YANCOAL
兖煤澳大利亚有限公司
MOOLARBEN COAL

REHABILITATION MANAGEMENT PLAN

Version	Effective Date *(Month/YYYY)*	Revision Detail *(Include the main areas reviewed, trigger / why the change)*	Approved By *(Name)*	Author *(Name/s)*	Review Team *(Name/s)*
1	Aug 2022	Original Rehabilitation Management Plan	T. Cini	MCO, IEMA	MCO, IEMA
2	March 2025	Review and update Rehabilitation Management Plan including: Update to Project Approvals 08_0135 and 05_0117 General text updates and additional content to align with form and way document Updates to final land use domains vegetation communities Updated Rehabilitation Risk Assessment Update to include approved Rehabilitation Objectives Update to include approved FLRP Added LOM rehabilitation schedule Updates to revegetation species typical seed mixes Updates to rehabilitation quality assurance process Updates to rehabilitation monitoring program methodology Update to rehabilitation TARP	I. Flood	MCO	MCO

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY TABLE

Name of mine		Moolarben Coal Complex	
Rehabilitation Management Plan commencement date		1 January 2025	
Rehabilitation Management Plan revision dates and version numbers		Version 2, March 2025	
Mining leases	**Leaseholder**	**No.**	**Expiry**
	Moolarben Coal Mines Pty Ltd, Sojitz Moolarben Resources Pty Ltd, Kores Australia Moolarben Coal Pty Ltd	1605	20 December 2028
		1606	20 December 2028
	Moolarben Coal Mines Pty Ltd	1628	24 February 2030
		1691	23 September 2034
	Moolarben Coal Mines Pty Ltd, Sojitz Moolarben Resources Pty Ltd, Kores Australia Moolarben Coal Pty Ltd	1715	31 August 2036
Date of Finalisation		31 March 2025	

1.0 INTRODUCTION

1.1 HISTORY OF OPERATIONS

The Moolarben Coal Complex (MCC) an open cut and underground coal mining operation is located approximately 40 kilometres (km) north of Mudgee in the Western Coalfield of New South Wales (NSW) (**Figure 1**).

Moolarben Coal Operations Pty Ltd (MCO) is the operator of the Moolarben Coal Complex on behalf of the Moolarben Joint Venture (Moolarben Coal Mines Pty Ltd [MCM], Yancoal Moolarben Pty Ltd (YM) and a consortium of Korean power companies). MCO, MCM and YM are wholly owned subsidiaries of Yancoal Australia Limited (Yancoal).

The MCC comprises four approved open cut mining areas (OC1, OC2, OC3 and OC4), three approved underground mining areas (UG1, UG2 and UG4) and other mining related infrastructure (including coal processing and transport facilities). Current mining operations undertaken across the MCC have approval until 31 December 2038. Since the commencement of coal mining operations in 2010, mining activities have occurred within OC1, OC2, OC3, OC4, UG1 and UG4 (Error! Reference source not found.).

Construction activities undertaken across the MCC to date include the progression of mining infrastructure for both open cut and underground operations. Mine infrastructure includes OC and UG administration buildings and maintenance workshops, the UG mine portal, Coal Handling and Preparation Plant (CHPP) and associated conveyors, railway loop and loading infrastructure, Run-of-Mine (ROM), water management and remote services infrastructure areas.

Mining operations are carried out 24 hours a day, 7 days a week. Significant surface disturbance activities undertaken across the MCC to date include:

- Exploration activities
- Topsoil Stripping
- Overburden removal using excavator and truck fleets
- Overburden removal using cast and dozer push
- Coal extraction
- Drilling and blasting select overburden and coal
- Spoil emplacement
- Bulk spoil reshaping and rehabilitation, and
- Construction and operation of water management work and other ancillary activities.

Longwall mining has been undertaken within UG1 and UG4 with UG2 longwall production planned in the future.

Rehabilitation has occurred in OC1, OC2, OC4, and progressive temporary rehabilitation of construction areas. Rehabilitation activities include landform establishment, growth medium development, ecosystem and land use establishment and rehabilitation maintenance.

This RMP has been prepared in accordance with the *Form and Way Rehabilitation Management Plan for Large Mines* (Resources Regulator (RR), 2024).

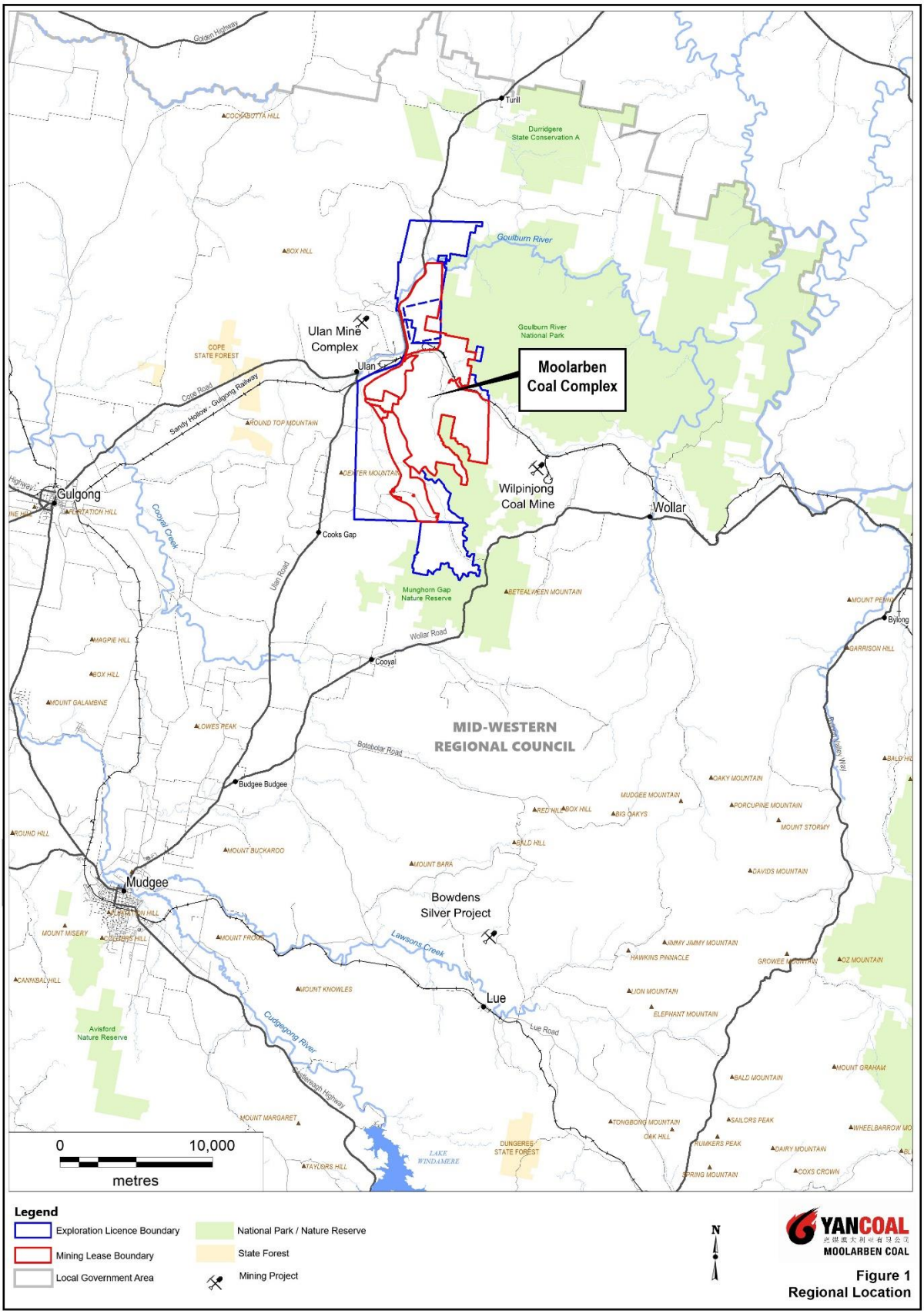

Figure 1 Regional Location

1.1.1 Moolarben Coal Complex (Stage 1)

The Moolarben Coal Project Stage 1 was assessed in the *Moolarben Coal Project Environmental Assessment Report* (MCM, 2006) and was approved by the NSW Minister for Planning on 6 September 2007 (Project Approval [05_0117]).

Project Approval (05_0117) has been subject to fifteen modifications. The modifications were generally required to reconfigure the mine layout (e.g. extension to mining areas, relocation of coal handling infrastructure and water infrastructure) and were aimed to improve the efficiency and operation of the MCC and enable access to additional economically viable coal reserves.

Stage 1 of the MCC has commenced and at full development will comprise three open cut mines (OC1, OC2, and OC3), a longwall underground mine (UG4), and mining related infrastructure (including coal processing and transport facilities) (**Figure 2**).

1.1.2 Moolarben Coal Complex (Stage 2)

The Moolarben Coal Project Stage 2 was assessed in the Moolarben Coal Project Stage 2 Environmental Assessment Report (Wells Environmental Services and Coffey Natural Systems, 2009), and Preferred Project Report (MCM, 2012) which was exhibited from 31 January 2012 to 24 February 2012. The Moolarben Coal Project Stage 2 was approved by the Planning Assessment Commission (PAC) (as a delegate of the NSW Minister for Planning) on 30 January 2015 (Project Approval [08_0135]).

Project Approval (08_0135) has been subject to four modifications. Modifications were generally required to reconfigure the mine layout (e.g. extension to mining areas, haul roads and infrastructure) and were aimed to improve the efficiency and operation of the MCC and enable access to additional economically viable coal reserves.

Moolarben Coal Project Stage 2 commenced in 2015. At full development, there will be one open-cut (OC4), two longwall underground mines (UG1 and UG2) and mining related infrastructure.

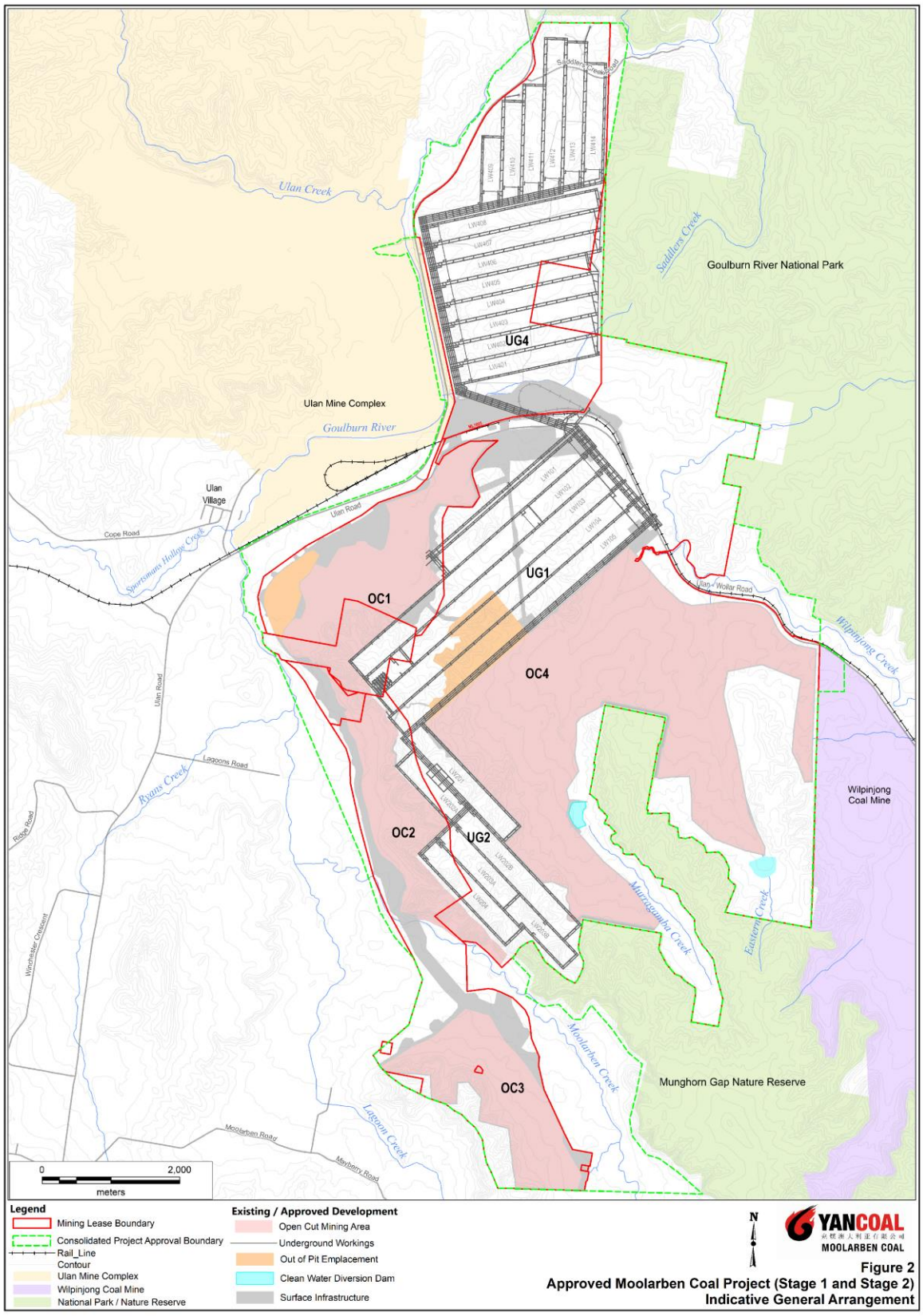

Figure 2 Indicative General Layout

1.2 CURRENT DEVELOPMENT CONSENTS, LEASES LICENCES

The date of grant and duration of the MCC approvals, leases and licences issued by government agencies relevant to the MLs are provided in **Table 1**.

Table 1 Key Approvals, Leases and Licences

Type	Approval	Number	Approval Authority	Date Granted	Expiry/ Renewal Date
Exploration Licences					
EL	Exploration Licence	6288	Minister for Mineral Resources	23/08/2004	23/08/2029
EL	Exploration Licence	7073	Minister for Mineral Resources	12/02/2008	12/02/2026
EL	Exploration Licence	7074	Minister for Mineral Resources	12/02/2008	12/02/2026
Mining Leases					
ML	Mining Lease	1605**	Minister for Mineral Resources	20/12/2007	20/12/2028
ML	Mining Lease	1606	Minister for Mineral Resources	20/12/2007	20/12/2028
ML	Mining Lease	1628	Minister for Mineral Resources	24/02/2009	24/02/2030
ML	Mining Lease	1691	Minister for Resources and Energy	3/10/2013	23/09/2034
ML	Mining Lease	1715	Minister for Resources and Energy	31/08/2015	31/08/2036
Project Approvals					
PA	Project Approval	05_0117 (as modified)	NSW Minister for Planning	6/09/2007	31/12/2038
PA	Project Approval	08_0135 (as modified)	PAC as a delegate of NSW Minister for Planning	30/01/2015	31/12/2038
EPBC	EPBC Act Approval	2007/3297	Commonwealth Department of the Environment and Water Resources	24/10/2007	31/12/2027
EPBC	EPBC Act Approval	2013/6926	Commonwealth Department of the Environment (DoE)	13/11/2014	31/12/2064
EPBC	EPBC Act Approval	2008/4444	DoE	18/05/2015	31/12/2065
EPBC	EPBC Act Approval	2017/7974	Department of the Environment and Energy (DoEE)	06/09/2019	31/12/2050
Licences					
LIC	Environment Protection Licence (EPL)	12932	NSW Environment Protection Authority (EPA)	November 2021	Until the licence is surrendered, suspended or revoked. The licence is subject to review every five years after the issue of the licence.

Notes:

** Including the carrying out of ancillary mining activities within AMA1015

1.3 LAND OWNERSHIP AND LAND USES

The MCC is located approximately 40 km north of Mudgee in the Western Coalfield of NSW in the vicinity of Cook's Gap and Ulan settlements as shown in **Figure 1**.

The MCC MLs exist predominantly within freehold land owned by MCO. Some small parcels of Crown Land also occur in the MCC MLs as shown in **Figure 3**.

Land use in the vicinity of the MCC is characterised by a combination of coal mining operations, ridgeline country, woodlands, nature reserves, agricultural operations and the Cooks Gap locality **(Figure 4**). Several reserved areas are located in the vicinity, including the Goulbourn River National Park and Munghorn Gap Nature Reserve.

Appendix A provides details of the land tenure of the general area as well as land ownership, occupancy and leases.

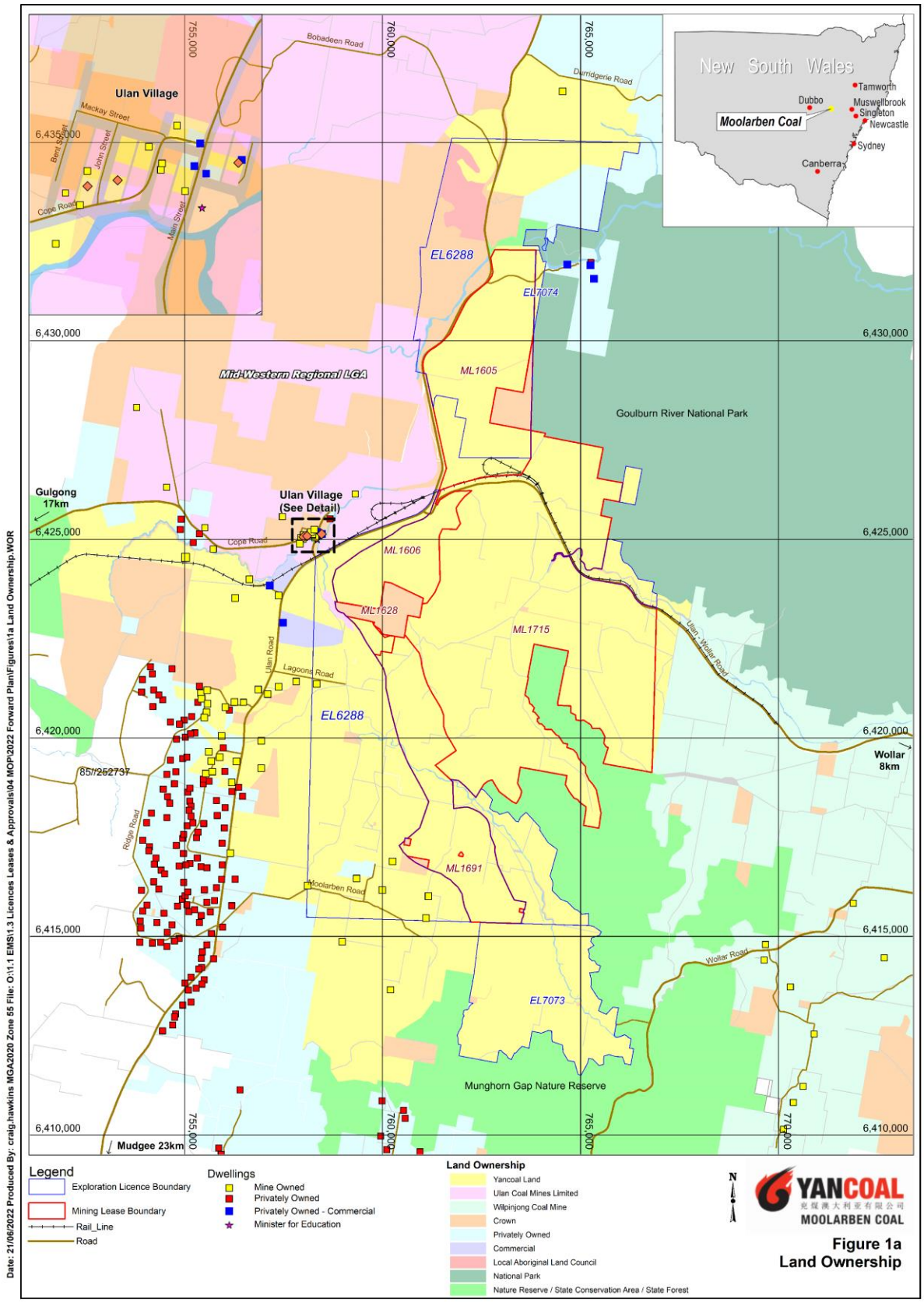

Figure 3: Land Ownership Around the Moolarben Coal Complex (RMP Figure 1a)

