, location of operations and the potential for campaign mining.

For example, winds are predominately from north west during winter and south east during summer. In winter, activities may be required to be modified when mining several hundred metres to the west of the HVGC facilities (ie moved further west or in a location where dust will not be transported to the HVGC). In summer, activities may need to be modified when mining to the south of HVGC facilities.

Similar consideration will need to be given to such winds as well as south westerly winds when considering noise impacts. Summer would be the most favourable time for mining at the western end of the strip, but there may be some occasions, when mining activities may need to be modified.

It is contemplated that CNA may seek to adopt campaign mining if negotiated with the HVGC which may result in a more concentrated period of mining close to the HVGC facilities but over a shorter time period. Any agreement with the HVGC will acknowledge the potential short-term impacts of campaign mining.

Monitoring Considerations

The most appropriate form of monitoring will be considered and discussed with the HVGC and DECC. The monitoring program will be detailed in the Amenity Management Plan for the HVGC. The monitoring mechanism would need to allow for the situations when the HVGC is not attended. Furthermore the HVGC activities in themselves may result in noise and air emissions. Therefore the monitoring program and review of results will need to allow for the HVGC existing site conditions and activities of the club including the use of the tug plane and group events. A schedule of activities, including times that the HVGC expect members to be in residence overnight, will be required from the HVGC to provide appropriate interpretation and mitigation measures.

Predicted Noise and Air Quality Impacts

The expected noise levels at the HVGC club building and nearby caravan parking area that were presented in the EA Report are summarised in *Table 1*. This information was not presented in a tabulated format in the EA Report because at the time of the assessment the HVGC was not considered a Sensitive Receiver. This information has now been extracted from the modelling results for the HVO South Coal Project EA Report submitted in 2008.

Table 1 NOISE LEVELS PREDICTED AT HVGC FACILITIES

EA Report	Description	Predicted $L_{eq,15min}$ Noise Levels, dB(A) (adverse INP winds)	DECC Active Recreation Criterion, $L_{eq,period}$ (day, evening or night)
Mining Scenario			
Scenario C2	Operations occurring in three pits (including South Lemington Pit 1). Trucking approximately 1km east of HVGC, but not through HVGC. Refer to HVO South Coal Project EA Volume 2, Annex H, Figure C3	50-55	55 to 60
Scenario D	No operations in South Lemington Pit 1. Operations approximately 1.8km from the HVGC facilities. Refer to HVO South Coal Project EA Volume 2, Annex H, Figure C4.	35-40	55 to 60

Notes: 1. The $L_{eq,15minute}$ predictions provide a conservative representation of expected $L_{eq,period}$ noise from the operations.

Table 1 indicates that the DECC Active Recreation criterion are met for Scenarios C2 (approximately year 2019) and D (approximately year 2024). These represent the expected range in noise levels at the HVGC, when excluding scenarios whereby plant is working virtually in and through the HVGC airstrip.

This suggests Scenario C2 operations be used as the threshold beyond which operational management to mitigate noise should be invoked.

The modelling work undertaken¹ for the air quality assessment indicated that in 2006, when mining was approximately 800 m to the north west of the HVGC facilities (approximately the closest distance possible without intruding onto the airstrip itself), this point would have experienced:

- Maximum 24-hour PM₁₀ concentration of 100 µg/m³
- Annual average PM₁₀ concentrations of 40 µg/m³
- Annual average TSP concentration of 80 µg/m³
- Annual average dust (insoluble solids) deposition of 3.5 g/m²/month.

The predicted maximum 24-hour average PM₁₀ concentration does exceed the assessment criterion of 50 µg/m³. However future monitoring of air quality will need to consider the status of occupation of the HVGC facilities. For example this concentration may occur when the site is not occupied.

The predicted annual average PM₁₀ concentration of 40 µg/m³ is also above the assessment criterion of 30 µg/m³. However the site is not occupied on a continuous basis and so the annual average criterion cannot be related to health effects in that same way as it would at a normal community receptors.

For the other assessed scenario (Scenario B1 - approximately year 2014 when mining is taking place closest to the airstrip but not actually on the airstrip), the predictions for HVGC facilities are:

- Maximum 24-hour PM₁₀ concentrations of 140 µg/m³
- Annual average PM₁₀ concentrations of 28 µg/m³
- Annual average TSP concentration of 85 µg/m³
- Annual average dust (insoluble solids) deposition of 3 g/m²/month

Apart from the maximum 24-hour PM₁₀ concentration, which exceeds the 24-hour PM₁₀ assessment criterion of 50 µg/m³, the values are below the relevant assessment criteria.

¹ Modelling for the Environmental Assessment was undertaken with the ISCMOD model. This model is based on the US EPA's ISC-ST model, but has been modified in to improve the performance of the model in predicting short-term (24-hour) PM₁₀ concentrations. The nature of the modification and the reasons for them are explained in a paper by Holmes N, Lakmaker S and Charnock N (2007) "The performance of Dispersion Models in Predicting Maximum 24-hour PM₁₀ Concentrations from Open Cut Mines" 14th IUAPPA World Congress, Brisbane, 9-13 September, 2007.

The predicted concentration of $140 \mu\text{g}/\text{m}^3$ is above $50 \mu\text{g}/\text{m}^3$ but it is below the United States EPA standard of $150 \mu\text{g}/\text{m}^3$ (99-percentile of 24-hour concentration over a year). The $150 \mu\text{g}/\text{m}^3$ level has been referred to in recent approvals as a criterion that should not be exceeded for a cumulative concentration. Conditions of approval for mining operations have often referred to $50 \mu\text{g}/\text{m}^3$ as a level that should not be exceeded due to emissions from the mine considered in isolation and $150 \mu\text{g}/\text{m}^3$ as a level that should not be exceeded cumulatively.

These modelling results reflect the mine plan that was initially developed for the HVO South Coal Project but excludes the mining of the western end of the HVGC airstrip in order to emulate the mine plan that now needs to be developed. It can therefore be confirmed that these results presented above are indicative of the new mine plan to be developed with proposed mining operations surrounding the HVGC.

However to support the development of the Amenity Management Plan for the HVGC a new mine plan will still be developed (excluding the mining of the HVGC airstrip). Air quality and noise modelling will then be undertaken based on the new plan to confirm the results provided above. If the new modelling results do not reflect those presented above further management measures will be implemented to ensure that:

- air quality thresholds as presented following in the *Proposed Statement of Commitments Regarding HVGC – Section ii* are not exceeded at the HVGC facilities during times of occupation that have been notified by HVGC to CNA; and
- noise emissions at the occupied HVGC facilities during times of overnight occupation that have been notified by HVGC to CNA do not exceed the noise limits for Active Recreation Receiver which is an upper target of $60\text{dB(A)} L_{\text{Aeq,period}}$ when in use, pursuant to the Industrial Noise Policy.

