Centennial Coal

Ecological Assessment of Borehole Drilling, Airly Coal Mine
Due Diligence

June 2012

Reference: 0123721

Environmental Resources Management Australia
53 Bonville Avenue,
Thornton NSW 2322
Telephone +61 2 4964 2150
Facsimile +61 2 4964 2152
www.erm.com

This page left intentionally blank
(Remove after printing to PDF)

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1 INTRODUCTION

1.1 OVERVIEW

Environmental Resources Management Australia Pty Ltd (ERM) has been commissioned by Centennial Coal, to provide a due diligence ecological assessment of the potential constraints and impacts of borehole drilling on Centennial owned land, near to the Airly Coal Mine, NSW.

The aim of the assessment is to identify likely impacts to biodiversity and if appropriate, to provide avoidance and mitigation measures for one borehole site and the associated access track. It is understood that the information will be used to identify potential constraints and to inform if further assessments are required.

1.2 BOREHOLE LOCATION AND DESCRIPTION

The proposed borehole location is within an area of cleared land, at the base of Mount Airly. Mount Airly is a large sandstone mesa approximately one kilometre from Airly village and six kilometres south west of Capertee, NSW.

1.3 LEGISLATIVE REQUIREMENTS

Mount Airly is included within the Lithgow Local Government Area, with the zoning listed as Rural 1a. The legal status of flora and fauna species and ecological communities identified within the site has been assessed in accordance with relevant legislation. Consideration has been given to threatened species and ecological communities listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which have the potential to occur within the site. The State Environmental Planning Policy 44 – Koala Habitat Protection applies to the local government area of Lithgow and therefore this site, and will be considered accordingly.

2 METHODOLOGY

2.1 DESKTOP ASSESSMENT

A desktop assessment was undertaken to identify potential ecological impacts of the drilling and to inform threatened species to target as part of the field survey.

2.1.1 DECCW Record Search

A search of the Department of Environment, Climate Change and Water (DECCW) Wildlife Atlas database for the Bathurst and Wallerwang map sheets was conducted for all recent records of threatened flora and fauna within the locality (being defined as an area within a 10 kilometre radius).

The guide to Rare Plants of the Capertee Valley (DECCW) was reviewed, which highlights threatened flora species known to occur within the local area of the study site.

Vegetation Mapping

Vegetation community mapping was obtained online from DECCW, providing coverage of Airly Mountain and surrounding area (Vegetation of the Western Blue Mountains, 2006).

DSEWPC Online Database

A search of the on-line database maintained by the Department of Sustainability, Environment, Water, Population and Climate Change (DSEWPC) was conducted in order to identify the likely presence of nationally listed threatened and migratory species and other matters of national environmental significance in the locality.

2.2 FIELD SURVEYS

Field surveys were conducted on the 18th October 2010 with both diurnal and nocturnal surveys conducted.

2.2.1 Site Access Inspection

The proposed borehole location was inspected to determine habitat values of the site and likely impacts of the drilling activities. Features targeted included hollow bearing trees, fallen timber, rocky outcrops and groundcover. All

fauna observed was noted, with reptile searches in suitable habitat and signs and tracks of animal activity also recorded.

Targeted searches for threatened plants were conducted in areas likely to be impacted and the immediate vicinity. The vegetation community types surrounding the drilling site was also assessed.

The above surveys were also conducted for those areas where clearance will be required to gain access to the borehole site.

During the site visit the position of the borehole was revised in response to field findings, so as to reduce ecological impacts. This was achieved in conjunction with representatives from GSS Environmental, Centennial Coal and RPS.

2.2.2 *Nocturnal Surveys*

Spotlighting for 30 minutes after dusk was undertaken at the proposed borehole location to survey nocturnal flora. ANABAT recordings were conducted on the Mount Airly Plateau and at the borehole location. When bats were observed the detector was aimed towards the animals to increase the likelihood of identification. Analysis of bat calls was provided by Glenn Hoye of Fly By Night Bat Surveys Pty Ltd.

3 RESULTS

3.1 DESKTOP ASSESSMENT

3.1.1 DSEWPC Online Database

The environmental reporting tool listed 13 threatened fauna which have the potential to occur within the study area (*Table 3.1*). Freshwater fish were omitted as there was not any suitable habitat at the borehole location A further 13 migratory and 11 marine birds were listed under EPBC legislation. One critically endangered community was listed with the potential to occur, White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. The Macquarie Marshes Ramsar site is listed within the same catchment although would not be impacted due to a buffer of over 350 km. It should be noted the DESEWPC database search is a prediction of occurrence based on habitat requirements and known distribution rather than actual records.

