

# **ENVIRONMENTAL ASSESSMENT**


Section 75W Modification Application  
Moolarben Coal Project – Stage 1  
(05\_0117 MOD 7)

March 2010

CR 6015\_13\_v1

Section 75W Modification Application  
Moolarben Coal Project Stage 1 – MOD 7

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# 1. INTRODUCTION

This report constitutes an application made pursuant to Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act), seeking modification of the Major Project Approval for Stage 1 of the Moolarben Coal Project (MCP), issued on 6 September 2007 and as modified on 26 November 2008 (05\_0117 MOD 1), 18 December 2008 (05\_0117 MOD 2), 30 June 2009 (05\_0117 MOD 4), 5 October 2009 (05\_0117 MOD 5) and 12 January 2010 (05\_0117 MOD 6).

The environmental assessment (EA) for Stage 1 (Wells, 2006) described the need to develop a water supply and dewatering borefield above the underground mine (UG4), including a network of above ground pipes. The EA assessed the impact of extracting groundwater via the borefield, but did not address the impacts associated with constructing the borefield surface infrastructure (i.e., access tracks, powerlines, pipelines, transfer pumps, groundwater bores and water storage tanks). This modification (05\_0117 MOD 7) seeks approval to construct the borefield surface infrastructure so that the water supply and dewatering borefield can be developed.

Moolarben Coal Mines Pty Limited (MCM), the proponent for the MCP, is a wholly owned subsidiary of Yanzhou Coal Mining Limited<sup>1</sup> (Yanzhou). Yanzhou owns and operates the Austar coal mine, has a 60% share in the Ashton coal mine and is a capital venture partner in the Newcastle Coal Infrastructure Group (NCIG).

This report has been prepared by Coffey Natural Systems on behalf of MCM.

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<sup>1</sup> In December 2009 the ownership of Felix Resources Limited was transferred to Yanzhou Coal Mining Limited, a Chinese owned coal mining company. Yanzhou Coal Mining Limited is a top 100 publicly listed company on the Chinese Stock Exchange.

## **2. BACKGROUND**

### **2.1 Project Location**

The MCP is located in the Western Coalfields of New South Wales, east of the village of Ulan and approximately 40 km northeast of Mudgee, in the Mid Western Region local government area (see Figure 1).

The MCP is bordered by the Goulburn River to the northwest; Goulburn River National Park, Wilpinjong Coal Mine and Munghorn Gap Nature Reserve to the east; privately-owned grazing land to the south; and privately-owned grazing land, Ulan village and Ulan Coal Mine to the west.

The dominant land uses are grazing, rural residential, conservation and mining. The Ulan village west of the mine comprises a small rural primary school, two churches, a hotel and mine-owned residential dwellings and vacant land. A rural residential development is located approximately 4 km to the southwest of the mine. A small number of farms and scattered homesteads occupy the rest of the surrounding freehold land.

The locality is serviced by the Ulan–Cassilis Road (linking Mudgee and Cassilis), Cope Road (linking Gulgong and Ulan) and Ulan–Wollar Road (linking Wollar and Ulan). The Gulgong–Sandy Hollow Railway provides the transport link for delivery of coal to domestic and export markets (via Muswellbrook).

The borefield will be developed above and adjacent to the Underground 4 mine (UG4), which is located to the north of the mine infrastructure area, south and east of the Goulburn River and west of the Goulburn River National Park. The area in which the borefield will be developed is characterised by naturally vegetated and regenerating open forests on low sandstone ridges. There is only one privately-owned property (Stone Cottages) in the immediate vicinity of the borefield. At its closest point, the borefield will be separated from the nearest dwelling (a tourist accommodation cottage) on this property by at least 800 m and from the main residence by about 1,300 m. The next closest private residence is over 2 km from the borefield.

### **2.2 The Moolarben Coal Project**

On 6 September 2007, the Minister for Planning granted project approval (05\_0117) for Stage 1 of the MCP.

Since gaining approval for Stage 1, MCM has made six separate applications under S75W of the EP&A Act to modify the Minister's approval for the project:

- In August 2008, an application was made to the Department of Planning (DoP) to make administrative changes and to rearrange specific items of approved infrastructure so as to improve operational efficiency and provide improved conservation outcomes. The application (05\_0117 MOD 1) was approved on 26 November 2008.

- In December 2008, an application was made to the DoP to allow preliminary construction activities to commence prior to completion of required mine access road works. The application (05\_0117 MOD 2) was approved on 18 December 2008.
- In February 2009, an application was made to the DoP to allow Stage 1 to receive and process run-of-mine (ROM) coal from the proposed Stage 2 project (see below); increase throughput of processing, handling and rail loading to 17 Mtpa ROM coal and 13 Mtpa product coals; increase off-site transport of product coal to 13 Mtpa; and extend the approved operating life of Stage 1 infrastructure so that Stages 1 and 2 of the MCP will be fully integrated. The application (05\_0117 MOD 3) is currently being assessed by the DoP.
- In April 2009, an application was made to the DoP to change the configuration of the rail loop from a figure-8 to a balloon loop layout. The application (05\_0117 MOD 4) was approved on 30 June 2009.
- In June 2009, an application was made to the DoP to relocate the ROM coal facility and develop a water sharing pipeline from the Ulan coal mine. The application (05\_0117 MOD 5) was approved on 5 October 2009.
- In December 2009, an application was made to the DoP to relocate the rejects bin. The application (05\_0117 MOD 6) was approved on 12 January 2010.

The approved project, as modified, entails the construction and operation of three open cut mines (OC1, OC2 and OC3), one underground mine (UG4); coal handling, processing and rail load out infrastructure; and associated surface facilities. At full production, Stage 1 will produce up to 10 million tonnes per annum (Mtpa) of product coal for export and domestic markets, and will employ in excess of 300 permanent full time workers.

A summary of the approved Stage 1 project is provided in Table 1.

**Table 1 Stage 1 project summary**

Aspect		Description
Project life		21 years, to 20 December 2028.
Mining operations	Open cut	Three open cut mines (OC1 – 302 ha, OC2 – 150 ha and OC3 – 550 ha) will be mined at a combined rate of up to 8 Mtpa ROM coal.  Overburden (30 m average depth) will be blasted where necessary and be removed using excavator and truck operations.  Coal will be blasted and recovered using excavator and truck operations.
Mining operations	Underground	One underground mine (UG4 – depth 70 to 140 m) will be mined at up to 4 Mtpa ROM coal.  Coal will be recovered by longwall mining and transferred to surface by conveyor.  UG4 mine drift entries in the Stage 1 Main Infrastructure Area.
Blasting		Up to 2 blasts a day and 9 blasts a week over any 12 month period, between the hours of 9:00 a.m. to 5:00 p.m. Monday to Saturday.