Agreement with HVGC

The DoP requested a copy of the 2002 Agreement between CNA and the HVGC. This Agreement was developed pursuant to condition 7.4 of DA 114-12-98. A copy of the Agreement is attached to this letter. Under the Agreement and covering letter, the restriction on dragline operations only applies for the life of DA 114-12-98. Upon Project Approval for the HVO South Coal Project being granted, DA 114-12-98 will be surrendered and this aspect of the current Agreement will no longer be valid. The other aspects of the Agreement relating to blasting, lighting and compliance with CASA guidelines are matters that could be construed as outlasting the surrender of DA 114-12-98 and therefore CNA will continue to comply with these restrictions unless those restrictions are varied or concluded with the agreement of the Club. However CNA propose to satisfy HVGC concerns about air safety and draglines by agreeing (as a Statement of Commitment) to not operate above the OLS unless agreed with HVGC. The OLS control would replace the soon to be redundant 1.3km restriction and should be acceptable as it is based on CASA guidelines. The OLS was defined in Figure 2.3 of the HVO South Coal Project Response to Submissions Report (2008) which is attached. In addition, CNA can commit to work with the HVGC to develop a new Agreement through the Amenity Management Plan process which will address other issues such as noise, dust, location of the large mining equipment and campaign mining where the controls set by the Project Approval will be or are exceeded.

Proposed Statements of Commitments Regarding HVGC

CNA will update the Statement of Commitments and include the following conditions to address the concerns relating to the HVGC:

- I. An Amenity Management Plan for HVGC land will be developed in consultation with HVGC and submitted to the Director General 3 months before the date that mining in the Riverview South-East extension area commences under this Project Approval.*
- II. The Applicant shall ensure that noise emissions at the occupied HVGC facilities during times of overnight occupation that have been notified by HVGC to CNA do not exceed the noise limits for Active Recreation Receiver which is a maximum of 60 L_{Aeq} dB(A) pursuant to the Industrial Noise Policy.*

However, if CNA has a written negotiated noise Agreement with HVGC (including one relating to campaign mining) and a copy of this Agreement has been forwarded to the DECC, then CNA may exceed the noise limits in accordance with the negotiated noise Agreement.

- III. ²The Applicant shall ensure that air quality thresholds at the HVGC facilities during times of occupation that have been notified by HVGC to CNA do not exceed air quality limits for a Sensitive Receiver unless otherwise in accordance with an agreement with the HVGC (or owner of the HVGC land). Pursuant to practice set in recent approvals for Hunter Valley mines these limits will be:*
 - Maximum 24-hour PM₁₀ concentration of 50 $\mu\text{g}/\text{m}^3$ due to emissions from the CNA's operations and 150 $\mu\text{g}/\text{m}^3$ when all sources of PM₁₀ are considered*
 - Annual average PM₁₀ concentrations of 30 $\mu\text{g}/\text{m}^3$*
- IV. CNA will not operate above the obstacle limitation surface (OLS) as defined in Figure 2.3 of the HVO South Coal Project Response to Submissions Report (2008) unless agreed with the HVGC.*

² This condition has been written to be consistent with conditions of consent for recently approved mines. These conditions typically allow the 99-percentile of 24-hour PM₁₀ concentrations measured over a year to be less than 150 $\mu\text{g}/\text{m}^3$ and the contribution from the mine to be less than 50 $\mu\text{g}/\text{m}^3$. For practical reasons it is suggested that the 150 $\mu\text{g}/\text{m}^3$ limit be set as a maximum level, which if exceeded would result in the mining operations contributing PM₁₀ to the HVGC "residential area" and club house would be suspended. The standard of 50 $\mu\text{g}/\text{m}^3$ (due to the CNA's emissions) is more difficult to implement because of the difficulty in identifying which dust comes from mining and which dust comes from other sources. It would be determined by subtraction of PM₁₀ concentrations measured by TEOMs located at upwind and downwind monitoring sites to be selected in consultation with HVGC and the DECC.

Response to Department of Water and Energy's Letter

DoP provided CNA with a copy of a letter dated 30th of July 2008 from the DWE.

DWE have reiterated their concerns in relation to the HVO South Coal Project.

CNA understand that DWE now have three areas of concern in relation to water management including:

1. Compliance with the *Hunter Regulated River Water Sharing Plan* (HRRWSP);
2. The retention of the 150 m buffer zone; and
3. Compliance with *draft Hunter Unregulated River Water Sharing Plan* (HURWSP).

Overview

CNA has consulted and continues to consult extensively with the DWE regarding the HVO South Coal Project application and other water related issues across HVO. CNA can confirm that work has continued to be undertaken and data collected as requested by DWE. DWE have made numerous requests for information via various emails, letters, meetings and water licence variations.

To improve efficiency of studies some of the works required for HVO South mining areas have also included the rest of HVO. This has resulted in longer timeframes for the completion of some of the studies.

CNA has responded to DWE requests by email, letter and phone discussions to ensure their requests are understood.

CNA has commenced all of the following works or studies and completed some of these works. Some of these apply to areas within HVO North. The studies will contribute to providing DWE with the information they have requested:

- Resistivity surveys of the alluvium in the vicinity of the South Lemington Pit 2 (2007), Cheshunt (Barry) Pit (2007) and Carrington Pit (2008);
- Modelling of groundwater - HVO South Coal Project EA Report (ERM 2008);
- Installation of new monitoring bores in the vicinity of the Cheshunt (Barry) Pit (2007) and Carrington Pit (2008);
- Installation of data loggers within the monitoring bores (2008);
- Modelling of groundwater – Hunter River and Cheshunt Pit cross section (Coffey 2008). This modelling will illustrate and quantify the impact of mining closer to the Hunter River;
- Modelling of groundwater – Wollombi Brook cross section. This modelling will illustrate and quantify the impact of approved and existing mining within the alluvium to the Wollombi Brook;
- Improved monitoring of pit seepage into Cheshunt and Carrington Pits (2008);

- Collation and assessment of groundwater data against model predictions;
- Investigation into geotechnical stability of the Cheshunt (Barry) Pit highwall (Golder 2008); and
- Research into fracturing resulting from open cut blasting.

CNA has now completed the additional groundwater modelling in relation to the Cheshunt Pit. The scoping for this modelling commenced in March 2008 following discussions with DWE. This report will be provided to both DoP and DWE along with further information that CNA hopes will address all of DWE's requests relating to the HVO South Coal Project that have been received over the last 12 months. This report will include all issues raised by the DWE during the assessment phase of the project and a description of how issues have been considered and/or addressed.

Compliance with the Hunter Regulated River Water Sharing Plan

DWE state in their letter that *"the regulated Hunter River is governed under the Hunter Regulated River Water Sharing Plan (HRRWSP). A basic tenet of all water sharing plans across NSW is the prohibition of transfer of water between water sources. In accordance with this policy, the HRRWSP does not recognise the transfer of regulated river water to another source"*.

CNA has obtained legal advice on the application of the current water legislation and Water Sharing Plans on its operations. A summary of this advice is attached and states that:

- the HRRWSP, and hence Parts 2 and 3 of Chapter 3 to the *Water Management Act 2000*, apply to operations affecting water sources within 40 m of the highest bank of the Hunter River, and any of its prescribed tributaries; and
- the HRRWSP does not apply to open cut mines located within HVO South as the limits of all pits associated with the proposal (Cheshunt, Riverview and South Lemington Pits 1 and 2) are greater than 40 m from the highest bank of the Hunter River.

Based on the interpretation provided by this legal advice, CNA believe that the HRRWSP does not apply to *water seepage* (if any) into a pit from hard rock aquifers and/or from alluvial aquifers associated with the Hunter River and its prescribed tributaries.