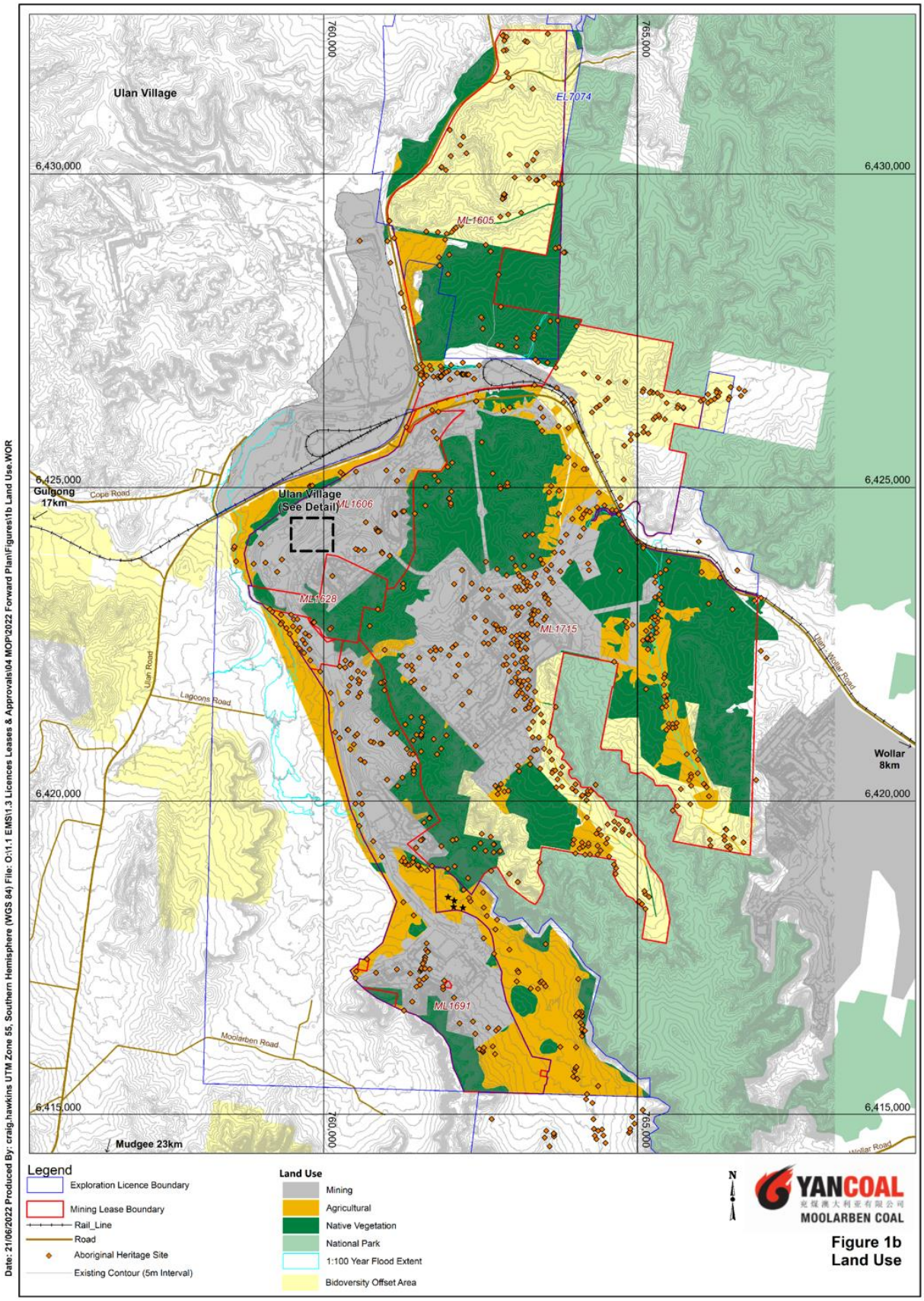

Figure 4 Land Use Around the Moolarben Coal Complex (RMP Figure 1b)

2.0 FINAL LAND USE

2.1 REGULATORY REQUIREMENTS FOR REHABILITATION

Several regulatory requirements relate to rehabilitation at the MCC. **Table 2** through to **Table 5** outline these requirements from development consents, mining leases, relevant legislation, and relevant policies.

2.1.1 Key Regulatory Guidelines

Key regulatory guidelines which have been considered during preparation of this RMP include (but are not limited to):

- Form and way: Rehabilitation Management Plan (large mines) (NSW RR, 2024)
- Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines (NSW RR, 2024)
- Leading Practice Sustainable Development Program for the Mining Industry – Mine Rehabilitation (former Commonwealth Department of Industry, Tourism and Resources, 2016)
- Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom, 2004)
- Managing Urban Stormwater – Soils and Construction Volume 2 (DECC, 2008)
- A Rehabilitation Manual for Australian Streams (Rutherford, 2000), and
- Mine Rehabilitation: a Handbook for the Coal Mining Industry (Hannan, 1995).

Table 2: Project Approval 05_0117

NSW Project Approval Condition	Area	RMP Section
Rehabilitation Offsets *35B. Within 12 months of the commencement of activities under MOD 14, unless otherwise agreed by the Secretary, the proponent must, in consultation with BCS, the Department and AG DCCEEW and to the satisfaction of the Secretary, develop suitable rehabilitation performance and completion criteria for the vegetation communities to be established in the rehabilitated OC2 and/or OC3 landforms to generate the residual ecosystem and species credits for Koala listed in Table 12A.* *The performance and completion criteria must include consideration of the effect of climatic conditions, such as drought, the NSW Biodiversity Offsets Policy for Major Projects 2014 and the associated Fact sheet: Mine Site Rehabilitation (OEH, 2014).* *Notes:* • *The rehabilitation offset performance and completion criteria form a component of the Rehabilitation Management Plan required under condition 69 of this schedule.* • *The indicative final rehabilitation areas are shown in Figure 8.2 of Appendix 8.*	Rehabilitation Offsets in OC2 and/or OC3	4.0
35C. If at the end of 10 years after landform establishment in OC2 and/or OC3, unless otherwise agreed by the Secretary, the rehabilitation does not meet the performance and completion criteria in condition 35B to the satisfaction of the Secretary, the Proponent must retire the relevant number of residual credits listed in Table 12A under other mechanisms provided by the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the Secretary. *Notes:* • *Landform establishment is a recognised stage of rehabilitation when the final land shape has been developed prior to growth medium development and ecosystem development.* • *As landform establishment stage will progressively occur across the mine site, the performance criteria for new areas progressing into the landform establishment stage will need to be assessed by the Secretary on a regular basis, for example every 3 years, to determine whether the requirements of the condition are being met.* • *In accordance with the NSW Biodiversity Offsets Policy for Major Projects, additional biodiversity credits can be generated for the ongoing management of the rehabilitation area to ensure its biodiversity values are continually improved. Any additional credits could be secured through a Biobanking Agreement and used to offset future developments.*	Rehabilitation Offsets in OC2 and/or OC3	3.0
35D. Notwithstanding the requirements in conditions 35B and 35C, the Proponent may retire the residual credits listed in Table 12A earlier than the specified timeframe in condition 35C by other mechanisms under the BC Act in place of rehabilitation, to the satisfaction of the Secretary.	Rehabilitation Offsets in OC2 and/or OC3	3.0

<table>
<tr><th>NSW Project Approval Condition</th><th>Area</th><th>RMP Section</th></tr>
<tr><td>

Rehabilitation Objectives

65. The Proponent must rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation described in the EA (and depicted conceptually in the figure in Appendix 8), and comply with the objectives in Table 13.

Table 13: Rehabilitation Objectives

<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>Mine site (as a whole)</td><td>• Safe, stable and non-polluting;
• Constructed landforms are to drain to the natural environment (excluding the final voids);
• Final landforms are to be consistent with the surrounding topography of the area, taking into account relief patterns and principles; and
• Minimise visual impact of final landforms as far as is reasonable and feasible.</td></tr>
<tr><td>Final Voids</td><td>• Minimise the size and depth of final voids so far as is reasonable and feasible, subject to meeting the objectives below;
• 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.</td></tr>
<tr><td>Water quality</td><td>• Water retained on site is fit for the intended land use (s) for the post-mining domain(s).
• The potential ecological, hydrological and geomorphic impacts from post-mining water discharges on receiving creeks are assessed and appropriate mitigation measures are effectively implemented as part of the closure plan.</td></tr>
<tr><td>Surface Infrastructure</td><td>• To be decommissioned and removed, unless the Executive Director, Mineral Resources agrees otherwise.</td></tr>
<tr><td>Agricultural land</td><td>• Establish agricultural land in areas indicated in the figure in Appendix 8 to a similar agricultural suitability to that existing prior to mining.</td></tr>
<tr><td>Other land</td><td>• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of:
○ native forests and woodland, including EECs;
○ habitat for threatened fauna species; and
○ wildlife corridors (as indicated in the figure in Appendix 8).</td></tr>
<tr><td>Community</td><td>• Ensure public safety; and
• Minimise the adverse socio-economic effects associated with mine closure.</td></tr>
</table>

Note: The Proponent must prepare and implement a Rehabilitation Management Plan in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992.

</td><td>Rehabilitation Areas</td><td>4.0</td></tr>
</table>

NSW Project Approval Condition	Area	RMP Section
Progressive Rehabilitation *66. The Proponent shall rehabilitate the site progressively. That is, 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 shall be employed when areas prone to dust generation cannot yet be permanently rehabilitated.* *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 project.*	Rehabilitation Areas	6.0
67. The Proponent shall progressively landscape the environmental bunds on site.	Environmental bunds on site	6.0
Appendix 3 – Statement of Commitments ***Rehabilitation*** • *Soils will be stockpiled and used to rehabilitate areas not required for ongoing operations.*	Soil Stockpiles	6.0
• *MCO is committed to progressively rehabilitating mined areas as soon as practical following disturbance, in accordance with an approved Rehabilitation Management Plan, including returning areas disturbed by mining to their pre-mining land use (unless otherwise agreed with relevant stakeholders). The plan will be updated, as required, to include the Open Cut 1 and Open Cut 2 extension areas. The plan will consider use of terrestrial riparian buffers.*	Rehabilitation Areas	6.0
• *The majority of the Open Cut 1 and Open Cut 2 extension areas will be rehabilitated for biodiversity outcomes.*	Open Cut 1 and Open Cut 2 extension areas	4.0
Visual • *Trees and shrubs will be planted to provide a visual screen:* ○ *To the switch and bore pads located adjacent to Saddlers Creek Road, where required.* ○ *Along the southern edge of Cope Road, where views of Open Cut 1 extension areas will be possible, subject to landowner consent.*	As described in the condition	6.0
• *The Landscape Management Plan (or equivalent) will be reviewed and updated to describe the measures that will be implemented to manage visual impacts associated with the Open Cut 1 and Open Cut 2 extension areas, such as:*	Open Cut 1 and Open Cut 2 extension areas	6.0
○ *Vegetation screen planting, subject to land owner's consent, along the southern edge of Cope Road, in areas visually affected by direct views of the Open Cut 1 extension area.*		
○ *Investigating the feasibility of targeted vegetation screen planting for affected properties along Ridge Road (with direct views from the residence to both Open Cut 1 and Open Cut 2 extension areas), to mitigate the visual and lighting impacts of Open Cut 1 and Open Cut 2 extension areas, subject to landowner consent.*		
○ *Building-up out-of-pit embankments first so that continued operations are obscured by the embankment. Wherever possible out-of-pit emplacements around the perimeter will be established first, providing a visual screen while work is undertaken in the central part of the emplacement.*		
○ *Seeding and grassing embankment outer faces visually exposed to private residents as soon as practically possible to soften the view.*		

NSW Project Approval Condition	Area	RMP Section
○ *Where possible, maintaining a strip of vegetation along the leading face of the ridgeline associated with the Open Cut 1 extension area to provide a visual screen to workings for as long as practical.*		
○ *Use of operational screening measures such as landform re-establishment sequencing and lighting management.*		
○ *Progressive rehabilitation.*		
Biodiversity • *Tree hollows and other habitat features will be salvaged for use as compensatory habitat, in rehabilitation areas.*	Rehabilitation Areas	6.0
• *The cleared area along the mining lease boundary will be rehabilitated and revegetated to enable cleared EEC to re-establish.*	As described in the condition	
• *Disturbed areas not required for ongoing access and maintenance will be rehabilitated. Endemic species will be used to supplement natural vegetation regeneration, where required.*	Rehabilitation Areas	
• *Progressive rehabilitation of disturbed areas and re-use of habitat features (e.g. hollow logs, rocks) in rehabilitation areas to minimise the habitat resource competition in adjoining conservation reserves.*	Rehabilitation Areas	

Table 3: Project Approval 08_0135

<table>
<tr><th>NSW Project Approval Condition</th><th>Area</th><th>RMP Section</th></tr>
<tr><td>

REHABILITATION

Rehabilitation Objectives

53. The Proponent must rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (and depicted conceptually in the figures in Appendix 9), and comply with the objectives in Table 17.

Table 17: Rehabilitation Objectives

<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td rowspan="6">Mine site (as a whole)</td><td>• Safe, stable and non-polluting;
• Constructed landforms drain to the natural environment (excluding final voids); and
• Minimise visual impact of final landforms as far as is reasonable and feasible.</td></tr>
<tr><td>• Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems that is compatible with the conservation values of the adjacent Munghorn Gap Nature Reserve and Goulburn River National Park, that is comprised of:
○ 1502 ha of open woodland including Grey Box – Narrow leaved Ironbark shrubby woodland on hills of the Hunter Valley, North Coast and Sydney Basin; Scribbly Gum – Brown Bloodwood woodland of the southern Brigalow Belt South; Rough-barked Apple – Coast Banksia shrubby woodland on Warkworth Sands of the central Hunter Valley, Sydney Basin; and White Box Yellow Box Blakely's Red Gum Woodland (EEC);</td></tr>
<tr><td>○ aquatic habitat areas (within the diverted creek lines and retained water features);</td></tr>
<tr><td>○ habitat for threatened fauna species; and</td></tr>
<tr><td>○ wildlife corridors.</td></tr>
<tr><td>Final Voids</td><td>• Minimise the size and depth of final voids so far as is reasonable and feasible, subject to meeting the objectives below:
○ 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.</td></tr>
</table>

</td><td>Rehabilitation Areas</td><td>4.0</td></tr>
</table>

<table>
<tr><th>NSW Project Approval Condition</th><th>Area</th><th>RMP Section</th></tr>
<tr><td>
Table 17: Rehabilitation Objectives (continued)
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>Water Quality</td><td>• Water retained on site is fit for the intended land use (s) for the post-mining domain(s).
• The potential ecological, hydrological and geomorphic impacts from post-mining water discharges on receiving creeks are assessed and appropriate mitigation measures are effectively implemented as part of the closure plan.</td></tr>
<tr><td>Surface Infrastructure</td><td>• To be decommissioned and removed, unless Resources Regulator agrees otherwise.</td></tr>
<tr><td>Degraded riparian areas along Wilpinjong Creek and along Murragamba and Eastern Creeks downstream of the mined areas to the boundary of the Wilpinjong mine</td><td>• Restore channel stability;
• Restore riparian and aquatic ecosystem function; and
• Include compensatory aquatic habitat areas.</td></tr>
<tr><td>Community</td><td>• Ensure public safety; and
• Minimise the adverse socio-economic effects associated with mine closure.</td></tr>
<tr><td colspan="2">Note: The proponent must prepare and implement a Rehabilitation Management Plan in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992.</td></tr>
</table>
</td><td></td><td>4.0</td></tr>
<tr><td>Progressive Rehabilitation
54. The Proponent 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 yet be permanently rehabilitated.
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 project.</td><td>Rehabilitation Areas</td><td>6.0</td></tr>
<tr><td>Long Term Security of Rehabilitated Areas
55. Prior to relinquishing the mining lease that covers the site, unless the Secretary agrees otherwise, the Proponent must make suitable arrangements to protect the rehabilitation areas with conservation value in perpetuity, in consultation with BCS and to the satisfaction of the Secretary.</td><td>Stage 2 Rehabilitation Areas</td><td>4.1</td></tr>
<tr><td>Appendix 3 – Statement of Commitments
Rehabilitation
36. MCM will rehabilitate the Stage 2 project area to restore forest and woodland across the valley landscape, including rehabilitating 631 ha of currently degraded secondary grasslands. Areas of derived native grassland, secondary grassland and exotic grassland will be rehabilitated to treed landscapes.</td><td>Stage 2 Rehabilitation Areas</td><td>4.0</td></tr>
<tr><td>37. MCM will implement best practice environmental management to progressively rehabilitate mined and degraded non-mined areas with a focus on the re-establishment of C/EEC Box Gum Woodland and threatened species habitat.</td><td>Stage 2 Rehabilitation Areas</td><td>4.0, 5.0 and 6.0</td></tr>
</table>

NSW Project Approval Condition	Area	RMP Section
38. The gradients of final landform slopes will be generally designed to be no more than 10 to 14 degrees. However, where the out-of-pit (OOP) emplacement area is spatially constrained the final gradients of these slopes will be limited to a maximum of 20 degrees, provided it is agreed to by the relevant regulators.	Stage 2 Rehabilitation Areas	4.0, 5.0 and 6.0
Visual *41. Rehabilitation will be carried out on disturbed areas as soon as practical after disturbance with emphasis on bunding and the OOP emplacement area.*	Stage 2 Rehabilitation Areas	6.0

Table 4: Commonwealth Approval EPBC 2007/3297

EPBC Requirements	Area	RMP Section
3. *In order to protect the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland listed ecological community, the person taking the action shall prepare and implement a detailed Rehabilitation and Offsets Management Plan for the project to the satisfaction of the Minister for the Environment and Water Resources. The proponent shall progressively rehabilitate the site to the satisfaction of Minister for the Environment and Water Resources and the NSW Department of Primary Industries, in general accordance with the proposed Rehabilitation and Offset Management Plan. The Rehabilitation and Offset Management Plan must include:*	Rehabilitation Areas	This RMP
(a) *the rehabilitation objectives for the site, vegetation offsets and landscaping;*		6.0
(b) a description of the short, medium, and long term measures that would be implemented to: • *rehabilitate the site;* • *implement the vegetation offsets; and* • *landscape the environmental bunds;*		6.0 Biodiversity Offset Management Plan
(c) performance and completion criteria for the rehabilitation of the site, implementation of the vegetation offsets, and landscaping of the environmental bunds;		4.0
(d) a detailed description of the measures that would be implemented over the next 3 years including the progressive rehabilitation of mining areas and progressive implementation of the vegetation offset areas referred to in Condition 2.		Forward Plan
(e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria (see (c) above);		8.0
(f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and		3.0
(g) details of who would be responsible for monitoring, reviewing, and implementing the plan.		11.2

Table 5: Mining Lease Conditions

ML	Condition	Condition Requirement	Area	RMP Section
ML 1605, ML 1606, ML 1628	Condition 7	*Disturbed land must be rehabilitated to a sustainable/agreed land use to the satisfaction of the Director-General.*	Rehabilitation Areas	This RMP
ML1691	Condition 7	*Any disturbance as a result of activities under this lease must be rehabilitated to the satisfaction of the Director-General.*	Rehabilitation Areas	This RMP
ML1715	Condition 2	*Any disturbance as a result of activities under this lease must be rehabilitated to the satisfaction of the Minister.*	Rehabilitation Areas	This RMP

2.2 FINAL LAND USE OPTIONS ASSESMENT

A conceptual final land use has been previously determined through existing project approval processes. See **Section 2.4.1** of this RMP for details on final land use domains. This section does not replace the outcomes of those processes.