**Table 1 Stage 1 project summary (cont'd)**

<b>Aspect</b>	<b>Description</b>
Coal handling, preparation, and processing	<p>Coal from OC1, OC2 and OC3 will be transferred by truck to the ROM coal facility, prior to transfer via conveyor to the CHPP or raw coal stockpile.</p> <p>Coal from UG4 will be transferred to the coal handling and processing plant (CHPP) or raw coal stockpile by conveyors.</p> <p>Crushing and sizing facilities will be included at both the ROM coal facility and CHPP.</p> <p>Up to 12 Mtpa of ROM coal will be processed.</p> <p>Coal will be transferred from the CHPP to the product coal stockpile via conveyors.</p>
Coal production, loading and rail transport	<p>Product coal will be produced at up to 10 Mtpa.</p> <p>Product coal will be loaded onto trains via a rail loop and rail load out facility, and railed to market on the Gulgong-Sandy Hollow rail line in up to four trains a day (four trains during any 24 hour period).</p>
Water demand and supply	<p>Water demand at peak production will be about 6.9 ML/day (2,520 ML/year).</p> <p>Water will be supplied from mine inflows, surface water capture, recycled process water, water sharing with adjoining mines and groundwater bore field, where required.</p>
Waste rock, coarse rejects and tailings management	<p>Excavated overburden initially used to form environmental bunds through out-of-pit emplacement on the western side of OC1 and OC2, around the OC3 facilities and along the haul road between OC3 and OC1.</p> <p>Remaining overburden will be placed within open cut mine voids.</p> <p>Coarse rejects and tailings will be emplaced with overburden in open cut mine voids.</p> <p>An emergency tailings dam will be established adjacent to the CHPP.</p>
Mine access	<p>Access to OC1, OC2 and OC3 from Ulan-Wollar Road.</p> <p>Access to UG4 and the CHPP from Ulan-Cassilis Road, north of Ulan-Wollar Road junction.</p>
Support facilities and utilities	<p>Support facilities including offices, bathhouses, workshops and fuel storages (where required), will be established at the Main Infrastructure Area (to service UG4 and the CHPP), and at OC1 and OC3.</p> <p>Power will be supplied from the 66 kV Ulan to Wilpinjong transmission line, via an on-site 66/11 kV substation.</p>
Hours of operation	<p>Construction during daylight hours, 7 days a week. Some noisy activities will be conducted outside of school hours to minimise noise impacts on Ulan Public School.</p> <p>Civil works in the Main Infrastructure Area will occur 24 hours a day, 7 days a week.</p> <p>Mining operations will occur 24 hours a day, 7 days a week.</p>
Employment	220 construction and 317 full time positions.
Rehabilitation	All disturbed areas will be progressively rehabilitated.

On 14 July 2008, MCM lodged a Major Project Application for Stage 2 of the MCP, Major Project 08\_0135. Stage 2 will consist of one open cut mine (OC4); two underground mines (UG1 and UG2); ROM and raw coal stockpiles; and support facilities. Stage 2 ROM coal will be handled and processed using the approved Stage 1 ROM coal facilities and CHPP. The application (08\_0135) is currently being assessed by the DoP.



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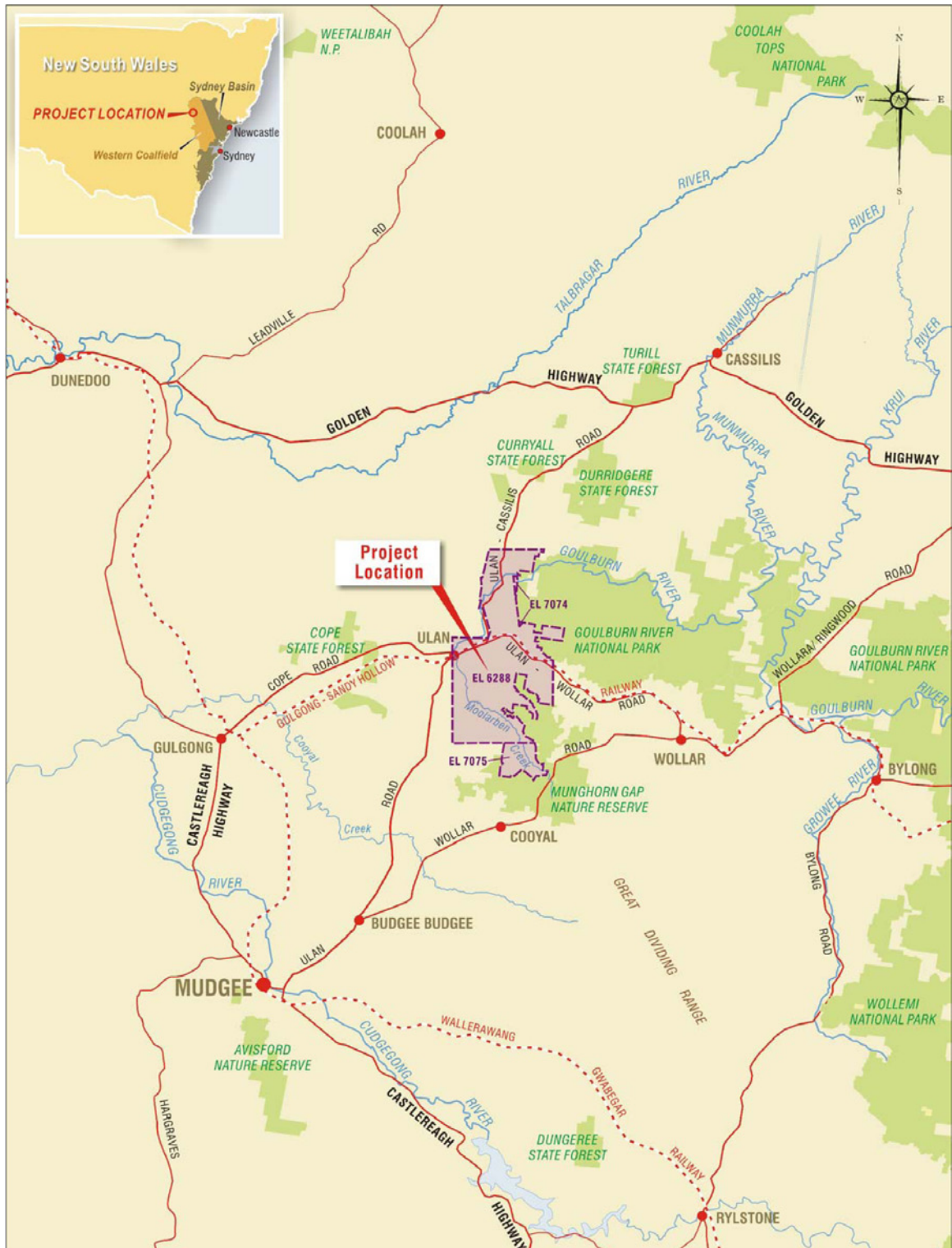


Figure 1 Moolarben Coal Project location

## **3. PROPOSED MODIFICATION**

### **3.1 Summary of Proposed Modification**

The proposed modification involves constructing access tracks, powerlines, pipelines, transfer pumps, groundwater bores and water storage tanks to enable the development and operation of a water supply and dewatering borefield for Stage 1 of the MCP.

No other changes will be made and construction and operation of Stage 1 will occur in accordance with the conditions of the Minister's approval, as modified.

The modification will not affect the extent or timing of the mining activities or any other aspect of the approved project.

### **3.2 Need for Modification**

The Stage 1 EA (Wells, 2006) conceptually described a water supply and dewatering borefield (Figure 2):

*The dewatering of the underground mining operations will be undertaken through a series of dewatering/water production bores constructed on the surface with a piping network located in disturbed areas and following existing infrastructure corridors where feasible (EA Section 4.5.2.5).*

*... underground operations will be dewatered through a series of de-watering bores and above ground polyethylene pipes constructed where possible within previously disturbed areas ... Water sourced from the dewatering of ... underground operations will be pumped to the various water storages within the project area, through a network of above ground polyethylene pipes, utilising existing infrastructure corridors where feasible (EA Section 4.7.1).*