CNA expert consultants have undertaken modelling of predicted leakage and endeavoured to investigate methods to monitor leakage across HVO South. The requests from DWE in relation to monitoring reports and response mechanisms to account for surface flow loss, or loss of saturated head in connected alluvium are being addressed through investigations into appropriate mechanisms to enable CNA to comply with the requests.

It is important to recognise that the HVO South Coal Project is requesting approval for ongoing operations at HVO South along with extensions to mining in the existing open cut mines. In many instances the DWE is referencing requests in relation to existing approved operations that were approved and commenced prior to the *Water Management Act 2000* and prior to the proclamation of the HRRWSP in 2004. These requests are therefore in relation to existing open cut mines. The existing licences will be required to be modified once the HVO South Coal Project is approved at which time DWE requests can be satisfied in further detail if required.

Buffer Zone

The DWE in their letter of 30 July 2008 reiterate the "significant risk" associated with any reduction of the existing 150 m buffer zone.

This buffer zone was referenced in the DIPNR *Draft Stream/Aquifer Guidelines for Management of Stream/Aquifer Systems in Coal Mining Developments* (DIPNR, April 2005) as a notification zone of 150 m between the highwall of open cut mining and streams or associated alluvial zones (buffer zone). CNA understand that these Guidelines are only in draft form despite having been published in April 2005 and have no statutory force. Nevertheless, CNA have considered the draft Guidelines and note that the draft Guidelines require specific merit based assessments for any proposed reduction of this buffer zone. Hence in accordance with the draft Guidelines, CNA conducted a specific and detailed merit assessment to provide evidence of negligible impact to justify a reduction of the buffer zone.

We also note that DWE have not explicitly advised what level of risk is acceptable and on what basis it disagrees with the expert assessment.

The DWE state that they are concerned that the *"potential impacts to all water users in Zone 1 of the HRRWSP which would result from permanent increase of induced seepage flow from the regulated Hunter River water source and connected alluvium into the mine pit, have not been addressed in the RTCA response."*

The HVO South Coal Project EA Report has shown that the increase in leakage along the section of the Hunter River that adjoins HVO is minimal and accordingly this concern has been addressed by CNA.

Furthermore, it is understood that the 150 m buffer zone was defined arbitrarily to be twice the width of a zone in which fracturing could in principle be induced by blasting, such width being assumed to be 75 m. The evidence for this has not been provided by DWE. As such, CNA is researching the foundation for the 150 m requirement and 75 m impact zone to assess the actual and likely fracturing from blasting. Outcomes of this research will be provided to both DoP and DWE. This information should support the establishment of an evidence based and scientifically valid buffer zone.

CNA has also completed further geotechnical studies to assess the risk of wall failure within the zone between Cheshunt Pit and the Hunter River. Results of this study indicate that a suitable factor of safety against failure can be obtained under the current design and the conservative groundwater assumptions made. CNA consider the current pit wall design to be conservative, and are confident that the same conclusion with regard to stability would be reached if the buffer zone were reduced.

Compliance with draft Hunter Unregulated River Water Sharing Plan (HURWSP)

DWE have stated that they do *"not accept the assertion that Lemington South extension is not to be accounted for in the framework of the draft Hunter Unregulated and Alluvial Water Sharing Plan."*

As stated in the Response to Submissions Report CNA did not reference the *Water Act 1912* Order under Section 113A for an Embargo on any further Applications for Sub Surface Water Licences for the *Wollombi Brook Alluvium Water Shortage Zone GWMA 041*, in the EA Report because it is not relevant. The embargo only applies to applications made after publication of the Order on 2 February 2007 (CNA submitted its application to DWE to licence South Lemington Pit 1 in February 2006). CNA submits that there is no basis to suggest that this application was not accepted or abandoned. DWE advise that they consider the application was not accepted, however CNA did not receive a written notification of this nor was the application fee that was paid to DWE refunded. Requests for additional information were made by the DWE however they acknowledged that the HVO South Coal Project EA was in progress and would contribute additional data to the water licence application.

Furthermore, the embargo does not apply to “bores” (in this case an excavation) “on a property which are the subject of a development consent that was granted prior to the date of this Order” (2 February 2007) “and which are consistent with the General Terms of Approval included in that consent”. Development consents for all HVO South mining operations were granted before 2 February 2007.

The draft HURWSP was only released in March 2008. Therefore the HVO South EA Report could not have considered this Plan. CNA’s submission to the DWE on the draft HURWSP raised concerns that the water share components for existing CNA excavation licences that influence aquifers are not recognised and sought clarification.

CNA are investigating how to address the DWE’s requests in relation to South Lemington Pit 1. However it is important to understand that this pit is already located less than 150 m from the edge of the alluvium on the north western end and the proposed extension will be greater than 150 m from the Wollombi Brook alluvium as shown in Attachment 5.

DWE questioned why the information provided in the Part 5 Water Act application for South Lemington Pit 1 submitted to the DWE in 2006 was different to the information in the EA Report. The application was for an existing approved open cut mine. The data provided was historical as it pertained to the original modelling predictions provided in the South Lemington EIS (1997). The HVO South Coal Project was in progress but had not been submitted at that time so the application reflected the current approved mine. The HVO South Coal Project EA Report did not produce results of the assessment including the South Lemington Pit 1 and the proposed extension area until late 2007. Therefore the data in the 2006 water licence application could not be the same.

The results of the HVO South EA have now indicated that two dimensional cross sections are necessary to determine the specific information requested by the DWE. This modelling is now in progress.

Proposed Statements of Commitments for Groundwater

CNA acknowledges DWE’s comments in relation to the approval of the project application. CNA are of the understanding that the Part 3A process can continue and the project can be assessed. Most of the issues raised by the DWE relate to the *Water Management Act 2000* licensing aspects and apply to the existing approved operations and can therefore be managed through independent negotiations with DWE as part of its future licensing requirements.

To assist with the progressing of this project application CNA has considered the conditions of approval proposed by DWE in their letter. CNA propose instead to update the Statement of Commitments and include the following conditions in response to DWE concerns:

1) DWE Proposed Condition:

No excavation may occur within 150 metres of the Hunter River or its connected alluvium.

CNA still request approval from the DoP for mining up to 100 metres from the edge of the alluvium of the Hunter River within the Cheshunt Pit. However if this is not permitted CNA will accept the below condition.

CNA Proposed Condition:

No excavation may occur within 150 metres of the Hunter River or its connected alluvium or as otherwise agreed by the Director-General.

2) DWE Proposed Condition:

No excavation may occur within 150 metres of the Wollombi Brook or its connected alluvium.

CNA still request approval from the DoP for mining up to 100 metres from the edge of the alluvium of the Wollombi Brook within the South Lemington Pit 2. However if this is not permitted CNA will accept the below condition.

CNA Proposed Condition:

No excavation may occur within 150 metres of the Wollombi Brook or its connected alluvium with the exception of areas already approved for South Lemington Pit 1 and South Lemington Pit 2 (DA 215/97) and as otherwise agreed by the Director-General.

3) DWE Proposed Condition:

RTCA must comply with the operating rules of the Hunter Regulated River Water Sharing and Hunter Unregulated and Alluvium Water Sharing Plan when enacted.

It is unreasonable to expect CNA to commit to complying with a Plan that is in draft and not yet proclaimed, nor can a Project Approval condition require CNA to comply with legislation that is otherwise not applicable. Note CNA have provided a submission to DWE on the draft HURWSP.

