

WILPINJONG COAL PROJECT
OPEN CUT OPERATIONS
MINING OPERATIONS PLAN

2017 – 2019



PREPARED BY
WILPINJONG COAL PTY LIMITED

June 2017

Wilpinjong Coal Pty Limited

Mining Operations Plan

Name of Mine: Wilpinjong Coal Pty Limited

MOP Commencement Date: 01 July 2017

MOP Completion Date: 30 June 2019

Mining Authorisations (Lease / Licence No.): Mining Lease (ML) 1573, Exploration Licences (EL) 7091 & 6169

Name of Authorisation/Title Holder(s): Wilpinjong Coal Pty Limited

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The nominated Coordinator for this document is	Environment and Community Manager
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1.0 Introduction

This Mining Operations Plan (this MOP) has been prepared by Wilpinjong Coal Pty Limited (WCPL) (the Mine), to satisfy conditions and the requirements of:

- Mining lease (ML) 1573¹;
- Development Consent (SSD-6764); and
- *ESG3: Mining Operations Plan Guidelines*², September 2013 (here within referred to the MOP Guidelines).

1.1 History of Operations

The Mine is owned by WCPL, a wholly owned subsidiary of Peabody Australia Pty Ltd (Peabody). The Mine is an existing open cut coal mining operation situated approximately 40 kilometres (km) north-east of Mudgee, near the Village of Wollar, within the Mid-Western Regional Local Government Area, in central New South Wales (NSW) (**Figure 1**). The mine produces thermal coal products which are transported by rail to domestic customers for use in electricity generation and to port for export. Open cut mining operations and associated mobile equipment movements are undertaken 24 hours per day, seven days per week.

WCPL and Peabody Pastoral Holdings Pty Ltd are a major landholder owning adjacent rural properties and land to the east and south-east of the mine. Land to the west of the mine is owned by adjacent mining companies, whilst the National Parks and Wildlife Service estate own significant land to the north and south-west of the Mine.

Private properties are located predominantly in and around the Wollar Village approximately 1.5 km to the east of the Mine, along Mogo Road to the north of the Mine.

The Mine originally operated under Project Approval (PA 05-0021) that was granted by the Minister for Planning under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) on 1 February 2006. On 24 April 2017, WCPL was granted Development Consent (SSD-6764) for the Wilpinjong Extension Project (WEP) that provides for the continued operation of the Mine at rates of up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) out to 2033, and access to approximately 800 hectares (ha) of open cut extensions. Development Consent (SSD-6764) has superseded the Project Approval (Project Approval 05-0021).³

The Mine is surrounded by the narrow flood plains associated with the upper reaches and tributaries of the Wollar Creek catchment (which in turn drains to the Goulburn River), the undulating foothills, ridges and escarpments of the Great Dividing Range and the dissected landforms of the Goulburn River National Park (**Plan 1A** and **Figure 2**). Land use in the vicinity of the Mine is a combination of coal mining operations, conservation areas, stock grazing and rural residential development.

This MOP has been developed in accordance with the MOP Guidelines to include all proposed mining and associated activities as described in the WEP EIS⁴, for the period 1 July 2017 to 30 June 2019 (here within referred to as the MOP term). Subject to approval, this MOP will replace the current MOP⁵ (as amended) that was initially approved by the DRG on 11 June 2014.

In accordance with the definition as provided in the Guidelines, the Wilpinjong Coal Mine is classified as a Level 1 Mine.

¹ ML1573 issued 8 February 2006 by the then Minister for Primary Industries under the *Mining Act 1992*.

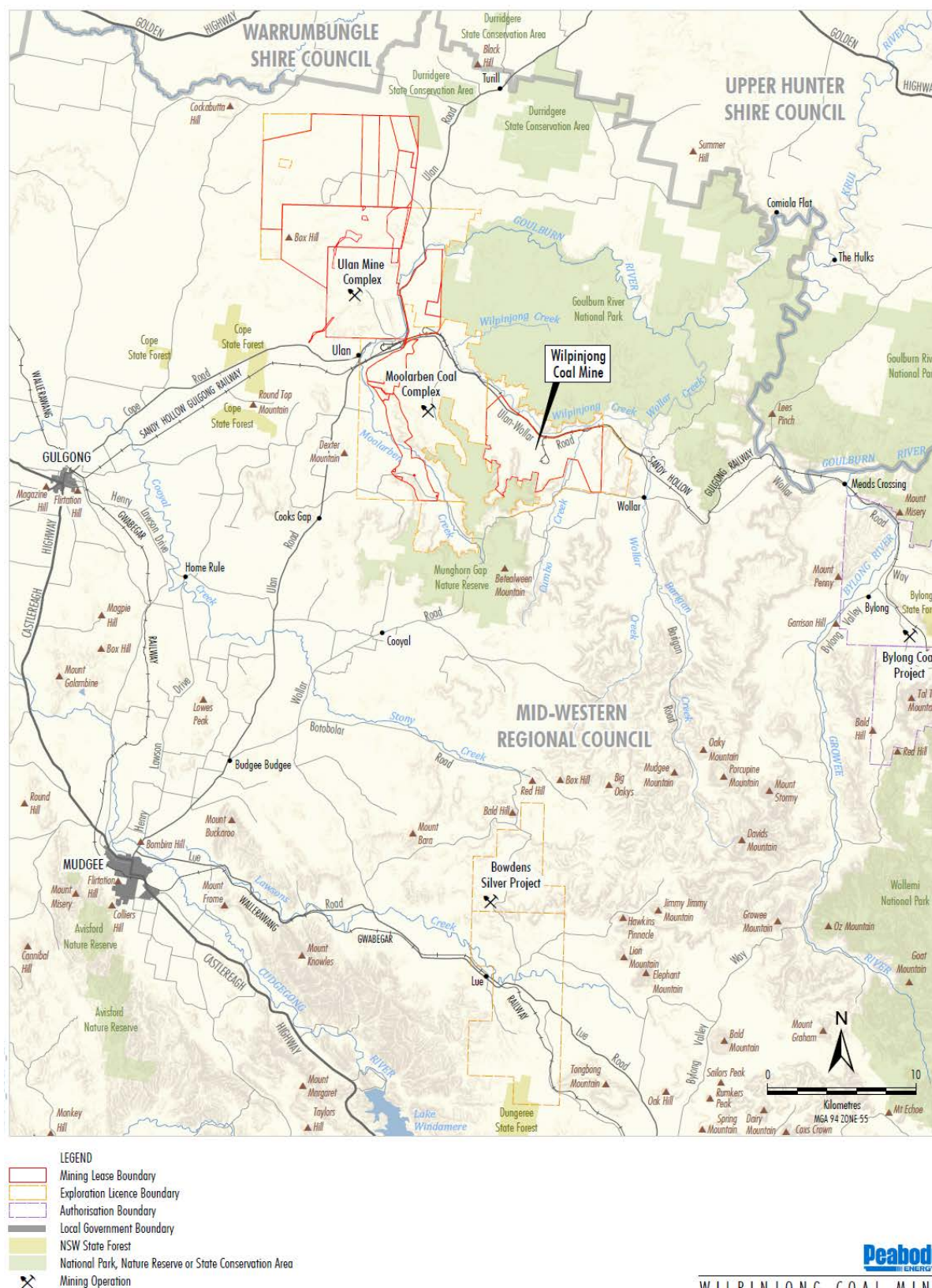
² *ESG3: Mining Operations Plan Guidelines, September 2013* issued by the NSW Trade & Investment – Division of Resources and Energy. This obligation to prepare a MOP derives from Condition 27 of ML1573.

³ Condition 9, Schedule 2 of SSD-6764 (Surrender of Existing Project Approval).

⁴ Wilpinjong Extension Project Environmental Impact Statement (WCPL, 2016).

⁵ MOP Amendment C was approved on the 5 October 2016.

Figure 1 Locality Plan



1.2 Current Consents, Authorisations and Licences

WCPL operate under Development Consent (SSD-6764) (**Appendix 1**) as displayed in **Figure 2**. A summary of the approved Mine as a result of the WEP is provided in **Table 1**.

Table 1 Summary of the Approved Wilpinjong Coal Mine

Component	Approved Wilpinjong Coal Mine ¹
Mining Method	<ul style="list-style-type: none"> Open cut mining operation extracting ROM coal.
Open Cut Extent	<ul style="list-style-type: none"> Eight contiguous open cut pits (including a new open cut pit in Slate Gully i.e. Pit 8) and associated contained infrastructure area comprising approximately 2,790 hectares.
ROM Coal Production Rate	<ul style="list-style-type: none"> Up to 16 Mtpa of ROM coal.
Waste Rock Management	<ul style="list-style-type: none"> Waste rock deposited predominantly within mined-out voids. Elevated waste emplacement area (Pit 2).
Annual Waste Rock Production	<ul style="list-style-type: none"> Annual waste rock production of approximately 43 million bank cubic metres.
Coal Washing	<ul style="list-style-type: none"> Beneficiation of ROM coal in the CHPP. Facilities for the handling and stockpiling of both washed and unwashed (bypass) coal.
Product Coal	<ul style="list-style-type: none"> Approximately 13 Mtpa of thermal product coal for domestic electricity generation and export, capped at maximum rail limits.
Coal Rejects (tailings and coarse rejects)	<ul style="list-style-type: none"> Coal rejects placed predominantly within mine voids. Tailings filter press to allow co-disposal of the tailings with coarse rejects
Water Supply	<ul style="list-style-type: none"> Make-up water demand to be met from runoff recovered from mine operational areas, recovery from tailings disposal areas, open cut dewatering, advanced dewatering of pit areas and supply from a borefield (if required). Recovery of water from tailings via tailings filter press.
Water Disposal	<ul style="list-style-type: none"> Mine water treated in a Water Treatment Facility (WTF) and discharged to Wilpinjong Creek in accordance with Environment Protection Licence (EPL) 12425.
Project Life	<ul style="list-style-type: none"> 28 years (from the date of grant of a Mining Lease 1573).
Product Coal Transport	<ul style="list-style-type: none"> An average of six and a maximum of 10 laden trains per day leaving the mine. Transport via the Sandy Hollow-Gulgong Railway.
Hours of Operation	<ul style="list-style-type: none"> Open cut mining, handling and processing of ROM coal at the CHPP and train loading at the Wilpinjong Coal Mine is currently undertaken 24 hours per day, seven days per week.

Notes: ¹ Following the commencement of development under this consent (SSD-6764), and prior to the surrender of the project approval (MP 05-0021), the conditions of this consent (SSD-6764) shall prevail to the extent of any inconsistency with the conditions of MP 05-0021.

Table 2 provides a summary of the other approvals, leases and licences that the Mine operates under.

Table 2 Mine Approvals, Leases and Licences

Relevant Authority	Instrument	Approval/Licence No.	Expiry Date
DP&E	Development Consent	SSD-6764	28 years from commencement of Project Approval (i.e. 2033)
DRG	Mining Lease	ML 1573	February 2027
	Mining Lease Application	MLA 510	Section 1.2.1
	Mining Lease Application	MLA 515	Section 1.2.1
	Mining Lease Application	MLA 3 (yet to be lodged)	Section 1.2.1
	Exploration Licence	EL 6169	28/11/2017
		EL 7091	03/03/2019
	Mine within Wilpinjong B Notification Area	ML 1573	Endorsed DSC 19 February 2013 Approved 24 January 2014
	Mining Operations Plan (MOP)	This MOP	30 June 2019
	Tailings Emplacement	Section 101 – TD1 and TD2 (approv. No. 07/1226)	February 2006 (Facility decommissioned)
	Tailings Emplacement	TD3 and TD4 (High Risk Activity Notification)	December 2011 (Facility decommissioned)
	Tailings Emplacement	TD5 (High Risk Activity Notification)	December 2013 (Facility decommissioned)
	Tailings Emplacement	Section 100 – TD6 (approv. No. 08/9006)	31 January 2016
	Tailings Emplacement	Section 101 - Decommission TD2 -(approv. No. 09/2396)	29 April 2009 (Facility decommissioned)
	Tailings Emplacement	Section 101 - Decommission TD1 -(approv. No. 09/2396)	28 October 2011 (Facility decommissioned)
EPA	Environment Protection Licence (EPL)	EPL 12425	Until the licence is surrendered, suspended or revoked. The licence is subject to review every 3 years
	NSW Radiation Control Act 1990 Registration	Licence Number 5061384	02 January 2016 (Renewal Submitted)
Work Cover NSW	Explosives Licence	NSW Explosives Act 2003 Part 3 Licence (Licence Number XSTR200024)	24 March 2018
DPI-Water	Water Licences	Refer to Table 6	Refer to Table 6

Note: Copies of the Development Consent (SSD-6764), EPL 12425 and ML 1573 are available on the Peabody Energy website (<http://www.peabodyenergy.com.au>)

1.2.1 Mining Lease Applications

The WEP extends into three new Mining Lease Applications (MLA) areas within both EL 6169 and EL 7091 (**Figure 2**). WCPL has lodged three MLAs with the DRG (within the NSW Department of Planning and Environment) for the WEP development areas outside of the existing ML1573. WCPL will also renew existing ELs and ML1573 as required during the life of the Mine. As discussed with the DRG on the 5 June 2017, WCPL will amend this MOP and associated MOP Plans accordingly after receiving official confirmation from the DRG the MLAs have been converted into a Mining Lease (ML) and new MLs have been issued to WCPL. No mining activities will occur in the MLAs until the new MLs are issued and this MOP is amended and approved by the DRG.

Figure 2 The Approved Wilpinjong Extension Project

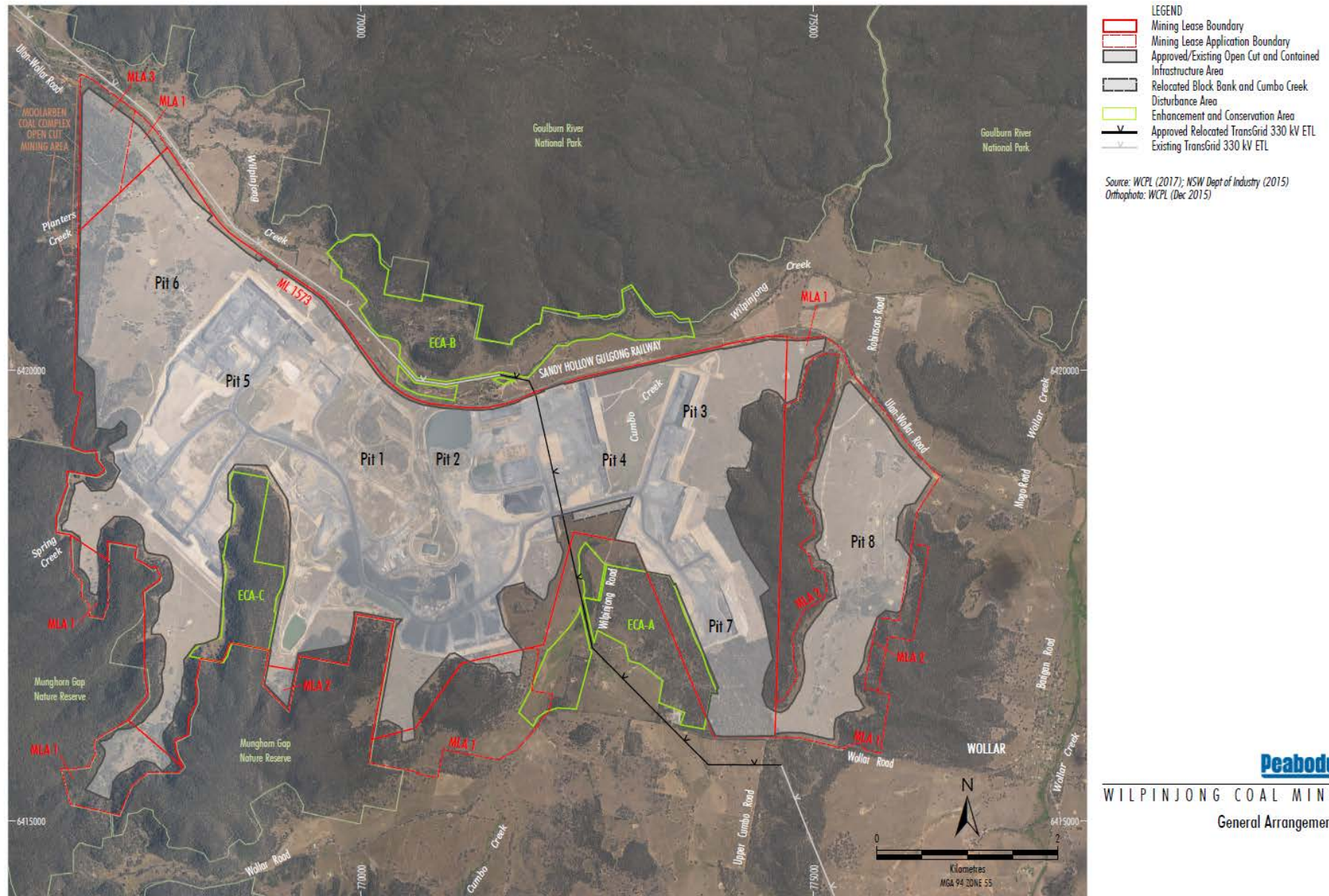


Figure 3 General Mine Layout



Source: WCPL (2015)
Orthophoto: WCPL (Jun 2015)

Peabody
ENERGY

WILPINJONG EXTENSION PROJECT

Existing Coal Handling and
Preparation Plant
and Mine Facilities Areas

Condition 64, Schedule 3 of Development Consent (SSD-6764) requires the development of a Rehabilitation Management Plan (RMP). As stated by this condition, the MOP may be used to address the requirements of the RMP required under Development Consent (SSD-6764), however the MOP must clearly document how the requirements have been met.

Table 3 outlines the RMP conditions and other associated rehabilitation objectives and strategies as required by Development Consent (SSD-6764) and indicates where they addressed in the MOP.

Table 3 Development Consent (SSD-6764) Requirements

Development Consent (SSD-6764) Rehabilitation Requirements		MOP Section
Rehabilitation Objectives		
60. The Applicant must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be consistent with the proposed rehabilitation strategy described in the EIS (and shown conceptually in Appendix 8), and comply with the objectives in Table 11.		
<i>Table 11: Rehabilitation Objectives</i>		
Feature	Objective	
Mine site (as a whole)	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Final landforms designed to incorporate micro-relief and integrate with surrounding natural landforms and adjacent mine rehabilitation • Final landforms maximise geotechnical performance, stability and hydrological function • Constructed landforms maximise surface water drainage to the natural environment (excluding final void catchments) • Minimise long term groundwater seepage from the site to ensure negligible environmental consequences beyond those predicted for the development • Minimise visual impact of final landforms as far as is reasonable and feasible 	Section 4.2 & Section 4.3 & Section 5.2 & Section 5.3 & Section 5.4
Final Voids	<ul style="list-style-type: none"> • Minimise to the greatest extent practicable: <ul style="list-style-type: none"> ○ the size and depth of final voids ○ the drainage catchment of final voids ○ any high wall and low wall instability risk ○ risk of flood interaction for all flood events up to and including the PMF 	As Above
Surface infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Secretary agrees otherwise 	As Above
Rehabilitation	<ul style="list-style-type: none"> • Rehabilitate at least 2,906 hectares of self-sustaining woodland ecosystem to the BVTs specified in Tables 8 and 9; • Establish self-sustaining ecosystem function in areas of: <ul style="list-style-type: none"> ○ aquatic habitat, within diverted and/or re-established drainage lines and retained water features, with consideration of hydro-geomorphological constraints; ○ habitat for threatened flora and fauna species; and ○ habitat for flora and fauna species known to occur in the region. 	Section 3.3.6 & As Above
Cumbo Creek relocation	Restored in accordance with conditions 26 to 28 of this Schedule.	Section 4.3 & Section 5.2
Other reinstated drainage lines	Drainage lines are restored in accordance with the principles, concepts and techniques described in "A rehabilitation manual for Australian streams (Rutherford, I; Jerie, K; Marsh, N 2000)	Section 4.3 & Section 5.2
Community	<ul style="list-style-type: none"> • Ensure public safety • Minimise the adverse socio-economic effects associated with mine closure 	Section 3.4.17 & Section 4.3 & Section 5.2
<p><i>Note: To avoid any doubt, the final landform in Pit 8 must not include a final void and must be consistent with the landform proposed in the Applicant's Response to the Planning Assessment Commission Review, dated February 2017, and shown conceptually in Appendix 8.</i></p>		

Table 3 Development Consent (SSD-6764) Requirements cont.

Development Consent (SSD-6764) Rehabilitation Requirements	MOP Section
<p>Rehabilitation Strategy</p> <p>61. Within 6 months of the commencement of development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Rehabilitation Strategy to the satisfaction of the Secretary. This strategy must:</p> <ul style="list-style-type: none"> (a) In consultation with the proponent of the Moolarben Coal Mine, investigate options to integrate the final landform with the Moolarben Coal Mine, including options to integrate final voids and minimise the sterilisation of land post-mining; (b) Include an assessment of partially backfilling voids 2 and 6 above the groundwater equilibrium level having regard to the final void rehabilitation objectives in Table 11, including consideration of downstream water quality and the objectives in Table 6; (c) Include a revised final landform plan which builds on the rehabilitation objectives in Table 11, including incorporation of micro-relief, landform stability, hydrological and ecological function; and (d) Include detailed justification for proposed changes to the final landform, having regard to the approved post-mining land use. <p><i>Note: The strategy should build on the proposed rehabilitation strategy shown in Appendix 8.</i></p>	<p>Section 5.2.1</p>
<p>Progressive Rehabilitation</p> <p>62. The Applicant must rehabilitate the site progressively as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies must be employed when areas prone to dust generation cannot be permanently rehabilitated.</p> <p><i>Note: It is accepted that some parts of the site that are progressively rehabilitated may be subject to further disturbance at some later stage of the development. It is also accepted that delays in rehabilitation due to extended wet or dry conditions may occur.</i></p> <p>63. The Applicant must commence the ecosystem and land use establishment phase of rehabilitation for areas within 50 metres of the Munghorn Gap Nature Reserve, within 2 years of ceasing mining operations in those areas.</p> <p><i>Note: It is accepted that some ancillary infrastructure would need to be retained for access and water management.</i></p>	<p>Section 2.3.3.3 & Section 2.3.3.8 & Section 7.2</p> <p>Section 5.3.4</p>

Table 3 Development Consent (SSD-6764) Requirements cont.

Development Consent (SSD-6764) Rehabilitation Requirements	MOP Section
<p>Rehabilitation Management Plan</p> <p>64. Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <ul style="list-style-type: none"> (a) be prepared in consultation with DPI Water, OEH, Council and the CCC; (b) be prepared in accordance with any relevant NSW Government mining rehabilitation guidelines; (c) describe how the rehabilitation of the site be integrated with the biodiversity offset strategy; (d) include a conceptual life of mine rehabilitation schedule, a detailed rehabilitation schedule covering a period of up to 3 years, and an annual program for reviewing and revising the schedule; (e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site and triggering remedial action (if necessary); (f) clearly identify the rehabilitation offset areas required under condition 36 of this Schedule including: areas required for the ecosystem and Regent Honeyeater species credits; areas generating different credits per hectare for Regent Honeyeater species credits; and BVT's proposed to generate the offset credits; (g) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform (including final voids), biodiversity values and final land use; (h) describe the rehabilitation methodologies that will be implemented to achieve the rehabilitation performance measures; (i) describe a process for managing minor delays or changes to progressive rehabilitation forecasts; (j) include interim rehabilitation where necessary to minimise the area exposed for dust generation; (k) include a program to monitor, independently audit and report on the effectiveness of rehabilitation methodologies and progress against the detailed performance measures, trends and completion criteria; and (l) build to the maximum extent practicable on the other management plans required under this consent. <p><i>The Mine Operations Plan (MOP) may be used to address the requirements of the Rehabilitation Management Plan required under this condition. However, the MOP must clearly document how the requirements of this condition have been met.</i></p> <p><i>It is accepted that the Rehabilitation Management Plan initially submitted in accordance with this condition would not include the agreed rehabilitation offsets performance and completion criteria required under condition 37 of this schedule or any rehabilitation changes resulting from the Rehabilitation Strategy required under condition 61 of this schedule.</i></p>	<p>This MOP</p> <p>Section 1.4 Section 1.1</p> <p>Section 3.3.6</p> <p>Section 5.2.2 & This MOP</p> <p>Section 5.4</p> <p>Section 3.3.6 & Section 5.2</p> <p>Table 3 Section 1.4.2 & Section 3.4 & Section 4.2 & Section 5.0</p> <p>Section 3.3 & Section 3.4 & Section 5.2 & 5.3 Section 5.4</p> <p>Section 9.2</p> <p>Section 3.4.3</p> <p>Section 8.0</p> <p>Section 3.4 & Section 3.3.6</p> <p>This MOP</p>
<p>65. Within 3 months of approval of the performance and completion criteria for rehabilitation offsets required under condition 37 of this schedule, the Applicant must revise the Rehabilitation Management Plan to include the approved performance and completion criteria, including a protocol for assessing and reporting on rehabilitation offsets against the performance criteria, as the mine is progressively rehabilitated.</p>	<p>Section 3.3.6</p>

Condition 3, Schedule 5 of Development Consent (SSD-6764), outlines general management plan requirements that are applicable to the preparation of this MOP. **Table 4** presents these requirements and indicates where they are addressed within this MOP.

Table 4 General Management Plan Requirements

Development Consent (SSD-6764) Condition	MOP Section
Management Plan Requirements	
3. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
(a) detailed baseline data;	Section 3.0
(b) a description of:	
• the relevant statutory requirements (including any relevant approval, licence or lease conditions);	Section 1.2
• any relevant limits or performance measures/criteria;	Section 3.0
• the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	Section 5.4
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 3.0 & Section 4.0 & Section 5.0
(d) a program to monitor and report on the:	
• impacts and environmental performance of the development;	Section 3.0
• effectiveness of any management measures (see c above);	Section 8.0
(e) a contingency plan to manage any unpredicted impacts and their consequences;	Section 9.0
(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 10.0
(g) a protocol for managing and reporting any:	
• incidents	Section 3.2.2
• complaints	Section 3.2.1
• non-compliances with statutory requirements; and	Section 10.1
• exceedances of the criteria and/or performance criteria; and	Section 10.1
(h) a protocol for periodic review of the plan.	Section 10.2

1.2.2 Mining Lease & Exploration Licences

WCPL approved mining activities occur within ML 1573 (**Figure 2**). ML1573 was granted under the *Mining Act 1992*, on 08 February 2006. WCPL exploration activities continue to occur within adjacent exploration licences (EL) EL 6169 and EL 7091 (**Figure 2**) and within ML1573. The date of grant and duration of mining and explorations licenses relevant to the WCPL are provided in **Table 2**. **Table 5** outlines the approval conditions within ML1573 as they relate to the MOP and rehabilitation and where they addressed in the MOP.

Table 5 MOP Conditions from ML1573

MOP Conditions from ML1573	Addressed in the MOP
<p>27.</p> <p>(a) Mining operations must not be carried out otherwise than in accordance with a Mining Operations Plan (MOP) which has been approved by the Director- General of the Department of Primary Industries- Mineral Resources.</p> <p>(b) The [MOP] must:</p> <ul style="list-style-type: none"> • identify areas that will be disturbed by mining operations; • detail the staging of specific mining operations; • identify how the mine will be managed to allow mine closure; • identify how mining operations be carried out on site in order to prevent and or minimise harm to the environment; • reflect the conditions of approval under: <ul style="list-style-type: none"> - the <i>Environmental Planning and Assessment Act 1979</i>; - the <i>Protection of the Environment Operations Act 1997</i>; and - and any other approvals relevant to the development including the conditions of this lease; and • have regard to any relevant guidelines adopted by the Director-General. <p>(c) The titleholder may apply to the DG to amend an approved MOP at any time.</p> <p>(d) It is not a breach of this condition if:</p> <ol style="list-style-type: none"> i) the operations constituting the breach were necessary to comply with a lawful order or direction given under the <i>Mining Act 1992</i>, the <i>Environmental Planning and Assessment Act 1979</i>, Protection of the <i>Environment Operations Act 1997</i> or the <i>Occupational Health and Safety Act 2000</i>; and ii) the Director-General had been notified of the terms of the order or direction prior to the operations constituting the breach being carried out. <p><i>Note: The Director-General is deemed to be notified of the terms of an order or direction if the order or Direction was issued by the Department or a copy of the order or direction has been faxed to 02 4931 6790.</i></p> <p>(e) A MOP ceases to have affect 7 years after date of approval or other such period as identified by the D-G. An approved amendment to the MOP under condition 29 does not constitute an approval for the purpose of this paragraph unless otherwise identified by the DG.</p>	<p>This document</p> <p>Section 2.0 Plans 3A & 3B Section 1.4.1</p> <p>Section 3.0</p> <p>Section 1.2</p> <p>Section 1.1</p> <p>Section 1.2.1</p> <p>Section 1.1</p>

1.2.4 Environment Protection Licence

WCPL operate under Environment Protection Licence (EPL) 12425 and subject to review every three years. All monitoring results, community complaints and environmental incidents required for reporting by EPL 12425 are reported annually to the NSW Environmental Protection Authority (EPA) as part of the EPL Annual Returns.

WCPL will seek to vary EPL 12425 to align with the WEP and approved management plans as required by Development Consent (SSD-6764).

1.2.4 Water Licences

WCPL currently holds water licences for a number of test and dewatering bores located within and outside the mining lease. **Table 6** details of the current water licenses held by WCPL.

Table 6 Water Licence Summary

Licence Number	Description	Valid to	Entitlement (ML/annum)
Licences under the <i>Water Management Act, 2000</i> (Alluvial Aquifer)			
WAL 21499 ¹	Alluvial Aquifer Licence	Current	474 units ²
Licences under the <i>Water Act, 1912</i> (Porous Rock Aquifer)			
20BL173517	Pit 1 Licence	10 June 2020	2021
20BL173516	Pit 2 Licence	10 June 2020	
20BL173514	Pit 3 Licence	10 June 2020	
20BL173515	Pit 4 Licence	10 June 2020	
20BL173513	Pit 5 Licence	10 June 2020	
20BL173973	Pit 6 Licence	22 December 2021	
20BL170147	Dewatering	30 March 2021	770
20BL170148	Dewatering	30 March 2021	
20BL170149	Dewatering	30 March 2021	
20BL170150	Dewatering	30 March 2021	
20BL170151	Dewatering	30 March 2021	
20BL170152	Dewatering	30 March 2021	
20BL170153	Dewatering	30 March 2021	
20BL170063	Water Supply Bore (GWs10)	18 December 2016 ³	110
20BL170062	Water Supply Bore (GWs11)	18 December 2011 ⁴	110
20BL170061	Water Supply Bore (GWs12)	18 December 2011 ⁴	110
20BL170059	Water Supply Bore (GWs14)	18 December 2016 ³	110
20BL170058	Water Supply Bore (GWs15)	18 December 2011 ⁴	110

Notes: HydroSimulations (2016) ¹ Assigned to the Wollar Creek Water Source. ² One unit is currently equivalent to 1.0 ML as per the *Available Water Determination Order for Various NSW Unregulated and Alluvial Water Sources (No. 1) 2013*.³ Under the *Water Management Act 2000* and will convert as of 1 July 2016 in line with the commencement of the *Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016*. ⁴ Renewal Application lodged with DPI-Water on the 25 June 2016.

1.3 Land Ownership and Land Use

WCPL owns the majority of land in and surrounding the Mine area. Land ownership for properties within and surrounding the Mine area are shown in **Appendix 4** and **Plan 1C**. WCPL-owned lands not subject to mining are mainly used for stock grazing through leases or agistment. Isolated lots of Crown Land and Crown Roads occur within the Mine area. **Table 7** provides the land ownership table relevant to WCPL. The main infrastructure area is contained centrally within the mining operations area with only mobile infrastructure (e.g. environmental monitoring equipment and water management infrastructure) located outside of the central mining operations area. Satellite infrastructure will also be required for Pit 8.

A substantial buffer of WCPL owned land and Crown Land occurs to the south and east of the Mine. To the west of the Mine, the land is largely owned by WCPL, Moolarben Coal Pty Ltd and Ulan Coal Mines Limited (UCML). Large areas of the National Parks Estate occur to the north (i.e. Goulburn River National Park) and south-east (i.e. Munghorn Gap Nature Reserve) of the Mine. Some Council owned roads and Crown Land roads still remain open within the ML despite applications to close these roads being submitted prior to the commencement of mining. Consultation with Mid-Western Regional Council (MWRC) and Department of Primary Industries – Lands is ongoing regarding the applications to close these Roads. This process is expected to be finalised during the MOP term.

The nearest private receivers (i.e. residents within the Wollar Village) are situated approximately 1.5 km from mining operations (see **Plan 1D**).

Table 7 Schedule of Land Ownership

Tenure Type	Lot Number	Deposited Plan Number
Freehold	49	DP755454
Freehold	9	DP755454
Freehold	5	DP755454
Freehold	109	DP755454
Freehold	72	DP755454
Freehold	48	DP755454
Freehold	184	DP755425
Freehold	68	DP755454
Freehold	5	DP703225
Freehold	6	DP755454
Freehold	2	DP720305
Freehold	17	DP755454
Freehold	1	DP853565
Freehold	114	DP42127
Freehold	11	DP703223
Freehold	31	DP755454
Freehold	26	DP755454
Freehold	123	DP755425
Freehold	10	DP755454
Freehold	6	DP703225
Freehold	47	DP755454
Freehold	19	DP755454
Freehold	37	DP755454
Freehold	1	DP703224
Freehold	183	DP755425
Freehold	12	DP703223
Freehold	182	DP755425
Freehold	23	DP755454
Freehold	18	DP755454
Freehold	45	DP755454
Freehold	87	DP755425
Freehold	27	DP755454
Freehold	13	DP703223
Freehold	15	DP755454
Freehold	196	DP755425
Freehold	13	DP755454
Freehold	95	DP755425
Freehold	46	DP755454
Freehold	12	DP755454
Freehold	88	DP755425
Crown	91	DP755425
Freehold	1	DP112124
Freehold	90	DP755425
Freehold	122	DP755425
Freehold	24	DP755454
Freehold	124	DP755425
Freehold	3	DP755454

Tenure Type	Lot Number	Deposited Plan Number
Freehold	14	DP755454
Freehold	156	DP755425
Freehold	22	DP755454
Freehold	104	DP755454
Freehold	1	DP727117
Freehold	10	DP703223
Freehold	94	DP755425
Freehold	1	DP728756
Freehold	195	DP755425
Freehold	1	DP724617
Freehold	93	DP755425
Freehold	11	DP755454
Freehold	69	DP755454
Freehold	43	DP583255
Freehold	35	DP755454
Freehold	122	DP724655
Freehold	44	DP583255
Freehold	42	DP583255
Freehold	59	DP755454
Freehold	100	DP755454
Freehold	50	DP755454
Freehold	30	DP755454
Freehold	41	DP583255
Crown	123	DP724655
Freehold	92	DP755425
Crown	7302	DP1138926
Crown	115	DP42127
Freehold	3	DP583254
Freehold	71	DP755425
Freehold	55	DP755425
Freehold	56	DP755425
Freehold	4	DP122991
Freehold	6	DP250053
Freehold	58	DP755425
Freehold	125	DP755425
Freehold	139	DP755425
Freehold	34	DP755425
Freehold	187	DP755425
Freehold	57	DP755425
Freehold	146	DP755455
Freehold	141	DP755425
Freehold	7	DP122991
Freehold	116	DP755425
Freehold	54	DP755425
Freehold	11	DP122991
Freehold	5	DP122991
Freehold	149	DP755425

Table 7 Schedule of Land Ownership (cont.)