2.3 FINAL LAND USE STATEMENT

The principal final land use vision at the MCC is to:

- Enhance biodiversity by providing a net increase in native vegetation and improving connectivity with adjacent woodland and forest communities at Munghorn Gap Nature Reserve and Goulburn River National Park
- Reinstate pre-mining land use on areas of OC3 by re-establishing agricultural land
- Achieve safe, stable, and non-polluting landforms with beneficial uses post mining
- Satisfy all regulatory requirements under MCO development consents, mining leases and licences.

It is envisaged that the rehabilitated Murragamba and Eastern Creeks will be used for conservation, passive recreation and environmental education purposes. Some infrastructure may also be retained post-mining for future exploration/mining purposes or for passive recreation, educational and transport activities.

Final post mining land uses will be subject to consultation with relevant regulatory authorities and key stakeholders, including surrounding landholders.

The proposed final land use for the MCC is represented in The Final Landform and Rehabilitation Plan (Plan 1 - Final Landform Features and Plan 2 Final Landform Contours).

A description of the post-mining land use goals relevant to biodiversity enhancement and agriculture are outlined in the following sections.

2.3.1 Biodiversity Enhancement

Regional biodiversity values will be enhanced by creating long-term north-south and east-west habitat corridors linking the Goulburn River National Park and Munghorn Gap Nature Reserve. Enhanced corridor linkages will be achieved through the rehabilitation of disturbed lands (including riparian areas) with native vegetation. This rehabilitation will develop habitats similar to the existing undisturbed environments.

Native vegetation rehabilitation areas will be a mosaic of Box Gum Shrubby Woodland, Sedimentary Ironbark Forest and Box Gum Grassy Woodland communities. Box Gum Woodland associations will be consistent with key species associated with the Box Gum Woodland Endangered Ecological Community.

The type of woodland or forest community will ultimately be dependent on the post-mining landform slope and overburden material characteristics.

Native vegetation will be established across the majority of OC1, OC2 and OC4 footprints and along the steeper areas of OC3 where the final landform approaches the ridge to the west. This will integrate with remnant stands of vegetation and enhance habitat connectivity.

2.3.2 Agriculture

MCO will re-establish lands suitable for agriculture on portions of the OC3 final landforms (**Figure 5: Final Landform Features (FLRP Plan 1)**). Agricultural rehabilitation areas will be predominantly rehabilitated with pasture species suitable for grazing.

2.3.3 Final Voids

One final void will remain in each of OC1, OC3 and OC4. A detailed description of final void design and management is provided in **Section 6.2.3.4**.

2.4 FINAL LAND USE AND MINING DOMAINS

Consistent with contemporary rehabilitation regulatory requirements, MCO have developed final land use and mining domains for the MCC.

The NSW RR has provided a list of Final Land Use and Mining domain names and codes that must be adhered to within this Rehabilitation Management Plan (RMP). **Table 6** details the specific domain titles and the relevant codes.

Table 6: NSW Resource Regulator Domain Codes (2021)

FINAL LAND USE DOMAIN	CODE	MINING DOMAIN	CODE
Native Ecosystem	**A**	**Infrastructure Area**	**1**
Agricultural – Grazing	**B**	Tailings Storage Facility	2
Agricultural – Cropping	C	**Water Management Area**	**3**
Rehabilitation Biodiversity Offset Area	**D**	**Overburden Emplacement Area**	**4**
Industrial	E	**Active Mining Area (Open cut void)**	**5**
Water Management Areas	**F**	**Underground Mining Area (SMP)**	**6**
Water Storage (Excluding Final Void)	**G**	**Beneficiation Facility**	**7**
Heritage Area	H	Other	8
Infrastructure	**I**		
Final Void	**J**		

The domains highlighted grey in **Table 6** are not applicable to MCO but have been included in this table for context.

2.4.1 Final Land Use Domains

Final land use domains are defined as land management units characterised by similar final land use objectives. Each final land use domain will require specific rehabilitation methods.

For MCC the site will be rehabilitated to final land uses of Domain A – Native Ecosystem, Domain B – Agriculture Grazing, and Domain D – Rehabilitation Biodiversity Offset Area. The final land use domains for this Plan are presented in **Table 7** and shown on the approved Final Landform and Rehabilitation Plan in **Figure 5**.

Table 7: Final Land Use Domains

Code	RMP Final Land Use Domain	RMP Final Land Use Domain Description
A	Native Ecosystem	Native vegetation consistent with Box Gum Woodland associations previously cleared by development of the Moolarben Coal Complex, including stands of *Allocasuarina* within OC1. All rehabilitation areas will contribute to habitat linkages between the Munghorn Gap Nature Reserve and the Goulburn River National Park. Box Gum Woodland associations to be reestablished in rehabilitation areas include: Blakely's red gum – yellow box grassy open forest White box – narrow leaved ironbark shrubby open forest White box – yellow box grassy woodland on basalt
		Native vegetation comparable to Sedimentary Ironbark Forest communities in adjacent undisturbed areas, including stands of *Allocasuarina* within OC1.
B	Agriculture - Grazing	Areas to be rehabilitated to be capable of supporting sustainable grazing. Pasture areas will be vegetated with a mix of native and non-invasive perennial pasture species.
D	Rehabilitation Biodiversity Offset Area	Areas within OC2/OC3 to be rehabilitated to establish specific PCT vegetation communities. This will generate the residual Framework for Biodiversity Assessment (FBA) ecosystem credits for HU730 (Plant Community Type (PCT) 618) and HU910 (PCT1696) and species credits for the Koala[1].
F	Water Management Areas	The final landform drainage includes rehabilitated diversions of Murragamba and Eastern Creeks that will integrate with the surrounding catchments and be comparable to selected creek analogue sites. Native vegetation in riparian zone of the rehabilitated creek areas will comprise: Riparian variation of Blakely's red gum – yellow box grassy open forest Riparian variation of White box – yellow box grassy woodland on basalt

[1] *Residual credits may be retired by other mechanisms under the BC Act in place of rehabilitation.*

Code	RMP Final Land Use Domain	RMP Final Land Use Domain Description
G	Water Storage (Excluding Final Void)	If applicable, sediment dams/water storages identified for retention in the final landform landscape (to provide water resources for fauna habitat or for agricultural purposes). Retained water storage systems will be de-silted and stabilised (if required).
I	Infrastructure	If applicable, infrastructure identified to be retained (e.g. water supply and distribution structures and access tracks) for future management, exploration/mining purposes or for passive recreation, educational and transport purposes.
J	Final Void	A final void in OC1, a final void in the southern extent of OC3, and a final void at the eastern extent of OC4. Final voids will be safe, stable, profiled for long-term stability and non-polluting. Final void batters will be rehabilitated with suitable vegetation.

2.4.2 Mining Domains

Mining domains identify the footprint of areas disturbed for mining related activities. Mining domains are classified as a land management unit with a discrete operational function. These areas have similar geophysical and geochemical characteristics that will require similar specific rehabilitation treatments to achieve the final land use(s). The mining domains for the MCC are defined below in **Table 8.**

Table 8: Mining Domains

Code	RMP Mining Domain	RMP Final Land Use Domain Description
1	Infrastructure Area	Infrastructure areas including but not limited to: • CHPP and related facilities • administration areas • fuel farms • stores • training building • service bays • bathhouses • haul truck tyre slab • hardstand/laydown • access road • haul road • pipelines

Code	RMP Mining Domain	RMP Final Land Use Domain Description
		• temporary MIA • explosives storage facilities • sewage treatment plant
3	Water Management Area	Includes components of the network of dams that forms the MCC water management system in place to control the movement of water around the site. These include sedimentation, diversion, mine water and clean dams.
4	Overburden Emplacement Area	Areas in which overburden and interburden is placed. Temporary overburden stockpiles will be strategically placed near other large disturbance areas, such as dams and infrastructure areas, to expedite backfilling and rehabilitation and minimise rehandling of overburden material.
5	Active Mining Area (Open cut void)	The current active mining areas.
6	Underground Mining Area (SMP)	Underground mining areas including UG1, UG2 and UG4.
7	Beneficiation Facility	Coal handling and preparation plant (CHPP) within the stage 1 Project Approval boundary.

3.0 REHABILITATION RISK ASSESSMENT

The Rehabilitation Risk Assessment was reviewed on 25 February 2025. Environmental risks and controls for current operational areas, rehabilitation areas and offset areas have been identified and assessed in accordance with MCO's risk management processes following the general principles outlined in *ISO 31000:2018 Risk Management Guidelines*. The risk management methodology encompassed the following key steps:

- Establish the context for the risk assessment process
- Identify risks and potential impact
- Analyse risks, and
- Evaluate risks to determine the necessary controls for mitigation.

The scope of the risk assessment was to identify, assess, and evaluate the risks that need to be addressed to achieve the following in relation to the mining lease:

- The rehabilitation objectives
- The rehabilitation completion criteria for large mines
- The final land use as spatially depicted in the final landform and rehabilitation plan, and
- Identifies the measures that need to be implemented to eliminate, minimise or mitigate the risks.

A summary of the risks and controls identified in the RMP Rehabilitation Risk Assessment are outlined in **Table 9** below.

Table 9: Key Risks to Rehabilitation

Risk	Proposed Risk Controls	RMP Section
Unapproved post mining land uses/landforms for each domain based on approvals, agreements, known constraints and objectives	1. No change to post mining land use or closure activities without appropriate approval (EIS and RMP FLRP approval). 2. Approved post mining land use. 3. Rehabilitation Management Plan (RMP). 4. Rehab ITP (Surveying compliance as-built landform) 5. Approved ROBJs	2.0 4.0 7.0
LTA recovery of required rehabilitation resources (e.g. habitat features, mulch, soil)	1. Approved Vegetation clearance process via Biodiversity Management Plan. 2. Ground disturbance permit (internal process), includes survey for habitat features, soil survey details and stripping depth. 3. Clearing/stripping supervision 4. Topsoil surveys (monthly topsoil inventory)	6.0
Less than adequate weed and pest management during all phases on mining and rehabilitation resulting in unperforming achievement of rehab objectives and completion criteria.	1. Targeted management and control program implemented. 3. Restricted access in rehabilitated areas 4. Designated tracks throughout rehabilitated areas 5. Participate regional control programs in consultation with LLS. 5. Annual rehab monitoring and regular/ad hoc inspections for pest presence. 6. BMP and RMP outline monitoring requirements. 7. Funds allocated for rehabilitation management. *TARP Response - 1. Increase monitoring frequency at affected area(s) as required. 2. Implement additional targeted weed and pest control measures as required.	6.0 8.0
Adverse geochemical/chemical composition of materials such as overburden, interburden, processing wastes, subsoils and topsoils and imported	1. Known soils and overburden from testing. 2. Use of ameliorants as required. 3. Water sampling of mine and sediment dams. 4. Additional testing as required. 5. Selective handling, burial and capping depth or stockpiling for co-disposed tailings and reject material.	6.0

Risk	Proposed Risk Controls	RMP Section
cover materials which results in long term rehabilitation and closure issues.	6. Designated areas for co-disposal. 7. Dumping Excavated Faces and Stockpiles Procedure (Includes material management details). 8. RMP includes geochemistry section.	
Less than adequate management of spontaneous combustion in overburden areas results in long term rehabilitation and closure issues.	1. Selective material handling, and capping depth. 2. Spon Com management section in RMP. 3. Managed under approved Air Quality Management Plan (AQMP) 4. Principal Hazard Management Plan for Spontaneous Combustion - open cut. 5. TARP for spontaneous combustion. 6. Designated areas for co-disposal. 7. Dumping Excavated Faces and Stockpiles Procedure (Includes material management details). 8. Annual Rehabilitation Monitoring Program.	6.2.1.7
Inconsistent landform design (e.g. macro and micro-relief) which results in rework of rehabilitation areas.	1. Final landform design generally in accordance with Project Approval (Stage 1 and 2) 2. RMP, approved FLRP and ROBJs. 3. Rehabilitation QA/QC process (ITP) including as-built survey 4. Engagement with suitably qualified personnel on final landform design considerations 5. Use of specialist consultants for design and assessment of rehabilitation. 6. LOM planning process. 7. Rehabilitation monitoring program.	4.0 7.0 8.0
Less than adequate geomorphological, hydraulic and ecological function associated with creek diversions.	1. Engineering Report - Detailed Design for Proposed Diversions of Murragamba and Eastern Creeks	6.2.3.5
Insufficient soil amelioration undertaken to achieve suitable growth media for planting/seeding.	1. RMP. 2. Rehabilitation QA/QC process (ITP). 3. Rehabilitation Monitoring Program. 4. EIS soil assessments and material characterisation. 5. Soil surveys for new disturbance areas as required. 6. Soil testing of proposed topsoil to be used in each rehabilitation campaign. 7. Characterisation and amelioration recommendation reports from specialists.	6.2.1.1
Slope instability in areas of steeper slopes following the application of growth media.	1. Rock mulching 2. Deep ripping on contour.	6.2.3.2

Risk	Proposed Risk Controls	RMP Section
Crest tie-in settlement on the edge of highwall	1. Monitoring and maintenance of crest tie-in through annual rehabilitation monitoring program.	8.0
Long term rehabilitation is not tracking towards completion criteria.	1. RMP. 2. Use of rehabilitation monitoring and specialist consultants. 3. Rehabilitation ITP. 4. Rehabilitation maintenance and weed management. 5. LOM planning and budget process. 6. Approved completion criteria and indicators (Domain D in accordance with Project Approval). 7. Reporting in Annual Review. 8. Adaptive management of planting process considering monitoring results including supplementary planting as required. 9. Annual rehab monitoring program. 10. Draft completion criteria in RMP. 11. ARRFP and RMP TARP.	6.2 7.0 8.0 10.0
Rehabilitated OC2 and / or OC3 landforms not tracking towards completion criteria to enable generation of requirements ecosystem and species credits.	1. Approved OC2/OC3 completion criteria and performance indicators 2. Use of specialist consultants in development of criteria 3. RMP 4. Annual Rehabilitation monitoring 4. Rehabilitation ITP 5. ARRFP and RMP TARP	4.4 7.0 8.0 10.0

4.0 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

4.1 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

The overall rehabilitation objective for the MCC is to restore mine-disturbed land to a naturally vegetated state including native ecosystems, rehabilitation biodiversity offset areas and areas suitable for agricultural grazing. In addition, MCO aims to improve existing degraded and cleared land within its ownership outside the mine disturbance footprint.

In accordance with Condition 55, Schedule 3 of Project Approval (08_0135), prior to relinquishing the mining leases associated with Stage 2 of the Moolarben Coal Complex (unless the Secretary of the DPE agrees otherwise), MCO will make suitable arrangements to protect the rehabilitation areas with conservation value in perpetuity. These arrangements will be made in consultation with the BCS and to the satisfaction of the Secretary of the DPE.

4.2 DOMAIN REHABILITATION OBJECTIVES

To achieve the broad rehabilitation objectives presented in Project Approvals 08_0135 and 05_0117, rehabilitation objectives specific to each domain have been developed.

The rehabilitation objectives (ROBJs) for each domain are summarised in **Table 10**. These ROBJs were approved by the NSW RR on 9 January 2025.

Table 10: Summary Table of Approved Rehabilitation Objectives

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
B1 B3 B4	Agricultural – grazing	Infrastructure Area Water Management Area Overburden Emplacement Area	Agricultural revegetation	Land use capability is capable of supporting the target agricultural land use. Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.
A1 A3 A4 A7 B1 B3 B4 D1 D3 D4	Agricultural – grazing Rehabilitation Biodiversity Offset Area Native Ecosystem	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
A1 A3 A4 A7	Native Ecosystem	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of Box Gum Shrubby Woodland found in the local area. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Box Gum Shrubby Woodland found in the local area.

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
				Levels of ecosystem function of Box Gum Shrubby Woodland vegetation have been established that demonstrate the rehabilitation is self-sustainable.
A1 A3 A4	Native Ecosystem	Infrastructure Area Water Management Area Overburden Emplacement Area	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of Sedimentary Ironbark Forest found in the local area. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Sedimentary Ironbark Forest found in the local area. Levels of ecosystem function of Sedimentary Ironbark Forest vegetation have been established that demonstrate the rehabilitation is self-sustainable.
A1 A3 A4	Native Ecosystem	Infrastructure Area Water Management Area Overburden Emplacement Area	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) found in the local area and include specific species for the Regent Honeyeater. The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) found in the local area and include specific species for the Regent Honeyeater. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Box Gum Woodland (White box-yellow box

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
				grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) found in the local area. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) found in the local area. Levels of ecosystem function of Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) vegetation have been established that demonstrate the rehabilitation is self-sustainable. Levels of ecosystem function of Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) vegetation have been established that demonstrate the rehabilitation is self-sustainable. The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association) found in the local area and include specific species for the Regent Honeyeater The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association) found in the local area.

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
				Levels of ecosystem function of Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association) vegetation have been established that demonstrate the rehabilitation is self-sustainable.
F4	Water management Area	Overburden Emplacement Area	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of the Riparian zone of Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) found in the local area and include specific species for the Regent Honeyeater. The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of the Riparian zone of Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) found in the local area and include specific species for the Regent Honeyeater. Levels of ecosystem function of the Riparian zone of the Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) vegetation have been established that demonstrate the rehabilitation is self-sustainable. Levels of ecosystem function of the Riparian zone of the Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) vegetation have been established that demonstrate the rehabilitation is self-sustainable. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Riparian zone of the Box Gum Woodland

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
				(White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) found in the local area. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Riparian zone of the Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) found in the local area.
D1	Rehabilitation Biodiversity Offset Area	Infrastructure Area	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of the Riparian variant of PCT1696 found in the local area. The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Riparian variant of PCT1696 found in the local area. Levels of ecosystem function have been established that demonstrate the rehabilitation of the Riparian variant of PCT1696 is self-sustainable.
D1 D3 D4	Rehabilitation Biodiversity Offset Area	Infrastructure Area Water Management Area Overburden Emplacement Area	Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the PCT1696 found in the local area. The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of PCT1696 found in the local area. Levels of ecosystem function have been established that demonstrate the rehabilitation of PCT1696 is self-sustainable.
D4	Rehabilitation Biodiversity Offset Area	Overburden Emplacement Area	Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of PCT618 found in the local area.

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
				The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the PCT618 found in the local area. Levels of ecosystem function have been established that demonstrate the rehabilitation of PCT618 is self-sustainable.
A4 B4 J5	Native Ecosystem Rehabilitation Biodiversity Offset Area Final Void	Overburden Emplacement Area Active mining area (open cut void)	Groundwater	Impacts to groundwater regime are within predicted drawdown range as per the development consents and environmental assessments. Groundwater quality is within the range predicted in the relevant Moolarben environmental assessments and does not present a risk of environmental harm.
A1 A3 A4 A7 B1 B3 B4 D1 D3 D4 J5	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area Final Void	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility Active mining area (open cut void)	Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.
B1 B3	Agricultural – grazing Rehabilitation Biodiversity Offset Area	Infrastructure Area Water Management Area	Landform Stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
B4 D1 D3 D4		Overburden Emplacement Area		
A1 A3 A4 A7 B1 B3 B4 D1 D3 D4 F4	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area Water management Area	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Landform Stability	Final landforms are safe, stable, non-polluting and drain to the natural environment.
A1 A3 A4 A7 F4	Native Ecosystem Water management Area	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Landform Stability	The final landform is commensurate with the surrounding natural landform and where appropriate, incorporate geomorphic design principles.
J5	Final Void	Active mining area (open cut void)	Landform Stability	The size and depth of final voids will be minimised so far as is reasonable and feasible.

