

Airly Mine Extension Project

Review Report

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November 2015

The Airly Mine Extension Project Review Report ©
State of New South Wales through the NSW Planning Assessment Commission, November 2015.

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EXECUTIVE SUMMARY

The Airly Mine Extension Project is a proposed extension of the existing Airly underground coal mine, located approximately 40 kilometres north-west of Lithgow in the Lithgow City Council Local Government Area (LGA). The proposal involves extending the life of Airly mine by 25 years, including 20 years of mining followed by 5 years of post-mining decommissioning and rehabilitation. The proposal involves extending the existing mine to the east, constructing a new coal preparation plant, run-of-mine coal stockpile, reject emplacement area, and upgrading of existing facilities.

On 17 August 2015, the Minister requested the Planning Assessment Commission (the Commission) conduct public hearings and review the merits of the project paying particular attention to the potential subsidence related impacts on the natural values of the Mugii Murum-ban State Conservation Area, water impacts, and socio-economic impacts. The Commission was constituted by Ms Robyn Kruk AM (chair) with Mr Alan Coutts and Mr David Johnson. The Commission examined the documents referred to in the Terms of Reference, including the Preliminary Environmental Assessment Report (PEAR) provided by the Department of Planning and Environment (the Department). The Commission also received 509 written submissions, held a public hearing, visited the site and surrounds and met with the Department, the Applicant and various government agencies, including Lithgow City Council.

The Commission agrees with most of the findings and recommendations of the PEAR. However, the Commission also notes that the PEAR was not entirely clear about the final position of some government agencies on certain key issues identified in the Terms of Reference and raised in public submissions, including the position of the Division of Resources & Energy (within the Department of Trade & Investment) (DRE) on subsidence issues and the Environmental Protection Authority (EPA) on water discharge issues. Consequently, the Commission deemed it necessary to seek clarification from the Department in that regard, and to consult further with each of these agencies.

The Commission notes that the assessment of underground coal mining in areas of sensitive surface features is a relatively young science and the Commission recognises that there are a number of uncertainties associated with the current proposal. However, the Commission has been involved in the assessment of most of the key underground coal mines in NSW and understands that a robust set of conditions has been developed in recent years to deal with the inherent uncertainties surrounding underground mining. The Commission is satisfied that these uncertainties can be managed through a comprehensive framework involving performance criteria, the Extraction Plan process, and the role of the recommended Independent Expert Panel.

The Commission has made a total of nine recommendations in this report. The most significant recommendations relate to the establishment of an Independent Expert Panel to review all the relevant material and provide advice on potential subsidence-related impacts, particularly in relation to cliff lines and pagodas. The Commission has adopted a precautionary approach in relation to subsidence, and has recommended that this Panel should be established prior to determination in order to provide advice and recommendations about the predicted subsidence impacts and the proposed subsidence management regime. The Panel would also have an ongoing role in any approval by providing enforceable recommendations through the Extraction Plan approval process. The Commission has also made a number of recommendations relating to the need for further information on the timeline of coal extraction, confirmation from EPA in relation to water discharge issues, strengthening of the compensatory water supply measures under the Water Management Plan, provision of an alternative water source for bushwalkers, and the timely implementation of visual screening for the reject emplacement area.

The Commission has considered the repeal of clause 12AA from the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* in relation to the current proposal. The Commission is satisfied that economic, social and environmental impacts have been given a balanced consideration during this determination process and that the project is able to be managed with appropriate conditions in a manner that is generally consistent with the aims, objectives, and provisions of the policy.

The Commission has carefully balanced the key areas of concern, including the presence of unique cliff lines and pagodas, the proximity of the Greater Blue Mountains World Heritage Area, groundwater and surface water resources, and the socio-economic benefits. The Commission considers that the continued employment of existing staff and the creation of new jobs would make a significant positive contribution to the Lithgow City Council LGA and the region. The Commission also believes it is important to view the proposal from a broader strategic context, and notes that the Mugii Murum-ban State Conservation Area was originally established to both protect a natural area and allow access to an important coal resource.

On balance, the Commission is satisfied that the project's benefits outweigh its potential impacts, and that on balance the project is approvable. The project should proceed to determination, subject to the recommendations outlined in this report.

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GLOSSARY

Applicant	The Applicant under Part 4 of the EP&A Act 1979, in this report being Centennial Coal Company Pty Ltd (Centennial). ‘Applicant’ includes the Applicant’s EIS consultants.
Commission	The Commission to review this application, constituted by Ms Robyn Kruk AM (Chair), Mr David Johnson and Mr Alan Coutts
Council	Lithgow City Council
Department	Department of Planning and Environment
DOE	Commonwealth Department of the Environment
DRE	Division of Resources & Energy (within the Department of Trade & Investment)
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EPL	Environment Protection Licence
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
GBMWhA	Greater Blue Mountains World Heritage Area
IESC	Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development
Interaction Zone	New Hartley Mine Interaction Zone
LGA	Local Government Area
Minister	Minister for Planning
Mtpa	Million tonnes per annum
OEH	Office of Environment and Heritage
NOW	NSW Office of Water
NP	National Park
NPWS	National Parks and Wildlife Services
PEAR	Preliminary Environmental Assessment Report prepared by the Department of Planning and Environment
PPMZ	Panel and Pillar Mining Zone
PPEZ	Partial Pillar Extraction Zone
ROM	Run-of-Mine
RTS	Response to Submissions
SEARs	Environmental Assessment Requirements provided by the Secretary of the Department of Planning and Environment for an environmental impact statement
SEPP	State Environmental Planning Policy
SCA	State Conservation Area
Proposal	The subject of the application under Section 89C of the EP&A Act 1979, in this report being the Airly Mine Extension Project (SSD 5581).

1. INTRODUCTION

On 13 August 2015 the Minister for Planning, the Honourable Rob Stokes MP, requested the Chair of the Planning Assessment Commission (Commission) to carry out a review of the Airly Mine Extension Project, including the holding of a public hearing.

Ms Lynelle Briggs AO, chair of the Commission, nominated Ms Robyn Kruk AM, Mr Alan Coutts and Mr David Johnson to constitute the Commission for the review. Ms Kruk chaired the Commission.

1.1 Current Application

The Airly coal mine is an existing underground coal mine located in the Lithgow City Council LGA, approximately 40km north-northwest of Lithgow and 3 kilometres north-east of the Capertee township.

The mine currently operates under development consent DA 162/91, which allows extraction of up to 1.8 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal, the processing of this coal and the dispatch of product coal by rail to domestic and export markets. The development consent was modified on 28 August 2015, which extended the expiry date of the consent to April 2016.

The Applicant proposes to extend the existing underground mine operations, which would involve:

- extending underground mining operations to the east of the existing mining domains from the current mining lease (Mining Lease 1331) into an exploration license area (Authorisation Area 232);
- maintaining its existing rate of extraction of 1.8 Mtpa;
- extending the life of the mine for 25 years from the grant of a mining lease, including 5 years for post-mining decommissioning and rehabilitation;
- the construction of a new coal preparation plant, ROM stockpile and reject emplacement area; and
- modifications and upgrades to existing infrastructure and facilities.

Table 1 (on the next page) outlines the key components of both the existing approval and the proposed Airly mine extension project.

1.2 Statutory Context

The Commonwealth Minister for the Environment determined on 24 December 2013 that the Airly proposal is a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to 'matters of natural environmental significance', including listed threatened species and communities, the World Heritage values of the Greater Blue Mountains World Heritage Area (GBMWhA), and water resources.

The Commonwealth Government has previously accredited the State's environmental assessment processes under Part 4 of the *Environmental Planning & Assessment Act 1979*, via a bilateral agreement between the Commonwealth and NSW Governments. A revised bilateral agreement commenced in February 2015 and the Airly proposal is a transitional project under this new agreement. This project continues to be assessed under Part 4 of the EP&A Act and the recommendations about whether this project should be approved or refused under the EPBC Act (including potential conditions of approval) will be made to the Commonwealth Minister for the Environment.

Table 1: Comparison of existing approval and proposed development

Aspect	Existing Approval	Proposed Development
Development Application Area	Mining Lease (ML) 1331 boundary	Continue mining in ML1331 and extend east into A232
Rate of Production	1.8 Mtpa of ROM coal	No change
Mine Life	Existing consent (DA162/91) lapses in April 2016	Extend the life of mine by 25 years from 2015 to 2040, including 20 years of mining and 5 years post-mining decommissioning and rehabilitation.
Hours of Operation	24 hours per day, 7 days per week.	No change
Operational Workforce	Maximum of 120 employees with current workforce of 59.	Up to 135 employees with 20 full-time equivalent (FTE) contract positions over the life of the mine, and 30 FTE contract positions during construction and development
Pit Top Infrastructure	<ul style="list-style-type: none"> A series of access portals Ventilation fans for air exhaust (located within the northern-most adit) Bathhouse, office and assembly building Wash-down facilities, workshop, service building; Workforce, materials and ventilation portals, store building and training centre Bulk storage area, cable store; Potable water provision and sewage treatment plant Hardstand areas, haul roads, car parking areas and helicopter pad Diesel, fuel and oil storage and refuelling facilities Water management structures Compressor room, main fan, electrical distribution network 	<ul style="list-style-type: none"> No change to existing pit top access Construction of new: <ul style="list-style-type: none"> workshop, stores building, bulk storage yard, cable store and compressor building fire station above-ground refuelling facility for pit top and underground fleet additional effluent treatment tank electricity distribution network and communications for new development internal travel roads rejects bin, internal haul road and additional conveyors for REA site security gate Upgrade existing train refuelling station Minor upgrades to existing facilities
Coal Stockpile	<ul style="list-style-type: none"> 200,000 tonne (t) product coal stockpile. 30,000 t emergency ROM coal stockpile 	An additional 40,000 t ROM coal stockpile near the proposed coal preparation plant (CPP)
Coal Handling and Preparation Plant (CHPP)	Approval to construct a Coal Handling and Processing Plant (CHPP). Only the coal handling component of the CHPP has so far been constructed.	Construction of the CPP component of the CHPP, equipped with a water recycling facility
Reject Management	4.3 Mt coarse reject emplacement area (REA) and tailings dam (not constructed)	Construction of a life-of-mine REA near the CPP with capacity of 5.2 million cubic metres
Train Loading	A balloon loop, train load out facility and rail surge bin	No change
Product Coal Transport	All coal to leave the site by rail.	No change
Water Management	<ul style="list-style-type: none"> A system of sediment and storage dams Diversion of clean water, some for use in mining activities Process water supplemented by a production bore Effluent treatment system 	<ul style="list-style-type: none"> Modifications to existing system to accommodate new infrastructure requirements Construction of a run-off dam for the new REA and connection into the existing water management system Additional water tank installed in effluent treatment system

1.3 Strategic Context

The Airly Mine Extension Project is located approximately 5km northeast of the village of Capertee which had a population of 180 in the 2011 census. It is located within the Lithgow City Council LGA, which has a long history of coal mining, electricity generation and industrial enterprises, along with agriculture and forestry.

