



MOOLARBEN COAL PROJECT

Stage 2

*Executive
Summary*

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Stage 2

Environmental Assessment Report

Executive Summary

ES 1.1 Introduction

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, supporting infrastructure and facilities. These will be developed adjacent to the Stage 1 project, 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.

This Environmental Assessment (EA) report has been prepared to address the Director-General (DG) of Planning's Environmental Assessment 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 on behalf of MCM and with input from a team of specialist consultants.

Moolarben Coal Mines is a wholly owned subsidiary of Felix Resources Limited (Felix) a publicly listed company on the Australian Stock Exchange. Felix is an Australian resources company developing, operating and investing in resource-related projects with a primary focus on coal.

ES 1.1.1 Project Background

The mining of coal commenced in the 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 (Mineral Resources) granted EL 6288 to MCM, awarding it the right to explore for coal in an area of approximately 110 square km 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 Plans 1 and 2 in Volume 2).

The exploration area contains coal measures of mid to late Permian age, known as the Illawarra Coal Measures, which contain a number of economically viable coal seams. The major economically viable coal seams are the Ulan and Moolarben Seams. The Ulan Seam ranges in thickness from approximately 6 to 13 m and is amenable to extraction using both open cut and underground mining techniques. The Moolarben Seam is less ubiquitous than the Ulan Seam. Where it is encountered the Moolarben Seam generally occurs about 40 m above the Ulan Seam and is only economically viable when mined by open cut methods with the Ulan Seam. These seams yield low to moderately high ash, medium to high bituminous coals suitable for thermal power generation after processing. The Stage 2 Project Area contains an estimated 294 Mt coal resource and a ROM coal reserve of approximately 252 Mt.

With the grant of EL 6288, MCM initiated a program of coal exploration drilling and established a base line 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. Subsequent mine development planning has been divided into several stages to facilitate the orderly, economic and progressive extraction of the valuable coal resources and includes:

- Stage 1:
 - Three open cut mines – Open Cuts 1, 2 and 3 (OC1, OC2 and OC3).
 - One underground mine – Underground 4 (UG4).
 - Associated infrastructure.
- Stage 2:
 - One open cut mine – Open Cut 4 (OC4).
 - Two underground mines – Undergrounds 1 and 2 (UG1 and UG2).
 - Associated infrastructure.
- Future stages:
 - Incorporating remaining coal resources, which will require future applications.

A Major Project Application for Stage 1 was lodged with the Department of Planning (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 the 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 the project on 6 September 2007. The Stage 1 Project Approval has since been modified to make administrative changes, to rearrange specific items of approved infrastructure, to allow minor construction activities to commence and to provide improved conservation outcomes for the project. Construction of Stage 1 has now commenced.

The main components of the approved Stage 1 project are summarised in **Table ES.1** and the general layout of Stage 1 is shown in Plan 3 in Volume 2.

Table ES.1 Approved 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.
	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 Main Infrastructure Area.
Coal handling, preparation, and processing		Coal from open cut and underground mines will be transferred to the CHPP ROM stockpile by conveyors. Coal from OC2 and OC3 will be transferred by truck to the OC1 ROM coal facility, prior to transfer to the CHPP ROM stockpile. Crushing and sizing facilities will be included at both the OC1 ROM coal facility and CHPP. Up to 12 Mtpa of ROM coal will be processed.
Coal production, loading and rail transport		Product coal will be produced at up to 10 Mtpa. Product coal will be loaded onto trains on a dedicated 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).
Water demand and supply		Water demand at peak production will be about 6.9 ML/day (2,500 ML/year). Water will be supplied from bores and surface water storages from across the site, and where possible, through sharing arrangements with adjoining mines.
Waste rock, coarse rejects and tailings management		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 haulage road between OC3 and the OC1 ROM coal facility. Remaining overburden will be placed within open cut mine voids. Coarse rejects and tailings will be emplaced with overburden in open cut mine voids. An emergency tailings dam will be established adjacent to the CHPP.
Mine access		Access to the open cut mines OC1, OC2 and OC3, will be from Ulan-Wollar Road. Access to UG4 and the CHPP will be from Ulan-Cassilis Road, north of Ulan-Wollar Road junction.
Support facilities and utilities		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. Power will be supplied from the 66-kV Ulan to Wilpinjong transmission line, via a 66/11-kV substation constructed on-site.
Hours of operation		Construction will occur during daylight hours with limited night-time activities. Some noisy activities will be conducted outside of school hours to minimise noise impacts on Ulan Public School. Mining operations to occur 24 hours a day, 7 days a week.
Employment		220 construction and 317 full time positions.
Rehabilitation		All disturbed areas will be progressively rehabilitated.

In July 2008, MCM lodged a Major Projects Application and Preliminary Environmental Assessment with the DoP for Stage 2 of the MCP. The DoP issued Project Application No. 08_0135 in respect of this application. Following lodgement of the Major Project Application, MCM notified the public of its intentions to develop Stage 2 by the placement of notices in *The Australian* and the *Mudgee Guardian* newspapers 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 Major Project Application for Stage 2 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 DGRs for the environmental assessment for Stage 2 were prepared on this basis. However, 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 Projects Application was seeking to modify. This separate application (Application No. 05_0117 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 (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. On 18 February 2009 the DG of the DoP issued DGRs for the environmental assessment for the modification of Stage 1.

Jointly these two sets of DGRs identify the requirements that must be addressed in the environmental assessment for the project and in the EA report.

ES 1.1.2 Need for Stage 2 and the Modification of the Stage 1 Project Approval

Stage 2 is being developed to provide coal to the domestic and international coal markets. The project will deliver economic benefits at regional, state and federal levels as well as to other stakeholders. 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. The project will also bring economic benefits to Felix and its Joint Venture equity partners. This will be achieved by:

- Increasing the total annual coal output of Felix Resources.
- Optimising the value of the coal resources at the MCP by allowing more coal to be handled and processed by Stage 1 infrastructure and transport facilities.
- Increasing flexibility in delivery of different product coals (i.e., varying ash contents) allowing production rates to be matched to the price and demand for various grades.
- Meeting contractual obligations as part of the Newcastle Coal Infrastructure Group.

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 proposed modification of Stage 1.