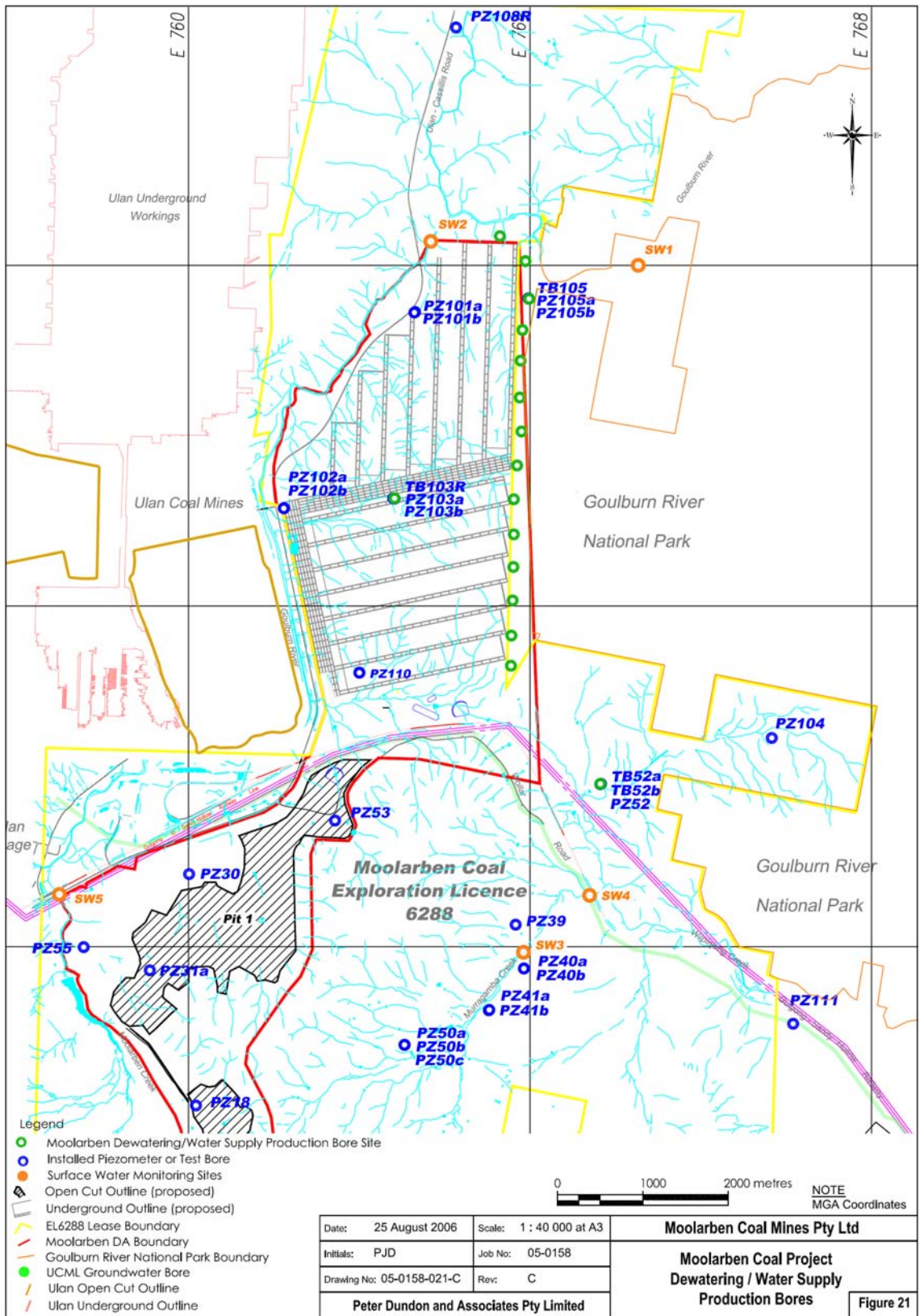
*A water supply system including a bore field with pumps, pipeline, storage dams and tanks will be installed to service the MCP ... additional water required for the project can be obtained from production bores located around the eastern side of the Underground No. 4 mine ... The production bores have the benefit of advanced dewatering of Underground No. 4 (EA Section 4.7.2).*

However, the Stage 1 EA did not address the impacts associated with constructing and operating the borefield.

The borefield is an integral part of the water supply arrangements for the mine, which comprises open cut mine inflows, surface water capture from disturbed areas, recycled process water, surplus water under sharing arrangements with Ulan coal mine and groundwater. Hence its construction and operation is required to enable the groundwater component of the mine water supply to be accessed.

The borefield is also required to enable dewatering of the Ulan coal seam in preparation for mining UG4 in future years. Dewatering of the coal seam is required to provide safe operating conditions during underground mining.

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(source: Stage 1 EA Appendix 5)

**Figure 2 Stage 1 EA proposed borefield**

### 3.3 Land Development Schedule

The land on which the modification will be developed is summarised in Table 1 and described in the Stage 1 Major Project Application (05\_0117). The majority of the development will be on land owned by MCM.

**Table 2 Land ownership**

Land Owner	Description	Parish	County
MCM	Lot 30 DP 755439	Lennox	Phillip
MCM <sup>1</sup>	Lot 31 DP 755439	Lennox	Phillip
MCM <sup>1</sup>	Vacant crown land (north of adjacent to Lot 31 DP 755439)	Lennox	Phillip
Crown <sup>2</sup>	Saddlers Creek Road	Lennox	Phillip
Crown <sup>2</sup>	Unidentified crown road	Lennox	Phillip
MWRC <sup>3</sup>	Ulan Road	Lennox	Phillip

1. Land licensed to MCM under the Crowns Land Act 1989 - license: 409273.
2. Unformed Crown Roads under the control of the Land and Property Management Authority.
3. Road and road reserve under control of Mid Western Regional Council

Mid Western Regional Council (MWRC) and the Land and Property Management Authority have agreed to MCM developing the borefield and associated surface infrastructure on land under their control.

### 3.4 Description of Proposed Modification

The borefield will be established above and adjacent to the UG4 mine, generally according to the layout indicated in Figure 3. It will generally comprise:

- Ten groundwater bores, bore pads and bore pumps.
- Ten 20,000 L (nominal) capacity water storage tanks.
- Thirteen transfer pumps.
- About 12 km of inter-connecting pipelines, powerlines and access tracks.
- About 10 Generators (as temporary power supply)

Pipelines, powerlines and access tracks will be contained within a 20 m wide infrastructure easement. The easement will be established along existing cleared or disturbed areas (generally comprising unsealed roads and 4WD tracks) to minimise vegetation clearing and land disturbance.

#### 3.4.1 Groundwater Bores, Bore Pads and Water Storage Tanks

Ten groundwater bores (M1, M6 to M12, TB103 and TB105) will be developed in the general locations indicated in Figure 3. This includes two existing test bores (i.e., TB103 and TB105, drilled during the Stage 1 groundwater assessment) and eight new bores, which will be developed into production and dewatering bores.

A cleared pad area of about 20 x 27 m (i.e., 0.54 ha) will be established at each bore location. The cleared and levelled pad areas will be covered with an inert compacted road base material. Each bore pad will comprise a bore, storage tank, transfer pump, associated piping and power

supply infrastructure. The cleared pad areas will provide access for construction and maintenance and infrastructure protection in the event of fire.

The bores will be equipped with a submersible pump, which will deliver the extracted groundwater to an adjacent storage tank of with a nominal capacity of about 20,000 L. Bore pumps will be sized to enable pumping at a rate of least 4.5 L/s.

Water storage tanks will be of standard plastic construction, have dimensions of about 2.5 m in height and 3.5 m in diameter, and coloured to blend in with the surrounding natural environment. The extracted groundwater will then be transferred via a network of pipes and transfer pumps (Figure 4) to a water storage dam within the mine infrastructure area (see Section 3.4.2).

Initially it is proposed to develop bores TB103, M9, M10, M11 and M12 (Figure 3). The remaining bores will be developed on an as needed basis, depending on water supply or mine dewatering requirements in future years. Each bore will be pumped on an as needed basis.

### **3.4.2 Pipeline and Transfer Pumps**

About 12 km of pipeline will be established to transfer extracted groundwater from the water storage tanks to a water storage dam within the mine infrastructure area. The pipeline will be constructed of high density polyethylene (HDPE) piping (90 to 250 mm in diameter), typical of that used for water supply and conveyance at other NSW coal mines.