The mine is one of several varying land uses in the area, including underground coal mining, rural residential, agriculture, transport infrastructure, commercial forestry, recreation (including tourism), coal handling infrastructure, transport infrastructure and nature conservation. There is a growing tourism and recreation industry in the region, however mining continues to make a significant contribution to the regional economy and is second only to the retail sector in terms of employment generation.

The mine is located in an area characterised by a steep and rugged topography with large areas of cliffs and significant rock outcrops. It is located within the Mugii Murum-ban State Conservation Area (SCA), and the Gardens of Stone National Park is to the south, which forms part of the Greater Blue Mountains World Heritage Area (GBMWH). The boundaries of the SCA are generally situated around Mount Airly and Genowlan Mountain. These landforms are characterized by high sandstone cliffs and pagodas, which Office of Environment and Heritage (OEH) considers to have a high level of scenic value

The mine was subject to a Commission of Inquiry in 1993 prior to the establishment to the Mugii Murum-ban SCA and the commencement of mining. The establishment of the Mugii-Murum-ban SCA was gazetted in March 2011 following discussions with the Applicant (as the landowner) and various special interest groups. The establishment of an SCA illustrates the government's efforts to both protect an important natural area and allow access to an important coal resource. While extraction of the coal was considered important, longwall mining was never contemplated as an appropriate method due to the existence of various significant sensitive surface features.

1.4 Mining SEPP Amendment

The Commission has carefully considered the repeal of clause 12AA from the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* in relation to the current proposal. The Commission is satisfied that economic, social and environmental impacts have been given a balanced consideration during this determination process and that the project is able to be managed with appropriate conditions in a manner that is generally consistent with the aims, objectives, and provisions of the policy.

1.5 Secretary's Preliminary Environmental Assessment Report

The Department has prepared a Preliminary Environmental Assessment Report (PEAR) for the project application, which has been considered by the Commission as part of the review process. The PEAR considered the merits of the proposal, its strategic and statutory context, public and agency submissions and the Applicant's response to submissions. The report identified three key issues:

- subsidence impacts on the surface features and conservation values of Mugii Murum-ban SCA including cliff lines, steep slopes, pagodas, gorges and biodiversity;
- potential impacts from discharge of mine-water; and
- socio-economic benefits for the Lithgow region and NSW.

The Department concluded that on balance, the project's benefits outweigh its residual impacts and that it is in the public interest and should be approved, subject to strict conditions.

2. THE COMMISSION'S REVIEW TASK

2.1 Terms of Reference

The Minister's request was issued on 13 August 2015 under Section 23D of the *Environmental Planning and Assessment Act 1979* and Clauses 268R and 268V of the *Environmental Planning and Assessment Regulation 2000*.

The Terms of Reference are as follows:

1. *Carry out a review of the Airly Mine Extension Project, and:*
 - a) *consider the environmental impact statement for the project, the issues raised in submissions, the Commonwealth Independent Expert Scientific Committee's advice, the additional information and response to submissions provided by Centennial Coal, the Department of Planning and Environment's preliminary environmental assessment report, and any other relevant information provided on the project during the review;*
 - b) *assess the merits of the project as a whole, having regard to all relevant NSW Government policies, and paying particular attention to its potential:*
 - *subsidence impacts on the natural values of the Mugii Murum-ban State Conservation Area, including cliff lines, steep slopes, pagodas and gorges, and any threatened species or endangered ecological communities;*
 - *water impacts, including any downstream water quality impacts in the Gardens of Stone National Park; and*
 - *social and economic impacts; and if necessary,*
 - c) *recommend further measures to avoid, minimize, and/or manage the potential impacts of the project.*
2. *Conduct public hearings during the review.*
3. *Submit its final report on the review to the Department of Planning and Environment within 10 weeks of receiving the Department's preliminary environmental assessment of the project, unless the Secretary of the Department of Planning and Environment agrees otherwise.*

2.2 Public Hearing and Submissions

The public hearing was held on 23 September 2015 at the Union Theatre, Lithgow. A total of 40 verbal submissions and 34 written submissions were made to the Commission at the public hearing. A list of speakers at the public hearing is provided in **Appendix 1** of this report.

A summary of the issues raised at the public hearing and written submissions is provided in **Appendix 2** of this Report. Concerns related to water, subsidence, economic and social impacts, biodiversity and visual amenity.

The Commission received a total of 509 written submissions from the community before and after the public hearing, including 412 objections and 97 submissions in support. Submissions made to the Department in response to the exhibition of the EIS have also been referred to the Commission for its consideration as part of its review of the proposal.

2.3 Documents

Through the course of the review the Commission accessed a wide range of documents including:

- the Applicant's Environmental Impact Statement;
- the Applicant's Response to Submissions;
- the Secretary's PEAR and recommended conditions;
- submissions from government agencies and the public;
- correspondence from the Applicant in response to submissions made during and after the public hearing; and
- additional information provided by the Department.

The Commission notes that the PEAR was not entirely clear about the final position of some government agencies on certain key issues identified in the Terms of Reference and raised in public submissions, including the position of the Division of Resources & Energy (within the Department of Trade & Investment) (DRE) on subsidence issues and the Environmental Protection Authority (EPA) on water discharge issues. Consequently, the Commission deemed it necessary to seek clarification from the Department in that regard, and to consult further with each of these agencies.

2.4 Meetings and Site Inspection

The Commission met with the Department of Planning and Environment (27 August 2015), the Applicant (23 September 2015) and Lithgow Council (24 September 2015). The Commission also visited the site on Wednesday 23 September 2015 with the Applicant and undertook an inspection of the area by air. On 28 September, the Commission met with DRE, EPA and the Department. Records of these meetings are provided in **Appendix 3** of this Report.

2.5 Correspondence

Through the course of the review the Commission has received correspondence in response to issues raised throughout the review process. A list of the correspondence received is provided below and copies of the correspondence are publicly available on the Commission's website.

Table 2: *Summary of correspondence*

Date	Prepared by	Purpose of Document
25 September 2015	EPA	Information to the Commission regarding the draft notice of licence variation
2 October 2015	Applicant	Additional information to EPA and the Department relating to water discharge
8 October 2015	DRE	Additional information to the Commission relating to subsidence
9 October 2015	EPA	Additional information relating to water discharge and on-site water management
16 October 2015	Applicant	Responses to concerns raised in public submissions
22 October 2015	Applicant	Response to DRE letter dated 9 October relating to subsidence
26 October 2015	Applicant	Additional information to the Department relating to subsidence
30 October 2015	EPA	Further clarification relating to water discharge and water management
2 November 2015	DRE	Additional information to the Commission relating to subsidence
3 November 2015	Department	Response to DRE letter dated 2 November relating to subsidence

3. COMMENTS, FINDINGS AND RECOMMENDATIONS

3.1 Subsidence

3.1.1 Introduction

The EIS includes a Subsidence Prediction and Impact Assessment (SPIA) undertaken by Golder Associates, which was peer reviewed by Mine Subsidence Engineering Consultants (MSEC). The peer review concluded that Golder Associates had the relevant experience to prepare the SPIA and confirmed that it had obtained similar subsidence predictions based on a different approach. DRE has also visited the site three times with its subsidence experts.

While the establishment of the Mugii Murrum-ban SCA allows access to an important coal resource, longwall mining was never considered an appropriate method due to the sensitive surface features. Instead, bord and pillar mining has been utilised, which is widely considered to be an out-dated method and has become less common since the 1960s. Bord and pillar mining is not the most efficient method of extracting coal and not nearly as cost-effective as longwall mining. Longwall mining can achieve up to 80% resource recovery, while bord and pillar can generally only achieve up to 60%.

In that regard the Commission acknowledges that the bord and pillar method is a relatively conservative approach to mining, which can avoid or minimise potential impacts to sensitive surface features, particularly in comparison to the more common longwall method of mining. The predicted extraction rates would recover around 52% of the total coal resource available beneath the SCA which is significantly less than the potential extraction rate of longwall mining. In order to protect the sensitive sandstone cliffs and pagodas, only 31% of coal recovery is proposed in the 'Cliff Line Zone' meaning that 69% would be left beneath cliffs in the form of long-term stable pillars. Nevertheless, the Commission notes that DRE has raised concerns about the proposed mine plan and subsidence predictions, which are discussed in detail in **section 3.1.3** below.