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
				The final void will be constructed to have negligible high wall instability risk. The final void is safe, stable and non-polluting.
A4 A7 B4 D4	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area	Water Management Area Overburden Emplacement Area Beneficiation Facility	Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.
A1 A3 A4 A7 B1 B3 B4 D1 D4 F4	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area Water management Area	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials.
A1 A7 B1 B3 B4 D1	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area Water management Area Final void	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community. All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and/or licence/lease/binding agreement, etc)

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
F4 J5		Active mining area (open cut void)		
A1 A3 A4 A7 B1 B3 B4 D1 D3 D4 F4 J5	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area Water management Area Final void	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility Active mining area (open cut void)	Surface water	Water retained in surface water storages is fit for the intended land use(s) for the post-mining domain(s)
A1 A3 A4 A7 B1 B3 B4 D1 D3	Native Ecosystem Agricultural – grazing Rehabilitation Biodiversity Offset Area Water management Area	Infrastructure Area Water Management Area Overburden Emplacement Area Beneficiation Facility	Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.

Spatial Reference	Final Land use Domain	Mining Domain	Rehabilitation Objective Category	Rehabilitation Objectives
D4 F4				
J5	Final void	Active mining area (open cut void)	Surface water	The drainage catchment of the final void will be minimised so far is reasonable and feasible.
A7 J5	Native Ecosystem Final void	Beneficiation Facility Active mining area (open cut void)	Water approvals	Structures that take or divert water such as final voids, dams, levees etc are appropriately licensed (e.g. under the Water Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.

4.3 REHABILITATION COMPLETION CRITERIA

Completion criteria are objective target levels or values assigned to a variety of indicators (e.g. slope, species diversity, percent groundcover), which can be measured to demonstrate progress and the ultimate success of rehabilitation. As such, completion criteria provide a defined end point at which time rehabilitation can be deemed successful and mining lease relinquishment can proceed. The draft rehabilitation completion criteria for all areas at MCC are listed in Appendix B.

These completion criteria will be utilised to demonstrate achievement of rehabilitation objectives. It is noted that completion criteria may be subject to refinement as rehabilitation progresses, including as a result of ongoing consultation with the relevant stakeholders, studies yet to be completed and continuous improvement processes informed by rehabilitation monitoring results. Progress towards achievement of the completion criteria will be monitored and reported on in the annual rehabilitation monitoring program.

The MCC rehabilitation completion criteria have been informed by the following information:

- Relevant conditions of PA 08_0135 and 05_0117
- The RR rehabilitation guideline documents including:
    - Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines
    - Guideline: Rehabilitation objectives and rehabilitation completion criteria
    - Completion criteria from previously approved MCO Mining Operations Plans, and
    - Relevant information collected during detailed mine planning processes.

Note that the rehabilitation completion criteria are draft until formally submitted to and approved by the RR.

4.4 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA – STAKEHOLDER CONSULTATION

4.4.1 Consultation for Rehabilitation Objectives and Completion Criteria

MCO has conducted comprehensive consultation programs during the Moolarben Coal Project Stage 1 and Moolarben Coal Project Stage 2 approval processes under the NSW *Environmental Planning and Assessment Act, 1979*. These consultation programs included the rehabilitation strategy for the MCC.

As per Conditions 35B and 35C, Schedule 3 of the Stage 1 Project Approval 05_0117 (as modified) MCO is required to develop rehabilitation performance and completion criteria for vegetation communities to be established in the rehabilitated OC2 and/or OC3 landforms to generate the residual Framework for Biodiversity Assessment (FBA) ecosystem credits for HU730 (Plant Community Type (PCT) 618) and HU910 (PCT1696) and species credits for the Koala[1]. These rehabilitation performance and completion criteria were approved by the DPE on 7 July 2020.

As per Condition 35 and 36, Schedule 3 of Stage 2 Project Approval 08_0135 (as modified) MCO is required to develop rehabilitation performance and completion criteria for vegetation communities to be established in the rehabilitated OC4 landforms to generate the residual FBA species credits for Regent Honeyeater. The rehabilitation performance and completion criteria for the generation of Regent Honeyeater species credits are not yet approved. Development of the rehabilitation performance indicators and completion criteria will be an iterative process, whereby monitoring results will be used to refine the completion criteria in future revisions of the RMP.

A summary of the stakeholder engagement undertaken as part of the development of MCO rehabilitation objectives and completion criteria is outlined in **Table 11**.

Table 11: Summary of stakeholder engagement undertaken for the development of rehabilitation objectives and rehabilitation completion criteria

Stakeholder	Consultation activities and form	Matters subject to consultation	Actions taken in response to stakeholder feedback
NSW Department of Planning and Environment (DPE)	Conditions 35B and 35C, Schedule 3 of the Stage 1 Project Approval 05_0117	Framework for Biodiversity Assessment (FBA) ecosystem credits for HU730 (Plant Community Type (PCT) 618) and HU910 (PCT1696) and species credits for the Koala[1]	Finalised completion criteria
NSW Department of Planning, Industry and Environment – Resources Regulator (RR)	Rehabilitation objectives in accordance with RR guidelines	Rehabilitation Objectives submitted for approval	Modifications to Rehabilitation Objective statements

NSW Department of Planning, Industry and Environment – Biodiversity and Conservation Division (BCD)	Conditions 35B and 35C, Schedule 3 of the Stage 1 Project Approval 05_0117	Framework for Biodiversity Assessment (FBA) ecosystem credits for HU730 (Plant Community Type (PCT) 618) and HU910 (PCT1696) and species credits for the Koala[1]	Finalised completion criteria

5.0 FINAL LANDFORM AND REHABILITATION PLAN

The Final Landform and Rehabilitation Plans have been developed in line with the requirements of the *Form and Way: Rehabilitation objectives, rehabilitation completion criteria statement and final landform and rehabilitation plan for large mines* (NSW RR 2024). The Final Landform and Rehabilitation Plan (FLRP) has been prepared to show the proposed final land use and final landform for MCC and are presented as two sub plans in this document.

These sub plans area:

1. Plan 1: Final Landform Features (**Figure 5: Final Landform Features (FLRP Plan 1)**)
2. Plan 2: Final Landform Contours (Error! Reference source not found.)

The following spatial data themes have been submitted via the Mine Rehabilitation Portal as Shapefiles as per the RR requirements.

- Final Land Use
- Final Landform Features
- Project Approval Boundary
- Final Landform Contours

The FLRP was approved by the RR on 9 January 2025.

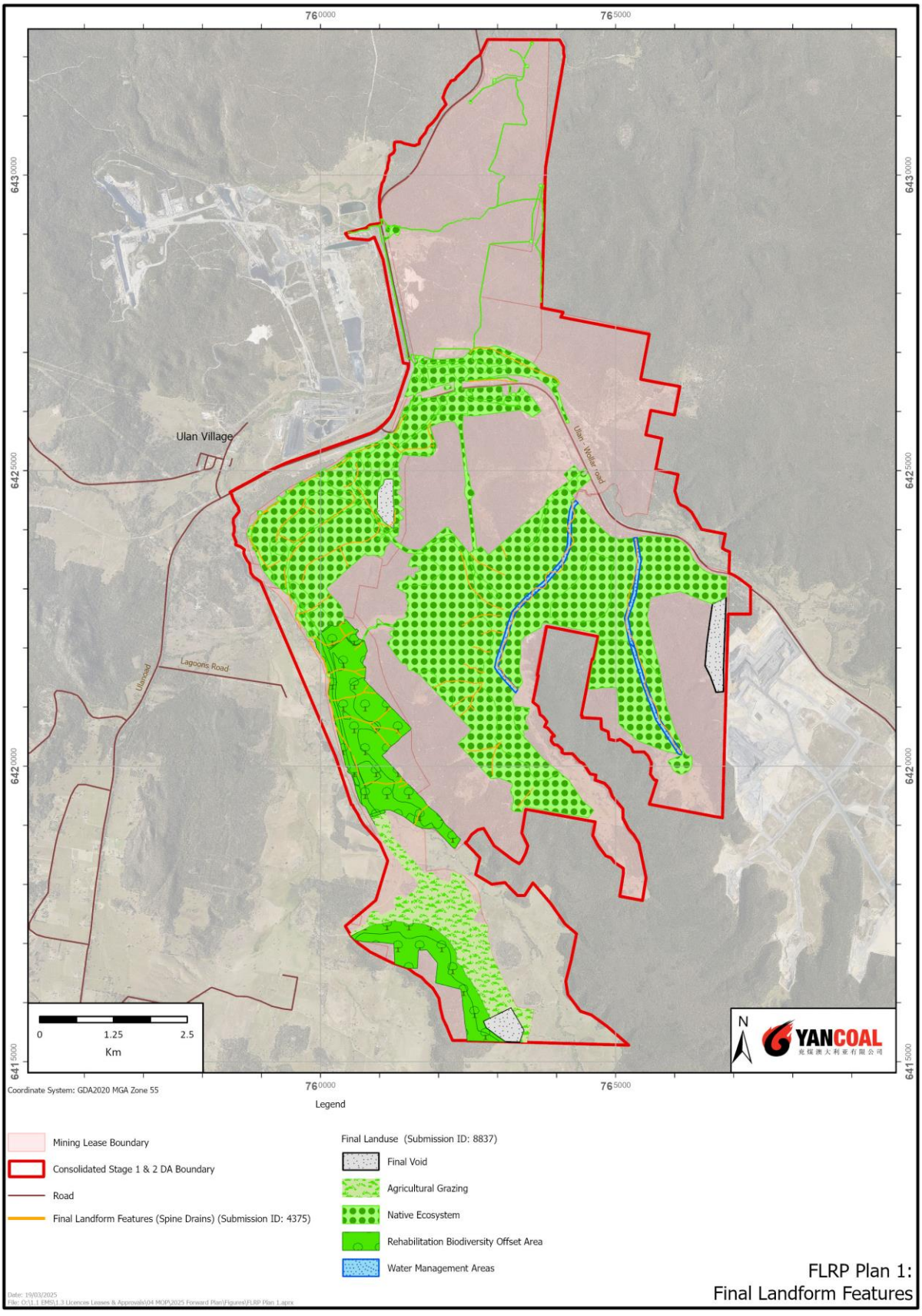

Figure 5: Final Landform Features (FLRP Plan 1)

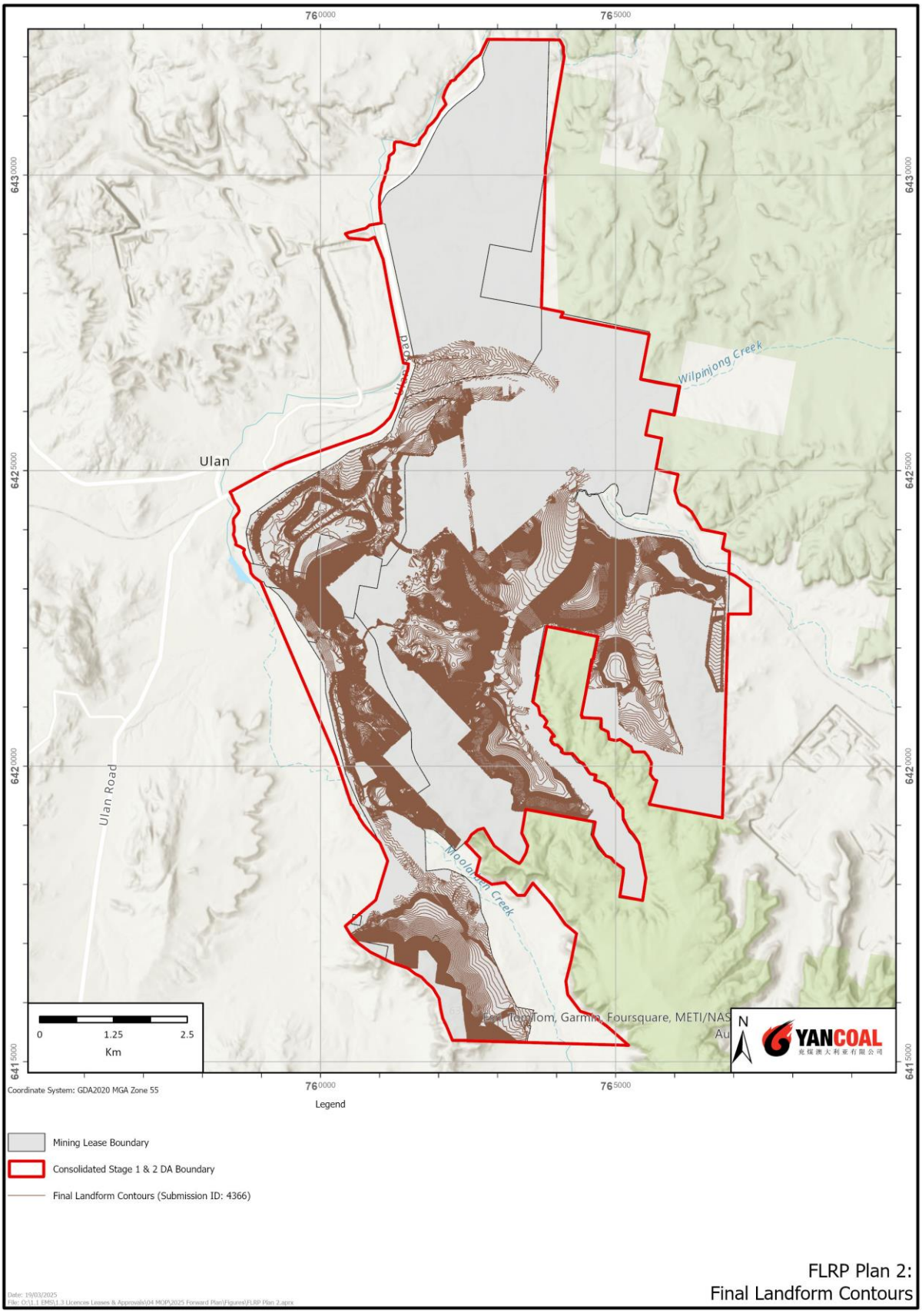

Figure 6: Final Landform Contours (FLRP Plan 2)

6.0 REHABILITATION IMPLEMENTATION

6.1 LIFE OF MINE REHABILITATION SCHEDULE

The rehabilitation schedule over the life of mine (LOM), from the commencement of this RMP until expected lease relinquishment is described in the following section. A current snapshot of disturbance and rehabilitation from 31 December 2024 is provided in **Figure 7**. The LOM rehabilitation schedule is presented in **Figure 8** – **Figure 10**. These figures illustrate projected disturbance and rehabilitation at five-yearly intervals until the completion of approved operations under PA 08_0135 and PA 07_0115 (expiry 2038), and achievement of the final land use.

Following the completion of mining operations, rehabilitation will continue to be undertaken to achieve the final landform and land uses as depicted in the FLRP.

In developing the rehabilitation schedule, rehabilitation is planned to be undertaken progressively and as soon as reasonably practical, with the following assumptions:

- There are no major changes to mining schedules due to market conditions or other factors
- The majority of the mining infrastructure will be required for the life of mine
- There are no extreme weather events (such as prolonged wet or dry periods) that would adversely affect landform establishment or rehabilitation progression.