3.1.2 DECCW Wildlife Atlas Database Records

The DECCW Wildlife Atlas database for the Bathurst and Wallerwang map identified 21 threatened fauna species recorded within a 10km radius of the study site, refer to *Table 3.1*. None of the recorded species were recorded from Mount Airly or at the proposed borehole location.

3.1.3 Literature Search

The guide to Rare Plants of the Capertee Valley (DECCW) highlighted eight threatened flora species known to occur within the Capertee Valley region; further informing the targeted field surveys (refer to *Table 3.2*).

3.1.4 Vegetation Mapping

Vegetation mapping did not indicate any endangered ecological communities (EEC's) recorded within the vicinity of the borehole.

The proposed borehole location was mapped as cleared and Severely Disturbed Land (Mapping Unit MU 62, DECCW). Slopes to the west of the cleared land were mapped as Hillslope Talus Mountain Grey Gum – Brown Stringybark – Grey Gum – Broad-leaved Hickory Moist Forest (MU 3).

Table 3.1 ***Threatened Fauna Recorded or with the Potential to Occur within 10km of the Borehole Site***

Scientific Name	Common Name	DSEWPC Record Search	DEWHA Online Tool
Callocephalon fimbriatum	Gang-gang Cockatoo	y	
Calyptorhynchus lathami	Glossy Black-Cockatoo	y	
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat		y
Climacteris picumnus	Brown Treecreeper	y	
Daphoenositta chrysoptera	Varied Sittella	y	
Dasyurus maculatus	Spotted-tailed Quoll	y	y
Falsistrellus tasmaniensis	Eastern False Pipistrelle	y	
Glossopsitta pusilla	Little Lorikeet	y	
Hieraaetus morphnoides	Little Eagle	y	
Lathamus discolor	Swift Parrot	y	y
Litoria booroolongensis	Booroolong Frog	y	y
Lophoictinia isura	Square-tailed Kite	y	
Melanodryas cucullata	Hooded Robin	y	
Melithreptus gularis gularis	Black-chinned Honeyeater	y	
Miniopterus australis	Little Bentwing-bat	y	
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	y	
Neophema pulchella	Turquoise Parrot	y	
Ninox strenua	Powerful Owl	y	
Nyctophilus timoriensis	Greater Long-eared Bat		y
Paralucia spinifera	Bathhurst Copper Butterfly		y
Petrogale penicillata	Brush-tailed Rock-wallaby		y
Petroica phoenicea	Flame Robin	y	
Polytelis swainsonii	Superb Parrot		y
Potorous tridactylus tridactylus	Long-nosed Potoroo		y
Pseudomys novaehollandiae	New Holland Mouse		y
Pteropus poliocephalus	Grey-headed Flying-fox		y
Pyrrholaemus saggitatus	Speckled Warbler	y	
Rostratula australis	Australian Painted Snipe		y
Stagonopleura guttata	Diamond Firetail	y	
Xanthomyza phrygia	Regent Honeyeater	y	y

1. y= indicates threatened species was highlighted by the search tool.
2. Species are listed under either the TSA 1995/EPBC or both acts

Table 3.2 ***Threatened Flora Recorded or with the Potential to Occur within 10km of the Borehole Sits using the DSEWPC Record Search and DEWHA Online Tool***

Scientific Name	Common Name	TSA	EPBC Act	RPCV
Acacia flocktoniae		V	V	
Boronia deanei		V	V	y
Derwentia blakelyi		V	-	y
Eucalyptus cannonii	Capertee Stringybark	**V**	**V**	**y**
Eucalyptus macrorhyncha subsp. cannonii	Cannon's Stringybark	V	V	
Euphrasia arguta		Ex	Ex	
Grevillea obtusiflora		**E**	**E**	**y**
Grevillea obtusiflora	Grey Grevillea	E	E	
Persoonia marginata	Clandulla Geebung	**V**	**V**	
Phebalium bifidum		**E**	**-**	**y**
Philotheca ericifolia		V	V	
Pomaderris brunnea	Rufous Pomaderris	V	V	
Prostanthera cryptandroides subsp. cryptandroides	Wollomi Mint-bush	V	V	y
Prostanthera stricta	Mount Vincent Mint-bush	**V**	**V**	**y**
Pultenaea sp. Genowlan Point	Genowlan Point Pultenaea	**E**	**Cr En**	**y**
Thesium australe	Austral Toadflax, Toadflax	V	V	

1. Status: V = vulnerable, E = endangered, Cr En = critically endangered Ex = extinct, y = occurs within the Rare Plants of the Capertee Valley Handbook.
2. Bold type = Recorded as part of the DSEWPC Record Search

3.2 FIELD STUDY

3.2.1 Vegetation

The preferred location for the borehole is an area of improved short grassland, which is accurately mapped as Cleared and Severely Disturbed Land (MU 62, DECCW). Access to the area is achieved via an existing access track and no additional vegetation clearance would be required. Native and exotic grass species were present with weeds including Stinging Nettle (*Urtica dioica*) and Blackberry (*Rubus* spp.). The cleared land was surrounded by Hillslope Talus Mountain Grey Gum – Brown Stringybark – Grey Gum – Broad-leaved Hickory Moist Forest (MU 3) which was mapped by DECCW. An ephemeral drainage line exists approximately 30 metres to the east of the borehole, which was predominantly cleared, with isolated remnant Eucalypts.