Tenure Type	Lot Number	Deposited Plan Number	Tenure Type	Lot Number	Deposited Plan Number
Freehold	83	DP755425	Freehold	59	DP755425
Freehold	188	DP755425	Freehold	144	DP755425
Freehold	161	DP755425	Freehold	73	DP755455
Freehold	78	DP755425	Freehold	35	DP755425
Freehold	107	DP755425	Freehold	1	DP250053
Freehold	105	DP755425	Freehold	136	DP755425
Freehold	18	DP755425	Freehold	134	DP755425
Freehold	5	DP250053	Freehold	135	DP755425
Freehold	2	DP122991	Freehold	142	DP755425
Freehold	85	DP755455	Freehold	145	DP755425
Freehold	26	DP755425	Freehold	140	DP755425
Freehold	6	DP122991	Freehold	137	DP755425
Freehold	152	DP755425	Freehold	86	DP755455
Freehold	9	DP122991	Freehold	51	DP755455
Freehold	132	DP755425	Freehold	160	DP755425
Crown	233	DP723412	Freehold	186	DP755425
Freehold	79	DP755425	Freehold	44	DP755425
Freehold	138	DP755455	Freehold	110	DP755454
Freehold	160	DP723767	Freehold	1	DP883254
Freehold	14	DP755425	Freehold	37	DP755425
Freehold	3	DP122991	Freehold	3	DP755425
Freehold	53	DP755425	Freehold	128	DP755425
Freehold	7	DP250053	Freehold	45	DP755425
Freehold	40	DP755425	Freehold	1	DP1078866
Freehold	151	DP755425	Crown	161	DP723767
Freehold	8	DP122991	Crown	147	DP755425
Freehold	153	DP755425	Crown	77	DP755425
Freehold	4	DP250053	Freehold	12	DP755425
Freehold	1	DP431744	Crown	234	DP723412
Freehold	150	DP755425	Crown	97	DP755425
Freehold	106	DP755425	Freehold	66	DP654143
Freehold	13	DP755425	Freehold	1	DP122991
Freehold	3	DP250053	Crown	235	DP723412
Freehold	49	DP755425	Freehold	70	DP755425
Freehold	157	DP755425	Crown	1	DP1139913
Freehold	80	DP755425	Freehold	140	DP755455
Freehold	148	DP755425	Crown	7318	DP1141391
Freehold	25	DP755425	Freehold	146	DP755425
Freehold	52	DP755425	Crown	7008	DP1095457
Freehold	76	DP755425	Freehold	143	DP755425
Freehold	27	DP755425	Freehold	69	DP755455
Freehold	10	DP122991	Freehold	89	DP755455
Freehold	2	DP250053	Freehold	138	DP755425
Freehold	46	DP755425	Freehold	52	DP755455
Freehold	50	DP755425	Crown	159	DP721237
Freehold	75	DP755425	Freehold	96	DP755455
Freehold	9	DP755425	Freehold	11	DP250053

Table 7 Schedule of Land Ownership (cont.)

Tenure Type	Lot Number	Deposited Plan Number
Freehold	94	DP755455
Freehold	12	DP250053
Crown	151	DP755455
Freehold	97	DP755455
Freehold	12	DP122991
Freehold	95	DP755455
Freehold	3	DP430668
Freehold	13	DP122991
Freehold	78	DP755455
Freehold	1	DP430668
Freehold	50	DP755455
Freehold	2	DP1071177
Freehold	4	DP755455
Freehold	116	DP755455
Freehold	10	DP250053
Freehold	57	DP755455
Freehold	2	DP430668
Freehold	59	DP755455
Freehold	133	DP755425
Freehold	194	DP755425
Freehold	237	DP724588
Freehold	130	DP755425
Freehold	158	DP755425
Freehold	8	DP755455
Crown	236	DP724588

Tenure Type	Lot Number	Deposited Plan Number
Crown	63	DP755455
Freehold	99	DP755455
Freehold	9	DP250053
Freehold	131	DP755425
Freehold	8	DP250053
Freehold	1	DP755455
Freehold	155	DP755425
Crown	158	DP721237
Crown	7304	DP1141384
Freehold	108	DP755425
Freehold	42	DP755425
Freehold	109	DP755425
Freehold	60	DP755425
Freehold	67	DP755454
Crown	52	DP755454
State Rail Authority (Crown)	Railway lands located between or adjacent to the above parcels of land	
Mid-Western Regional Council or Department of Lands (Crown)	Other roads located between or adjacent to the above parcels of land	
Crown	Creeks or streams located between or adjacent to the above parcels of land	

Note: Crown Roads, Council Roads and property under the control of the State Rail Authority have been identified and are shown on the ownership figures in **Appendix 4**.

1.3.1 Land Use

The Mine is located in the Upper Hunter Valley region of NSW. Landforms at the site consist of gently sloping colluvium and undulating foothills adjacent to north-flowing tributary creeks of Wilpinjong Creek (part of the Goulburn River Catchment). Steep timbered ridges exist to the south, west and east of the Mine. Wilpinjong Creek is located to the north of the mining lease (**Plan 1B** and **Figure 2**).

Land use in the vicinity of the Mine is characterised by a combination of coal mining operations, agricultural land uses, conservation and rural residential development (e.g. local villages of Wollar and Ulan). WCPL controlled lands that are not subject to mining operations are licensed out for grazing of stock (primarily cattle). The neighbouring Moolarben Coal Mine and Ulan Coal Mine are located west of the Mine (**Figure 1**). The Goulburn River National Park lies to the north and the Munghorn Nature Reserve is located to the south.

A recent aerial photograph of the Mine and surrounds is provided on **Figure 2**. As seen from **Figure 2**, significant areas of land have been modified by historical agricultural uses such as land clearing for grazing activities. Rocky outcrops remain largely uncleared.

With the exception of some corridors of vegetation to be cleared for ancillary works (e.g. construction of diversion structures upslope of the open cut mining areas), the majority of the area to be disturbed during the MOP term has historically been extensively cleared and used predominantly for grazing. Evidence of intermittent cropping on the drainage plains is also present.

Land use in the open cut areas includes mining-related infrastructure, remnant vegetation and cleared grazing land. The cleared grazing land is under unimproved pasture. No grazing is currently conducted in most of these areas, however, some limited grazing will be undertaken in Pit 6. Some dryland cropping has occurred in previous decades in the north-western open cut extension area in the vicinity of Ulan-Wollar Road

1.4 Consultation

Extensive consultation was conducted in establishing the environmental controls and management measures developed as part of the WEP EIS.

In preparation of this MOP, WCPL completed consultation with key government departments as summarised in **Table 8. Appendix 3** provides copies of the relevant correspondence undertaken during the preparation on the MOP.

On the 5 June 2017, WCPL met with the Department of Resources and Geoscience (DRG) to discuss the preparation of this MOP to align with the recently approved WEP. Also in attendance at the meeting was a representative from the NSW Department of Planning and Environment (DP&E). WCPL were able to present to the DRG and DP&E:

- The proposed mining and rehabilitation sequence within the WEP (subject to MLs being issued) approved areas and within existing mining lease (ML) areas;
- The rehabilitation strategies to align with the WEP EIS;
- The status of mining lease applications (MLAs) over portions of the WEP approved areas; &
- The status of management plan revisions relevant to this MOP required under SSD-6764.

As a result of that meeting it was agreed by the DRG this MOP would only seek a two year term, with forthcoming MOP amendments to include:

- Update mining and rehabilitation sequence within approved WEP areas, existing ML areas and new ML areas, subject to their conversion from MLAs;
- Undertake mining activities in accordance with existing approved management plans until the approval of revised and new management plans as required by Development Consent (SSD-6764); and
- Continue implementation of the approved completion criteria in **Section 6** of this MOP. Subject to approval of the revised Biodiversity Management Plan (BMP)⁶, the completion criteria of this MOP will be revised accordingly.

Table 8 Summary of Consultation with Stakeholders

Government Departments	Summary of Consultation	Issues Raised During Consultation	Section in MOP where addressed
DRE	Refer to Section 1.4	<ul style="list-style-type: none"> • Refer to Section 1.4 	Section 1.1 Section 2.1 Section 3.3.6 Section 5.4
DP&E	Refer to Section 1.4 Letter sent to DP&E on 1 June 2017 seeking feedback in the preparation of this MOP.		
DPI-Water	Letter sent to DPI-Water on 1 June 2017 seeking feedback in the preparation of this MOP.	<ul style="list-style-type: none"> • DPI Water replied on 7 June 2017 of their intentions to wait until MOP submission prior to commenting. 	NA
OEHL	Letter sent to OEHL on 1 June 2017 seeking feedback in the preparation of this MOP.	<ul style="list-style-type: none"> • No issues were raised by the OEHL during the preparation of this MOP. 	NA
EPA	Letter sent to EPA on 1 June 2017 seeking feedback in the preparation of this MOP.	<ul style="list-style-type: none"> • The EPA has no additional requirements to those outlined in the Guidelines. 	NA
MWRC	Letter sent to MWRC on 1 June 2017 seeking feedback in the preparation of this MOP.	<ul style="list-style-type: none"> • No issues were raised by the MWRC during the preparation of this MOP. 	NA
CCC	Refer to Section 1.4.1	<ul style="list-style-type: none"> • No issues were raised by the CCC during the preparation of this MOP 	.NA

⁶ Condition 42, Schedule 3 of Development Consent (SSD-6764)

Ongoing consultation is completed in accordance with the WCPL Environmental Management Strategy (EMS)⁷, which has previously involved the production of newsletters, establishment of the community consultative committees (CCC) and maintaining information on the Peabody website. The website is maintained⁸ in accordance with Development Consent (SSD-6764). The website provides the wider community with access to the sites monitoring results, details of current activities, proposed blast times, policies, environmental management plans and monitoring programs and any other information in relation to the site operation that may be considered of interest to the community. The Peabody Energy website address for WCPL is:

<https://www.peabodyenergy.com/Operations/Australia-Mining/New-South-Wales-Mining/Wilpinjong-Mine>

1.4.1 Rehabilitation and Mine Closure Consultation

WCPL have developed a conceptual Mine Closure Plan (MCP), formally required by PA05-0021, and as part of a Peabody's initiative to undertake life of mine closure planning for mining operations. The Mine is not planned for closure until 2033.

Condition 64(g), Schedule 3 of Development Consent (SSD-6764) requires the RMP to describe measures that would be implemented to address all aspects of rehabilitation including mine closure, final landform (including final voids), biodiversity values and final land use. **Table 3** outlines where the rehabilitation regulatory requirements are addressed in this MOP regarding mine closure.

The strategies and planning set out in the MOP, with respect to mine closure, reflect the current early stages of mine development and will be reviewed in consultation with all relevant government and community stakeholders during the life of the mine as strategies and planning mature and develop further. This will allow the MOP to be used as a dynamic document that can be continually improved over the life of the mine. The conceptual MCP will be reviewed and updated accordingly during the MOP term.

1.4.1 Community Consultation

In preparation of this MOP, WCPL completed consultation with the Community Consultative Committee (CCC)⁹ as summarised in **Table 8**. Mining operations and mine planning approval are discussed during quarterly CCC meetings which are held in accordance with Development Consent (SSD-6764) and the Guidelines.

During the CCC meeting held on the 27 February 2017, WCPL provided information to the members regarding the Mine's intentions of preparing of a new MOP to align with the WEP, subject to approval of the WEP.

During the CCC meeting held on the 15 May 2017, WCPL provided information to the members regarding the Mine's intentions to revise environmental management plans to align with the WEP, subject to approval of the WEP.

WCPL provides administrative support to assist with documenting and distributing meeting minutes to all CCC members. The meeting is chaired by an independent chairperson appointed by the Director-General of the DP&E. The outcomes of the CCC meeting are reported in the Annual Review (AR), formally known as the Annual Environmental Management Report (AEMR), and the meeting minutes, along with the AR are posted on the Peabody website.

WCPL also actively consults with the registered Aboriginal stakeholders. This has been done through the formal consultation process during the WEP and quarterly Native Title and Registered Aboriginal Parties Consultation Committee (RAPCC) meetings and development of the WEP Aboriginal Cultural Heritage Management Plan¹⁰. Current and proposed mining operations are discussed at these meetings.

⁷ Condition 1, Schedule 5 of Development Consent (SSD-6764)

⁸ Condition 12, Schedule 5 of Development Consent (SSD-6764)

⁹ Condition 5, Schedule 7 of Development Consent (SSD-6764)

¹⁰ Condition 47, Schedule 3 of Development Consent (SSD-6764)

2.0 Proposed Mining Activities

2.1 Project Description

The Mine originally operated under Project Approval (PA 05-0021) that was granted by the Minister for Planning under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) on 1 February 2006. On 24 April 2017, WCPL was granted Development Consent (SSD-6764) for the Wilpinjong Extension Project (WEP) that provides for the continued operation of the Mine at rates of up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) out to 2033, and access to approximately 800 hectares (ha) of open cut extensions. Development Consent (SSD-6764) has superseded the Project Approval (Project Approval 05-0021).

The mining sequence and rate of mining would continue to be subject to review on the basis of market conditions and customer demand, coal quality or unforeseen changes to mining conditions. No mining will occur during this MOP term in WEP approved areas within MLAs¹¹ until the relevant MLs have been issued and this MOP is amended and approved by the DRG.

An indicative mining sequence within Open Cut Pits 1, 2, 3, 4, 5, 6 and 7 during the MOP term are provided in **Plans 3A – 3B**. However, the mining sequence within the approved open cut extents will continue to be subject to periodic revision over the life of the mine. Any variation of the mining sequence as described in this MOP would require WCPL to amend the MOP as required by the Guidelines and in consultation with the DRG.

The mining operation uses bulk push dozers and hydraulic excavators to mine coal and overburden in a strip mining configuration and operates 24 hours per day, seven days per week. Steady state mining consists of a combination of truck and excavator mining and dozer bulk pushing of blasted overburden into the previous strip void, followed by the removal of coal and interburden (**Section 2.3.3**). Coal and interburden are mined in a similar manner to the overburden where dozers are used to rip and push the coal/interburden, followed by truck loading using excavators. Some interburden and coal blasting is also required (**Section 3.4.9**), depending on the thickness and hardness of the material. Overburden and interburden that is not bulk pushed with dozers is hauled into the previous strip void using haul trucks.

ROM coal is mined at a rate up to 16 Mtpa and transported by haul trucks along internal haul roads to the ROM pad where it is directly dumped into the ROM hoppers or is temporarily stockpiled and then rehandled to the hopper. ROM coal will either be washed at the CHPP or where required by-passed to the product stockpile and then loaded onto train carriages via the rail load facility (**Section 2.3.5**).

CHPP rejects consist of fine rejects and slimes, as well as coarse rejects. Fine rejects and slimes from the thickener are dewatered in the tailings filter press to allow co-disposal of tailings with coarse rejects and to increase water efficiency. The tailings filter press has been operational since April 2015. Coarse and fine CHPP rejects are hauled back to the mining operation and deposited below the natural surface in the mine voids. When the tailings filter press is not operational (e.g. scheduled maintenance or breakdown) tailings are directed to purpose-built tailings storage facilities (i.e. TD6 and TD7 when built) constructed within mine voids, or may alternatively be transferred to temporary holding and dewatering cells to be constructed in the vicinity of the CHPP to allow subsequent co-disposal with the coarse rejects within the mine voids, as described above. Onsite maintenance and servicing of heavy mining equipment is also undertaken at the Workshop (located within the Mine Facilities Area in **Figure 3**) and in the field as required.

¹¹ The WEP extends into three new Mining Lease Applications (MLA) areas within both EL 6169 and EL 7091 (**Figure 2**). WCPL has lodged MLAs with the DRG (within the NSW Department of Planning and Environment) for the WEP development areas outside of the existing ML. WCPL will also renew existing ELs and ML 1573 as required during the life of the Mine.

As discussed with the DRG on the 5 June 2017, WCPL will amend this MOP and associated MOP Plans accordingly after receiving official confirmation from the DRG the MLAs have been converted into a Mining Lease (ML) and new MLs have been issued to WCPL.

2.2 Asset Register

WCPL have developed an asset register (**Table 9**) of major infrastructure within the Mine's Primary Domains (**Plan 2**). Details regarding the Mine's domains are provided in **Section 5.1**. **Table 9** summarises each Primary Domain that includes the domain area, a description of the major infrastructure within the domain and general comments regarding infrastructure construction details.

Table 9 Major Infrastructure within Primary Domains

Primary Domains	Total Area (ha)	Major Infrastructure Assets	Area/ Length	Summary of activities at Mine Closure
Constrained Infrastructure Areas (Domain 1)	76.5	Rail loop	3100m	Steel rails, ballast , concrete sleepers
		Main Workshop (3 Bays)	3966m ²	Break up and remove concrete slab. Demolish steel framework and metal sheeting
		Main Workshop (2 Bays)	647m ²	Break up and remove concrete slab. Demolish steel framework and metal sheeting
		Heavy Vehicle Wash-down	362m ²	Break up and remove concrete slab and sump
		Demountable buildings (Bathhouse, Admin, etc.)	1480m ²	Pier footings, relocatable buildings, concrete pathways and cover areas.
		Power lines	3.95klm	Disconnect overhead 11kV, 33kV & remove poles and wires
		Substation/s	1764m ²	Disconnect supply and remove substation
		Sewage treatment facilities	120m ²	Disconnect tanks and remove facility
		Employee car park	6000m ²	Break up and remove bitumen and road base
		Refuelling facility	737m ²	Remove above ground tanks and concrete bunding and concrete slabs
		Mine entry road	3200m	Break up and remove bitumen and road base
		Meteorological tower	30m	Remove tower and disconnect supply
		Employee car park	1984m ²	Break up and remove road base (unsealed)
		Reverse Osmosis (RO) Plant	2587m ²	Demountable buildings, RO housed within shipping containers, hardstand area unsealed
		Haul Roads	551160m ²	Remove coal reject material from haul roads into emplacement areas within the Mine
Mine Infrastructure (Domain 2)	182.2	Boiler Maker Shed	242m ²	Break up and remove concrete slabs. Demolish steel framework and metal sheeting
		Power Lines	2914	Disconnect overhead 11kV, 33kV & remove poles and wires
		Water Pipelines	46567m	Remove surface poly pipe lines (150mm – 300mm diameter)
Coal Handling Preparation Plant (Domain 3)	63.6	Coal product stockpile	100095m ²	Approximate coal pad depth at 300mm. Remove all carbonaceous material
		ROM stockpile	375924m ²	Approximate coal pad depth at 300mm. Remove all carbonaceous material
		Belt Press Filter Plant	488.25m ²	Break up and remove concrete slabs. Demolish steel framework and metal sheeting
		CV- 1764 (to BPPF)	64m	Break up and remove concrete pier slabs. Demolish steel framework and metal sheeting
		Conveyors/gantries	4357m	Break up and remove concrete pier slabs. Demolish steel framework and metal sheeting
		Coal Reject Bin	246m ²	Break up and remove concrete pier slabs. Demolish steel framework and metal sheeting

Primary Domains	Total Area (ha)	Major Infrastructure Assets	Area/ Length	Summary of activities at Mine Closure
		Rail Load Out Bin	115m ²	Break up and remove concrete pier slabs. Demolish steel framework and metal sheeting
		CHPP	16182m ²	Break up and remove concrete pier slabs. Demolish steel framework and metal sheeting
		ROM Bin 1/Crusher	153m ²	Break up and remove concrete slabs. Demolish steel framework and metal sheeting
		ROM Bin 2/Crusher	215m ²	Break up and remove concrete slabs. Demolish steel framework and metal sheeting
		Pipelines	-	Captured by the other pipes section above
		Power lines	2500m	Disconnect overhead 11kV, 33kV & remove poles and wires
		Reclaim tunnel	250m	Break up and remove concrete reclaim tunnel
		Sub station	1764m ²	Disconnect supply and remove substation
		Water Tanks (small) x 2	36.54m ²	Remove potable water tanks <5m
		Thickener (large) x 1	314m ²	Demolish steel construction
		Clean Water Dam (Rail Loop)	2.0ha	Drain and remove sediments for post closure water management purposes.
		Dirty Water Dam	20.5ha	Drain and backfill to complement final landform
		Pit 2 West Dam (Pit 2)	1.3ha	Drain and backfill to complement final landform
		Lime Silo	152m ²	Break up and remove concrete slabs. Demolish steel framework and metal sheeting
		Emergency response shed	233m ²	Break up and remove concrete slabs. Demolish steel framework and metal sheeting
Mine Water Dams (Domain 4)	39.4	Pit 1 South Dam (Pit 1)	3.5ha	Drain and backfill to complement final landform
		CHPP Dam	5.6ha	Drain and backfill to complement final landform
		Ed's Lake	6.5ha	Drain and backfill to complement final landform
		TD1 & TD2 (Pit 1)	15.6ha	Both TD1 & TD2 rehabilitated
		TD3, TD4, TD5 (Pit 2)	25.3ha	TD3 capped awaiting rehabilitation; TD4 rehabilitated; TD5 under consolidation
		TD6 (Pit 2)	9.4ha	Active status: when at capacity TD6 will go under consolidation/ capping/rehabilitation

2.3 Activities Over the MOP Term

2.3.1 Exploration

WCPL will undertake exploration and prospecting activities across the Mine's tenement areas (**Table 10**) for the purposes of geological, geotechnical and hydrogeological investigations during the MOP term. The techniques used for exploration and prospecting include, but are not limited to:

- Aerial photograph interpretation;
- Field mapping and surveying;
- Core and non-core drilling allowing for lithological, coal quality and geophysical analysis;
- Gas evaluation;
- Magnetic surveys & seismic surveys; and
- Excavation, trenching and bulk samples.

Table 10 WCPL Proposed Exploration Program During the MOP Term

Year*	Exploration Interests	Mining Tenements and Proposed Exploration Holes			
		ML1573	EL6169	EL7091	Total
2017	Coal Quality	1	4	3	8
	Field Mapping & Geophysical Surveys	Yes	Yes	Yes	-
	Structural Definition	6	-	20	26
	Igneous Definition	4	-	-	4
	Palaeo Definition	67	-	-	67
2018	Coal Quality	2	1	3	6
	Field Mapping & Geophysical Surveys	Yes	Yes	Yes	-
	Structural Definition	10	-	10	20
	Igneous Definition	-	-	12	12
	Palaeo Definition	50	-	-	50
2019	Coal Quality	1	2	1	4
	Field Mapping & Geophysical Surveys	Yes	-	Yes	-
	Limit of Oxidation	-	-	25	25
	Structural Definition	5	-	10	15
	Palaeo Definition	10	-	15	25

Notes: * Based on calendar year

WCPL may be required to establish temporary access tracks, sumps and drill pads to carryout exploration activities. A review of the potential environmental, Aboriginal and European heritage issues are completed through the Ground Disturbance Permit (GDP) process. A fully completed GDP must be in place prior to any ground disturbance activities commencing. A copy of a GDP is provided in **Appendix 6**.

Following the environmental review process as required by the GDP, the proposed disturbance footprint will be prepared using small earthmoving equipment to allow for the work to be undertaken safely and in a manner that minimises environmental impacts. These works will continue to comply with DRG's *ESG5: Assessment Requirements for Exploration Activities* and/or other relevant guidelines.

Following the completion of exploration and prospecting activities, bore holes will be decommissioned in accordance with DRG's relevant guidelines. All disturbed areas including access tracks, sumps and drill pads will be rehabilitated if future disturbance is not proposed. An exploration report will be provided to the DRG annually in accordance with ML 1573 and EL 6169 and EL 7091.

As a result of the WEP, approximately 95Mt of additional ROM coal will be added to the expected life of the Mine. As at 30 June 2014, the remaining proved and probable open cut ROM coal reserves in ML 1573, EL 7091 and EL 6169 were approximately 198 Mt.

Ongoing exploration activities within ML 1573 and the surrounding EL 6169 and EL7091 to investigate the coal resource within WCPL's tenement areas will continue during the MOP term. These exploration activities and feasibility studies will continue throughout the MOP term and where applicable the necessary environmental approvals will be sought. Subject to the granting of any future approval for additional mining areas the MOP would be updated to reflect these changes.

As identified in the groundwater monitoring program and Groundwater Management Plan (GWMP)¹², WCPL would seek to expand its existing groundwater monitoring network by utilising specific exploration boreholes where applicable in consultation with WCPL's groundwater specialist.

2.3.2 Construction

The majority of the Mine's facilities were constructed in 2006 and 2007, including the office administration complex, ROM pad, Coal Handling and Preparation Plant (CHPP) rail spur, rail loop and rail loading infrastructure (**Figure 2 & Figure 3**). Additional infrastructure construction activities have occurred as required over the life of the mine, with significant CHPP upgrades occurring following approval of the Mining Rate Modification in September 2010. In 2012 and 2013 a reverse osmosis (RO) plant and a new workshop were constructed, and major mobile plant items associated with the new owner operator fleet were assembled on-site (**Figure 3**). The tailings filter press has been operational since April 2015 and a lime silo to buffer process water at the CHPP was commissioned in early 2017.

Construction/development activities as identified in the WEP would require the relocation of some existing public and private infrastructure and the development of general facilities and infrastructure in support of mining during the MOP term include:

- Extension of Ulan-Wollar Road relocations and associated rail crossing;
- Extension to relocations of local electrical transmission lines (ETLs) and services;
- Relocation of the TransGrid Wollar to Wellington 330 kV ETL;
- Extension/construction of the Pit 3 to Pit 8 haul road;
- Development of satellite ROM pads; and
- Development of satellite mine infrastructure areas and assembly of mobile equipment.

Construction/development activities would generally be restricted to daylight hours up to seven days a week. Additional mobile equipment would be required for short periods during the WEP's Project construction activities. The number and type of equipment would be expected to vary depending on the activity being undertaken. Consideration of construction/development activities and their potential for noise generation and air quality impacts were considered in the Noise and Blasting Assessment and Air Quality and Greenhouse Gas Assessment of the WEP EIS.

Construction/development activities that would progressively occur to support normal mining activities over the MOP term include:

- Progressive development and augmentation of dams, pumps, pipelines, up-catchment diversions, drains, storages, pollution control equipment and other water management equipment and structures;
- Progressive development of haul roads, light vehicle access roads and services;
- Relocation of public infrastructure and services (as described above);
- Construction and installation of ancillary infrastructure (e.g. internal roads, electrical infrastructure, potable water supply, sewage treatment facilities, site communications, fuel storage and refuelling areas remote crib huts and security);
- Replacement and/or upgrades to open cut mining and coal handling and processing machinery; and
- Installation or replacement of environmental monitoring equipment required for environmental management plans.

Other specific construction activities currently planned within the MOP term include:

- Upgrades to existing water treatment facility, including ultrafiltration;
- Construct tailings storage facility (TD7);
- Construction of a light vehicle workshop;

¹² The GWMP is a component plan of the Water Management Plan (WMP) as required by Condition 30(iv), Schedule 3 of Development Consent (SSD-6764).

- Construction of the Elevated Waste Dump in Pit 2 (up to 450m AHD then back to 430m AHD);
- Visual bunds up to approximately 3m above existing surface level along select pit boundaries.

2.3.3 Mining Operations

2.3.3.1 Mining Equipment Fleet

Open cut mining at WCPL during the MOP term is to be carried out primarily with dozers, loaders, hydraulic excavators and trucks. The equipment is sized to provide maximum flexibility and minimise coal losses. The estimated number of each equipment type to be used during the MOP term is presented in **Table 11**; however this may vary during the term of the MOP based on production requirements.

Table 11 Open Cut Mining Fleet

Mining Equipment Description	Make and Model	Number of Fleet
Excavator (overburden/coal)	R9350	4
	R9400	1
	R996B*	1
Haul Trucks (overburden/coal)	CAT 789	25
	CAT 793*	5
Dozers (open cut pit/product stockpile)	CAT D9*	2
	CAT D10	6
	CAT D11	12
	CAT 854 G Wheel	1
Front End Loader	CAT 993K	1
	CAT 994K	2
Grader	CAT 16M	4
	CAT 24M*	1
Water Trucks	Haulmax 3900	3
	18,000 Ltr Water Cart	2
	CAT 773 Water Cart	1
Drill Rig	ROCD65	3
	PitViper235	2
Scraper	CAT 637	2
Tyre Handler	MHT10180T	2

Note: *Subject to further noise assessment and modelling to ensure compliance with WEP noise assessments, prior to commissioning equipment on site.

2.3.3.2 Geotechnical Information Supporting Design Criteria

The shallow nature of the coal reserve provides for safe and more easily managed highwall, endwall and low-wall batters. The low strip ratio (i.e. 2:1 – 4:1) means that the total average depth of pits is between approximately 20-35 m. The highwall and endwall batters will be battered to approximately 70 degrees.

The low wall batters will be established using excavators and will be battered to 45 degrees from the toe of the coal seam. Where practicable the final coal seam will be excavated in retreat towards the coal haulage ramp to allow for safe extraction of the seam with minimal coal loss.

2.3.3.3 Mining Sequence

The indicative mining schedule and sequence of open cut mining operations will be undertaken in Pits 1, 2, 3, 4, 5, 6 and 7 during the MOP term as provided in MOP **Plans 3A – 3B**. Conventional open cut mining methods are used at the Mine, with a low strip ratio allowing for relatively rapid pit advance. The general sequence of open cut mining within the nominated Pits is as follows:

- Vegetation clearance and removal (including mulching);
- Topsoil/subsoil stripping by scrapers and/or dozers. Stripped topsoil is used directly in progressive rehabilitation or is placed in stockpiles for later re-use;
- Drilling and blasting of overburden, with some waste rock ‘cast blast’ into the adjacent mined-out strip;
- Dozer pushing of blasted overburden into the adjacent mined-out strip to expose the target seam, or removal with excavator and haul truck;
- Drilling and blasting plus ripping of coal/parting material;
- Mining of exposed coal seams by excavator and loading into haul trucks for transport directly to the ROM dump hopper or ROM pads;
- Interburden/parting material is then drilled and blasted, ripped, pushed or excavated and hauled to expose the underlying working coal sections
- Coarse rejects and tailings from the CHPP are selectively placed within mine voids, waste rock emplacements and approved tailing storage facilities
- Hauled overburden/interburden/parting material is strategically placed within mine voids and associated waste rock emplacements to develop the final landform
- Progressive (as as soon as reasonably practicable following disturbance) landform profiling and rehabilitation of mine voids and waste rock emplacements. In some areas, temporary rehabilitation is undertaken to stabilise landforms until further mining operations are carried out in the future.

The approximate annual volumes of stripped topsoil material, overburden, ROM coal, processing waste and product coal during the MOP term are provided **Table 12 (Section 2.3.10)**.

2.3.3.4 Vegetation Clearance and Topsoil/Subsoil Stripping

Approximately 404 hectares (ha) of vegetation would be progressively cleared over the MOP term. Specific vegetation clearance procedures are provided in **Section 3.3.5** and **Section 3.3.6**. The proposed disturbance areas during the MOP term, necessary for mining and construction related activities are provided on **Plans 3A – 3B**. The mitigation measures relevant to vegetation clearance activities as required by the RMP include the following:

- Surface salvage of known Aboriginal artefacts will be undertaken by a qualified archaeologist with assistance from representatives of the RAPs (refer to ACHMP);
- Completion of Ground Disturbance Permits (GDP) prior to disturbance;
- Wherever practicable, the clearance of vegetation would be undertaken progressively, with the area of vegetation cleared at any particular time generally being no greater than that required to accommodate projected development activities for the next 12 months;
- Where relevant, erosion and sedimentation controls are in place and consistent with the Water Management Plan;
- A Vegetation Clearance Protocol (VCP) has been developed to minimise the impact of the Mine vegetation clearance activities on flora. As a component of the protocol, pre clearance surveys will be completed to identify habitat trees and threatened fauna species. The proposed clearance areas will be delineated to prevent accidental damage to adjoining vegetation (**Section 3.3.6**);
- Topsoil resources will be identified, stripped and stockpiled for later use in rehabilitation (**Section 3.3.5**); and
- Where vegetation clearance is undertaken, timber will be mulched and used as a soil conditioner or salvaged for habitat creation on rehabilitation areas where practicable.

2.3.3.5 Drilling and Blasting

Overburden material that cannot be ripped or excavated by mobile plant will be drilled, including material being “cast blast” into the adjacent mined-out strip. Overburden drill holes will typically vary in depth from 5m to 40m. A mixture of ammonium nitrate fuel oil (AnFo) (dry holes) and emulsion blends (wet holes) are used at an average powder factor of approximately 0.4 kilograms per bcm. All blasts will comply with *Australian Standards (AS) 2187.2:2006 Explosives – Storage and Use – Use of Explosives* and the Blast Management Plan (BMgtP)¹³. For blasting criteria and blasting mitigation measures refer to **Section 3.4.9**.

2.3.3.6 Overburden and Coal Removal

Once the mining area is cleared of vegetation and the topsoil removed, the mining operation uses bulk push dozers and hydraulic excavators to mine overburden and coal in a strip mining configuration. Steady state mining consists of a combination of truck and excavator mining and dozer bulk pushing of blasted overburden into the void left by the previous strip. This is followed by the removal of coal and interburden. Mining strips are typically 60 - 70m wide and are oriented approximately east-west or north-south.

Coal and interburden are mined in a similar manner to the overburden. Dozers are used to rip and push the coal/interburden, which is then loaded into trucks using excavators. Some interburden and coal blasting is required, depending on the thickness and hardness of the material. Overburden and interburden that is not bulk pushed with dozers is hauled and dumped into the void behind the actively mined strip.

The ROM coal is transported by haul trucks along internal haul roads to the ROM pad where it is directly dumped into ROM hoppers for crushing or is temporarily stockpiled and then rehandled to the ROM hoppers.

2.3.3.7 Coarse Rejects and Tailings

The coarse coal reject material from the CHPP is hauled back to the mining operation and deposited below the natural surface in the mined-out voids as close to the pit floor as practically possible. Coarse reject material is dispersed throughout the overburden within the mine waste rock emplacements to manage its geochemical characteristics i.e. acid generation potential (**Section 2.3.4**).

Fine rejects and slimes from the thickener are dewatered in the tailings filter press to allow co-disposal of tailings with coarse rejects and to increase water efficiency. The tailings filter press has been operational since April 2015. Coarse and fine CHPP rejects are hauled back to the mining operation and deposited below the natural surface in the mine voids.

For further information regarding co-disposal of reject material, management of spontaneous combustion and potentially acid forming material, refer to **Section 2.3.3.10**, **Section 3.3.2** and **Section 3.3.3** respectively.

2.3.3.8 Rock/Overburden Emplacement

Mined waste rock (including overburden and interburden) would continue to be progressively placed in mine voids behind the advancing open cut operations, once the coal has been removed. A combination of temporary and permanent out-of-pit waste rock emplacements are located adjacent to the open cut mining operations (**Plans 3A – 3B**). Mine waste rock emplacements behind the advancing open cut are constructed to approximate the pre-mining topography. The waste rock emplacements would be progressively shaped (as soon as reasonably practicable following disturbance) by dozers for rehabilitation activities (i.e. re-contouring, topsoiling and revegetation). Some of the overburden is also utilised to construct internal walls for the tailings emplacements and visual bunds along select pit boundaries.

¹³ Condition 14, Schedule 3 of Development Consent (SSD-6764)

Final landform levels and topography of the backfilled mine landforms would generally approximate the pre mining topography, with some variations, and would be designed with an allowance for the long-term settlement of minor overburden.

The elevated waste rock emplacement in Pit 2 would be temporarily rehabilitated at a height of up to approximately 450 m AHD, before being reshaped and pushed down to a maximum elevation of approximately 440 m AHD at the end of the mine life as a component of finalising site landforms and slopes.

2.3.3.9 Progressive Rehabilitation

To minimise the area of disturbance at any one time, rehabilitation occurs progressively at the Mine as ancillary disturbance areas and final mine landforms become available for revegetation. The mine waste rock emplacements behind the advancing open cut would be constructed to approximate the pre-mining topography or the final landform approved by Development Consent (SSD-6764).

Mine waste rock emplacements would be shaped by dozer prior to the commencement of rehabilitation activities i.e. re-profiling, reapplication of topsoil/subsoil and revegetation and soil amelioration activities (**Section 5.3**).

2.3.3.10 Processing Residues and Tailings

The Mine produces both washed and unwashed coal products. The coal handling and processing infrastructure has been designed to accommodate the processing of raw coal and the handling of raw (bypass) and washed product coal.

ROM coal can be reclaimed at a rate of up to 1,600 tph from ROM Dump Hopper 1 and up to 1,400 tph from ROM Dump Hopper 2 to Sizing Station 1 and 2 respectively, via a feeder breaker. The broken coal is then screened, and if oversized, further crushed in separate sizers.

Sized coal less than 50 millimetres (mm) is transferred to either a raw coal stockpile or a product coal stockpile (bypass coal). Raw coal is reclaimed from the raw coal stockpiles and is fed to the coal preparation plant at up to 1,400 tph.

Sized coal is washed in the raw coal and desliming screens, with fine coal/slimes (less than 0.7 mm) fed to the fine coal circuit, washed medium coal (greater than 0.7 mm and less than 2 mm) fed to the medium coal washing circuit and washed coal (greater than 2 mm) fed to the coarse coal circuit.

The fine coal circuit separates coal fines from slimes and comprises cyclones, spirals, centrifuges, a screen and a tailings thickener. Tailings would be pumped from the tailings thickener to the tailings filter press, which would dewater the material to allow it to be conveyed to the reject bin.

The medium coal and coarse coal circuits comprise dense medium cyclones to separate the coarse rejects from the washed coal. The fine and coarse rejects from the CHPP are then combined for co-disposal as a component of general ROM waste emplacement operations.

Coal products from the CHPP are conveyed to the domestic and export product stockpiles for subsequent reclaim and loading to trains. The CHPP operates up to 24 hours per day, seven days per week.

2.3.3.11 Product Coal Transport

A train loading facility capable of loading coal at a rate of approximately 4,500 tonnes per hour is located at the head of the rail loop within the mine infrastructure area (**Figure 3**). Coal is reclaimed from load out conveyors that run the length of the product coal stockpiles.

Product coal is loaded onto trains 24 hours per day, seven days per week. No more than an average of six trains can be loaded each day and a maximum of 10 trains per day are loaded during peak coal transport periods. Coal is railed east to domestic power generation customers or to the Port of Newcastle for export. No coal is railed west of the Mine.

