MOOLARBEN COAL PROJECT

Stage 2

SECTION 1

Introduction

SECTION 1 – INTRODUCTION

Contents

1. INTRODUCTION S1-3
1.1 Overview 1-3
1.2 The Proponent 1-3
1.3 Location and Setting 1-4
1.4 Background 1-4
1.5 Stage 1 of the Moolarben Coal Project 1-5
1.6 Stage 2 of the Moolarben Coal Project 1-6
1.7 Modification of Stage 1 1-7
1.8 Integrated Stage 1 and Stage 2 Moolarben Coal Project 1-8
1.9 Need for Stage 2 and the Modification of Stage 1 1-8
1.10 Environmental Assessment 1-8
1.11 Preliminary Risk Assessment 1-9
1.12 Structure of the Environmental Assessment Report 1-18
1.13 How to Read the Environmental Assessment Report 1-21
1.14 Study Team 1-21
1.15 Acknowledgements 1-22

Tables

Table 1.1 Table of consequence severity levels S1-10
Table 1.2 Table of probabilities of occurrence 1-10
Table 1.3 Risk assessment matrix 1-10
Table 1.4 Preliminary risk assessment 1-11
Table 1.5 Summary of Volume 1 of the Environmental Assessment Report 1-18
Table 1.6 Summary of Director General's Requirements (Stage 2 and the modification of Stage 1) 1-19
Table 1.7 Specialist consultants involved in the preparation of the Environmental Assessment Report for Stage 2 and the modification of Stage 1 1-22

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1. INTRODUCTION

1.1 Overview

Moolarben Coal Mines Pty Limited (Moolarben Coal Mines, MCM) proposes to develop Stage 2 of the Moolarben Coal Project (MCP) in the Western Coalfields of New South Wales (NSW). The proposed Stage 2 project (Stage 2) comprises one open cut and two underground coal mines, and supporting infrastructure and facilities. These will be developed adjacent to the Stage 1 project (Stage 1), which was approved by the NSW Minister for Planning on 6 September 2007. When developed, both stages of the MCP (Stage 1 and Stage 2) will form an integrated mining complex (the MCP) with employees, equipment, infrastructure and facilities shared across the complex. To enable this integration, certain aspects of the Stage 1 Project Approval need to be modified.

Moolarben Coal Mines is seeking approval for both Stage 2 and the proposed modification of the Stage 1 Project Approval (modification of Stage 1), as described briefly below and in detail in Section 4.

This Environmental Assessment (EA) report has been prepared to address the Director-General (DG) of the Department of Planning's (DoP) requirements (DGRs) for assessment of the potential environmental, social and economic impacts of Stage 2 and the modification of Stage 1. The EA has been prepared jointly between Wells Environmental Services Pty Limited and Coffey Natural Systems Pty Ltd.

Since finalising this EA report, MCM has decided that it can make substantial capital expenditure savings by changing the design of the Stage 1 approved rail loop. Instead of an oval rail loop with a figure eight cross over, MCM is proposing to construct a standard balloon rail loop. The modified rail loop will be constructed in the same location as that previously approved. It will require less bulk earth works and will have a smaller footprint than the original design. Consequently, MCM will lodge a separate application to modify the Stage 1 Project Approval for the altered rail loop design. This application will be lodged with the DoP while this EA report is on exhibition.

1.2 The Proponent

Moolarben Coal Mines, the proponent for the project, is 100% owned by Felix Resources Limited (Felix). Moolarben Coal Operations Pty Ltd acts as the manager of the Moolarben Joint Venture. Moolarben Coal Operations Pty Ltd is 80% owned by MCM with two equity partners each with a 10% holding. These are Sojitz Corporation of Japan (a Japanese trading house) and Kores (a Korean power generation consortium).

Felix is an Australian resource company listed on the Australian Stock Exchange. Its focus is on developing, operating and investing in resource-related projects, principally coal. Felix's assets include the Yarrabee and Minerva coal mines in Queensland, and the Ashton coal mine and MCP in NSW. Felix is one of six equity partners in the Newcastle Coal Infrastructure Group (NCIG), having a 15.40% share in the group. Through its fully owned subsidiary, UCC Energy, it also is developing the Ultra Clean Coal Process (low carbon emission coal combustion technology).

1.3 Location and Setting

The MCP is located in the Western Coalfields of NSW, east of the village of Ulan and approximately 40 km northeast of Mudgee and 25 km east of Gulgong (see **Plan 1** in Volume 2). The MCP is bordered in part by the Ulan open cut and underground coal mine to the west, Goulburn River National Park to the north, Munghorn Gap Nature Reserve to the south and Wilpinjong open cut coal mine to the east. Stage 2 is located between Stage 1 and the Wilpinjong open cut coal mine.

Privately-owned residences are located to the west, southwest and south of the Stage 2 Project Area (see **Plans 2** and **2A** in Volume 2). These residences are generally separated from Stage 2 by Stage 1 and the Munghorn Gap Nature Reserve.

The land on which Stage 2 will be developed is detailed in **Appendix 1A** in Volume 1.

1.4 Background

The mining of coal commenced in the Ulan district in the early 1900s. The Ulan coal mine was commissioned in the 1980s to provide open cut thermal coal for domestic and export use. The Wilpinjong open cut coal mine was commissioned in early 2007 and provides thermal coal for domestic and export markets.