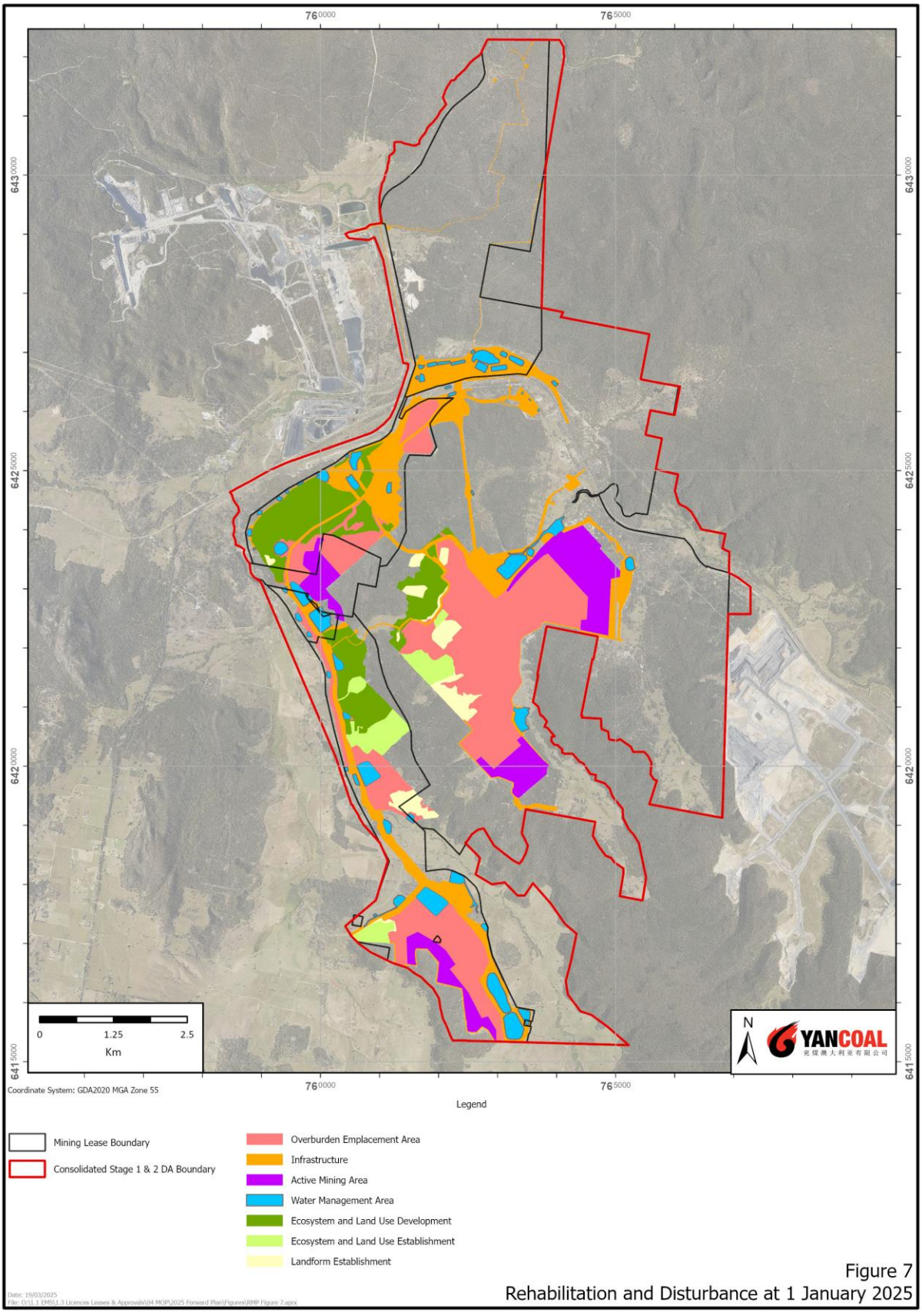

Figure 7: Rehabilitation and Disturbance as of 1 January 2025

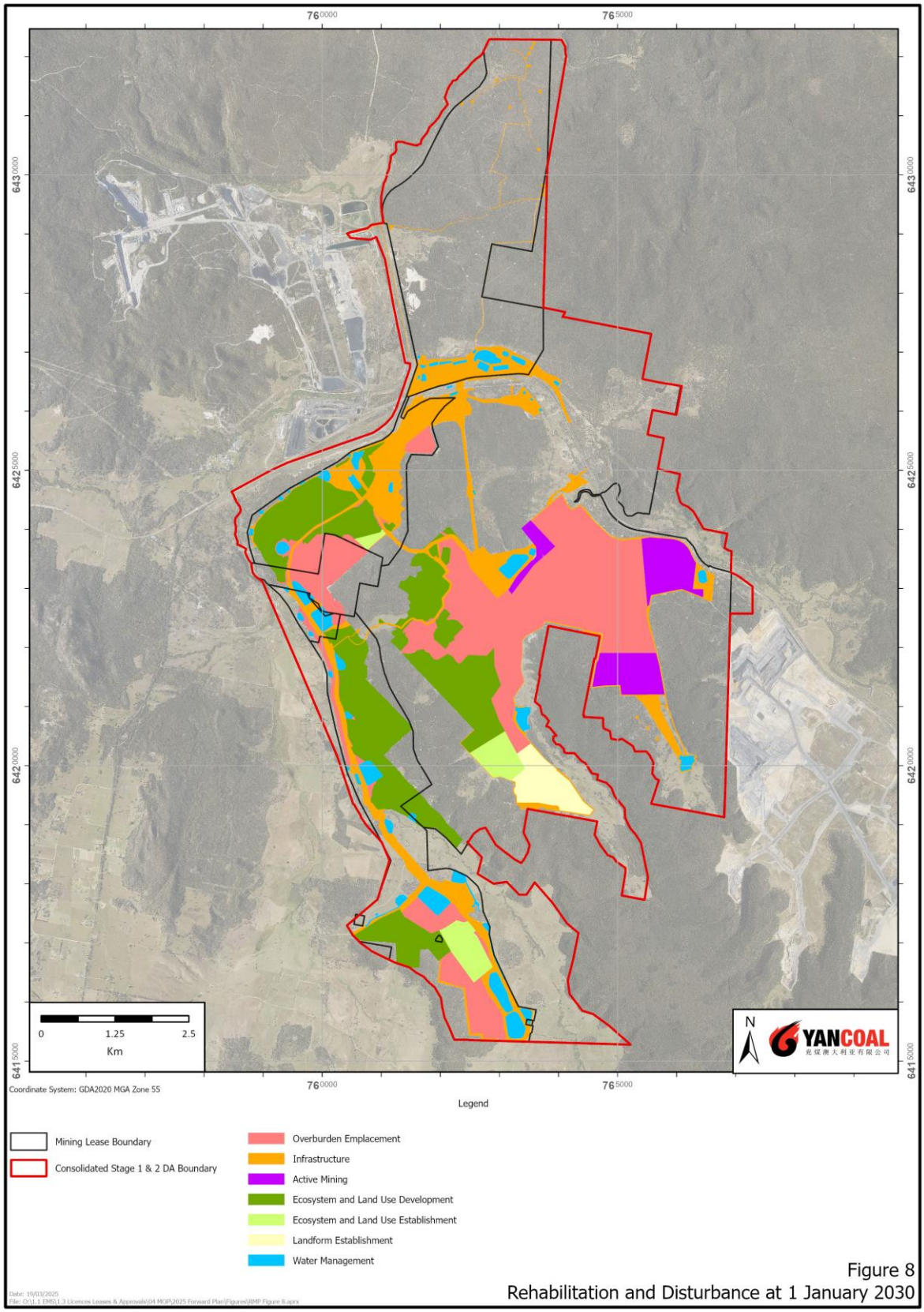

Figure 8: Planned Rehabilitation and Disturbance as of 1 January 2030

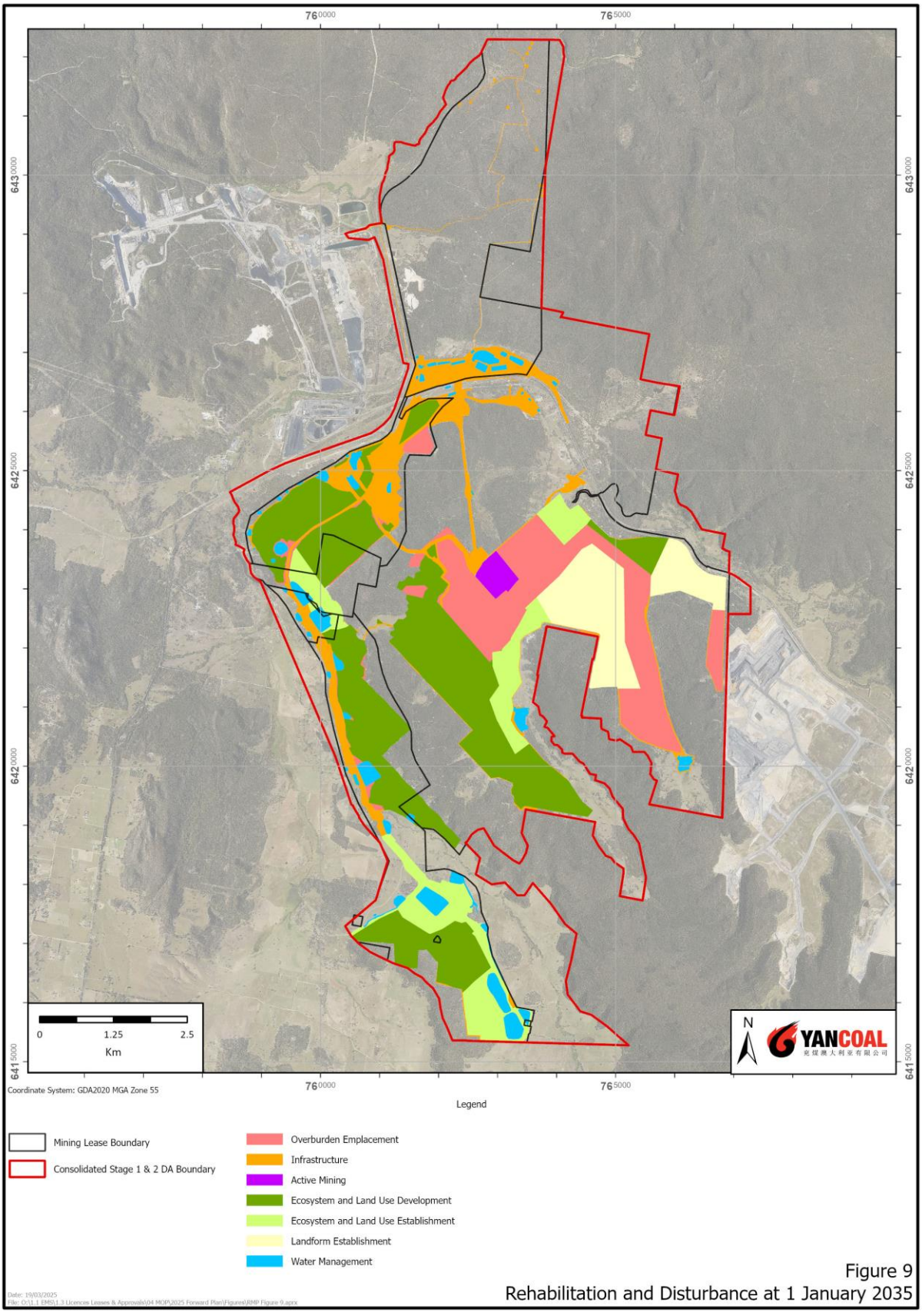

Figure 9: Planned Rehabilitation and Disturbance as of 1 January 2035

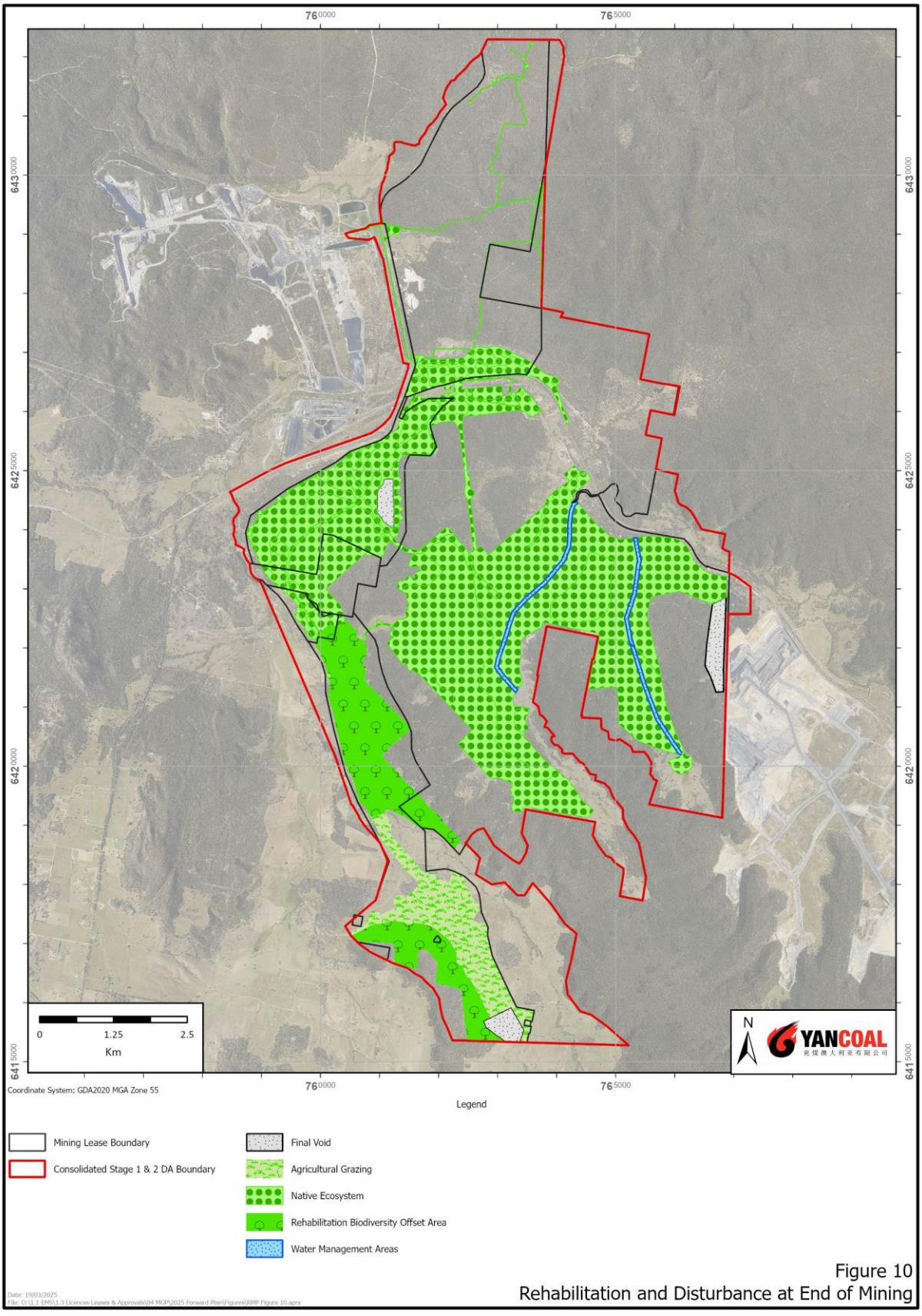

Figure 10: Final Rehabilitated Landform at End of Mine Life

6.2 PHASES OF REHABILITATION AND GENERAL METHODOLOGIES

The final land use objectives stipulated in approval requirements will be achieved through the implementation of a series of rehabilitation stages. As defined in the *Form and way: Rehabilitation Management Plan (large mines)* the rehabilitation phases are described below.

Phase 1: Active Mining– In the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.

Phase 2: Decommissioning – Removal of infrastructure associated with mining activities including preparation plants, hard stand areas, buildings, contaminated materials, hazardous materials. This phase of rehabilitation may also include studies and assessments associated with decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment.

Phase 3: Landform Establishment – This phase of rehabilitation consists of the processes and activities required to construct the approved final landform (as per the development consent and the approved Final Landform and Rehabilitation Plan). In addition to profiling the surface of rehabilitation areas to the approved final landform design this phase may include works to construct surface water drainage features, encapsulate problematic materials such as tailings, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials). The landform design and construction part of this phase incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology.

Phase 4: Growth Medium Development –This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to support the desired vegetation community (including short-lived pioneer species). This phase may include spreading the prepared landform with topsoil and/or subsoil and/or soil substitutes, applying soil ameliorants to enhance the physical, chemical and biological characteristics of the growth media, and actions to minimise loss of growth media due to erosion. Additional characterisation of materials e.g. subsoil, topsoil, organic additives and overburden surface is usually required in this phase to cross check data from the earlier phases.

Phase 5: Ecosystem and Land Use Establishment – This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community (e.g. seeding or tube stocking) and implementing land management activities such as weed control. This phase of rehabilitation may also include habitat augmentation such as installation of nest boxes.

Phase 6: Ecosystem and Land Use Development – This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving rehabilitation objectives, completion criteria and the Final Landform and Rehabilitation Plan. Completion criteria for this phase will include components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape.

Phase 7: Rehabilitation Competition – This final phase of rehabilitation occurs where a rehabilitation area has achieved the final land use for the mining area as stated in the approved rehabilitation objectives and the approved rehabilitation completion criteria and spatially depicted in the approved Final Landform and Rehabilitation Plan. Rehabilitation areas may be classified as complete when the NSW Resources Regulator has determined in writing that rehabilitation has achieved the final land use following submission of the relevant application by the lease holder.

6.2.1 Active Mining Phase

The RMP Form and Way document states in the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation. This sub section summarises the risks and opportunities for rehabilitation associated with the active mining phase across the mining domains. The sub sections have been prepared as per the RMP Form and Way document.

6.2.1.1 Soils and Material

Soil resources for rehabilitation have been identified and characterised for the *Moolarben Coal Project Stage 1 Environmental Assessment Report* (Wells Environmental Services, 2006), *Moolarben Coal Project Stage 1 Optimisation Modification Environmental Assessment* (EMM, 2013a) and *Moolarben Coal Project Stage 2 Environmental Assessment Report* (Wells Environmental Services and Coffey Natural Systems, 2009).

Field and laboratory tests indicate that the soils are mainly acidic in nature, have low organic matter content, are deficient in all major nutrients (such as phosphorus, sulphur and nitrogen) and are highly erodible. They are generally non-saline (EC_{se} < 2 dS/m) but may be prone to dryland salinity outbreak (there is some occurrence of saline discharge from soils within OC4). The suitability of the soil types for rehabilitation, the chemical and physical characteristics for each soil type and proposed soil stripping depth is summarised in Table 12.

Table 12: Topsoil Suitability for Rehabilitation Purposes

Soil Type	Soil Horizon	Rehabilitation Suitability	Physical and Chemical Characteristics	Stripping Depth (cm) #
Yellow Solodic	A1	Suitable if ameliorated	Acid pH with severe dispersive qualities, excessive Mg levels (low Ca:Mg ratio), poor fertility, low Ca	30*
	A2	Suitable if ameliorated	Acid pH with severe dispersive qualities, excessive Mg levels (low Ca:Mg ratio), poor fertility, low Ca	
	B	Not suitable	Dispersive clay, excessive Mg and Na levels	
Yellow Podzolic	A1	Suitable if ameliorated	Acid pH with severe dispersive qualities, excessive Mg levels (low Ca:Mg ratio), poor fertility	30*
	A2	Suitable if ameliorated	Acid pH with severe dispersive qualities, excessive Mg levels (low Ca:Mg ratio), poor fertility	
	B	Not suitable	Dispersive clay	
Earthy Sands	A1	Suitable for blending only.	Acid pH, elevated Al levels, high sand content	100
	A2	Suitable for blending only	Acid pH, elevated Al levels, high sand content with moderate dispersive qualities	
	A3	Suitable for blending only	Acid pH, elevated Al levels, high sand content with severe dispersive qualities	
	B	Not suitable	Dispersive clay, high Na and Mg levels	

Red Podzolic	A1	Suitable if ameliorated	Acid pH with severe dispersive qualities, elevated Al levels, poor fertility	25*
	A2	Suitable if ameliorated and blended	Acid pH with severe dispersive qualities, excessive Mg levels (low Ca:Mg ratio), poor fertility, sand gravel content exceeds 60%	
	B	Not suitable	Dispersive clay, high Na and Mg levels.	
Red Earth	A1	Suitable for blending only	Acid pH, elevated Al levels, high sand gravel content	100
	A2	Suitable for blending only	Acid pH, elevated Al levels, high sand gravel content	
	B	Suitable for blending only	Acid pH, elevated Al levels, high sand gravel content	
Alluvial	A1	Suitable if blended and ameliorated	Acid pH with moderate dispersive qualities, elevated Mg levels, poor fertility	45
	A2	Suitable if blended and ameliorated	Acid pH with moderate dispersive qualities, excessive Mg levels (low Ca:Mg ratio), poor fertility, sand gravel content levels are high	
Euchrozem	A1-B	Highly suitable	Neutral to alkaline pH, low erosion hazard, moderate to high fertility, potentially elevated Mn at depth	100

Source: Wells Environmental Services and Coffey Natural Systems (2009).
Notes: * Stripping depth has incorporated the blending of the top 10 to 20 centimetres (cm) of the A2 horizon to increase topsoil volume. # Stripping depth may vary based on further site investigation.

Soil Stripping

Soil resources are salvaged during pre-strip operations ahead of mining, at the relevant depth for the soil type (**Table 12**) based on soil mapping data and site verification. Soil characterisation and stripping depth is specified in Ground Disturbance Permits. All suitable and available soil resources will be salvaged for re-use in rehabilitation. Soil and other organic matter will be removed from cleared areas and either directly respread on shaped overburden rehabilitation areas or stockpiled for future reuse.

Topsoils and clay material subsoil will be stockpiled separately and will be managed to optimise the overall quality of growth media resources. Wherever practicable, cleared vegetation not retained for habitat augmentation on rehabilitation areas will be mulched on site and mixed into topsoil during the stripping process to enhance soil structure and organic content.

Topsoil Balance

MCO maintain a topsoil inventory balance which includes:

- Currently available stockpiled topsoil
- Topsoil yet to be recovered from future approved disturbance areas
- Topsoil volume required to achieve final rehabilitation of the site

At the time of preparing this RMP, MCO has a projected topsoil surplus, which should ensure that sufficient topsoil material is available to rehabilitate the site to achieve the targeted final land uses.

Topsoil Stockpile Management

MCO topsoil stockpile management strategies aim to preserve the soil resource and maintain overall soil health. Management practices used to optimise the long-term viability of stockpiled soil resources include:

- Material characterisation of topsoil and overburden material will be undertaken at an appropriate scale across the site, prior to the rehandling of topsoil that has been stockpiled on

site. Samples will be taken to characterise the nature of the soil material to determine potential limitations to plant growth and/or specific soil amelioration requirements.

- Soil stockpiles are generally constructed to a maximum of height of 3m, with a rough friable surface to reduce erosion, increase infiltration, and minimise anaerobic conditions at the base of the stockpile.
- Stockpiles are located on level or gently sloping areas to minimise erosion
- Where necessary, sediment fencing or other appropriate sediment controls will be installed around the base of stockpiles to minimise soil loss.
- Long-term stockpiles are preferentially located outside of mine disturbance areas away from slopes, heavily trafficked areas and drainage lines.
- Soil stockpiles that are inactive for longer than 6 months will be seeded with native grass and a cover crop to reduce erosion and maintain soil structure, organic content and microbial activity
- Soil stockpiles are managed to minimise weed growth. Prior to re-spreading soils, stockpiles shall be scalped to remove weeds and minimise the transfer of weed seeds into rehabilitation areas.
- Application of appropriate (type and quantity) soil amendments and fertilisers (e.g., sodic and dispersive soils will be treated with gypsum or lime, as required, where they are to be used on exposed surface areas).