ES 1.1.3 Stakeholder and Community Consultation

Community and stakeholder consultation for the MCP has been ongoing since the grant of EL 6288. This has included the establishment and implementation of:

- Land access protocols for exploration drilling and environmental studies.
- Community information sessions.
- Newspaper notices.
- Newsletters.
- 'One-on-one' discussions.
- The Moolarben Coal Exploration Community Consultative Committee.
- The Moolarben Coal Mine Community Consultative Committee (as required by the Stage 1 Project Approval).

Issues of concern raised during community consultation include the increased impacts associated with developing Stage 2 and the cumulative impacts of the MCP. In particular the issues of noise; air quality; dust; groundwater; creeks and river systems; traffic and road quality; visuals and lighting; vibration; Aboriginal and non-Aboriginal heritage; clearing of native vegetation; rehabilitation; proximity to residences; land acquisition; property values; rail movements; global warming; general quality of life; and cumulative impacts have been raised.

Issues in support of Stage 2, and the MCP more generally, have also been raised including opportunities for direct and indirect employment; cultural and recreational improvements to the district; investment in the local area and in Mudgee; property acquisitions; and road improvements.

Community consultation activities have been implemented through the exploration stage and environmental assessment activities for Stages 1 and 2. These activities will also continue to be undertaken throughout the construction and operation phases, as appropriate. In addition, a dedicated website (www.moolarben.coal.com.au) and 1800 telephone line (1800 556 484) has been established to enable residents of the district, interested persons and key community groups to remain informed of the MCP and contact representatives of MCM.

Representatives of MCM have also been communicating and liaising with government authorities throughout the planning and environmental assessment of Stage 2 and the modification of Stage 1.

ES 2.1 Project Description

Stage 2 will integrate with the approved Stage 1 project via the modification of Stage 1 to form an integrated mining complex, the MCP. At full production, the MCP will produce approximately 17 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal.

The main components of Stage 2 are summarised in **Table ES.2**, the modification of Stage 1 is summarised in **Table ES.3**, and a summary of the integrated mining complex is provided in **Table ES.4**. The general layout for Stage 2 is shown in Plan 4 in Volume 2.

Table ES.2 Stage 2 project summary

Aspect		Description
Project life		24 years (to 31 December 2033).
Mining operations	Open cut	<p>Maximum pit depth of 90 m with approximately 1,270 ha of surface disturbance over the life of the pit.</p> <p>Overburden will be blasted where necessary and be removed using excavator and truck operations.</p> <p>Coal will be blasted and recovered using excavator and truck operations.</p> <p>Up to 12 Mtpa ROM will be mined from OC4.</p>
	Underground	<p>Two underground mines (UG1 and UG2) will be mined at a combined rate of up to 4 Mtpa ROM coal.</p> <p>Coal will be recovered using longwall mining and transferred to the surface by conveyor.</p> <p>UG1 and UG2 mine highwall entries will be in the eastern highwall of OC1.</p>
Coal handling, preparation, and processing		<p>Coal from OC4 will be transferred by haul truck to the Stage 2 ROM coal facility.</p> <p>Coal from UG1 and UG2 will be transferred by conveyor to the OC1 ROM coal facility.</p> <p>Crushing and sizing facilities will be included at the Stage 2 ROM coal facility.</p> <p>Coal will be transferred from these ROM facilities to the CHPP.</p>
Water demand and supply		<p>Water demand at peak production will be about 5.1 ML/day (1,862 ML/year). This does not include water for washing Stage 2 coal.</p> <p>Water will be supplied from mine inflows, surface water capture, recycled process water, groundwater bore field, and where possible through sharing arrangements with adjoining mines.</p>
Waste rock, coarse rejects and tailings management		<p>Initial out-of-pit overburden emplacement until sufficient void space is available to safely backfill the pit.</p> <p>Coarse rejects and tailings will be emplaced with overburden in the open cut void.</p>
Mine access		Open cut and underground mine access from Ulan-Wollar Road.
Support facilities and utilities		<p>Support facilities, including offices, bathhouses, workshops and fuel storages (where required), will be established at the main Stage 2 ROM coal facility and at UG1 entry. Temporary facilities will be established in advance of mining at OC4.</p> <p>A network of internal roads to enable coal haulage and access around the site.</p> <p>Power will be supplied from the Stage 1 66/11-kV substation.</p>
Hours of operation		<p>Construction during daylight hours 7 days a week, with some 24 hour construction activities.</p> <p>Mining operations to occur 24 hours a day, 7 days a week.</p>
Employment		122 additional full time positions.
Rehabilitation		All disturbed areas will be progressively rehabilitated.

STAGE 2

Table ES.3 Modification of Stage 1 summary

Aspect	Description
Mining operations	The UG4 drift entries will be relocated to the northern highwall of OC1.
Coal handling infrastructure	<p>ROM coal from UG4 will be transferred by conveyor to the Stage 2 ROM coal facility. OC1 ROM coal facility will receive ROM coal from UG1 and UG2.</p> <p>The CHPP will receive ROM coal from Stage 2 (and from any other future ROM facility developed in the mining complex).</p> <p>The throughput of the CHPP will increase from 12 Mtpa to 17 Mtpa.</p> <p>The maximum output of the CHPP will increase from 10 Mtpa to 13 Mtpa of product coal.</p> <p>Product coal will be transported using up to 5 trains a day (4 during the day and 1 at night).</p>
Waste	Coarse rejects and tailings will be delivered to the OC4 ROM facility (for back hauling and emplacement in OC4).
Infrastructure and support facilities	Relocation of associated UG4 pit top facilities to the northern part of OC1.
Project life	The project life will need to be modified to allow the CHPP to accept ROM coal from Stage 2 for the life of the Stage 2 project, i.e., until 31 December 2033.