2.3.3.12 Coal Reject Management

The tailings produced from the CHPP consist of fine rejects and slimes from the thickener. Fine rejects and slimes from the thickener are dewatered in the tailings filtration plant to allow co-disposal of tailings with coarse rejects and to increase water efficiency. The tailings filtration plant has been operational since April 2015. Coarse and fine CHPP rejects are hauled back to the mining operation and deposited below the natural surface in the mine voids.

Tailings would continue to be pumped as a slurry and deposited in purpose-built tailings storage constructed within mine voids (including TD6 and TD7 when built) when the tailings filter press is not operational (or directed to temporary holding cells near the CHPP). Where relevant, once tailings dams are at capacity, they are progressively capped with overburden material to a minimum depth of cover of 2 metres (m) prior to final profiling and rehabilitation.

The disposal of CHPP rejects at the Mine would continue to be managed in accordance with the approved Life of Mine Tailings Management Strategy with appropriate updates to reflect the operation. CHPP rejects (including dewatered tailings) would continue to be used to infill the mine voids behind the advancing open cut operations.

PAF coarse rejects would be managed in the same way as PAF and PAF-LC waste rock, i.e. blended with NAF or acid consuming waste rock, producing an overall NAF material or encapsulated with NAF waste rock. The PAF tailings would continue to be managed in such a way as to minimise potential oxidation during disposal, including lime dosing if required when disposal occurs irregularly to dedicated tailings storage facilities.

Any PAF or PAF-LC material would be placed at least 2 m below the surface of the backfilled mine void landform and at least 5 m below the surface of the elevated waste rock emplacement in Pit 2.

2.3.4 Waste Management

WCPL has prepared and implemented a Waste Management Plan. The key waste streams comprise:

- Waste rock (as described in Sections 2.3.3.8);
- CHPP rejects (as described in Section 2.3.3.7 and 2.3.3.12);
- Sewage and wastewater;
- Recyclable and non-recyclable wastes; and
- Other wastes from mining and workshop activities (e.g. scrap metal, used tyres, waste hydrocarbons and oil filters).

In addition, WCPL would continue to dispose of both on and offsite inert waste from demolition of Peabody owned dwellings and structures in the waste rock emplacements in accordance with existing approvals and the Waste Management Plan.

WCPL have engaged an appropriately licensed waste management contractor to perform the following activities in relation to waste management, including but not limited to;

- On-site waste management;
 - Waste segregation of scrap steel, general waste, recyclables, hydrocarbons and hazardous materials.
- Off-site disposal to licensed waste facilities;
- Off-site recycling to licensed waste centres; and
- Recording and reporting waste volumes.

The sewage treatment¹⁴ and disposal facilities at the Mine currently include five aerated sewage treatment and pumping systems that discharge via an irrigation sprinkler system to within the rail loop and rehabilitation areas near remote crib huts and the CHPP. These facilities are currently serviced

¹⁴ WCPL also currently also have an additional 3 remote portable crib huts. The sewage and disposal is serviced by JR Richards.

regularly by a licensed contractor as required. This is undertaken in accordance with Condition O4 of EPL 12425.

Various waste materials are collected and sorted for recycling including paper, cardboard, metals, glass, air filters, oil filters, waste oil, waste grease, oil rags and hydraulic hoses by WCPL licensed waste contractor. In accordance with EPL 12425, WCPL can dispose up to 350 tonnes of waste tyres per annum on-site within mine void waste rock emplacement areas.

WCPL have developed a number of procedures and controls to minimise the potential to cause land contamination including:

- Handling, storage and disposal procedures for wastes;
- Handling, storage procedures for hazardous materials (**Section 3.4.6**);
- Pollution incident reporting (**Section 3.2.2**); and
- Spill response and remediation procedures.

In the event hydrocarbons have contaminated soil material as a result from spillages for example, the contaminated material will either removed from site by WCPL licensed waste contractor to an appropriate licensed facility for treatment or removed to WCPL's on site bioremediation area for remedial treatment. The bioremediation area is located within the open cut Pit 1. The material is disposed of within active waste emplacement areas only after the material has been successfully remediated. Contamination assessments of the Mine site during the mine closure phase will be carried out as described in **Section 5.3.1**.

2.3.5 Hazardous Materials

Hazardous reagents and explosives required for the Mine will be transported in accordance with the appropriate regulations under the NSW *Dangerous Goods (Road and Rail Transport) Act, 2008*. These regulations apply versions of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) (National Transport Commission, 2007). Explosives, including explosive precursors, will be managed in accordance with the NSW *Explosives Act, 2003* including a Security Plan developed in consultation with the explosives contractor for the Mine. All persons working with or having access to explosives will be licensed in accordance with the *Explosives Act, 2003*. Detonators and boosters are stored on-site in a purpose built compliant facility. Bulk explosives will only be mixed using a Mobile Manufacturing Unit within the blasting hole.

Bulk ammonium nitrate (AN) and emulsion are stored on-site during the loading process and mixed using mobile manufacturing plants before being delivered down the blast holes.

Hydrocarbons used on-site for the Mine include diesel, oils, greases and degreaser. Hydrocarbon storage facilities are designed, located, constructed and operated in accordance with AS 1940:2004. The storage and handling of flammable and combustible liquids and *NSW Work Health and Safety Act, 2011*. This will include the use of re-locatable self-bunded double skinned storage tanks when required.

Waste hydrocarbons will be collected, stored and removed by licensed waste transporters. The workshop infrastructure includes waste oil extraction equipment for efficient removal of waste oil during machinery servicing. Runoff from the workshop floor and apron, refuelling pads and truck washdown area pass through a purpose built oil/water separator system which is inspected and maintained on a regular basis. Oily water from the oil/water separator is removed from site by WCPL licensed waste contractor.

WCPL operate *ChemAlert*, a comprehensive tracking, storage and chemical information management system. No chemical or hazardous material will be permitted on-site unless a copy of the appropriate Safety Data Sheet (SDS) is available. All chemicals brought on-site will be recorded in a register which will identify the type of product, dangerous goods class, liquid class, hazardous chemical class and the quantity held on-site. The inventory register will also identify the compatibility of materials and the emergency response procedures in the event of a spill.

Chemical storages will be provided within the workshop and storage buildings and will be separated according to chemical type and storage requirements. Notifications, placarding and preparation of safety plans will be in accordance with the *WorkCover Guideline for Dangerous Goods*.

2.3.6 Decommissioning and Demolition Activities

There is no scheduled decommissioning and/or demolition activities planned for mine related major infrastructure during the MOP term. Decommissioning phases will generally involve the consolidation of tailings dams prior to capping and rehabilitation and the relocation of mobile crib huts and other satellite mine infrastructure for example.

WCPL will continue to undertake a range of renovating, building and demolition works of former residential and farm buildings located on Peabody owned lands. As a component of this work a range of building and demolition waste materials would be produced that will require disposal. Subject to approvals being obtained, the inert portion of these wastes would be disposed at depth in the Mine waste rock emplacements (e.g. at least 5m below the final landform surface). WCPL has protocols in place for classification of waste materials during building and demolition works. Any material not classified as inert would be collected and disposed by an appropriately licensed contractor.

The on-site disposal of this waste would correspondingly reduce waste disposal rates at the MWRC landfill site and heavy vehicle movements associated with transporting the building waste on public roads for disposal.

2.3.7 Temporary Stabilisation

Temporary rehabilitation is undertaken to stabilise landforms until further mining operations are carried out in the future. The Elevated Waste Rock Emplacement area will have the outer batters temporally rehabilitated (when completed) to minimise erosion prior to the emplacement area being fully rehabilitated. WCPL will review potential waste rock emplacement areas that may benefit from temporary stabilisation works during the MOP term.

2.3.8 Progressive Rehabilitation & Completion

Rehabilitation activities during the MOP term will primarily be undertaken in Domain 5 and Domain 6. At the completion of the MOP term, a total of 180.5ha of waste rock emplacement areas will be rehabilitated. Progressive rehabilitation of waste rock emplacement areas are identified in MOP **Plans 3A – 3B (Section 7.2)**.

During the MOP term, WCPL are scheduled to rehabilitate waste rock emplacements areas located in Pit 1, Pit 2, Pit 3, Pit 4, Pit 5, Pit 7 and rehabilitate TD3. The method of capping tailings dams prior to rehabilitation activities commence are detailed in **Section 2.4.10**. Further details regarding the rehabilitation activities during the MOP term are provided in **Section 7** of this MOP.

2.3.9 Material Production Scheduled during MOP term

As outlined in **Section 2.4.3**, the indicative mining schedule and sequence of open cut mining operations will be undertaken in Pit 1, Pit 2, Pit 3, Pit 4, Pit 5, Pit 6 and Pit 7 during the MOP term, as displayed in **Plans 3A – 3B**. An indicative material production schedule during the MOP term is provided in **Table 12**.

Table 12 Material Production Schedule during the MOP Term

Material Production Schedule during the MOP term			
Material	Unit	Year 1 (2017/2018)	Year 2 (2018/2019)
Stripped Topsoil	Mbcm	0.45	0.56
Rock/Overburden	Mbcm	41.0	47.5
ROM Coal	Mt	15.4	15.9
Coarse Reject Material	Mt	1.6	1.7
Tailings	Mt	0.20	0.25
Product Coal	Mt	13.3	13.8
Co-disposal Rejects	Mt	1.8	1.9

3.0 Environmental Issues Management

3.1 Environmental Risk Assessment

SLR Consulting Australia (SLR) was engaged by Peabody Energy Australia (PEA) to facilitate an Environment & Community (E&C) Broad Brush Risk Assessment (BBRA) workshop for Wilpinjong Coal Mine. The risk assessment was conducted in accordance with the Australian Standard AS/NZS ISO 31000:2009 Risk Management – Principles and Guidelines, and the Peabody Hazard Identification and Risk Management Standard (PEA-S&H-STD-001.3). The E&C BBRA workshop was held on 16 October 2016. A MOP specific risk assessment was also completed on the 12 May 2017.

The E&C BBRA workshop and the MOP risk assessment identified a number of potential environmental and community risks to the existing approved mining operation, with a particular focus of identifying risks relevant to the preparation of this MOP. **Table 13** provides a summary of key environmental and community risks that were identified and assessed and the section of the MOP where their management measures are addressed. A summary from the E&C BBRA is provided in **Appendix 4**.

WCPL have developed specific environmental management plans (**Section 3.2**) that have considered the potential environmental and community risks identified through such risk assessment processes, and describe the necessary controls to manage those identified risks. Note that all residual risks were acceptable/as low as reasonably practicable with the implementation of appropriate controls.

As a result of the WEP (i.e. Development Consent SSD-6764), WCPL were currently reviewing all required management plans to align with the WEP and SSD-6764, for resubmission and approval at the time of preparing this MOP.

Table 13 Key Environmental & Community Aspects from Risk Assessments

Key Environmental & Community Aspects Assessed	Potential Consequence and/or Hazard	Section addressed in MOP
Aboriginal Cultural Heritage	Accidental damage or loss of Aboriginal Cultural Heritage	Section 3.4.12
Approvals & Permitting	Non-compliances with operating approval conditions (SSD-6764) and EPL	Section 3.2
Blasting	Blasting at the mine exceeds criteria or results in a complaint	Sections 3.4.9
Dust/Air Quality	Mine generated dust that exceeds criteria or results in a complaint	Section 3.4.12
Erosion & Sediment Control	Pollution of surface water and breach of environmental protection licence (EPL)	Section 3.4.4
Flora & Fauna	Legislation and site procedures breach from unauthorised clearing, change in final land use	Section 3.3.6
Hazardous Materials & Dangerous Goods	Contamination or pollution events and breach of EPL and legislation	Section 3.4.6
Historic (European) Heritage	Damage or destruction of European heritage sites	Section 3.4.13
Reject Management	Rehabilitation and mine closure impacts as a result from spon comb and AMD.	Sections 3.3.2 & 3.3.3
Monitoring & Reporting	Non compliance with reporting requirements for the Project	Section 8.0
Noise	Mine generated noise that exceeds criteria or results in a complaint	Section 3.4.10
Rehabilitation & Mine Closure	Unstable landform, poor drainage and failure to meet lease relinquishment	This document

Key Environmental & Community Aspects Assessed	Potential Consequence and/or Hazard	Section addressed in MOP
Spontaneous Combustion	Spontaneous combustion of carbonaceous material	Section 3.3.2
Stakeholders	Inadequate consultation leads to negative community perception	Section 1.4
Topsoil	Loss of topsoil resource from poor storage, handling and maintenance	Section 3.3.5
Visual Impact	Poor rehabilitation outcomes and increased mining footprint	Section 3.4.11
Waste Management	Inappropriate waste disposal resulting in a EPL and legislative breaches	Section 2.3.4
Water	Pollution to surface and groundwaters and poor final void water quality. Flood water ingress into the mine as a result of a 100 year flood event.	Sections 3.3.4

3.2 Environmental Risk Management

An Environmental Management Strategy (EMS) has been developed as required by Development Consent (SSD-6764). Environmental management at the Mine also encompasses a range of environmental management plans (EMPs)¹⁵ and monitoring systems which have been developed in consultation with various government agencies and to the satisfaction of the Secretary of the DP&E.

The EMPs have prepared to address the relevant Development Consent (SSD-6764) conditions and detail environmental monitoring programmes and control strategies for identified environmental and community risks. The Mine currently operates under a number of existing EMPs and monitoring programmes, including but not limited to:

- Environmental Management Strategy (EMS);
- Noise Management Plan (NMP);
- Blast Management Plan (BMgtP);
- Air Quality Management Plan (AQMP);
 - Spontaneous Combustion Management Plan (SCMP);
- Water Management Plan (WMP), including:
 - Cumbo Creek Relocation Plan;
 - Site Water Balance (SWB);
 - Surface Water Management Plan (SWMP); and
 - Groundwater Monitoring Management Plan (GWMP).
- Biodiversity Management Plan (BMP);
- Aboriginal Cultural Heritage Management Plan (ACHMP)
- Historic Heritage Management Plan (HHMP)
- Rehabilitation Management Plan (RMP)¹⁶; and
- Social Impact Management Plan (SIMP).

Appendix 5 contains the current approved WCPL management plans and monitoring programmes relevant to the MOP as required under Development Consent (SSD-6764). As discussed with the DRG and DP&E (**Section 1.4**), this MOP will be amended and resubmitted for approval subject to the issuing of MLs and approval of the revised and new management plans required by Development Consent (SSD-6764).

¹⁵ All relevant EMPs as required under SSD-6764 were under review and resubmission at the time of preparing this MOP

¹⁶ The Mine Operations Plan (MOP) may be used to address the requirements of the Rehabilitation Management Plan required under this condition. However, the MOP must clearly document how the requirements of this condition have been met (**Section 1.2**)

3.2.1 Community Complaints

A protocol for the management and reporting of complaints has been developed as a component of the Mine EMS. In accordance with Condition M6.1 of EPL 12425, WCPL maintain a dedicated telephone number (**1300 606 625**) for the provision of comments or complaints. In addition, a separate hotline for blasting information is also maintained by WCPL (**1800 649 783**).

In accordance with Condition M6.2 of EPL 12425, these telephone lines are advertised in local newspapers quarterly, via the Wilpinjong Community Newsletter and on the Peabody website <https://www.peabodyenergy.com/Operations/Australia-Mining/New-South-Wales-Mining/Wilpinjong-Mine/Approvals,-Plans-Reports>

WCPL records and responds to all complaints and maintains a complaints register on its website. The complaints are managed in accordance with the WCPL Complaints Management Procedure. The Complaints Management Procedure outlines WCPL reporting requirements as follows:

- A summary of complaints received is reported monthly on the Peabody website;
- A summary of complaints received and actions taken is presented to the CCC as part of the operational performance review; and
- A summary of complaints received and actions taken is included in the Annual Review and the EPL Annual Return.

3.2.2 Pollution Incident Response Management Plan

A Pollution Incident Response Management Plan (PIRMP) has been prepared by WCPL, as holder of Environment Protection Licence No.12425 (EPL 12425) in accordance with Part 5.7A of the *Protection of the Environment Operations Act 1997* (POEO Act) and Part 3A of the *Protection of the Environment Operations (General) Regulation 2009* (Regulation).

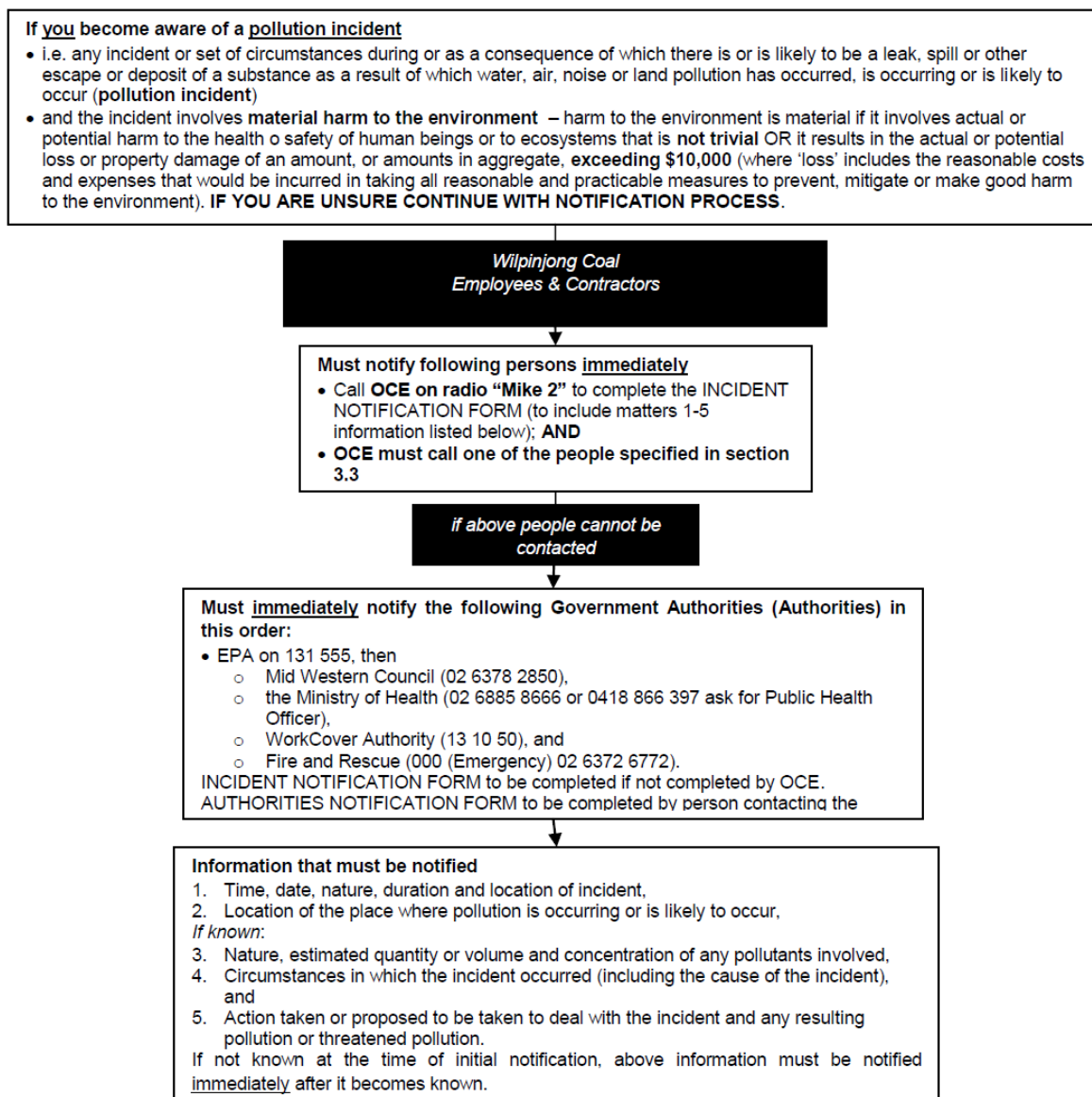
The PIRMP has been implemented by WCPL, including education of employees and contractors, in the event of a pollution incident at WCPL. In particular the PIRMP provides information regarding procedures for:

- The identification of a pollution incident;
- Notification of pollution incidents in certain circumstances; and
- Responses to pollution incidents by WCPL including all of its employees and contractors.

If a pollution incident occurs in the course of an activity at the premises so that *material harm to the environment* is caused or threatened (i.e. likely to be caused), Wilpinjong Coal will immediately implement this PIRMP (refer to **Figure 4** for notification process).

As required by the POEO Act and Condition 8, Schedule 5 of Development Consent (SSD-6764), a report to the Environment Protection Authority (EPA) and Secretary of DP&E must be prepared and submitted within 7 days of the incident.

Figure 4 PIRMP Notification Process



3.3 Specific Risk Relating to Rehabilitation

3.3.1 Geology and Geochemistry

WCPL completed a review of the geochemical properties of the Mine area and the WEP area in February 2015. *The Environmental Geochemistry Assessment of Overburden, Interburden and Coal Rejects (February 2015)* was undertaken by Geo-Environmental Management Pty Ltd (GEM).

The test work by GEM included acidity, sodicity, electrical conductivity (EC), acid base accounting, and element enrichment and solubility. The results from the GEM investigations concluded waste rock materials would typically be neutral to slightly alkaline, generally non-saline and is expected to be in the range from non-sodic to moderately sodic and acid forming (NAF).

The acid base accounting test work indicates however that a small quantity of interburden associated with the lower plies of the Ulan Coal Seam would be potentially acid forming – low capacity (PAF-LC) and coal from the Goulburn and Turill Seams¹⁷ would be potentially acid forming (PAF) or PAF-LC.

¹⁷ These seams are both considered to be uneconomic to mine and therefore, where they occur at the Project, would be excavated and disposed of with the waste rock.

The results from the GEM investigations were generally consistent with the results for the 2005 EIS, i.e. the overburden and interburden materials are expected to be non-saline and non-acid forming (NAF) and the coarse reject and tailings material produced from the CHPP is expected to contain some sulphur and is likely to have some capacity to be potential acid forming (low capacity) and be moderately saline (EIS, 2005).

Detailed description of the physical and chemical characteristics of the overburden, interburden, coarse reject and tailings materials is provided in Section 2 of WEP EIS.

The management strategies for spontaneous combustion and for potential acid generation material and saline material are described in **Section 3.3.2** and **Section 3.3.3** respectively.

3.3.2 Material Prone to Spontaneous Combustion

Spontaneous combustion events at the Mine have historically been associated with both ROM coal stockpiles and carbonaceous material located in temporary waste rock emplacements. While these events have been managed in accordance with the Spontaneous Combustion Management Plan (SCMP), they have at times resulted in perceptible odour and/or associated environmental complaints from nearby private receivers and/or users of Ulan-Wollar Road.

The coal stockpile spontaneous combustion events arose due to stockpiling of ROM coal for an extended period, and this is now avoided by close monitoring and priority washing of select ROM coal types after they have been stockpiled on-site for a designated period.

In June 2017, WCPL completed a review of the SCMP. As described in the SCMP, efforts for managing spontaneous combustion at the Mine will be focussed on prevention of outbreaks rather than management of outbreaks. The focus of spontaneous combustion management will be on reducing the risk of an outbreak. Mine planning is critical to the prevention and management of spontaneous combustion at the Mine.

Current measures for preventing outbreaks include mine planning, spontaneous combustion propensity testing, risk identification and assessment, and identification of potential hot spots. Mine planning considerations include:

- Placement and capping of carbonaceous material to minimise the potential for spontaneous combustion outbreaks;
- Placing higher-risk materials as low as practicable in the backfilled mine voids and elevated waste rock emplacement profiles
- Sealing exposed seams of non-active highwall faces with inert material (where exposed for an extended period); and
- Stockpile management.

WCPL has developed an inspection program for spontaneous combustion at the Mine. An inspection program of spoil emplacements, stockpiles and tailings emplacement areas has been implemented, based on visual and odour assessment, targeting cool moist periods when signs will be most visible, in accordance with the SCMP.

A management plan specific to the Keylah waste rock emplacement was developed and is appended to the SCMP. This plan was developed to facilitate the removal and disposal of carbonaceous material within the Keylah waste rock emplacement in a manner that minimises off-site odour and/or dust emissions. Staged removal of the Keylah waste rock emplacement commenced in October 2014 and is scheduled for completion in 2017. This work has been undertaken in consultation with relevant government agencies and the local community.

WCPL is conducting a review of spontaneous combustion propensity characteristics throughout the target coal seams (including partings). Results from the testing program will guide improvements to carbonaceous material management and mitigation. This review would also be applied to the design, construction and monitoring of the elevated waste rock emplacement that would be developed in Pit 2

Risk identification and assessment involves identifying and closely monitoring coal stockpiles that have a higher propensity to spontaneously combust. Additionally, selected ROM coal types (that are showing signs of heating or have been stockpiled on-site for an extended period) are prioritised for washing in the CHPP.

Using thermal imaging technology and visual inspections, existing spontaneous combustion hot spots across the Mine have been identified. These hot spots are monitored and assessed on a regular basis to determine appropriate mitigation strategies as well as providing feedback into the understanding of spontaneous combustion at the mine (i.e. appropriate capping depths and timeframe for reactivity of carbonaceous material).

3.3.3 Material Prone to Acid Mine Drainage

As described in **Section 3.3.1**, the bulk of the waste rock is expected to be NAF, non-saline and barren in terms of acid generation and neutralisation, apart from a small quantity of potential acid forming/low capacity (PAF/LC) material occurring in the floor rock of the G seam (2015 GEM).

Coarse reject material produced from the CHPP is expected to be non-saline and PAF/LC and the tailings were expected to be either potential acid forming (PAF) or PAF/LC (2015 GEM). There are no known acid mine drainage (AMD) issues associated with waste rock emplacements at WCPL, notwithstanding the implementation of management strategies in regards to PAF/LC and PAF materials, includes:

- Waste rock materials encountered from the floor rock of the G seam are managed so that no zones of PAF or PAF/LC material are exposed near the surface and the material blended well with NAF producing an overall NAF material or encapsulated with NAF material;
- Inert cover will be placed on top of the rehabilitation final landform surface to provide a benign barrier between any overburden that has not completely equilibrated with the surface geochemical conditions;
- PAF or PAF-LC material is placed at least 2 m below the surface of the backfilled mine void landform and at least 5 m below the surface of the elevated waste rock emplacement;
- The PAF tailings would continue to be managed in such a way as to minimise potential oxidation during disposal, including lime dosing if required when disposal occurs irregularly to dedicated tailings storage facilities;
 - The tailings dams are progressively capped with inert overburden material to a minimum depth of cover of 2 m creating a stable landform ready for final profiling, topsoiling (0.1 to 0.3 m layer) and revegetation.
- The topsoil management strategies including topsoil characterisation and mine waste rock characterisation to determine appropriate ameliorates e.g. the use of lime, gypsum and/or fertiliser to improve the chemical and/or nutrient properties of the soil; and
- The geochemical monitoring program of rehabilitated areas for pH, Electrical Conductivity (EC) and major cations to determine whether the vegetation substrate is approaching conditions similar to those found in the reference sites.
- Coarse reject material would be dispersed throughout the overburden within the mine waste rock emplacements with the aim of producing a mix with a sulphur content that has an acid producing potential less than the acid neutralising capacity of the overburden:
 - A blend ratio of at least 2:1 (overburden: coarse rejects) would be used. The total tonnage of coarse rejects produced over the life of the Mine would be approximately one-seventh of the total mine waste rock produced, therefore there would be scope to increase the blending ratio, if required;
 - Coarse rejects would not be placed within 2m of the final landform surface so there is sufficient coverage by non-acid forming overburden to provide a barrier to oxygen movement through the rehabilitated profile;

- Coarse reject material deposited below the natural surface in the mined-out voids and dispersed throughout to manage its geochemical characteristics (i.e. acid generation potential);
- Coarse rejects are placed so there is sufficient coverage by non-acid forming overburden to reduce oxygen movement through the rehabilitated profile, which also assists to minimise spontaneous combustion potential within the rehabilitated waste rock emplacement landform.

3.3.4 Erosion & Sediment Control

WCPL have developed a Surface Water Management Plan (SWMP)¹⁸ which provides sediment and erosion control strategies, principles and design criteria to control sediment laden water from areas disturbed by mining activities to maintain downstream water quality. Activities that have the potential to cause or increase soil erosion and sediments at the Mine include, but not limited to:

- Land disturbance e.g. vegetation clearing, topsoil stripping, construction of infrastructure and vehicular movements along internal unsealed access roads and mine haul roads;
- Altering existing surface flow regimes and configurations;
- Waste rock emplacements;
- Exploration drilling;
- Establishing rehabilitated landforms;
- Topsoil stockpiles; and
- Coal stockpiles.

Section 3.3.5 describes the three main soil units located in the mining area and their erosion potential subject to disturbance. Measures to minimise soil erosion and the potential for the migration of sediment to downstream systems apply the following principles¹⁹ to erosion and sediment controls for the Mine site:

- Minimising surface disturbance and restricting access to undisturbed areas;
- Progressive rehabilitation;
- Stabilisation of Mine infrastructure areas;
- Separation of runoff from disturbed and undisturbed areas where practicable;
- Construction of surface drains to control and manage surface runoff. Drains have been constructed using trapezoidal or parabolic cross-sections;
- Installing sediment fencing or other appropriate erosion and sediment controls; and
- Construction of sediment dams or use of existing water storages to contain runoff up to a specified design criterion.

The water management system for the Mine which includes:

- A series of sediment control structures have been constructed between the CHPP, coal stockpile areas and rail loop. These structures are used to polish sediment laden runoff which is then directed to a further series of sediment control structures within and adjacent to the rail loop;
- The mine access road from the Ulan Wollar Road to the administration car park has been sealed to control sediment transport and erosion issues;
- Mining activities are generally undertaken in a north to south direction. Surface water runoff generally flows in a south to north direction due to topographical influences. This means that the active mining voids can be used as sediment control structures as surface runoff from

¹⁸ SWMP is a component plan of the Water Management Plan as required by Condition 30(d)(iii), Schedule 3 of Development Consent (SSD-6764)

¹⁹ The above principles take into account the general recommendations for site drainage works presented in "Managing Urban Stormwater – Soils and Construction Volume 1" (Landcom, 2004).

disturbed areas and emplacements areas naturally drains to the active void. This runoff reporting to the active void is then transferred to the mine water system for recycling;

- Seeded topsoil stockpiles will be placed outside or behind proposed mining areas where possible and away from slopes and drainage lines;
- Rehabilitation of areas disturbed will be reshaped so that each pit area has a drainage line which will direct surface flows from south to north. A series of sediment dams may be constructed along drainage lines to polish sediment from surface runoff²⁰ and maintained until such time as vegetation establishes on topsoiled areas and where the runoff water quality characteristics are similar to areas that are undisturbed by mining activities;
- A number of diversion banks and channels to direct clean water around disturbed areas will be constructed. The structures will be progressively removed during mine development to facilitate coal extraction, and the area topsoiled and revegetated using suitable pasture species that will provide resistance to erosion and reduce the incidence of dust. Drainage lines with greater than 3% fall will be armoured to reduce scouring and erosion.
- Routine (i.e. monthly) inspections of sediment control structures as well as inspections following rainfall events of 20 mm or more in a 24 hour period are conducted by WCPL personnel. During these inspections, sediment control structures are inspected for capacity, structural integrity and effectiveness. Where there is an apparent accumulation of a substantial amount of sediment in a sediment dam, dam clean-out is undertaken so as to reinstate the minimum volumes;
- Sediment control dams will be constructed along major drainage lines in rehabilitated landforms to reduce suspended solids in water flowing from site. The dams will be spaced to control sediment transfer from site, with the final void at the north-eastern and western extents of the mine site used as the final sediment control point. The sediment control dams will be sized to contain rainfall events in accordance with the SWMP. The SWMP also includes a monitoring programme to determine the need for any maintenance and/or contingency measures.

3.3.5 Soil Types & Suitability

Soil landscapes were classified and mapped in accordance with descriptions in the Soil Landscapes of the Dubbo 1:250,000 Sheet (NSW Department of Land and Water Conservation [DLWC], 1998) and Mine field surveys. Three soil landscapes, viz. Ulan, Barigan Creek and Lees Pinch (DLWC, 1998) were identified in the original project area and WEP areas (**Table 14**).

Table 14 Soil Landscapes of the Project Area

Landscape	Soil Types Present	Limitations
Barigan Creek (bc)	Yellow Podzolic Soils are common on lower slopes and along drainage lines. Red Podzolic Soils on colluvial slopes, benches and rises.	High erosion hazard under cropping or where there is low surface cover; salinity in localized areas in drainage depressions.
Ulan (ul)	Yellow Podzolic Soils on lower slopes and drainage lines with patches of yellow Solodic Soils Solonetz in association with salt scalds. Yellow and Brown Earths on footslopes with minor areas of Earthy Sands.	Seasonal waterlogging on lower slopes; moderate to high erosion hazard under cultivation; moderate available water holding capacity.
Lees Pinch (lp)	Slopes 15-40 percent (%); shallow sandy soils with extensive rock outcrop, boulder debris slopes and sandstone cliffs.	Steep slopes, very low fertility, very low waterholding capacity.

After: DLWC (1998).

Major soil types identified include red podzolic soils which occur over the majority of ML 1573 on lower to mid slopes, yellow podzolic soils which occur on lower slopes and minor drainage lines, and

²⁰ The dams need to be spaced to control sediment transfer from site with the final dam on the northern end of the mining operation used as the final control point.

earthy sands which occur along Bens Creek and at the bases of sandstone escarpments. Brown earths occur in small patches on the eastern bank of Cumbo Creek and yellow solodic soils occur as a thin band in the south-east of ML 1573. Lithosols occur on the higher plateaus and escarpments adjoining the Munghorn Gap Nature Reserve and the steeper slopes in the east of ML 1573. Alluvial soils occur along drainage lines.

Table 15 outlines the soil resource management strategies undertaken by the Mine. **Section 5.3.3** outlines additional topsoil management practices to ensure soil viability and maintenance of this resource. In areas of significant earthworks, topsoil and subsoil resources will be identified, stripped and, wherever practicable, spread directly onto areas prepared for rehabilitation to make use of the potential seed bank.

Prior to soil stripping, soil resources will be quantified. Where a deficit of topsoil is identified, investigations will be undertaken to determine the viability of the use of subsoils and to identify the need for treatment measures (e.g. use of fertilisers) applied where there is a deficit of topsoil. Where direct spreading is not practicable, the stripped soil will be stockpiled and seeded with grasses, as listed in **Table 17**, to maintain soil viability prior to being re-spread.

Table 15 Topsoil Resource Management Strategies

Prior to Topsoil Stripping	Topsoil Stripping and Stockpiling	Stockpiled Topsoil Awaiting use in Rehabilitation Works
<ul style="list-style-type: none"> Completed GDP prior to land disturbance activities/clearing; Quantification of soil resources. Characterisation of the suitability of soil resources for rehabilitation works. Topsoil will be stripped prior to any land disturbance. Recommended topsoil stripping depths¹ as provided by the soil survey in the 2005 EIS: <ul style="list-style-type: none"> Red Podzolic (~150mm) Yellow Podzolic (~200mm) Brown Earth (~250mm) Alluvial (~300mm) Topsoil will be placed directly onto reshaped areas where possible. Recommended topsoil stripping depths¹ as provided by the soil survey in the WEP EIS, for WEP areas ~150mm. <p>For subsoil stripping:</p> <ul style="list-style-type: none"> Recommended subsoil² stripping depths¹ as provided by the soil survey in the WEP EIS, for WEP areas: <ul style="list-style-type: none"> For areas with shallow soils, rocks or high salinity ~350mm; For all other areas ~850mm; <p>Notes:</p> <p>¹ Subject to quantification of soils and identification using soil specialist.</p> <p>² Subsoil stripped at depths >150mm will require ameliorants as specified in WEP EIS (Appendix I) at the time of stripping.</p>	<ul style="list-style-type: none"> Minimisation of vegetation clearance and stripped progressively; Topsoil and subsoil stripped during periods of high moisture content; Where the pre-disturbance soil investigation determines that ameliorants (e.g. lime, gypsum and fertiliser) should be applied during stripping to improve the condition of the soil, they would be applied to the soil surface prior to stripping Mulching of vegetation prior to topsoil stripping, where possible, to provide additional organic matter. Selective stockpiling of soil according to soil type and soil characteristics; Stockpiling of soils in a manner that does not compromise the long-term viability of the soil resource; Wherever practicable, stripped soil would be directly replaced on completed sections of the final landforms; and Maximum height for stockpiles will be approximately 2-3 m. 	<ul style="list-style-type: none"> Implementation of measures to ensure long-term viability of soil resources and manage soil salinity, including: <ul style="list-style-type: none"> Soil stockpiles to be located outside of active mining areas; Stockpiles to be constructed with a rough surface to reduce erosion hazard, improve drainage and promote vegetation; Stockpiles which are to be inactive for extended periods to be fertilised and seeded to maintain soil structure, organic matter, and microbial activity; Topsoil and subsoil stockpiles will be seeded with pastures species (Table 17); Silt fencing (when required) to be installed around soil stockpiles to control potential loss of soil where necessary; Soil stockpiles would be located in positions to avoid surface water flows; Weed control programmes would be implemented on soil stockpiles if required; and Soil stockpiles to be deep ripped to establish aerobic conditions, prior to re-application for rehabilitation.