CNA Proposed Condition:

CNA must comply with the Water Management Act 2000 as relevant to the HVO South operations.

4) DWE Proposed Condition:

RTCA must submit an annual report which quantifies volumes of seepage into the mining operations and fully accounts for any and all interception of flow from the Hunter Regulated River and alluvium into mine works, and Wollombi Brook Unregulated River.

CNA Proposed Condition:

CNA must, in consultation with DWE, develop and apply an improved methodology to quantify volumes of seepage into the mining operations and report annually in the Annual Environmental Management Report (AEMR).

5) DWE Proposed Condition:

RTCA must develop trigger mechanisms to the satisfaction of DWE, for exception reporting related to increased seepage flow into mine workings.

CNA Proposed Condition:

CNA must, in consultation with DWE, develop trigger mechanisms for exception reporting relating to increased seepage flow into mine workings.

6) DWE Proposed Condition:

RTCA must present mechanisms to the satisfaction of DWE, which fully isolate the mining operation from the regulated Hunter River, and prevent induced ingress of alluvial groundwater to the mining excavation.

CNA Proposed Condition:

CNA must present to the DWE a program of research aimed at identifying methods to reduce leakage from rivers and associated alluvium towards nearby open cut CNA pits within 12 months of commencement of operations under this Project Approval. The status of the research must be reported in the Annual Environmental Management Report (AEMR).

CNA hopes that this information is adequate and will assist with the project assessment. CNA requests the opportunity to meet with the DoP to discuss any of the information provided to allow a resolution of any outstanding issues.

CNA would appreciate feedback on the potential timing of Project Approval as changes to existing approvals may be required to allow ongoing operations. Specifically an amendment to the Mining Operations Plan (MOP) for HVO South will be required by November 2008. The renewal of this MOP has been on hold since the commencement of the HVO South Coal Project. It was intended that a new consolidated MOP for HVO South would be prepared on approval of the HVO South Coal Project. Therefore any ability to expedite the issuing of the Project Approval would be gratefully acknowledged.

If you have any questions in relation to this response letter, please do not hesitate to contact me on (07) 3361 4131 or Anna.McMullen@rtca.riotinto.com.au.

Yours sincerely,



Anna McMullen
Manager – Project Approvals

Enclosed:

- 1 – DECC email
- 2 – HVGC and CNA Agreement
- 3 – Figure 2.3 – Proposed Obstacle Limitation Surface for Mining in Close Proximity to the HVGC
- 4 - Summary of Legal Advice
- 5 – South Lemington Pit 1 and Wollombi Brook High Bank Figure

ATTACHMENTS

Attachment 1

DECC EMAIL

From: Mattes Andrew [Andrew.Mattes@environment.nsw.gov.au]
Sent: Monday, 28 July 2008 12:14 PM
To: McMullen, Anna (RTCA)
Cc: Luke Stewart; Clark Larry
Subject: RE: HVO South Environmental Assessment
Anna,

You have asked if:

the Department of Environment and Climate Change could provide us with a letter with the recognised classification for the Hunter Valley Gliding Club (HVGC) facilities and any information on the levels we are required to comply with according to that classification.

The *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* defines a sensitive receptor as:

a location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area

A common sense application of this definition would include the HVGC as a sensitive receptor. The assessment criteria should be identical to those used for all other sensitive receptors impacted by the proposed development.

However, as the HVGC is not continuously occupied, there may be scope for fine particle management methods that would not be practicable to apply for a normal business or residence. For example, the EA may identify that adverse impacts at the HVGC occur:

- only for a number of hours per year; and
- under certain meteorological conditions; and
- have particular mine operations as the main contributor.

If this was the case, there would appear to be scope to develop a management plan that reduces the risk of adverse impacts at the HVGC by modifying mine activities under identified meteorological conditions when the HVGC is being used. Such a management plan would obviously require the co-operation of the HVGC.

Regards,

Andrew Mattes
Manager Air Technical Advisory Services
Air Policy NSW DECC
02 9995 5836

From: McMullen, Anna (RTCA) [mailto:Anna.McMullen@rtca.riotinto.com.au]
Sent: Friday, 25 July 2008 4:48 PM
To: Mattes Andrew
Cc: Luke Stewart; Todoroski Aleksandar; Clark Larry; najah.ishac@erm.com
Subject: RE: HVO South Environmental Assessment

Hello Andrew,
I am assuming today is Aleks' last day at DECC.

I was hoping you may be able to assist with my email query below?
We are seeking assistance and guidance and would appreciate any information you can provide.
If you require more details our consultants from ERM are able to assist:
Luke Stewart (02) 8584 8866
Environmental Approvals - Senior Project Manager
Najah Ishac T: (02) 8584 8868 M: 0409 788 708
Manager, Acoustics NSW

Regards,
Anna

Attachment 2

HVGC AND CNA AGREEMENT

ES0-1168-4
~~01-LOS-0076~~ ~~LOS-0454~~

COAL & ALLIED

A Rio Tinto Group Company

20 December 2002

Mr J Kostiw
Hunter Valley Gliding Club Co-operative Ltd
Comleroi Road
WARKWORTH NSW 2330

Dear Mr Kostiw,

**RE: HUNTER VALLEY OPERATIONS (RIVERVIEW PIT) - AGREEMENT FOR
WARKWORTH AIRSTRIIP**

Please refer to the document "Agreement for the Warkworth Airstrip" signed by representatives from Coal & Allied (CNA) and Hunter Valley Gliding Club Co-operative Ltd on 11 April 2002 (copy attached).

Further to discussions between Mick Lovely and yourself, CNA agree that dragline operations in the Riverview Pit shall at no stage occur within a 1.3 km radius of the western end of the Glider Club Strip for the life of the Riverview/Cheshunt Development Consent (DA114-12-98), unless a subsequent agreement is reached between CNA and the Hunter Valley Gliding Club Co-operative Ltd.

Please do not hesitate to contact me should you wish to discuss this matter further on 6570 0228.

Yours sincerely



N Senapati
HVO General Manager

Coal & Allied Operations Pty Ltd
ABN 16 000 023 656

Lemington Road, Ravensworth via Singleton NSW 2330 Australia
PO Box 315 Singleton NSW 2330 Australia
Telephone +61 2 6570 0300 Facsimile +61 2 6570 0275

COAL & ALLIED OPERATIONS PTY LTD
ABN 16 000 023 656

and

HUNTER VALLEY GLIDING CLUB CO-OPERATIVE LIMITED
ABN 36 104 071 896

AGREEMENT FOR WARKWORTH AIRSTRIP

This Agreement is made on _____ 2002.

Between: COAL & ALLIED OPERATIONS PTY LTD
ABN 16 000 023 656 of Lemington Road, Ravensworth via Singleton in the
State of New South Wales ("CNA");

**And: HUNTER VALLEY GLIDING CLUB CO-OPERATIVE
LIMITED**
ABN 36 104 071 896 of _____
("Gliding Club").

Recitals:

- A. CNA is the owner and operator of the Mine and holds the Development Consent.
- B. The Gliding Club is the owner and operator of the Airstrip.
- C. The Mine and the Airstrip have existed and operated in close proximity to each other for many years.
- D. The parties have had an effective and co-operative relationship in the past and seek to continue that relationship.
- E. Condition 7.4 of the Development Consent requires CNA and the Gliding Club to enter into an agreement *"to address the potential impact of the Mine on the use and operation of the (Airstrip)"*.
- F. The parties enter into this Agreement to satisfy the requirements of the condition and to seek to continue the existing co-operative relationship between the parties.