In March 2004, the Minister for Mineral Resources under the *Mining Act 1992* invited Expressions of Interest for an Exploration Licence (EL) in the Moolarben coal authorisation area. On 23 August 2004, the Minister for Mineral Resources granted EL 6288 to MCM, awarding it the right to explore for coal in an area of approximately 110 km^2 located to the east of the village of Ulan, and in part bordered by the Ulan coal mine to the west, Goulburn River National Park to the north, Munghorn Gap Nature Reserve to the south and Wilpinjong coal mine to the east (see Plan 1 in Volume 2).

With the grant of EL 6288, MCM initiated a program of coal exploration drilling and established a baseline environmental monitoring program to better understand the geology and environmental setting of the EL area. The information obtained from these programs enabled MCM to commit to developing the coal resources within EL 6288.

Since the granting of EL 6288 and approval of Stage 1, the western boundary of the Goulburn River National Park has been adjusted and now extends into the Stage 1 Project Approval boundary. However, no aspect of Stage 1 will be developed within the National Park.

In February 2008, two additional exploration licences (EL 7073 and EL 7074) were granted to MCM. These exploration licences are located to the south and east of EL 6288, respectively (see Plan 1 in Volume 2). Exploration within EL 6288 and subsequent planning for mine development has been divided into several stages designed to facilitate the orderly, economic and progressive extraction of the valuable coal resources, as follows:

- Stage 1:
  - Three open cut mines – Open Cuts 1, 2 and 3 (OC1, OC2 and OC3).
  - One underground mine – Underground 4 (UG4).
- Stage 2:
  - One open cut mine – Open Cut 4 (OC4).
  - Two underground mines – Undergrounds 1 and 2 (UG1 and UG2).

- Future stages:
  - Incorporating remaining coal resources, which will require future applications.

1.5 Stage 1 of the Moolarben Coal Project

A Major Project Application for Stage 1 was lodged with the DoP in December 2005. The DoP issued Major Project Application No. 05_0117 in respect of this application and, in March 2006, issued DGRs for environmental assessment for the proposed project. The EA for Stage 1 was publicly exhibited commencing in September 2006 then reviewed by an Independent Hearing and Assessment Panel in November 2006. A Response to Submissions report incorporating a Preferred Project report was subsequently submitted to the DoP in December 2006. The Minister for Planning approved Stage 1 on 6 September 2007.

The main components of Stage 1 are summarised below:

- Three open cut mines (OC1, OC2 and OC3) to be mined at a combined rate of up to 8 million tonnes per annum (Mtpa) run-of-mine (ROM) coal, to produce coal for export and domestic markets.
- One underground mine (UG4) to a be mined via the longwall mining method at a maximum rate of 4 Mtpa ROM coal, to produce coal predominantly for the export market.
- A coal handling and preparation plant (CHPP) with a throughput of approximately 12 Mtpa of ROM coal, incorporating crushing plants, conveyors, raw coal and product coal stockpiles, coal washery, and coal stacking and reclaiming by overhead trippers and reclaim tunnels, to produce a maximum of 10 Mtpa of product coals.
- A dedicated rail loop and rail load out facility, with product coals railed to market via the Gulgong-Sandy Hollow rail line at a rate of up to four trains per day.
- Support facilities, including offices, bathhouses, workshops and fuel storages.
- External access to the CHPP, UG4 and main site office from Ulan-Cassilis Road and to OC1, OC2 and OC3 from Ulan-Wollar Road.
- Internal access roads and haul roads.
- Water to be supplied from bores and surface water storages from across the site and, where possible, through sharing arrangements with adjoining mines.
- Power to be supplied from the 66-kV Ulan to Wilpinjong transmission line, via a 66/11-kV substation constructed on site.
- Placement of overburden and coarse reject within mined out voids and out of pit emplacement areas.
- All disturbed areas to be progressively rehabilitated.

The general arrangement of Stage 1 is shown in **Plan 3** in Volume 2.

Stage 1 is approved to operate until 20 December 2028.

On 20 December 2007, the Minister for Mineral Resources granted Mining Lease (ML) 1605 and ML 1606 to MCM. In August 2008, the Department of Environment and Climate Change (DECC) issued Environment Protection Licence (EPL) 12932 for Stage 1.

In August 2008, an application was lodged with the DoP pursuant to the provision of Section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify the Project Approval for Stage 1. The application sought to make administrative changes and to rearrange specific items of approved infrastructure so as to improve operational efficiency and provide improved conservation outcomes for Stage 1. The application (05_0117 MOD 1) was approved on 26 November 2008.

In December 2008, an application was lodged with the DoP pursuant to the provision of Section 75W of the EP&A Act to seek approval for minor construction activities for Stage 1 to commence prior to completion of the main mine site access intersection. The application (05_0117 MOD 2) was approved on 18 December 2008 and construction of Stage 1 (as modified) has since commenced.

1.6 Stage 2 of the Moolarben Coal Project

In July 2008, MCM lodged a Major Project Application and a Preliminary Environmental Assessment (PEA) report with the DoP for Stage 2 of the MCP. The DoP issued Major Project Application No. 08_0135, in respect of this application.