Table ES.4 Summary of the proposed integrated mining complex

Aspect	Description
Mining operations	<p>Open cut</p> <p>Four open cut mines (OC1, OC2, OC3 and OC4) will be mined at a combined rate of up to 13 Mtpa.</p> <p>Up to 8 Mtpa ROM coal will be mined from OC1, OC2 and OC3 combined.</p> <p>Up to 12 Mtpa ROM coal will be mined from OC4.</p> <p>Overburden will be blasted where necessary and be removed using excavator and truck operations.</p> <p>Coal will be blasted and recovered using excavator and truck operations.</p> <p>Underground</p> <p>Three underground mines (UG1, UG2 and UG4) will be mined at a combined rate of up to 4 Mtpa ROM coal.</p> <p>Coal will be recovered using longwall mining and transferred to surface by conveyors.</p> <p>Highwall entries for UG1 and UG4 mines will be constructed in the OC1 highwalls and UG2 will be accessed from UG1.</p>
Coal handling, preparation, and processing	<p>Coal from open cut and underground mines will be transferred to the CHPP by internal haul roads or conveyors.</p> <p>Crushing and sizing facilities will be included at the OC1 ROM coal facility, Stage 2 ROM coal facility and CHPP.</p> <p>Up to 17 Mtpa ROM coal will be processed.</p>
Coal production, loading and rail transport	<p>Up to 13 Mtpa product coals will be produced.</p> <p>Product coals will be loaded onto trains using a dedicated rail loop and rail load out facility, and transported to market on the Gulgong-Sandy Hollow rail line, using up to 5 trains a day.</p>

Table ES.4 Summary of the proposed integrated mining complex (cont'd)

Aspect	Description
Water demand and supply	Water demand at peak production will be about 7.3 ML/day (about 2,668 ML/year). Water will be supplied from mine inflows, site surface water capturing, and groundwater bores, and where possible through sharing arrangements with adjoining mines.
Waste rock, coarse rejects and tailings management	Excavated overburden from OC1, OC2 and OC3 will be used initially to form environmental bunds through out-of-pit emplacement on the western side of OC1 and OC2, around the OC3 facilities and along the haulage road between OC3 and the OC1 ROM coal facility. Excavated overburden from OC4 will be initially emplaced in two out-of-pit emplacements in the southern and south western areas of the Murragamba Creek valley. Remaining overburden will be placed in open cut mine voids. Coarse rejects and tailings will be placed with overburden in open cut mine voids. An emergency tailings dam will be established adjacent to the CHPP.
Mine access	Access to OC1, OC2, OC3, UG1, UG2 and UG4 from the same access point off Ulan-Wollar Road. Access to OC4 and the Stage 2 ROM coal facility and Stage 2 office and workshop facility from a second access point off Ulan-Wollar Road. Access to the CHPP from Ulan-Cassilis Road, north of the Ulan-Wollar Road junction.
Support facilities and utilities	Support facilities, including offices, bathhouses, workshops and fuel storages will be established at the Stage 2 ROM coal facility, CHPP, OC1, OC3, UG1 and OC4, where required. Power will be supplied from the 66-kV Ulan to Wilpinjong transmission line, via a 66/11-kV substation constructed on site.
Hours of operation	Stage 1 construction during daylight hours with limited night-time activities to minimise noise impacts on Ulan Public School. Stage 2 construction during daylight hours with some 24 hour construction. Mining operations to occur 24 hours a day, 7 days a week.
Employment	220 construction and 439 full time positions.
Rehabilitation	All disturbed areas will be progressively rehabilitated.

ES 2.1.2 Work Force and Working Hours

The Stage 1 construction workforce will be used to construct Stage 2. Construction of Stage 2 will generally occur Monday to Sunday, 7.00 a.m. to 6.00 p.m., with 24 hour construction as required.

At peak operating capacity Stage 2 will potentially employ 122 workers. This will be in addition to the 317 operational staff expected to be employed for Stage 1. The MCP will operate 7 days a week, 24 hours per day with varying shift times for the open cut, underground and coal preparation plant. Shift change over times will be outside school bus hours and will be coordinated with Ulan and Wilpinjong mine shift change over times, where possible, to reduce the potential for cumulative traffic impacts.

ES 2.1.3 Project Alternatives

Moolarben Coal Mines evaluated a number of alternatives to the design of Stage 2, including mine layout and design, mining methods, extraction rates, infrastructure and facilities development, as

well as the no development option. The proposed mine layout and design comprises the best economic, operational, community and safety outcomes with the least potential to cause environmental impacts.

ES 3.1 Environmental Assessment

An extensive environmental monitoring network was established for Stage 1 and includes monitoring of meteorological conditions, air quality, noise, surface water and groundwater. Key issues identified through stakeholder consultation, a preliminary risk assessment and in the DGRs for Stage 2 and the modification of Stage 1 were used to focus detailed investigations undertaken by specialist consultants. The potential impacts of Stage 2 and its integration with Stage 1 (through the modification of Stage 1) on the existing environment are summarised below. This includes consideration of cumulative impacts with other mines, where applicable.

ES 3.1.1 Air Quality

Air quality modelling using standard dust control measures used at other NSW coal mines indicated that the contribution of dust from combined Stage 2 and Stage 1 operations would cause short term dust impacts at numerous privately-owned residences to the west and southwest of the MCP area under worst case conditions. Following this prediction MCM has committed to use increased dust controls across the MCP. In particular, MCM has committed to using chemical dust suppressants on trafficked areas. Use of chemical dust suppressants is widely known across the mining industry but has seen little uptake at other NSW coal mines.

Revised air quality modelling accounting for implementation of increased dust control measures indicates that the introduction of Stage 2 to the MCP will not cause additional impacts to that predicted in Stage 1. Moolarben Coal Mines has further committed to operate Stage 2 within the Stage 1 Project Approval limits for air quality and will implement a real-time dust monitoring and management program to ensure it meets this commitment.

ES 3.1.2 Greenhouse Gases

Stage 2 will give rise to greenhouse gas emissions including carbon dioxide, nitrous oxide and methane. The (Commonwealth) Department of Climate Change defines three scopes of emissions for greenhouse gases. Scope 1 emissions are those that will be generated directly by the mining operation, such as emissions resulting from diesel fuel combustion and fugitive gases liberated from the coal during mining. Scope 2 emissions are indirect emissions that are derived from the production of electricity purchased and consumed on site, such as electricity used in the mining and processing of coal. Scope 3 emissions are all other indirect emissions from sources that are not owned or controlled by MCM. These include emissions from the combustion of diesel fuel used in the rail transportation of coal to market, and also the burning of coal by coal customers.