6.2.1.2 Flora

Impacts to flora are managed across MCO in accordance with the approved Biodiversity Management Plan (MCO_ENV_0034). This Plan outlines the specific procedures for vegetation clearance, enhancement of surrounding remnant vegetation areas to improve connectivity, management of offset areas, and the control of weeds and vertebrate pests.

Ground disturbance activities (including clearing of vegetation) are managed through the MCO Ground Disturbance Permit (GDP) process. The GDP provides an internal check against all relevant approvals and identifies the range of environmental constraints and hazards associated with the proposed works. The GDP specifies relevant controls and management actions to be implemented prior to undertaking the ground disturbing activities. Flora considerations within the GDP include:

- Presence of EECs or threatened species
- Salvage and reuse of cleared vegetation

Controls to be implemented to minimise the potential impact on flora include:

- Use of a GDP for all clearing activities
- Delineation of areas to be cleared in the field
- Installation of appropriate erosion and sediment controls
- Pre-clearance surveys prior to clearing any native vegetation
- Tree felling procedures for habitat trees

Seed Collection

MCO has an extensive native seed collection program that undertakes year-round collection from relevant vegetation communities located within the MCC biodiversity offset areas, non-operational/undisturbed areas and other MCO owned land. Where practicable and available, seed will be collected from threatened flora species proposed to be cleared, as a part of the Vegetation Clearance Protocol (VCP). The MCO collected seedbank will be supplemented by commercially available material from local native seed suppliers where required.

Seed collection, processing, treatment and storage will be conducted in accordance with the requirements of the Australian Florabank Guidelines (2000).

Harvested seeds not used in direct sowing or production of tubestock will be stored for future use and incorporation in rehabilitation seed mixes. An ongoing inventory of native seed collections will be maintained in addition to a life of mine seed requirements database.

Native vegetation establishment in rehabilitation areas may be supplemented with tubestock, where necessary. Tubestock is used to assist with achieving the desired plant community species composition and density, particularly where monitoring indicates that infill planting is desirable.

MCO uses a specialist local nursery to propagate native plants to be used for infill planting. Typically orders are placed for tubestock in spring, for delivery and planting in autumn the following year. All tubestock used in rehabilitation at MCO is propagated from locally sourced seedstock.

Weed Management

Under the *Biosecurity Act 2015*, MCO has a general biosecurity duty to prevent, eliminate or minimise spread of priority weeds.

There are also a number of weed species (particularly introduced perennial grasses) which are a significant concern in regard to the long-term viability of the Box Gum Woodland EEC and have been listed as a Key Threatening Process (NSW Department of Environment, Climate Change and Water [DECCW], 2010).

Minimising the risk of weed infestation of rehabilitation areas requires a 'whole of operation' approach to weed management. The MCO weed control program consists of:

- Regular inspections of all operational lands to identify areas requiring the implementation of weed management measures
- Implementation of appropriate weed management measures across all MCO owned land including rehabilitation areas, which may include mechanical removal, application of approved herbicides and the use of biological control agents
- Control of priority weeds, when identified on MCO owned land in accordance with the relevant Department of Primary Industries (DPI) control category and the relevant regional weed management plans
- Inspections and maintenance of topsoil stockpiles to minimise weed establishment and spread into rehabilitation areas

- Identification of weed infestations adjacent to or within the proposed disturbance area during preclearance surveys
- Follow-up inspections to assess the effectiveness of the weed management measures implemented and the requirement for any additional management measures
- Restricting vehicles to existing access tracks only with signage denoting rehabilitation areas.

Weed control activities will focus on priority weeds under the *Biosecurity Act 2015*. Specific management controls implemented across the MCC consider the recommended controls for individual weed species as outlined within the DPI, NSW WeedWise database (https://weeds.dpi.nsw.gov.au/) and will be guided by the Central Tablelands Regional Strategic Weed Management Plan 2023-2027 (LLS 2022). All weed control works will be completed in accordance with the *Pesticides Act 1999*.

6.2.1.3 Fauna

Impacts to fauna are managed across MCO in accordance with the approved Biodiversity Management Plan (MCO_ENV_0034). This Plan includes specific procedures for vegetation clearance, fauna management strategies, enhancement of surrounding remnant vegetation areas to improve habitat and connectivity, management of offset areas, salvage and reuse of habitat features, and the control of weeds and vertebrate pests.

Any ground disturbance activities (including vegetation clearing) at MCO are required to be completed in accordance with the GDP process. Fauna considerations within the GDP include:

- Identifying the presence of threatened species
- Controls on the felling of habitat trees, including tree felling protocols and the presence of a suitably qualified and experienced fauna spotter-catcher.

Management of Pest Animals

A variety of vertebrate pest species are present across the MCO landholding. Vertebrate pest species are managed in consultation with the Local Land Services (LLS), and in accordance with the *Biosecurity Act 2015*, *Pesticides Act 1999* and the *Central Tablelands Regional Strategic Pest Animal Management Plan 2024-2028 (LLS 2024)*.

Vertebrate pest control is undertaken as required and can include trapping, baiting and/or shooting. Fauna monitoring undertaken to date indicates there are no significant feral animal problems causing impacts to existing rehabilitation areas at MCO. Where monitoring identifies that pest animals present a risk to rehabilitation, vertebrate pest animal control will be undertaken in consultation with the LLS and in accordance with the requirements of the *Biosecurity Act 2015*.

Pest animal control programs will consider:

- Using a range of appropriate pest control measures to minimise collateral damage to native animals (e.g. the destruction of rabbit burrows, feral cat and goat trapping and baiting of foxes, wild dogs and wild pigs)

- Follow-up inspections to assess the effectiveness of control measures implemented and the requirement for any additional control measures.

Land management contractors are engaged by MCO to undertake regular vertebrate pest control programs. Where possible control programs are coordinated with LLS programs or with neighbouring landholders e.g. National Parks and Wildlife Service. A summary of the pest animal management activities is reported in the Annual Review.

Vegetation Clearance Protocol (VCP) and Habitat Augmentation

A VCP has been developed and implemented to minimise impacts on threatened flora and fauna species during native vegetation clearing at the MCC. A detailed description of the VCP is provided in the Biodiversity Management Plan. Key components of the protocol include:

- Delineation of areas to be cleared
- Pre-clearing procedures
- Fauna management measures
- Vegetation clearance measures.

Pre-clearing procedures are covered in the GDP process and pre-clearance surveys. The GDP requires that a pre-clearance survey will be conducted by an appropriately trained and qualified person. The objective of the pre- clearance survey is to identify:

- The presence of threatened flora and/or fauna
- Potential habitat features located within proposed disturbance areas (such as hollow bearing trees) that may require special management during clearing
- Habitat features that can be salvaged for reuse in rehabilitation areas or in adjoining non-disturbed native vegetation areas
- Active nesting/roosting sites that may require active management prior to or during disturbance to minimise impacts on those fauna species
- Weed infestations that may need treatment prior to or during disturbance
- Pest species that may require control prior to disturbance.

6.2.1.4 Rock/Overburden Emplacement

Waste rock (including overburden and interburden) mined in OC1, OC2, OC3 and OC4 will be placed in out-of-pit emplacement areas, or in-pit to backfill previously mined areas.

Temporary overburden stockpiles will be strategically placed near other large disturbance areas, such as dams and infrastructure areas, to expedite backfilling and rehabilitation and to limit rehandling of overburden material. Out-of-pit overburden emplacements (and associated environmental bunds) will be progressively constructed and rehabilitated as soon as practicable following dumping to the final height, to mitigate visual, noise and air quality impacts.

Selected overburden materials (e.g., clay subsoils and large rocks) will be stockpiled for later use, or used directly in the reconstruction of Murragamba and Eastern Creeks.

Overburden emplacements will be established in accordance with designs incorporated in the Final Landform and Rehabilitation Plan (FLRP).

6.2.1.5 Waste Management

Waste Management at MCC is undertaken in accordance with the MCO Waste Management Plan (MCO_ENV_PLN_0026). This Plan is designed to achieve the following:

- Maintain compliance with the conditions of Project Approvals, EPL and relevant waste management legislation
- Outline processes and procedures for the management of all wastes generated during the construction and operational phases of MCC
- Detail waste monitoring and tracking procedures
- Minimise material disposed to landfill
- Provide awareness to staff and contractors of their responsibilities regarding waste management
- Outline protocols for any waste related non-compliances or complaints

Key waste streams that may be generated by MCO comprise:

- Recyclable and non-recyclable general wastes
- Sewage and effluent
- Other wastes from mining and workshop activities (e.g., waste oils, scrap metal, batteries, filters, oily rags, pallets and used tyres).

General waste minimisation principles (i.e., reduce, re-use and recycling) will continue to be applied at the MCC to minimise the quantity of wastes that require off-site disposal as described in the MCO Waste Management Plan.

All general domestic waste (e.g., general solid [putrescibles] and general solid [non-putrescible] waste as defined in *Waste Classification Guidelines Part 1: Classifying Waste* [EPA, 2014]) and general recyclable products will continue to be collected by an appropriately licensed contractor.

Discharges from all on-site sewage management systems are licensed by EPL 12932.

MCO maintains a register of regulated waste collected by the licensed waste contractor for disposal.

6.2.1.6 Geology and Geochemistry

Description of Mine Geology

The MCC is located in the northern part of the Western Coalfield, on the northwest margin of the Sydney Basin (Wells Environmental Services and Coffey Natural Systems, 2009).

Coal occurs in mid to late Permian age (approximately 250 to 275 million years before present) sediments collectively known as the Illawarra Coal Measures (also referred to as Permian coal measures). The Ulan Seam is the main seam targeted at MCO.

Narrabeen Group sediments (sandstones and conglomerates) of Triassic age (approximately 200 to 250 million years before present) overlie the coal measures, which in turn overlie older basement rocks of sedimentary (Shoalhaven Group) and igneous origin. Small intrusive plugs and remnant Tertiary-age (approximately 5 to 65 million years before present) basalt flows also outcrop in the area. Unconsolidated and partially consolidated Tertiary-age paleochannel and Quaternary-age (less than approximately 5 million years before present) sediments occur as valley fill and along dominant drainage lines (Wells Environmental Services and Coffey Natural Systems, 2009).

Environmental Geochemistry

An assessment of the geochemical characteristics of the waste rock material associated with the development of the MCC is provided in the Moolarben Coal Project Stage 1 Geochemical Assessment (Environmental Geochemistry International Pty Ltd, 2006) and the Moolarben Coal Project Stage 2 Geochemical Assessment (Environmental Geochemistry International Pty Ltd, 2008).

Results of geochemical testing suggest that the bulk of the Moolarben overburden and floor material is likely to be non-acid forming. Potentially acid forming low capacity (PAF-LC) overburden materials were identified as being associated with the Moolarben Seam, and the roof and floor of the Ulan Seam.

6.2.1.7 Material Prone to Spontaneous Combustion

Spontaneous combustion management is undertaken in accordance with the MCO Spontaneous Combustion Principal Hazard Management Plan (MOC-TECH-1252) and Air Quality Management Plan (MCO_ENV_PLN_0025).

Spontaneous combustion has previously occurred in open cut emplacement areas within OC1 and OC2. MCO continue to manage spontaneous combustion within emplacement areas in accordance with the specified site management plans. Operational actions to manage risks and instances of spontaneous combustion include:

- Undertaking annual reactive ground testing to target the presence and oxidation of sulphides to manage blasting hazards
- Testing for the presence of sulphides as part of the exploration drilling program
- Testing of overburden, coal and reject material (including for the heating of sulphides) has been conducted across all open cut mining areas with several samples tested annually.
- Restricting access to identified spontaneous combustion areas
- Reviewing the risk to personnel, environment, community, and operations
- Watering to cool known heating
- Exposure, spreading, and excavation of any heating material
- Applying further water
- Cover with inert material, track roll and reshape
- Monitoring of area to identify any further areas of heating.

Spoils will be selectively handled and blended to avoid emplacement of PAF material in concentrated areas, and to manage the potential risk of spontaneous combustion. Other spontaneous combustion management measures include:

- Accumulations of coal, coarse rejects and other carbonaceous material, particularly if it is known to contain pyritic material, will be buried under a minimum of 5 m of inert overburden material.
- Should any outbreaks of spontaneous combustion occur during mining operations, the available details of the materials involved, location, date, time and climatic conditions will be recorded on surveyed plans. These areas will be monitored and assessed at closure to put in place appropriate mitigation measures to minimise the likelihood of spontaneous combustion occurring post mine closure. These areas will also be included as part of the ongoing inspection and monitoring that will be required following closure of the mine and before final lease relinquishment.

6.2.1.8 Materials Prone to Acid Mine Drainage

PAF Management Procedures

Landform design and surface water management are designed to minimise the potential for reconstructed landforms to generate acid mine drainage (AMD). Management measures adopted by MCO to minimise the potential generation of AMD include:

- Blending overburden to avoid emplacement of PAF capacity material in concentrated areas
- If required, treatment of dispersive materials (e.g. with lime) if exposed on dump surfaces or used in engineered structures to minimise the potential to expose acid generating substrate; and
- Treatment and isolation of PAF coal rejects to minimise infiltration and subsequent leachate.
- Operational sampling and geochemical testing of mine materials and water quality monitoring to identify any potential emerging risks of elevated PAF material presence.

6.2.1.9 Ore Beneficiation Waste Management (Reject and Tailings Disposal)

MCO will generate approximately 3 Mtpa of coarse rejects and tailings from the washing of coal at full capacity. Following initial out-of-pit emplacement of overburden, all other waste rock (i.e. overburden, coarse rejects and tailings) will be used to backfill the mine void.

The three options for disposal include:

- In Dump - disposal of rejects within active overburden dump, thereby dispersing the rejects
- Block Tipping – disposal of rejects in segregated bulk within overburden dumps; and
- Cell Dump – disposal of rejects in cells within overburden dumps.

Rejects will be covered with at least 5 m of inert material. All identified PAF will be blended to avoid emplacement in concentrated areas and will be emplaced in deeper areas of the pit.

Emplacement of dispersive materials and overburden materials hostile to tree root growth will also be avoided near the surface of the final landform to minimise erosion potential, land slumping and potential for revegetation failure. Where dispersive spoils are emplaced at or near the surface, the material may require amelioration (e.g., with lime or gypsum). Once the landform is re-shaped, the ameliorants may be applied (if necessary), and the area deep-ripped along the contour.

6.2.1.10 Erosion and Sediment Control

Erosion and sediment control measures will be implemented for the life of the operation to minimise the potential impact on the surrounding environment. Erosion and sediment control strategies at the MCC are outlined in the approved Surface Water Management Plan (SWMP).

Activities that have the potential to generate sediment at the MCC include:

- Vegetation clearing and topsoil stripping
- Construction and use of linear infrastructure
- Open cut mining operations
- Operation of the CHPP infrastructure
- Operation and construction of additional site infrastructure (including office and workshop areas)
- Construction of operational sediment control measures
- Construction of creek crossings
- Construction and operation of exploration sites
- Construction of overburden and emplacement areas and haul routes
- Earthworks associated with mine site rehabilitation.

Prior to any site disturbance, a GDP needs to be prepared and authorised by the Environment and Community Manager (ECM) or delegate. Each GDP is to include reference to the erosion and sediment controls that must be established prior to disturbance.

Erosion and sediment control measures and techniques will be designed and operated in accordance with the requirements of Landcom 'Managing Urban Stormwater: Soils and Construction including Volume 1 (2004), Volume 2A – Installation of Services (DECC, 2008), Volume 2C – Unsealed Roads' and 'Volume 2E Mine and quarries' (DECC, 2008). Where required the design and operation of erosion and sediment control strategies and techniques will be supplemented with the *International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control Document.*

Rehabilitation of the overburden emplacement areas and open cut pit will be conducted progressively over the life of the mine, forming an integral component of mining operations. Erosion and sediment controls to be implemented during the rehabilitation phase include:

- Progressive rehabilitation of disturbed land as soon as practicable
- Implementation of temporary or interim vegetation measures as required
- Construction of drainage controls to improve the stability of rehabilitated land
- Reshaping, topsoiling and vegetating former areas used for earthworks, roads and batters as soon as practical upon completion of works
- Application of gypsum, lime or other appropriate soil ameliorant at quantified rates to mitigate soil sodicity/dispersibility where exposed subsoils have been identified
- Control of weeds through selective herbicide application and the reseeding of areas that fail to establish

- Construction and installation of erosion and sediment controls such as silt fences, catch drains, grass swales, buffer strips and sediment dams down slope of rehabilitation areas
- Regular inspections and maintenance of all erosion and sediment control works
- Restricting access to rehabilitated areas through fencing and/or signposting.

Specific erosion and sediment controls to be implemented at the MCC are as follows:

- Clean water diversion drains and banks
- Silt fences (or equivalent control)
- Vegetated buffer strips
- Sediment dams/basins.

Other *Blue Book* (Landcom, 2004) or *International Erosion Control Association Guideline* (IECA, 2008) erosion and sediment control measures may be implemented at the MCC as required.

6.2.1.11 Ongoing Management of Biological Resources for Use in Rehabilitation

In general, biological resources at MCO are managed in accordance with the Biodiversity Management Plan.

Topsoil Management

Topsoil management actions to manage biological resources for use in rehabilitation in place at MCO are described in section 6.2.1.1.

Native Vegetation Seeding

Native vegetation seed will be sown simultaneously with non-persistent cover crop and native grass species, preferably in the warmer months between late September and March. Sowing will occur as soon as possible after ground preparation through deep ripping, to optimise the conditions for germination prior to surface crust development.

Native vegetation restoration includes initial establishment of local pioneer species to condition the soil for successive plant regeneration. Direct seeding is typically a cost-effective means of re-introducing pioneer species including wattles and native grass species known to occupy disturbed environments throughout the local area.

Tubestock Planting

Native vegetation establishment in rehabilitation areas may be supplemented with tubestock, where required. Tubestock is used to assist with achieving the desired plant community species composition, particularly where monitoring indicates that infill planting is required.

Habitat Features

Prior to site disturbance, a GDP needs to be authorised by the ECM or delegate. In conjunction with the GDP process a pre-clearance survey will be conducted and will identify potential habitat features, nesting sites, hollows etc.

Trees containing features with the potential to provide significant nesting/roosting habitat resources (i.e. numerous hollows suitable for nesting/roosting) for birds, bats and/or arboreal mammals will be clearly marked as habitat trees and retained for reuse in the rehabilitation program.

Where practical and feasible, habitat features such as large hollows and rock identified during the pre-clearance surveys will be salvaged and stockpiled for reuse in rehabilitation areas or relocated to adjoining areas of remnant vegetation. Remaining tree limbs, stumps, shrubs and other woody vegetation may be mulched or used in whole (or in part) in rehabilitation areas.