Operative Provisions:

1 Definitions and Interpretation

1.1 Definitions

"Airstrip" means the "David Parker" airstrip owned and operated by the Gliding Club located adjacent to the Mine.

"CASA" means the Department of Transport and Regional Services, the Civil Aviation Safety Authority and Airservices Australia.

"CNA" means Coal & Allied Operations Pty Ltd ABN 16 000 023 656.

"Gliding Club" and "Glider Club" means Hunter Valley Gliding Club Co-operative Limited ABN 36 104 071 896.

"Mine" means the Hunter Valley Operations, Riverview Pit, owned by CNA, and located immediately adjacent to the western end of the Airstrip.

"Riverview Pit" means the pit of that name within the Mine.

1.2 Interpretation

In this Agreement unless the context otherwise requires:

- (a) **(headings)** headings, boldfacing and underlinings are for convenience only and do not affect interpretation;
- (b) **(singular)** the singular includes the plural and vice versa;
- (c) **(successors and assigns)** a reference to a party to a document includes that party's permitted successors, assigns, administrators and substitutes; and
- (d) **(rules of construction)** no rule of construction applies to the disadvantage of a party because that party was responsible for the preparation of this Agreement.

2 Relevant Consent Condition

2.1 The Development Consent contains the following condition *"Within 1 month of the commencement of Dragline Operations, or as otherwise agreed to by the Director-General, the Applicant shall enter into a private agreement with the Hunter Valley Gliding Club to address the potential impact of the mine on the use and operation of the Glider Club. This includes the potential impacts to the flight paths from the draglines operation. The agreement shall take into consideration the impacts of the dragline position on:*

- *useable length of the runway;*
- *interference with flight paths; and*
- *Guidelines of the Department of Aviation.*

Within the 1 month period, the Dragline Operations at no stage shall occur within a 1.3km radius of the western end of the Glider Club Strip. However, in the event that the Director General considers that the Dragline Operation is unduly impacting on the operational safety of the Glider Club, the Director-General may request modification to the Dragline Operation until such time as the safety issue is addressed to the satisfaction of the Director-General.

Should an agreement between the two parties be unable to be reached within 1 month of the commencement of the Dragline Operation, the matter shall be referred to the Director-General for mediation. The Director-General shall consider the matter and the Director-General's decision shall be final and binding on both parties".

2.2 This Agreement is the agreement referred to in condition 2.1.

3 Guidelines

CNA will not knowingly breach any guidelines of CASA that apply to CNA.

4 Notification

The Gliding Club will notify CNA of any alleged impediment to the useable length of the runway and flight paths of the Airstrip, as a result of the operation of the dragline.

5 Agreement

5.1 Exclusion Zone

"Within 6 months of the commencement of Dragline Operations, or as otherwise agreed to by the Director-General, the applicant shall enter into a private agreement with the Hunter Valley Gliding Club to address the potential impact of the mine on the use and operation of the Glider Club. This includes the potential impacts to the flight paths from the draglines operation. The agreement shall take into consideration the impacts of the dragline position on :

- *Useable length of the runway;*
- *Interference with flight paths; and*
- *Guidelines of the Department of Aviation*

Within the 6 month period, the Dragline Operations at no stage shall occur within a 1.3km radius of the western end of the Glider Club Strip. However, in the event that the Director-General considers that the Dragline Operation is unduly impacting on the operational safety of the Glider Club, the Director-General may request modification to the Dragline Operation until such time as the safety issue is addressed to the satisfaction of the Director-General.

Should an agreement between the two parties be unable to be reached within 6 months of the commencement of the Dragline Operation, the matter shall be referred to the Director-General for mediation. The Director-General shall consider the matter and the Director-General's decision shall be final and binding on both parties".

5.2 Further Investigation

CNA, in consultation with the Gliding Club, will investigate options to ensure the continued long-term operation of the Gliding Club.

5.3 Blasting Notification

CNA shall notify the Gliding Club, on each Thursday afternoon (via the agreed email and telephone procedure), of any proposed blasting within the Riverview Pit on the following Friday to Sunday.

A CASA approved strobe light will be installed on top of the Gliding Club clubhouse which will be activated by an authorised person ten (10) minutes prior to any blasting within the Riverview Pit.

Should the Glider Club propose to fly on weekdays, other than Friday, additional notification may be provided upon request.

5.4 Additional Strobe Lighting

CNA will install:

- a) The clubhouse strobe will also be attached to a flashing light within the clubhouse of the Gliding Club.
- b) On the modular tower located in the Lemington Mine, with a CASA approved strobe light that will operate continuously.
- c) The top of the Riverview dragline boom will be fitted with a strobe that will only be activated when power is down on the dragline.
- d) The strobe lighting will be installed once the Glider Club has advised CNA of the appropriate CASA approved lighting.

5.5 Meeting

CNA shall meet with the Gliding Club within six (6) months of the granting of the Consent to discuss and implement any additionally identified or required actions to ensure the continued operation of the Gliding Club.

6 Dispute

Any dispute incapable of resolution by the parties within thirty (30) days of the meeting referred to in clause 6 shall be referred to the Director-General of the Department of Planning for mediation.

7 Authority

- 7.1 **By CNA** CNA warrants that it has the power and authority to enter into this Agreement and to perform its obligations herein.
- 7.2 **By Gliding Club** The Gliding Club warrants that it has the power and authority to enter into this Agreement and to perform its obligations herein.

8 Notices

- 8.1 **Address** All notices required to be given under this Agreement will be in writing and will be validly served by pre-paid post, hand delivery or facsimile and addressed as follows:

"CNA"

Attention: James Bailey, Manager Environmental Services
Coal & Allied Operations Pty Ltd
PO Box 315
SINGLETON NSW 2330
Telephone: (02) 6570 0252
Facsimile: (02) 6570 0350

"Gliding Club"

Attention : Joe Kostiw
Hunter Valley Gliding Club Co-operative Limited
PO Box 9
NEWCASTLE NSW 2300
Telephone : (02) 49269965 (Mon-Fri 0900 – 1700 hrs)
Telephone : (02) 49886120 (After Hours)
Facsimile : (02) 49296712

- 8.2 **Post** A notice served by post will be deemed to have been served at the expiration of three (3) Business Days after the time at which it was posted.
- 8.3 **Facsimile** A notice served by facsimile will be deemed to have been served the first Business Day after the facsimile is sent by the party serving the notice provided that the sender has received an error free transmission report.
- 8.4 **Change of Address** A party may at any time, by giving written notice to the other, change the addressee, address, telephone and facsimile numbers at which it is to receive notices.

9 Entire Agreement

This document comprises the whole agreement between the parties as to its subject matter and may only be varied, modified or extended by agreement in writing expressed to be supplemental hereto and signed by the parties.

10 Governing Law & Jurisdiction

This Agreement is to be governed by and construed in accordance with the laws of New South Wales and the parties submit to the non-exclusive jurisdiction of the courts of that State.

11 Costs

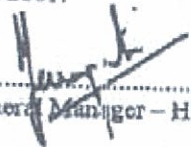
CNA will pay for legal and other costs and expenses of preparing and executing this Agreement.