Accounting for Scope 1, 2 and 3 sources, the average annual greenhouse gas emissions for the MCP are estimated to be 29.585 Mtpa of carbon dioxide equivalent. If only Scopes 1 and 2 are considered then the average annual greenhouse gas emissions for the MCP are estimated to be 0.262 Mtpa of carbon dioxide equivalent. Scope 3 emissions (assuming all coal is exported) from the project would not be included in the NSW or Australian greenhouse gas emissions inventories as these emissions would be accounted for in the inventory for the country in which the end user is located. Hence when compared to Australia's annual greenhouse gas emissions of 559 Mtpa (2006 estimate), the contribution of 0.262 Mtpa for Scope 1 and Scope 2 emissions from the MCP

will cause a potential increase in the national average emissions of less than 0.05%. This equates to about 0.16% of NSW's annual greenhouse gas emissions.

ES 3.1.3 Noise and Blasting

Acoustic modelling of Stage 2 and Stage 1 cumulative noise emissions under worst case meteorological conditions (an inversion or northeast winds) indicates that, at some time during operations, four privately-owned residences will experience minor to moderate (up to 3 dB) exceedences of the Stage 1 Project Approval night-time noise assessment criteria. This is in addition to the noise impacts predicted in Stage 1. However, there will be no impact on the Ulan Public School, no impact on sleep disturbance at any privately-owned home and no cumulative impacts due to noise from the MCP, Ulan and Wilpinjong mines. Further, construction of Stage 2 will not contribute additional noise or affect any additional receivers to that predicted for Stage 1 construction.

A comprehensive noise monitoring program will be implemented for the MCP addressing noise from both Stage 1 and Stage 2. Real-time monitoring will be used at selected residences to enable proactive management of noise emissions from the MCP. Attended noise monitoring will be undertaken to assess compliance with impact assessment criteria at those residences predicted to experience noise levels at or above the impact assessment criteria.

There will be no adverse road traffic noise impact generated by the additional traffic associated with Stage 2. However, the predicted traffic noise from other sources, combined with MCP traffic may exceed the 55 dB(A) night-time assessment criteria for residences within 30 m of Ulan-Cassilis and Cope roads.

The rail traffic noise assessment predicts likely exceedance of night-time rail noise criteria at residences within 60 m of the train line. However, management and control of offsite rail noise is the responsibility of the rail network operator and not MCM.

Stage 2 is separated by more than 2 km from privately-owned residences and blasting required for Stage 2 will not impact on any privately-owned residence above the relevant blasting criteria. Blast monitoring will be implemented when blasting is within 500 m of Transgrid's 330-kV transmission lines, Ulan-Wollar Road, Gulgong-Sandy Hollow rail line and an Aboriginal rock art site above UG2. Maximum instantaneous charge values of blasts will be calculated and managed to ensure no adverse impacts to infrastructure and the rock art site.

ES 3.1.4 Groundwater

A monitoring network of over 100 bores has been established to monitor baseline groundwater conditions across the MCP area. Six main aquifer units have been defined and comprise a surficial alluvium, colluvium and weathered basement rock water table aquifer system and a series of five underlying hard rock aquifers, including Triassic age sandstone aquifers and Permian age coal seam aquifers.

Groundwater flows in the surficial water table aquifer system generally follows the local surface topography, and is not hydrologically connected to the deeper coal seam aquifers. In the Stage 2 Project Area the surficial aquifers do not sustain baseflow to the local creek system. The groundwater flow direction in the deeper aquifers is generally toward the northeast.

Groundwater quality varies across the Stage 2 Project area, and MCP more generally, with higher salinity concentrations encountered in the surficial water table aquifer system and the Permian age coal measure aquifers, including the Ulan Seam. The quality of groundwater inflows into the Stage 2 mine voids (UG1, UG2, and OC4) is expected to be poor.

Numerical groundwater modelling has indicated that the development of Stage 2, and the MCP more generally, will impact on groundwater levels in the Permian age coal measures, including the Ulan Seam. Groundwater drawdown in excess of 5 m in the Ulan Seam as a result of dewatering at the MCP is predicted to extend to about 18 km from the MCP mine area. Drawdown in the overlying Permian age aquifers is predicted to extend up to 16 km from the MCP mine area. Only minor drawdown is predicted in the overlying Triassic age aquifers in proximity to the MCP mining areas (less than 5 m in the lower Triassic age aquifer and less than 1 m in the upper Triassic age aquifer). Drawdowns are predicted to be localised and of limited magnitude in the surficial water table aquifer system, although drawdown of up to 10 m is predicted in the palaeochannel aquifer within the Bora Creek valley between UG1 and UG4. The development of Stage 2 is not predicted to impact on groundwater levels and availability within alluvial aquifers associated with the Goulburn River.

In the event that groundwater level reductions exceed predicted drawdowns by 20% or more at pertinent monitoring locations, MCM will either reduce pumping rates from a particular pumping bore or bores; cease pumping from a particular pumping bore or bores; continue with pumping and dewatering with closer monitoring, or modify the mining plan, if appropriate. In the event that Stage 2, or the MCP more generally, adversely affects an existing groundwater supply then MCM will provide a replacement supply of at least equal volume and quality.

ES 3.1.5 Surface Water

Stage 2 is located within the upper Goulburn River catchment, predominantly within the subcatchments of the Murragamba and Eastern Creek valleys. Murragamba and Eastern creeks are tributaries of Wilpinjong Creek. A small section of Stage 2 is located within the Bora Creek subcatchment, which flows into the Goulburn River. The Murragamba and Eastern Creek valleys are characterised by steep sided and mostly heavily forested slopes and ridgelines with extensive areas of out-cropping sandstone. The valleys transition quickly from steep slopes to flat open and mostly cleared valley floors and floodplains.

Surface water runoff from areas to be mined or disturbed as part of Stage 2 could potentially contain sediments, soluble salts and hydrocarbons (i.e., fuels, oils and grease). These contaminants have the potential to drain into the local waterways during the construction and operations phases of the project. These potential impacts will be mitigated by the implementation of a water management strategy, which will include design of suitable erosion and sediment control measures.

The water management strategy will be based on the objectives of separating clean and dirty water. Clean water runoff from areas upstream from mining areas will be segregated from runoff on disturbed areas. Clean water will be diverted around the mining and disturbed areas to maintain environmental flows to Murragamba, Eastern and Wilpinjong creeks.

Surface runoff from disturbed areas, pit inflows and recycled water will be dealt with separately and retained for on-site use. This will require drainage works, sedimentation ponds and water

storages to be developed in and around the open cut mine and across the mine infrastructure area.