Stage 2 comprises:

- One open cut mine (OC4) to be mined at a rate of up to 12 Mtpa ROM coal, to produce coal for export and domestic markets.
- Two underground mines (UG1 and UG2) to be mined via the longwall mining method at a maximum combined rate of 4 Mtpa ROM coal, to produce coal predominantly for the export market.
- Coal handling facilities incorporating ROM stockpiles, dump hopper, crushing and sizing plant, transfer conveyors, raw coal stockpile, coal stacking by overhead trippers, reclaim tunnels and conveyors. The dump station and crushing and sizing plant located at the Stage 2 ROM coal facility will have a throughput capacity of up to 17 Mtpa ROM coal.
- Coal from OC4 to be transferred via haul truck to the Stage 2 ROM coal facility.
- Coal from UG1 and UG2 to be transferred via conveyor to the OC1 ROM coal facility.
- Coal to be reclaimed from the raw coal stockpile at the Stage 2 ROM coal facility and conveyed to the (Stage 1) CHPP.
- Support facilities, including offices, bathhouses, workshops and fuel storages (where required) to be established at the Stage 2 office and workshop facility, and at the UG1 entry. Temporary facilities to be established in advance of mining at OC4.
- External access to OC4, UG1 and UG2, Stage 2 ROM coal facility and Stage 2 office and workshop facility from Ulan-Wollar Road.
- Internal access roads and haul roads.

- Water management and supply infrastructure, with water supplied from mine inflows, captured surface water, recycled process water, the Stage 1 groundwater borefield and through sharing arrangements with adjoining mines, where possible.
- Partial relocation of Murragamba Creek and Eastern Creek.
- Power to be supplied from the Stage 1 66/11-kV substation.
- Coarse rejects and tailing to be emplaced with overburden in the open cut voids.
- Progressive rehabilitation and revegetation of disturbed mine areas.

The general arrangement of Stage 2 is shown in Plan 4 in Volume 2.

The open cut mine (OC4) is located in the floor of the Murragamba Creek valley and adjoining valley to the east (referred to throughout this report as the Eastern Creek valley). The underground mines (UG1 and UG2) are located below the Triassic sandstone ridges between the Moolarben and Murragamba valleys, and between OC1, OC2 and OC4 (see Plan 4 in Volume 2). The Ulan Seam, which ranges from about 11 m to about 13 m in thickness, will be mined with the full seam recovered in OC4 and a partial section in UG1 and UG2.

Stage 2 will produce medium-high volatile, high-energy coal for export and a high ash middlings thermal coal product for the domestic power station market. The underground and open cut mines will operate concurrently.

Moolarben Coal Mines is seeking approval to construct and operate Stage 2 up to 31 December 2033.

1.7 Modification of Stage 1

The Major Project Application for Stage 2 (MP 08_0135) contemplated the need to modify certain aspects of the Stage 1 Project Approval to enable the efficient integration of the two stages and to reduce the duplication of major infrastructure components for Stage 2.

The proposed modification of Stage 1 seeks to:

- Enable Stage 1 infrastructure to receive, handle and process Stage 2 coal.
- Increase the throughput of Stage 1 processing, handling and rail loading up to 17 Mtpa ROM coal and 13 Mtpa product coals.
- Transport up to 13 Mtpa of product coal via rail from the site.
- Relocate UG4 access portals, coal handling infrastructure and surface facilities from within the Stage 1 infrastructure area to within the northeast part of OC1.
- Extend the approved operating life of Stage 1 infrastructure (CHPP, rail loading facility and rail loop) to 31 December 2033, to enable continued handling, processing and transport of Stage 2 coals for the life of Stage 2.

These proposed changes to Stage 1 will not alter the size of mines (OC1, OC2, OC3 or UG4), the methods of mining, or the rate of coal extraction for Stage 1, from that provided for in the Stage 1 Project Approval.

1.8 Integrated Stage 1 and Stage 2 Moolarben Coal Project

The integrated MCP will comprise four open cut mines (OC1, OC2, OC3 and OC4), three underground mines (UG1, UG2 and UG4), a CHPP, rail loading facility and rail loop. At full production the integrated MCP will extract and process up to 17 Mtpa of ROM coal, comprising up to 13 Mtpa from open cut mining and up to 4 Mtpa from underground mining, and will transport up to 13 Mtpa of product coals via rail from the site.

1.9 Need for Stage 2 and the Modification of Stage 1

Stage 2 will result in the investment of $120 million in order to extract and process approximately 252 Mt of coal for both the export and domestic markets. The benefits from mining the resource include the creation of direct and indirect employment opportunities during the project's construction and operational phases, as well as royalties and taxes paid to the various tiers of government. The monies received by government will be reinvested in the broader community to maintain or enhance standards of living.

Stage 2 requires the utilisation of approved Stage 1 infrastructure to handle and process Stage 2 ROM coal and to transport product coals to market. The ability for MCM to integrate the two stages and to utilise Stage 1 infrastructure for Stage 2 provides MCM with improved coal handling efficiencies and reduced capital expenditure and operating costs. This will be achieved through the modification of Stage 1.

The principal objectives for the development and operation of Stage 2 and its integration with Stage 1 are:

- To safely, efficiently and profitably maximise the economic recovery of coal reserves within the Stage 2 Project Area.
- To conduct mining operations with socially acceptable environmental impacts using best management practices and applying the best available technology that is economically achievable.
- To conduct mining operations in a manner that promotes good relations with the local community, neighbours and statutory authorities.
- To maximise synergies from the integration of Stage 1 and Stage 2.
- To maximise, where possible, the economic benefits of the project to the residents of the Mid-Western Regional Council local government area.