12 Counterparts

This Agreement may be executed in counterparts as may be deemed necessary or convenient and all such counterparts taken together will be deemed to constitute one and the same instrument.

Executed as an agreement,

Executed by COAL & ALLIED
OPERATIONS PTY LTD
pursuant to s.127(1) of the Corporations
Act 2001:

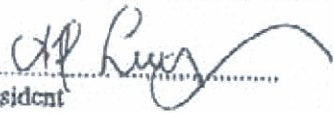

General Manager - HVO

NIK SENAPATI
Nik Senapati


Manager Environmental Services

C. J. Bailey
James Bailey

Signed by HUNTER VALLEY
GLIDING CLUB
CO-OPERATIVE LIMITED
by its authorised representatives:


President

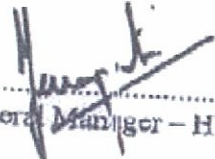

A.H. Levy


Authorised Representative


J.W. Kostiw

Executed as an agreement.

Executed by COAL & ALLIED
OPERATIONS PTY LTD
pursuant to s.127(1) of the Corporations
Act 2001;

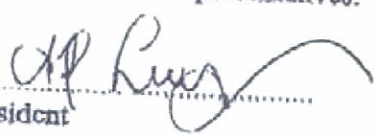

General Manager - HVO

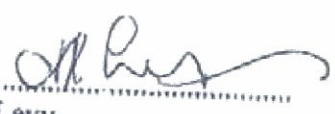
NIK SENAPATI
Nik Senapati

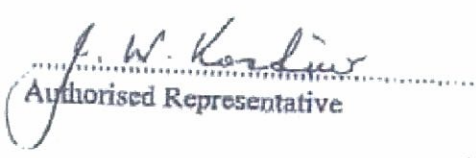

Manager Environmental Services

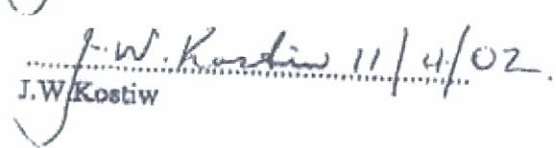

James Bailey

Signed by HUNTER VALLEY
GLIDING CLUB
CO-OPERATIVE LIMITED
by its authorised representatives:


President


A.H. Levy


Authorised Representative


J.W. Kostiw

**FIGURE 2.3 - PROPOSED OBSTACLE LIMITATION
SURFACE FOR MINING IN CLOSE
PROXIMITY TO THE HVGC**

Legend

-  Gliding airstrip
-  5% or 1:20 gradient from the ground surface level of the airstrip at line a to a maximum height of 80m
-  20% or 1:5 gradient from the ground surface level of the airstrip at line b to a maximum height of 45m

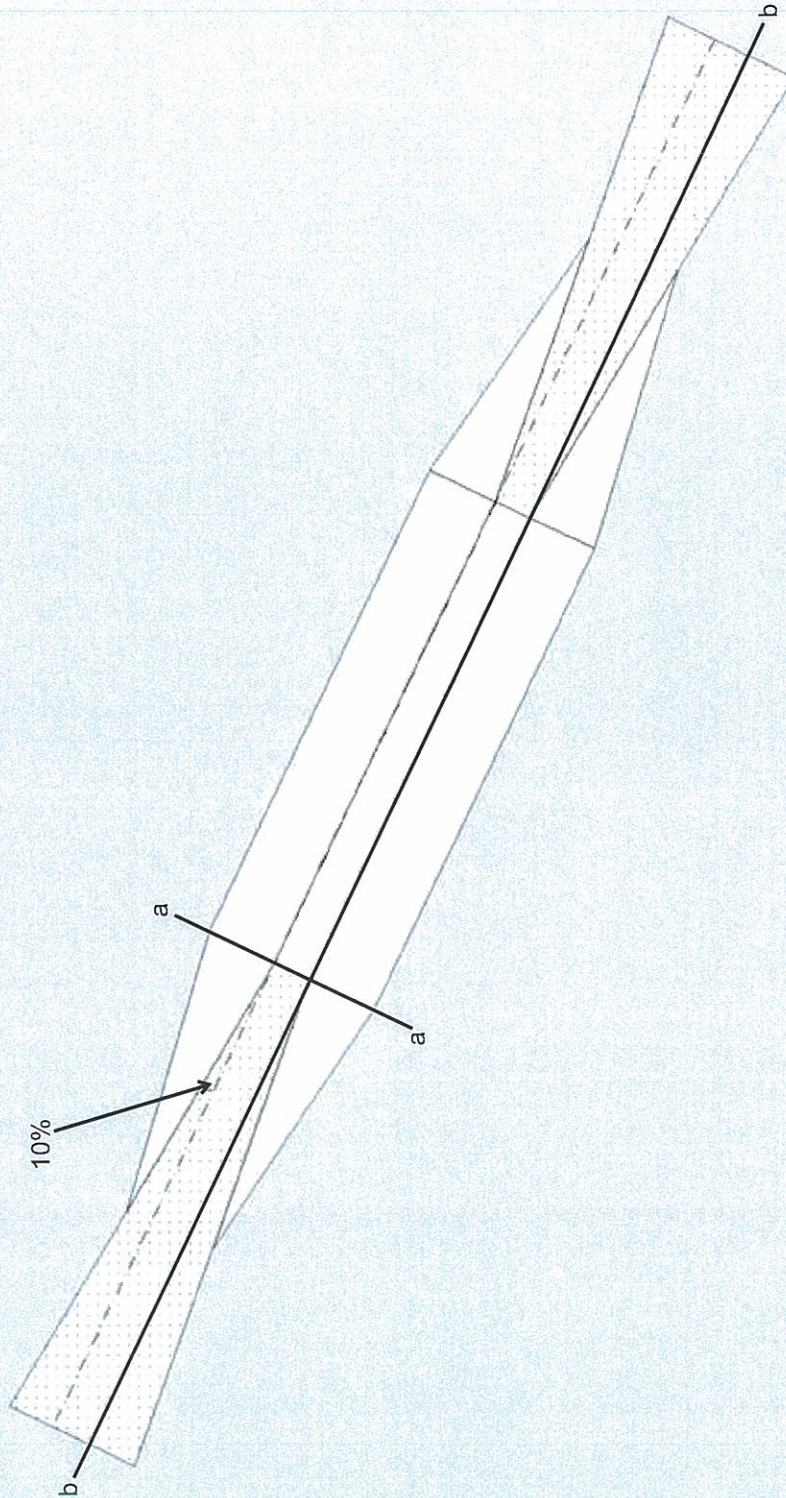
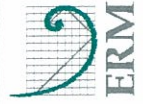


Figure 2.3

Proposed obstacle limitation surface for mining in close proximity to HVG

Client:	Coal & Allied Operations Pty Limited		
Project:	Response to Submissions Report		
Drawing No:	0082598s_RSR_01		
Date:	01/07/2008	Drawing size:	A4
Drawn by:	ML	Reviewed by:	LS
Source:	-		
Scale:	Not to Scale		

Environmental Resources Management Australia Pty Ltd
Building C, 33 Saunders St, Pyrmont, NSW 2009
Telephone +61 2 8584 8888