Mining of the Stage 2 open cut (OC4) will require the realignment of sections of Murragamba and Eastern Creeks to facilitate the extraction of the coal resource beneath these creeks. The reconstructed creeks will lessen the grade of the existing creeks, increase the number of meanders and will comprise numerous pool and riffle structures. Once rehabilitated, the realigned creeks will provide ecologically diverse aquatic and riparian habitat that will improve water quality and provide a valuable landscape feature.

ES 3.1.6 Water Demand and Supply

A water balance for Stage 2 and the MCP, more generally, has been calculated based on the estimated water demand for the mine. Approximately 157 ML of water per million tonnes of ROM coal will be required. This is a revised water demand estimate to that used in the water balance calculations for Stage 1 and assumes that Stage 2 underground coal will not be washed, there will be recovery and recycling of water from tailings and rejects, and that chemical dust suppressants will be used on trafficked areas. The revised water demand estimate equates to a maximum water demand at peak production for Stage 2 of about 1,862 ML/annum and for the MCP of about 2,668 ML/annum. The water balance model shows that under average rainfall conditions Stage 2, in isolation from Stage 1, will experience a water deficit in Year 10, but the MCP will have adequate supply of water for the duration of the project. Under worst case low rainfall conditions Stage 2, in isolation from Stage 1, will experience a water deficit in Years 9 to 13 and the MCP in Years 8 to 12. Depending on the modelled rainfall scenario, the volume of this deficit for Stage 2 ranges from 9 to 200 ML and for the MCP from 49 to 216 ML, in individual years.

Water for operations purposes will be first sourced from all groundwater mine inflows, runoff from disturbed mine areas and the recycling of water from the CHPP and tailings. Make-up water will then be sourced from the borefield (this was assessed as part of Stage 1) and from surplus water generated by the nearby Ulan or Wilpinjong coal mines through a water sharing arrangement. The sharing of water from either the Ulan or Wilpinjong mines will have the added benefit of reducing the requirement to extract groundwater from the borefield. Supplementary make-up water will also be available from the Splitters Hollow Dam on the Red Hills property in the northern part of the Stage 2 Project Area, although this will require the existing dam licence to be amended.

In the unlikely event that insufficient water is available from any of the above sources, mining operations will be adjusted to meet the available water supplies. This will be achieved either by reducing the rate of coal beneficiation or adjusting the mine schedule.

A water balance for environmental flow water for Murragamba and Eastern Creeks has been modelled separately. The source and supply of clean water for environmental flows will be from catchment areas upstream from the proposed mining areas. The water balance modelling indicates there will be between 500 and 4,300 ML/year of clean water available and that this is more than enough to maintain environmental flows in Murragamba and Eastern Creeks for the duration of Stage 2.

The impact of the post-mining landscape on environmental flows to Wilpinjong Creek down stream of its confluence with Murragamba and Eastern Creeks has also been modelled. It is predicted that surface water runoff from Murragamba Creek and Eastern Creek catchments will reduce by up to 7% compared with pre-mining levels. However, environmental flows are expected to increase once

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backfilled rehabilitated areas consolidate and the post-mining landscape reaches a stable hydrologic condition.

Water surpluses are predicted for the final years of the project when water demands are reduced following the completion of open cut mining and maximum inflows into UG4. At this stage there will be the need to discharge the surplus water off-site. However, no off-site discharges will occur unless the quality of the water to be discharged meets the criteria specified in the environmental protection licence for the MCP.

ES 3.1.7 Ecology

The total potential Stage 2 disturbance area is 2,474 ha, comprising open cut and underground infrastructure areas, out-of-pit waste rock emplacements, and mine areas. Of this, approximately 1,756 ha is currently intact native vegetation and the remainder comprises other land cover classifications, such as cleared agricultural and existing infrastructure areas.

The establishment and operation of OC4, and infrastructure and facilities for Stage 2 (ROM coal facility and office and workshop facility) will directly result in the clearing of 851 ha of intact native vegetation. More subtle indirect impacts on vegetation and, hence possibly on fauna, will result from surface subsidence associated with the two underground mines, UG1 and UG2.

Of the 851 ha of native vegetation to be cleared, approximately 157 ha is consistent with the definition of the endangered ecological community (EEC) White Box Yellow Box Blakely's Redgum Woodland (WBYBBRW) (as defined by the *Threatened Species Conservation Act 1995*) and its *Environment Protection and Biodiversity Conservation Act 1999* critically endangered ecological community (CEEC) equivalent.

Removal of native vegetation will also impact on habitat for threatened fauna species, particularly those that occupy the valley floor such as woodland birds and microchiropteran bats (e.g., Painted Honeyeater, Hooded Robin, Diamond Firetail and Long-eared Pied Bat). As previously indicated, areas above the underground mines will experience indirect impacts from surface subsidence. The effects of this will be largely restricted to ridge tops and associated midslopes where vegetation is predominantly characterised by Western Dry Schlerophyll Forests. These forested areas provide habitat and foraging resources for species such as the Glossy Black-cockatoo and Brown Treecreeper, and are not expected to be adversely affected by mine subsidence surface effects. No threatened aquatic biota were found or expected to occur within the study area.

The management and mitigation of ecological impacts will be principally focused at the landscape level through the restoration and/or conservation of sustainable habitat over the long term. This will be achieved by avoiding areas with ecologically important values, where possible, through rehabilitation and revegetation works to improve ecological values on mined and cleared areas within the Stage 2 Project Area, conservation of habitat values through salvage and compensatory works, and the establishment and enhancement of habitat corridors for wildlife connectivity.

Moolarben Coal Mines will provide offsets for EEC and native vegetation that will be destroyed by the construction and operation of the MCP. Within its landholdings, MCM has identified 460 ha of existing native vegetation that will not be impacted by mining, of which 162 ha is WBYBBRW EEC. This land will be conserved and enhanced to offset the clearing of EECs and native vegetation for Stage 2. Moolarben Coal Mines is also currently negotiating the purchase of other landholdings identified by the DECC as preferred lands comprising EECs for addition to the National Estate.

These EEC conservation measures will offset the clearing of EECs for Stage 2 at a ratio of 2 to 1. In addition, all revegetated and rehabilitated areas within MCM's ownership will provide long term offsets to those areas of native vegetation cleared by Stage 2. Once rehabilitated, this will amount to over 1,700 ha. Offset areas not offered for inclusion in the National Estate will be protected under a Voluntary Conservation Agreement for the duration of Stage 2. Long-term protection post mining will be provided by the Native Vegetation Act.