1.10 Environmental Assessment

A Major Project Application (08_0135) together with a PEA was lodged with the DoP on 14 July 2008. These project application documents included the combined description of Stage 2 with those aspects of Stage 1 requiring modification to enable Stage 2 to be integrated with Stage 1.

Following lodgement of the Major Project Application, MCM notified the public of its intentions to develop Stage 2 by placing notices in *The Australian* and *The Mudgee Guardian* on 21 July 2008.

On 11 September 2008, the DG of the DoP issued DGRs for the environmental assessment for Stage 2 as described in the Major Project Application (i.e., the combined description of Stage 2 with those aspects of Stage 1 requiring modification). The DGRs for Stage 2 are included as **Appendix 1B** in Volume 1.

On 2 February 2009, MCM submitted a separate application for the modification of the Stage 1 Project Approval for those elements of Stage 1 that the Stage 2 Major Project Application was seeking to modify. This separate application (05_0177 MOD 3) was submitted to DoP to enable the envisaged interactions between Stage 2 and Stage 1 to become legally effective. This was necessary, as the Stage 2 Major Project Application (MP 08_0135) did not provide the legal mechanism by which the Stage 1 Project Approval could be modified. This application for the modification of the Stage 1 Project Approval only refined the description of those elements of Stage 1 that the Stage 2 Major Project Application was seeking to modify, and did not include any further modifications to those already contemplated in the Stage 2 Major Project Application.

The DGRs in respect of 05_0177 MOD 3 were issued on 18 February 2009 and reiterated key issues for environmental assessment that the DGRs for Stage 2 had already identified. The DGRs for the modification of Stage 1 are included as **Appendix 1C** in Volume 1.

Jointly these two sets of DGRs identify the requirements that must be addressed in the environmental assessment for the project. These two sets of DGRs form the basis on which this EA report has been prepared.

As previously indicated, MCM will make separate application to modify the approved Stage 1 rail loop. Hence, a further application to modify the Stage 1 Project Approval (05_0177 MOD 4) will be lodged during the public exhibition period of this EA report. It is also expected that the application for the modification of the rail loop will be assessed separately to Stage 2 and the modification of Stage 1 (05_0177 MOD 3) included in this EA.

1.11 Preliminary Risk Assessment

Following the submission of the Major Project Application for Stage 2, MCM carried out a preliminary risk assessment of Stage 2 and the proposed interactions with Stage 1 to identify the key issues for consideration in the environmental assessment for Stage 2 and the modification of Stage 1. The outcomes of consultation with government, special interest groups and the public, along with acquired site knowledge and experience gained from Stage 1, were used to inform the preliminary risk assessment.

The risk assessment followed the procedure outlined in the Risk Management Guidelines Companion to AS/NZS 4360:2004. This involved identifying aspects of Stage 2 and the modification of Stage 1 that have the potential to cause an undesirable impact. Each identified potential impact was assigned a consequence severity level (C) (**Table 1.1**) and predicted frequency or probability of occurrence (P) (**Table 1.2**). These were then combined using a risk assessment matrix (**Table 1.3**) to determine the level of risk posed by each identified potential impact. An impact with a high consequence severity level and high probability of occurrence represents a high risk, while a low consequence severity level and low probability of occurrence represents a negligible risk (Table 1.3). The determined level of risk was then used to identify appropriate actions for assessment and measures and controls that could be applied to avoid, mitigate or manage the identified risk (**Table 1.4**). The risk rankings assume there are no control measures applied to reduce the potential level of impact.

Table 1.1 Table of consequence severity levels

Consequence Type	Consequence Severity Level				
	1	2	3	4	5
Health and safety	Fatality/permanent disability.	Serious lost time injury >1 month.	Moderate 1 week to 1 month lost time injury.	Minor lost time injury 1 day to 1 week.	No lost time injury.
Natural environment	Very serious long-term environmental impairment of ecosystem functions.	Serious long-term environmental impairment of ecosystem functions.	Serious medium term environmental effects.	Moderate, short-term effects but not affecting ecosystem functions.	Minor effects on biological or physical environment.
Social/cultural heritage	On-going serious widespread social issues, or significant irreparable damage or loss of structures/items of cultural significance.	On-going serious social issues, or significant damage to structures/items of cultural significance.	Medium-term social impacts on local population, or permanent damage to items of cultural significance.	Minor medium-term social impacts on local population, or damage or loss of items of low cultural significance.	Minor short-term social impacts on local population, or damage of items of low cultural significance.
Community/ government reputation/ media	Serious public or media outcry (international coverage).	Significant adverse national media/public/ non-government organisation attention.	Attention from media and/or heightened concern by local community. Criticism by non-government organisations.	Minor, adverse local public attention.	Localised community complaints.
Legal	Significant prosecution and fines. Very serious litigation including class actions.	Major breach of regulation. Major litigation.	Serious breach of regulation with investigation or report to authority with prosecution and /or moderate fine possible.	Minor legal issues, minor non-compliances and breaches of regulation.	

Table 1.2 Table of probabilities of occurrence

A	Almost certain	The event is expected to occur during the project.
B	Likely	The event will occur during the project.
C	Possible	The event will probably occur at some time during the project.
D	Unlikely	The event could occur at some time during the project.
E	Rare	The event may occur only in exceptional circumstances.

Table 1.3 Risk assessment matrix

Probability	Consequence				
	1	2	3	4	5
A	H	H	H	M	M
B	H	H	M	M	L
C	H	H	M	L	N
D	H	M	L	L	N
E	M	L	L	N	N

H = High, M = Medium, L = Low, N = Negligible.