Waste rock emplacement areas reshaped following mining to construct a post mining landform will contain appropriate drainage works prior to the topsoil application. The area will then be ripped and seeded using direct seeding techniques. Waste rock/soil characterisation will assist WCPL determine appropriate ameliorates in rehabilitation where necessary (e.g. the use of lime, cow manure, organic growth medium (OGM), gypsum and/or fertiliser to improve the chemical and/or nutrient properties of the soil). For more information refer to **Section 5.3.2**.

3.3.6 Biodiversity

WCPL have prepared a revised Biodiversity Management Plan (BMP) ²¹ as required by Development Consent (SSD-6764). The BMP outlines strategies for the management strategies, procedures, controls and monitoring programs required to manage flora and fauna within the Enhancement and Conservation Areas (ECA), Biodiversity Offset Areas (BOA), Regeneration and Rehabilitation Areas in accordance with Development Consent (SSD-6764).

As discussed with the DRG and DP&E (**Section 1.4**), biometric vegetation types (BVT) performance and completion criteria relevant to the Mine's rehabilitation areas are still being developed in accordance with Schedule 3, Condition 37 of the Development Consent. Upon resolution of the performance and completion criteria, in accordance with Condition 65 of the Development Consent, the BMP will be comprehensively updated as required to reflect the new criteria. In addition this MOP will be updated²² to align with the new criteria in the BMP. Until such time the existing completion criteria (**Section 5.4**) developed and approved in the current BMP (required by PA05-0021) will apply to the areas already seeded. The biodiversity monitoring program for the rehabilitation areas is included in Section 9 of the BMP and summarised in **Section 8.0** of this MOP.

In 2005, FloraSearch surveyed an area of approximately 2,300 ha within ML 1573 and surrounding areas. The study recorded a total of 401 flora species; the most common species identified were *Asteraceae* (daisies) and *Poaceae* (grasses). Seven remnant vegetation communities were described along with two derived communities. Two vegetation communities (1 and 5a) listed under both the TSC Act and the EPBC Act were identified across the study area. *Eucalyptus cannonii* (Capertee Stringybark) was the only threatened flora species recorded during the original flora survey²³

One threatened ecological community was identified in the MOD 5 Extension Area in 2013 as being representative of both the NSW Endangered Ecological Community (EEC) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and the Commonwealth Critically Endangered Ecological Community (CEEC) White Box- Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Approximately 10.6 ha of Box-gum Woodland EEC/CEEC (comprising 8.4 ha of grassland and 2.2 ha of woodland) was approved to be cleared for MOD 5. Approximately 47.8 ha of Box-Gum Woodland EEC/CEEC was mapped in the Biodiversity Offset Areas (excluding areas of derived grassland that may equate to the EEC/CEEC)

For WEP areas in 2015, twelve native vegetation communities were identified in the open cut extension and infrastructure areas. Of these, three are listed as threatened ecological communities under the TSC Act and/or EPBC Act. Small patches of Blakely's Red Gum Woodland (grassy) and Yellow Box Woodland (grassy) were assessed to equate to:

- White Box - Yellow Box - Blakely's Red Gum Woodland Endangered Ecological Community (Box-Gum Woodland EEC) under the TSC Act;

²¹ Condition 42, Schedule 3 of the Development Consent (SSD-6764). The BMP is provided in **Appendix 5** of this MOP.

²² Within 3 months of approval of the performance and completion criteria for rehabilitation offsets required under condition 37 of this schedule, the Applicant must revise the Rehabilitation Management Plan to include the approved performance and completion criteria, including a protocol for assessing and reporting on rehabilitation offsets against the performance criteria, as the mine is progressively rehabilitated

²³ Further investigations conducted in 2015 by the Sydney Herbarium concluded that this species was in fact a hybrid of *Eucalyptus cannonii* and *Eucalyptus macrorhyncha*. This hybrid is not listed as a threatened species.

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community (Box-Gum Woodland CEEC) under the EPBC Act; and
- Slaty Box Forest (in the south-west corner of the Project open cut extension areas) was assessed to equate to the Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion Vulnerable Ecological Community (Slaty Gum VEC) under the TSC Act.

One threatened flora species occurs within the open cut extension and infrastructure areas, namely *Ozothamnus tessellatus*, listed as 'Vulnerable' under both the TSC Act and EPBC Act. Three areas of *Ozothamnus tessellatus* were found equating to a direct count of 1,090 plants.

The WEP requires clearance of approximately 354 ha of native vegetation in the open cut extension and infrastructure areas, including the clearance of 9.5 ha of Box-Gum Woodland EEC/CEEC. WCPL has developed a Biodiversity Offset and Rehabilitation Strategy (Strategy)²⁴ to compensate for the biodiversity impacts. The Strategy addresses unavoidable impacts on threatened species, populations and communities that are listed under the TSC Act.

The Strategy, which accounts for a total of 16,924 ecosystem credits (**Table 16**) (refer to BMP for further details), comprises a package of BOA properties that will be set aside for conservation and managed in perpetuity.

Table 16 Ecosystem Credits Required for the Wilpinjong Extension Project

Native Vegetation Communities	Disturbance Area (ha)	Ecosystem Credits Required
Listed Ecological Communities		
Slaty Box Forest ¹	9.5	519
Box Gum Woodland ²		
Blakely's Red Gum Woodland	6	258
Yellow Box Woodland (Grassy)	3.5	119
Total Listed Ecological Communities	19	896
Other Forest and Woodland		
Fuzzy Box Woodland	1.5	37
Rough-barked Apple Woodland	126	5,995
Blakely's Red Gum Woodland (Shrubby)	4	197
Grey Gum – Narrow-leaved Stringybark Forest	42.5	2,250
Red Ironbark Forest	39.5	2,161
White Box Woodland (Shrubby)	98	4,590
Western Grey Box Woodland	3	76
Narrow-leaved Ironbark Forest	20.5	722
Total Other Forest and Woodland	335	16,028
Total Native Vegetation	354	16,924

Source: DP&E (2016) Notes:

1. Listed as a Vulnerable Ecological Community (VEC) under the NSW TSC Act as "Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion"
2. Listed as an EEC under the TSC Act as 'White Box – Yellow Box – Blakely's Red Gum (Box Gum) Woodland' and listed as CEEC under the EPBC Act.

²⁴ The originally Biodiversity Offset and Rehabilitation Strategy was developed as part of the EIS (WCPL, 2006) to compensate for the 290 ha of remnant woodland which would be cleared as a result of the Mine. This strategy included the establishment of three ECAs (480 ha) and nine Regeneration Areas (380 ha) as well as 1920 ha of Rehabilitation Areas.

The Biodiversity Offset Areas alone will not satisfy the credits required listed in **Table 16**, however the residual credits will be generated through the establishment of woodland rehabilitation at the Mine site (**Section 3.3.6**).

In addition, the Strategy also includes a number ECAs, and Regeneration Areas (**Section 4.3**) that will strengthen the linkages between the woodland rehabilitation areas, and the Goulburn River National Park and Munghorn Gap Nature Reserve. The Strategy will also assist in the faunal recolonisation of rehabilitation areas and Regeneration Areas.

A total of 20 threatened fauna species listed under the TSC Act have been recorded within the open cut extension and infrastructure areas during the current and previous surveys, comprising 13 birds and seven bats²⁵. Under the NSW Offset Policy (OEH, 2014b), these threatened fauna species are classed as ecosystem species (i.e. species that can be predicted to be present based on a habitat assessment) (WEP EIS).

3.3.6.1 Vegetation Clearance and Threatened Species Management Protocol

A vegetation clearance and threatened species management protocol (**Figure 5**) has been developed to avoid accidental disturbance and minimise impacts on biodiversity at the Mine:

- **Delineation of Disturbance Area** (Vegetation adjoining the proposed clearance areas will be clearly marked to prevent accidental damage during vegetation clearance activities);
- **Pre-Clearance Surveys** (Pre-clearance surveys include habitat assessments by appropriately qualified ecologist which involve the inspection of potential habitat features within the proposed disturbance area);
- **Managing Impacts of Fauna** (The implementation of each management strategy will be dependent on the characteristics of the habitat tree/burrow in question, determine by WCPL supervising ecologist);
 - **Site Observations** (Identification of a threatened species under the TSC Act of EPBC Act in the WCPL mine area or immediate surrounds, the threatened species management strategies will be initiated); and
 - **Threatened Species Management Strategies** (Management strategies will include threat abatement, capture and release, relocation and provision of habitat resources. The management strategies will be determined on a case by case basis in consultation with WCPL supervising ecologist).
- **Vegetation Clearance Procedures** (Following the implementation of the relevant fauna management strategies, clearance of vegetation will only proceed in accordance with clear delineation of the disturbance area, trees inspected for potential seed harvesting, habitat trees felled as soon as possible after a negative survey result and salvage of habitat features i.e. hollow branches, for use in rehabilitation program).

3.3.6.2 Seed Collection and Propagation

Seed collection and propagation activities where practicable, will contribute to revegetation associated with the rehabilitation of Mine disturbance areas. Seed collection and propagation activities include, but not limited to:

- Examination of trees for their provision of seed prior to vegetation clearance;
- Progressive collection of native seed from the local area to augment revegetation resources;
- The use of collection methods such as the manual removal of plant cuttings and stripping of seed pods, fruiting cones or berries directly off the plant into collection bags for transfer to drying rooms; and
- The maintenance of a seed inventory which will record the amount of seed collected, species type and treatment and propagation specifications.

²⁵ Refer to BMP and Blast Management Plan (**Section 3.4.9**) for further management and mitigation measures regarding an Eastern Bentwing-bat roosting site located in an old mine adit adjacent from Pit 8.

The seed collection program will take into account seasonality of seed availability and the specific target seed lists required to establish the various vegetation classes onsite. It should be noted that the detailed species list will be determined once the performance and completion criteria are resolved for the establishment of BVTs and Regent Honeyeater habitat as described in the BMP. In the meantime, rehabilitation areas will be stabilised, in addition to soil improvement methodologies using green manure crops. Once the criteria is finalised, areas will be sown with appropriate BVT species (**Table 17**).

Seeds of the threatened *Ozothamnus tessellatus* will be collected and propagated for use in the rehabilitation and Regeneration Areas. Seeds from *Ozothamnus tessellatus* will be collected during November (or other relevant times that seed is available) from the known populations within the open cut extension and infrastructure areas and throughout the Biodiversity Offset Areas (where the species is also known to occur).

3.3.6.3 Revegetation

Revegetation will be progressive, commencing soon after the completion of landform shaping. Visual impacts associated with unvegetated mine landforms is expected to progressively reduce once the vegetative cover begins to establish.

As at December 2016, approximately 374 ha of completed landforms have been rehabilitated. As part of the WEP EIS, WCPL identified an opportunity to prioritise woodland establishment within the existing mine rehabilitation areas where rehabilitation to date has focussed on the establishment of productive pasture for grazing.

WCPL also sees an opportunity to prioritise Regent Honeyeater habitat establishment within existing mine rehabilitation areas. As such, WCPL proposes to conduct a re-evaluation of the previous rehabilitation areas against contemporary BVT classifications to prioritise Regent Honeyeater habitat establishment within existing mine rehabilitation areas. Therefore, the revised entire post mining land use will be woodland (**Figure 9**).

WCPL are currently trialling green manure crops as a way of providing stabilisation and soil improvement. Essentially a crop is grown before being ploughed into the soil when the plant is still 'green'. At WCPL, the green crop has included various combination of legumes (cow peas, clover), sorghum, millet, sudan grass, and oats. Combinations and rates are shown in **Table 17**. Species known to provide habitat for the Regent Honeyeater will then be used in revegetation, once resolution of performance and completion criteria are resolved for the establishment of BVTs and Regent Honeyeater habitat in the revised BMP.

It should be noted that of the existing 374 ha of completed landforms rehabilitated to date, those areas considered to be woodland communities (i.e. primarily under eucalypts) may remain as they are, as these areas do not contribute to the ecosystem/species credits (**Section 3.3.6**) to meet the Biodiversity Offset Strategy package. However, those completed landforms currently under pasture or considered not woodland will be upgraded with relevant woodland species to meet the forthcoming BVT requirements.

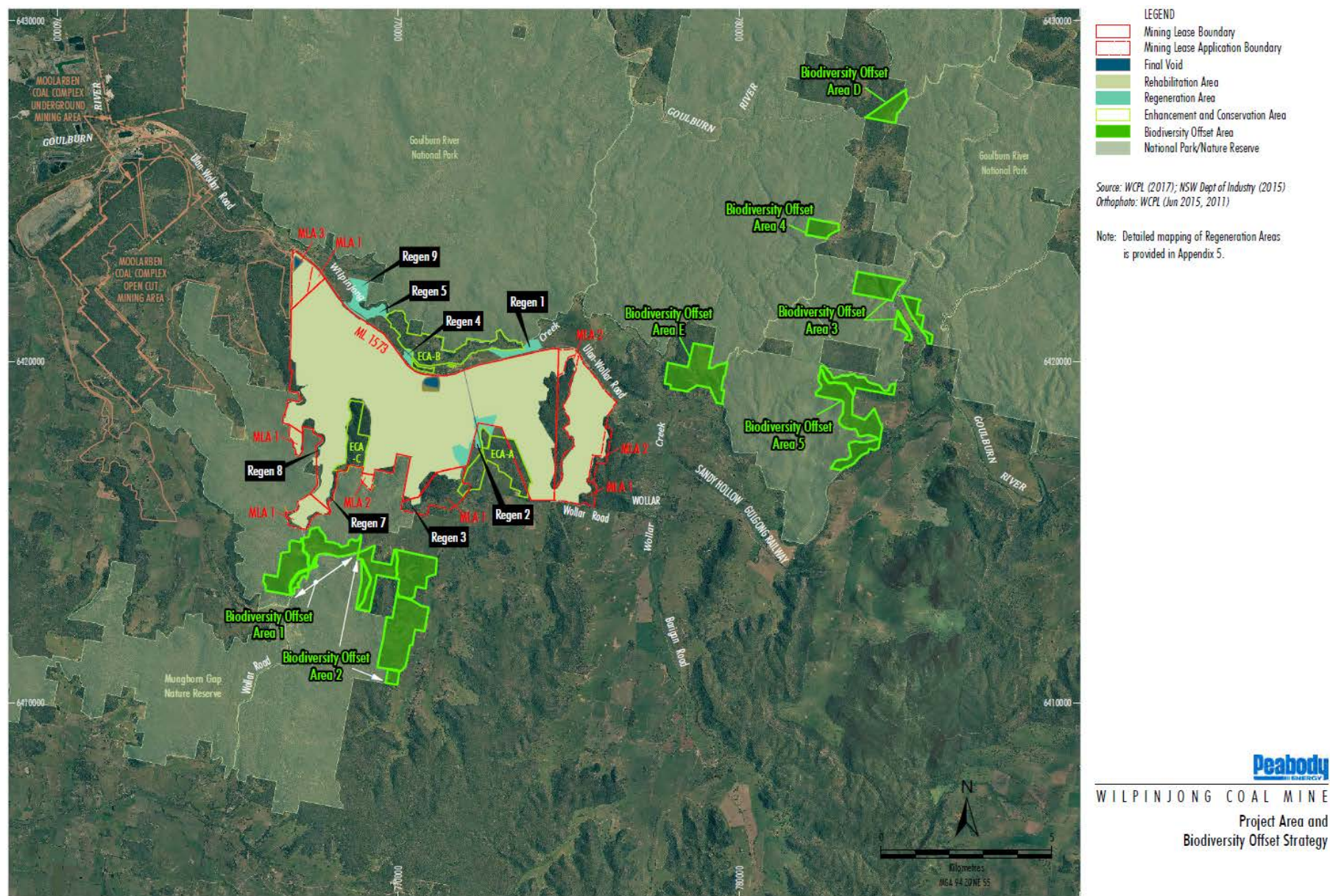


Figure 5 Biodiversity Offset Strategy

Table 17 Green Manure Combinations and Rates

Species	Rates (kg/ha)
Chicory	4kg
Cowpea	12kg
Sorghum	6kg
Cowpea	12kg
Jap Millett	6kg
Cowpea	12kg
Sorghum	6kg
Cowpea	12kg
Sudan Grass	10kg
Oates	60kg
Clover	15kg

3.3.6.5 Habitat Augmentation

Where practicable, habitat features (e.g. large hollows) would be salvaged during vegetation clearance activities and utilised in the rehabilitation areas, regeneration areas and other management domains. In addition, artificial roosting/nesting boxes for fauna, particularly threatened fauna, may be used in the rehabilitation areas, regeneration areas and other management domains to provide additional habitat resources. For more information regarding habitat augmentation refer to the BMP.

3.3.6.6 Weed Control

WCPL has a legal responsibility to control Noxious Weeds under the *Noxious Weeds Act 1993*. Any noxious weeds identified will be prioritised for treatment during the next round of weed treatment. The GIS database will be updated where significant weed outbreaks are identified and a suitable plan of management will be developed and implemented. In addition to this, an annual routine weed management program will be implemented whereby herbaceous weed species are treated to prevent further spread. Treatment of all weeds will be undertaken by suitably qualified and experienced personnel. For more information regarding weed control refer to the BMP.

3.3.6.7 Vertebrate Pest Management

Feral fauna (including pigs and rabbits) and pest species (including kangaroos) recorded during recent surveys are likely to directly affect the success of revegetation/regeneration works. Control of the feral fauna populations is considered essential to the success of any revegetation/ regeneration works as these species have the potential to damage establishing vegetation through grazing and/or trampling.

WCPL have implemented targeted management programs to control feral pigs and rabbits in close consultation with the OEH and Department of Primary Industries (DPI). Where deemed appropriate, baiting programs will be supplemented by open-range shooting and ripping of rabbit warrens with a bulldozer or similar piece of equipment where suitable access can be achieved whilst avoiding impacts to native vegetation. Feral predators such as dogs, cats, foxes will also be targeted by 1080 poisoning, trapping and shooting. Annual fauna monitoring will be conducted by appropriately trained and experienced personnel in order to determine if feral animal controls are adequate. For more information regarding vertebrate pest management refer to the BMP.

3.3.6.8 Rehabilitation Monitoring Programme

The Biodiversity Monitoring Program, as described in detail in the BMP includes monitoring of flora and fauna, and a range of landscape function indicators. This monitoring program will be used to

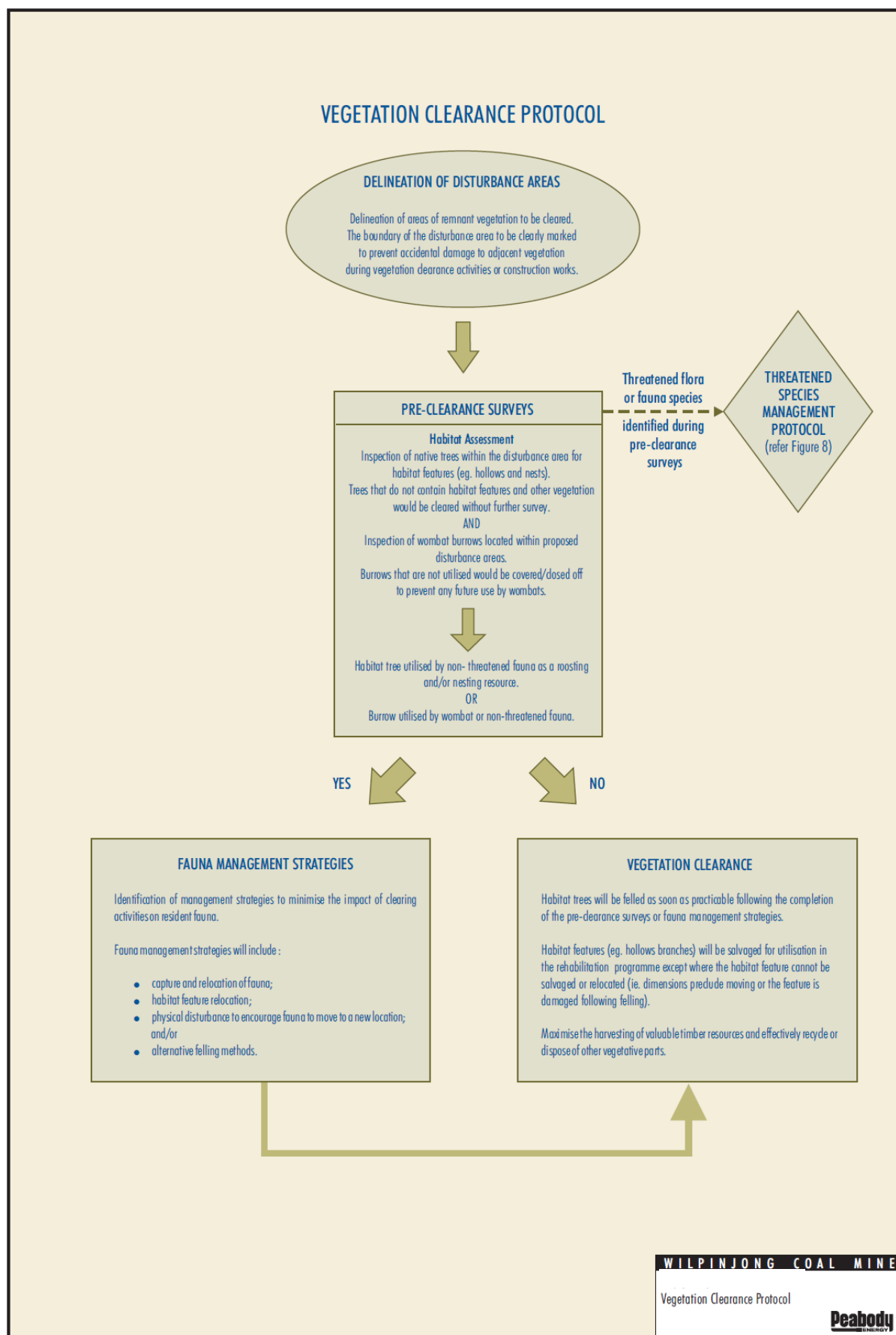
evaluate ecosystem function and performance and the success of specific management actions implemented across the various management Domains. Reference sites have established during the first round of biodiversity monitoring and will also be established in areas of equivalent habitat type adjacent to the management Domains.

During the term of this MOP, current reference sites will be reviewed for adequacy when resolution of performance and completion criteria is resolved for the establishment of BVTs and Regent Honeyeater habitat in the revised BMP. New sites will be identified as required.

The current version of the BMP reiterates the previously approved completion criteria and interim performance targets will remain in place until the revised BMP is comprehensively updated to reflect the new criteria and targets, including the following subsections.

For further details of the rehabilitation program as provided in the BMP, refer to **Section 8.0**.

Figure 6 Vegetation Clearance Protocol



3.4 Other Environmental and Rehabilitation Risks

3.4.1 Overburden Characterisations

An assessment of the geochemical characteristics of the waste rock material associated with the development of the Project is provided in the Geochemistry Assessment prepared by Geo-Environmental Management. The Geochemistry Assessment concluded that the waste rock materials generated from the Project would typically be neutral to slightly alkaline and generally non-saline. The waste rock is expected to range from non-sodic to moderately sodic.

Non-sodic waste rock material would preferentially be placed on the surface of rehabilitated landforms (where reasonable and feasible). Where this is not reasonable and feasible, the sodic waste rock material present on the outer slopes of re-profiled landforms would be treated with a material containing soluble calcium (e.g. gypsum, calcium chloride or limestone). In addition, a layer of soil would be placed over waste rock material on rehabilitated landforms to minimise the long-term exposure of sodic waste rock to rainfall and associated potential stability and water quality impacts.

Rehabilitated areas will be periodically analysed for pH, electrical conductivity (EC), major cations and organic matter to understand the soil ability to support vegetation goals and post mine land use. Soil samples will be generally taken to a minimum depth of 300 mm and samples taken from the 0 mm – 100 mm, 100 – 200 mm intervals and 200 – 300 mm. The samples will be generally taken at 10m intervals along the monitoring transect and sampled every three years (or as required). Additional testing may be undertaken annually at the recommendation of WCPL rehabilitation specialist for some areas. For further details regarding soil monitoring refer to **Section 8.2.2**.

The data will be used to identify potential deficiencies over time and assist with the development of maintenance programs if under-performing areas are identified during visual and other monitoring. This will also assist with determining/demonstrating whether the waste rock is suitable as a long-term substrate for sustainable rehabilitation.

3.4.2 Slopes and Slope Management

Rehabilitated slopes of the final landforms are to be constructed to no greater than 1:6 (10 degrees or 17%) across the entire MLA area. Graded banks will be constructed across the slope of rehabilitated areas to collect and direct water flowing from newly rehabilitated areas into rock waterways. For more information regarding water management on rehabilitated areas refer to **Section 5.3.2**.

3.4.3 Air Quality

WCPL currently implements a range of dust mitigation measures (e.g. haul road watering and real time dust monitoring) as part of operations to minimise potential dust emissions as required by the Air Quality Management Plan²⁶ (AQMP) and pollution reduction programme requirements under EPL 12425.

The air quality monitoring program has been developed to quantify potential air quality impacts and to facilitate the evaluation of air quality control measures. The monitoring program involves regular dust deposition PM_{2.5} and PM₁₀ monitoring at a number of sampling sites around the Mine. Meteorological monitoring and forecasting assist operations in the prediction of likely adverse meteorological conditions that have the potential to exacerbate dust generation from the Mine.

As required by Condition 18 and 19, Schedule 3 of Development Consent (SSD-6764), WCPL must ensure all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not cause exceedence of the relevant performance criteria at both privately owned and mine owned residences.

WCPL will implement dust management measures (**Table 18**) consistent with those applied during the air quality modelling by Todorski (2015). Air quality management measures at the Mine are

²⁶ Condition 20, Schedule 3 of Development Consent (SSD-6764).

generally consistent with best practice dust controls identified in the NSW Coal Mining Benchmarking Study (Katestone Environmental Pty Ltd, 2011). In addition, those additional dust management measures identified as being practicable to implement by Todorski (2015), will be implemented. **Table 18** lists the mine activities that generate dust and the associated management and mitigation measures which will be used to manage potential air quality impacts where relevant.

Table 18: Air Quality Mitigation and Management Measures

Emission Type	Area/Activity	Management Measure
Wind Blown Particulate Matter Sources	Areas disturbed by mining	<ul style="list-style-type: none"> Only the minimum area necessary for mining is disturbed. Exposed areas are reshaped, topsoiled and revegetated as soon as practicable.
	Waste rock emplacements	<ul style="list-style-type: none"> Progressive rehabilitation (i.e. reshaping, topsoil placement and revegetation) of waste rock emplacements continues throughout the life of the Wilpinjong Coal Mine.
	Coal handling areas	<ul style="list-style-type: none"> Coal handling areas are kept in a moist state using water carts or alternative means to minimise wind-blown and traffic generated dust. Water sprays on CHPP feed. Water sprays used when tipping raw coal.
	Coal stockpiles	<ul style="list-style-type: none"> Water sprays on clean coal stockpile discharges.
Mining Generated Particulate Matter Sources	Haul road dust	<ul style="list-style-type: none"> All roads and trafficked areas are watered using water carts to minimise the generation of dust as required. Obsolete roads are ripped and revegetated.
	Light vehicle roads	<ul style="list-style-type: none"> Development of light vehicle roads is limited and the locations of these are clearly defined. Regularly used light vehicle roads are watered. Obsolete roads are ripped and revegetated.
	Topsoil stripping	<ul style="list-style-type: none"> Access tracks used for topsoil stripping during the loading and unloading cycle are watered. Stripping occurs during favourable wind conditions.
	Topsoil stockpiling	<ul style="list-style-type: none"> Long-term topsoil stockpiles are revegetated with a cover crop.
	Drilling	<ul style="list-style-type: none"> Air pollution control equipment are operated and maintained on all drilling rigs.
	Blasting	<ul style="list-style-type: none"> Wind conditions are assessed prior to blasting and blasts are postponed if wind speed and direction are above trigger limits in the Blast Management Plan. Adequate stemming is used at all times. Holes are dipped for water to determine controls to minimise blast fumes. Where water is identified, explosive product is 'bottom loaded' to displace water or a gas bag used for water less than 500 mm. Where significant water is identified a wet-hole product is used. Water is decanted from blast holes.
All	All	<ul style="list-style-type: none"> Real-time air quality monitoring is undertaken and used as a guide to the implementation of the above management measures to maintain compliance with air quality criteria.

3.4.4 Water Management

The water management strategy for the Mine is based on the containment and re-use of mine water as well as the control of sediment that may be potentially carried with runoff from disturbed areas. The key components of the strategy are:

- Separation of undisturbed and disturbed area runoff using upslope diversions. This includes both passive and pumping options to maintain clean water flow around disturbed areas;
- Collection and re-use of surface runoff from disturbed areas;
- Capture and on-site containment of mine water, comprising groundwater inflows and incident rainfall-runoff to operational areas;
- Re-use of contained mine water for dust suppression over active surfaces (e.g. haul roads);
- Recycling of mine water associated with the CHPP and tailings disposal areas;

- Consumption of contained waters in the Mine water supply system;
- Flood mitigation;
- Management of treated sewage effluent in accordance with the OEH's Environmental Guidelines for the Utilisation of Treated Effluent;
- Discharge of treated water via a water treatment facility for discharge to Wilpinjong Creek in accordance with EPL 12425.

At the Mine, undisturbed area runoff is separated from disturbed area runoff by up-catchment diversions, where reasonable and feasible. Water that cannot be reasonably diverted (e.g. due to geotechnical/engineering limitations), is captured in the water management system. In accordance with EPL 12425, the Mine is permitted to discharge up to 15 ML/day of excess mine water to Wilpinjong Creek, providing the discharge meets certain requirements, including an upper limit on EC of 500 $\mu\text{S/cm}$.

Up-catchment diversion works will continue to be designed subject to site-specific review of soils and upslope catchment areas, with particular focus on channel stability and longevity. The design capacity of future up-catchment diversion works will depend on the size of the catchment, the design life of the up-catchment diversion and the potential consequences of a breach.

Sediment dams contain runoff from waste emplacement areas and topsoiled/partially rehabilitated mine areas that have been shaped to final profiles, covered with topsoil and seeded. Sediment dams allow for gravity settling of sediment prior to release off-site. Sediment dams will be maintained until such time as vegetation successfully establishes on topsoiled areas and where runoff has similar water quality characteristics to areas that are undisturbed by mining activities.

3.4.4.1 Water Management System

As described in **Section 3.4.4**, the mine water management system is based on the collection, storage and use of water collected from areas used for the mining and handling of coal and mine waste rock. The mine water management system is shown in schematic form on **Figure 6** and will be progressively developed as water management requirements for open cut pit development and rehabilitation change over time.

3.4.4.2 Water Balance

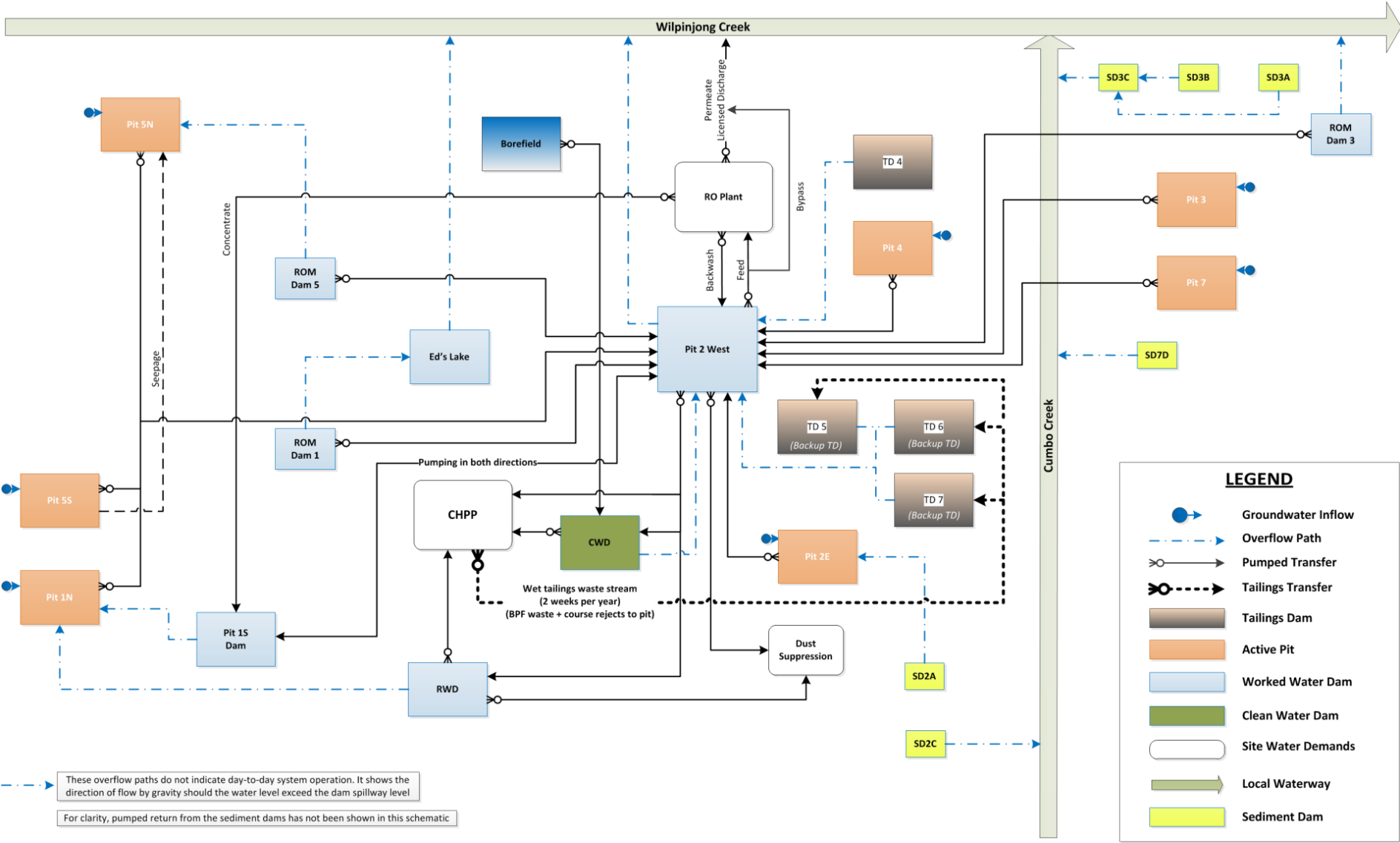
WCPL completed a recent review of the Mine's Site Water Balance²⁷. The general components and linkages of the water management system simulated by the model are shown in schematic form on **Figure 7**.

The water balance model was run using a computer-based operational simulation model (OPSIM), which assessed the dynamics of the Water Management System under conditions of varying rainfall and catchment conditions throughout the Wilpinjong Coal Mine life. The OPSIM model dynamically simulated the operation of the Water Management System and produced outputs of all site water volumes and representative water qualities on a daily time step. The model was configured to simulate the operations of all major components of the Water Management System.

For 2016, the predicted average net inflows total 3,068 ML/annum while average predicted net outflows total 2,309 ML/annum, with a net water balance of 759 ML.

²⁷ Condition 30(d) (ii) of Schedule 3 of Development Consent (SSD-6764)

Figure 7 Mine Water Management System



Source: WEP EIS

3.4.4.2 Surface Water

WCPL have conducted an extensive water quality monitoring program and have compiled a database of water quality observations with site data from 2004 onwards. Monitoring locations include sites on Wilpinjong Creek, Cumbo Creek, Wollar Creek, and on-site water storages. Water quality monitoring is predominantly undertaken by grab sampling, however continuous monitoring of electrical conductivity (EC) and pH occurs at the WCPL gauging stations on Wilpinjong Creek and Cumbo Creek.

Surface water monitoring and management is conducted as required by the Surface Water Management Plan²⁸ (SWMP), a component of the Water Management Plan²⁹ (WMP). The surface water monitoring sites are provided in **Appendix 4**.

The surface water monitoring program for the Mine involves the monitoring (water quality, flow and impact on users) of various surface water bodies upstream and downstream from the operations. The SWMP outlines the monitoring location, frequency of monitoring, water quality and quantity parameters and performance criteria. The results of this programme are assessed with on-site meteorological monitoring in the site water balance to optimize performance and validate predictions.

The SWMP also details the surface water control structures, works and procedures that will be designed to manage potential surface water impacts and minimise mine water use and outlines the triggers used to determine if an investigation is required (i.e. implementation of the surface water response plan) in the event of an exceedence of an impact assessment criteria.

The SWMP will be reviewed and updated as required throughout the term of this MOP. Subsequent reviews of the SWMP as the Mine progresses toward mine closure will include post mining water monitoring, strategies to manage water in the post mining landscape and outline relevant contingency measures. As described in **Section 3.4.4** surface water management is a fundamental activity for this MOP term, particularly the diversion of clean catchment water around the infrastructure and mining works. This is achieved largely by the upslope diversion of the clean catchment water.