3.1.2 Mine Plan

The Commission notes that the project has been divided into five distinct mining zones with each representing a specific geotechnical environment (see **Figure 1** on the next page).

Within these five mining zones, there are four different proposed methods that would have gradually increased subsidence effects, including:

- 'first workings only' with no pillar extraction – to be used in areas beneath the most sensitive surface features (the 'Cliff Line Zone');
- 'partial pillar extraction' involving the removal of the edges of some pillars – to be used in the areas adjacent to the most sensitive surface features (the 'PPEZ');
- 'pillar splitting and quartering' involving the removal of some internal parts of the pillars – to be used in the shallower areas adjacent to sensitive surface features (the 'shallow zone'); and
- 'panel and pillar mining' involving more extensive extraction of pillars with the retention of only a limited amount of 'chain pillars' – to be used in the deeper areas (the 'PPMZ' and 'Interaction Zone').

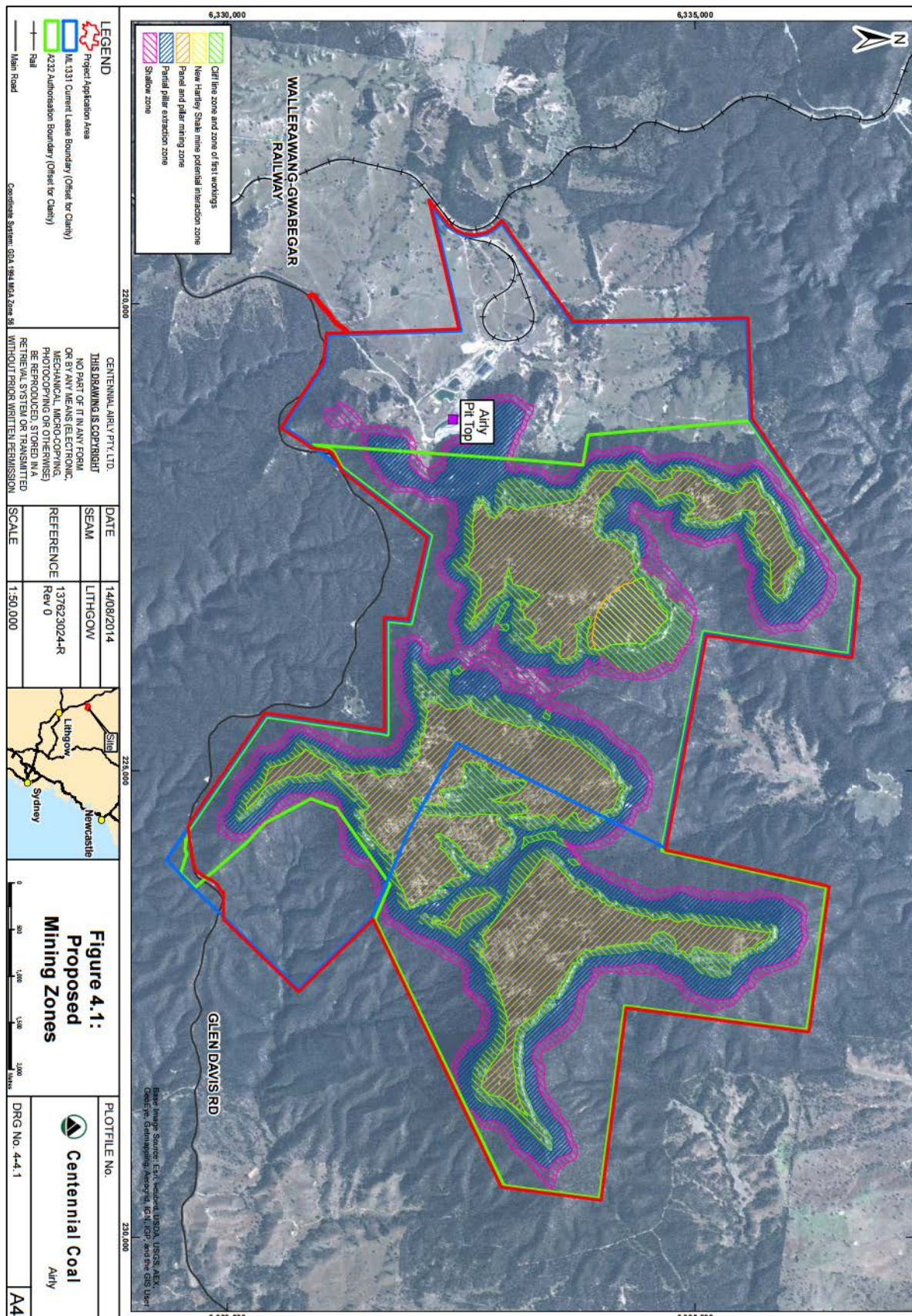


Figure 1: Proposed Mining Zones

The Commission note that the EIS states that the mining sequence would generally move from the western part of the project area in an easterly direction. This may involve a combination of the four mining methods ranging from first workings only to full pillar extraction. However, the Commission notes that there is no specific timetable or plan in the EIS, RTS or any other documentation illustrating the specific sequence of proposed mining across the 25 year timeframe.

While the Commission acknowledges that bord and pillar mining is more flexible than longwall mining and may involve amendments to mine plans throughout the process to minimise risk to surface structures, the lack of a predicted timetable describing the likely sequence of mining has made the task of assessing the potential subsidence impacts more difficult, particularly in relation to those impacts that are likely to occur in the early stages of the project. The Commission considers that such a timetable enhances certainty in decision-making and recommends that the Department require the Applicant to provide a proposed timeline of coal extraction, including a plan showing the expected progression of mining over the 25 year project life.

3.1.3 Subsidence Predictions

The Commission notes that the SPIA predicts that subsidence impacts will be relatively low and are substantially lower than the maximum subsidence effects that have already been observed at the mine as a result of previous mining (see **Table 3** below).

Table 3: Predicted subsidence levels across the proposed mining zones

Mining zone	Vertical subsidence (mm)	Tilt (mm/m)	Tensile strain (mm/m)	Compressive strain (mm/m)
First Workings only (Cliff Line Zone)	10 – 65	0.6 – 1.1	0.2 – 0.3	0.2 – 0.5
Pillar Splitting & Quartering (Shallow Zone)	3.5 – 25.5	0.6 – 1.1	0.1 – 0.4	0.2 – 0.6
Partial Pillar Extraction (PPEZ)	25 – 65	0.5 – 2.6	0.2 – 1.1	0.2 – 1.9
Panel and Pillar Mining (PPMZ)	40 – 106	1 – 3.3	0 – 1	0 – 2
Interaction Zone (<i>first workings only</i>)	10 – 65	0.6 – 1.1	0.2 – 0.3	0.2 – 0.5
Interaction Zone (<i>below super-critical voids</i>)	200	2.5 – 6.7	1.0 – 2	0.7 – 3.3
Interaction Zone (<i>below sub-critical voids</i>)	500	6.2 – 16.7	2.4 – 5	1.8 – 8.3
Previous mining areas	1,800	85	25.5	42.5
Maximum predicted across proposed zones	500	16.7	5	8.3

While the Applicant has predicted generally low levels of subsidence effects, concerns have been raised by the Principal Subsidence Engineer (Dr Gang Li) at DRE, and in numerous other public submissions, including those from Dr Pells and the Colo Committee, about the mine plan and the accuracy of the predicted subsidence effects. In particular, Dr Li has raised concern about the angle of draw (8 degrees) for the proposed mine design, which is lower than more common mine designs that incorporate a wider angle of draw (26.5 degrees). Dr Li has also raised concern about the ‘factor of safety’ relating to the long term stability of pillars, which is proposed to be 1.6 and is less than the more common industry practice of 2.11.

The Commission notes that the Applicant has provided further information to the Commission and the Department in response to the concerns about the mine plan and the accuracy of predicted subsidence effects. This information refers to various other examples of similar mine designs in Australia and South Africa, which indicate that a 'factor of safety' of 1.63 has a probability of 99.9% long term pillar stability.

In its most recent correspondence on 2 November 2015, DRE has considered the additional information provided by the Applicant and the public submissions, and has maintained its support for the project. DRE has noted that the angle of draw of 26.5 degrees is proposed in many areas of proposed mining, including beneath the former New Hartley Shale Mine. DRE also notes that many areas of the mine would have a factor of safety greater than 2, which would provide certainty in relation to long term stability.

The Commission notes that bord and pillar mining allows a more responsive and adaptive approach than the more common longwall mining method, as there is flexibility to cease or change the mining operations based on any potential impacts or risks. However, the Commission also acknowledges that some parties have identified that the proposed mine plan proposes to use a reduced angle of draw and a reduced 'factor of safety' relating to long-term stability of pillars. The Commission agrees with the recommendations from both DRE and the Department that an Independent Expert Panel should be established to provide greater certainty around these key issues, which is discussed in detail in **section 3.1.7** below

3.1.4 Impacts on Cliff Lines

In written and verbal submissions, numerous individuals and organisations raised concerns about the protection of landscape features within the Mugii Murum-ban SCA from potential subsidence impacts, particularly in relation to cliffs, pagodas, gorges and steep slopes. DRE has specifically noted the importance of maintaining long term stability across the project area in order to protect these significant cliff line features.

The Commission notes that the Applicant has proposed that the Cliff Line Zone would protect the majority of the cliffs, pagodas and the steep slopes by limiting extraction to first workings. In addition, within the Cliff Line Zone the Department has recommended strict performance criteria to limit damage to no more than 2% of the total area of cliffs and 2% of the total area of pagodas.