Table 1.4 Preliminary risk assessment

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
1	Air Quality	Degradation of Air Quality from Stage 2 of MCP and cumulative impacts of Stage 2, Stage 1, Ulan Coal Mine and Wilpinjong Coal Mine.	B	3	M	MCM to engage Holmes Air Sciences to prepare an Air Quality Impact Assessment. Assessment to be undertaken in accordance with relevant guidelines and assessed against Stage 1 Approval criteria; Design mining operations with flexibility of mine scheduling between Stage 1 and Stage 2 to allow operational changes to improve air quality; and Non mine-owned land acquisitions to be undertaken as determined by modelling based on Stage 1 acquisition criteria.	Yes
2	Air Quality	Greenhouse gas emissions and associated impacts to climate change.	A	1	H	MCM to engage Holmes Air Sciences to prepare a quantitative assessment of potential scope 1, 2 and 3 greenhouse gas emissions of the project, along with qualitative assessment of potential impacts of these emissions on the environment. Assessment to be undertaken in accordance with relevant guidelines; and Design infrastructure and mining operations to minimise impacts with considered energy savings principles.	Yes
3	Air Quality	Impacts to human health.	B	3	M	MCM to engage Holmes Air Sciences to prepare a Health Risk Assessment to identify potential health impacts associated with the project.	No

Table 1.4 Preliminary risk assessment (cont'd)

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
4	Noise	Degradation of acoustical amenity on privately owned properties from Stage 2 of MCP and cumulative impacts of Stage 2, Stage 1, Ulan Coal Mine and Wilpinjong Coal Mine.	B	3	M	MCM to engage Spectrum Acoustics to prepare an acoustical impact assessment, which includes construction, operation, onsite and offsite road and rail impacts. Assessment to be undertaken in accordance with relevant guidelines and assessed against relevant criteria; Design infrastructure and mining operations to minimise noise impacts, and where necessary operations are designed to integrate with the adjoining MCP Stage 1 reducing project noise sources; and Non mine owned land acquisitions to be undertaken as determined by modelling based on Stage 1 acquisition criteria.	Yes
5	Rail Transport Noise	Increase in rail noise associated with change in product coal from 10Mtpa to 13 Mtpa.	C	4	L	MCM to engage Spectrum Acoustics to undertake Rail Transport Noise assessment to identify potentially impacted residences along railway line between Muswellbrook and Wallerawang near Lithgow.	Yes
6	Road Transport Noise	Exceedances of road traffic noise criteria due to increased traffic from Stage 2 of the MCP.	D	4	L	MCM to engage Spectrum Acoustics to undertake a Road Transport Noise assessment to identify potentially impacted residences.	Yes
7	Blasting and Vibration	Damage of nearby structures and Aboriginal archaeological sites and disturbance to residents in the MCP area and surrounds.	C	2	H	MCM to engage Spectrum Acoustics to prepare a blasting and vibration assessment. Assessment to be undertaken in accordance with relevant guidelines and assessed against relevant criteria.	Yes

Table 1.4 Preliminary risk assessment (cont'd)

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
8	Water Supply	Insufficient water supply for both Stages 1 and 2 of the MCP.	C	3	M	MCM to engage Worley Parsons and Aquaterra to prepare site water balance and water management strategy; and Design infrastructure and mining operations to minimise water demands.	Yes
9	Groundwater	Impacts on groundwater users, humans and the environment including baseflows and Ground water Dependant Ecosystems (GDEs).	A	1	H	MCM to engage Aquaterra to prepare a groundwater assessment and strategy that aims to minimise impacts to groundwaters, and assesses potential impacts against the relevant criteria.	Yes
10	Surface Water	Relocation of Murragamba and Eastern Creeks.	A	2	H	MCM to engage Worley Parsons to prepare relocation strategy and conceptual design; Develop a vision for stream relocation that provides for adequate objectives and targets to be set to measure the progress of the stream relocation and rehabilitation; and Design of a phased program of detailed designs for the staged relocation of Murragamba and Eastern Creeks to ensure that relocation planning improves with experience.	Yes
11	Surface Water	Degradation of water quality and quantity.	B	3	M	MCM to engage Worley Parsons to prepare surface water assessment and strategy that aims to minimise impacts to surface waters and assesses potential impacts against relevant criteria; and Design of mining operations that will allow surface water flows to be maintained where possible.	Yes
12	Surface Water	Flooding.	D	4	L	MCM to engage Worley Parsons to prepare flooding assessment.	No

Table 1.4 Preliminary risk assessment (cont'd)

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
13	Subsidence	Impacts to cliff lines, agricultural lands, geological formations, areas of public access, cultural sites, flora and fauna (key threatening process) groundwater, structures and surface infrastructure.	B	1	H	MCM to engage Mine Subsidence Engineering Consultants to prepare subsidence impact assessment; and Design of underground mining layouts, where possible to conserve or limit damage caused by subsidence to areas/items of environmental, European or Aboriginal Heritage significance.	Yes
14	Soils	Increased erosion of soils due to erodible soil types within the project area, vegetation stripping and stripping of soils within mining disturbance areas.	B	3	M	MCM engaged JAMMEL Environmental and Planning Services Pty Ltd to undertake soil surveys, land capability assessment and agricultural suitability assessments of EL 6288; and Erosion and sediment controls to be designed and implemented for all construction areas in accordance with the Landcom Soils and Construction Manual, 2004.	Yes
15	Geochemical	Salt and acid generation from coal and overburden, from open cut and underground mining degrading surface water quality.	B	3	M	MCM to engage Environmental Geochemistry International Pty Limited to prepare a geochemical assessment of overburden, coal and reject from underground and open cut areas.	No
16	Rehabilitation, Final Landform and Final Void Management	Ineffective rehabilitation of Open Cut following mining inconsistent with surrounding vegetation communities and landforms.	C	2	H	Design of final landform to be consistent with surrounding landforms and vegetation communities.	Yes
17	Rehabilitation, Final Landform and Final Void Management	Excessive final voids and/or ineffective utilisation of voids post mining.	D	2	M	Design of final landform to minimise final voids and develop strategy for the management of final voids.	Yes