3.4.5 Groundwater

Groundwater monitoring and management is conducted as outlined within the Groundwater Monitoring Management Plan³⁰ (GWMP), a component of the SWMP. The Wilpinjong Coal Mine groundwater monitoring sites are displayed in **Appendix 4**.

The groundwater monitoring program involves the monitoring of water levels and water quality from the Mine water supply bores and groundwater seepage and surface water runoff which collect in pit sumps during mining operations. The groundwater monitoring program also involves the monitoring of groundwater levels in coal measures and alluvium associated with Wilpinjong, Wollar and Cumbo Creeks, and selected landholder bores and wells as required.

The results of the groundwater monitoring program would inform progressive refinement of the numerical model as each of the open cut mining areas is developed. Revised outputs from the numerical model would be reported in the Annual Review, as relevant over the life of the Wilpinjong Coal Mine and used to inform regular site water balance reviews (refer to Site Water Balance for additional information). The GWMP also outlines the triggers used to determine if an investigation is required (i.e. implementation of the ground water response plan) in the event of an exceedence of a groundwater performance triggers.

There are no 'high priority groundwater dependent ecosystems identified in the relevant water sharing plans in the vicinity of the Wilpinjong Coal Mine. There is potential for groundwater dependent ecosystems to occur on the plateaus in the vicinity of the Wilpinjong Coal Mine. However, any groundwater dependent ecosystems on these plateaus would be accessing perched groundwater

²⁸ Condition 30(d) (iii) of Schedule 3 of Development Consent (SSD-6764)

²⁹ Condition 30 of Schedule 3 of Development Consent (SSD-6764)

³⁰ Condition 30(d) (iv) of Schedule 3 of Development Consent (SSD-6764)

systems associated with the Narrabeen Group and would not be affected by mining in the deeper strata (HydroSimulations, 2015).

During the MOP term WCPL may install additional groundwater monitoring piezometers utilising exploration boreholes within EL6169 and EL7091 to extend groundwater monitoring at the Mine and surrounds as required by the GWMP.

3.4.6 Hazardous Materials Storage

Hydrocarbon Storages

Hydrocarbons used on-site include fuels (i.e. diesel and petrol), oils, greases, degreaser and kerosene. Two bunded 88,000 litre (L) and one 110,000 L diesel storage tanks are located on-site. Oil is stored in two 28,000 L self-bunded double-skinned oil storage tanks, and a 110,000 L self bunded multiple compartment hydrocarbon storage tank is also maintained for storage of coolant and oil. Two shipping containers are used for the storage of oil and grease pods. Flammable paints are stored on a containment pallet in a fenced compound, as well as in a locked cabinet inside the workshop.

Hydrocarbon storage facilities are constructed and operated in accordance with *Australian Standard (AS) 1940:2004 The Storage and Handling of Flammable and Combustible Liquids* and the *NSW Work Health and Safety Regulation, 2011*.

The workshop infrastructure includes waste oil extraction equipment. An oil/water separator is located downslope of the workshop area, and an oil/water separator is located at the vehicle washdown bay area. All waste hydrocarbons collected in the separators are disposed of by a licensed contractor.

The hydrocarbon storage and management facilities have been upgraded as a component of the owner operator transition. These facilities include an oil/water separator for the expanded workshop, hydrocarbon storage and refuelling areas and a new fuel and oil dispensing facility south of the workshop in area refer to as the MIA pad.

Explosives Storage

Explosives required for the Mine include initiating products and detonators, ammonium nitrate fuel oil and emulsion explosives. The explosives storage and blast reload facilities are currently located in the south-west of Pit 1, however explosives storages would be periodically relocated as mining progresses. Explosives on-site are stored and used in accordance with *AS 2187.2:2006 Explosives – Storage, Transport and Use – Use of Explosives*. *AS 2187.2:2006* details the requirements for the safe storage, handling and land transport of explosives, safe storage distances from other activities and bunding requirements.

Soil Contamination Assessments

WCPL will undertake soil contamination assessments (as required) at key hazardous storage facilities during the life of the mine. In 2017, WCPL will complete soil testing and analysis of material at the Reload Facility (after the Reload Facility is relocated) to determine if appropriate soil remediation measures are required.

3.4.7 Greenhouse Gases

Management of greenhouse gases at WCPL is outlined in the AQMP³¹. WCPL will implement all reasonable and feasible measures to minimise the release of greenhouse gas (GHG) emissions from the Mine. Scope 1 and Scope 2 GHG emission sources identified for the Mine include on-site combustion of diesel fuel, petrol fuel, petroleum based greases and oils, explosives, emissions of methane from the exposed coal seam, gaseous fuels and on-site consumption of electricity (Todoroski, 2015).

³¹ Condition 20, Schedule 3 of Development Consent (SSD-6764)

The conservative estimate annual average GHG emissions over the life of the Mine is expected 0.13Mt CO₂-e (Scope 1 and Scope 2), approximately 0.02% of the Australia GHG emissions for the 2013 and 2014 period (Todoroski, 2015).

GHG emissions at the Mine are minimised through the efficient use of diesel by the mobile fleet. Diesel use is minimised by:

- Optimising the design of haul roads to minimise the distance travelled between the pit and the CHPP;
- Minimising the re-handling of material (i.e. coal, overburden and topsoil); and
- Maintaining the fleet in good operating order.

In addition to the diesel minimisation strategies above, WCPL has also recently implemented a number of mining efficiency improvement projects, including:

- Optimisation of dozer pushing i.e. increasing the amount of material moved by dozers;
- Increasing the bucket size on excavators to move more material with each bucket load; and
- Introduction of new, more efficient equipment to site e.g. mobile equipment fleet upgrade;

Other potential mitigation and management measures to reduce GHG emissions that may be considered by WCPL include:

- Investigate areas to minimise electricity consumption of site;
- Conduct a review of alternate energy sources;
- Provide energy and awareness programs for staff and contractors; and
- Minimise the production of waste generate on-site.

WCPL's greenhouse gas emissions are reported and tracked each year through National Greenhouse Energy Reporting (NGER) and in the Annual Review (**Section 10**), which is prepared in accordance with Condition 4 of Schedule 5 of the Development Consent (SSD-6764). An exploration drilling program has also been undertaken across the Mine to test methane levels in the coal seams. The results of this program confirm that the Mine is a low gas pit.

3.4.8 Acid Mine Drainage

As described in **Section 3.3.1**, the bulk of the waste rock is expected to be NAF, non-saline and barren in terms of acid generation and neutralisation, apart from a small quantity of potential acid forming/low capacity (PAF/LC) material occurring in the floor rock of the G seam (2015 GEM). Coarse reject material produced from the CHPP is expected to be non-saline and PAF/LC and the tailings were expected to be either potential acid forming (PAF) or PAF/LC (2015 GEM).

There are no known Acid Mine Drainage (AMD) issues associated with mine waste rock emplacements at WCPL, however the implementation of management strategies in regards to material with the capacity for acid generation are described in **Section 3.3.3**.

WCPL completed a review of the geochemical properties of the Mine and the WEP area in February 2015. *The Environmental Geochemistry Assessment of Overburden, Interburden and Coal Rejects (February 2015)* was undertaken by Geo-Environmental Management Pty Ltd (GEM). The results from the GEM investigations were generally consistent with the results for the 2005 EIS (2015 GEM). The management strategies for spontaneous combustion and for potential acid generation material and saline material are described in **Section 3.3.2** and **Section 3.3.3** respectively.

3.4.9 Blasting

WCPL have developed a Blast Management Plan³² (BMgtP) which describes management of blast induced ground vibration and airblast overpressure levels and minimise these blast emission impacts on the local community, infrastructure, on a vulnerable micro-bat species, and cultural heritage sites

³² Condition 14, Schedule 3 of development Consent (SSD-6764)

to the extent required by the Blast Conditions in Development Consent (SSD-6764) and Environmental Protection Licence 12425 (EPL 12425).

WCPL's Blast Monitoring Program includes monitoring of airblast overpressure and ground vibration for all blasts at locations as close as reasonably practical to the nearest Private Receiver. Monitoring will also be undertaken at relevant public infrastructure and Aboriginal heritage sites (**Appendix 4**) and a microbat roosting site as described in the BMgtP.

The objective of the monitoring is to obtain assurance that Blast Criteria are being achieved at Private Receivers (**Table 19**) and that damage criteria are being achieved for public infrastructure and Aboriginal heritage sites. Further information on the management of Aboriginal heritage sites can be found in WCPL's Aboriginal Cultural Heritage Management Plan.

Table 19 Blasting Impact Criteria³³

Location	Airblast overpressure (dB(Lin Peak))¹	Ground vibration (mm/s)²	Allowable exceedance
Residence on privately owned land	115	5	5% of the total number of blasts over a period of 12 months
	120	10	0%
All public infrastructure	-	50 (or a limit determined by the structural design methodology in AS 2187.2-006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Secretary)	0%

Notes: ¹ dB(Lin Peak) = decibel linear in peak. ² mm/s = millimetres per second.

The approved blasting hours are between 9.00 am and 5.00 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary. In accordance with the Development Consent (SSD-6764), WCPL may carry out a maximum of:

- A maximum of 2 blasts per day; and
- A maximum of 5 blasts per week, averaged over a calendar year.

These restrictions do not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, blast misfires or blasts required to ensure the safety of the Mine or its workers.

Notes:

- A blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the Mine.
- For the avoidance of doubt, should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast.
- In circumstances of recurring unfavourable weather conditions (following planned but not completed blast events), to avoid excess explosive sleep times and minimise any potential environmental impacts, WCPL will seek agreement from the Secretary for additional blasts to be fired on a given day.

Any Private Receiver that registers an interest in being informed of the blasting schedule shall be notified via either telephone, e-mail, or text message or as otherwise agreed between the parties.

³³ However, these criteria do not apply if WCPL has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.

Those same landholders will be notified of a misfire if more than one hour has elapsed since the time of the blast, or where the misfire is greater than 30% of the original blast size.

WCPL maintains an up to date free-call Blasting Hotline to provide the community with information on the blasting schedule. The Blasting Hotline number is **1800 649 783**. The Blasting Hotline will be advertised in local newspapers at least quarterly, via the Wilpinjong Community Newsletter and on the WCPL website.

Road closure notification boards will be maintained on the Ulan-Wollar Road and will reflect the most current blasting program. Every effort will be made to give at least three days warning of impending road closures although short-term blasting demands may limit the notification period.

3.4.10 Noise

WCPL have developed a Noise Management Plan³⁴ (NMP) which describes the management and mitigation measures to minimise the Mine's operational, road, and rail noise impacts on the local community to the extent required by the Noise Conditions in Development Consent (SSD-6764) and Environmental Protection Licence 12425 (EPL 12425).

The noise monitoring programme comprises both attended and real-time monitoring (**Appendix 4**). Integrated protocols for both monitoring methodologies are outlined in the NMP. Meteorological monitoring is also conducted as described in the NMP to assist operations in the prediction of likely adverse meteorological conditions that have the potential to exacerbate noise emissions and dust generation from the Mine.

Table 20: Noise Impact Assessment Criteria (dBA)

Property ID & Location ¹	Day ²	Evening ³	Night ⁴	
	LAeq (15 minute)	LAeq (15 minute)	LAeq (15 minute)	LAeq (1 minute)
102	36	36	38	45
Wollar Village – Residential⁵	36	37	37	45
All other privately owned land	35	35	35	45
901 – Wollar School	35 (internal) 45 (external) When in use			-
150A – St Luke's Anglican Church⁴ 900 – St Laurence O'Toole Catholic Church⁴	40 (internal) When in use			-

Notes: ¹ To interpret the locations referred in Appendix 4. ² Day is defined as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sunday and Public Holidays. ³ Evening is defined as the period 6 pm to 10 pm. ⁴ Night is defined as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sunday and Public Holidays. ⁵ EPL daytime limit is currently 35dBA(Leq). ⁴ Both churches are now owned by WCPL.

The Noise Criteria in **Table 20** apply under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
- Stability category G temperature inversion conditions.

The Noise Criteria in **Table 20** do not apply if WCPL has a written agreement with the relevant landowner/s to generate higher noise levels, and WCPL has advised the DP&E in writing of the terms of this agreement.

³⁴ Condition 5, Schedule 3 of Development Consent (SSD-6764)

WCPL utilise a combination of attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 19**. Unattended or real-time monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Mine.

WCPL will implement best management practice to minimise the operational, road, and rail noise of the Project to the extent required by the Development Consent (SSD-6764) and EPL12425. WCPL will implement the noise management measures consistent with those applied for the noise modelling by SLR undertaken for the WEP EIS. Noise management and control measures include:

- Planning Controls;
- Operational Controls; and
- Engineering Controls.

The NMP contains protocols for responding to noise related complaints (**Section 3.2.2**) and is subject to continual review and reporting through the Annual Review process. The protocol for responding to real-time noise investigation triggers is described in the existing NMP and includes the implementation of suitable management measures, including the temporary standing-down of components of mobile plant, if required.

3.4.11 Visual and Lighting

The design and construction of surface infrastructure was undertaken in a manner that minimises visual contrasts where such infrastructure is potentially visible from private residences or public vantage points. Progressive revegetation onto rehabilitated landforms will further minimise the visual impact of the Mine and will be completed soon after landform shaping. WCPL has implemented a number of measures to minimise potential visual impacts at the Wilpinjong Coal Mine:

- Vegetated visual bunds have been constructed along the northern boundary of Pit 5;
- Flood bunds that also act as visual bunds have been constructed around Pit 3 near Ulan-Wollar Road;
- A tree screen has been established along the east-west section of Wollar Road to the south of the Wilpinjong Coal Mine;
- Trees have been established along the mine access road;
- Mine areas are rehabilitated as soon as practicable following disturbance;
- Temporary rehabilitation of the approved elevated waste rock emplacement in Pit 2 will occur following construction;
- All external lighting is operated in accordance with Australian Standard 4282 (INT) 1995 – Control of Obtrusive *Effects of Outdoor Lighting*.

In addition, overburden material would be placed along selected boundary areas of each Project open pit to act as a safety bund (i.e. to prevent accidental access). In some areas these bunds (once they are revegetated) would assist in reducing direct views to open cut workings from publicly accessible locations. Bunds would be constructed up to 3 m above the existing surface level and would remain as a permanent landscape feature or be integrated into the rehabilitated final landforms.

In particular, a perimeter bund would be constructed at the southern extent of Pit 8 to restrict access and reduce views of the active open pit development areas (and ultimately the final void) from Wollar Road. The bund would be up to approximately 3 m in height and would be progressively vegetated with shrubs and trees to screen views of Pit 8. In addition, existing remnant vegetation along Ulan-Wollar Road and Wollar Road would continue to be maintained where practicable to minimise views of the Mine from these roads.

3.4.12 Aboriginal and European Heritage

Aboriginal Heritage

WCPL have developed an Aboriginal Cultural Heritage Management Plan³⁵ (ACHMP). The ACHMP also includes an Archaeological Salvage Program. The ACHMP is currently under review as required by Development Consent (SSD-6764).

The ACHMP has been prepared to assist WCPL in the investigation, salvage and management of Aboriginal heritage issues at the Mine. This Plan has been developed in consultation with OEH and Registered Aboriginal Parties (RAPs).

The ACHMP summarises the archaeological surveys and provides site specific management strategies for previously identified sites. The monitoring programme described in the ACHMP will continue to be implemented during the MOP term.

Aboriginal artefacts salvaged from areas to be disturbed will continue to be collected and relocated to a “keeping place” where the artefacts are analysed, documented and stored. Aboriginal artefacts will be replaced back into the landscape once final rehabilitation works are completed.

European Heritage

The WEP identified 21 sites of local historical heritage significance and three items with no historical heritage significance. Of the identified 21 sites of local heritage significance, four have the potential to be impacted by the Project. One site, namely the Historical Shale Oil Mine Complex is located in Slate Gully, partially within the Project open cut boundaries. The Road Embankment is located within the potential construction area for the proposed realignment of the TransGrid Wollar to Wellington 330 kV ETL. A further two sites (Pine Park and William Carr’s Hut) are located in relatively close proximity to the Mine.

To manage any potential mining effects upon the known local heritage sites, WCPL will develop a Historic Heritage Management Plan (as required by Condition 49, Schedule 3 of Development Consent SSD-6764) for the development to the satisfaction of the Secretary. Management measures such as the realignment of the electricity transmission lines will be implemented (where reasonable) to minimise Mine related impacts upon heritage items, such as the “stone wall”.

3.4.13 Spontaneous Combustion

WCPL have prepared and implemented the Spontaneous Combustion Management Plan (SCMP)³⁶, describing the management measures that will be used to minimise the occurrence of spontaneous combustion through the monitoring of potential causes of spontaneous combustion events.

Assessment of the propensity of the coal and carbonaceous partings to spontaneous combustion identified the majority of the coal and waste material in the coal stratigraphy had a low propensity for spontaneous combustion. However, site experience has now shown that parting material in the lowest section of the coal stratigraphy poses a risk for spontaneous combustion. Interburden material associated with the lowest coal ply (G Seam) presents the highest risk for spontaneous combustion when exposed to atmospheric conditions.

In June 2017, WCPL completed a review of the SCMP. As described in the SCMP, efforts for managing spontaneous combustion at the Mine will be focussed on prevention of outbreaks rather than management of outbreaks. The focus of spontaneous combustion management will be on reducing the risk of an outbreak. Mine planning is critical to the prevention and management of spontaneous combustion at the Mine. For additional information in regards to spontaneous combustion management, refer to **Section 3.3.2**.

³⁵ Conditions 47, Schedule 3 of Development Consent (SSD-6764)

³⁶ The SCMP as required by the AQMP, Condition 20, Schedule 3 of Development Consent (SSD-6764).

3.4.14 Bushfire

Bushfire management at the Mine will be carried out in accordance with the BMP. Bushfire management has also been developed in consultation with the NSW RFS to specifically address bushfire management issues across WCPL landholdings, including the identification of assets, assessment of fire risk and identification of management strategies to reduce the risk of fire to people and property (Eco Logical, 2011). Operationally, the objectives of bushfire management are to:

- Reduce fire ignition potential; and
- Prevent the spread of fire within and beyond WCPL's landholdings.

From a conservation perspective, the objectives of the bushfire management are to:

- Protect the flora and fauna communities within WCPL's landholding from inappropriate fire regimes and unplanned fire events; and
- Utilise fire as a management tool to maintain and enhance native ecosystems, where applicable.

Bushfire management includes:

- A Bushfire Hazard Assessment – to assess terrain, vegetation and fuel loading and potential fire intensity;
- A Bushfire Risk Assessment – to assess fire risks (i.e. the chance of a fire igniting, spreading and causing damage to assets) and assets at risk of fire;
- Management Approaches for the three identified and mapped bushfire management zones (Asset Protection Zone, Strategic Fire Advantage Zone and Land Management Zone);
- Scheduled tasks for bushfire management across WCPL landholdings; and
- Information to assist in the preparation of burn programs for the bushfire management zones.

3.4.15 Exploration

As previously discussed in **Section 2.3.1**, the exploration drilling program will continue during the MOP term to update gas and coal quality data for WCPL. In general, all land preparation required will be in accordance with the (**Section 3.2.1**) and associated ground disturbance permits. Mitigation measures relevant to exploration and land clearing activities at WCPL include the following:

- Drilling sites and access will be located to avoid areas of remnant vegetation, other sensitive areas and minimise the requirement for vegetation clearance.
- A vegetation clearance protocol and a Ground Disturbance Permit (GDP) procedure and checklist have been developed. The GDP requires the approval of WCPL Environmental Manager prior to any land clearing activities taking place. The vegetation clearance protocol and GDP aims to minimise environmental impacts, including minimising the area required for disturbance for drill sites and access tracks, identify environmental issues such as Aboriginal and European heritage sites, identify sensitive flora and fauna communities, outline erosion and sediment control measures, provide topsoil management and limiting soil disturbance measures, avoiding threatened species, and the identification of any seed or timber resources that can be salvaged. In accordance with GDP process, follow up inspections are completed by WCPL's Environmental Department to ensure the GDP is carried out and each drill site is rehabilitated to the appropriate standard. Please refer to **Appendix 6** for a copy of a GDP.
- Additionally, an Exploration Site Preparation Procedure has been established to detail the standards required when completing exploration site preparation. An Exploration Site Rehabilitation Procedure which details the standards required when completing exploration site rehabilitation at WCPL has also been developed. The standards apply to both exploration on Mining Leases and Exploration Licences.

3.4.16 Construction

A number of infrastructure projects are planned to within the MOP term (**Section 2.3**). The existing infrastructure is largely located within the present approved open cut disturbance area. All ROM coal

handling and haulage to the CHPP will remain within the confines of the existing approved open cut mining disturbance area. Notwithstanding, some minor construction activities may be required outside of the existing open cut disturbance area within WCPL's land and will include clean water diversion drains, light vehicle access tracks and environmental monitoring sites e.g. groundwater monitoring piezometers.

Mitigation measures relevant to construction activities outside approved open cut disturbance area will include the following:

- Infrastructure will be located to avoid areas of remnant vegetation, ECA's and regeneration areas. Vegetation clearance will be kept to a minimum where practicable and in accordance with Project Approval conditions;
- Implementing WCPL vegetation clearance protocol and Ground Disturbance Permit (GDP) procedure;
- Topsoil resources will be identified, stripped and stockpiled for later use in rehabilitation in accordance with **Section 3.3.5**; and
- Where vegetation clearance is undertaken, timber will be cleared, mulched, salvaged and windrowed. Windrowed timber, where practicable, will then be used in rehabilitation.

3.4.17 Public Safety

All efforts will be made to ensure the safety of the public, both as visitors to the site and off the site. Measures to be implemented by WCPL to minimise risks to public safety include:

- Induction programmes for employees, contractors and visitors;
- Signage and communication protocols for visitors and suppliers;
- Identification systems for visitor access to the site;
- First aid training requirements for employees and contractors;
- Maintenance of fire trails and fire management measures in accordance with the bush fire management plan;
- Fence lines maintained in an operational condition;
- Right of way accesses to neighbours are maintained;
- A vegetated bund that will serve as both a safety bund and visual bund is to be progressively constructed along Ulan-Wollar Road where required. The existing rail embankment on the southern side of the Ulan-Wollar Road will provide a barrier for some of the mining areas in the short-term; and
- Maintenance of locked gates around the site for security purposes.

Public and employee safety are fundamental considerations in the design and operation of the Mine and will be addressed through site procedures and work methods.

4.0 Post Mining Land Use

4.1 Regulatory Requirements

Table 3 (Section 1.2) identifies the regulatory requirements for rehabilitation objectives, rehabilitation strategy, progressive rehabilitation and the preparation of a rehabilitation management plan as identified in Development Consent (SSD-6764). **Table 5 (Section 1.2)** identifies the regulatory requirements for rehabilitation as required Mining Lease 1573 (ML1573).

4.2 Post Mining Land Use

The Mine is located in an area in the Wilpinjong Valley between the Goulburn River National Park and the Munghorn Gap Nature Reserve. Early European settlers cleared the flat valley floor to graze stock and cultivate pastures.

Land use in the vicinity of the Mine is characterised by a combination of coal mining operations (Ulan Coal Complex and Moolarben Coal Complex), agricultural landuses (primarily grazing) and rural residential development (evident in the local villages of Wollar, Ulan and the localities of Cumbo, Slate Gully and Araluen). The majority of WCPL's Residual Land is currently leased for agricultural purposes. WCPL foresees no potential land use conflicts for the Biodiversity Offset Areas based on adjacent land uses.

Prior to mining operations commencing, the Wollar area was typical of early (around the 1800s) European settlement where lands deemed arable were cleared of most vegetation including the Mine areas, primarily for grazing purposes and dryland cropping. A rural land capability assessment determined that the land capability within the Mine disturbance area is of greater than 5 which indicates that the land is suitable for a limited set of land uses (grazing, forestry, nature conservation and some horticulture (WCPL, 2015). The post mining land use will be entirely woodland (**Section 3.3.6.4**). The conceptual plan of the post mining landscape is shown on **Figure 9** and **Plan 4**. Post-mining land use planning has been provided by DP&E to prioritise Regent Honeyeater habitat establishment within existing mine and future rehabilitation areas.

The Goulburn River National Park adjoins the Mine to the north and covers an area of approximately 71,000 ha. As the National Park covers part of the Great Dividing Range, it extends into both the Hunter and Cudgegong River Catchments. Some 90 km of the Goulburn River lies within the National Park (Hill, 1999; 2000). The Munghorn Gap Nature Reserve covers an area of some 5,900 ha and straddles the Great Dividing Range.

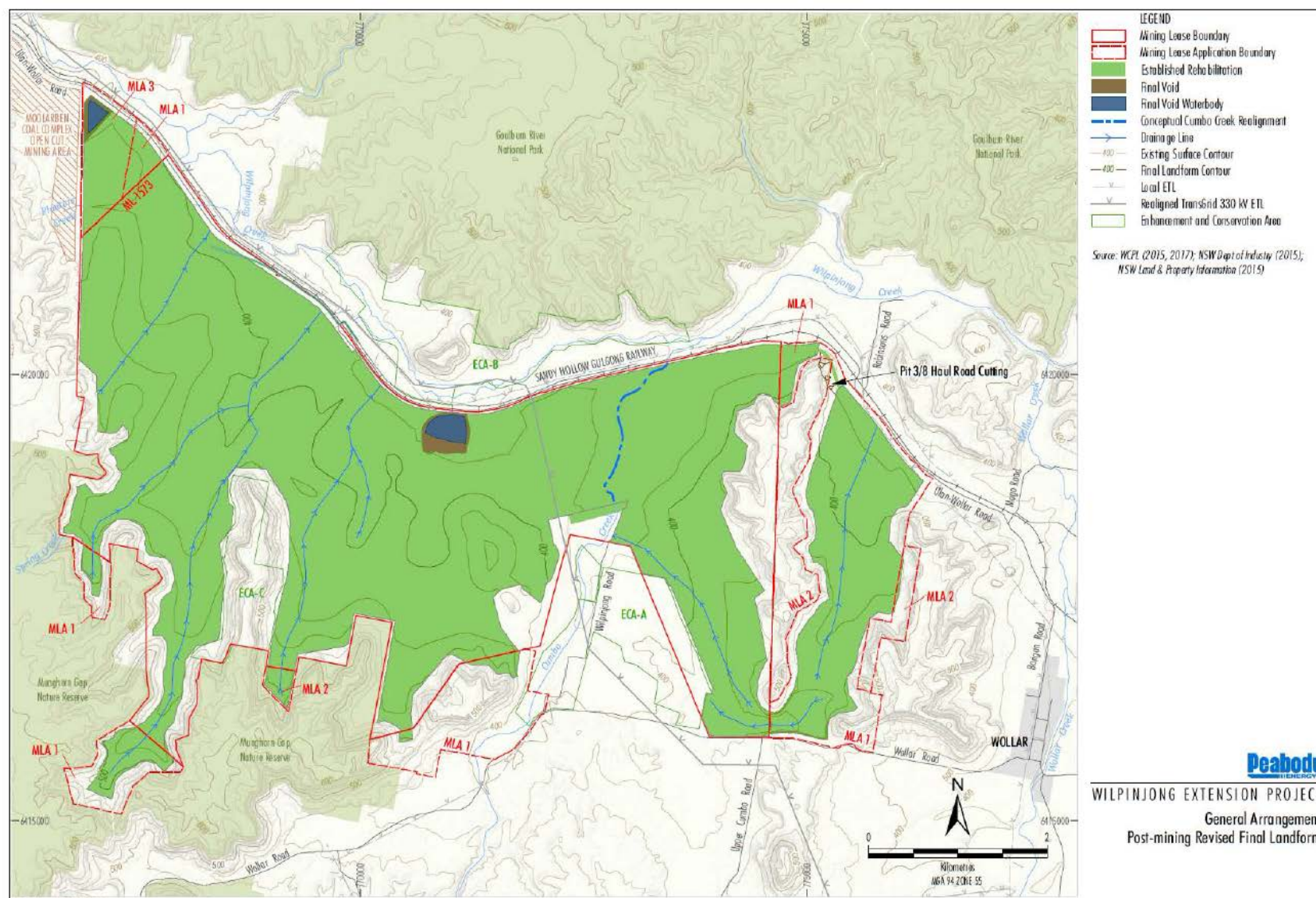
4.2.1 Rehabilitated Areas and Features

Final landform concepts would be revised and refined throughout the Project life, utilising the outcomes of on-going consultation with relevant stakeholders, rehabilitation, regeneration areas and ECA monitoring results and the results of trials. The final landform design concepts would remain consistent with the objectives presented in **Section 4.3**.

Final landform levels and slope would approximate the pre-mining topography (EIS 2005). Final landforms are designed in accordance with Wilpinjong Landform Standards and Technical Specifications which are designed with an allowance for the predicted long-term settlement of mine waste rock and tailings. A final void would be located at the north-western extent of the final landform and another centred along the northern extent (**Figure 8**). A final void management plan is currently under review.

Final landform drainage would be designed to integrate with the surrounding catchment (i.e. in a generally north to south direction) and some permanent creek features formed within rehabilitation areas in locations similar to current creek lines (e.g. Planters Creek). Catchment surface flow will be reinstated from the base of the Munghorn Gap Nature Reserve area north to Wilpinjong Creek and onto the Goulburn River as shown in the proposed final landform design (**Figure 8 & Plan 4**).

Figure 8 Revised Post Mining Landform



The final landform is to drain in a generally south to north direction. Drainage lines with greater than 3% fall will need to be armoured to reduce scouring and erosion. Sediment control dams are to be constructed along major drainage lines in rehabilitated landforms to reduce suspended solids in surface flow from the site. Sediment dams will be placed along the main drainage lines as close as practical to the northern edge of the mining lease

The revised revegetation concepts for the Mine propose woodland vegetation (**Figure 9**). The rehabilitation phases during this MOP term are described in **Section 5.3**.

4.3 Rehabilitation Objectives

4.3.1 Rehabilitation Areas

Rehabilitation areas include areas disturbed by the Mine which will be rehabilitated and revegetated. The proposed management and implementation of rehabilitation works in areas disturbed by mining, includes progressive rehabilitation and revegetation.

Specific rehabilitation objectives for the Mine (as a whole) are:

- Safe, stable and non-polluting;
- Final landforms designed to incorporate micro-relief and integrate with surrounding natural landforms and adjacent mine rehabilitation;
- Final landforms maximise geotechnical performance, stability and hydrological function;
- Constructed landforms maximise surface water drainage to the natural environment (excluding final void catchments);
- Minimise long term groundwater seepage from the site to ensure negligible environmental consequences beyond those predicted for the development;
- Minimise visual impact of final landforms as far as is reasonable and feasible;
- All infrastructure to be decommissioned and removed, unless the Secretary agrees otherwise;
- Drainage lines are restored in accordance with the principles, concepts and techniques described in *“A rehabilitation manual for Australian streams (Rutherford, I; Jerie, K; Marsh, N 2000); and*
- Ensure public safety

A specific rehabilitation objective for the rehabilitation includes:

- Rehabilitate at least 2,906 hectares of self-sustaining woodland ecosystem to the BVTs specified in Tables 8 and 9 of Development Consent (SSD-6764);
- Establish self-sustaining ecosystem function in areas of:
 - aquatic habitat, within diverted and/or re-established drainage lines and retained water features, with consideration of hydro- geomorphological constraints;
 - habitat for threatened flora and fauna species; and
 - habitat for flora and fauna species known to occur in the region.

Specific rehabilitation objectives for final void areas are as follows:

- Minimise to the greatest extent practicable:
 - the size and depth of final voids;
 - the drainage catchment of final voids;
 - any high wall and low wall instability risk; and
 - risk of flood interaction for all flood events up to and including the PMF.

Specific rehabilitation objectives for Cumbo Creek relocation are as follows:

- Restored in accordance with Condition 26 to 28 of Development Consent (SSD-6764)

4.3.2 Regeneration Areas

Regeneration Areas have been established on areas of WCPL owned land situated proximal to Project disturbance/rehabilitation areas (**Figure 2** and **Figure 5**). These areas were established as part of the WCP EIS (WCPL, 2005). The Regeneration Areas contain predominantly cleared agricultural land in which woodland vegetation will be established through natural regeneration and selective planting. The WEP EIS resulted in a reduction to the size of the Regeneration Areas as they occurred within the open cut extension and infrastructure areas. The original purpose of the Regeneration Areas is still being satisfied as the land within the open cut extension and infrastructure areas will be rehabilitated to woodland.

Specific rehabilitation objectives for the Regeneration Areas include:

- To establish woodland vegetation in the Regeneration Areas (including the banks of Wilpinjong and Cumbo Creeks) through natural regeneration and selective planting if required (i.e. in areas where natural regeneration is unsuccessful); and
- To increase the continuity of woodland vegetation in the region. This will be done by providing woodland corridors between Goulburn River National Park, ECA's and remnant vegetation adjoining the Munghorn Gap Nature Reserve (**Figure 10**).

4.3.3 Enhancement and Conservation Areas (ECA)

In 2012, WCPL entered into a Conservation Agreement with the NSW Minister for the Environment, for three parcels of land surrounding ML 1573. ECAs A, B, and C have been established for conservation purposes (**Figure 2** and **Figure 5**). These 3 parcels of land currently make up the total 480 ha of land required by Condition 32 of the Development Consent (SSD-6764).

The ECAs comprise a variety of vegetation communities including those that will be disturbed by the Mine. Approximately 295 ha of remnant vegetation will be conserved and enhanced by the ECAs, including more than 80 ha of the Box Gum Woodland EEC. In addition, approximately 185 ha of woodland vegetation will be established in the ECAs through natural regeneration/selective planting, including 50 ha of the Box Gum Woodland EEC.

Enhancement of the ECAs will be achieved by the implementation of appropriate land management practices such as weed control, management of livestock access to encourage natural regeneration and selective planting.

The ECAs aim to contribute to the continuity of woodland vegetation by establishing links between the Regeneration and Rehabilitation Areas, and existing remnant vegetation in Munghorn Gap Nature Reserve, Goulburn River National Park. Further, two of the three ECAs have been positioned on the margins of Goulburn River National Park or Munghorn Gap Nature Reserve, which is considered beneficial in terms of the strategic role of the ECAs in the region.

5.0 Rehabilitation Planning

5.1 Domain Selection

Mine closure or rehabilitation domains for this MOP have been identified on the basis of their operational and functional purpose within the mining disturbance boundary and presented in **Table 21** and displayed in **Figure 10**.

Primary domains can be defined as land management units within the mine site, usually with unique operational and functional purpose and therefore similar geophysical characteristics. Primary domains outline current land use during the MOP period.

Secondary domains are land management units characterised by a similar post mining land use objective. Secondary domains define the final land use at mine closure.

Table 21 MOP Rehabilitation Domains

Primary Domains	Code	Secondary Domains	Code
Constrained Infrastructure Area	1	Woodland Area*	A
Mine Infrastructure	2	Mixed Woodland/Pasture Area*	B
Coal Handling Preparation Plant	3	Final Voids	C
Mine Water Dams	4	Cumby Creek Realignment	D
Overburden Emplacement Areas	5	Environmental Conservation Area and Regeneration Areas	E
Tailings Storage Areas	6	Infrastructure – Environmental Monitoring	F
Active Mining Areas	7		
Rehabilitation Areas (Pre-MOP)	8		
Environmental Conservation Areas	9		
Future Mining Areas	10		

Note: * Secondary Domain be revised to Woodland Area in the forthcoming MOP Amendment to address the BVT requirements as discussed in **Section 3.3.6**, **Section 3.3.6.4** and **Section 4.2**.

5.2 Domain Rehabilitation Objectives

As discussed in **Section 4.2** and **Section 4.3** the objectives of final rehabilitated landform is to establish a safe, non-polluting and stable landform that is compatible with the surrounding landscape and that meets the requirements of the post mining land use (**Table 22** and **Figure 11**). This will incorporate selective vegetation communities determined by beneficial outcomes for the Regent Honeyeaters determined by DP&E.

Final rehabilitation requirements would ultimately be refined and developed in consultation with key government authorities and other relevant stakeholders and reported in consecutive Open Cut MOP's for approval prior to implementation. In addition to the rehabilitation objectives outlined in **Section 4.3**, the rehabilitated objectives as required by Development Consent (SSD-6764) for Primary and Secondary Domains, are presented below in **Table 22**.