These performance criteria are consistent with other mining operations in NSW which have mined under cliffs and similar surface features. The Commission supports this approach. Consequently, the Commission is generally satisfied that the proposed method of extraction would appropriately minimise subsidence impacts on cliffs, steep slopes, pagodas and gorges.

There are only six cliff lines located outside of the proposed Cliff Line Zone, and the Commission notes that that these cliffs are small and not high in visual prominence. The predicted vertical subsidence for these six cliffs is about 60 mm and the predicted levels of tilt and strain are less than 2mm/m, which are both relatively low. The upper-bound predictions of damage range from 2% to 18% of the total cliff face areas for these six cliff lines.

Nevertheless, the Commission also recommends that the Independent Expert Panel should confirm that the predicted subsidence-related impacts on cliffs, steep slopes, pagodas and gorges are accurate and reliable, and the recommended management regime is appropriate, prior to the determination. A conservative and precautionary approach is considered appropriate given the significance of surface structures and divergence of technical views.

3.1.5 Ecological Impacts

In written and verbal submissions, numerous individuals and organisations raised concerns about impacts on terrestrial ecology, particularly in relation to two endangered ecological communities (*Genowlan Point Allocasuarina nana* Heathland and the Box-Gum Woodland). Concerns were also raised regarding impacts on threatened flora which includes the threatened species *Pultenaea* sp. Genowlan Point (critically endangered under the TSC and EPBC Acts) and four fauna species associated with cliffs.

The Commission notes that comprehensive seven-part assessments based on maximum impact scenarios have been undertaken in accordance with the 'Threatened Species Assessment Guidelines' (DECC, 2007) and found that the risk of any impacts to threatened species is low.

The Commission is generally satisfied with the Department's recommended performance measures in the conditions of consent that would require no environmental consequences to threatened species and EECs. In relation to the vulnerable species, the Department has also recommended performance criteria that would protect 98% of the total area of cliffs, pagodas, gorges and steep slopes (as discussed above in **section 3.1.4**).

Nevertheless, the Commission has recommended that the Independent Expert Panel should be consulted in preparing, revising and enforcing the Biodiversity Management Plan, which is included within the suite of documents required under the Extraction Plan process.

3.1.6 Impacts on Heritage and Built Features

In written and verbal submissions, concerns were raised about the possible impacts to Aboriginal and heritage sites related to subsidence. There are a total of 34 heritage sites located within the project area. The Commission is satisfied that there would be predicted negligible impacts to these sites and notes that the Department has recommended performance measures requiring that these predictions are met.

The Commission is also satisfied that potential subsidence impacts on other buildings and infrastructure including emergency services communication tower, Telstra copper cable, Nissen Hut, Stone Cottage and Airly Camp Ground, can be suitably managed through the Extraction Plan process and the Department's performance measures.

3.1.7 Subsidence Management Framework and Performance Criteria

The Commission notes that underground coal mining in areas of sensitive surface features is a relatively young science and is still evolving. The Commission recognises that there are a number of uncertainties that currently exist in relation to the proposed mine plan and potential subsidence-related impacts on sensitive surface features. The Commission also notes that there are a number of other uncertainties, including the ability to physically monitor subsidence effects within the SCA, and the adequacy of Trigger Action Response Plans (TARPs).

The Commission has been involved in the assessment of most of the recent key underground coal mines in NSW, and is aware that a robust set of conditions has been developed in recent years to manage the uncertainties associated with the subsidence-related impacts of underground mining. The Commission is generally satisfied that the uncertainties of this mine plan can be managed through a comprehensive framework involving performance criteria, the Extraction Plan process, and the role of the recommended Independent Expert Panel.

Nevertheless, the Commission considers that there is scope for improving the existing framework of conditions and believes the recommended Independent Expert Panel is a significant and appropriate step towards ensuring that subsidence-related impacts are properly addressed. In particular, the Commission has adopted a precautionary approach and considers that the Panel should be established prior to determination in order to confirm that the mine plan is appropriate and the predicted subsidence effects are accurate and reliable.

Furthermore, the Commission does not consider that the role of the Panel should be merely advisory, rather the recommendations from the Panel should be enforceable through the Extraction Plan approval process, and publicly reported, to ensure that they are appropriately incorporated into the ongoing management of the mine.

3.1.8 Summary of Recommendations

1. That the Department requires the Applicant to provide a proposed timeline of coal extraction, including a plan showing the expected progression of mining over the 25 year project life.
2. That the proposed condition of consent that establishes the Panel of suitably qualified experts should specify that the Panel will be constituted by at least two suitably qualified, experienced and independent experts (i.e. an Independent Expert Panel) whose appointment has been approved by DRE.
3. That the Independent Expert Panel should be established prior to determination, and undertake the following:
 - review all submitted material on subsidence, including additional information supplied by the Applicant and its consultant, and comments from DRE and its Principal Subsidence Engineer;
 - provide advice and recommendations about the following:
 - the accuracy and reliability of predicted subsidence impacts on sensitive surface features, particularly in relation to cliff lines in the vicinity of the areas to be mined beneath the former New Hartley Shale Mine;
 - the adequacy of the management regime in the proposed conditions of consent, including the performance criteria, management plans and monitoring requirements, in terms of providing appropriate protection to sensitive surface features.
4. That the proposed condition for the Extraction Plan expressly requires consultation with the Independent Expert Panel in preparing, revising and enforcing the Extraction Plans and associated management plans (including the Water Management Plan, Biodiversity Management Plan and Land Management Plan), particularly in relation to relevant mine design principles, the development of detailed Trigger Action Response Plans and performance indicators.
5. That all information relevant to the Independent Expert Panel's advice and recommendations is made publicly available on the Applicant's website.

3.2 Water Resources

3.2.1 Introduction

As described in section 2.1, the Minister's Terms of Reference specifically require the Commission to consider the Commonwealth Independent Expert Scientific Committee's advice, and to pay particular attention to water impacts, including any downstream water quality impacts in the Gardens of Stone National Park. These issues are considered in detail in **sections 3.2.2 and 3.2.3**.

The Commission considers it important to highlight that there has been a substantial amount of work undertaken on the water resource impacts of the project throughout the development assessment process to date, particularly in response to issues raised by various agencies and in subsequent public submissions.

Table 4 (on the next page) provides an overarching summary of the key documents that the Applicant has prepared in relation to water resources.

Table 4: *Summary of documents relating to water resources*

Document	Stage provided and date	Prepared by	Purpose of the document
Groundwater Impact Assessment	EIS	GHD	Assess any potential impacts of the proposal on groundwater receptors
Surface Water Impact Assessment	EIS	GHD	Assess potential impacts on quality and quantity of existing surface water resources
Aquatic Ecology and Stygofauna Assessment	EIS	Cardno	Assess any potential impacts to aquatic ecology and stygofauna as well detailing any appropriate mitigation measures
Peer Review of the Groundwater Impact Assessment	Initial Department Assessment	Hydro Algorithmics	Review the groundwater assessment conducted by GHD
Response to Groundwater Solutions International submission	RTS	GHD	Respond to each area of concerns raised by Groundwater Solutions International
Surface Water Licensing Requirements	RTS	GHD	Confirm the current and future surface water licence requirements and review current availability within relevant surface water source
Ecotoxicology Assessment	RTS	GHD	Determine the ecotoxicity and chemical constituents of mine water discharge from Airly Mine as well as within the Airly Creek catchment
Responses to EPA submission on Ecotoxicology Assessment	RTS	GHD	Respond to comments raised by EPA in their assessment of the Ecotoxicology Assessment
Responses to submissions made during the PAC review and public hearing	Initial PAC Assessment	Applicant	Respond to concerns raised by non-government organisations within various submissions and presentations made to the PAC

3.2.2 Groundwater Impacts

The EIS included a Groundwater Impact Assessment (GIA) based on a groundwater model constructed with reference to the *Aquifer Interference Policy* (AIP) and the *Australian Groundwater Modelling Guidelines*.

Groundwater Modelling

At the EIS stage, the Independent Expert Scientific Committee (IESC) raised some concerns about the resolution of the groundwater model. However, the IESC considered that the groundwater data had been largely collected to a satisfactory standard and over an appropriate timeframe. The Commission also notes that the groundwater model was peer reviewed by Dr Noel Merrick who acknowledged that it was fit for purpose, particularly in relation to the AIP.

The Commission acknowledges that data from additional monitoring bores can be used to calibrate the groundwater model as part of the recommended Water Management Plan as mining progresses. The Commission has carefully considered the IESC submission, the peer review, the RTS, additional information provided by the Applicant and NOW's submission, and is satisfied that there was sufficient data available to prepare the GIA and that the groundwater model is adequate.

Geological Profile

There are two independent sources of groundwater, including the shallow and deeper regional sources. The shallow groundwater sources are less productive under the AIP and are essentially isolated to the mesas of Mount Airly and Genowlan Mountain (see **Figure 2**), including the fractured rock groundwater resources in the Narrabeen Sandstone and Shoalhaven Groups. The deeper regional groundwater sources include hard rock aquifers in the Devonian Group (highly productive under the AIP) and the Shoalhaven Group (less productive under the AIP). The groundwater in the Devonian Group is used by 36 registered groundwater bores in the Capertee Valley, east of the mine.