With the exception of road crossings, the pipeline will be laid directly on the ground within an infrastructure easement (Section 3.4.4). Where road crossings are required the pipeline will be buried. This includes an approximate 30 m section of pipeline located beneath the Ulan-Cassilis Road. A horizontal boring rig will be used to construct this section of pipeline so that surface disturbance and traffic disruption are both minimised.

The borefield pipeline will report to an existing water transfer pipeline located within the road reserve on the western side of Ulan-Cassilis Road, south of and adjacent to the Ulan Underground Coal Mine access road (Figure 3). This existing pipeline was developed as part of an earlier modification to the Stage 1 approval (05\_0117 MOD 5) (Coffey, 2009), which was made to facilitate water sharing with the Ulan Coal Mine and in anticipation of future borefield development needs.

Transfer pumps will be located at critical locations within the pipeline network (Figure 4). These will be capable of pumping at rates of between about 4.5 and 45 L/s, with lower capacity pumps and smaller diameter piping located at more distant bore locations (e.g., M6, M7, M8, M9, M12 and TB105). The pipeline and transfer pump network has been designed to minimise pump duties and energy consumption.

The completed pipeline will be pressure tested to ensure it meets relevant design and construction standards, and will be inspected regularly during its operation.

### **3.4.3 Power Supply**

Generators will be used to provide power to bores (TB103, M9, M10, M11 and M12) and associated transfer pumps (TS1, TS2, TS3, TS8, TS9, TS10 and TS11) initially. In time, the generators will be replaced with a dedicated overhead powerline, which will be extended to

service the other bores and transfer pumps as the rest of the borefield is developed and brought on line. The borefield powerline will be constructed within the infrastructure easement, adjacent to the pipeline, and will conform to relevant industry and Country Energy standards (Standards Australia, 2007).

The borefield powerline will tee into an existing 22 KV powerline which supplies power to the mine administration area. This existing powerline is located within the road reserve on the western side of Ulan-Cassilis Road. The take off point will be in the vicinity of the junction of the Ulan Underground Coal Mine access road with Ulan-Cassilis Road, opposite the borefield pipeline and access track entry point. At this location the borefield powerline will cross beneath Ulan-Cassilis Road, which will require a second conduit to be established by the horizontal boring rig (see Section 3.4.2).

#### **3.4.4 Infrastructure Easement and Access Tracks**

The pipeline, overhead powerline and borefield access tracks will be established within a 20 m wide infrastructure easement. The overhead powerlines will be located in the centre of this easement, between the access track and the pipeline. The pipeline will be laid on the ground about 2 m from the centre of the powerline. The general configuration of the infrastructure easement is shown in Figure 5.

The borefield layout and infrastructure easement route (Figure 3) have been designed to take advantage of existing vehicle tracks so that further land disturbance, vegetation clearing and impacts on local biodiversity and Aboriginal cultural heritage values are minimised (see Section 5). However, trees and shrubs (greater than 1 m in height) within 10 m of the powerline will need to be slashed or thinned. This is required as a risk management measure against the spread of fire, as well as infrastructure protection in the event of strong winds or fire.

Ground disturbance will be kept to a minimum other than in areas requiring complete vegetation removal (i.e., access tracks, bore pads and areas immediately around power poles). In these areas, ground cover (i.e., grasses, herbs, low shrubs, fallen logs and bush rock) will be maintained within the infrastructure easement, wherever practicable. This will maintain habitat for ground dwelling fauna species, reduce soil erosion and assist in the natural regeneration of disturbance areas following decommissioning of the borefield upon completion of mining.

### **3.5 Borefield Construction**

Construction of the borefield will require:

- Up to two dozers – to establish bore pads and the infrastructure easement.
- A drilling rig – to develop and complete the bores.
- A horizontal boring rig – to construct the pipeline under the Ulan-Cassilis Road.
- Delivery trucks – to bring pumps, piping, tanks, generators, poles, powerlines, etc to site.
- Support vehicles and light vehicles – to transport supplies and construction workers.

Construction of the borefield will be carried out during daylight hours only.

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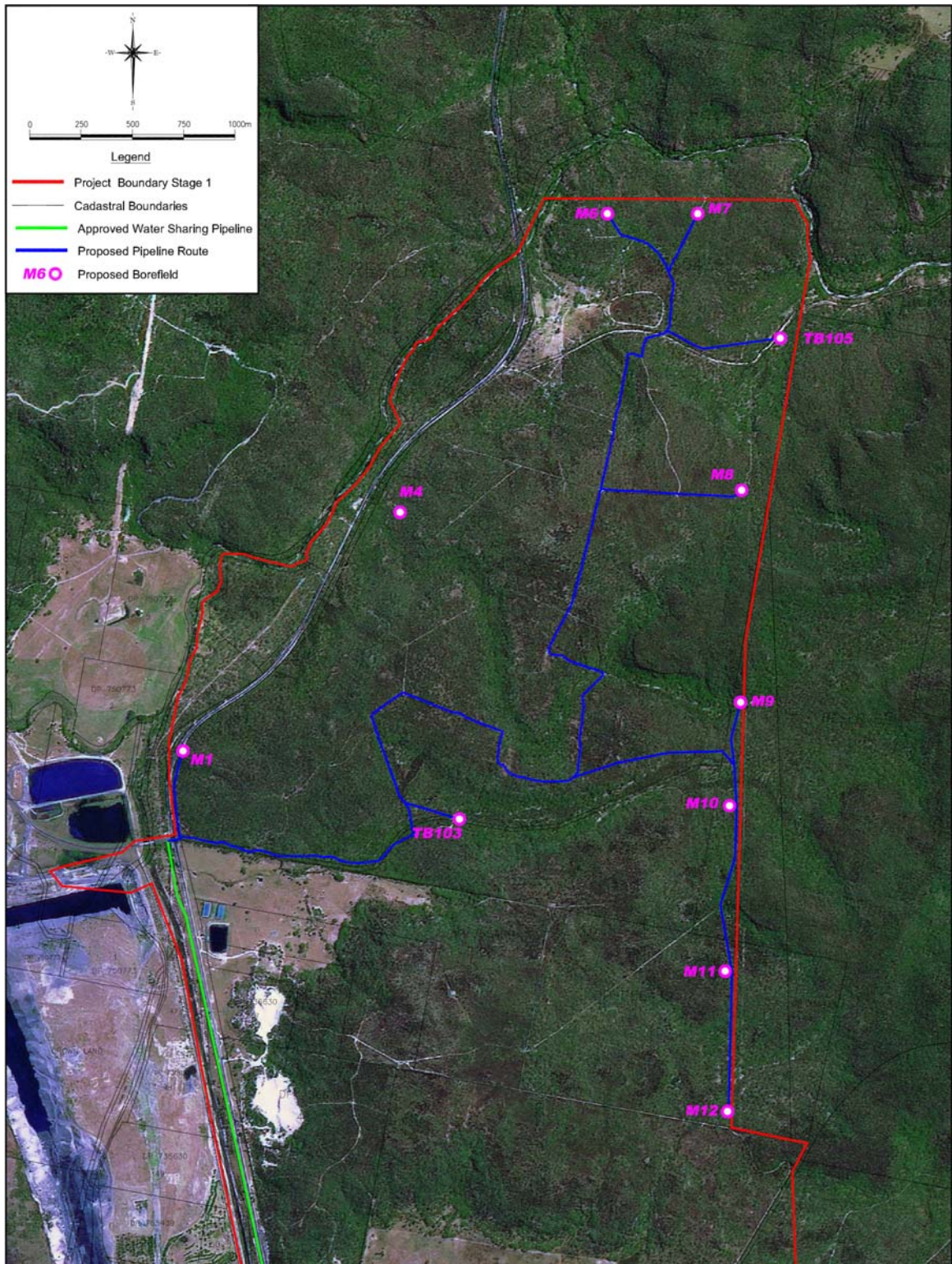