Attachment 4

SUMMARY OF LEGAL ADVICE

8 September 2008

AURORA PLACE 88 PHILIP STREET SYDNEY
GPO BOX 521 SYDNEY NSW 2001 AUSTRALIA
DX 117 SYDNEY www.minterellison.com
TELEPHONE +61 2 9921 8888 FACSIMILE +61 2 9921 8123

BY E-MAIL: Anna.McMullen@riotinto.com

Anna McMullen
Environmental Coordinator – Project Approvals
Hunter Valley Services
Rio Tinto Coal Australia

Dear Anna,

Hunter Valley Operations - South Coal Project

1. Introduction

- 1.1 We refer to recent correspondence between Coal & Allied ('CNA'), the NSW Department of Planning ('DoP') and the NSW Department of Water and Energy ('DWE') in relation to the Hunter Valley Operations - South Coal Project ('HVO South') and its potential impact on the Hunter River and Wollombi Brook.
- 1.2 CNA has requested legal advice in relation to the application of the *Water Sharing Plan for the Hunter Regulated River Water Source 2003* ('**Hunter River Water Sharing Plan**') and the *Draft Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2008* ('**Draft Hunter Unregulated and Alluvial Water Sharing Plan**') on mining operations at HVO South.

2. Hunter River Water Sharing Plan

- 2.1 The Hunter River Water Sharing Plan commenced operation on the date of its proclamation on 1 July 2004 (see NSW Government Gazette No. 110, 1 July 2004).
- 2.2 All water sharing plans in NSW are made pursuant to the *Water Management Act 2000* ('**WM Act**'). In general, the WM Act and these water sharing plans govern activities associated with water sources in NSW.
- 2.3 Relevantly, the Dictionary in the WM Act defines *water source* as "*the whole or any part of:*
 - (a) *one or more rivers, lakes or estuaries, or*
 - (b) *one or more places where water occurs naturally on or below the surface of the ground,**and includes the coastal waters of the State.*"

- 2.4 By virtue of clause 4 of the Hunter River Water Sharing Plan this plan only applies to a discrete body of water. Clause 4 is titled '*Area and waters to which this Plan applies*' and it limits the application of the Hunter River Water Sharing Plan in the following manner:

"(1) *The water source in respect of which this Plan is made is:*

- (a) *between the banks of all rivers, from the upstream limit of Glenbawn Dam water storage downstream to the estuary of the Hunter River, and from the upstream limit of Glennies Creek Dam water storage downstream to the junction with the Hunter River, which at the date of commencement of this Plan have been declared by the Minister to be regulated rivers, and*
- (b) *the unconsolidated alluvial sediments underlying the waterfront land of all rivers referred to in subclause (a), except those unconsolidated alluvial sediments within one metre of works taking water pursuant to licences issued under Part 5 of the Water Act 1912 or their equivalent aquifer access licences issued under the Act.*

Note. A regulated river is a river that has been declared by the Minister, by order published in the New South Wales Government Gazette, to be a regulated river.

Note. The regulated rivers referred to in subclause (1) are listed in Appendix 1.

Note. Waterfront land has the meaning defined in the Act.

...' [emphasis added]

- 2.5 Pursuant to section 5 of the WM Act, definitions in the Act are incorporated into the Hunter River Water Sharing Plan. Therefore, for the purposes of determining the application of the Hunter River Water Sharing Plan to mining operations at HVO South the term '*waterfront land*' is defined to mean:

- "(a) *the bed of any river, together with any land lying between the bed of the river and a line drawn parallel to, and the prescribed distance inland of, the highest bank of the river, or*
- (a1) *the bed of any lake, together with any land lying between the bed of the lake and a line drawn parallel to, and the prescribed distance inland of, the shore of the lake, or*
- (a2) *the bed of any estuary, together with any land lying between the bed of the estuary and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the estuary, or*
- (b) *if the regulations so provide, the bed of the coastal waters of the State, and any land lying between the shoreline of the coastal waters and a line drawn parallel to, and the prescribed distance inland of, the mean high water mark of the coastal waters,*

where the prescribed distance is 40 metres or (if the regulations prescribe a lesser distance, either generally or in relation to a particular location or class of locations) that lesser distance. Land that falls into 2 or more of the categories referred to in paragraphs (a), (a1) and (a2) may be waterfront land by virtue of any of the paragraphs relevant to that land."

[emphasis added]

- 2.6 In light of the above definition, the application of the Hunter River Water Sharing Plan is limited to water occurring naturally in the unconsolidated alluvial sediments within 40 metres of the highest bank of the Hunter River and any of its regulated rivers or tributaries.
- 2.7 We have been provided with two plans dated 4 September 2008 and entitled Wollombi Brook and Hunter River (annexed) which appear to demonstrate that all proposed CNA open cut mine excavations at HVO South are *"greater than 40 metres from the highest bank of the Hunter River and Wollombi Brook"*. Therefore, the water source within these HVO mine pits (as depicted in these plans) are not subject to the Hunter River Water Sharing Plan.
- 2.8 The sections set out above generally relate to the land (eg. river beds and waterfront land) over or through which this water source flows. However, Hunter River Water Sharing Plan does not purport to govern all water that has the potential to or once flowed through this water source. Water outside the boundary as described above in clause 4 of the Hunter River Water Sharing Plan is not governed by the Plan.

3. Draft Hunter Unregulated and Alluvial Water Sharing Plan

- 3.1 In addition to the Hunter River Water Sharing Plan, DWE is proposing to introduce the Draft Hunter Unregulated and Alluvial Water Sharing Plan.
- 3.2 The Draft Hunter Unregulated and Alluvial Water Sharing Plan was on public exhibition between March 2008 and 2 May 2008. We note from a recent conversation with a representative from the Newcastle Office of DWE, that DWE proposes that the Draft Hunter Unregulated and Alluvial Water Sharing Plan be gazetted in March 2009 and commence operation on 1 July 2009. Accordingly, the commencement of this plan and its application to mining at HVO South remains uncertain.
- 3.3 Further, the WM Act provides that water sharing plans only take effect once proclaimed. There is also no requirement in the WM Act to consider draft water sharing plans before these plans are proclaimed. In addition, the final form of the Hunter Unregulated and Alluvial Water Sharing Plan may not reflect the current version of the plan that CNA is being asked to address at this point in time.

If you have any questions in relation to this letter please contact Penny Murray at this office.