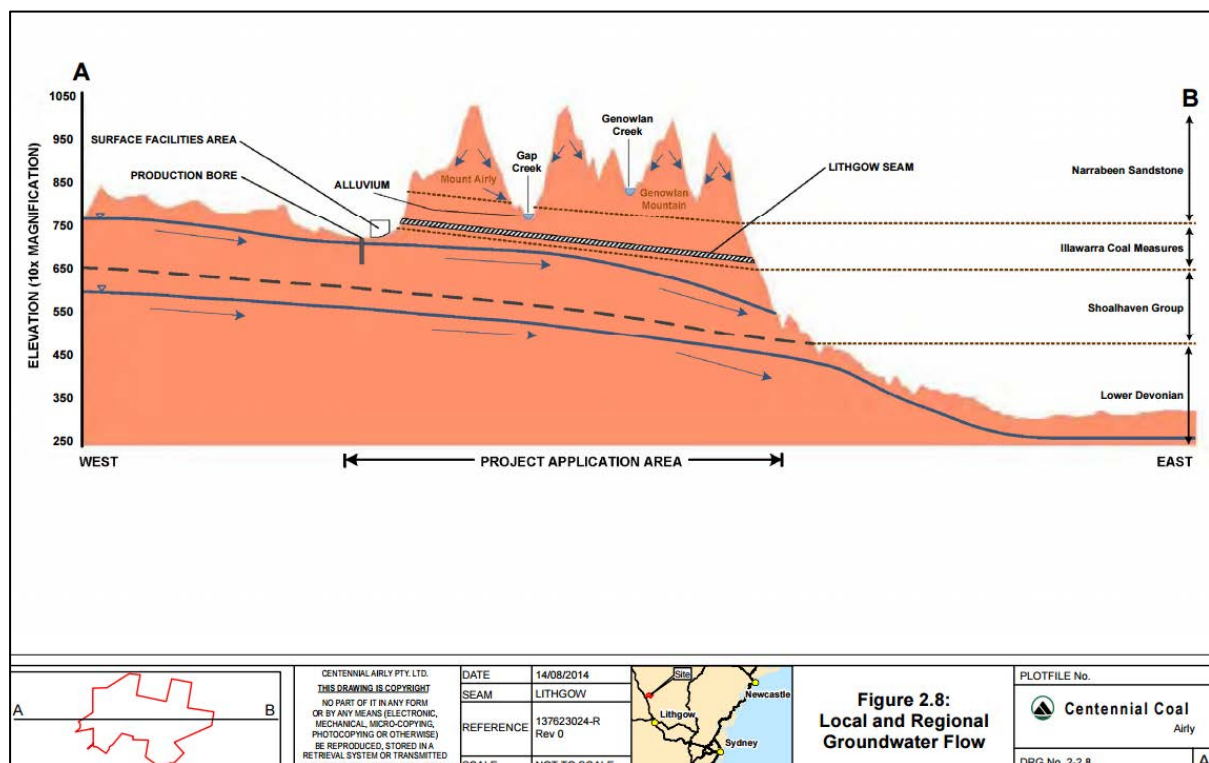


Figure 2: Conceptualisation of local and regional groundwater sources in the site

Potential Groundwater Impacts

In terms of drawdown of the deeper groundwater resources, the Commission notes that the predicted levels are very low (maximum 0.1m) in the aquifers within the more productive Devonian Group and no drawdown is predicted within the Shoalhaven Group.

In terms of drawdown of shallow groundwater sources, the Commission notes the levels of drawdown are predicted to be between 2.5 and 3.5m beneath Gap Creek, up to 1.1m beneath Genowlan Creek, and that no drawdown is predicted beneath the Grotto or Oasis. The Commission also notes that there are low levels of drawdown predicted within the fractured rock groundwater sources, including localised drawdown of up to 2m in the Narrabeen Sandstone Group and 0.1m in the Shoalhaven Group.

The Commission is satisfied with the Department's view that there would be no change in water quality to Gap or Genowlan Creek, or to the beneficial use categories of these creeks as a result of predicted levels of groundwater drawdown. The Commission emphasises that NOW is satisfied that the project's impacts would be within acceptable Level 1 impacts under the AIP.

The IESC also raised concerns about the identification of groundwater dependent ecosystems (GDEs). The Commission has assessed the potential impacts of subsidence on GDEs and stygofauna. The Commission notes that the Department has adopted NOW's recommendation in its proposed conditions requiring the Applicant to include a program to monitor and report on GDEs and stygofauna within its Groundwater Management Plan. The Commission also notes that OEH raised no residual concerns on this matter. Consequently, the Commission is satisfied that impacts on GDEs and stygofauna are not likely to be significant.

Groundwater Monitoring

The Department received a submission from Groundwater Solutions International (GSI) that raised concerns about the adequacy of the groundwater monitoring and the availability of water licence entitlements. The Applicant has since engaged GHD Pty Ltd to prepare a response to these criticisms, which noted NOW's satisfaction with the groundwater monitoring network and provided details about the additional water entitlements that the Applicant has obtained.

Conclusion

The Commission is satisfied that the Department has adopted NOW's recommendations in the draft conditions, which requires a comprehensive Groundwater Monitoring and Management Plan, including additional monitoring of groundwater in the east of the site to calibrate the groundwater model and inform subsequent mining practices through the Extraction Plan process. As NOW is the lead agency with responsibility for groundwater issues, the Commission accepts its advice that the project is acceptable in terms of groundwater impacts and notes that its recommendations have been included in the proposed conditions of consent.

3.2.3 Surface Water

The EIS included a Surface Water Impact Assessment (SWIA) which is based on a water and salt balance model, water quality and regional water balance assessment. The EIS also includes an Aquatic Ecology and Stygofauna Assessment undertaken by Cardno. The Commission also notes that the Applicant has been in consultation with EPA throughout the process of this review.

In written and verbal submissions, concerns have been raised in regards to the potential effects on surface watercourses from discharges into Airly Creek and flow-on effects in downstream watercourses, as well as potential subsidence-related impacts.

Key Watercourses

The Commission notes that there are a number of key watercourses in the project area in terms of usage and importance to the local ecosystems, including Gap Creek, Genowlan Creek, the Grotto and the Oasis (see **Figure 3** below). There are also a number of seeps and springs that occur throughout the project area, such as the well-known Village Spring.

The mesas of Mount Airly and Genowlan Mountain are intersected by Gap Creek and the upper reaches of Genowlan Creek, which include the areas known as the Grotto and the Oasis. Gap Creek joins Genowlan Creek to the north of the site, which in turn flows to its confluence with the Capertee River. Airly Creek enters the Gardens of Stone NP to the south of the project area before joining Capertee River. All other watercourses within the project area eventually flow into Capertee River, which is located approximately 35km downstream within the Wollemi National Park.

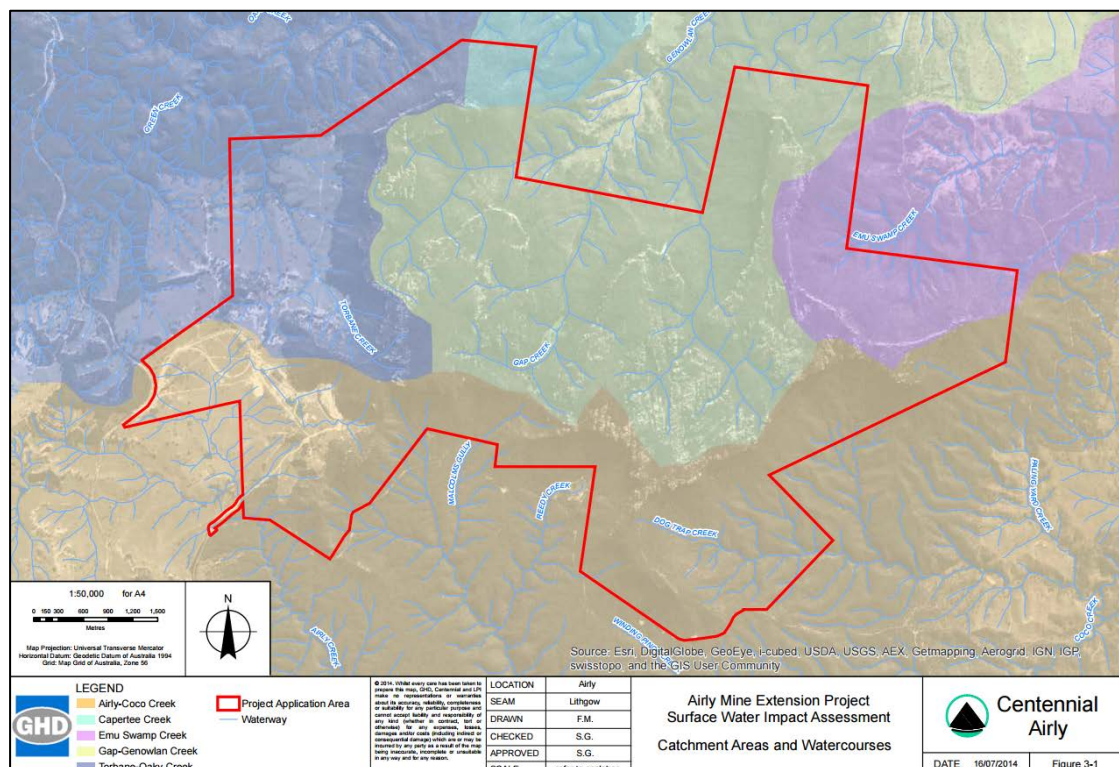


Figure 3: Key watercourses within the project area

Discharges to Airly Creek

In written and verbal submissions, concerns were raised about the discharge of highly saline minewater from the site into Airly Creek. The Commission notes that Airly Creek is already in a degraded state with generally poor existing water quality in most key areas of measurement, including electrical conductivity, total suspended solids, turbidity, nitrogen and phosphorous.