ES 3.1.8 Subsidence

Subsidence effects, such as ground strains, tilt and curvature, will occur in areas of underground mining. Natural features and surface improvements (i.e., infrastructure) within the mine subsidence footprint include EECs (and EPBC Act equivalent CEECs), threatened species, cliffs and overhangs, archaeological sites, power lines, tracks, farm dams, rural building structures, fences and farm houses. Modelling has predicted impacts from subsidence, such as surface ponding, fracturing of bedrock and rock falls, which will potentially lead to impacts on fauna habitat, EECs and archaeological sites. It is predicted that the mining of longwall panels in the Stage 2 underground mines (UG1 and UG2) will result in up to 1,980 mm of surface subsidence.

The height of the fracture zone above the mined longwall panels is predicted to extend up to the existing ground surface level. Surface cracking will be more visible where the depths of cover are less than 100 m, and it is expected in these areas that the fracture zones will be continuous from the mine workings up to the surface. There are some basalt flows above the longwall panels, which are expected to be of sufficient thickness and strength to resist fracturing. A close association exists between the location of these basalt units and the occurrence of EECs (and CEEC equivalents). Hence only minor impacts are expected on these communities from surface subsidence effects. While the cracking of the beds of some minor drainage lines will occur, the impact on the quality and quantity of water draining from the ridge areas is expected to be minor. Ingress of surface water through these cracks also poses a mine safety risk. Blocks of coal will be left in place to protect the Munghorn Gap Nature Reserve, an Aboriginal rock art site, Ulan-Wollar Road and the Gulgong-Sandy Hollow rail line.

The level of predicted surface subsidence and the effects of longwall mining on the natural features and items of surface infrastructure can be managed through appropriate mine design and the implementation of appropriate management strategies. This includes the development and implementation of a detailed Subsidence Management Plan to manage and mitigate the effects of mine subsidence, and a comprehensive monitoring and inspection program to ascertain and guide remediation works, such as slope stability; drainage, erosion and sediment control; and sealing of surface cracks, where necessary. Moolarben Coal Mines will implement all necessary subsidence management and mitigation measures to minimise and remediate the impacts associated with the mining of coal from the Stage 2 underground mines.

ES 3.1.9 Aboriginal Heritage

Stage 2 will impact a total of 173 identified Aboriginal cultural sites. The majority of these sites are located within the footprint of OC4. The sites comprise stone artefact scatters, individual isolated stone artefact finds, rock shelters, an Aboriginal rock art site, a grinding groove site, and potential archaeological deposits. The majority of the surveyed sites are located within the valley floor area adjacent to drainage channels.

The artefact sites were identified by a team of archaeologists and local Aboriginal community members. This team was assembled following comprehensive consultation with Aboriginal groups and individuals undertaken in accordance with the DECC's Aboriginal Community Consultative Interim Guidelines.

Moolarben Coal Mines has committed to implementing a range of impact mitigation and conservation measures to minimise the impact of Stage 2 on all Aboriginal sites within the mining area. This includes salvaging all Aboriginal objects and archaeological material in areas to be disturbed by mining. Moolarben Coal Mines has provided a keeping place for the storage of these objects.

Moolarben Coal Mines will also prepare an Aboriginal Heritage Management Plan in order to assist in managing cultural resources found within lands under its control. The plan will be developed from an Aboriginal Heritage Planning workshop with input and advice from local Aboriginal community stakeholders.

ES 3.1.10 Non-Aboriginal Heritage

There are 11 non-Aboriginal heritage items in the Stage 2 Project Area including building remnants of an old school, farm houses, a potential burial site, water troughs, wells and a dry stone wall. All are considered to be of local significance and are in various stages of decay.

Nine of these sites will be directly impacted by mining, three of which are considered to be of high local significance. A further five sites are considered to be of moderate local significance. The two sites that will not be impacted are of high local significance. Prior to the nine sites being impacted, historical research, archival recording and/or archaeological assessment will be undertaken in consultation with Mid-Western Regional Council (MWRC), Mudgee Historical Society and/or a professional archaeologist, where appropriate.

ES 3.1.11 Soils

The Stage 2 Project Area comprises a range of soil types, some of which have been identified as presenting a high erosion hazard. Appropriate handling and management measures will be employed to prevent these soils from eroding and entering surface waters flowing from the Stage 2 Project Area. Topsoils and sub-soils identified as being suitable for rehabilitation of the site will be stockpiled separately and managed so as to maintain seed banks and soil fertility in preparation for topsoiling of rehabilitated mined areas.

ES 3.1.12 Transport

It is expected that construction of Stage 2 will generate approximately 100 wide loads, up to 20 concrete trucks a day during major pours, and up to 6 delivery trucks a day over the course of the construction period. These trucks may cause some temporary annoyance to local road users and, where possible, delivery of materials will be made outside school bus times. All wide loads will be conveyed to site under escort.

At peak production, the potential addition of 122 workers for Stage 2 operations will increase daily vehicle numbers on surrounding roads. However, as a proportion of existing traffic numbers, the additional increase in vehicles will be small - about 8% of existing vehicle numbers on Ulan-Cassilis Road. As existing traffic numbers are low, the road network will safely accommodate this additional traffic. Furthermore, as the shift changeovers for Stage 2, and the MCP more generally,

will be outside of school bus service hours, the increased vehicle numbers due to Stage 2 will not impact on the operation and safety of school buses. There are also planned road improvements to Ulan-Cassilis Road which will be carried out by MWRC. Moolarben Coal Mines is partly funding these road improvements, which will further improve traffic safety on this road.

Stage 2 will require the diversion of two sections of Ulan-Wollar Road around planned mining operations. These road works will be constructed with minimal impact to road users.

All coal produced by the MCP will be transported east via rail. Most coal will be destined for international markets and will be railed to the Port of Newcastle for export. Stage 2 will generate one additional coal laden train per day. Waiting times for motorists at level crossings will not increase and will remain well within industry accepted tolerances.

ES 3.1.13 Visual

The construction and operation of Stage 2 will result in cultural modifications to the local landscape, which will impact on the visual amenity of the area. However, Stage 2 will be constructed in an area already heavily modified by mining, and the addition of further mine development and infrastructure will not be out of place with these surrounding mining land uses.