Table 1.4 Preliminary risk assessment (cont'd)

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
18	Ecology	Loss of flora, fauna, and aquatic values including known and potential threatened species, endangered populations, endangered ecological communities, matters of national environmental significance, migratory species, relationships and connectivity to Munghorn Gap Nature Reserve and Goulburn River National Park.	A	2	H	MCM to engage Ecovision Consulting and Marine Pollution Research to undertake flora, fauna and aquatic assessment of the study area in accordance with the DECC guidelines; and Design mining operations and infrastructure to minimise impacts to flora, fauna and aquatic attributes in the MCP area.	Yes
19	Aquatic Ecology	Impact of mining and creek diversions on water quality and fish habitat and GDEs.	A	2	H	MCM to engage Marine Pollution Research to undertake flora, fauna and aquatic assessment of the study area in accordance with DECC guidelines; and Design mining operations and infrastructure to minimise impacts to water quality and fish habitats.	Yes
20	Aboriginal Heritage	Loss of aboriginal heritage from open cut and underground mining operations.	B	1	H	MCM to engage Archaeological Risk Assessment Services to prepare consultation and aboriginal heritage assessment of the study area in accordance with the DECC guidelines; and Design of infrastructure and mining operations to minimise impact.	Yes
21	European Heritage	Disturbance and impact to items of European heritage from underground operations.	C	2	H	MCM to engage Heritas to review existing heritage impact assessment and revise findings and recommendations for Stage 2.	Yes

Table 1.4 Preliminary risk assessment (cont'd)

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
22	Social and Economic	The loss of significant gain for local, regional, state and national economies, through royalties, taxes and employment, if the project was not approved.	A	2	H	MCM to engage Hunter Valley Research Foundation to prepare economic impact assessment.	Yes
23	Social and Economic	Reduction in property values.	C	3	M	Increased employment in a region generally results in greater demand for available residential properties, resulting in generally increased property values; Properties directly impacted by mining operations with exceedances of accepted criteria would be managed where feasible or purchased at pre-mining/market land values; The relatively transient nature of the mining means impacts to individual properties are temporary; and No further action required.	Yes
24	Traffic and Transport	Realignment of Ulan Wollar Road, Carrs Gap Road and Murragamba Road.	A	4	M	MCM to engage Sinclair Knight Merz Pty Limited to prepare a preliminary realignment design.	Yes
25	Traffic and Transport	Impact to traffic flow and safety, with regard to both rail and road.	C	2	H	MCM to engage Sinclair Knight Merz Pty Limited to prepare a traffic impact assessment, road safety audit, rail traffic impact assessment and rail level crossing assessment.	Yes
26	Preliminary Hazard Analysis	Public and mine personnel safety during the construction and operational phases of the project.	C	1	H	MCM to engage Sinclair Knight Merz Pty Limited to prepare a Preliminary Hazard Analysis for the project that assesses potential risks to mine personnel and public.	Yes

Table 1.4 Preliminary risk assessment (cont'd)

No.	Aspect	Issues	Risk			Proposed Action	Identified Key Issue in DGRs
			P[1]	C[2]	R[3]		
27	Visual	Disturbance of visual amenity for surrounding residents and road users.	A	3	H	MCM to engage O'Hanlon Design Pty Ltd to prepare a visual impact assessment; and Design infrastructure and mining operations to minimise impacts.	Yes
38	Cumulative Impacts	Increased impacts from MCP Stage 2 due to existing impacts from MCP Stage 1, Ulan Coal Mine and potential impacts from Wilpinjong Coal Mine.	A	2	H	Ensure assessments of surface waters, groundwater, flora and fauna, noise and air quality investigate impacts with respect to the existing and potential impacts from adjoining coal mines.	Yes

[1] P = Probability of Issue occurring – (A – Almost Certain to E – Rare).

[2] C = Consequence Severity Level – (1 – Most severe to 5 – least severe).

[3] R = Assigned Risk Level – (H = High, M =Medium, L = Low, N = Negligible).

1.12 Structure of the Environmental Assessment Report

This EA report describes Stage 2 and the modification of Stage 1, provides an assessment of potential impacts that are predicted to occur if the project is developed, and recommends measures to avoid, mitigate or manage those impacts.

The document has been prepared to address relevant issues and requirements raised by key stakeholders (government agencies, statutory authorities and the community) and as determined by MCM in its preliminary risk assessment. It concludes by presenting MCM's commitments to operate the project in an environmentally and socially acceptable manner, and a justification for developing the project.