Figure 3 General borefield layout

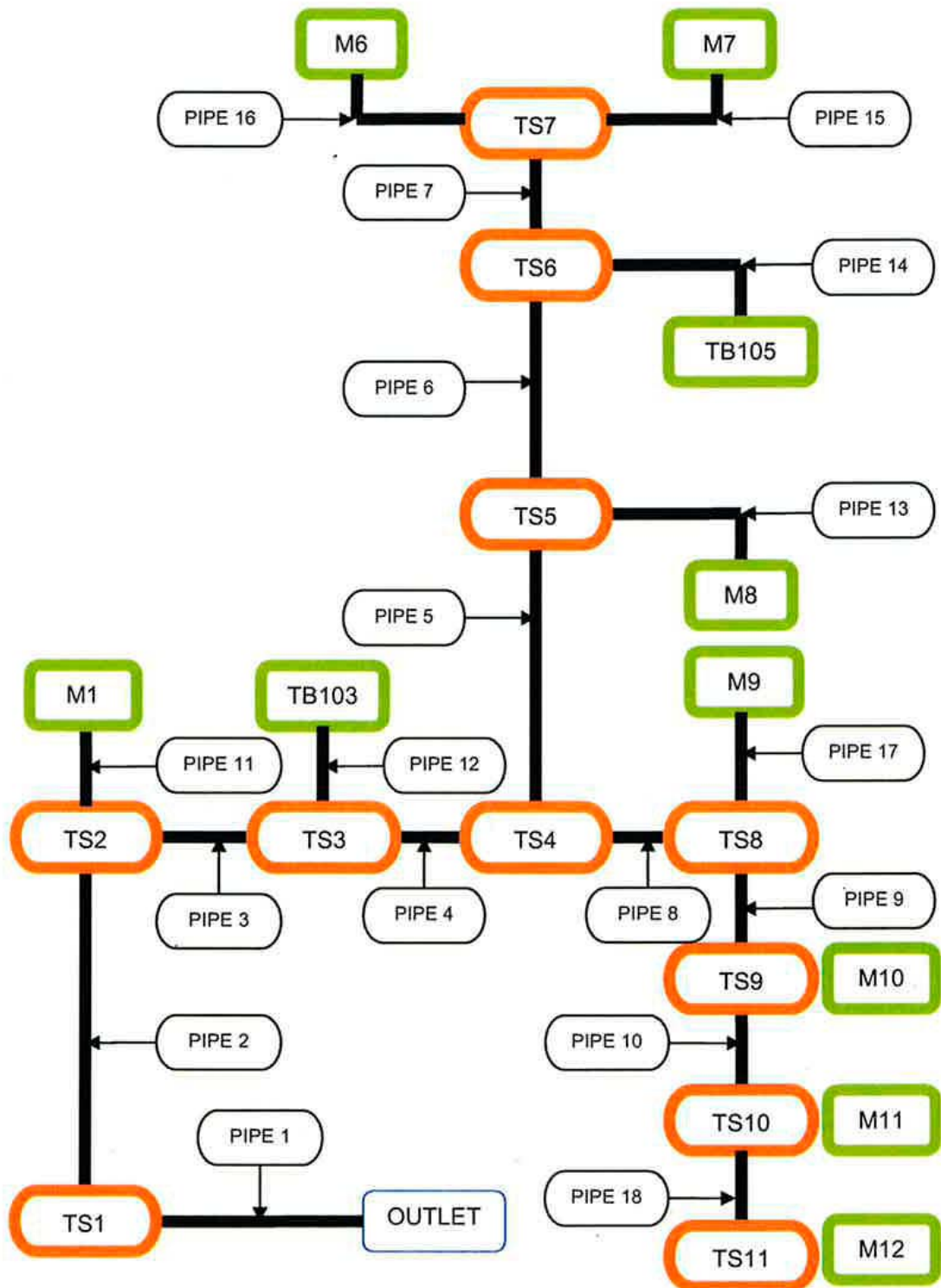


Figure 4 Pipeline and transfer pump schematic layout



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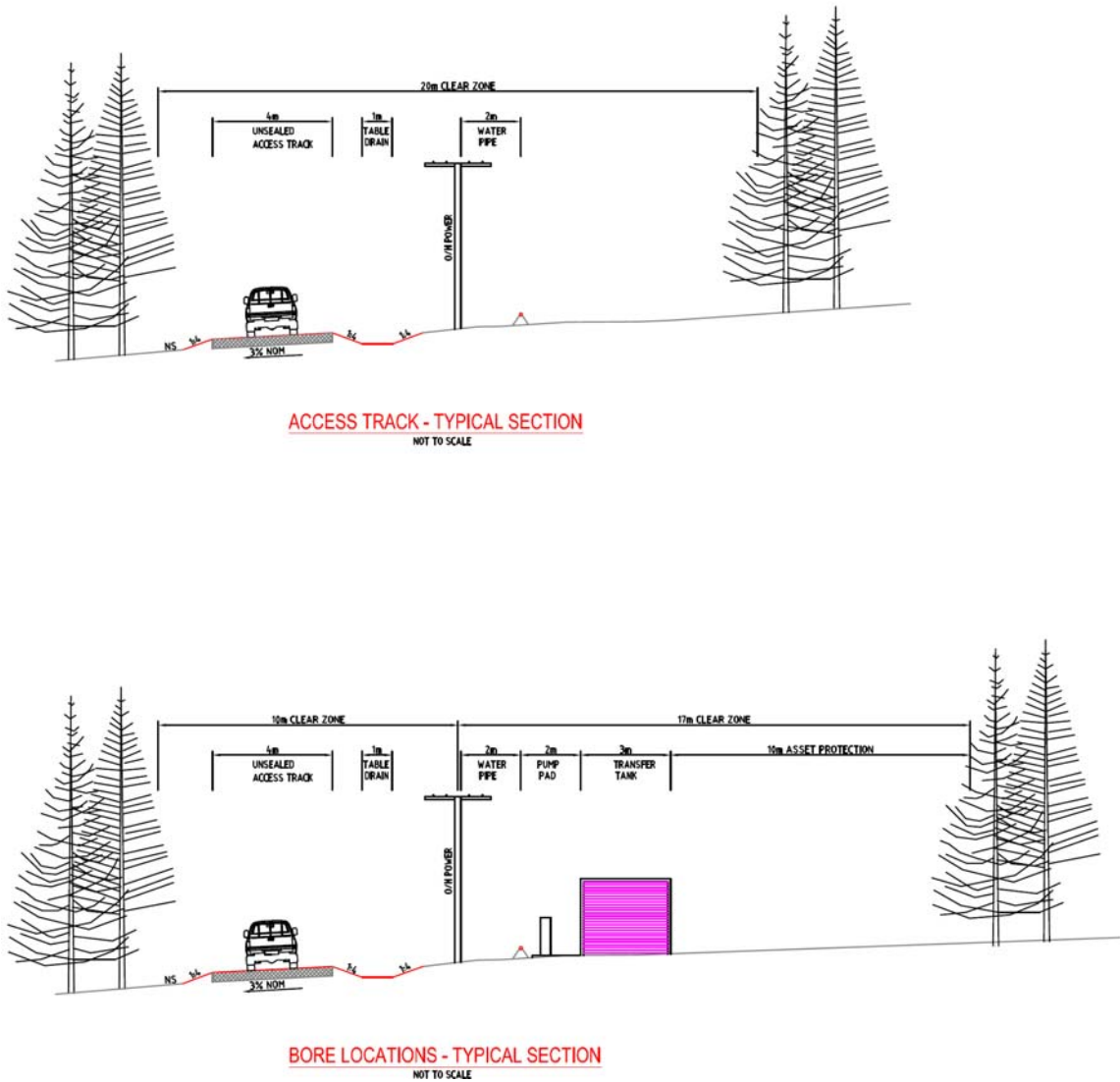


Figure 5 Indicative sections – bore pads and infrastructure easement

## **4. PLANNING FRAMEWORK**

### **4.1 S75W EP&A Act**

Under Section 75W of the EP&A Act, the proponent may request the Minister's approval for a project to be modified.