Mining within the Stage 2 Project Area will be visible only to people travelling along Ulan-Wollar Road. There are no sensitive 'viewers' that look into or over the area, as all properties in the vicinity of the project are mine-owned. Furthermore, the majority of traffic travelling along Ulan-Wollar Road is expected to be mine related or through-traffic.

Stage 2 infrastructure will be developed adjacent to Stage 1 infrastructure and this will have the effect of increasing the overall visual extent of the infrastructure areas at the MCP. However, as there are no private residences that have views over this area Stage 2 infrastructure will only be visible to passing traffic on Ulan-Cassilis and Ulan-Wollar roads.

Night-time lighting at Stage 2 will be visible from a range of viewing points along travel routes. These lighting impacts will vary with time, progressing with the mine face, be intermittent, and vary depending on screening, elevation and distance from each potential viewer. The addition of sky glow from Stage 2 will be small, however, the cumulative effect of lighting from all the mines in the area will cause viewers to drive through a highly visible industrial landscape for several kilometres. The implementation of bunding and planting, progressive revegetation, and lighting controls will serve to soften the visual impact of Stage 2 and the MCP more generally.

Stage 2 will not affect views from the surrounding nature reserve and national park as there is no readily accessible public access to areas overlooking the MCP.

ES 3.1.14 Social and Economic

Stage 2 will result in beneficial employment and economic impacts at local, regional, state and national levels. Construction of the Stage 2 infrastructure will occur concurrently with that of Stage 1 using the same workforce. It is estimated that MCM will invest \$525 million over six years for construction of the mining facilities. Of this, \$242 million will be spent on mining equipment (\$200 million for Stage 1 and \$42 million for Stage 2) and \$283 million on construction costs (\$205 million for Stage 1 and \$78 million for Stage 2). The total investment in Stage 2 construction is estimated to be \$120 million.

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At maximum production levels, the operation of the MCP complex will result in revenue of \$780 million per annum and will potentially generate 439 full-time jobs, of which up to 122 jobs will be generated by Stage 2 alone. It is expected that the MCP will produce an output of \$731 million, indirectly create an additional 1,432 full-time jobs regionally, and contribute tax and other public sector revenues of \$162 million per annum, including \$47 million per annum in production royalties to the State Government.

Moolarben Coal Mines will also enter into a Voluntary Planning Agreement (VPA) with MWRC for Stage 2. The VPA for Stage 2 will be in addition to the \$4,550,000 being voluntarily contributed to MWRC as part of Stage 1, and will compliment the commitments MCM has with MWRC under its Stage 1 VPA. The Stage 2 contributions will comprise staged payments for each 0.5 Mtpa incremental increase above the Stage 1 approved product output (i.e., when the MCP output is greater than 10 Mtpa) up to a total value of \$1,365,000. The company expects that MWRC will use this money to finance road maintenance, community infrastructure and other needs in the local area and throughout the LGA.

The relocation of Stage 2 mine workers and their families to the area could place pressure on the availability and affordability of housing in Mudgee and Gulgong, which could disadvantage people from lower socio-economic groups, and put pressure on the demand for social services such as medical facilities and schools. However, the increase in population to the local government area (LGA) as a direct result of the operation of Stage 2 is estimated to be less than 0.06%. This assumes all mine employees are employed from outside the local government area. Moolarben Coal Mines is committed to employing local workers wherever possible, and this will further reduce the demands on social and community services from mine workers and their families moving into the area.

It is expected that Stage 2 will have a positive impact on the social and economic environment of the LGA and, more broadly, at state level and nationally. In addition, will endeavour to employ local people, provide job training opportunities and support local businesses.

ES 3.1.15 Hazards and Risks

A preliminary hazard assessment has indicated that the impact of the consequences of all identified hazards in the surface mine and pit top facilities do not have the potential to impact off-site due to the application of buffer zones around the open cut workings. An Emergency Response Plan will be prepared and regular emergency response training drills will be conducted to ensure the readiness of the mine rescue team, in the event that an on-site hazard eventuates.

The adjoining conservation reserves are principally managed for the conservation of biodiversity, and therefore the use of fire within these areas is governed by biological thresholds rather than asset protection. Relatively few human-made assets exist along the boundary of the reserves, thereby minimising the risk of bush fire impacts on life and property. Many off-park assets are located within extensively cleared lands throughout the surrounding valleys, thereby increasing the separation of bush fire prone lands from areas of human habitation. Moolarben Coal Mines has proposed a number of measures to reduce the risk of bushfires to the surrounding conservation areas to acceptable levels. It will also develop a detailed bush fire management plan in conjunction with the local DECC office.

ES 3.1.16 Waste

The construction and operation of Stage 2 will result in the generation of various waste streams. Moolarben Coal Mines is committed to a waste management approach that entails avoidance, reduction, reuse, recycling or reclamation, waste treatment and disposal. Stage 2 waste management actions will build on the Stage 1 Waste Management Plans so as to ensure an integrated approach to waste management. Waste from Stage 2 is not predicted to have any significant impact on the environment.

Stage 2 sewage effluent will generally be treated on-site and used to irrigate rehabilitated areas, or be disposed of off-site by a licensed contractor. Hazardous waste will be managed in accordance with relevant legislation.

Potentially acid forming (PAF) overburden materials have been identified and are mainly associated with the Moolarben Seam, and roof and floor of the Ulan Seam. Most of the PAF overburden and floor material in the Stage 2 Project Area can be adequately managed through operational mixing, strategic placement in pit voids below long term groundwater levels, and/or treatment with limestone. Routine testing will be carried out to ensure all potential acid-generating material is properly identified and appropriately managed so that there will be no risk of long-term or off-site acid rock drainage.

ES 3.1.17 Land Use

Within the Murragamba and Eastern creek valleys, there are approximately 670 ha of low class agricultural land. At best, these lands are capable of supporting grazing and occasional cultivation provided that appropriate soil conservation and erosion control practices are employed. The MCP will result in the loss of these lands due to open cut mining and the rehabilitation of the mined areas to native vegetation.

The area of open cut mining will be rehabilitated and revegetated so as to improve the areas ecological function and wildlife connectivity. The realignment of the Murragamba and Eastern creeks will enable the creation of stable, ecologically diverse elements that will act to link the Munghorn Gap Nature Reserve to the Goulburn River National Park.