The EA report is presented in six volumes. Volume 1 of the EA report is divided into an executive summary and eight separate sections, which provide detailed descriptions of the project; the process involved in obtaining approval; an overview of community consultation; identification and analysis of environmental and social impacts; and proposed management safeguards to either avoid, mitigate or manage the residual environmental and social impacts of the project. Volume 1 also contains a glossary of terms and list of references used within the EA report. **Table 1.5** provides a summary of each of the sections of Volume 1 of the EA report. **Table 1.6** lists the key issues that have been addressed as identified in the DGRs for Stage 2 and the modification of Stage 1, and where in Section 5 these have been addressed. These issues are listed in the table in the order they are presented in Section 5. This ordering is generally indicative of the importance of issues, with the more important issues addressed first.

Volume 2 contains plans (i.e., maps and diagrams) while Volumes 1, 3, 4, 5 and 6 contain detailed specialist studies. The specialist studies provide a detailed technical analysis of the key issues identified and associated with the project.

Table 1.5 Summary of Volume 1 of the Environmental Assessment Report

Section	Description
Executive Summary	Provides a detailed summary of Volume 1 of the EA report.
Abbreviations and Glossary	List of all abbreviations and defined terms used within Volume 1 of the EA report.
Section 1. Introduction	This section introduces the proponent, project location, background, approved Stage 1, proposed Stage 2 and modification of Stage 1, need for the project, environmental assessment requirements, preliminary risk assessment project objectives, Stage 2 and its interactions with the approved Stage 1, the need for the project, and the environmental assessment process and study team. In addition, this section explains to the reader how the report has been structured and how it should be read.
Section 2. Project Approval Framework	This section describes the project approval framework under Part 3A of the EP&A Act and the applicable environmental planning instruments, legislation, licences, approvals and permits that apply.

Table 1.5 Summary of Volume 1 of the Environmental Assessment Report (cont'd)

Section	Description
Section 3. Stakeholder and Community Consultation	This section describes the stakeholder and community consultation that has been undertaken in the lead up to, and throughout, the environmental assessment process for Stage 2 and the modification of Stage 1. Consultation includes community consultative committees, community information sessions, newsletters, 'one on one' discussions, website and telephone hotline, consultation with government authorities and public exhibition of the EA.
Section 4. Project Description	This section provides a detailed description of Stage 2 and the modification of Stage 1, and describes the interactions between the two stages, including infrastructure and facilities, roads and utilities, proposed equipment fleet, water management, waste management, work force and working hours. It also provides a brief description of the coal resource.
Section 5. Impact Assessment	This section provides a description of the existing environment and an assessment of the potential impacts of Stage 2 and the modification of Stage 1 on the environment, and poses safeguards and management measures to avoid or minimise these impacts. This section draws on the detailed assessment of key issues provided in the specialist reports contained in Volumes 3, 4, 5 and 6.
Section 6. Statement of Commitments	This section contains commitments that MCM will implement. These commitments are consistent with the commitments made for Stage 1 and include integrating environmental management of Stage 2 into the environmental management strategy for Stage 1.
Section 7. Project Justifications	This section contains a justification for the project against economic, social and environmental objectives, including consideration of the need for the project, alternatives considered and whether it is consistent with the objects of the EP&A Act, including the principles of ecologically sustainable development.
Section 8. References	List of references of all material used in the preparation of Volume 1 of the EA report.

Table 1.6 Summary of Director General's Requirements (Stage 2 and the modification of Stage 1)

Key Issues to be Addressed	Reference in EA Report
Air Quality	Volume 1, Section 5.1 and Volume 1, Appendix 3A.
Greenhouse Gas, including: • A quantitative assessment of the potential scope 1, 2 and 3 greenhouse gas emissions of the project, and qualitative assessment of the potential impacts of these emissions on the environment. • A detailed description of the measures that would be implemented on site. • Measures to minimise the greenhouse gas emissions of the project.	Volume 1, Section 5.2 and Volume 1, Appendix 3B.
Noise and Blasting, including the potential construction, operational and off-site road and rail noise impacts.	Volume 1, Section 5.3 and Volume 1, Appendix 4.

Table 1.6 Summary of Director General's Requirements (Stage 2 and the modification of Stage 1) (cont'd)

Key Issues to be Addressed	Reference in EA Report
Soil and Water, including: • Site water balance, which includes a detailed description of the measures that would be implemented to minimise water use on-site and ensure that there is a secure water supply for both Stage 1 and Stage 2. • Detailed assessment of the potential impacts of the project on the quantity, quality and long term integrity of the surface water and ground water resources in the project area, paying particular attention to all significant watercourses and their associated tributaries. • Detailed conceptual plans for the proposed relocation of Murragamba and Eastern Creeks, which clearly articulate the vision statement, design criteria and completion criteria for the proposed creek relocations, and include sufficient evidence to demonstrate that the proposed creek relocations are both reasonable and feasible.	Water: Volume 1, Section 5.4 (groundwater), and Volume 3, Appendix 5; Volume 1 Section 5.5 (surface water) and Volume 4, Appendix 6; Volume 1 Section 5.6 (site water balance) and Volume 4, Appendix 6A and 6B. Soils: Volume 1 Section 5.11 and Volume 6, Appendix 11.
Biodiversity, including: • Accurate estimates of any vegetation clearing associated with the project. • A detailed assessment of the potential impacts of the project on any terrestrial and aquatic threatened species, populations, ecological communities or their habitats. • A detailed description of the measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long term.	Volume 1, Section 5.7 and Volume 4, Appendix 7.
Subsidence, including: • Accurate predictions of the potential subsidence effects of the proposed mine plan, and detailed sensitivity analysis of these predictions. • A detailed assessment of the potential impacts of these subsidence effects on both the natural and built environment.	Volume 1, Section 5.8 and Volume 5, Appendix 8.
Heritage, both Aboriginal and non-Aboriginal.	Volume 1, Sections 5.9 and 5.10 and Volume 5, Appendices 9 and 10.
Transport, including: • A detailed assessment of the potential impacts of the project on the safety and performance of both the road and rail network, and any associated railway crossings.	Volume 1, Section 5.12 and Volume 6, Appendices 12 and 13.
Visual	Volume 1, Section 5.13 and Volume 6, Appendix 14.
Social and Economic.	Volume 1, Section 5.14 and Volume 6, Appendix 15.
Hazards, paying particular attention to public safety.	Volume 1, Section 4, Section 5.15 and Volume 6, Appendix 16.