3.2.2 Flora

Targeted flora searches did not find any threatened species within the footprint required for the drill rig or access tracks. Potential exists for several threatened species of flora to exist within the adjacent Eucalyptus forest, however clearance of this native vegetation is not required.

3.2.3 Fauna

No threatened fauna were recorded during the surveys and the disturbed areas are not likely to provide important habitat for threatened species.

Two Common Wombat (*Vombatus ursinus*) holes were found close to the proposed drilling location which appeared to be recently used (refer to *Figure 1*). One individual Wombat was observed during spotlighting approximately 20 metres from the holes where fresh spraints were found.

Eastern Grey Kangaroo (*Macropus giganteus*) and the Red-necked Wallaby (*Macropus rufogriseus*) were observed grazing on the grassland area close to the proposed borehole drilling location. Eastern Froglet (*Crinia signifera*) were heard calling from the drainage line, approximately 40 metres from the borehole location. Birds recorded during the survey are listed in *Table 3.3*. The above species are all common to the area and no threatened fauna were recorded during the surveys with the disturbed areas likely to provide important habitat for threatened species.

ANABAT analysis recorded up to five species of microchiroptera, although this was carried out over a large area including Airly Mountain. None of the species recorded are listed as threatened (refer to *Table 3.4*).

Fauna Habitat

The Eucalypt moist forest vegetation adjacent to the cleared areas has high potential for several threatened species to occur. Hollow bearing trees were common throughout the forested area, representing suitable habitat for birds, reptiles and arboreal mammals, including suitable breeding habitat. This was complemented by an abundance of fallen logs and trees providing shelter for ground dwelling fauna.

The drainage line, approximately 30 metres away from the drilling location, is ephemeral, although leads into a small dam which is likely to be permanent. These freshwater resources are likely to represent a significant habitat for a wide range of native fauna including frogs.

The cleared areas which will be affected by the proposed borehole works, although utilised by several species, are unlikely to hold any significant habitat value for threatened species. The area is used by Common Wombats (*Vombatus ursinus*) with two entrances found at the time of the field survey. Areas of high habitat value such as the Eucalypt forest are not anticipated to be disturbed by the drilling process.

Table 3.3 Birds Recorded During the Field Surveys

Common Name	Scientific Name	EPBC Act Status
Australian Raven	*Corvus coronoides*	
Galah	*Eolophus roseicapillus*	
Nankeen Kestrel	*Falco cenchroides*	Mi,Ma
Australian Wood Duck	*Aquila audax*	Mi
Crimson Rosella	*Platycercus elegan*	
Willie Wagtail	*Rhipidura leucophrys*	

1. 1. Mi, Migratory Listed. Ma, Marine Listed species

Table 3.4 Bats Recorded from ANABAT Analysis

Common Name	Scientific Name	Occurrence
White-striped Mastiff Bat	*Tadarida australis*	C
Chocolate Wattled Bat	*Chalinolobus morio*	P
Large Forest Bat	*Vespadelus darlingtoni*	C
Southern Forest Bat	*Vespadelus regulus*	Po
Little Forest Bat	*Vespadelus vulturnus*	P

1. C=confident, P= probable, Po=Possible

3.3 FOOTPRINT SELECTION AND POTENTIAL IMPACTS

Initially an area of 50 by 50 metres in area was the requirement for the drilling footprint. It is understood that the footprint required has been substantially reduced by use of a small track mounted drilling rig. This reduces the likelihood of impacts significantly and provided more scope for repositioning the borehole in previously cleared areas.

An area of 25m x 25m was surveyed at each drill pad location to ensure that an adequate area was covered for the footprint of the drill rig and associated equipment.

The area selected for the borehole (ARP04) is in a cleared area with good access via existing tracks with no vegetation clearance required.