Apart from naturally vegetated areas, land use activities that currently occur above UG1 and UG2 will be able to continue subject to negotiated agreements between MCM and the respective land owners in relation to subsidence. The native vegetation in these areas will be left intact to maintain habitat connectivity between the Munghorn Gap Nature Reserve and the Goulburn River National Park.

At the cessation of mining, infrastructure will be dismantled and the land use will be consistent with the approved Mine Closure Plan.

ES 3.1.18 Rehabilitation

Rehabilitation of Stage 2 does not aim to return land disturbed by mining to its pre-mining state, but rather to rehabilitate the site with a mosaic of native open woodland, grassland and shrubland, improving the ecological value of the site in the long term. Areas of native vegetation and cleared lands disturbed by mining will be progressively rehabilitated and revegetated with native species. In addition to rehabilitating disturbed areas, MCM commits to revegetating all cleared lands within their ownership, as well as improving existing vegetated areas on its lands. This will enhance the

biodiversity values of the area in the long term and provide connectivity between green spaces and wildlife corridors.

A Rehabilitation and Offset Management Plan will be developed for Stage 2 to guide the rehabilitation and revegetation of cleared lands under the control of MCM, both within and outside the mine footprint. This plan will be integrated with a similar plan for Stage 1, and will consider the rehabilitation and offset objectives for the entire MCP.

ES 3.1.19 Mine Closure

The conceptual post-mining landscape will guide rehabilitation efforts. The Murragamba Creek and Eastern Creek valleys will be rehabilitated to improve ecological function and wildlife connectivity. The OC4 mine footprint will be progressively rehabilitated with a mosaic of native woodland and grassland including EEC species. The final landscape will include public self-guided nature walks and trails, with viewing platforms, bird hides, raised creek crossings, and rest stations with interpretive displays. Infrastructure and facilities may be retained for future mining, or used for non-mining purposes such as tourism and education, or will be dismantled. Entry points to UG1 and UG2 will be sealed and fenced to prevent public access, to ensure that the post-mining landscape is safe and stable.

Prior to the completion of Stage 2 mining operations, an integrated Mine Closure Plan will be developed for the MCP. The Mine Closure Plan will describe the conceptual closure and decommissioning process, final rehabilitation including final voids, post-closure maintenance, environmental monitoring, land tenure and future land use.

ES 4.1 Statement of Commitments

Moolarben Coal Mines proposes, and is committed, to the operation of the MCP as one integrated coal mining project. It will construct and operate the MCP:

- In accordance with the applicable Stage 1 and Stage 2 project approvals.
- In an environmentally responsible manner.
- In compliance with the principles of ecologically sustainable development.
- In accordance with best practice.
- By the application of best available technology economically achievable.

This includes developing and implementing an Environmental Management Strategy (EMS) for the MCP. The EMS will be supported by a raft of environmental management plans and environmental monitoring programs. These plans and programs will detail the management and mitigation measures that will be implemented to prevent and/or minimise adverse impacts to the environment and the community.

ES 5.1 Justification of Stage 2 and the Modification of the Stage 1 Project Approval

Stage 2 and its integration with Stage 1 through the modification of the Stage 1 Project Approval will provide economic, social and environmental benefits. These will be offset to some degree by the residual environmental impacts of the project (i.e., impacts that will remain after the application of all avoidance, minimisation and management measures). Environmental benefits will be largely

derived from rehabilitation of disturbed land and the provision of offsets. The social and economic benefits to the local, regional and Australian community will be derived through employment opportunities, payment of contributions, taxes, royalties and their flow on effects.

ES 5.1.1 Residual Environmental Impacts

The main residual environmental impacts of Stage 2 are:

- The removal of a total of 851 ha of intact native vegetation, of which 157 ha is EEC/CEEC habitat. There will be no direct impacts to individual threatened flora or fauna species.
- Potential indirect impacts (e.g., reduction in foraging habitat) on threatened woodland birds (e.g., Hooded Robin, Brown Treecreeper, Diamond Firetail and Painted Honeyeater) and a microchiropteran bat (Large-eared Pied Bat) species.
- Progressive loss of over 11 km of creek habitat in the Murragamba Creek and Eastern Creek valleys and associated feeder drainages, springs, swales, farm dams and groundwater-dependant ecosystems.
- The removal of five Aboriginal heritage sites of high significance and 16 sites of medium significance. An additional two Aboriginal heritage sites of high significance and seven sites of medium significance will be disturbed.
- The likely removal of three non-Aboriginal heritage sites of high local significance and five sites of medium local significance.
- Elevated noise levels at non mine-owned residences, particularly to the southwest of the project area. Noise assessment criteria are predicted to be exceeded by up to 3 dB at four private residences at some period during the mine life.
- Elevated dust levels at non mine-owned residences, particularly to the southwest of the project area. Air quality assessment criteria are predicted to be exceeded at five private residences at some period during the mine life.
- Average annual Scope 1 and 2 greenhouse gas emissions for the MCP will be 0.262 Mt CO₂-e.
- Surface subsidence of up to 1.9 m will occur above UG1 and UG2.
- The environmental flow of water in Murragamba and Eastern creeks will be reduced by 7%.
- A final mine void, partially filled with water, will remain at the end of the project life.

ES 5.1.2 Environmental Benefits

Environmental benefits of Stage 2 include:

- Conversion of existing low value and degraded land to land with native vegetation and increased ecological value.
- Improving connectivity between the Munghorn Gap Nature Reserve and the Goulburn River National Park through the establishment of native vegetation. These habitat corridors will allow safe passage for native wildlife and assist in enhancing and conserving the biodiversity of the area.

- Extending the habitat of the Goulburn River National Park and the Munghorn Gap Nature Reserve through the provision of adjacent flora and fauna offset areas.
- Management and improvement of MCM land that is outside of areas of direct disturbance.
- Prevention and control of listed environmental and noxious weeds from the project area, focussing on known listed species of rehabilitated landscapes such as Galena, Rhodes Grass and Coolati Grass.
- Protection of 43 Aboriginal heritage sites on MCM-owned properties through the designation of these properties for heritage conservation.
- Realignment of Murragamba and Eastern creeks which will provide an opportunity to create watercourses that are of lower gradient, subject to less erosion, and have higher biological diversity than the current alignments.

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