While it is likely that mining has had an influence on water quality in Airly Creek, the Commission accepts that it is not currently possible to determine the relative extent of the influence of mining operations. There are a number of factors that may be relevant, including past land clearing, agricultural uses, the ephemeral nature of the waterway and its location in the Shoalhaven Group strata. The Commission also notes that the amounts of both previous discharges and the proposed future discharges are relatively low with a maximum of 180 megalitres (ML) per year, which is significantly less than other similar mines like Clarence Colliery with an expected 5,000 ML per year by 2026.

The Commission notes that due to the ephemeral nature of the upper reaches of Airly Creek upstream of the mine's LDPs, the Applicant has been unable to satisfy the requirement for a minimum of two years of ambient monitoring data as required in the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC guidelines). The Applicant has instead provided three years of monitoring data from Airly Creek downstream of the pit top facilities and licensed discharge points (LDPs) to derive proposed site specific trigger values (SSTVs) under the ANZECC guidelines.

The Applicant has proposed site specific trigger values (SSTVs) that are much higher than the ANZECC guidelines default values (as shown in **Table 5** below). However, the Commission notes that the Applicant's model predicts that 99% of all species would still be protected prior to entering the Gardens of Stone National Park and the Wollemi National Park, which represents the highest level of protection provided under the ANZECC Guidelines. Furthermore, the Applicant has proposed to revise the SSTVs after two years of monitoring data has been obtained from the upstream monitoring point in Airly Creek.

Table 5: Proposed site specific trigger values

Parameter	Units	ANZECC default trigger values	Proposed SSTVs
EC	µS/cm	350	2,998
TSS	mg/l	25	68
Turbidity	NTU	25	83
Total nitrogen	mg/l	0.25	1.88
Total phosphorous	mg/l	0.02	0.24
Barium	mg/l	No data	0.0252

The Applicant has been in consultation with EPA in relation to discharge limits and has been provided with a draft variation to the existing Environment Protection Licence (EPL). The draft EPL variation was developed in consultation with OEH and provides discharge limits and monitoring requirements that would ensure that the appropriate dilution occurs and the 99% species protection is achieved.

The Applicant recently met with EPA on-site to discuss residual issues that were raised by EPA in relation to the EPL variation. Following this meeting, the Commission received a preliminary response from EPA indicating that any residual issues can likely be resolved, including the imposition of a Special Condition on the EPL requiring the Applicant to provide further catchment modelling demonstrating that the 99% species protection would be achieved.

The Commission is generally satisfied that the potential discharge impacts can be adequately managed through the recommended conditions of consent and an amended EPL. Nevertheless, the Commission recommends that the Department seeks further confirmation from EPA about these issues prior to determination.

Recommendation

- That, prior to determination, the Department seeks written confirmation from EPA that any residual issues relating to water discharges into Airly Creek and any downstream water quality impacts in the Gardens of Stone National Park can be adequately resolved, particularly in relation to the achievement of 99% species protection.

Subsidence-related impacts on watercourses

A number of written submission and presentations at the public hearing raised concerns about potential surface cracking in streams as a result of subsidence impacts. The SWIA predicts that no surface cracking of streams would occur in four of the five proposed mining zones. The Commission notes that a general setback of 20m from mine workings to Gap Creek and Genowlan Creek has been proposed wherever the depth of cover is less than 40m. As a result, the SWIA predicts that the maximum subsidence effects in these watercourses would be only 25.5 mm of vertical subsidence and 1.1 mm/m of tilt.

However, the Commission notes there is potential subsidence-related surface cracking of two first order drainage lines, which are located within the Interaction Zone (refer to **Figure 4** on the next page). The potential loss of water in these drainage lines may lead to a minor reduction in flow downstream in Gap Creek and Genowlan Creek (both third order streams), which are located outside the Interaction Zone. The SWIA predicts that even if the two first order drainage lines are drained completely, this would reduce total catchment runoff by less than 9.5% in Gap Creek, and less than 2% at its confluence with Genowlan Creek.

The Commission is satisfied that there would be no cracking of Gap Creek and Genowlan Creek, and that any potential reduction in flow associated with the cracking of first order drainage lines would likely be within the limits of natural variability based on the small flows potentially affected. The Commission also notes the recommended conditions of consent requiring negligible impacts on water quality and bank stability. As described in **section 3.1.8**, the Commission also recommends that the Independent Expert Panel should be consulted in preparing, revising and enforcing the Water Management Plan, which is included within the suite of documents required under the Extraction Plan process.

Nevertheless, the Commission notes that there are three licensed surface water users downstream of the site that may be affected by potential flow reductions in Gap Creek and Genowlan Creek. The Department has recommended its standard condition of consent requiring the Applicant to provide a compensatory water supply to downstream users for such impacts. However, the Commission recommends that the condition of consent relating to the Water Management Plan should be strengthened to include specific consideration of the potential impacts to these downstream water users, and the measures to implement the provision of compensatory water supply.

The Commission also notes the potential predicted impacts on the Village Spring, which is a source of water for bushwalkers and hikers. It is reported by the Applicant that the seep at Village Spring is fed by drainage from the old shale workings. While there is uncertainty about the impact, the Commission does not agree with the Department's view and considers the potential loss of the spring to be an unacceptable impact given the recreational values of the SCA. Consequently, the Commission recommends that the spring should be replaced by an artificial water source for bushwalkers and hikers.

Recommendations

7. That the recommended condition of consent relating to the Water Management Plan should be strengthened to include specific consideration of the potential impacts to downstream water users of subsidence-related flow reductions in Gap Creek and Genowlan Creek, and the measures to implement the provision of compensatory water supply.
8. That the Department should include a condition of consent requiring that the Applicant provides an alternative, artificial water source to the Village Spring to ensure that bushwalkers and hikers have access to drinking water.

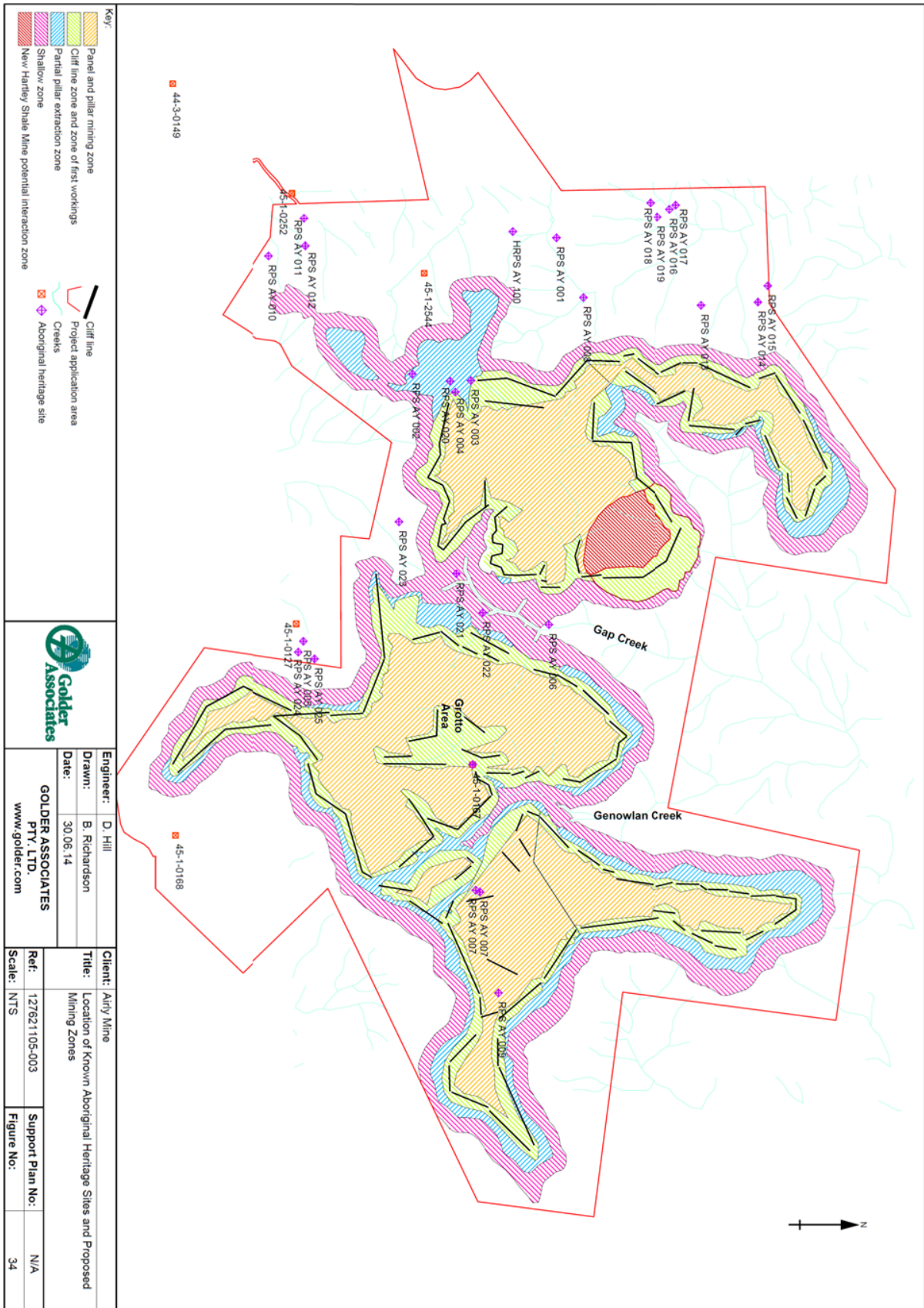


Figure 4: Watercourses and Proposed Mining Zones

3.3 Social and Economic Impacts

The EIS includes a revised Economic Impact Analysis (EIA) undertaken by Aigis Group, dated March 2015, and a Social Impact Assessment (SIA) prepared by James Marshall & Co, dated August 2014. The Department's Chief Economist and the Centre for International Economics (CIE) undertook a review of the EIA.