The terms of the Minister's approval can be modified by revoking or varying a condition of the approval or by imposing an additional condition of the approval, and by changing the terms of any determination made by the Minister under Division 3 in connection with the approval.

This application (05\_0177 MOD 7) to modify the Minister's approval for the Stage 1 project will not alter the size of approved mines (OC1, OC2, OC3 or UG4); the methods of approved mining; the rate of approved coal extraction, materials handling and production; or the method and frequency of approved off-site coal transport. Further, the proposed changes will not radically alter or transform the existing approved project and the Stage 1 project will be substantially the same development as approved by the Minister, that being three open cut and one underground coal mines producing up to 10 Mtpa product coals, with supporting infrastructure, including a CHPP and rail loop.

Therefore, the proposed amendments sought for approval come under the power of the Minister to modify the Stage 1 approval, in accordance with the provisions of Section 75W of the EP&A Act.

### **4.2 Section 147 EP&A Act**

Moolarben Coal Mines has disclosed reportable political donations, as required under Section 147 of the EP&A Act, for its application to modify the Stage 1 project 05\_0117 MOD 6 and these are on the public file. Moolarben Coal Mines, its current (Yanzhou) and past (Felix) parent companies or its joint venture operating partners have not made any further reportable political donations since modification application 05\_0117 MOD 6 for Stage 1 was determined.

## 5. ENVIRONMENTAL ASSESSMENT

### 5.1 Potential Impacts and Mitigation

The proposed modification will result in clearing and disturbance to existing vegetation, fauna habitat and aboriginal cultural heritage sites. The impacts and mitigation measures that will be implemented to minimise the risk of adverse environmental effects as a result of the proposed changes are described below.

#### 5.1.1 Groundwater

The impact of extracting groundwater from the coal seam aquifers to provide adjunct mine water supplies and to dewater the UG4 mine were assessed in the Stage 1 EA (EA Sections 5.6.8.2 and 5.6.10.1 and EA Appendix 5 Section 5.4 and Figure 21) (Wells, 2006), and is not considered in this assessment.

#### 5.1.2 Biodiversity

Ecovision Consulting (Ecovision) has assessed the potential impact of constructing the borefield on threatened species, endangered populations (EPs), endangered ecological communities (EECs) and habitats. Ecovision's assessment draws on publicly available scientific databases and site investigations undertaken for Stage 1 (Wells, 2006). Supplementary field surveys within the borefield development area were undertaken to validate prior assessment findings. The Ecovision assessment report is included as Appendix 1.

The borefield area is generally characterised by Dry Schlerophyll Forests comprising Scribbly Gum and Broad-leaved Ironbark as the dominant tree species. Yellow Box and other box gum species consistent with the *Threatened Species Conservation Act 1995* (TSC Act) definition of the White Box Yellow Box Blakely's Redgum Woodland EEC have only minor occurrence in the area. These box gum species are also consistent with the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) definition for critically endangered ecological community (CEEC).

Prior studies identified the occurrence of habitat for eight threatened fauna species, the Brown Treecreeper, Speckled Warbler, Gilbert's Whistler, Glossy Black Cockatoo, Powerful Owl, Large Bentwing bat, Large-eared Pied Bat and Greater Long-eared Bat. Each of these has the capacity to forage and breed within the site. Potential breeding areas coincide with drainages where there is a high density of tree hollows.

There are no EPs or their habitats and threatened and declining woodland birds are generally absent due to low soil fertility and the scarcity of water resources.

Compared to the extent of existing vegetation within the borefield development area, the disturbance footprint of the borefield is relatively small, with a total disturbance footprint of about 24 ha (Table 3). Of this about 3.5 ha is already cleared or disturbed, generally comprising unsealed roads and 4WD tracks. These existing cleared and disturbed areas will be used to provide vehicle access for construction and ongoing maintenance and will form part of the

borefield infrastructure easement. A further 0.5 ha of non-EEC native vegetation will be cleared to supplement existing access tracks, to enable development of bore pad sites and the establishment of powerline poles.

A further 20 ha of existing vegetation (Table 3) will be thinned and slashed within the infrastructure easement. Trees and shrubs will be removed in these areas as a fire prevention and asset protection measure. However, natural groundcover will be maintained where practicable. This will enable the safe construction and operation of the borefield powerline and provide a generally cleared area upon which the borefield pipeline will be laid. About 0.5 ha of EEC (Table 3) will be disturbed in the development of the infrastructure easement.

In areas not directly cleared, groundcover (i.e., grasses, herbs, low shrubs and bush rock where practicable) will be retained to provide habitat for ground dwelling fauna, minimise the risk of soil erosion and enable natural regrowth upon completion of mining. Felled trees, branches and mulched vegetation will be used to provide supplementary habitat and groundcover for ground dwelling fauna in areas adjacent to bore pads and along the periphery of the infrastructure easement.

**Table 3 Vegetation impacts**

<b>Vegetation Type</b>	<b>Direct Impacts<sup>1</sup> (ha)</b>	<b>Indirect Impacts<sup>2</sup> (ha)</b>
Blakely's Redgum - Yellow Box - Rough-barked Apple grassy woodland (EEC)	-	0.5
Scribbly Gum – Brown Bloodwood woodland	0.5	17.0
Grey Gum - Narrow-leaved Stringybark - Ironbark woodland	-	2.0
Cleared Land (i.e., existing tracks, secondary grasslands and shrublands)	3.5	0.5
<b>Total</b>	<b>4.0</b>	<b>20.0</b>

1. Direct impacts include the removal of the tree canopy and shrub understory (i.e. fauna habitat).
2. Indirect impacts include the removal of the tree and shrub understory during the construction stage, with ongoing slashing used to maintain this structural change throughout the operation period.

There is also the potential for indirect impacts on biodiversity values from weed infestation and sediment and water release into locally adjacent areas. However, the application of standard environmental management controls, such as erosion, sediment, weed and pest control measures, will greatly reduce the risk and occurrence of indirect impacts.

Ecovision recommends the following management measures be adopted to offset the biodiversity impacts associated with developing the borefield:

- Implement the measures proposed in MCM's landscape management plan to ensure suitable land clearing and habitat protection protocols are adhered to during construction of the borefield.
- Retain existing native vegetation groundcover (grasses, herbs and low shrubs) within the infrastructure easement through vegetation slashing rather than vegetation removal (excluding tracks and immediate bore surrounds).
- Implement regular exotic plant monitoring and control activities to prevent the occurrence and spread of exotic plants introduced into adjoining native vegetation.

- Undertake tree hollow clearing activities sensitive to the breeding requirements of local threatened species.
- Recover fauna habitats (e.g. trees with hollows and surface rock) and place on periphery of pipeline easement.
- Install compensatory habitat features such as hollows, preferably natural hollows recovered from land clearing, to offset the loss of any tree hollows.

Ecovision concluded the development of the borefield will not have a significant impact on biodiversity. Further, provided the recommended management and mitigation measures are implemented, the modification will meet the government's 'maintain' objectives for biodiversity values.

Moolarben Coal Mines commits to adopting the recommended management measures. Further, to offset the impact on 0.5 ha of EEC, it will conserve and enhance an additional 1.0 ha of naturally regenerating EEC, on property no. 24 (Wells, 2006), which is owned by MCM, through measures such as weed control, seeding and planting. This is additional to the requirements for conserving at least 4 ha of EEC and conserving and enhancing at least 2.6 ha of EEC on this property, as required under condition 41A of the Stage 1 approval, as a result of a prior modification (05\_0117 MOD 5).