Yours faithfully
MINTER ELLISON

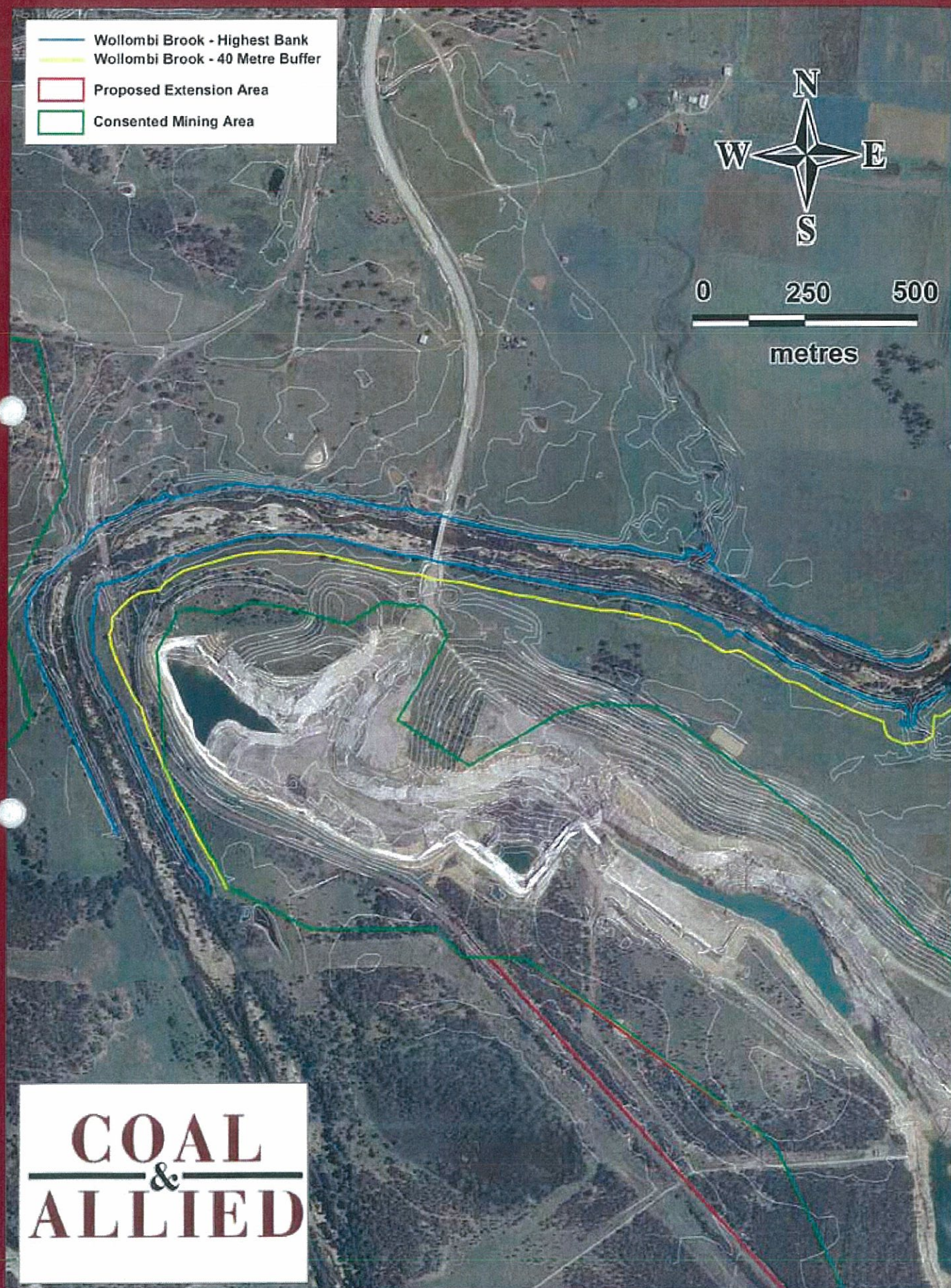


Penny Murray
Partner

Contact: Kate Addinall Direct phone: +61 2 9921 4866 Direct fax: +61 2 9921 8287
Email: kate.addinall@minterellison.com
Partner responsible: Penny Murray Direct phone: +61 2 9921 4868
Our reference: KXA:PLM:20-5526418

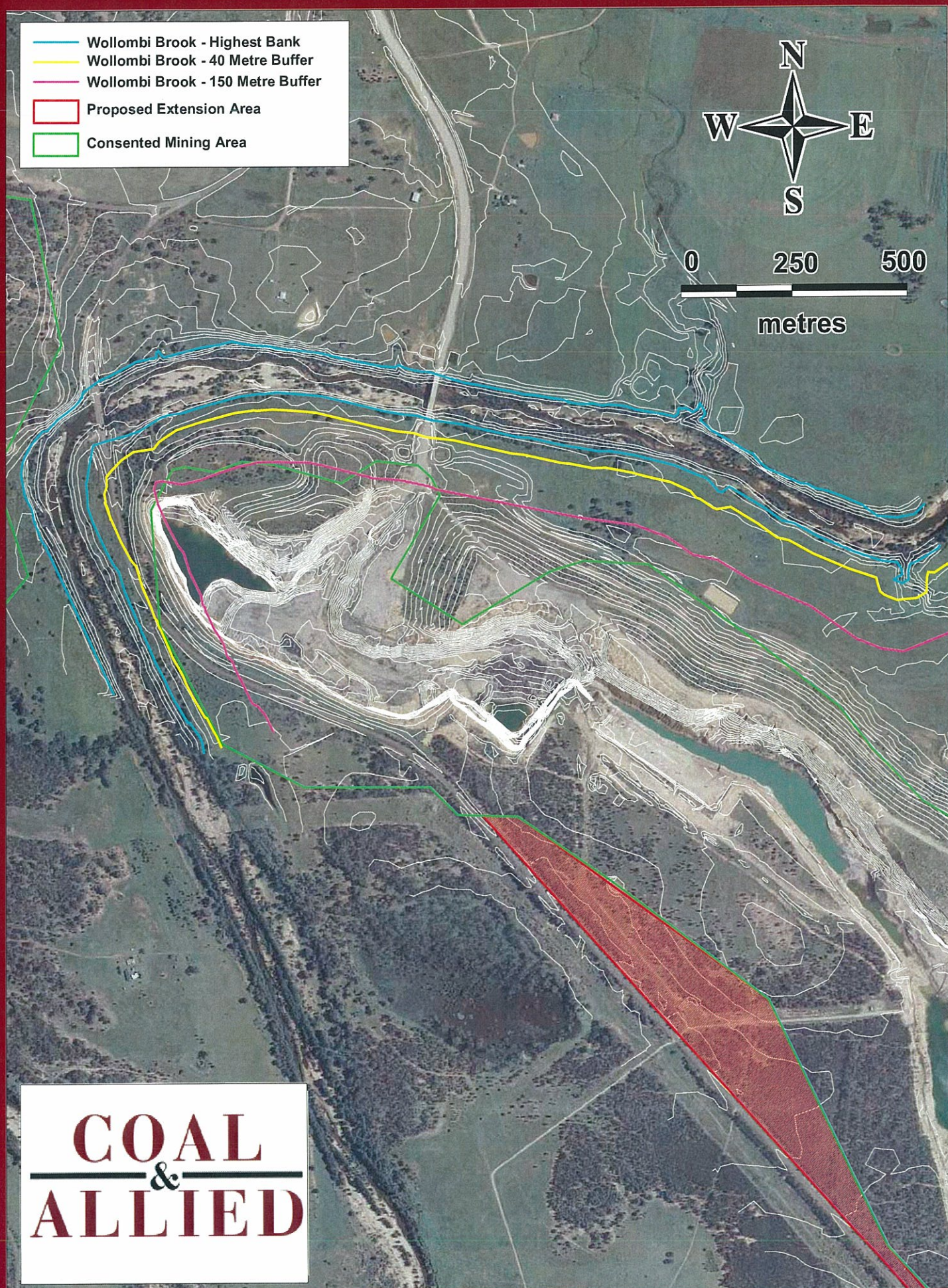
Annexure: Two figures dated 4 September 2008 and entitled Wollombi Brook and Hunter River





Attachment 5

SOUTH LEMINGTON PIT 1 AND WOLLOMBI BROOK HIGH BANK FIGURE



COAL
&
ALLIED