Both reviews found that the EIA did not provide an adequate assessment of the costs and benefits of the project. In response to these findings, the Applicant provided a revised EIA which the CIE reviewed and reported that various aspects of the EIA should be clarified or adjusted. The Commission has considered these documents in detail in assessing the social and economic impacts of the proposal as well as taking into account both verbal and written submissions.

The proposed mine extension project has a capital investment value of approximately \$86.63 million and involves the extraction of up to 1.8 Mpta for 25 years and proposes an increase in employment from 59 existing jobs to approximately 120 permanent positions

The most recent CIE review suggests a number of amendments that Aigis should make to their calculations. In particular, one area of difference was the calculation of royalties that the Applicant estimates at a value of \$116.4 million, whereas the estimates from DRE suggest royalties more likely to be in the range of \$80 million. The CIE review also suggests that certain calculations are difficult to confirm as the Applicant has not offered up certain parts of information in particular in relation to employee wages and profits.

The Commission acknowledges that given the current volatility of coal prices, there is some ambiguity in determining the exact economic benefits for this project. Nevertheless, the Commission is of the view that overall both figures demonstrate that the proposal would likely result in a positive net economic benefit to the Commonwealth, State and local area, although the benefits may be marginal.

The Commission notes that there were numerous verbal and written submissions indicating support for the proposed mine extension and suggesting that the proposed mine extension would provide direct and indirect employment opportunities and other social benefits to the region. Speakers indicated that the Lithgow area is already experiencing a downturn as a direct result of the closure of other mines and industry in the area and were concerned that any further loss of mines in the area would adversely impact the social fabric of the town.

The Commission notes that the Applicant has committed to contributing three cents per saleable tonne of coal from the Springvale, Angus Place and Airly mines to Lithgow City Council, capped at a maximum payment of \$200,000. The contribution would be used for long-term community activities and projects to be agreed by both the Applicant and Council and must be reported publicly.

The Commission met with Council to discuss the proposed project and in particular the proposed contribution scheme. Council confirmed that they had agreed an approach with the Applicant. Given Council's support of the proposed financial contribution, the Commission supports the commitment to the community and is satisfied that it is reflected in the Department's recommended conditions of consent.

Overall, the Commission is of the view that the continued employment of existing staff and the new full time and temporary jobs that could be generated from the proposed mine extension project would make a positive contribution to the Lithgow City Council LGA and the region.

3.4 Reject Emplacement Area

The Commission heard concerns from speakers at the public hearing and within the written submissions regarding the design of the Reject Emplacement Area (REA) and the potential acid mine drainage (AMD) impacts. The Applicant has since provided further information to the Commission in order to address the concerns raised.

In relation to the design of the REA, a concept design was provided by the Applicant within the EIS. The concept design includes details regarding drainage and designs for dealing with water in flood events. The design is currently in concept form and the Applicant states that further details will be prepared prior to construction. The Commission notes that the REA is only required to be constructed in order to service the Coal Preparation Plant (CPP) as the REA would be used to store the reject material produced through the operation of the CPP. The Commission understands that the REA may not be constructed as it is market dependent. The Commission is satisfied that if the REA is to be constructed, then further detail design would be provided to the Department for approval.

In relation to potential AMD impacts, the Applicant has provided information to the Commission stating it has undertaken testing of the coal within the targeted Lithgow coal seam, which indicates that the potential for AMD drainage formation from reject material is low. The Commission has received advice from EPA confirming that it has no specific concerns about the issue. DRE has also not raised any concerns about the integrity of the REA. The Commission notes that in the event AMD result occurred during mining operations, the recommended conditions for water management would adequately manage the potential risks on site. The Commission is therefore satisfied that the Water Management Plan would manage any potential risks from AMD.

3.5 Visual Impacts

Concerns have been raised with the Commission regarding the potential impact of the proposed Airly Mine expansion on the visual amenity of the area, in particular the potential impact on the tourism sector. The Commission undertook a site visit on 23 September 2015. During this site visit, the Commission noted that glimpses of the existing mine are already possible from the Glen Davis Road.

In order to reduce the visual impact of the proposed mine extension and in particular the REA from Glen Davis Road, the Applicant proposes progressive rehabilitation and the planting of trees to act as visual screening. The Commission agrees with the Department's view that these screening measures would mitigate any adverse visual impacts of the new infrastructure and that any potential resulting visual impacts on Glen Davis Road or nearby residential properties would be negligible. Nevertheless, the Commission recommends that the Department strengthens its condition regarding visual impacts to ensure that screening planting is undertaken in a timely manner.

Recommendation

9. That the proposed conditions of consent relating to visual mitigation measures are strengthened to ensure that vegetation screening or other mitigation measures commence before any construction occurs and are implemented in a timely manner.

4. CONCLUSIONS AND FINDINGS

The Commission has carefully considered the proposal and the submissions made, including written submissions to the Commission, presentations at the public hearing, submissions made on the Environmental Impact Statement, the Response to Submissions report, the Applicant's Response to the RTS report, and further information provided by the Applicant after the public hearing. The Commission has sought clarification on a number of issues from the Department, and also specific sought expert advice from the DRE and EPA.

The Commission has made nine recommendations in this report, which are summarised in **section 5** below. Provided that these recommendations are adequately addressed, the Commission is satisfied that the project can be approved, subject to conditions.

5. RECOMMENDATIONS – CONSOLIDATED SUMMARY

Subsidence

1. That the Department requires the Applicant to provide a proposed timeline of coal extraction, including a plan showing the expected progression of mining over the 25 year project life.
2. That the proposed condition of consent that establishes the Panel of suitably qualified experts should specify that the Panel will be constituted by suitably qualified, experienced and independent experts (i.e. an Independent Expert Panel) whose appointment has been approved by DRE.
3. That the Independent Expert Panel should be established prior to determination, and undertake the following:
 - review all submitted material on subsidence, including additional information supplied by the Applicant and its consultant, and comments from DRE and its Principal Subsidence Engineer;
 - provide advice and recommendations about the following:
 - the accuracy and reliability of predicted subsidence impacts on sensitive surface features, particularly in relation to cliff lines in the vicinity of the areas to be mined beneath the former New Hartley Shale Mine;
 - the adequacy of the management regime in the proposed conditions of consent, including the performance criteria, management plans and monitoring requirements, in terms of providing appropriate protection to sensitive surface features.
4. That the proposed condition for the Extraction Plan expressly requires consultation with the Independent Expert Panel in preparing, revising and enforcing the Extraction Plans and associated management plans (including the Water Management Plan, Biodiversity Management Plan and Land Management Plan), particularly in relation to relevant mine design principles, the development of detailed Trigger Action Response Plans and performance indicators.
5. That all information relevant to the Independent Expert Panel's advice and recommendations is made publicly available on the Applicant's website.

Water Resources

6. That, prior to determination, the Department seeks written confirmation from EPA that any residual issues relating to water discharges into Airly Creek and any downstream water quality impacts in the Gardens of Stone National Park can be adequately resolved, particularly in relation to the achievement of 99% species protection.
7. That the recommended condition of consent relating to the Water Management Plan should be strengthened to include specific consideration of the potential impacts to downstream water users of subsidence-related flow reductions in Gap Creek and Genowlan Creek, and the measures to implement the provision of compensatory water supply.
8. That the Department should include a condition of consent requiring that the Applicant provides an alternative, artificial water source to the Village Spring to ensure that bushwalkers and hikers have access to drinking water.

Visual Impacts

9. That the proposed conditions of consent relating to visual mitigation measures are strengthened to ensure that vegetation screening or other mitigation measures commence before any construction occurs and are implemented in a timely manner.

APPENDIX 1

List of Speakers at the Public Hearing

Date & Time: 3.00 pm, Wednesday, 23 September 2015

Place: Union Theatre, 63-65 Bridge Street, Lithgow, NSW 2790

Hearing Schedule

1. Bob Miller (Centennial Coal)
2. Maree Statham (Lithgow City Council)
3. Andrew Muir
4. Dr Haydn Washington (Colo Committee)
5. Neil Gorrell
6. Nell Schofield (Land Water Future)
7. Peter Shelley
8. Richard Trounson
9. Graeme Osborne (CFMEU)
10. Richard Sharp
11. Corey Griffin
12. Steven Pells
13. Nathan Dolbel
14. John Medcalfe (Running Stream Water Users Association)
15. Robert Cluff
16. Jan O'Leary (CSG Blue Mountains)
17. Keith Muir (The Colong Foundation for Wilderness)
18. Tim Waddell
19. Maxwell Taylor
20. Geoff Miell
21. Ghaz Ahmedi
22. Alex Scheibner
23. John Thirlwall
24. Tara Cameron (Greater Blue Mountains World Heritage Area Advisory Committee)
25. Julie Tito
26. Madi Maclean (Blue Mountains Conservation Society)
27. Raymond Munday

28. Dianne Munday
29. Stephen McKenzie
30. Elizabeth McKenzie
31. Greg Currie
32. Darrin Francis
33. Andrew Fawbert
34. Ian Fishpool
35. Donna Upton (Capertee Valley Alliance Inc)
36. Donna Upton
37. Bruce Upton
38. Grahame Danaher
39. Miah Currie
40. Peter Waterton

APPENDIX 2

Summary of Presentations Made at the Public Hearing

Comments provided during the public hearing and in written submissions are synthesised and summarised below:

Water

- Concerns regarding the heavy metals found in the production bore
- Water monitoring should be carried out by an independent person
- Concerns regarding the water modelling
- Concern of water pollution from discharges
- Water discharges could impact on the GBMWha area
- Risk of downstream pollution
- Potential impacts on aquatic ecology
- Water sample sites are not appropriate
- Clean and dirty water needs to be separated

Subsidence

- Mining zones are being used to protect surface features
- Concerns regarding the undermining of the cliffs and pagodas
- The proposal to limit damage to the 40 kilometres of cliff line to 2% were adopted it would permit up to 800 meters of unacceptable cliff falls
- Should be no more than 50% extraction
- Any rock falls would destroy the area
- Assurances on subsidence lack credibility
- Risk to damaging the heritage of the SCA
- Concerns about the interaction zone
- Cliffs over 50m should not be undermined
- Need specific criteria triggering “adaptive management” and stipulating potential responses

Economic and Social Impacts

- If the mine was not to go ahead there would be a huge negative impact to Lithgow
- Proposal provides both direct and indirect employment
- Families not able to stay in area if mine extension not approved
- No guarantee the mine won't go into care and maintenance
- Two thirds of the Airly workforce come from the local area
- Loss of jobs affects volunteer organisations, schools, sports teams
- Business already suffering in the area
- Coal market is in decline
- Centennial is a supporter of the community

Overall environmental impacts

- Airly is a clean mine that is environmentally responsible
- Daily auditing of pillars is already occurring
- The proposal will delay the inclusion of the SCA into the BMWha for 25 years
- Adaptive management plans should be in the public domain

Others

- Concerns if mine sold to another party
- Mine has a good safety record
- Threatens the viability of tourism in the area
- Incident at Clarence mine could happen at Airly
- Will impact on other industries in the area including agriculture, horticulture and tourism
- Rehabilitation – concerns with this being carried out given the viability of the mine
- A small roofed area with storage tank should be provided at sites for visitors due to potential loss of spring water
- Concerns regarding impact of the REA

Biodiversity

- Concerns about the habitat of the critically endangered Regent Honeyeater
- The area is internationally listed as a bird watching area
- Number of rare plants and animals in the area
- Cliff collapses put species at risk
- Particular concerns regarding the *Pultenaea* species

Visual

- Screening not been planted yet
- Infrastructure designed to reduce impact to visual amenity
- There is tourism activity in the area that should be respected
- Landscape architect should be engaged to help screening
- The coal reject area should be screened

APPENDIX 3

SUMMARY OF MEETINGS WITH OTHERS

Summary Notes of Meeting with the Department of Planning & Environment

Meeting note taken by: Johanna Lee **Date:** Thursday, 27 August 2015 **Time:** 2.00 pm

Meeting place: PAC

Attendees:

PAC: Robyn Kruk AM (Chair); Alan Coutts; David Johnson; Johanna Lee; and Clay Preshaw

Department: David Kitto (Executive Director); and Thomas Watt (Planning Officer)

The purpose of the meeting is to brief the PAC on the extension project proposal.

The main points of discussion are outlined below:

Background

- Board and pillar operation.
- The State Conservation Area that covers the mine area was made in agreement with Centennial Coal (Applicant).
- 36 million tonne of coal is a small scale resource.

Subsidence

- Subsidence is the lower end of the spectrum.
- Adaptive management can be quite successful in managing subsidence unlike in long wall mining.

Water

- Discharge will only occur during wet periods. Discharge into Airly Creek will flow through the National Park then eventually comes into Capertee Creek.
- Upper areas of Airly Creek are ephemeral.
- Lack of water monitoring data was addressed in the IESC. This is being addressed via condition.
- Differing views on the water model. Applicant provided a response on this issue.
- EPA will be responsible for dealing with metals and will condition accordingly.

Biodiversity

- Management of the pit top construction will be important as next to an area of high biodiversity values.

General items:

- Is a conservative mine plan that protects sensitive elements.
- Economic assessment will range depending on coal price.
- Flexible mine operation in that it can be turned on and off if economic environment demands it.
- The mine consent is due to lapse end of October. The Applicant has submitted a modification to extend the approval by 6 months.
- Partial view will be possible from road. Applicant is planting trees to assist with obscuring views to the pit top.

Documents provided: - N/A

Briefing finished at approximately: 3.00 pm

Summary notes of meeting with Applicant

Meeting note taken by: Johanna Lee **Date:** Wednesday, 23 September 2015 **Time:** 10:00am

Meeting place: Airly Mine

Attendees:

PAC: Robyn Kruk AM (Chair); Alan Coutts; David Johnson; and Johanna Lee.

Applicant: Bob Miller (Mine Manager); Sam Price (Environment Co-Ordinator); James Wearne (Group Approvals Manager); Greg Banning (General Manager for Projects); Niagimdar Singh (Approval Co-ordinator) and Stuart Grey (GHD Hydrogeologist)

The purpose of the meeting is to provide an overview of the project to the PAC and undertake a site visit.

The main points of discussion are outlined below:

Operations

- Infrastructure already designed for the life of the mine
- 64 people employed and is a 5 day operation
- Already operating to the SCA Draft Management Plan
- Dry mine

Subsidence

- Do not currently have an expert panel however, have own audit system
- Natural rock falls in the area – not related to the existing mine as there was no failure in the pillars underground this area
- Centennial will provide additional information in response to the 2% figure of rock falls raised in submissions
- Currently have a monitoring program to check the pillars at the end of each shift
- Investigating the use of suitable additional monitoring systems

Biodiversity

- *Pultenea* on the point of the Genowlan Point Heathland – area is fenced off by National Parks

Water

- Mining is taking place above the aquifers – so should not be impacts downstream
- Preference is to keep the production bore to be used in dry periods
- Discharge will only occur during times of high rainfall
- Working with EPA in regards to the discharge events

Other

- No requirement to provide a VPA – are contributing to an overall fund for Lithgow Council

Documents provided: Presentation slides

Finished at approximately: 1.00 pm

Summary of Notes of Meeting with Lithgow Council

Meeting note taken by: Johanna Lee **Date:** Thursday, 24 September 2015 **Time:** 11:00am

Meeting place: Lithgow Council Chambers

Attendees:

PAC: Robyn Kruk AM (Chair); Alan Coutts; David Johnson; and Johanna Lee.

Lithgow City Council: Maree Statham (Mayor); Roger Bailey (General Manager) and Andrew Muir (Group Manager Environment and Development)

The purpose of the meeting is to understand any outstanding issues that Lithgow City Council may have.

The main points of discussion are outlined below:

VPA

- Comfortable with the option provided by the company. This has been covered in altered Statement of Commitments

Environmental

- Believe the mine is able to co-exist in the area
- Comfortable with the proposed water and subsidence issues
- New residents to the area are aware that mining exists in the area

Other

- Unanimous support from Council for the project
- At present Lithgow doesn't have enough diversity to survive without the mines
- People are very nervous about future job losses

Documents provided: - N/A

Briefing finished at approximately: 12.00 pm

Summary Notes of Meeting with the Environment Protection Authority (EPA)

Meeting note taken by: Johanna Lee **Date:** Monday, 28 September 2015 **Time:** 3.00 pm

Meeting place: PAC Offices

Attendees:

PAC: Robyn Kruk AM (Chair); Alan Coutts; David Johnson; Johanna Lee; and Clay Preshaw

Department: Howard Reed (Manager Coal & CSG); and Thomas Watt (Planning Officer)

EPA: Darryl Clift (Unit Head), Richard Whyte (Regional Manager) and Allan Adams (Operations officer)

The purpose of the meeting is to understand any outstanding issues EPA have regarding the project.

Outstanding Issue

- One outstanding issue regarding the toxicology
- Meetings have been held with Centennial regarding this matter but agreement had not been reached
- The main point of disagreement is regarding EPA's approach to monitoring as opposed to Centennials approach
- Agreed that an additional meeting with Centennial needs to be made to try and resolve this outstanding issue

Separation of clean and dirty water

- The current situation is unconventional, however EPA will provide further written advice

REA

- There are options presented for the handling of the REA. Final option not confirmed
- Acknowledged that one suggestion from public submission was to use cells

Production Bore

- Is proposed to put the water from the bore into the large dirty water dam rather than it being separated
- EPA will discuss this further with Centennial

After the meeting

After the meeting a phone call was made to Centennial informing them of the need for a further EPA meeting and that a further meeting would be set up by EPA.

Documents provided: - N/A

Finished at approximately: 3.30 pm

Summary Notes of Meeting with the Division of Resources and Energy

Meeting note taken by: Johanna Lee **Date:** Monday, 28 September 2015 **Time:** 4.00 pm

Meeting place: PAC Offices

Attendees:

PAC: Robyn Kruk AM (Chair); Alan Coutts; David Johnson; Johanna Lee; and Clay Preshaw

Department: Howard Reed manager Coal & CSG); and Thomas Watt (Planning Officer)

DRE: Gang Li (Principal Subsidence Engineer) and William Hughes (Director Mineral Operations)

The purpose of the meeting is to understand any outstanding issues DRE have regarding subsidence

Surface Protection

- Standard to protect surface features is 26.5° project proposes 8°.
- The factor of safety (FOS) commonly accepted to be used for long term stability is FOS 2.11 for rectangular pillars and FOS 2.21 for square pillars the applicant proposes FOS 1.6
- Concern regarding the long term stability of the proposed mine design

Recommendation

- Expert panel to determine the appropriate design criteria's in the mine design stage

Request for further information

- Given the above concerns the Commission request further written advice from DRE regarding potential subsidence on the site.

After meeting

A letter requesting further information from DRE was sent on Tuesday the 29th of September in order to address outstanding concerns as well as issues raised in the public hearing and within the submission

Documents provided: - N/A

Finished at approximately: 5.10 pm