The Environment and Community Relations Manager (ECRM) will be responsible for ensuring that management and monitoring measures and commitments are implemented prior to vegetation and habitat clearing, including pre-clearance fauna and habitat (tree hollows) surveys. The ECRM will also be responsible for ensuring that construction crews are aware of the environmental management and mitigation measures relevant to construction of the borefield, and that they comply with any environmental management requirements or directions.

### **5.1.3 Aboriginal Cultural Heritage**

Archaeological Risk Assessment Services Pty Ltd (ARAS) has assessed the potential impact of constructing the borefield on Aboriginal cultural heritage. Field surveys were carried out with local Aboriginal stakeholder representatives between 24 and 27 November, 2009. Survey transects covered proposed groundwater bore pad sites and the infrastructure easement (i.e., access track, powerline and pipeline route). The ARAS assessment report is included as Appendix 2.

Twelve previously unknown Aboriginal sites (comprising fifteen Aboriginal objects) and one known Aboriginal site (S1MC255, comprising four Aboriginal objects) were identified within the surveyed transects. The cultural record of these sites is made up of seven isolated finds and three artefact scatters (two – S1MC255 and S1MC314 – containing potential archaeological deposits). The archaeological evidence is presented as stone artefact material (flakes and quartz artefacts) that has been exposed by previous track clearing activities and through natural surface erosion processes.

Ten of these sites (S1MC313, S1MC315-321 and S1MC323-324) are assessed as having low scientific significance. The remaining three sites (S1MC255, S1MC314 and S1MC322) are assessed as having medium scientific significance. None of the identified sites are of high scientific significance. Further, none of the sites are considered rare or contain Aboriginal cultural landscape values, and none of the sites or Aboriginal objects are considered to offer research or educational potential.

Based on a review of background archaeological and historical research and land use history, recent field assessment and advice from Aboriginal consultation and stakeholder representatives, the borefield development areas are considered to have only low to medium potential for Aboriginal heritage.

The following recommendations have been made by ARAS:

- Sites S1MC322 and S1MC271 can be avoided by re-routing the infrastructure easement to an alternate cleared access track. (Site S1MC271 is a small rock shelter site in the vicinity of Site S1MC322, which was identified in the Stage 1 EA. This site will not be impacted by the borefield).
- Sites S1MC313, S1MC315-321 and S1MC323-324 should be salvaged using the methods outlined in the approved Aboriginal heritage management plan (AHMP). This includes storing the salvaged artefacts in the Keeping Place provided by MCM to the local Aboriginal stakeholder groups.
- Sites S1MC255 and S1MC314, which are of medium scientific interest should be salvaged and in addition undergo shallow subsurface investigation to determine if they contain in-situ sub-surface deposits using the methods outlined in the approved Aboriginal heritage management plan (AHMP).
- Known Aboriginal sites immediately adjacent to borefield disturbance areas and not impacted by the borefield should be fenced off to avoid potential disturbance to Aboriginal sites and objects.
- Cultural heritage monitoring and salvage work is undertaken by a qualified archaeologist and members of the Aboriginal Stakeholder community groups: Mudgee Local Aboriginal Land Council based in Mudgee; Murong Gialinga Aboriginal and Torres Strait Islander Corporation, based in Mudgee; and Warrabinga Native Title Claimants Aboriginal Corporation, based in Kandos.
- If additional Aboriginal sites or objects are identified as result of the cultural heritage monitoring and cannot be permanently avoided, further archaeological assessment may be required prior to continuing with construction.

Moolarben Coal Mines commits to adopting these recommendations, which are in accord with the protocols and management measures developed by MCM in its approved AHMP. This includes involving local Aboriginal community representatives in the monitoring of ground disturbance activities; and in the recording, salvaging and storing of Aboriginal objects disturbed or impacted by site works.

The ECRM will be responsible for ensuring that shift managers and construction workers are aware of their responsibilities under the AHMP, and that any Aboriginal objects unearthed during construction or operational activities required for the modification are appropriately recorded, reported, salvaged and stored.

### 5.1.4 Noise

Spectrum Acoustics has reviewed the noise impacts associated with the construction and operation of the borefield. This review is included as Appendix 3.

Predicted worst case noise levels from the operation of the borefield (i.e., pumps in the vicinity of bore TB105) is 34 dB(A) at the nearest private dwelling (i.e., a tourist accommodation cottage at Stone Cottages). This is marginally below the approved operational noise criterion for the mine at rural residences (i.e., 35 dB(A)).

The water storage tank at this bore site will be positioned to shield pump noise from this dwelling. This will reduce the potential worst case noise impacts from 34 dB(A) to 26 dB(A) at this dwelling. The effectiveness of this acoustic screen will be validated by attended monitoring and additional screening implemented where required.

No other privately-owned residences will be impacted by noise from the borefield.

### 5.1.5 Other Impacts

**Table 4 Other impacts**

Environmental / Social Descriptor	Borefield Activity Description and Potential Impacts	Environmental Management and Mitigation Measures
Soil and sediment	<p>Development of the borefield will require disturbance of about 24 ha of land (0.05 ha for bore pads, 4.8 ha for access tracks and 19.2 ha for powerline and pipeline easements).</p> <p>Clearing and earthwork activities required to construct the bore pads, access tracks and powerline and pipeline easements will potentially increase the risk of erosion and sediment release into adjacent down slope areas and local drainage lines.</p>	<p>An erosion and sediment control plan has been prepared for the construction of the borefield, including use of sediment fences and other temporary sediment controls, and is included in Appendix 4. This is in addition to the implementation of general site environmental management procedures. These management and monitoring measures will inhibit the release of sediment into local drainage lines and down slope of working areas.</p> <p>Cleared bore pads will be capped with an inert compacted road base material</p> <p>Where practicable, groundcover (grasses, herbs, etc) will be maintained to minimise the risk of erosion and sediment release.</p> <p>Soils will be stockpiled and following completion of construction will be used to rehabilitate areas not required for ongoing operations. These areas will be rehabilitated with native grasses and other native groundcover vegetation.</p> <p>The ECRM will be responsible for ensuring that erosion and sediment control measures are implemented and fully functioning prior to, and for the duration of, all relevant clearing, earthwork and construction activities.</p>

**Table 4 Other impacts (cont'd)**

<b>Environmental / Social Descriptor</b>	<b>Borefield Activity Description and Potential Impacts</b>	<b>Environmental Management and Mitigation Measures</b>
Water	<p>A leak or rupture in the borefield pipeline or temporary water storage tanks will release water (average EC of about 720 µS/cm) into surrounding soils, naturally vegetated areas and local drainage lines, depending on the site of failure.</p> <p>However, potential adverse effects are considered minor as the quality (i.e., pH, salinity and dissolved ions) of the borefield groundwater is generally on par with the quality of the Goulburn River receiving waters. Further, the maximum total storage volume of all storage tanks (200 KL) and pipelines (0.5 KL) will be about 200.5 KL. Although only a small percentage of this would be expected to be released to the environment in the event of a pipeline leak or burst, or single tank leak or rupture.</p>	<p>The pipeline will be constructed of HDPE pipe to industry standards, will be pressure tested prior to use and will operate under low pressure conditions. In addition, non-pumping transfer pumps will act as stop valves to prevent the gravitational release of water into the pipeline network from upstream of those transfer pumps.</p> <p>All water storage tanks, pumps and pipelines will be inspected regularly as part of general site environmental management and monitoring procedures.</p> <p>In the event that a leak or rupture does occur, pumping will cease and the resultant cause investigated and repaired, and any adverse impact (e.g., localised soil scouring around the release point) remediated.</p>
Traffic	<p>Access to the borefield for construction and maintenance will be via existing crown roads and 4WD access tracks off the Ulan-Cassilis Road.</p> <p>Use of these access arrangements by dozers, drilling rigs and delivery trucks will generally be infrequent and for short periods of time during construction of the borefield. Access by light vehicles will be more frequent during construction and then less frequent during operation.</p> <p>Only small numbers of construction vehicles (earth moving equipment, drilling rigs, delivery trucks and support vehicles) will be required during the construction of the borefield.</p>	<p>Appropriate traffic management will be implemented for construction vehicles entering and leaving the borefield site to Ulan-Cassilis Road, where required.</p>
Visual	<p>The potentially visible aspects of the borefield will comprise about 600 m of 90 mm HDPE piping and 6 m overhead powerline, transfer pump, a cleared bore pad area, one bore head (bore TB105), 20,000 L water storage tank and erosion and sediment controls (i.e., table drains and temporary sediment fencing).</p> <p>These will be located on Moolarben owned land adjacent to the public access road to the Stone Cottages, and will only be visible to the owners and visitors of the Stone Cottages.</p> <p>These aspects of the development will not be incongruous with other existing farm infrastructure on other parts of this public access road.</p>	<p>Trees and shrubs will be planted to provide a visual screen to the bore pad and water storage tank from the Stone Cottages public access road, where required.</p>