When salvaged, habitat features will be reused in native vegetation rehabilitation areas as follows:

- Stag trees – hollow bearing timber for vertical placement within rehabilitation for avian species or arboreal mammals, and bark retained timber for arboreal microbats
- Coarse Woody Debris – horizontal placement of hollow logs or small piles of timber and rocks creating cavities for habitat by small ground dwelling mammals and reptiles placed for interconnectivity across rehabilitation areas
- Habitat trees and non-habitat trees used generally as coarse woody debris

6.2.1.12 Mine Subsidence

A detailed description of predicted subsidence impacts and proposed subsidence management, mitigation and monitoring is provided in the *Moolarben Coal Project Stage 2 Preferred Project Report Subsidence Impact Assessment* (Mine Subsidence Engineering Consultants [MSEC], 2011), the *Moolarben Coal Project Stage 1 Optimisation Modification Environmental Assessment* (EMM, 2013b), the *Moolarben Coal Complex UG1 Optimisation Modification Subsidence Assessment* (MSEC, 2015) and the *Moolarben Coal Complex UG1 Longwalls 101 to 105 Extraction Plan* (Longwalls 101-105 Extraction Plan) (MCO, 2020) and the *Moolarben Coal Complex UG4 Longwalls 401 to 408 Extraction Plan* (Longwalls 401-408 Extraction Plan) (MCO, 2022). In accordance with Condition 77, Schedule 3 of Project Approval (05_0117) and Condition 5, Schedule 4 of Project Approval (08_0135), additional Extraction Plans (including a subsidence monitoring program) will be developed for the MCC prior to secondary extraction in UG2.

Subsidence Management and Remediation

MCO manage subsidence and associated remediation in accordance with the Subsidence Principal Hazard Management Plan (MUG-TECH-9723).

The overriding objective for subsidence management is to minimise the potential for, or extent of, the predicted subsidence impacts.

Several potential management measures will be implemented to mitigate/remediate subsidence impacts on land resulting from underground mining operations. Minor cracks that develop are not expected to require remediation as geomorphologic processes will result in natural filling of these cracks over time.

Remediation of typical surface cracks (generally in the order of 150 mm up to approximately 500 mm in areas of lower depth of cover) will be undertaken where practicable and accessible using conventional earthmoving equipment (e.g., a backhoe) and will include:

- Infilling of surface cracks with soil or other suitable materials; or
- Locally re-grading and re-compacting the surface.

Notwithstanding, remediation will be undertaken in the event a crack is identified to present a significant risk to safety of people or livestock and/or presents a long-term degradation or erosion risk.

Areas of surface cracking will be stabilised using erosion protection measures (e.g., vegetation seeding and planting and/or brush matting). Drainage works and rehabilitation of subsidence troughs (i.e. areas of induced ponding) will be conducted as necessary and may include stabilisation of banks subject to soil slumping.

If surface crack remediation works are required in remnant vegetation areas, compact mobile equipment will be used, where practicable, to minimise damage to surrounding vegetation. If the remediation work requires clearing of remnant vegetation to an extent that would exceed the benefit of the remediation, the requirement for remediation will be reviewed. Vegetation that requires clearance will be subject to the GDP and VCP (as per the approved Biodiversity Management Plan).

Further details of MCO's subsidence management strategies associated with underground operations are provided within the respective MCO Extraction Plans.

6.2.1.13 Management of Potential Cultural and Heritage Issues

Aboriginal heritage and historic heritage management strategies are outlined in the approved Heritage Management Plan (HMP) (MCO_ENV_PLN_0029) for MCO. The HMP includes protocols for the involvement of the Aboriginal community, procedures for heritage surveys, recording and salvaging and management strategies for identified heritage sites within the MCC. Known heritage sites are shown on Error! Reference source not found..

Key roles and responsibilities concerning heritage management are outlined in the approved HMP

6.2.1.14 Exploration Activities

MCO will continue to undertake exploration drilling within the mining lease to obtain further geological and geotechnical information relevant to planned future mining and construction activities.

Prior to any exploration activity commencing, a GDP must be completed. The GDP identifies environmental, heritage and relevant regulatory obligations and management measures to mitigate and minimise potential impacts.

In addition, MCO considers the relevant requirements of ESG5: Assessment Requirement for Exploration Activities (DRE, 2015) during the preparation of a GDP for proposed exploration drilling

activities. In conjunction with the GDP process, MCO minimise the impacts from exploration drilling activities using the following controls:

- Implement the requirements from the due diligence assessments, including heritage and ecology
- Minimise disturbance (i.e., use existing tracks) and if required, only slash and remove vegetation from access tracks and drill pad areas
- Appropriately sized machinery will be utilised during site establishment, decommissioning and rehabilitation activities (if required)
- Decommissioning, removal of wastes, sealing of boreholes, and site rehabilitation will be consistent with the Exploration Codes of Practice: Rehabilitation and Exploration Code of Practice: Environmental Management (DRE, 2015).

Rehabilitation activities involve infilling sumps, site stabilisation, topsoil replacement, applications of ameliorants and appropriate seed mix to return to site former land use.

6.2.2 Decommissioning

The decommissioning phase encompasses all works required to prepare land for rehabilitation including removal of any unnecessary built infrastructure, foundation and hardstand materials, services, equipment and material including wastes and contamination.

Decommissioning, demolition and removal of infrastructure from the mine site will generally be undertaken during the mine closure phase. Any infrastructure including dams, roads and buildings which is beneficial for post-mining land use may be retained subject to relevant landowner agreements and regulatory approvals.

A detailed Mine Closure Plan will be developed for the MCC prior to mine closure and will include a demolition and decommissioning strategy, including a land contamination assessment. Issues expected to be addressed by this assessment will include, but not be limited to, decontamination of areas such as those impacted by carbonaceous material (e.g., coal spillage, coal storage), hydrocarbon spillage (e.g., workshops, fuel storage areas) or by sedimentation (e.g., dams which have directly received pit water).

6.2.2.1 Site Security

MCO implements controls for maintaining site security and minimising public safety incidents that include:

- A site security system to ensure public and employee safety is maintained during all phases of the operation. These systems and procedures have been established in accordance with the relevant requirements of the *Work Health and Safety Act 2011*, *Mining Act 1992*, and relevant conditions of the mining tenements
- Fencing and signage denoting authorised access only surrounding the boundary of MCO mining operations. Access to mining areas controlled by boom gates.

- Employee and contractor inductions regarding mine safety and environmental management issues prior to being authorised to work on site.
- Use of electronic sign in system for visitors, including an induction to site process
- Operational staff are on site at all times
- Blasting activities are undertaken in accordance with the MCO Blast Management Plan (MCO_ENV_PLN_0023) which includes the positioning of blast sentries to restrict access to blast areas
- The operation and maintenance of a 24-hour emergency response line for the reporting of any concerns associated with MCO relating to public safety

To reduce the degree of disturbance to the rehabilitation areas, measures have been put in place to limit access to these areas to authorised personnel only, including restricting vehicles to existing access tracks and signage denoting rehabilitation areas.

6.2.2.2 Infrastructure to be Removed or Demolished

A detailed Mine Closure Plan will include an assessment of all structures to be decommissioned and demolished. A demolition strategy will be prepared in accordance with Australian Standard AS2601-2001: The Demolition of Structures (or its latest version) to determine the appropriate demolition techniques, equipment required, and the optimal decommissioning sequencing.

All fixed plant, built infrastructure, equipment and services will be progressively decommissioned when infrastructure items and plant become redundant. All mining related infrastructure will be removed at mine closure; however, some infrastructure may be retained to support future post-mining land uses.

Key decommissioning activities pertaining to onsite infrastructure include:

- Disconnection of all above ground and buried services and removal of associated infrastructure
- Removal of all waste and hazardous material
- Removal or remediation of any contaminated soils
- Removal of all built surface infrastructure, plant and equipment.

6.2.2.3 Buildings, Structures and Fixed Plant to be Retained

Infrastructure (e.g. dams, surface water drains and bunds, roads, and buildings) which are determined to be beneficial for future uses will be left in place, subject to approval by the Resources Regulator and any other relevant regulatory agency.

Some water management structures may remain post closure. A Geotechnical assessment will be carried out by a suitably qualified engineer to verify that the water infrastructure retained on site is long term stable.

6.2.2.4 Management of Carbonaceous/Contaminated Material

The Mine Closure Plan will include a land contamination assessment which will highlight potential contaminated and hazardous materials present. Issues expected to be addressed by this assessment

will include, but not be limited to, decontamination of areas such as those impacted by carbonaceous material (e.g. coal spillage, coal storage), hydrocarbon spillage (e.g. workshops, fuel storage areas) or by sedimentation (e.g. dams which have directly received pit water).

Management measures regarding PAF material and carbonaceous material prone to spontaneous combustion are detailed in **Section 6.2.1.7** and **6.2.1.8.**

During decommissioning all carbonaceous material will be removed from the footprint of the CHPP including ROM and product stockpile areas and emplaced at depth in spoil.

6.2.2.5 Hazardous Materials Management

During decommissioning, hazardous materials (hydrocarbons and chemicals) will be managed in accordance with the MCO Waste Management Plan. Removal of hazardous materials will be undertaken by a licenced waste disposal contractor and disposed/recycled at a licenced waste facility.

As detailed in **Section 6.2.2.4** strategies for the identification and remediation of hazardous material will be identified in the Mine Closure Plan.

6.2.2.6 Underground Infrastructure

At the completion of underground mining operations all underground infrastructure (e.g., conveyors and dewatering systems) that can be recycled or reused will be removed.

Portals will be sealed and access restricted in accordance with requirements of the *Mine Design Guideline [MDG] 6001 Guideline for the Permanent Filling and Capping of Surface Entries to Coal Seams* [NSW Department of Trade and Investment, Regional Infrastructure and Services [DTIRIS] Mine Safety Operations, 2012]).

Rehabilitation of land above the underground mines subject to subsidence will be undertaken as required during mine operations in accordance with the MCC's Extraction Plans required under Condition 77, Schedule 3 of Project Approval (05_0117) and Condition 5, Schedule 4 of Project Approval (08_0135). Subsidence management and rehabilitation measures are described in **Section 6.2.1.12**.

6.2.3 Landform Establishment

Landform establishment is the process of shaping the final landform to a safe, stable and non-polluting landform that is appropriate for the desired final land use and consistent with the surrounding landscape. The final landform for the MCC is shown on the Final Landform contour plan in Section 6.

The final landforms for MCC will be designed and constructed generally in accordance with the approval requirements outlined in **Table 2** to

Table 5. The final landforms are designed to be free draining, stable landforms that are visually consistent with the surrounding landscape with typical gradients of 10° to 18° (18% to 32%).

6.2.3.1 Water Management Infrastructure

A Water Management Plan (MCO_ENV_PLN_0028) (WAMP) has been developed for the MCC in accordance with the requirements of Project Approval (05_0117) and Project Approval (08_0135).

Surface water will be managed with the aim of minimising erosion, preventing off-site sediment release, preventing use of brine in rehabilitation areas and increasing water availability for uptake by vegetation in rehabilitated areas. Drainage of rehabilitation areas will be developed in accordance with best practice guidelines including *Landcom (2004) Managing Urban Stormwater: Soils and Construction Volume 1 and DECC (2008) Managing Urban Stormwater: Soils and Construction Volume 2.*

Run-off from rehabilitation areas will be managed via the inclusion of drainage and diversion channels and sediment dams and retention basins. This will assist to control the velocity of surface drainage across rehabilitation areas and assist in minimising erosion. Some sediment dams/water storages and ponded areas will remain in the post-mining landform to provide water resources for fauna habitat or for agricultural purposes.

Drainage, diversion channels and swales will be installed to divert run-off and carry surface water away from erodible surfaces, particularly during construction and seed emergence stages of rehabilitation. Drainage channels will be designed and built to ensure they reduce flow velocity. This may include use of temporary check structures (such as hay bales), rock armouring or lining to prevent scouring. Ultimately, channels will be vegetated with stoloniferous grasses or other suitable ground cover for long-term protection.

Sediment dams and ponds will be designed and constructed to accommodate critical storm events. Sediment dams and ponds will generally be located downhill of disturbance and rehabilitation activities to provide control of sediment laden water and prevent off-site contamination and ponded water for irrigating rehabilitation areas. The inclusion of sediment dams and ponds into the final landform will increase potential water availability in the post-mining landscape. This will provide aquatic and water sensitive terrestrial habitat and water resources for agricultural purposes. Revegetation of permanent sediment dams and ponds will consider the use of rush and other aquatic species to provide bank stability and fauna habitat opportunities.

Water management structures (including clean water diversion drains and sediment dams) not required for water management in the final landform will be progressively decommissioned when no longer required for operational water management.

Drainage from OC4 rehabilitation areas will be directed to the reconstructed and rehabilitated Murragamba and Eastern Creeks and away from the final void. However, during the creek construction and the subsequent rehabilitation and stabilisation period, flows from upslope areas will be collected in temporary dams upstream of the diversion, where a pipe system will extend from the dam, to downstream of the realigned creek section to release the environmental flows (**Section 6.2.3.5**).

6.2.3.2 Final landform construction: general requirements

The backfilled open cut pits will generally form elevated landforms above the pre-mining land surface due to bulking and expansion of the excavated overburden. The final landform will be designed to comprise slopes with gradients generally 10 to 18 degrees (°). However, where spatial constraints do not allow for this design, the gradient of overburden emplacement slopes will be constructed to no more than 20° without approval of RR. Where steep slopes are constructed, suitable erosion control structures such as contour banks, drop structures and rock armouring may be used to provide long-term stability.

Reconstructed landform slopes will be shaped to have non-linear profiles and a high degree of surface roughness. In addition, graded banks and contour channels/benches may be used to break up long slopes, slow down and redirect run-off.

Other engineering controls such as sediment dams, spillways, drainage and diversion channels, rock armouring and drop structures will be incorporated into the final landforms (where necessary) to manage post-mining surface water flows. A detailed description of surface water management is provided in the MCC Water Management Plan.

Micro-relief design

The final landform design will incorporate micro-relief, which will assist in creating a stable and aesthetic final landform that blends in well with the surrounding natural topography. Final landform designs within OC3 and OC4 will be progressively revised during the life of the mine to include micro-relief wherever feasible.

The key aspects of the design include:

- Natural looking landscape with ridges that transition from convex to concave slopes, small sub-watersheds containing water channels that merge into larger water channels that are designed with the required cross-sectional profile to handle variable flows
- Landforms appear as a natural landscape with minimal long-term maintenance
- Landscape variability promotes biodiversity – as the landscape has varying aspects and slope, and reduced erosion.

Landform evolution modelling

Landform design studies are used at the MCC to assess the risk of long-term stability and erosion in the final landforms and determine controls for addressing the identified risks

Landloch Pty Ltd (Landloch) performed a technical soils and erosion assessment for the landform design of OC2. WEPP runoff/erosion modelling was utilised to investigate a wide range of slope profiles and surface treatment/revegetation options.

As part of this assessment, SIBERIA landform evolution modelling has been used to:

- Inform stable long-term rehabilitation on the proposed landform

- Identify areas of within the current landform that may require either modification or changes in management to assist in achieving stable rehabilitation outcomes.

6.2.3.3 Final Landform Construction: Reject Emplacement Areas and Tailings Dam

As detailed in **Section 6.2.1.9** coal rejects will be co disposed with overburden in the backfilled voids.

6.2.3.4 Final Landform Construction: Final Voids, Highwalls and Low walls

The conceptual final landform at the MCC will comprise three final voids at mine closure, one within each of OC1, OC3, and OC4 as depicted in **Figure 5: Final Landform Features (FLRP Plan 1)**.

Final void size will be minimised as far as practicable, while allowing for the efficient mining of coal from within the approved mining area. It is anticipated that following open cut mining/mine closure, the final voids in OC1 and OC3 will be groundwater sinks and will gradually fill with groundwater and rainfall run-off.

Final voids will be designed by a suitably qualified Geotechnical Engineer and will be made safe, stable and non-polluting by:

- Battering back the low walls and high wall to minimise potential for failures and mass movement (see sections below)
- Capping (or excavating) exposed coal seams with inert material to prevent ignition from spontaneous combustion, bushfires or human interference
- Constructing a trench or safety berm, as well as a security fence along the entire length of the remaining highwall where accessible to vehicles
- Erecting suitable signs, clearly stating the risk to public safety and prohibiting public access
- Constructing clean water diversion structures around the voids and limiting the slopes and slope lengths conveying run-off generated on the low walls and high walls
- Designing and constructing final voids (size and depth) to maintain the voids as groundwater sinks that intercept all groundwater flows through the backfilled pits; and
- Locating final voids to minimise the risk of flood interaction for flood events up to and including the Probable Maximum Flood level.

Low Walls

The low wall is assumed to comprise of mixed, disturbed and fragmented material. Stability of the low wall will be achieved in the following manner:

- The low wall will be battered back from the angle of repose to maintain the long-term geotechnical stability of the face. Geotechnical stability will be determined by a qualified Geotechnical Engineer considering an assessment of the overburden material, the likely degree of settlement, and the degree of weathering expected in the long-term. However, it is expected that the low wall sides of the final void will be battered back to a maximum of 18° with a goal of 10° being optimal.
- Surface water drainage on and over the low wall will be minimised through the construction of drainage control structures aimed to divert as much of the catchment as possible away from the final void.

- Erosion of the low wall will be controlled by limiting the length of slope through contour and graded drains, minimising the slope, and by the establishment of suitable vegetation.
- Battering of the low wall against the bottom of the high wall, where possible, to enhance high wall stability. Benching of the spoil material may need to be considered in some areas to achieve geotechnical stability and minimise erosion.

High Walls

The high wall is assumed to comprise of undisturbed, solid material generally occurring above the economically lower-most limits of the mineable seam in the final void. Depending on the geology of the deposit, the high wall material may comprise a range of natural occurring soil or rock materials of varying strengths or states of weathering.

To maintain the safety of the final void, the surrounding final slopes will be left in a condition where a suitably qualified Geotechnical Engineer assesses the risk of slope failure as minimal. The following will be considered when assessing the geotechnical stability of the high wall:

- Long-term final void water levels
- Height and inclination of slope and number and spacing of intermediate benches (as may be required to achieve the final slope)
- Shear strength of the high wall soils and rocks
- Density and orientation of fractures, faults, bedding planes, and any other discontinuities, and the strength along them
- The effects of the external factors, such as surface run-off.

Where possible, revegetation of the high wall may be undertaken using an appropriate grass and shrub/tree seed mix and applied using specialised techniques (e.g., aerial seeding or hydro seeding). The feasibility/practicality of this procedure will be confirmed prior to mine closure. The purpose of this procedure will be to establish a vegetation cover to provide some stability, and also mitigate visual impacts.

Public Safety

Consistent with the rehabilitation objectives, at mine closure, the final voids will be made safe in terms of access by humans, livestock and wildlife. A physical barrier will be constructed at a safe distance from the perimeter of the void to prevent human access. The highwall areas will be secured by the construction of a trench and a safety berm where practicable, as well as a security fence along the entire length of the remaining highwall. The trench and berm will be constructed in such a way to restrict vehicle access.

Signs will also be installed at intervals along the entire length of the fence, denoting the risk to public safety and prohibiting public access.

Final Void Monitoring

Monitoring of the final voids will be undertaken prior to and during the mine closure phase and will include monitoring the effectiveness of erosion and surface water control measures, surface water run- off volumes and geotechnical stability. The monitoring program will be undertaken until such time that the completion criteria for the final voids have been met.

6.2.3.5 Construction of Creek/River Diversion Works

The final landform design for the MCC includes realignment of an approximate 5 km section of Murragamba Creek and an approximate 5 km section of Eastern Creek (as shown in **Figure 5**).

Several baseline studies have been conducted to determine the pre-mining stream health quality and channel stability of the Goulburn River, Bora Creek, Moolarben Creek, Ryan's Creek, Murragamba Creek, Wilpinjong Creek and Eastern Creek. Details of the studies are found in the EA and the MCO Water Management Plan (WAMP).

A detailed design for the realignment of the Murragamba has been developed by Alluvium Consulting and a concept design has been progressed for *Eastern Creek Reinstatement*.