Figure 10 Mine Domains

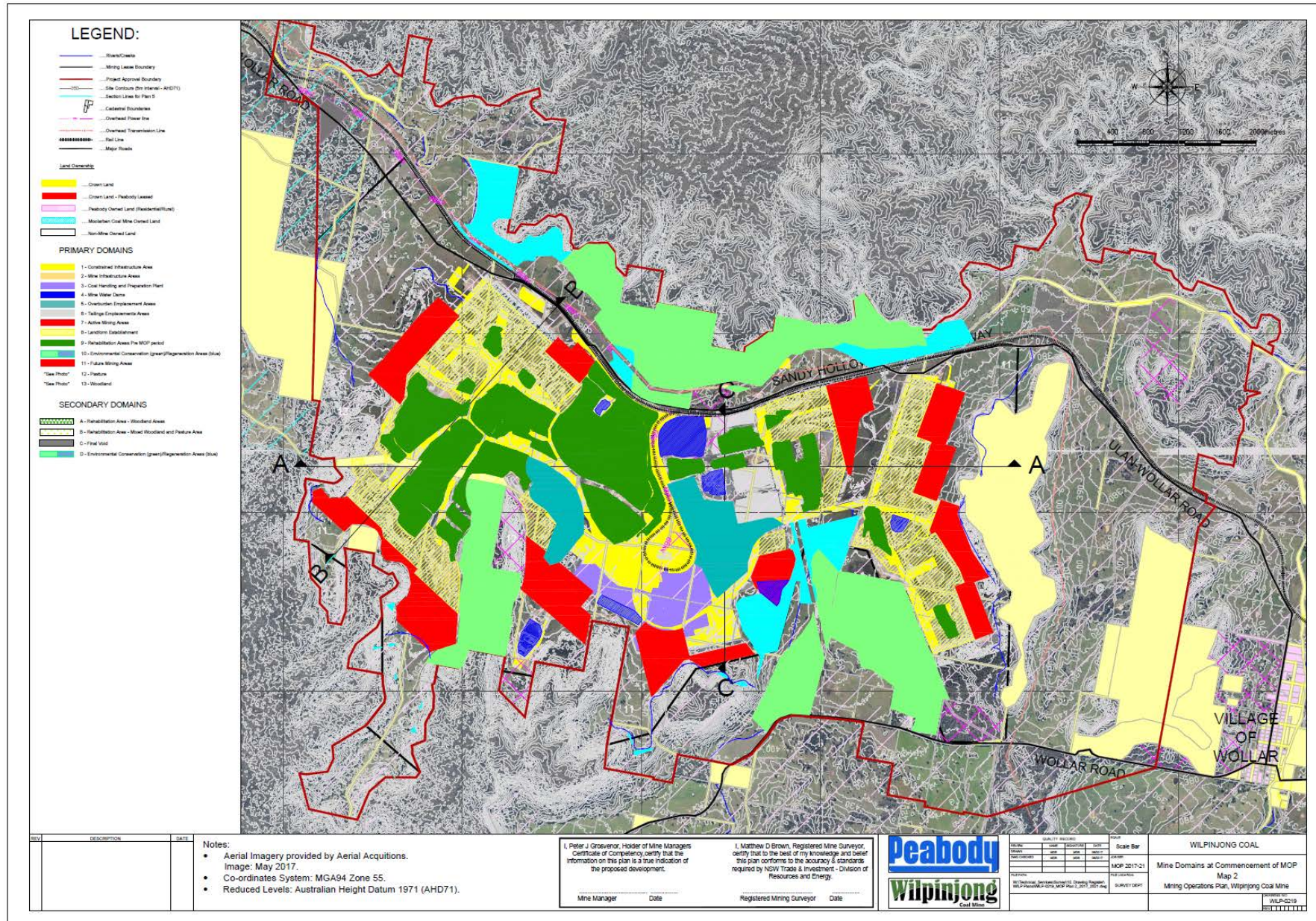


Table 22 Domain Rehabilitation Objectives

Domains	Feature	Rehabilitation Objectives ³⁷
All Domains	Mine Site (as a whole)	<ul style="list-style-type: none"> • Safe, stable and non-polluting; • Final landforms designed to incorporate micro-relief and integrate with surrounding natural landforms and adjacent mine rehabilitation; • Final landforms maximise geotechnical performance, stability and hydrological function; • Constructed landforms maximise surface water drainage to the natural environment (excluding final void catchments); • Minimise long term groundwater seepage from the site to ensure negligible environmental consequences beyond those predicted for the development; • Minimise visual impact of final landforms as far as is reasonable and feasible.
	Surface Infrastructure	<ul style="list-style-type: none"> • All infrastructure to be decommissioned and removed, unless the Secretary agrees otherwise
	Rehabilitation	<ul style="list-style-type: none"> • Rehabilitate at least 2,906 hectares of self-sustaining woodland ecosystem to the BVTs specified in Tables 8 and 9 of Development Consent (SSD-6764); • Establish self-sustaining ecosystem function in areas of: <ul style="list-style-type: none"> ○ aquatic habitat, within diverted and/or re-established drainage lines and retained water features, with consideration of hydro- geomorphological constraints; ○ habitat for threatened flora and fauna species; and ○ habitat for flora and fauna species known to occur in the region.
	Other reinstated drainage lines	<ul style="list-style-type: none"> • Drainage lines are restored in accordance with the principles, concepts and techniques described in “A rehabilitation manual for Australian streams (Rutherford, I; Jerie, K; Marsh, N 2000).
	Community	<ul style="list-style-type: none"> • Ensure public safety; and • Minimise the adverse socio-economic effects associated with mine closure.
Domain D - Final Voids	Final Voids	<ul style="list-style-type: none"> • Minimise the size and depth of final voids so far as is reasonable and feasible, subject to meeting the <i>Mine Site</i> objectives; • Minimise the drainage catchment of the final void so far as is reasonable and feasible; • Negligible high wall instability risk; • The size and depth of the final voids must be designed having regard to their function as long-term groundwater sinks, to ensure that groundwater flows across the back filled pit towards the final void; and • Minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood level.

³⁷ (Table 11: Rehabilitation Objectives) Condition 60, Schedule 3 of Development Consent (SSD-6764)

Domains	Feature	Rehabilitation Objectives ³⁷
Domain E - Cumbo Creek Realignment	Cumbo Creek Realignment	<ul style="list-style-type: none"> Restore in accordance with conditions 26 to 28 of Schedule 3, Development Consent (SSD-6764): <p>Cumbo Creek Relocation</p> <p>26. The Applicant must design, construct, maintain, and rehabilitate the proposed relocation of Cumbo Creek, to the satisfaction of the Secretary.</p> <p>27. Within one month of completing the construction of the Cumbo Creek relocation, the Applicant must submit an as-executed report, certified by a practising registered engineer, to the Secretary.</p> <p>28. Prior to destroying the original creek line, WCPL must demonstrate that the Cumbo Creek relocation is operating successfully, in consultation with DPI Water and to the satisfaction of the Secretary.</p>

5.2.1 Rehabilitation Strategy

WCPL will prepare a Rehabilitation Strategy (within 6 months of commencement of development under SSD-6764) unless otherwise agreed by the Secretary. The Rehabilitation Strategy will be prepared to the satisfaction of the Secretary. This Rehabilitation Strategy must:

- Be prepared, in consultation with the proponent of the Moolarben Coal Mine, investigate options to integrate the final landform with the Moolarben Coal Mine, including options to integrate final voids and minimise the sterilisation of land post-mining;
- Include an assessment of partially backfilling voids 2 and 6 above the groundwater equilibrium level having regard to the final void rehabilitation objectives, including consideration of downstream water quality and the objectives in Table 6;
- Include a revised final landform plan which builds on the rehabilitation objectives, including incorporation of micro-relief, landform stability, hydrological and ecological function; and
- Include detailed justification for proposed changes to the final landform, having regard to the approved post-mining land use.

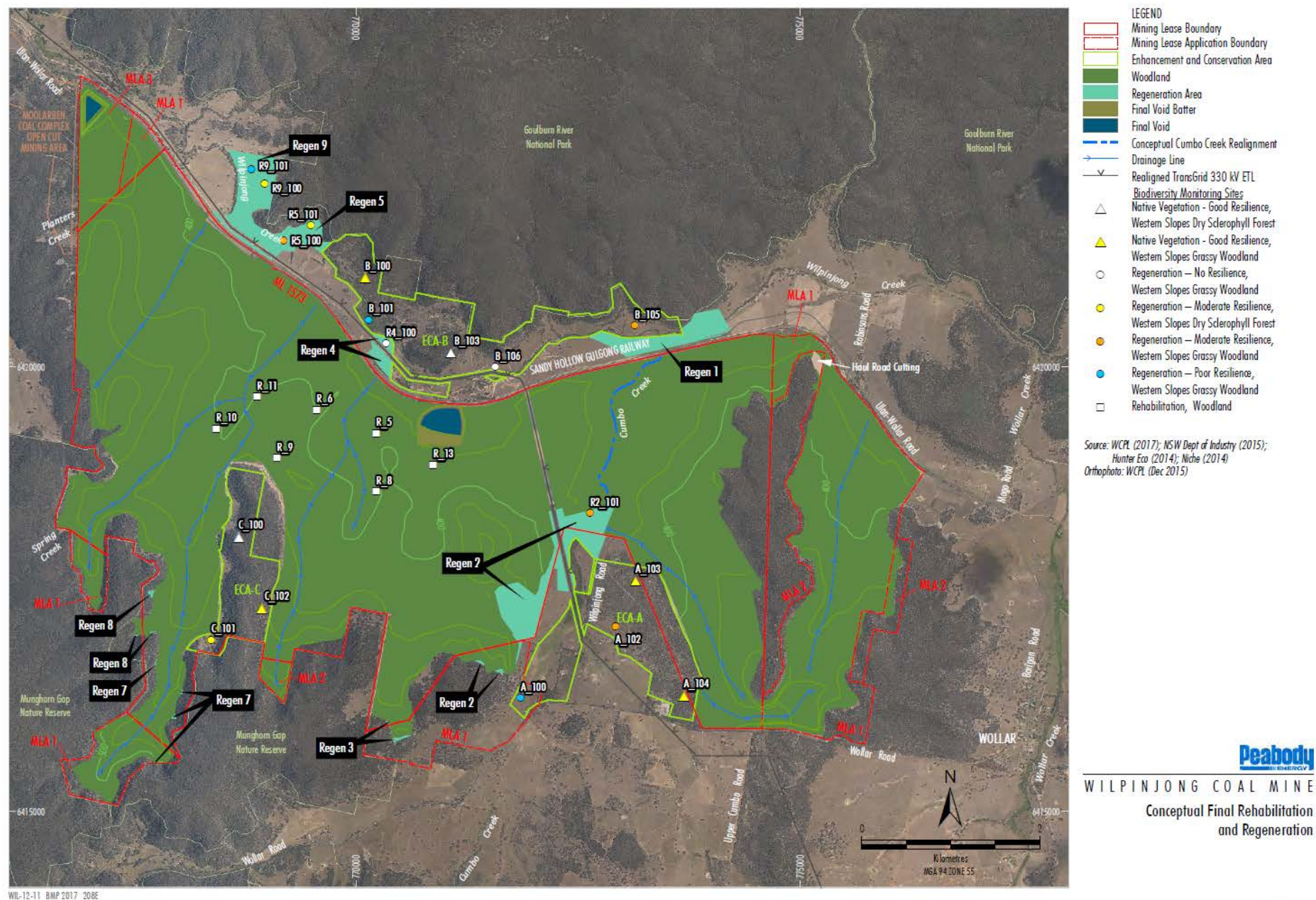
WCPL anticipate developing this strategy during 2017 for submission to the Secretary within 6 months of the commencement of development under SSD-6764. Subject to approval of this Strategy from the Secretary, this MOP will be amended accordingly.

5.2.2 Conceptual Life of Mine Rehabilitation

Condition 64, Schedule 3 of Development Consent (SSD-6764) requires:

- A conceptual life of mine rehabilitation schedule:
 - The general arrangements (as provided in Section 2 of the WEP EIS) provide a current conceptual progression of rehabilitation throughout the life of the Mine. A review of the life of mine schedule will be undertaken during the MOP term.
- A detailed rehabilitation schedule covering a period of up to 3 years:
 - During consultation, it was agreed by the DRG this MOP would only seek a two year term. An indicative mining sequence and rehabilitation sequence during the MOP term are provided in **Plans 3A – 3B**.
- An annual program for reviewing and revising the schedule:
 - Reviews of the MOP will be undertaken by Environment and Community Manager and Technical Services Manager as required during the MOP term to assess the effectiveness of the procedures against the objectives of MOP. For further information about the review process for the MOP see **Section 10**.

Figure 11 Conceptual Final Rehabilitation and Regeneration



5.3 Rehabilitation Phases

This MOP outlines the rehabilitation strategies implemented on site primarily associated with the advancing open cut and waste rock emplacement areas. Typically, the following rehabilitation phases of the Mine include:

- **Stage 1: Decommissioning** – removal of hard stand areas, buildings, contaminated materials, hazardous materials;
- **Stage 2: Landform Establishment** – incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology;
- **Stage 3: Growth Medium Development** – incorporates physical, chemical and biological components of the growing media and ameliorants that are used to optimise the potential of the media in terms of the preferred vegetative cover;
- **Stage 4: Ecosystem Establishment** – incorporates revegetated lands and habitat augmentation; species selection, species presence and growth together with weed and pest animal control /management and establishment of flora;
- **Stage 5: Ecosystem Development** – incorporates components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape; and
- **Stage 6: Relinquished Land** - lands that have met the required mine rehabilitation and closure requirements for lease relinquishment.

The rehabilitation phases identified within Primary Domains during the MOP period are outlined in **Plans 3A to 3B** and summarised in **Table 23**.

Table 23 Rehabilitation Phases During the MOP term

Primary Domains Rehabilitation Phase										
	(Domain 1) Constrained Infrastructure Areas	(Domain 2) Mine Infrastructure	(Domain 3) Coal Handling Preparation Plant	(Domain 4) Mine Water Dams	(Domain 5) Overburden Emplacement Areas	(Domain 6) Tailings Storage Areas	(Domain 7) Active Mining Areas	(Domain 8) Rehabilitation Areas (Pre-MOP)	(Domain 9) Environmental Conservation Areas	(Domain 10) Future Mining Areas
Decommissioning	x	x	x	x	x	✓	x	x	x	x
Landform Establishment	x	x	x	x	✓	✓	x	x	x	x
Growth Medium Development	x	x	x	x	✓	✓	x	x	x	x
Ecosystem Establishment	x	x	x	x	✓	✓	x	x	x	x
Ecosystem Development	x	x	x	x	✓	✓	x	✓	✓	x
Relinquished Lands	x	x	x	x	x	x	x	x	x	x

5.3.1 Decommissioning

Infrastructure with no ongoing beneficial use would be removed from the site at the completion of the project. Foundation slabs would be excavated for disposal or buried in a void in an approved manner.

Process reagents and fuels unused at the completion of mining would be returned to the supplier in accordance with the relevant safety and handling procedures. Foundation soils would be chemically tested, contour ripped and chemically ameliorated, as required (in accordance with EPA requirements). Stockpiled soils would then be applied as necessary and stabilised. Revegetation would be undertaken with suitable endemic tree species, consistent with the Project revegetation strategy (**Section 5.4**).

Roads that have no specific post-mining use would be ripped, topsoiled and revegetated. Some access roads may be retained post-mining to enable access and for use in bushfire and other land management activities.

Water management structures and sediment control structures would either be retained as wetland habitat/water features or decommissioned and rehabilitated. The design, capacity and final location of these post mining water management structures will be refined and detailed in revised water management plans as the Mine progresses towards mine closure. Some access roads may be retained post-mining to enable access and for use in bushfire and other land management activities.

5.3.2 Landform Establishment

As identified in the WEP, mine waste rock emplacements including contained infrastructure areas would cover an area of approximately 2,790 ha. All landforms will be designed in accordance with the Mine's landform standards. Where long slopes are present, contour drains or deep staggered rips would be established to assist in initial surface stabilisation.

The surface of mine waste rock emplacements would be constructed to approximate (where practicable) the existing topographic form of the shallow valleys which drain the Project area. Mine waste rock emplacement surfaces would be formed to enhance rainfall absorption. Regular slopes and sharp transition angles would be varied and rounded to provide a more natural appearance.

A pattern of creek features (flow paths) would be formed over the final landforms comparable to the pre-mine regime (**Figures 9 & 11**). These reconstructed creek features would convey upslope runoff across the Mine area to Wilpinjong Creek.

Revegetation of the mine waste rock emplacements is described in **Section 3.3.3.4 and Section 5.3.4**.

The mine waste rock emplacements behind the advancing open cut would be constructed to approximate the pre-mining topography. Mine waste rock emplacements would be shaped by dozer prior to the commencement of rehabilitation activities (i.e. re-profiling, re application of topsoil/subsoil and revegetation).

The elevated waste rock emplacement would be temporarily rehabilitated at a height of up to approximately 450 m AHD, before being reshaped and pushed down to a maximum elevation of approximately 440 m AHD at the end of the mine life as a component of finalising site landforms and slopes.

The following technical standards will be implemented during construction of the final landform at Wilpinjong Coal Mine.

Inert Cover Depth

Inert cover will be placed on top of the rehabilitated final landform surface to provide a benign barrier between any overburden that has not completely equilibrated with surface geochemical conditions.

At least 2m of inert cover will be placed on top of the rehabilitation final landform surface to provide a benign barrier between any overburden that has not completely equilibrated with the surface geochemical conditions.

At least 5m of inert cover will be placed on top of the rehabilitation final landform surface of the elevated waste rock emplacement to provide a benign barrier between any overburden that has not completely equilibrated with the surface geochemical conditions.

Once ready for rehabilitation, the tailings dams are progressively capped with inert overburden material to a minimum depth of cover of 2 m creating a stable landform ready for final profiling, topsoiling (0.1 to 0.3 m layer) and revegetation. The final landform levels and topography of the rehabilitated tailings disposal areas will generally approximate the pre-mining topography, with some variations, and are designed with an allowance for the long-term settlement of tailings and an inert capping layer.

Drainage Control

The natural pre-mining drainage direction at Wilpinjong Coal Mine is from south to north. Water drains from the base of the Munghorn Gap Nature Reserve area north to Wilpinjong Creek and onto the Goulburn River. This drainage pattern will be reinstated during construction of the final landform and completion of rehabilitation works.

The domain would be profiled to a free-draining landform with runoff reporting to the natural environment.

The final landform is to drain in a generally south to north direction. Drainage lines with greater than 3% fall will need to be armoured to reduce scouring and erosion. Specifications for graded banks and rock waterways are set out below should they be required.

Sediment Control Structures

Sediment control dams are to be constructed along major drainage lines in rehabilitated landforms to reduce suspended solids in water flowing from site. The dams need to be spaced to control sediment transfer from site with the final dam on the northern end of the mining operation used as the final control point. The dams should be sized to contain rainfall events in accordance with Surface Water Management Plan.

Slope Angles

Rehabilitated slopes are to be constructed to no greater than 1:6 (10 degrees or 17%)³⁸ across the entire ML area (with the exception of Pit 8 and final voids).

Graded Banks

Graded banks are constructed across the slope of rehabilitated areas and are used to collect and direct water flowing from newly rehabilitated areas into rock waterways.

All graded banks shall be constructed at 1% longitudinal grade to the contour of the slope. Cross-fall from the outside edge of the bank to the invert will be between 2% to 3%. Construction of the graded banks is to be programmed to ensure there is no breaching or trafficking over constructed banks.

These structures will most likely only be required when rehabilitating out of pit dumps with 1:6 slopes. Graded banks will generally be constructed at 50 m intervals down a slope i.e. the first graded bank will be constructed at 1% to the contour 50 m from the top of the slope, the second bank at 100 m, etc.

Rock Waterways

The function of rock waterways is to collect and safely discharge flows from graded banks to natural or rehabilitated ground with low slope angles.

Rock waterways are to be excavated following the completion of landform reshaping. Geo-textile will be laid and secured in the excavated structure followed by the placement of suitably sized rock. The

³⁸ Apart from slopes associated with the final voids, slopes greater than 15% would be utilized in areas of the Project backfilled mine landform to transition from the gentler slopes of the backfilled landform into the natural steeper slopes located below the escarpments/cliffs and very steep slopes associated with the sandstone ridges that surround the mine

base of all major rock waterways is to be constructed with a concave finish which allows for an average maximum cross fall to the centre line of 5%. Base width is measured on top of the rock floor of the waterway and not across the excavated earth base. The base width of all major waterways shall be 2m.

Rock lined wo-boys will be constructed every 10m along the rock water ways to act as energy dissipation structures. The crest of wo-boys will be concave rather than convex. This is to encourage flow to the centre of the waterway rather than to the outside where erosive forces may cause damage to the sides of the waterway.

Rock waterways are most likely to be required when rehabilitating out of pit dumps as these landforms will have the steepest slopes (see Slope Angles section above) and therefore the highest velocity water flows from the top to the bottom of the landforms.

Final Voids

At the completion of mining, the Mine's final landform would include final voids located in the north-west of Pit 6, and in Pit 2 (Pit 2 West Dam) (**Figures 8 and 11**).

Once mining operations cease, groundwater inflows to the final voids would no longer be collected and pumped out, and as a result, two of the final voids would gradually begin to fill with water. Water in other on-site operational storages may also be transferred to the final voids in Pits 2 and 6 to facilitate decommissioning and rehabilitation.

Inflows into the final voids would comprise incident rainfall, runoff within the final void catchment area and groundwater. The catchment area of the final voids would be defined by permanent perimeter bunds, diversion channels and/or bunds/ embankment walls.

As required by the Development Consent (SSD-6764), mine planning would target minimising the size of the final voids. The final surface catchment of the final voids would also be minimised by the use of contour landforms. **Section 5.2** and **Table 21** provide further rehabilitation objectives as required.

Perimeter bunding would be formed around the final voids in order to restrict access to steeper slopes. Any further final void access restrictions (e.g. fencing) for safety and exclusion of livestock would be designed and implemented in consultation with relevant authorities.

A Final Void Management Plan (FVMP) would be developed as a component of the Mine Closure Plan in advance of mine closure in consultation with the DP&E, DRG and other relevant authorities.

5.3.3 Growth Medium Development

Topsoil is to be placed on top of the final landform to act as germination medium for vegetation and as a seed source from the natural seed bank present at the time of topsoil stripping. Topsoil placement shall only proceed once the final landform and major drainage works (i.e. graded banks, drainage channels and rock waterways if required) have been completed. Topsoil is to be applied at a minimum of 100 mm thickness and maximum of 300 mm in all areas.

Topsoiling must be undertaken from the top of slopes or top of sub drainage catchment to minimise erosion damage created by storm runoff from bare upslope areas. Care should be taken to minimise the travel over previously spread topsoil by running on bare spoil and turning onto the spreading run. Topsoiling must be conducted along the general run of the contour. Topsoil is not to be placed in down slope bands as this increases the incidence of erosion. Generally, no topsoil is to be placed in the invert of drainage lines or drainage works.

Topsoil will not be required where vegetation trials have demonstrated that inert cover can be used as a suitable substitute. Lime and/or gypsum, cow manure, OGM (for example) or fertiliser will be applied on inert cover or topsoil materials used for rehabilitation activities if necessary to assist in improving the physical and chemical characteristics of the rehabilitation materials.

Deep ripping, seeding and fertilizing will be undertaken following the placement of topsoil and construction of drainage structures on the reshaped final landform. Ripping will be carried out to a

depth of 300 mm to 500 mm on the contour and undertaken with survey control. Full and continuous ripping is to be undertaken between surveyed rip lines. The maximum permissible distance between any two rip lines and or rip sets is 1.5m. Deep ripping will be utilised so that rip lines remain open for erosion control and to encourage infiltration of water. Seeding and fertilising should be undertaken contemporaneously with contour ripping.

5.3.4 Ecosystem Establishment

On completion of landform contouring, topsoiling and erosion and sediment control works, a vegetative cover would be applied as soon as practicable with the aim at sowing specified seed species reflecting seasonal conditions. This would involve sowing cover pasture species and seeding and planting of selected shrub and tree species.

As required by Development Consent (SSD-6764) WCPL will commence the ecosystem and land use establishment phase of rehabilitation for areas within 50m of the Munghorn Gap Nature Reserve, within 2 years of ceasing mining operations in those areas³⁹.

Where rehabilitation areas are to be seeded, a suitable seedbed would be prepared using appropriate equipment to increase the chances for successful seedling establishment. Where necessary, seed would be sowed with fertiliser. Areas seeded may be lightly scarified to assist shallow seed burial. Both seeding and direct planting techniques would be utilised for tree and shrub species. Seeding and planting activities would take into account seasonal factors and would be scheduled, where possible, prior to the expected onset of reliable rains.

Revegetation of Mine disturbance areas would be conducted progressively as mining proceeds, with coal removal and the formation of final landforms behind the advancing face of the open cut (i.e. completed mine waste rock emplacements). Rehabilitation and revegetation of infrastructure areas would also be undertaken progressively as infrastructure is decommissioned.

The entire revegetation programme for the Mine rehabilitation areas provides for woodland areas (**Figure 9** and **Figure 11**).

The revegetation programme for the Mine rehabilitation areas would establish some 2906 ha of woodland vegetation, and in association with the establishment of woodland vegetation in the regeneration areas and ECAs, would contribute to an overall net increase in woodland vegetation of some 1,095 ha.

In recognition of the importance of vegetation corridors to regional biodiversity, the rehabilitation programme has been designed to link the revegetated woodland areas to the regeneration areas or existing remnant vegetation (**Figure 9** and **Figure 11**).

Following surface preparation, vegetation establishment across the rehabilitated area is commenced. The aim of revegetation is to minimise erosion, improve water quality, visual improvement, dust generation and facilitate the development of the post-mining land-use, be it agricultural production or habitat/ecosystem enhancement. Where applicable, vegetation may be established by the following methods:

- Sowing or direct seeding;
- Propagules (seeds, lignotubers, corms, bulbs, rhizomes and roots) stored in the topsoil;
- Spreading harvested plants with brady-sporous seed (seed retained on the plant in persistent woody capsules) onto areas being rehabilitated;
- Planting nursery-raised seedlings (tubestock); and
- Invasion from surrounding areas through vectors including birds, natural self recruitment, animals and wind.

³⁹ Note: It is accepted that some ancillary infrastructure would need to be retained for access and water management.

The most common method of vegetation establishment at WCPL is broadcast and direct seeding of selected pasture or tree seed mixes. Seed sowing is usually supplemented by the concurrent application of granulated fertiliser. Sowing is undertaken shortly after topsoil spreading to avoid loss of topsoil due to wind and rain action. Tubestock is generally only used to establish vegetation where rapid growth or specific species establishment is required, such as remedial revegetation, erosion control or visual bunding.

Fertiliser application is beneficial to vegetation establishment to replenish any nutrient deficiencies. The type of fertiliser and application rate varies according to the specific site, soil type and post mining use of the area. When applying any additional chemical or products to the soil, the effects of runoff and leaching will be considered, as rapid leaching from organic wastes are known to provide ideal conditions for algal blooms and exacerbate weed growth and infestation.

Timing for initial vegetation establishment is an important factor for successful revegetation. Where possible, sowing and planting are planned to occur as soon as possible prior to the expected onset of reliable rains or after a break of the season (i.e. Autumn and Spring).

Following the changes in topography, drainage and soil conditions that results from open cut mining, some local provenance species may not be suitable for revegetation and seed sourced from outside the immediate district may be required. The most appropriate species to use to rehabilitate the area are those most suited to the soil types, drainage status, aspect and climate of the site. The biodiversity values of the surrounding native vegetation communities are considered during rehabilitation planning. Distribution of vegetation type and species selection will be designed to enhance these values, whilst ensuring that weed and fire hazards are not increased for surrounding local agricultural areas.

5.3.5 Ecosystem Development

This section presents a summary of rehabilitation monitoring program as described in the Biodiversity Management Plan. A detailed description of this program is set out in **Section 8**.

Rehabilitation performance will be monitored to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures. An overview of the content of the rehabilitation monitoring program is provided below.

A series of monitoring locations have been set up in the rehabilitation areas on the mine site, in the ECA's and regeneration areas to monitor establishment and regeneration of vegetation. These sites are visited annually to record changes in vegetation progress.

Visual monitoring of revegetation will be conducted as part of other routine environmental activities to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed and animal pest control). Annual photographic recording of each established vegetation monitoring site will also be recorded.

Conventional vegetation monitoring is carried out in rehabilitated spoil areas on the mine site as well as the regeneration areas, ECA's and analogue sites located in undisturbed and pasture locations. This involves using quadrats and transects to measure vegetation parameters which allows a progressive assessment of vegetation progress. Monitoring at these sites is undertaken annually. Analogue sites are compared to the other monitoring sites and act as a "calibration" to allow for variations between seasons.

Rehabilitated spoil areas will be monitored for spoil pH, electrical conductivity (EC), major cations and organic matter to determine whether the vegetation substrate is approaching conditions similar to those found in the analogue sites. This data will be used to identify potential spoil deficiencies over time and assist with the development of maintenance programs if underperforming areas are identified during visual and other monitoring. This will also assist with determining/demonstrating whether the spoil is suitable as a long term substrate for sustainable rehabilitation.

Terrestrial fauna surveys will be conducted to sample fauna species diversity and abundance in the rehabilitation, ECA and regeneration areas. Systematic survey sites have been established to monitor amphibians, reptiles, birds and mammals. At least one survey site will be established in each major habitat type present within each ECA where practical. These sites will be monitored annually and are located in:

- Creek line and riparian habitats;
- Woodland areas; and
- Predominantly cleared land previously used for grazing.

Fauna monitoring will involve the use of Elliot Traps, cage traps, pit falls, spotlighting, echo location for bats, call broadcasting for birds and reptile surveys. These procedures will be supported by a series of observations in the field. Further details of flora and fauna monitoring are provided in the BMP.

5.4 Performance Criteria, Measures and Indicators

WCPL have developed preliminary completion criteria, measures and indicators for each domain and rehabilitation phase, as required by the MOP Guidelines and Project Approval.

WCPL's completion criteria and monitoring program for Ecosystem Establishment Phase (**Table 27**) and Ecosystem Development Phase (**Table 30**), is based on the Biometric methodology for assessing ecosystem function (Gibbons et al 2009). Landscape Function Analysis (LFA) will be used for assessing rehabilitation stability and progress (Tongway & Hindley 2004). For further information regarding Biometric completion criteria and LFA refer to Section 6.0 of the BMP (**Appendix 5**).

As discussed with the DRG and DP&E (**Section 1.4**), biometric vegetation types (BVT) performance and completion criteria relevant to the Mine's rehabilitation areas are still being developed in accordance with Schedule 3, Condition 37 of the Development Consent. Upon resolution of the performance and completion criteria, in accordance with Condition 65 of the Development Consent, the BMP will be comprehensively updated as required to reflect the new criteria. In addition this MOP will be updated to align with the new criteria in the BMP. Until such time the existing completion criteria (**Section 5.4**) developed and approved in the current BMP (required by SSD-6764) will apply. The biodiversity monitoring program for the rehabilitation areas is included in Section 9 of the BMP and summarised in **Section 8.0** of this MOP.

The criteria will be reviewed and refined in consultation with relevant agencies throughout this MOP period and successive MOPs. The refinement of the criteria will involve, but not limited to, results from research and rehabilitation trials and monitoring results from the various monitoring programs as outlined in **Section 8.0**.

The completion criteria will be utilised to quantitatively demonstrate the progress and ultimate success of a biophysical process. These criteria have been developed for each phase of the rehabilitation so that the rehabilitation success can be quantitatively tracked throughout the life of the mine.

The performance measures quantify the rehabilitation and land management program in terms of efficiency or effectiveness and establish the indicative timeframes for completion.

The performance indicators are used to define and evaluate the program, typically in terms of making progress towards the development of sustainable ecosystems whilst also providing a framework for the implementation of key activities. These indicators provide the basis for the procedural context of the site work practices. The performance indicators are attributes of the biophysical environment e.g. pH, slope, that can be used to approximate the progression of a biophysical process and can be measured to demonstrate and track the progress of an aspect of rehabilitation towards a desired completion criteria.

6.0 Rehabilitation Tables

WCPL have prepared the following rehabilitation tables to address each rehabilitation phase during the MOP term as identified in **Table 22**. The rehabilitation tables provide the performance indicators and criteria to achieve the performance measures and rehabilitation objectives applicable to each domain.

Although no decommissioning activities in terms of infrastructure are scheduled to occur during the MOP term, **Table 24** provides the appropriate performance indicators, measures and criteria should WCPL require decommissioning of infrastructure within domains during the term of the MOP.

Rehabilitation activities during the MOP term will primarily be undertaken in Primary Domains 5 and 6. **Tables 25 to 28** provide the appropriate performance indicators, measures and criteria applicable should WCPL identify additional areas for rehabilitation during the MOP term.

The activities and applicable objectives, indicators, measures and completion criteria for each rehabilitation phase are specified in following tables:

- Decommissioning Phase – **Table 24**;
- Landform Establishment Phase – **Table 25**;
- Growth Medium Development Phase – **Table 26**;
- Ecosystem Establishment Phase – **Table 27**; and
- Ecosystem Development Phase – **Table 28**.

WCPL have not identified areas within the mining lease that will be subject to relinquishment during the MOP term. As mining activities at WCPL are scheduled to continue past the MOP period and the Mine has a mine life until the year 2033, there will be no areas subject for lease relinquishment at the end of the MOP term. Therefore no Relinquishment Land Phase table has been developed for this MOP.

Further details regarding the rehabilitation activities during the MOP term are provided in **Section 7.0** of this MOP. Where there is duplication between primary and secondary domains (e.g. water management and infrastructure), referencing between the two domain types has been used to reduce repetition between the primary and secondary domains.