**Table 4 Other impacts (cont'd)**

<b>Environmental / Social Descriptor</b>	<b>Borefield Activity Description and Potential Impacts</b>	<b>Environmental Management and Mitigation Measures</b>
Dust	<p>Dust generating activities will comprise minor earth works, vegetation clearing, bore drilling and a small number of vehicles travelling on unsealed access tracks.</p> <p>These activities will be undertaken in an area distant from residential dwellings and separated from main mine development and operational activities.</p> <p>Only minor dust generation will occur during construction of the borefield.</p>	Water carts will be used to minimise potential dust generation from unsealed access tracks, and construction areas, where required.

## 5.2 Existing Environmental Controls

In December 2008, the DoP approved a raft of environmental management plans and monitoring programs (EMPs) for the construction phase of Stage 1, including:

- Environmental Management Strategy.
- Environmental Monitoring Program.
- Construction Noise Management Plan.
- Noise Monitoring Program.
- Aboriginal Heritage Management Plan.
- Water Management Plan, including:
  - Erosion and Sediment Control Plan.
  - Surface and Groundwater Water Monitoring Program.
  - Surface Water and Groundwater Response Plan.

The management and monitoring measures described in these plans and programs will be extended to cover the construction of the borefield. Moolarben Coal Mines is currently preparing operational management plans for Stage 1 in preparation for the commencement of mining. The environmental management and mitigation measures described in these plans will also be applied to the operation of the borefield.

Moolarben Coal Mine's ECRM is responsible for ensuring that the management, monitoring, mitigation and contingency measures and commitments detailed in these construction and operational environmental management plans are appropriately implemented. Together with the General Manager, the ECRM is also responsible for ensuring that the construction and operation of Stage 1 complies with the Minister's approval for the project.

## 6. COMMITMENTS

In addition to the commitments made in the Stage 1 approval, MCM commits to implementing the following management and mitigation measures (Table 5) to ensure that the impacts associated with the proposed modification are minimised:

**Table 5 Management and mitigation commitments**

Environmental Aspect	Management and Mitigation Commitments
Noise	<ul style="list-style-type: none"> <li>• Borefield construction will be undertaken only during daylight hours.</li> <li>• Submersible bore pumps will be used to reduce pumping noise.</li> <li>• The water tank at bore pad site TB105 will be positioned to shield potential pump noise from the Stone Cottages residences. Alternatively, other acoustic shielding will be implemented.</li> </ul>
Biodiversity	<ul style="list-style-type: none"> <li>• Pre-clearing fauna surveys will be undertaken and arboreal fauna and nesting sites will be recovered and relocated. Tree hollows, fallen logs and bush rock will be salvaged for use as compensatory habitat at the edges of the pipeline easement and in areas surrounding the bore pads.</li> <li>• Feral animals, weeds and pests will be controlled.</li> <li>• The disturbance to 0.5 ha of EEC will be offset by conserving and enhancing 1.0 ha of EEC on property no. 24.</li> </ul>
Cultural heritage	<ul style="list-style-type: none"> <li>• Cultural heritage sites S1MC313-321 and S1MC323-324 will be salvaged and stored in the Keeping Place.</li> <li>• Cultural heritage sites S1MC255 and S1MC314 will undergo shallow subsurface testing and salvaging.</li> <li>• An alternative infrastructure easement route will be implemented to avoid impacting sites S1MC271 and S1MC322, where practicable.</li> <li>• Cultural heritage sites adjacent to and outside construction areas will be fenced to prevent potential disturbance.</li> <li>• Cultural heritage monitoring and salvage will be undertaken by a qualified archaeologist and members of the Aboriginal Stakeholder community groups.</li> <li>• Where additional cultural heritage sites are identified, further archaeological assessment will be carried out prior to continuing with construction.</li> <li>• Local Aboriginal community representatives will be involved in monitoring ground disturbance activities; and in the recording, salvaging and storing of cultural heritage objects impacted by site works.</li> </ul>
Soil and water	<ul style="list-style-type: none"> <li>• Standard industry (Blue Book) erosion and sediment control measures will be implemented during construction and operation of the borefield.</li> <li>• Soils will be stockpiled and used to rehabilitate areas not required for ongoing operations.</li> <li>• Groundcover will be maintained to minimise the risk of soil erosion, wherever practicable.</li> <li>• The borefield will be regularly inspected and maintained so as to reduce the risk of pipe or water tank leakage or rupture.</li> <li>• In the event that a leak or rupture is detected, pumping will cease and the resultant cause investigated and repaired and any adverse impacts remediated.</li> </ul>

## **7. CONCLUSION**

The modification will disturb about 24 ha of land, additional to that approved for disturbance in the Stage 1 approval. This includes the thinning and slashing of about 20 ha of native vegetation, including 0.5 ha of EEC, and the direct clearing and removal of 0.5 ha of non-EEC native vegetation. Up to twelve Aboriginal heritage sites known to occur within this disturbance area will be impacted. The modification will not impact surrounding privately-owned properties or residences.

Moolarben Coal Mines has used the outcomes from specialist studies to minimise the extent of potential impacts associated with the development of the modification.

Adoption of the management and mitigation measures recommended by specialist consultants, implementation of management and mitigation measures in approved EMPs, and the carrying out of construction and operations in accordance with MCM's project commitments and the Stage 1 approval will mitigate any adverse environmental effects of the modification.

The modification will enable MCM to construct and operate the water supply and dewatering borefield generally as contemplated and conceptually described in the Stage 1 EA.

The modification will not alter the size of approved Stage 1 mines, the mining methods, the rate of approved coal extraction and production, or the method and frequency of off-site coal transport. Further, the proposed changes will not radically alter or transform the approved project and it will be substantially the same development as approved by the Minister.

This report demonstrates that there will be no substantive environmental impacts as a result of constructing and operating the borefield. Finally, all other aspects of the MCP will remain consistent with the project approval (as modified).

## **8. REFERENCES**

- Coffey (2009). Environmental Assessment Section 75W Modification Application Moolarben Coal Project Stage 1 (05\_0117 MOD 5). Report prepared for Moolarben Coal Mines Pty Ltd by Coffey Natural Systems Pty Ltd.
- Standards Australia (2007). Wiring Rules. AS/NZS 3000:2007. Australian/New Zealand Standard for Wiring Rules. Revised July 2009.
- Wells (2006). Moolarben Coal Project Environmental Assessment Report. Report prepared for Moolarben Coal Mines Pty Ltd by Wells Environmental Services.