The original proposed location for the borehole was approximately 25 metres upslope of two wombat holes. Wombat burrows may extend over 30 metres and often continue upslope to avoid the risk of flooding. Potential impacts of the work include burrow collapse and blocking of the burrows due to use of heavy machinery and the drilling process. All native fauna are protected under the *National Parks and Wildlife Act, 1979* and therefore the preferred borehole location has been adjusted accordingly to reduce the likelihood of disturbing the burrows (*Figure 1, Table 5*). Both wombat burrows present were angled in a westerly dissection, which is up slope. Situating the drilling location down slope from the wombat holes would reduce the likelihood of impacting upon them. An unsealed road between the suggested borehole location and the wombat burrow would further separate the wombat holes

and the drilling activities. Immediately prior to drilling a thorough search should be undertaken to determine if any new entrances are present. If new entrances are discovered within 30 metres of the borehole location, opportunities to resite the borehole should be assessed.

Other potential constraints to the location of ARP04 include the drainage line to the east which may provide an import resource for native fauna and potentially threatened species. The Eucalypt forest to the west would also be unsuitable for drilling as it would require extensive vegetation clearance, which may trigger the *Vegetation Act 2003* (NV Act 2003). The revised ARP04 location is located to provide sufficient buffer between the above constraints to reduce any disturbance as far as practicable, refer to *Figure 1*, and for the location of the co-ordinates refer to *Table 3.5*.

Table 3.5 Suggested Borehole Location to Minimise Ecological Impacts

Borehole Location	Latitude	Longitude
ARP04	-33.103403°	150.043480°

Legend

- ARP04
- Wombat Hole

Figure 1

Proposed Borehole Site Location, ARP04

Client:	Centennial Coal	
Project:	Due Diligence Ecological Assessment, Airy Coal Mine	
Drawing No:	0123721s_DDEA_G001_R0.mxd	
Date:	8/11/2010	Drawing Size: A4
Drawn By:	SW	Reviewed By: ED
Projection:	GDA 1994 MGA Zone	
Scale:	Refer to scale bar	

N

0 10 20 30m

Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

ERM

3.3.1 Mitigation Measures

Selection of the borehole location in a cleared area has prevented the need for native vegetation clearance, and direct removal of threatened species and/or their habitats. The removal of vegetation is a Key Threatening Processes listed under the EPBC Act. Indirect impacts to native species and vegetation as a result of borehole drilling activities may include:

- Drilling water run off and contamination of water bodies;
- Impact on Wombat burrows;
- introduction of *Phytophthora cinnamomi* (root-rot);
- damage to surrounding vegetation and habitats as a result of transit of heavy goods and equipment; and
- introduction of exotic weed species.

Table 3.6 ***General strategies for minimising impacts to native vegetation during construction phase***

	Action	Purpose
1.	Search for wombat burrows around the location of the proposed drilling site to identify active burrows should occur prior to commencement of works. If additional wombat burrows are found a buffer of 30 meters should be positioned around the entrance to the burrow. No machinery should enter the buffer. If the chosen drilling location is significantly downslope then the buffer distance maybe reduced to 15 metres.	To avoid impacts on wombats and burrows at the location.
2.	Any cleared top soil and leaf litter should be spread back over the disturbed area after drilling activities have ceased.	To aid regeneration
3.	Avoid night works	To avoid disturbance to nocturnal fauna, including the Common Wombat.
4.	Check vehicles and persons for exotic weeds prior to mobilising to Mt. Airly	Avoiding introduction of exotic weeds (key threatening process).
5.	Implement soil and water management controls. Include controls for drilling, fuel use and hydrocarbon use which should be managed within cleared areas	Minimise sediments and other pollutants entering surrounding vegetated area and waterways.
6.	*Phytophthora* hygiene protocols represent best practice and are therefore optional. It is recommended machinery and footwear are cleaned prior to mobilising to Mount Airly to ensure no soil is adhered to equipment. Cleaning would not be necessary between the drilling sites. Disinfectant recommended is 1% Sodium Hypochlorite (bleach).	To ensure the development activities do not introduce *Phytophthora* into adjacent vegetation.

4 CONCLUSION

The selection of a previously cleared and disturbed site for the borehole location (ARP04) will avoid significant impacts to biodiversity including threatened species and their habitats. The lack of significant vegetation clearance also avoids a Key Threatening Process. Implementation of the recommended 'good practice' mitigation measures identified above will further prevent significant ecological impacts. The drilling activity does not require a test of significant under the NSW Threatened Species Conservation Act 1995 as no threatened species or communities are likely to be impacted by the works. Referral to DSEWPC will not be required as significant impacts to EPBC listed species or communities act are not predicted.

REFERENCES

DECCW (NSW) **A Guide to the Rare Plants of the Capertee Valley**, Hawesbury-Nepean Catchment Management Authority.

DECCW. (2006)The **Vegetation of the Western Blue Mountains (including the Capertee, Cox's, Jenolan and Gurnang Areas)**. Hawkesbury – Nepean Catchment Management Authority