Table 24 Rehabilitation Tables – Decommissioning Phase

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
Applicable Domains: Refer to <i>Table 22 Rehabilitation Phases During the MOP term</i>							
<p>To be decommissioned and removed, unless the Secretary agrees otherwise</p> <p>Safe, stable and non-polluting.</p> <p>Ensure public safety.</p>	All redundant services have been identified for disconnection and removal.	Disconnection & removal of redundant electrical, water and communication services.	<p>The disconnection & removal of electrical, water and communication services are:</p> <ul style="list-style-type: none"> Assessed against the Mine's register of services to ensure all redundant services, including buried and remote services have been identified, disconnected and removed (as appropriate); and Disconnection & removal of services in accordance with the Mine's safety and risk management system. 	<p>Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i></p> <p>Condition 64, Schedule 3 of SSD-6764.</p> <p>Section 5 WEP EIS</p> <p>EPL 12425</p>	No	Ongoing operations	Ongoing operations
	All redundant buildings and associated mining infrastructure have been identified for removal and/or demolition.	Removal and demolition of redundant buildings and associated mining infrastructure.	<p>The removal and demolition of buildings and mining infrastructure with no beneficial use post mining are:</p> <ul style="list-style-type: none"> Assessed against the Mine's register of services to ensure all services to all redundant buildings and infrastructure that will not be utilised post mining, have been identified, disconnected and removed (as appropriate) before removal and demolition works commence; Assessed against the Mine's register of infrastructure register to ensure all redundant buildings and infrastructure, that will not be utilised post mining, identified and removed; The site does not present a safety risk and environmental threat; Characterise all building and infrastructure waste material for appropriate removal, recycle and disposal strategies for example: <ul style="list-style-type: none"> bitumen, roadbase, concrete material from roadways, carparks and hardstand areas will be ripped up and the material appropriately placed within waste rock emplacement areas. 		No	Ongoing operations	Ongoing operations

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
			<ul style="list-style-type: none"> Salvage and sell, where appropriate, scrap metal, poly pipelines, mobile buildings, mining equipment and infrastructure to assist with mine closure costs; Foundation soils would be chemically tested, contour ripped and chemically ameliorated where required; Coal fines, coal reject material and other possible contaminants have been removed from haul roads, mine water dams, coal stockpiles, sediment dams and hardstand areas for placement in selected mine voids and/or tailings facilities. Dewater all mine water in pipelines back into the mine water system prior to removing. 				
	All redundant mobile mining equipment has been identified for removal.	Removal of all redundant mobile mining equipment.	<ul style="list-style-type: none"> Remove all mobile equipment from the site that will not be utilised during mine closure. Salvage and sell machinery/infrastructure to assist with closure costs where appropriate. 	Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i>	No	Ongoing operations	Ongoing operations
	Crust forming over completed tailings dams.	Forming crust is geotechnical stable to enable capping program.	<p>Decommissioning of tailings storage facilities in accordance with approvals granted under Section 101 of the <i>Coal Mines Health and Safety Act 2002</i>.</p> <p>Rehabilitation of tailings dam to occur when they are deemed to be suitably safe by an appropriately qualified engineer.</p>	<p>Relevant Section 101 Approval.</p> <p>Wilpinjong Coal Rehabilitation - Technical Standards</p>	No	TD6 Active	TD6 ongoing rehabilitation

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Mine water dams with beneficial use post mining have been identified.	Prepare mine water dams with a beneficial use post mining.	<p>The dewatering and removal of sediments from mine water dams that have been identified as beneficial use post mining will involve:</p> <ul style="list-style-type: none"> Dewatering of dams. If the mine water is not suitable for discharge, then return water back into the Mine's water system for storage and/or treatment; Dewatering of dams. If the Mine water is identified as suitable for discharge, the water to be discharged in accordance with discharge limits (both volume and quality) set for the Project in the EPL; Removing all coal fines and/or other possible contaminated sediments from the dams for placement in selected mine voids and/or tailings facilities; Re-shaping dams (where required) in accordance with their intended use, this may involve re-sizing, facilitating cattle access or providing that they are shaped to enhance habitat functionality for specific fauna species; and The installation of appropriate sediment and erosion control measures. 	<p>EPL 12425</p> <p>Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i></p> <p>Condition 29, Schedule 3 of SSD-6764</p> <p>Condition 64, Schedule 3 of SSD-6764</p>	No	Ongoing operations	Ongoing operations
	Mine water dams with no beneficial use post mining have been identified for decommissioning.	Decommission mine water dams with no beneficial use post mining.	<p>The dewatering mine water dams that have been identified as having no beneficial use post mining will involve:</p> <ul style="list-style-type: none"> Dewatering of dams. If the Mine water is not suitable for discharge, then return water back into the mine water system for storage and/or treatment; Dewatering of dams. If the Mine water is identified as suitable for discharge, the water to be discharged in accordance with discharge limits (both volume and quality) set for the Project in the EPL; Prepare dewatered dams to be filled with appropriate inert material from site; and The installation of appropriate sediment and erosion control measures. 	<p>Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i></p> <p>Condition 64, Schedule 3 of SSD-6764.</p> <p>Section 5 WEP EIS</p> <p>EPL 12425</p>	No	Ongoing operations	Ongoing operations

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	All hazardous products have been identified.	All hazardous products have been removed from site.	<p>All hazardous products including hydrocarbons, explosives and other chemicals are:</p> <ul style="list-style-type: none"> Assessed against the Mine's register of hazardous products for removal and disposal from site; Removed and disposed of in accordance with manufactures and legislative requirements; Stored in accordance with manufactures and legislative requirements until removal; and Returned to supplier where appropriate. 	<p>Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i></p> <p>Condition 64, Schedule 3 of SSD-6764.</p> <p>Section 4 WEP EIS</p> <p>EPL 12425</p>	No	Ongoing operations	Ongoing operations
	Complete contamination investigations of the site.	Contaminated areas identified and remediated.	<p>Complete contamination investigations at mine closure to:</p> <ul style="list-style-type: none"> Determine appropriate course of action e.g. application of ameliorates, removal or remediation; and Ensure site does not present a safety risk and does not pose an immediate and ongoing environmental threat. 	<p>Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i></p> <p>Condition 64, Schedule 3 of SSD-6764.</p> <p>Section 5 WEP EIS</p>	No	Ongoing operations	Ongoing operations

Table 25 Rehabilitation Tables – Landform Establishment Phase

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
Applicable Domains: Refer to <i>Table 22 Rehabilitation Phases During the MOP term</i>							
<p>Mine site (as a whole):</p> <ul style="list-style-type: none"> • Safe, stable and non-polluting • Final landforms designed to incorporate micro-relief and integrate with surrounding natural landforms and adjacent mine rehabilitation • Final landforms maximise geotechnical performance, stability and hydrological function • Constructed landforms maximise surface water drainage to the natural environment (excluding final void catchments) • Minimise long term groundwater seepage from the 	Inert cover depth	Final landform capped with appropriate coverage of compacted inert material over carbonaceous material.	<p>Inert cover will be placed on top of the rehabilitated final landform surface to provide a benign barrier between any overburden that has not completely equilibrated with surface geochemical conditions.</p> <p>The final landform surface will be reshaped using spoil from the mining operation. The landform surface will then be capped with at least 2 m of compacted inert cover.</p> <p>Maintain a minimum of 5m compacted inert material coverage over the carbonaceous material, following final land form shaping of the Elevated Waste Rock Emplacement (in Pit 2).</p>	<p>Section 2 WEP EIS</p> <p>Section 5 WEP EIS</p> <p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.2 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Rejects emplacement	No spontaneous combustion and/or acid generation.	<p>Coarse reject disposed of in mined out final voids as close to the pit floor as practically possible.</p> <p>A blend ratio of at least 2:1 (overburden: coarse rejects) would be used with the aim of producing a mix with a sulphur content that has an acid producing potential less than the acid neutralising capacity of the overburden.</p> <p>The reject will be covered with overburden material and then at least 2m of inert cover when creating the final landform surface.</p> <p>Coal reject emplacement regarding the Elevated Waste Rock Emplacement (Pit 2) will be designed and constructed with designated carbonaceous material zones to avoid future exposures of the carbonaceous material.</p>	<p>Section 2 WEP EIS</p> <p>Section 5 WEP EIS</p> <p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 3.3.2 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
site to ensure negligible environmental consequences beyond those predicted for the development • Minimise visual impact of final landforms as far as is reasonable and feasible Cumbo Creek relocation: Restored in accordance with conditions 26 to 28 SSD-6764.	Slope angle	Rehabilitated slopes no greater than 10°.	Rehabilitated slopes are to be generally constructed to no greater than 1:6 (10 degrees or 17%) across the entire ML area (with the exception of Pit 8).	Section 2 WEP EIS Section 5 WEP EIS Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.2 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Slope length	Slope length no greater than 50m when slope angles of 10°.	Graded banks will generally be constructed at 50 m intervals down a slope i.e. the first graded bank will be constructed at 1% to the contour 50 m from the top of the slope, the second bank at 100 m.	Wilpinjong Coal Rehabilitation - Technical Standards	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Landform shaping	Final landform to approximate pre-mining topography.	The surface of mine infrastructure areas re-profiled to drain adequately consistent with the local surrounding landscape. The surface of mine waste rock emplacements would be constructed to approximate (where practicable) the existing topographic form of the shallow valleys which drain the Project area. The maximum height of the Elevated Waste Rock Emplacement in the south of Pit 2 would be constructed to 440m AHD. Landforms would be monitored to ensure early identification of potential problems with landform development.	Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i> Section 2 WEP EIS Section 5 WEP EIS Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.2 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Drainage design	Reinstate drainage pattern consistent to pre-mining drainage direction.	<p>The final landform is to drain in a generally south to north direction.</p> <p>Drainage lines with greater than 3% fall will need to be armoured appropriately to reduce scouring and erosion.</p> <p>Graded banks will be constructed across the slope of rehabilitated areas to collect and direct water flowing from newly rehabilitated areas into rock waterways.</p> <p>Further specifications for graded banks and rock waterways are set out in Section 5.3.2.</p>	<p>Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i></p> <p>Section 5 WEP EIS</p> <p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.2 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Sediment control	Sediment control dams are to be constructed along major drainage lines.	<p>Sediment control dams are to be constructed along major drainage lines in rehabilitated landforms to reduce suspended solids in water flowing from site.</p> <p>The dams need to be spaced to control sediment transfer from site with the final dam on the northern end of the mining operation used as the final control point.</p> <p>Note: Water can only be discharged from licensed discharge points (LDP). Discharges from LDP's must be in accordance with discharge limits (both volume and quality) set for the Project in the EPL.</p> <p>The dams should be sized to contain rainfall events in accordance with the Wilpinjong Coal Mine Water Management Plan.</p> <p>All other sediment control works are to be consistent with the Wilpinjong Coal Mine Water Management Plan.</p>	<p>Section 5 WEP EIS</p> <p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Water Management Plan (Condition 30, Schedule 3 of SSD-6764)</p> <p>EPL 12425</p> <p>Section 5.3.2 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Erosion and soil loss	Erosion controlled on Rehabilitated Areas	<p>No significant erosion, i.e. no tunnel or gully erosion is present that would constitute a safety hazard, compromise the capability of supporting the end land use or impact water quality in adjacent waterways.</p> <p>No erosion gullies > 0.2 m deep.</p>	<p>Water Management Plan (Condition 30, Schedule 3 of SSD-6764)</p> <p>Section 5.3.2 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Graded banks		All graded banks shall be constructed at 1% longitudinal grade to the contour of the slope. Cross-fall from the outside edge of the bank to the invert will be between 2% to 3%.	Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.2 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Rock waterways		Geo-textile material will be laid and secured in the excavated structure followed by the placement of suitably sized rock. The base of all major rock waterways is to be constructed with a concave finish which allows for an average maximum cross fall to the centre line of approximately 5%. Base width is measured on top of the rock floor of the waterway and not across the excavated earth base. The base width of all major waterways shall be approximately 2m. Generally, rock lined wo-boys will be constructed every 10m along the rock water ways to act as energy dissipation structures. The crest of wo-boys will be concave rather than convex. Further specifications for rock waterways are set out in Section 5.3.2.	Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.2 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Tailings capping	Tailings dams capped with a minimum of 2m inert material.	<p>Decommissioning of tailings storage facilities in accordance with approval granted under High Risk Activity Notification.</p> <p>Placement of a coarse reject layer using hydraulic fill methods, or as otherwise prescribed, to permit the placement of inert material.</p> <p>Tailings dams capped with compacted inert material to a minimum depth of cover of 2m, prior to final profiling and rehabilitation.</p> <p>Slope angles will be generally $< 5^{\circ}$, which is consistent with the surrounding landscape.</p> <p>The final landform of the emplacement will be free draining and consistent with the surrounding natural and rehabilitated landform.</p>	<p>HRA Notification</p> <p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.2 Mining Operations Plan</p>	No	TD6 Active TD 3 Capped	TD6 Active TD3 Rehabilitated
	Confirm suitability of overburden material.	Material characterisation of the overburden material.	<p>Representative soil samples across the surface of the final landform to characterise the overburden material.</p> <p>Subject to on-going recommendations from rehabilitation specialist, the overburden material in the final landform will be considered suitable if the results from the material characterisation determine:</p> <ul style="list-style-type: none"> – Soil electrical conductivity (EC) $< 1000 \mu\text{S}/\text{cm}$ – Soil pH 6.0 – 8.5 – No evidence of salts causing saline salt scalds on the soil surface. <p>Note: Or as otherwise characterised by further testing of in-situ overburden material and/or criteria being achieved by ameliorants.</p>	Section 3.4.1 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Overburden material not suitable.	Remove or ameliorate unsuitable overburden material.	If overburden material determined unsuitable: <ul style="list-style-type: none"> • Apply appropriate soil ameliorants at rates specified from material characterisation results; or • Remove and place unsuitable material within waste rock emplacements and replace with suitable overburden material coverage; or • Cover with a layer of suitable overburden material at a depth nominated by rehabilitation specialist. 	Section 3.4.1 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
Final voids: <ul style="list-style-type: none"> • Minimise to the greatest extent practicable: • the size and depth of final voids • the drainage catchment of final voids • any high wall and low wall instability risk • risk of flood interaction for all flood events up to and including the PMF. 	Catchment Area	Minimise each void catchment area	The catchment areas for the proposed two final voids located within Pit 2 (22ha) and Pit 6 (8ha) shall be minimised to the greatest extent practicable.	Condition 60, Schedule 3 of SSD-6764. <i>Table 11 Rehabilitation Objectives</i> Section 5 WEP EIS Final Void Management Plan as required by Project EIS (Section 5.1.2)	No	No final voids in the landform as described in the WEP EIS at the start of the MOP.	No final voids in the landform as described in the WEP EIS at the end of the MOP term. Final void management plan to be developed in advance of mine closure (MCP).
	Water inflows	Minimise surface water inflows to voids	Surface water inflows to the final voids minimised through appropriate land forming.				
	Void stability	Voids geotechnical engineered	Final voids geotechnically designed and profiled for long term stability.				
	Void bunding	Appropriate bunds around void	Perimeter bunding formed around final voids to reduce the risk for all flood events.				
	Void security	Appropriate security fencing	Safety fencing erected to limit public access to voids.				
	Carbonaceous material	Identify exposed carbonaceous material	No exposed carbonaceous materials in the final void floor.				

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
			Final void design in accordance with the Final Void Management Plan (FVMP).				

Table 26 Rehabilitation Tables – Growth Medium Development Phase

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
Applicable Domains: Refer to <i>Table 22 Rehabilitation Phases During the MOP term</i>							
Rehabilitate at least 2,906 hectares of self-sustaining woodland ecosystem to the BVTs specified in Tables 8 and 9; Establish self-sustaining ecosystem function in areas of: <ul style="list-style-type: none"> • aquatic habitat, within diverted and/or re-established drainage lines and retained water features, with consideration of hydro-geomorphological constraints; • habitat for threatened flora and fauna species; and • habitat for flora 	Topsoil depth	Topsoil depth applied evenly within specific range.	Topsoil placement shall only proceed at the completion of the landform establishment phase. Topsoil is to be applied at a minimum of 100 mm thickness to a maximum of 300 mm in all areas.	Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.3 Mining Operations Plan Section 5 WEP EIS	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Topsoil placement	Minimise loss of topsoil during application.	Topsoil is not to be placed in down slope bands as this increases the incidence of erosion. No topsoil is to be placed in the invert of drainage lines or drainage works. Topsoil handling will not be carried out in extreme weather conditions including heavy rainfall events and strong winds.	Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.3 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Topsoil properties	Material characterisation of topsoil material.	Representative soil samples of the top soil material for characterisation. Topsoil chemistry parameters: <ul style="list-style-type: none"> • Soil pH (H₂O) 6.0 – 8.5 • Soil EC <1000 µS/cm • Cation Exchange Capacity (CEC) >10 • Soil ESP <6% Note: Or as otherwise characterised by further testing of insitu topsoil material and/or criteria being achieved by ameliorants.	Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.3 Mining Operations Plan Rehabilitation monitoring (Section 8.2 Mining Operations Plan)	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
and fauna species known to occur in the region.	Application of ameliorants	Soil analysis to determine type and application rate of ameliorant required	<p>If topsoil characterisation determines soil amendment are required:</p> <ul style="list-style-type: none"> • Apply appropriate soil ameliorants at rates specified from topsoil material characterisation results; • Even application of soil ameliorants; and • Incorporation of soil ameliorants e.g. chisel plough 	<p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.3 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Topsoil ripping	Complete ripping of topsoil	<p>Ripping will be carried out to an approximate depth of 300 mm to 500 mm on the contour and undertaken with survey control.</p> <p>Full and continuous ripping is to be undertaken between surveyed rip lines.</p> <p>The maximum permissible distance between any two rip lines and or rip sets is 1.5 m.</p>	<p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.3 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Runoff water quality	Water quality runoff from Rehabilitated Areas does not pose a threat for downstream users.	<p>All sediment controls are to be consistent with the ESCP.</p> <p>Water runoff from rehabilitation areas to remain within the Mines' water management system until satisfying criteria in Table 29.</p> <p>Note: Water runoff criteria from rehabilitated areas, will be subject to ongoing background monitoring in consultation with EPA.</p>	<p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 3.4.4 Mining Operations Plan</p> <p>Water Management Plan</p> <p>EPL12425</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Erosion and soil loss	Erosion controlled on Rehabilitated Areas	<p>No significant erosion, i.e. no major rills or gully erosion is present that would constitute a safety hazard, compromise the capability of supporting the end land use or impact water quality in adjacent waterways.</p> <p>No erosion gullies > 0.2 m deep.</p>	<p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.3 Mining Operations Plan</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Table 27 Rehabilitation Tables – Ecosystem Establishment Phase

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP																													
Applicable Domains: Refer to <i>Table 22 Rehabilitation Phases During the MOP term</i>																																				
Rehabilitate at least 2,906 hectares of self-sustaining woodland ecosystem to the BVTs specified in Tables 8 and 9; Establish self-sustaining ecosystem function in areas of: • aquatic habitat, within diverted and/or re-established drainage lines and retained water features, with consideration of hydro-geomorphologic al constraints; • habitat for threatened flora and fauna species; and • habitat for flora and fauna species known to occur in the region.	Establishment of appropriate vegetative cover	Stabilise landform with appropriate vegetative cover.	On completion of landform contouring, topsoiling and erosion and sediment control works, a vegetative cover would be applied as soon as practicable.	Wilpinjong Coal Rehabilitation - Technical Standards Sections 3.3.6 & 5.3.4 Mining Operations Plan WEP EIS	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.																													
	Woodland Species	Selection of woodland species in accordance with native forests and woodlands suitability.	Establish woodland lands in areas as indicated by Figure 9 . Table 17 provides the list of species to be used in revegetation of woodland areas.	Wilpinjong Coal Rehabilitation - Technical Standards Sections 3.3.6 & 5.3.4 Mining Operations Plan WEP EIS	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.																													
	Temporary Rehabilitation Species	Selection of pasture species	Table 17 provides the list of pasture species to be used in revegetation of temporary rehabilitation areas.	Section 2.4.14 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.																													
	BioMetric Condition of Woodland Species.	Establishment Period Year 0 – 5 for Woodland Species	Biometric interim performance target of 34 at Year 5. <table border="1"><thead><tr><th colspan="10">Site Attributes (% cover)</th></tr><tr><th>NSR (count)</th><th>NOC</th><th>NMS</th><th>NGCG</th><th>NGCS</th><th>NGCO</th><th>EC</th><th>NTH (count)</th><th>OR</th><th>FL (m)</th></tr></thead><tbody><tr><td>12</td><td>0</td><td><4</td><td>60+</td><td><2</td><td><2</td><td>60</td><td>0</td><td>1</td><td>10</td></tr></tbody></table>	Site Attributes (% cover)										NSR (count)	NOC	NMS	NGCG	NGCS	NGCO	EC	NTH (count)	OR	FL (m)	12	0	<4	60+	<2	<2	60	0	1	10	Biodiversity Management Plan Rehabilitation Monitoring (Section 8.2 Mining Operations Plan)	No	Progressive rehabilitation of waste emplacement areas.
Site Attributes (% cover)																																				
NSR (count)	NOC	NMS	NGCG	NGCS	NGCO	EC	NTH (count)	OR	FL (m)																											
12	0	<4	60+	<2	<2	60	0	1	10																											

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	LFA	LFA Stability LFA Infiltration LFA Nutrient Recycling	During the first round of monitoring, the three LFA indices will be assigned scores of between 0 and 100. A self-sustaining stable landform is deemed to have been achieved when a LFA score of 50 or more is recorded.	Biodiversity Management Plan Rehabilitation Monitoring (Section 8.2 Mining Operations Plan)	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Habitat augmentation	Supplement habitat features in rehabilitated and ECAs	Where practicable, habitat features (e.g. large hollows) would be salvaged during vegetation clearance activities and utilised in the rehabilitation areas, regeneration areas and ECAs. In addition, artificial roosting/nesting boxes for fauna, particularly threatened fauna, may be used in the rehabilitation areas, regeneration areas and ECAs to provide short-term habitat resources.	Section 3.3.6 Mining Operations Plan Biodiversity Management Plan (BMP) WEP EIS	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Runoff water quality	Water quality runoff from Rehabilitated Areas does not pose a threat for downstream users.	All sediment control controls are to be consistent with the ESCP. Water runoff from rehabilitation areas to remain within the Mines' water management system until satisfying criteria in Table 29 . Note: Water runoff criteria from rehabilitated areas, will be subject to ongoing background monitoring in consultation with EPA.	Wilpinjong Coal Rehabilitation - Technical Standards Section 3.4.4 Mining Operations Plan EPL12425 Water Management Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Erosion and soil loss	Erosion controlled on Rehabilitated Areas	No significant erosion, i.e. no major rills or gully erosion is present that would constitute a safety hazard, compromise the capability of supporting the end land use or impact water quality in adjacent waterways. No erosion gullies > 0.2 m deep. Monitoring confirms stabilisation of erosion and/or equivalent to or less than surrounding non-disturbed areas, as determined by EFA or similar systems based monitoring results.	Wilpinjong Coal Rehabilitation - Technical Standards Section 5.3.3 Mining Operations Plan Water Management Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Weeds	Establishment Period Year 0 – 5 for weed control	Exotic Plant Cover (EC) no greater than 60% cover as determined by Biometric site attribute score for establishment period of 1 to 5 years. No noxious weeds present.	Biodiversity Management Plan Section 5.3.5 Mining Operations Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Table 28 Rehabilitation Tables – Ecosystem Development Phase

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP																																													
Applicable Domains: Refer to <i>Table 22 Rehabilitation Phases During the MOP term</i>																																																				
Rehabilitate at least 2,906 hectares of self-sustaining woodland ecosystem to the BVTs specified in Tables 8 and 9; Establish self-sustaining ecosystem function in areas of: • aquatic habitat, within diverted and/or re-established drainage lines and retained water features, with consideration of hydro-geomorphological constraints; • habitat for threatened flora and fauna species; and • habitat for flora and fauna	BioMetric Condition of Woodland Species.	Establishment Period Year 6 - 10 for Woodland Species	Biometric interim performance target of 45 at Year 10. <table><tr><th colspan="9">Site Attributes (% cover)</th></tr><tr><td>FL (m)</td><td>OR</td><td>NTH (count)</td><td>EC</td><td>NGCO</td><td>NGCS</td><td>NGCG</td><td>NMS</td><td>NOC</td></tr><tr><td>10</td><td>1</td><td>0</td><td>40</td><td><2</td><td><2</td><td>45 - 60</td><td>5 - 60</td><td>0</td></tr><tr><td colspan="9">NSR (count)</td></tr><tr><td colspan="9">12</td></tr></table>	Site Attributes (% cover)									FL (m)	OR	NTH (count)	EC	NGCO	NGCS	NGCG	NMS	NOC	10	1	0	40	<2	<2	45 - 60	5 - 60	0	NSR (count)									12									Biodiversity Management Plan Rehabilitation Monitoring (Section 8.2 Mining Operations Plan)	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Site Attributes (% cover)																																																			
FL (m)	OR	NTH (count)	EC	NGCO	NGCS	NGCG	NMS	NOC																																												
10	1	0	40	<2	<2	45 - 60	5 - 60	0																																												
NSR (count)																																																				
12																																																				
	BioMetric Condition of Woodland Species.	Establishment Period Year 11 – 15 for Woodland Species	Biometric interim performance target of 56 at Year 15. <table><tr><th colspan="9">Site Attributes (% cover)</th></tr><tr><td>FL (m)</td><td>OR</td><td>NTH (count)</td><td>EC</td><td>NGCO</td><td>NGCS</td><td>NGCG</td><td>NMS</td><td>NOC</td></tr><tr><td>25</td><td>1</td><td>0</td><td>30</td><td>2</td><td><2</td><td>5 - 45</td><td>5 - 60</td><td>10 - 45</td></tr><tr><td colspan="9">NSR (count)</td></tr><tr><td colspan="9">15</td></tr></table>	Site Attributes (% cover)									FL (m)	OR	NTH (count)	EC	NGCO	NGCS	NGCG	NMS	NOC	25	1	0	30	2	<2	5 - 45	5 - 60	10 - 45	NSR (count)									15									Biodiversity Management Plan Rehabilitation Monitoring (Section 8.2 Mining Operations Plan)	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
Site Attributes (% cover)																																																				
FL (m)	OR	NTH (count)	EC	NGCO	NGCS	NGCG	NMS	NOC																																												
25	1	0	30	2	<2	5 - 45	5 - 60	10 - 45																																												
NSR (count)																																																				
15																																																				

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
species known to occur in the region.	LFA	LFA Stability LFA Infiltration LFA Nutrient Recycling	During the first round of monitoring, the three LFA indices will be assigned scores of between 0 and 100. A self-sustaining stable landform is deemed to have been achieved when a LFA score of 50 or more is recorded.	Biodiversity Management Plan Rehabilitation Monitoring (Section 8.2 Mining Operations Plan)	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Runoff water quality	Water quality runoff from Rehabilitated Areas does not pose a threat for downstream users.	The quality of water leaving the site should be such as not to cause no significant deterioration of water quality to the downstream beneficial use(s) or water quality objectives of the receiving waters. Runoff water from rehabilitation is within the range of water quality recorded from analogue sites and does not pose a threat to downstream water quality. Preliminary water quality runoff criteria from rehabilitated areas: <ul style="list-style-type: none"> pH (H₂O) 6.0 – 8.5 EC <1000µS/cm TSS <50mg/L Note: Water runoff criteria from rehabilitated areas, will be refined subject to ongoing background monitoring in consultation with EPA. Water runoff from rehabilitation areas to remain within the Mines' water management system until satisfying criteria.	Wilpinjong Coal Rehabilitation - Technical Standards Section 3.4.4 Mining Operations Plan EPL12425 Water Management Plan	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.

Domain Objective/s	Performance Indicator	Performance Measure	Completion Criteria	Justification/Source	Complete (Yes/No)	Progress at start of MOP	Progress at end of MOP
	Erosion and soil loss	Erosion controlled on Rehabilitated Areas	<p>No significant erosion, i.e. no major rills or gully erosion is present that would constitute a safety hazard, compromise the capability of supporting the end land use or impact water quality in adjacent waterways.</p> <p>No erosion gullies > 0.2 m deep.</p> <p>Monitoring confirms stabilisation of erosion and/or equivalent to or less than surrounding non-disturbed areas, as determined by EFA or similar systems based monitoring results.</p>	<p>Wilpinjong Coal Rehabilitation - Technical Standards</p> <p>Section 5.3.3 Mining Operations Plan</p> <p>Erosion and Sediment Control Plan (a component of the Water Management Plan)</p>	No	Progressive rehabilitation of waste emplacement areas.	Progressive rehabilitation of waste emplacement areas ongoing past the term of this MOP.
	Terrestrial fauna	Annual ecological monitoring	Fauna monitoring will be used to qualitatively validate BioMetric and LFA monitoring results (i.e. self-sustaining stable landforms and vegetation structure have been successfully recreated or reintroduced and are being inhabited or frequented by local fauna).	Biodiversity Management Plan	No	Ongoing	Ongoing
	Weeds	Establishment Period Year 11 – 15 for weed control	<p>Exotic Plant Cover (EC) no greater than 20%-30% cover as determined by Biometric site attribute score for establishment period of 11 to 15 years.</p> <p>No noxious weeds present.</p>	Biodiversity Management Plan	No	Ongoing	Ongoing
	Feral animals	Control feral animals	<p>Annual feral animal control programs to be completed throughout the year as required by the BMP.</p> <p>Ecological monitoring confirms current feral animal control program effective.</p>	<p>Rehabilitation Monitoring (Section 8.2 Mining Operations Plan)</p> <p>Biodiversity Management Plan (BMP)</p>	No	Ongoing	Ongoing

7.0 Rehabilitation Implementation

7.1 Status of MOP Commencement

Mine waste rock emplacements have been progressively re-shaped behind the active mining block to construct landforms generally consistent with the pre-mining landform surface. Other Project components including areas of tailings emplacements have also been progressively rehabilitated as the area has become available.

Revegetation of completed landforms has been progressively undertaken since 2008 and has included establishing both woodland and grassland vegetation communities, consistent with the Project's rehabilitation objectives (**Section 5.2**) and post-mining land use (**Section 4.1**). As at December 2016 approximately 374ha of completed landforms have been rehabilitated. The cumulative area of rehabilitation since 2008 is provided in **Table 28**.

Table 29 Cumulative Rehabilitation Areas

Year Rehabilitated	Area (Ha)	Final Land Use	Cumulative Area (Ha)
2008	10	Woodland Habitat: for threatened flora and fauna species; and for flora and fauna species known to occur in the region.	10
2009	25		35
2010	65		100
2011	65		165
2012	43		180
2013	41		221
2014	40		261
2015	43		304
2016	70		374

Table 30 provides a summary of the status of activities for each domain at the commencement of the MOP period. The status of the domains include:

- **Active:** Domains subject to on-going mining operations and associated mining activities;
- **Not Active** Domains subject to proposed mining operations; and
- **Maintenance:** Domains subject to rehabilitation monitoring, ecological monitoring and rehabilitation maintenance activities.

Table 30 Mining Activity Status

Domain	Domain Status	Domain Activities
Domain 1 Constrained Infrastructure Area	Active	Table 9 provides a summary of key assets within Domain 1. The infrastructure in this domain, includes but not limited to haul roads, mine entry road, rail loadout, main workshop, RO plant, mine administration and bathhouse facilities.
Domain 2 Mine Infrastructure	Active	Table 9 provides a summary of assets within Domain 2. This domain contains general infrastructure utilised by the Open Cut operations including haul roads.
Domain 3 Coal Handling Preparation Plant	Active	Table 9 provides a summary of assets within Domain 3. This domain contains the CHPP, rail load out facility, surface conveyors, product stockpile, ROM stockpiles, reject bin and proposed belt press filter.
Domain 4 Mine Water Dams	Active	Table 9 provides a summary of assets within Domain 4. This domain is a made up of a number of clean and dirty water dams used by the Mine for operational purposes.
Domain 5 Overburden Emplacement Areas	Active	<p>This domain is a made up of a number of out of pit and in pit overburden emplacement areas. Progressive rehabilitation of waste emplacement areas has occurred during the mine life.</p> <p>Table 29 provides the cumulative areas of mine waste rock emplacement areas rehabilitated since 2008.</p> <p>At the commencement of the MOP period the following overburden emplacement areas included:</p> <ul style="list-style-type: none"> • Duffy Dump (Pit 2) –13.5 Ha • Keylah Dump (Pit 5) –2.6 Ha • Pit C Dump (Pit 1) –12.7 Ha • Pit:2 Elevated Dump (pit:2) – 51.3 Ha • Pit:1 Central Dump: 27.0 Ha • Wester Pits: 197 Ha • Eastern Pits: 178 Ha <p>During the MOP term WCPL will continue the establishment of additional waste emplacement areas.</p>
Domain 6 Tailings Storage Areas	Active	<p>This domain is a made up of a number decommissioned tailings storage facilities and one active tailings storage facilities. Progressive rehabilitation of tailings facilities has occurred during the mine life.</p> <p>At the commencement of the MOP period there are a number of tailing facilities in various life stages at the commencement of this MOP term, including:</p> <ul style="list-style-type: none"> • TD1 – Rehabilitated; • TD2 – Rehabilitated; • TD3 – Capped, awaiting rehabilitation this MOP term;; • TD4 – Rehabilitated; • TD5 – Undergoing consolidation; • TD6 – Actively receiving tailings; and • TD7 – Conceptual design.
Domain 7 Active Mining Areas	Active	<p>This domain is made up from a number of active mining areas including Pit 1, 2, 3, 4, 5, 6 and Pit 7.</p> <p>At the commencement of the MOP period, the total active mining area was approximately 161ha</p>
Domain 8 Rehabilitation Areas (Pre-MOP)	Maintenance	At the commencement of the MOP term approximately 374 ha of completed Mine landforms have been rehabilitated (Table 28) and has included establishing both woodland and grassland vegetation communities, consistent with the Project's rehabilitation objectives and post-mining land use.
Domain 9 Environmental Conservation Areas	Maintenance	Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development.
Domain 10 Future Mining Areas	Not Active	This domain is made up from a number of proposed mining areas that have not commenced at the beginning of the MOP term.

Domain	Domain Status	Domain Activities
Domain A* Rehabilitation Area – Woodland Areas	Maintenance	At the commencement of the MOP term approximately 374 ha of completed Mine landforms have been rehabilitated (Table 32). Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development.
Domain B* Rehabilitation Area – Mixed Woodland and Pasture Areas	Maintenance	At the commencement of the MOP term approximately 374 ha of completed Mine landforms have been rehabilitated (Table 32). Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development.
Domain C Final Void	Not Active	There are two final voids proposed for the final landform (Plan 4). There are no final voids in the landform at the commencement of the MOP term.
Domain D Cumbo Creek Realignment	Active	No rehabilitation activities are scheduled for this domain during the MOP term. During this MOP term, mining activities will continue along the proposed alignment path (Plans 3A – 3B).
Domain E Environmental Conservation Areas & Regeneration Areas	Maintenance	Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development.
Domain F Infrastructure – Environmental Monitoring	Active	This domain includes a number of environmental monitoring sites.

Note: * Secondary Domain be revised to Woodland Area in the forthcoming MOP Amendment to address the BVT requirements as discussed in **Section 3.3.6**, **Section 3.3.6.4** and **Section 4.2**.

7.2 Proposed Rehabilitation Activities this MOP Period

Mining and progressive rehabilitation activities over the term of this MOP are shown in **Plans 3A to 3B**. A description of proposed rehabilitation activities for each domain is provided in **Sections 7.2.1 to 7.2.16**. Final landform shaping of overburden emplacement areas will be progressively (as soon as reasonably practicable following disturbance) completed during the MOP term and rehabilitated. In addition, one tailings facility is scheduled to be capped and rehabilitated. **Table 31** summarises the forecast disturbance and where rehabilitation activities during the MOP period will be undertaken.

Revegetation will be progressive, commencing soon after the completion of landform shaping. Species to be planted in the rehabilitated landforms will be a mixture of native and introduced locally successful tree, grass and legume species. Locally collected tree and shrub seed will be used where practical. **Table 17** provides the list of provisional species to be used in revegetation of woodland areas until the forthcoming MOP Amendment to address the BVT requirements as discussed in **Section 3.3.6**, **Section 3.3.6.4** and **Section 4.2**. Areas nominated for temporary rehabilitation, will use pasture species as identified in **Table 16**.

Several waste emplacement areas have been identified for temporary rehabilitation, including Duffy Dump (Pit 2) and Pit C Dump (Pit 1). Revegetation to stabilise the dumps will proceed after reshaping activities have been completed.

In previously rehabilitated areas, ongoing maintenance activities will include controlling weeds and pests, repairing landforms, re-seeding and application of maintenance fertilisers as required. The requirement of these activities will be based on the annual rehabilitation monitoring program (**Section 8.0**) and opportunistic inspections of rehabilitated areas.

In regeneration and ECA and offset areas, ongoing activities will include controlling weeds and pests as required. The requirement of these activities will be based on the annual monitoring program, opportunistic inspections (**Section 8.0**) and as required by the Biodiversity Management Plan.

Table 31 Rehabilitation and Disturbance Progression during the term of the MOP

Year*	Total Disturbances	Total Rehabilitation	Cumulative Rehabilitation	Comments
2017	181.3ha	85.5ha	85.5ha	Rehabilitation of Overburden emplacement areas in Pit: 4,5,7 plus Tailings Facility TD3
2018	222.9ha	95.0ha	180.5ha	"Includes disturbance for Public Rd re-alignment in NW area and some infrastructure areas in Pit 3. Ongoing rehabilitation of overburden emplacement areas in Pit: 1, 2,3,4,5 & 7.
At end of MOP	404.2ha	180.5ha	180.5ha	

Notes: End of calendar year

Sections 7.2.1 to 7.2.16 provide a summary of rehabilitation activities scheduled for each domain during the MOP term, including the appropriate rehabilitation phase to be undertaken. To avoid duplication, rehabilitation phases and criteria previously covered in **Section 5.3** and **Tables 24 – 29** are referenced accordingly, with respect to the following rehabilitation activities, including:

- Timing and activities involved in decommissioning;
- Physical and chemical characteristics of mining and process waste of emplaced material relevant to rehabilitation;
- Method of landform establishment;
- Final landform profile and slopes;
- Characteristics of all cover material including sealing/drainage layers, subsoil/topsoil;
- Thicknesses of cover layers and methods of laying and compaction including topsoil, imported substrate material;
- Drainage and erosion control methods;
- Soil amelioration/treatment methods;
- Vegetation species and establishment techniques;
- Management of cleared vegetation;
- Habitat establishment techniques; and
- Maintenance activities/requirements.

7.2.1 Domain 1 – Constrained Infrastructure Area

No rehabilitation activities are scheduled for this domain during the MOP term.

7.2.2 Domain 2 – Mine Infrastructure

No rehabilitation activities are scheduled for this domain during the MOP term.

7.2.3 Domain 3 – Coal Handling Preparation Plant

No rehabilitation activities are scheduled for this domain during the MOP term.

7.2.4 Domain 4 – Mine Water Dams

No rehabilitation activities are scheduled for this domain during the MOP term.

7.2.5 Domain 5 – Overburden Emplacement Areas

Completed earthworks to redesign, shape and place additional inert material at Duffy Dump (Pit 2) were completed in the previous MOP term. WCPL are reviewing strategies to provide a temporary vegetative cover to assist in stabilising sections of the dump during the MOP term.

Keylah Dump (Pit 5) is scheduled for rehandling by the end of 2017. By removing the overburden material it will allow access to the coal resource under the dump. This overburden emplacement area will transfer to active mining areas during the MOP term.

The Noise Bund was rehandled during February 2014, with material prone to spontaneous combustion placed on the floor of Pit 4 and the remaining overburden material placed in the footprint of the Elevated Waste Emplacement Area (Pit 2).

The Elevated Waste Rock Emplacement Area (when completed) will have the outer batters temporally rehabilitated to minimise erosion and assist in stability.