Table 1.6 Summary of Director General's Requirements (Stage 2 and the modification of Stage 1) (cont'd)

Key Issues to be Addressed	Reference in EA Report
Waste, including: • Accurate estimates of the quantity and nature of the potential waste streams. • A detailed description of the measures that would be implemented to minimise, reuse, recycle and dispose of any waste produced on site. • A coal reject and tailings disposal strategy.	Volume 1, Sections 4, 5.15 and 5.16 (geochemical) and Volume 6, Appendix 17.
Rehabilitation, including: • A detailed description of the proposed rehabilitation strategy for the project, taking into consideration any relevant strategic land use planning or resource management plans or policies. • The scope for integrating this strategy with the rehabilitation and offset strategies of the MCP and the adjoining mines.	Volume 1, Sections 4 and (predominantly) Section 5.18 and Volume 4, Appendix 7; and Volume 6, Appendix 11.

1.13 How to Read the Environmental Assessment Report

Anyone seeking to obtain information about Stage 2 and the modification of Stage 1 and potential impacts on the environment can do so at two levels.

Firstly, for those who want a general understanding of the project and its impacts, reading Volume 1 should be sufficient. While a small number of figures (i.e., maps and diagrams) are included in this volume, the majority of figures are included as plans in Volume 2. These have been drafted at A3 size. Volume 1 should be read with reference to these plans.

Secondly, those seeking an in-depth understanding of Stage 2 and the modification of Stage 1 should read Volume 1 together with the plans in Volume 2 and refer to the specialist reports contained in Volumes 3, 4, 5 and 6.

Numerous abbreviations and terms are used throughout Volume 1. Abbreviations and defined terms are contained in Volume 1 and precede the introduction (Section 1).

1.14 Study Team

This EA report was prepared by Wells Environmental Services Pty Limited and Coffey Natural Systems Pty Ltd with the management and assistance of MCM and specialist consultants shown in **Table 1.7**.

MCM personnel include:

- Ian Callow – Project Manager.
- Mike Johnstone – General Manager, Exploration.
- Malcolm Burling – Engineering Manager.

Table 1.7 Specialist consultants involved in the preparation of the Environmental Assessment Report for Stage 2 and the modification of Stage 1

Project Role	Consultant
Project management, and environmental assessment report writing, and assessment of impacts and safeguards.	Wells Environmental Services Pty Ltd. Coffey Natural Systems Pty Ltd.
Acid rock drainage assessment.	Environmental Geochemistry International Pty Ltd.
Acoustical and vibration impact assessments.	Spectrum Acoustics Pty Ltd.
Air quality, greenhouse gas and health risk assessments.	Holmes Air Sciences Pty Ltd.
Drafting and graphics.	Pegasus Technical.
Economic assessment and social profiles.	Hunter Valley Research Foundation.
Flora, fauna and aquatic ecology impact assessments.	Ecovision Consulting in conjunction with Marine Pollution Research Pty Ltd.
Groundwater assessment.	Aquaterra Pty Ltd.
Indigenous and non-indigenous heritage assessments.	Archaeological Risk Assessment Services Pty Ltd and Heritas Architecture.
Project geology.	Minerva Geological Services Pty Ltd.
Soils, agricultural suitability and land capability assessment.	JAMMEL Environmental Planning Services Pty Ltd and Wells Environmental Services Pty Ltd.
Subsidence impact assessment.	Mine Subsidence Engineering Consultants Pty Ltd.
Surface water and flooding assessments.	Worley Parsons Pty Ltd.
Transport and preliminary hazard assessments.	Sinclair Knight Merz Pty Ltd.
Visual impact assessment.	O'Hanlon Design Pty Ltd.

1.15 Acknowledgements

The assistance and co-operation of local residents of the Ulan district; aboriginal community groups comprising the Mudgee Local Aboriginal Land Council, Murong Gialinga Aboriginal and Torres Strait Islander Corporation, Warrabinga Native Title Claimants Aboriginal Corporation, and North East Wiradjuri Co. Ltd; Ulan Progress Association; staff of Wilpinjong coal mine; New South Wales DoP; government authorities and Mid-Western Regional Council (MWRC) is gratefully acknowledged in the preparation and production of the Environmental Assessment report.

A special thank you is extended to the local land owners, many of whom operate farming enterprises, for permitting access to your land. The assistance, patience and advice given by yourselves and your families is gratefully acknowledged. The MCP project team appreciate your assistance in obtaining geological, environmental and heritage information for the project.