Portions of overburden emplacement areas associated with Pits 1, 2, 3, 4, 5 and 7 (**Plans 3A – 3B**) are scheduled for progressive rehabilitation during the MOP term. Overburden emplacement areas progressively rehabilitated during the MOP term will transfer to rehabilitated areas. The following rehabilitation phases identified within this domain during the MOP term include:

- **Decommissioning:**
 - No decommissioning activities as described in **Section 5.3.1** are required to undertake rehabilitation.
- **Landform Establishment:**
 - Physical and chemical characteristics of mining and process waste of emplaced material relevant to rehabilitation are described in **Section 5.3.2** and **Table 25**;
 - Method of landform establishment are described in **Section 5.3.2** and **Table 25**;
 - Final landform profile and slopes are described in **Section 5.3.2** and **Table 25**; and
 - Characteristics of all cover material including sealing/drainage layers, subsoil/topsoil are described in **Section 5.3.2** and **Table 26**.
- **Growth Medium Development:**
 - Thicknesses of cover layers and methods of laying and compaction including topsoil, imported substrate material are described in **Section 5.3.3** and **Table 26**;
 - Drainage and erosion control methods are described in **Section 5.3.3** and **Table 26**;
 - Soil amelioration/treatment methods are described in **Section 5.3.3** and **Table 26**;
- **Ecosystem Establishment:**
 - Vegetation species and establishment techniques are described in **Section 3.3.6**.
- **Ecosystem Development:**
 - Habitat establishment techniques are described in **Section 5.3.5** and **Section 3.3.6**; and
 - Maintenance activities/requirements are described in **Section 5.3.5** and **Table 28**.

7.2.6 Domain 6 – Tailings Storage Areas

Several former tailings facilities are scheduled for progressive rehabilitation as identified on **Plans 3A – 3B**. Commencement of rehabilitation activities for TD3, (**Section 2.3.5.3**) and in accordance with the relevant requirements for decommissioning tailings dams. Tailings facilities progressively rehabilitated during the MOP term will transfer to rehabilitated areas. The following rehabilitation phases identified within this domain during the MOP term include:

- **Decommissioning:**
 - Decommissioning activities as described in **Table 24**.
 - Decommissioning activities will be in accordance with the relevant requirements for decommissioning tailings dam approval.
- **Landform Establishment:**
 - Physical and chemical characteristics of mining and process waste of emplaced material relevant to rehabilitation are described in **Section 5.3.2** and **Table 25**;
 - Method of landform establishment are described in **Section 5.3.2** and **Table 25**;
 - Final landform profile and slopes are described in **Section 5.3.2** and **Table 25**; and

- Characteristics of all cover material including sealing/drainage layers, subsoil/topsoil are described in **Section 5.3.2** and **Table 25**.
- **Growth Medium Development:**
 - Thicknesses of cover layers and methods of laying and compaction including
 - topsoil, imported substrate material are described in **Section 5.3.3** and **Table 26**;
 - Drainage and erosion control methods are described in **Section 5.3.3** and **Table 26**;
 - Soil amelioration/treatment methods are described in **Section 5.3.3** and **Table 26**;
- **Ecosystem Establishment:**
 - Vegetation species and establishment techniques are described in **Section 3.3.6**.
- **Ecosystem Development:**
 - Habitat establishment techniques are described in **Section 5.3.5** and **Section 3.3.6**;
 - and
 - Maintenance activities/requirements are described in **Section 5.3.5** and **Table 28**.

7.2.7 Domain 7 – Active Mining Areas

No rehabilitation activities are scheduled for this domain during the MOP term. Some areas of the active mining area will transfer to overburden emplacement areas during the MOP term as identified on **Plans 3A – 3B**.

Vegetation would be progressively cleared over the MOP term. Specific vegetation clearance procedures are provided in **Section 3.3.6** and the Biodiversity Management Plan (BMP).

A review of the potential environmental and heritage issues will be completed through the Ground Disturbance Permit (GDP) process. A fully completed GDP must be in place prior to any ground disturbance activities commencing. A copy of a GDP is provided in **Appendix 6**.

7.2.8 Domain 8 – Rehabilitated Areas

Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development, including the following rehabilitation maintenance activities:

- Controlling weeds and pests;
- Repairing landforms;
- Revegetation (i.e. replanting and/or reseeded); and
- Application of maintenance fertilisers as required.

The requirement of these rehabilitation maintenance activities will be based on the annual rehabilitation monitoring program (**Section 8.0**) and opportunistic inspections of rehabilitated areas. The rehabilitation maintenance activities are described in **Section 5.3.5** and **Table 28**.

7.2.9 Domain 9 – Environmental Conservation Area & Regeneration Areas

Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development to include rehabilitation maintenance activities for controlling weeds and pests.

The requirement of these activities will be based on the annual monitoring program, opportunistic inspections (**Section 8.0**) and as required by the Biodiversity Management Plan. The rehabilitation maintenance activities are described in **Section 5.3.5** and **Section 3.3.6**.

7.2.10 Domain 10 – Future Mining Areas

No rehabilitation activities are scheduled for this domain during the MOP term, however some areas of the future mining area will transfer to active mining areas during the MOP term as identified on **Plans 3A – 3B**.

7.2.11 Domain A – Rehabilitation Area (Woodland Area)⁴⁰

Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development, including the following rehabilitation maintenance activities:

- Controlling weeds and pests;
- Repairing landforms;
- Revegetation (i.e. replanting and/or reseeding); and
- Application of maintenance fertilisers as required.

The requirement of these rehabilitation maintenance activities will be based on the annual rehabilitation monitoring program (**Section 8.0**) and opportunistic inspections of rehabilitated areas. The rehabilitation maintenance activities are described in **Section 5.3.5** and the BMP.

7.2.12 Domain B – Rehabilitation Area (Mixed Woodland and Pasture Area)⁴¹

Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development, including the following rehabilitation maintenance activities:

- Controlling weeds and pests;
- Repairing landforms;
- Revegetation (i.e. replanting and/or reseeding); and
- Application of maintenance fertilisers as required.

The requirement of these rehabilitation maintenance activities will be based on the annual rehabilitation monitoring program (**Section 8.0**) and opportunistic inspections of rehabilitated areas. The rehabilitation maintenance activities are described in **Section 5.3.5** and the BMP.

7.2.13 Domain C – Final Void

There will be no final voids in the landform at the end of MOP term (**Figure 9 & Figure 11**) as identified by the WEP EIS. However, there are two final voids proposed in the final landform (**Figure 9, Figure 11 & Plan 4**) at mine closure. A Final Void Management Plan (FVMP) a component of the Mine Closure Plan will be prepared in advanced of mine closure.

7.2.14 Domain D – Cumbo Creek Realignment

No rehabilitation activities are scheduled for this domain during the MOP term. During this MOP term, mining activities will continue along the proposed alignment path (**Plans 3A – 3B**). Backfilling and reinstating the new alignment path will be in accordance with the Cumbo Creek Relocation Plan (CCRP) as part of the mining operations. The CCRP is subject to approval by the DP&E and other relevant agencies prior to the commencement of these activities.

7.2.15 Domain E – Environmental Conservation Area and Regeneration Areas

Rehabilitation activities within this domain during the MOP term will primarily be associated with Ecosystem Development activities to include rehabilitation maintenance for controlling weeds and pests.

The requirement of these activities will be based on the annual monitoring program, opportunistic inspections (**Section 8.0**) and as required by the BMP. The rehabilitation maintenance activities are described in **Section 5.3.5** and the BMP.

⁴⁰ Secondary Domain be revised to Woodland Area in the forthcoming MOP Amendment to address the BVT requirements as discussed in **Section 3.3.6, Section 3.3.6.4** and **Section 4.2**.

⁴¹ Secondary Domain be revised to Woodland Area in the forthcoming MOP Amendment to address the BVT requirements as discussed in **Section 3.3.6, Section 3.3.6.4** and **Section 4.2**.

7.2.16 Domain F – Infrastructure (Environmental Monitoring)

No rehabilitation activities are scheduled for this domain during the MOP term. There will be a number of environmental monitoring sites (**Plan 4**) remaining at the end of mine life to monitor the performance of the post mining landform.

7.3 Summary of Rehabilitation Areas during the MOP

Table 32 outlines the proposed rehabilitation activities within Primary Domains during the MOP term.

Table 32 Summary of Rehabilitation Proposed during the MOP Period

Primary Domain	Rehabilitation Phase	Area (ha) at start of MOP	Area (ha) at end of MOP
Constrained Infrastructure Area (1)	Active	76.4	76.4
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Mine Infrastructure (2)	Active	202	293
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Coal Handling Preparation Plant (3)	Active	63.6	63.6
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Mine Water Dams (4)	Active	44	52
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Overburden Emplacement Area (5)	Active	482	461.3
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Tailings Emplacement Areas (6)	Active	30.4	23.4
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		

Primary Domain	Rehabilitation Phase	Area (ha) at start of MOP	Area (ha) at end of MOP
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Active Mining Areas (7)	Active	161	186.5
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Rehabilitated Areas (8)	Active	374.5	555.0
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Environmental Conservation and Regeneration Areas (9)	Active	837.3	650.0
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		
Future Mining Areas (10)	Active	915.6	511.2
	Decommissioning		
	Landform Establishment		
	Growth Medium Development		
	Ecosystem Establishment		
	Ecosystem Development		
	Relinquished Lands		
	TOTAL		

Note: The mining process at WCPL does not provide for areas of landform establishment at the year end or at the end of the MOP term. However, the mining process continually transitions from active mining, overburden emplacement, landform establishment, to growth medium establishment through the year.

7.4 Relinquishment Phase Achieved during MOP Period

As mining activities at WCPL are scheduled to continue past the MOP period and the Mine has an approved mine life until the year 2033, there will be no areas subject for lease relinquishment at the end of this MOP term.

8.0 Rehabilitation Monitoring and Research

WCPL has developed and implemented a Biodiversity Monitoring Program (as detailed in the BMP) that includes monitoring of flora and fauna, and a range of landscape function indicators. This monitoring program will be used to evaluate ecosystem function and performance and the success of specific management actions implemented across the various Domains. Reference sites will be established during the first round of biodiversity monitoring and will also be established in areas of equivalent habitat type adjacent to the Domains.

The strategic objective of the monitoring is to obtain assurance that WCPL's biodiversity management program is ensuring the Mine is progressing towards its Completion Criteria. WCPL's monitoring program includes recognised methods to assess native vegetation and habitat complexity (BioMetric), landscape stability (LFA), and faunal diversity.

8.1 Vegetation Monitoring (Biometric)

The BioMetric assessment method has been adopted for the purposes of measuring and comparing native vegetation and habitat complexity against the quantitative completion criteria and Interim Performance Targets. The BioMetric methodology is a standardised, repeatable and recognised approach to biodiversity assessment in NSW.

WCPL propose to adopt the BioMetric assessment process and have undertaken a rapid assessment process to determine the most likely and suitable monitoring locations (**Table 33**) including those reference sites that will be used to develop site specific benchmark vegetation types and conditions. Monitoring locations have been selected based on their representativeness as either reference or treatment sites. Treatment sites, being those selected from the various management domains across the Mine. A number of these treatment sites will be located in the riparian zones of Wilpinjong and Cumbo Creeks. WCPL propose to refine the monitoring sites during the first round of BioMetric monitoring.

Methodology

BioMetric plots, comprising a 20m x 20m flora plot nested within a larger 20m x 50m (1000m²) habitat complexity plot will be established at each monitoring site. The long axis of the transect will be positioned perpendicular to the slope for compatibility with other monitoring methods (i.e. LFA). Each end of the 50m transect will be permanently identified for repeatability. A photograph will be taken at 1.5m intervals down the central 50m transect.

Flora plot

Flora plots (20m x 20m) will be used to systematically collect floristic data. Only Native Plant Species Richness (NSR) data is collected in each flora plot. The flora plot is to coincide with the origin of the central 50m transect with measurements occurring along the 0-20 section and 10 metres either side of the central transect. NSR data will be collected along the transect, in accordance with the methodology described in Gibbons et al 2009.

Habitat complexity plot

Habitat complexity plots (1000m²), consistent with those used to assess vegetation condition and habitat under the NSW BioBanking Scheme, will be used to sample all vegetation structure and habitat features including Exotic Plant Cover (EC). Data will be collected for all site attributes in the habitat complexity plot, with the exception of NSR (which will be collected in the flora plots), in accordance with the methodology described in Gibbons et al 2009.

8.2 Landscape Stability (LFA)

Landscape Function Analysis (LFA) will be adopted as the primary monitoring methodology to assess the landscape stability of regeneration and rehabilitation areas across the Mine. WCPL have

undertaken a rapid assessment process to determine the most likely and suitable LFA monitoring locations (**Figure 10**).

Methodology

Data relating to the eleven LFA SSCIs will be collected along the 50m transect established within the BioMetric plots to ensure consistency and repeatability of monitoring data. LFA monitoring will be undertaken in accordance with the methodology described in Tongway & Hindley 2004.

8.3 Fauna

Fauna monitoring will be used to qualitatively validate BioMetric and LFA monitoring results (i.e. self-sustaining stable landforms and vegetation structure have been successfully recreated or reintroduced and are being inhabited or frequented by local fauna).

Terrestrial fauna surveys will be conducted to sample fauna species diversity and abundance in each Management Domain. Systematic surveys sites will monitor amphibians, reptiles, birds and mammals (including bats) at a selection of representative sites already established for Biometric monitoring.

Corresponding survey sites will also be established in areas of equivalent habitat type adjacent to the Management Domains to provide reference sites. Reference sites will provide comparative data so that the long-term progress of the Management Domains can be determined.

Methodology

Birds

Each fauna monitoring site will be surveyed on three occasions for the presence of bird species. Observers will spend 10 minutes recording all birds seen and heard within a 50 m radius (0.8 ha) of a central point, followed by a further 10 minutes searching the balance of a 2 ha plot. The total numbers of birds observed (heard and seen) will be recorded during a 20 minute sampling period. Birds observed outside of the formal survey time, or off the 2 ha sampling plot, will also be recorded as present however these observations will not be used in subsequent analyses.

Ground fauna (amphibians, mammals and reptiles)

Pitfall traps will be established at selected Biometric monitoring sites to measure reptile, amphibian and small mammal populations. A pitfall trap line will consist of a permanently installed 30 metre drift fence and five 20 litre buckets spaced five metres apart (dug into the ground so the lip is at ground level). The buckets will be inspected twice daily (morning and evening). Results will be recorded as species observed and total count. Buckets will be sealed with lids during non-monitoring periods to prevent incidental fauna capture.

Bats

Bat monitoring will be undertaken at selected Biometric monitoring sites using Anabat Bat Detectors. Monitors will be established at each site for one night to record any bat calls. Bat calls will be analysed by a suitably qualified and experienced ecologist.

8.4 Biodiversity Monitoring Program Summary

A summary of WCPL's Biodiversity Monitoring Program is provided in **Table 33**.

8.5 Data Management and Review

Monitoring results will be collated after each monitoring round and compared against the Completion Criteria and Performance Targets. If monitoring results show that targets are not being met, the Trigger Action Response Plans (TARPs) in **Section 9** will be implemented. The results from the monitoring program will be reported as outlined in **Section 10.0**.

All monitoring results are managed by the ECM and/or Environmental Representative within the document control system and maintained at the Mine for at least four years after the monitoring or event to which they relate took place. All records are kept in a legible form, or in a form that can readily be reduced to a legible form.

Table 33: Biodiversity Monitoring Program

Area	Site	Coordinates		Management Zone	Vegetation Class	Monitoring Method			
		Easting	Northing			BioMetric	LFA	Fauna	Bats
ECA-A	A_100	771861	6416276	Regeneration (poor resilience)	Western Slopes Grassy Woodland	X	X	X	
	A_102	772926	6417078	Regeneration (moderate resilience)		X		X	
	A_103*	773154	6417587	Native vegetation (good resilience)		X			
	A_104*	773695	6416293	Native vegetation (good resilience)		X		X	X
ECA-B	B_100*	770111	6420997	Native vegetation (good resilience)	Western Slopes Grassy Woodland	X		X	
	B_101	770542	6420592	Regeneration (moderate resilience)		X		X	X
	B_103*	771072	6420157	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest	X		X	
	B_105	773141	6420468	Regeneration (moderate resilience)		X		X	
	B_106	771571	6420001	Regeneration (no resilience)	Western Slopes Grassy Woodland	X	X		
ECA-C	C_100*	768682	6418083	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest	X		X	X
	C_101	768377	6416929	Regeneration (moderate resilience)		X		X	
	C_102*	768940	6417281	Native vegetation (good resilience)	Western Slopes Grassy Woodland	X		X	
Regeneration Area 2^	R2_101	772639	6418355	Regeneration (moderate resilience)	Western Slopes Grassy Woodland	X			
Regeneration Area 4^	R4_100	770347	6420268	Regeneration (no resilience)	Western Slopes Grassy Woodland	X	X	X	
Regeneration Area 5^	R5_100	769191	6421422	Regeneration (moderate resilience)	Western Slopes Grassy Woodland	X		X	
	R5_101	769500	6421595	Regeneration (moderate resilience)	Western Slopes Dry Sclerophyll Forest	X		X	

Table 32: Biodiversity Monitoring Program cont.

Area	Site	Coordinates		Management Zone	Vegetation Class	Monitoring Method			
		Easting	Northing			BioMetric	LFA	Fauna	Bats
Regeneration Area 9^	R9_100	768975	6422067	Regeneration (moderate resilience)	Western Slopes Dry Sclerophyll Forest	X			
	R9_101	768828	6422230	Regeneration (poor resilience)	Western Slopes Grassy Woodland	X			
Rehabilitation	R5	770234	6419256	Rehabilitation - Woodland	Western Slopes Dry Sclerophyll Forest	X	X		
	R6	769562	6419517	Rehabilitation - Woodland		X	X	X	
	R8	770231	6418596	Rehabilitation - Grassland			X		
	R9	769118	6418973	Rehabilitation - Woodland	Western Slopes Dry Sclerophyll Forest	X	X	X	
	R10	768433	6419301	Rehabilitation - Grassland	Western Slopes Grassy Woodland/Native Grassland		X		
	R11	768896	6419664	Rehabilitation - Grassland			X		
	R13	770872	6418901	Rehabilitation - Grassland			X		
	Ref_1	775261	6451958	Turill SCA	Western Slopes Grassy Woodland	X	X		
Reference Site	Ref_2	224152	6424015	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X	X	X	X
	Ref_3	217853	6424354	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X	X	X	X
	Ref_4	779353	6419938	Turill SCA	Western Slopes Grassy Woodland	X	X		
	Ref_6	222265	6422430	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X	X		
	Ref_7	218145	6425455	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X	X		
	Ref_8	781932	6414688	Goulburn River NP	Western Slopes Grassy Woodland	X	X	X	X
	Ref_9	221614	6422152	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X			
	Ref_10	220576	6428690	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X	X	X	X
	Ref_11	775036	6451459	Turill SCA	Western Slopes Grassy Woodland	X			

Table 32: Biodiversity Monitoring Program cont.

Area	Site	Coordinates		Management Zone	Vegetation Class	Monitoring Method			
		Easting	Northing			BioMetric	LFA	Fauna	Bats
Reference Site (Continued)	Ref_12	773663	6449945	Turrill SCA	Western Slopes Grassy Woodland	X			
	Ref_13	782174	6421967	Turrill SCA	Western Slopes Dry Sclerophyll Forest	X	X		
	Ref_14	782174	6421967	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X	X	X	X
	Ref_15	766024	6426575	Goulburn River NP	Western Slopes Grassy Woodland	X			
	Ref_16	766047	6426748	Goulburn River NP	Western Slopes Grassy Woodland	X			
	Ref_17	776767	6452950	Turrill SCA	Western Slopes Grassy Woodland	X			
	Ref_18	775232	6451125	Goulburn River NP	Western Slopes Grassy Woodland	X			
	Ref_20	769129	6421893	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X			
	Ref_21	769832	6422848	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X			
	Ref_22	768130	6423829	Goulburn River NP	Western Slopes Dry Sclerophyll Forest	X			
	Ref_23	769183	6422270	Goulburn River NP	Western Slopes Grassy Woodland	X			
	Ref_25	764212	6431932	Goulburn River NP	Western Slopes Grassy Woodland	X			

8.5.1 Mine Closure Monitoring

At mine closure, the existing environmental monitoring program will be maintained until all decommissioning and rehabilitation works have been completed in accordance with the relevant rehabilitation criteria and objectives. In consultation with regulatory authorities, there may be the need to remove redundant and/or establish additional monitoring sites to complement existing programs at mine closure, for example establishing water quality monitoring sites at final void locations.

Capped tailings dams will be monitored during the life of the Mine and post mining to determine the success of the capping and rehabilitation process.

Approaching mine closure, contaminated assessments will be carried out to identify areas of potential contamination and develop appropriate remedial measures and monitoring requirements as the mine transfers into the closure phase.

The post closure monitoring and measurement program will be similar to that undertaken during the active mining operation, however the monitoring program may be prioritised to focus on potential environmental aspects that are likely to cause pollution and/or verify the success or failure of the rehabilitated post mining landforms.

Post closure monitoring will be conducted for up to five years after decommissioning and final rehabilitation has been completed, or until such time as monitoring records demonstrate that the site is no longer contributing, nor has the potential to contribute, pollutants to the surrounding environment, and that rehabilitation has achieved in accordance with the relevant rehabilitation criteria. Monitoring and reporting of ECA and biodiversity areas post mine closure will continue in accordance with the requirements of the Biodiversity Management Plan.

8.6 Research and Rehabilitation Trials and Use of Analogue Sites

8.6.1 Research and Rehabilitation Trials

WCPL are currently trialling green manure crops as a way of providing stabilisation and soil improvement. Essentially a crop is grown before being ploughed into the soil when the plant is still 'green'. At WCPL, the green crop has included various combination of legumes (cow peas, clover), sorghum, millet, sudan grass, oats. Combinations and rates are shown in **Table 17**. Species known to provide habitat for the Reagent Honeyeater will then be used in revegetation, once resolution of performance and completion criteria are resolved for the establishment of BVTs and Regent Honeyeater habitat in the revised BMP.

Direct drilling of seed into rehabilitation trial areas was undertaken to assess performance of increasing seed to soil contact and seed germination in comparison to areas which have been rehabilitated using the broadcast seeding method. Soil amelioration trials will continue to assess suitable gypsum application rates into topsoil given soil testing conducted prior to seeding indicated that the soils were sodic. Rehabilitation trials proposed to be undertaken during the MOP term include:

- Ozathalmus trial;
- Fire trial;
- Trialling various topsoil depths to determine optimum growth medium conditions for seeding of pasture grasses and target tree species; and
- Trials to evaluate suitable seed mix volumes that reduce the competition of pasture grass species and promote target species growth.

Results of these trials will be used as a guide for progressively rehabilitating disturbed areas across the mining operation and for closure planning and will continue to be reported in the AR. Further rehabilitation research will be conducted as required and potentially involve participation in ACARP projects, university programmes and campaigns conducted by specialised consultants during the MOP term. Information regarding new research and rehabilitation trials will be reported annually in the AR.

9.0 Intervention and Adaptive Management

9.1 Threats to Rehabilitation

Table 34 outlines potential risks and consequences associated with rehabilitation activities. A Trigger Action Response Plan (TARP) has been developed (**Section 9.2**) to identify appropriate response measures to manage any potential rehabilitation risk.

Table 34 Rehabilitation Risks

Rehabilitation Risk	Potential Consequence/Hazard
Topsoil	Insufficient depth/volume, compromise topsoil stockpile.
Spoil	Acidic, alkaline, saline soils.
Surface	Insufficient depth of inert material.
Landform	Excessive slope length, slope gradient not consistent with pre-mining topography.
Vegetation	Poor establishment, excessive weeds, monoculture
Erosion & sediment control	Landform stability, failure of water management structures, ability to freely drain.

The processes outlined in this MOP will be implemented to control or eliminate these rehabilitation risks. Where necessary, rehabilitation procedures will be amended accordingly during the MOP term with the aim of continually improving rehabilitation standards

WCPL is also planning to undertake a detailed review of the Mine Closure Plan during the MOP term, including a revised risk assessment. The risk assessment will identify potential risk associated with the decommissioning and rehabilitation, including rehabilitation liability and related business risk, technical challenges during rehabilitation and decommissioning, potential impacts on the environment and local community, and long-term post-mining land-use issues.

9.2 Trigger Action Response Plan

WCPL have prepared a Trigger Action Response Plan (TARP) for rehabilitation to identify appropriate response measures in the event rehabilitation outcomes are not achieved.

Table 35 demonstrates how the various rehabilitation risks, management measures and responsibilities are structured to achieve compliance with the relevant statutory requirements, and the framework for management and contingency actions.

Table 35 Rehabilitation Trigger Action Response Plan

Rehabilitation Risk	Consequence/ Hazard	TARP Code	Contingency Responses
Topsoil	Insufficient/excessive topsoil depths	Trigger	<ul style="list-style-type: none"> Monitoring confirms average topsoil replacement at depths <100mm
		Action	<ul style="list-style-type: none"> Topsoil is to be applied at a minimum of 100mm thickness and maximum of 300 mm. Review topsoil application procedure and topsoil balance. Review topsoil stripping methods. Increase application of topsoil (and/or application of appropriate humus material) to achieve average minimum depth of 100mm.
		Responsible Persons	E&C Manager and Technical Services Manager
	Loss of topsoil	Trigger	<ul style="list-style-type: none"> Monitoring of topsoil stockpiles identifies significant erosion and loss of topsoil resource.
		Action	<ul style="list-style-type: none"> Remediate affected areas, fertilise and seed to stabilise as necessary. Install/repair silt fencing as required. Continue to monitor. Reshape stockpile with a rough surface to reduce erosion hazard, improve drainage and promote vegetation. Re-seed and fertiliser as necessary.
		Responsible Persons	E&C Manager ,Technical Services Manager and Mine Manager
Spoil	Acidic and/or alkaline overburden material	Trigger	Representative sampling of spoil material for chemical analysis confirms: <ul style="list-style-type: none"> Soil pH < 5.5 Soil pH >8.5
		Action	<ul style="list-style-type: none"> Application of appropriate soil ameliorants at rates per hectare as specified by laboratory results. Undertake further investigations to determine potential factors contributing to acidic/alkaline conditions. Application of appropriate soil ameliorants at rates per hectare as required. Consider removing unsuitable material and replace with material within pH range. Retest to determine pH within acceptable range.
		Responsible Persons	E&C Manager and Technical Services Manager
	Highly saline overburden material	Trigger	Representative sampling of spoil material for chemical analysis confirms: <ul style="list-style-type: none"> EC >1000uS/cm
		Action	<ul style="list-style-type: none"> Undertake additional sampling to verify EC readings. Consult with WCPL rehabilitation specialist. Seek further advice from WCPL rehabilitation specialist Consider removing unsuitable material and replace with material within EC range. Retest to determine EC within acceptable range.

Rehabilitation Risk	Consequence/Hazard	TARP Code	Contingency Responses
		Responsible Persons	E&C Manager and Technical Services Manager
Surface	Insufficient inert material depth	Trigger	<ul style="list-style-type: none"> Monitoring confirms inert material of >2m coverage over rejects and tailings is not being achieved.
		Action	<ul style="list-style-type: none"> Increase volume of compacted inert minimum coverage of 2m when creating final landform. Continue monitoring to confirm compacted inert material coverage of 2m is being achieved. Review inert material application procedure.
		Responsible Persons	E&C Manager ,Technical Services Manager and Mine Manager
	Insufficient inert material depth (Elevated Waste Rock Emplacement)	Trigger	<ul style="list-style-type: none"> Monitoring confirms compacted inert material not achieving minimum coverage of 5m (at all times) in some areas over carbonaceous material when: <ul style="list-style-type: none"> Active as an operational dump; and Creating final landform.
		Action	<ul style="list-style-type: none"> Increase volume of compacted inert minimum coverage of 5m over carbonaceous material when: <ul style="list-style-type: none"> Active as an operational dump; and Creating final landform Continue monitoring to confirm compacted inert material coverage of 5m is being achieved. Review inert material application procedure to ensure sufficient inert material is available to achieve the minimum coverage of 5m is at all times throughout the various life phases of the dump.
		Responsible Persons	E&C Manager ,Technical Services Manager and Mine Manager
Landform	Excessive slope lengths	Trigger	<ul style="list-style-type: none"> Majority slope lengths >50m limit at slope angles of 10°.
		Action	<ul style="list-style-type: none"> If possible, undertake rectification works to reduce average slope lengths to approximately 50m when slope angles of 10°. Seek further advice from WCPL rehabilitation specialist to: <ul style="list-style-type: none"> Review final landform design and stability performance; and Determine if additional measures are necessary to manage surface water flows to ensure slope stability can be maintained.
		Responsible Persons	E&C Manager and Technical Services Manager
	Slope gradient and topography	Trigger	<ul style="list-style-type: none"> Final slope angle above >10° and may be considered inconsistent with pre-mining topography.
		Action	<ul style="list-style-type: none"> Regrade slopes to achieve <10°. Resurvey to confirm slope angle. Seek further advice from WCPL rehabilitation specialist to review final landform design and performance; and Seek consultation with government authorities if landform is at risk of not achieving pre-mining topography as

Rehabilitation Risk	Consequence/Hazard	TARP Code	Contingency Responses
			identified within the EIS.
		Responsible Persons	E&C Manager and Technical Services Manager
Native Vegetation	Low Biometric Scores	Trigger	Score obtained during annual monitoring round is less than Interim Performance Targets
		Action	<ul style="list-style-type: none"> • Notify the WCPL ECM. • Check and validate the data to ensure correct/accurate. • Review site attribute scores to determine which attributes are contributing to the lower than expected score • Review management actions undertaken during previous 12 months (applicable to relevant Management Period) to determine if actions have contributed to the lower than expected score • Review previous monitoring scores and climatic conditions to establish whether external factors could be contributing to the lower than expected score. • Site value score 34-44 (target 45): <ul style="list-style-type: none"> – Review monitoring data against management actions applicable to the 'maintenance period 1'. Increase management effort to address identified lagging site attribute score. – Maintain monitoring until three consecutive years of improvement are measured. • Site value score <34 (target 34): <ul style="list-style-type: none"> – Treat surface as if in the 'establishment period'. Use management actions to improve condition. Refer to LFA results to determine if there are other causal factors. – Expand monitoring program to include additional treatment and reference sites. – Site value score declines from expected performance target range to a preceding range: – Analyse data for potential reasons for decline. – Develop remedial actions to address declining biodiversity values. – Review LFA monitoring to examine for potential causal factors OR start LFA monitoring if landform instability is detected. – Expand monitoring program to include additional treatment and reference sites.
		Responsible Persons	E&C Manager
	Low LFA Scores	Trigger	<5% annual improvement or significant decline in LFA Score (from previous monitoring round)
		Action	<ul style="list-style-type: none"> • Notify the WCPL ECM. • Check and validate the data to ensure correct/accurate. • Review individual SSCI and LFA Index results to determine which SSCI or index result is contributing to the lower than expected score • Review management actions undertaken during previous 12 months (applicable to relevant Management Period) to determine if actions have contributed to the lower than expected score • Review previous monitoring scores and climatic conditions to establish whether external factors could be contributing to the lower than expected score

Rehabilitation Risk	Consequence/Hazard	TARP Code	Contingency Responses
			<ul style="list-style-type: none"> Develop remedial actions to address stagnant or declining landscape stability, if stagnant or declining score not caused by external factors. Maintain monitoring of affected site until first LFA score ≥ 50 (i.e. stable landform) and Review monitoring program and consider expanding to include additional treatment and reference sites.
		Responsible Persons	E&C Manager
	Weeds	Trigger	<ul style="list-style-type: none"> Noxious weeds present. Monitoring indicates weed density equivalent greater than surrounding non-disturbed areas. Noxious weeds present.
		Action	<ul style="list-style-type: none"> Maintain monitoring program for presence of weeds in accordance with the BMP. Maintain seasonal weed spraying control measures as required by BMP. Review BMP to determine if existing weed control measures are adequate. Increase monitoring frequency for presence of weeds. Increase frequency and areas regarding weed spraying program.
		Responsible Persons	E&C Manager
Erosion/sediment control	Unstable landforms	Trigger	<ul style="list-style-type: none"> Monitoring indicates: <ul style="list-style-type: none"> Significant erosion is present; and Erosion gullies > 0.2 m deep
		Action	<ul style="list-style-type: none"> Undertake appropriate remediation works to address erosion. Maintain monitoring program. Investigate potential causes contributing to erosion; Review existing erosion controls for adequacy; Undertake appropriate remediation works to address erosion.
		Responsible Persons	E&C Manager , Technical Services Manager and Mine Manager
Progressive Rehabilitation	Delays or changes to forecast	Trigger	Mine planning indicates a significant delay or significant change in the rehabilitation schedule, as outlined in Plans 3A and 3B, which has the potential to impact annual rehabilitation targets.
		Action	<ul style="list-style-type: none"> Undertake a comprehensive review of alternate mine planning scheduling to determine if annual rehabilitation targets can still be achieved; If not, consult with DRG to notify of pending changes to the rehabilitation schedule; Review and update of the MOP where material changes to progressive rehabilitation forecasts occur in consultation with the DRG; and Provide summary of delays and changes in the Annual Review.
		Responsible Persons	E&C Manager , Technical Services Manager and Mine Manager

10.0 Reporting & Review

10.1 Reporting

At the end of March each year, WCPL will review the environmental performance of the Mine and submit an Annual Review report to the DP&E. This report will:

- a) describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;
- b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:
 - Relevant statutory requirements, limits or performance measures/criteria;
 - Monitoring results of previous years; and
 - Relevant predictions in the EA;
- c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- d) identify any trends in the monitoring data over the life of the project;
- e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
- f) describe what measures will be implemented over the next year to improve the environmental performance of the project.

Specifically, the Annual Review will include a summary report on the Biodiversity Offset requirements and progress against the 3 year Management Schedule.

A copy of the Annual Review will be made publicly available on the WCPL website.

Table 36 provides a summary of the reporting mechanisms applicable to the WCPL, including which stakeholders will receive copies of each report and distribution.

Table 36 Reporting Framework

Report	Frequency	Distribution	Responsibility for Report Preparation
Incident Report	Provide detailed report within 7 days of notification	<ul style="list-style-type: none"> • DP&E (Manager, Mining Projects) • DRG (Director – Environmental Sustainability) • OEH/EPA (General Contact) 	Environment and Community Manager
Annual Review (AR)	Annually (end of March each year)	<ul style="list-style-type: none"> • DP&E (Manager, Mining Projects) • DRG (Director – Environmental Sustainability) • OEH/EPA (General Contact) • DPI Water (Mines Assessment and Planning) • Mid Western Regional Council (General Manager) • CCC Members 	Environment and Community Manager

10.2 Review & Implementation

Reviews of the MOP will be undertaken by Environment and Community Manager, Mine Manager and Technical Services Manager as required during the MOP term to assess the effectiveness of the procedures against the objectives of MOP. The MOP may also be reviewed, and if necessary amended, for example, to incorporate future modifications of Development Consent (SSD-6764) and any proposed activities that are not in accordance with the MOP. The MOP may also be reviewed and revised due to changes in environmental requirements, risk assessments, monitoring results, completion criteria, technologies, legislation and short and long term rehabilitation schedules. Any proposed amendment to the MOP would be completed in accordance with the MOP Guidelines and in consultation with the DRG and other relevant stakeholders.

The General Manager and the Mine Manager will ensure appropriate resources are provided to implement the MOP. The implementation of this MOP will be the responsibility of the Environment and Community Manager and Technical Services Manager.

11.0 Rehabilitation Plans (A3)

12.0 References

Cunningham, G.M., Higginson, F.R., Riddler, A.M.H. and Emery, K.A. (undated) Systems Used to Classify Rural Lands in New South Wales. Soil Conservation Service of NSW and NSW Department of Agriculture.

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Wilpinjong Coal Pty Limited (2017) Biodiversity Management Plan

Wilpinjong Coal Pty Limited (2017) Noise Management Plan

Wilpinjong Coal Pty Limited (2017) Blast Management Plan

Wilpinjong Coal Pty Limited (2017) Air Quality Management Plan

Wilpinjong Coal Pty Limited (2017) Water Management Plan

Wilpinjong Coal Pty Limited (2017) Aboriginal Cultural Heritage Management Plan

13.0 Abbreviations

AEMR	Annual Environmental Management Report (now Annual Review)
AR	Annual Review
BMP	Biodiversity Management Plan
CCC	Community Consultative Committee
CCL	Consolidated Coal Lease
CHPP	Coal Handling and Preparation Plant
CL	Coal Lease
DMR	NSW Department of Mineral Resources (now DRE)
DP&E	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
DRE	Division of Resources and Energy
DSC	NSW Dams Safety Committee
EEC	Endangered ecological community
Project EIS	<i>Wilpinjong Coal Project Environmental Impact Statement 2005</i>
EPA	NSW Environment Protection Authority
EP&A Act	NSW <i>Environmental Planning and Assessment Act, 1979</i>
EPL	Environment Protection Licence
MOP	Mining Operations Plan
NOW	NSW Office of Water (now DPI Water)
TARP	Trigger Action Response Plan
VCP	Vegetation Clearance Protocol
WCPL	Wilpinjong Coal Pty Limited

ATTACHMENT 1

Rehabilitation Plans (A0)

ATTACHMENT 2

Development Consent (SSD-6764)

ATTACHMENT 3

Correspondence

ATTACHMENT 4

Risk Assessment & Figures

ATTACHMENT 5

WCPL Environmental Management Plans

ATTACHMENT 6

Ground Disturbance Permit

ATTACHMENT 7

LOM Tailings Strategy