The Eastern Creek and Murragamba Creek reinstatement designs are founded upon a backfilled corridor that is to be formed in accordance with a dumping strategy. The strategy minimises the potential for ongoing and differential settlement that may adversely affect diversion performance. The upper horizons in the backfilling corridor provide a low permeability layer to limit seepage to deep backfill and a shallow sandy aquifer immediately below the creek bed. This will convey baseflow in a manner consistent with the existing system. This shallow alluvial aquifer will be constructed with paleochannel sands that are prevalent in the mine footprint near the surface.

The hydrology for both creek catchments has been informed by learnings from previous studies on Murragamba Creek and in monitoring data on small creek systems with similar geomorphic and hydrologic characteristics in the region. The hydrology and the geomorphic configuration of the design (valley fill/chain of ponds configuration) has been tested against hydraulic criteria for constructed channels that is widely adopted in the Australian mining industry. The design is suitable for long term stability with recognition that chain of ponds are inherently low energy systems that do not maintain continuous active channels.

The Eastern and Murragamba Creek reinstatement designs will include revegetation with appropriate aquatic fringing vegetation species within the creek line, and riparian variants of the targeted vegetation communities within the creek line corridors. Aquatic habitat features such as woody debris, snags, gravel beds, rocks, cobbles, pools and riffles will all be incorporated into the final designs.

6.2.4 Growth Medium Development

Growth medium development includes activities to reinstate soils (including subsoil/regolith soils) with the physical, chemical and biological characteristics required for vegetation establishment and growth. Elements applicable for growth medium development are described throughout various sections in this document including the following:

- Characterisation of soil types and their suitability for rehabilitation in **Section 6.2.1.1**.
- Soil management methodologies in **Section 6.2.1.1**.
- Weed Control activities implemented in **Section 6.2.1.2**.

Wherever possible, topsoil will be stripped and transferred directly to areas that have been shaped for rehabilitation, thereby eliminating the need for storage and rehandling.

During rehabilitation activities topsoil is spread to a minimum nominal depth of 100mm. Application of soil ameliorants such as gypsum, lime or compost is undertaken at rates determined by topsoil testing. Ameliorants are added to reduce soil dispersion, increase nutrients and organic carbon levels, to improve soil quality and the ability to sustain cover crops and native woodland species. Typically nitrogen and phosphorous rich fertilisers would not be used in native vegetation rehabilitation areas, however may be used in agricultural rehabilitation areas based on soil testing report recommendations.

Surface preparation activities for rehabilitated areas will commence as soon as practicable following the completion of landform establishment through bulk shaping. Surface preparation at MCO involves the following general steps:

- Installation of drainage structures and erosion control measures
- Installation of habitat features such as stag trees, rock piles, woody debris and aquatic habitats to augment the habitat value of the rehabilitation areas
- Spreading of topsoil
- Application of soil ameliorants where required
- Deep ripping parallel to the contour to de-compact the overburden base, key in topsoil, provide erosion control and provide a suitable seed bed
- Seeding with the target vegetation community and cover crop

Ripping occurs on the contour generally to a depth of 500-600mm on slopes, and 200-300mm on level areas. Rocks are left in-situ to provide rain splash erosion protection and micro-habitat features.

6.2.5 Ecosystem and Land Use Establishment

Ecosystem establishment includes activities to establish the desired floristic composition (species diversity and density) and habitat features. This phase incorporates management actions such as weed and vertebrate pest control to support vegetation establishment and growth.

Revegetation

Revegetation activities are planned to occur after the completion of landform shaping, application and preparation of growth media and the construction of drainage structures.

The rehabilitation strategy at MCO involves the establishment of native ecosystems through the creation of rehabilitated woodland and forest communities that will link to remnants adjoining the project area. Rehabilitated woodland and forest areas will be created to contain flora species assemblage's characteristic of the pre-mining communities, with a focus on Box Gum Woodlands, in accordance with commitments made in the EIS.

Species selection for native revegetation areas have been designed to promote the development of forest and woodland communities with structured understorey, mid-storey and tree canopy coverage. Species of the target vegetation communities will be seeded and planted adjacent or close to similar vegetation communities (where possible) to enhance vegetation connectivity. The re-establishment of ecological function conducive to the development of Box Woodland Endangered Ecological Community (ECC) will also be a key feature of the rehabilitation program.

Species will also be chosen to contribute to faunal biodiversity and habitat with the inclusion of areas with feed trees for the Regent Honey Eater and Koala. Shrubs and patches of native grasslands will be used to improve habitat for declining woodland bird species (e.g., Hooded Robins and Grey Crowned Babblers) and to control dominance of competitive native and exotic species.

Threatened local flora (e.g., Capertee Stringybark, Hoary Sunray and Scant Pomaderris) will also be targeted for planting in areas conducive to their establishment and survival in consideration of the location and surrounding habitat of the species prior to disturbance. If these species are present within proposed vegetation clearance areas, and if viable seed is available, seed will be collected from these species prior to disturbance.

The species identified in the *Moolarben Coal Project Stage 2 Ecological Impact Assessment* (Ecovision Consulting, 2008) are used to guide selection of appropriate native species for rehabilitation of disturbed areas.

Species selection will take into consideration climate (e.g., water availability and frosts), landform (e.g., slopes, floodplains and creeks), soil availability, type and fertility.

As described in **Section 2.4**, the native ecosystem final land use domain is proposed to include the following vegetation communities:

- Box Gum Shrubby Woodland
- Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)
- PCT510 Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)
- PCT 1305 Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association)
- PCT1696 Box Gum Woodland (Blakely's Red Gum - Rough-barked Apple shrubby woodland of central and upper Hunter)
- PCT618 Box Gum Woodland (White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley)
- Sedimentary Ironbark Forest
- Riparian variants of the above communities along creek reestablishment areas in the final landform
- Pasture areas for agricultural grazing final land use

A summary of the typical species associated with the vegetation communities in the rehabilitation program, and the general location in the reconstructed landscape is provided below. The location of

rehabilitated vegetation communities is designed to replicate the positioning of pre-mining vegetation communities, in terms of connectivity to similar vegetation remnants and their natural position within the landscape.

Box Gum Shrubby Woodland Revegetation Species

Generally, Box Gum Shrubby Woodland will be established on lower and mid slopes of OC1. Box Gum Shrubby Woodland areas at OC1 will also include stands of Allocasuarina to reinstate those removed during disturbance. A list of typical species for Box Gum Shrubby Woodland rehabilitation areas is provided in **Table 13**.

Table 13: Typical Species used for Box Gum Shrubby Woodland Rehabilitation

Species	Common Name
Overstorey	
Angophora floribunda	Rough-barked Apple
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus dawsonii	Slatey Gum
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus melliodora	Yellow Box
Eucalyptus moluccana	Grey Box
Understorey	
Acacia linearifolia	Narrow-leaved wattle
Allocasuarina gymnanthera	She-oak
Dodonaea viscosa spp *cuneata*	Wedge-leaf Hop Bush
Daviesia acicularis	Spiny Bitter pea
Acacia decora	Western Silver Wattle
Allocasurina diminuta[1]	She-oak
Allocasurina verticillata[1]	Drooping Sheoak
Ground cover	
Dianella revolute	Flax Lilly
Aristida vagans	Three-awned Speargrass
Austrodanthonia racemosa	Wallaby Grass
Austrostipa scabra	Rough Speargrass
Dichelachne micrantha	Short-hair Plume Grass
Arundinella nepalensis	Reed Grass

[1] Species to be utilised to form stands of *Allocasuarina* spp within the Box Gum Shrubby Woodland community within OC1.

Sedimentary Ironbark Forest Revegetation Species

Sedimentary Ironbark Forest will generally be established on upper slopes and crests of the OC1 overburden emplacement areas. Sedimentary Ironbark Forest areas will also include stands of *Allocasuarina* within OC1. A list of typical species for Sedimentary Ironbark Forest rehabilitation areas is provided in **Table 14**.

Table 14: Typical Species used for Sedimentary Ironbark Forest Rehabilitation

Species	Common Name
Overstorey	
Angophora floribunda	Rough-barked Apple
Eucalyptus agglomerate	Blue-leaved Stringybark
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus fibrosa	Broad-leaved Ironbark
Eucalyptus rossii	Scribbly Gum
Callitris endlicheri	Black Cypress
Eucalyptus dwyeri	Dwyer's Red Gum
Eucalyptus parramattensis	Parramatta Red Gum
Eucalyptus punctata	Grey Gum
Understorey	
Acacia leucolobia	Box-leaved Wattle
Acacia linearifolia	Narrow-leaved wattle
Leucopogon muticus	Blunt Beard Heath
Allocasuarina diminuta[1]	She-oak
Allocasuarina verticillata[1]	Drooping She-oak
Allocasuarina gymnanthera	She-oak
Ground cover	
Aristida vagans	Three-awned Speargrass
Austrostipa scabra	Speargrass
Dichelachne micrantha	Short-haired Plumed Grass
Microlaena stipoides	Weeping grass
Hardenbergia violacea	Purple Coral pea

[1] Species to be utilised to form stands of *Allocasuarina* spp within the Sedimentary Ironbark Forest community within OC1.

In addition to the species listed in **Table 14**, species that provide Regent Honeyeater foraging resources will also be established in Sedimentary Ironbark Forest rehabilitation areas. These species would include *Eucalyptus sideroxylon* (Mugga Ironbark), *Eucalyptus punctata* (Grey Gum), *Eucalyptus polyanthemos* (Red Box), *Eucalyptus caleyi* (Caley's Ironbark) and *Eucalyptus moluccana* (Grey Box).

Box Gum Woodland (PCT1695 White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association) Revegetation Species

Generally, Box Gum Woodland PCT 1695 will be established on the upper slopes and elevated areas of the OC4 rehabilitation areas. A list of typical species for Box Gum Woodland PCT 1695 rehabilitation areas is provided in **Table 15**.

Table 15: Typical Species used for Box Gum Woodland PCT 1695 Rehabilitation

Species	Common Name
Overstorey	
Angophora floribunda	Rough barked apple
Eucalyptus melliodora	Yellow Box
Eucalyptus moluccana	Grey Box
Understorey	
Acacia buxifolia	Box leaf wattle
Acacia decora	Western silver wattle
Acacia penninervis	Mountain hickory
Acacia verniciflua	Varnish wattle
Daviesia genistifolia	Broom bitter pea
Daviesia ulicifolia	Gorse bitter pea
Dodonaea viscosa	Sticky Hop-bush
Hardenbergia violacea	Purple Coral pea
Ground cover	
Aristida spp.	Wiregrass
Austrodanthonia spp.	Wallaby grass
Austrostipa aristiglumis	Plains grass
Austrostipa scabra	Speargrass
Carex appressa	Tall sedge
Bothriochloa macra	Red Grass
Arundinella nepalensis	Reed Grass
Einadia spp.	Saltbush
Cynodon dactylon	Couch
Calotis lappulaceae	Burr Daisy

Box Gum Woodland (PCT 510 - Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association) Revegetation Species

Generally, Box Gum Woodland PCT 510 will be established on flat alluvial areas surrounding the realigned Murragamba and Eastern Creeks on OC4. A list of typical species for Box Gum Woodland PCT 510 rehabilitation areas is provided in Table 16.

Table 16: Typical Species used for Box Gum Woodland PCT 510 Rehabilitation

Species	Common Name
Overstorey	
Eucalyptus melliodora	Yellow Box
Eucalyptus blakelyi	Blakely's Red Gum
Angophora floribunda	Rough barked apple
Eucalyptus bridgesiana	Apple Box
Understorey	
Acacia implexa	Hickory wattle
Acacia fimbriata	Fringed wattle
Acacia verniciflua	Varnish wattle
Cassinia quinquefaria	
Olearia elliptica	Sticky daisy bush

Ground cover	
Themeda australis	Kangaroo grass
Cymbopogon refractus	Barbed wire grass
Aristida ramosa	Purple wire grass
Dianella revoluta	Blueberry lily
Carex appressa	Tall sedge
Bothriochloa macra	Red Grass
Microlaena stipoides	Weeping Grass
Desmodium brachypodum	Large Tick-trefoil
Cynodon dactylon	Couch

Box Gum Woodland (PCT 1305 - White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association) Revegetation Species

Box Gum Woodland PCT 1305 will be established on one elevated area of the OC4 rehabilitation, to merge in with the adjoining remnant vegetation community on the boundary of the project disturbance area. A list of typical species for Box Gum Woodland PCT 1305 rehabilitation areas is provided in **Table 17**.

Table 17: Typical Species used for Box Gum Woodland PCT 1305 Rehabilitation

Species	Common Name
Overstorey	
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum
Angophora crebra	Narrow-leaved ironbark
Understorey	
Acacia deanii	Green wattle
Acacia decora	Western silver wattle
Acacia spectabilis	Mudgee wattle
Allocasuarina diminuta	
Allocasuarina gymnanthera	
Bossiaea rhombifolia	
Bursaria spinosa	Blackthorn
Daviesia genistifolia	Gorse bitter pea
Daviesia ulicifolia	Broom bitter pea
Dodonaea boroniifolia	Fern-leaf Hop-bush
Dodonaea viscosa	Sticky-Hop bush
Hardenbergia violacea	Purple Coral pea
Indigofera australis	Australian indigo
Olearia elliptica	Sticky daisy bush
Ozothamnus diosmifolius	Rice flower
Pultanaea microphylla	Spreading bush-pea
Ground cover	
Atriplex semibaccata	Berry saltbush
Calotis lappulacea	Yellow burr-daisy
Einadia spp.	Saltbush

Enchylaena tomentosa	Ruby saltbush
Gahnia aspera	Rough saw sedge
Lomandra longifolia	Spiny-headed mat-rush
Swainsona galegifolia	Smooth Darling-pea
Aristida spp.	Wiregrass
Austrodanthonia spp.	Wallaby grasss
Cymbopogon refractus	Barbed wire grass
Microlaena stipoides	Weeping grass
Cynodon dactylon	Couch

Box Gum Woodland PCT 1696 (Blakely's Red Gum - Rough-barked Apple shrubby woodland of central and upper Hunter) Revegetation Species

Box Gum Woodland PCT 1696 will be established on mid slope to lower areas of the OC2 and OC3 rehabilitation areas. A list of typical species for Box Gum Woodland PCT 1696 rehabilitation areas is provided in **Table 18**.

Table 18: Typical Species used for Box Gum Woodland PCT 1696 Rehabilitation

Species	Common Name
Overstorey	
Eucalyptus crebra	Narrow-leaved ironbark
Eucalyptus blakelyi	Blakely's Red Gum
Angophora floribunda	Rough-barked apple
Understorey	
Acacia buxifolia	Box-leaf wattle
Acacia cheelii	Motherumbah
Acacia decora	Western silver wattle
Acacia hakeoides	Hakea wattle
Acacia verniciflua	Varnish wattle
Allocasuarina gymnanthera	
Bursaria spinosa	Blackthorn
Daviesia genistifolia	Broom bitter pea
Daviesia ulicifolia	Gorse bitter pea
Dodonaea boroniifolia	Fern-leaf Hop-bush
Dodonaea viscosa	Sticky Hop-bush
Hardenbergia violacea	Purple Coral pea
Melaleuca decora	
Melaleuca thymifolia	Thyme honey-myrtle
Ozothamnus diosmifolius	Rice flower
Ground cover	
Calotis cuneifolia	Purple burr-daisy
Calotis lappulacea	Yellow burr-daisy
Carex appressa	Tall sedge
Einadia spp.	Saltbush
Gahnia aspera	Rough saw sedge
Lomandra longifolia	Spiny headed mat rush

Aristida spp.	Wiregrass
Austrodanthonia spp.	Wallaby grass
Austrostipa scabra	Speargrass
Bothriochloa macra	Red grass
Chloris truncata	Windmill grass
Cymbopogon refractus	Barbed wire grass
Elymus scaber	Wheatgrass
Eragrostis spp.	Love grass
Microlaena stipoides	Weeping grass
Sporobolus creber	Slender Rat's tail grass
Themeda australis	Kangaroo grass
Cynodon dactylon	Couch

Box Gum Woodland PCT 618 (White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley) Revegetation Species

Generally, Box Gum Woodland PCT 618 will be established on the upper slopes of the OC2 and OC3 rehabilitation areas, to merge in with the adjoining remnant vegetation communities on the boundary of the project disturbance area. A list of typical species for Box Gum Woodland PCT 618 rehabilitation areas is provided in **Table 19**.

Table 19: Typical Species used for Box Gum Woodland PCT 618 Rehabilitation

Species	Common Name
Overstorey	
Angophora floribunda	Rough-barked apple
Eucalyptus albens	White box
Eucalyptus crebra	Narrow-leaved ironbark
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus moluccana	Grey box
Understorey	
Acacia implexa	Hickory wattle
Acacia decora	Western silver wattle
Acacia polybotrya	Hairy feather wattle
Acacia spectabilis	Mudgee wattle
Acacia verniciflua	Varnish wattle
Allocasuarina gymnanthera	
Bursaria spinosa	Blackthorn
Daviesia genistifolia	Broom bitter pea
Daviesia ulicifolia	Gorse bitter pea
Olearia elliptica	Sticky daisy bush
Pandorea pandorana	Wonga wonga vine
Ground cover	
Calotis lappulacea	Yellow burr-daisy
Einadia spp.	Saltbush
Gahnia aspera	Rough saw sedge
Lomandra longifolia	Spiny headed mat rush

Swainsona galegifolia	Smooth Darling-pea
Vittadinia spp.	New Holland daisy
Austrodanthonia spp.	Wallaby grass
Austrostipa scabra	Speargrass
Austrostipa verticillata	Slender bamboo grass
Bothriochloa macra	Red grass
Chloris truncata	Windmill grass
Cymbopogon refractus	Barbed wire grass
Elymus scaber	Wheatgrass
Eragrostis spp.	Lovegrass
Microlaena stipoides	Weeping grass
Sporobolus creber	Slender Rat's tail grass
Themeda australis	Kangaroo grass
Cynodon dactylon	Couch

Agricultural Pasture Rehabilitation Species

Following emplacement and amelioration of topsoils, non-invasive pasture species mixes that are appropriate for the growing season will be sown onto agricultural rehabilitation areas. The seed mix will include perennial species to provide permanent cover (including on drainage channels and steep slopes) and a granular fertilizer to stimulate growth. Cool and warm season pasture and cover crop seed mixes and sowing rates are listed in Table 20.

Table 20: Typical Species used for Agricultural Pasture Establishment

Spring/Summer		Autumn/Winter	
Species	**Rate (Kg/Ha)**	**Species**	**Rate (Kg/Ha)**
Millet	5	Oats/Ryecorn	20
Ryecorn/Oats	5	Millet	5
Couch	5	Couch	10
Wimmera Ryegrass	8	Wimmera Ryegrass	5
Cereal Rye	10	Perennial Rye	5
White Clover	5	Subterranean Clover	8
Lucerne	5	Seradella	10
		White Clover	5

Riparian Revegetation Species

Planting of native perennial grasses and deep-rooted woodland species (such as Box and Redgum species) on upper and mid banks will be incorporated into the design for the Murragamba and Eastern Creek diversions to increase habitat and minimise erosion, sedimentation and instability. The use of non-persistent cover crop and native riparian species will increase ground cover and provide cohesion of the banks.

Table 21 lists a selection of species that are proposed for use in revegetating the reconstructed creeks. Where necessary, these will be supplemented with other ground cover (such as stoloniferous grasses) to ensure the creek beds are appropriately protected against erosion.

Table 21: Typical Species used for Riparian Rehabilitation

Upper Banks	
Species	**Common Name**
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus melliodora	Yellow Box
Eucalyptus moluccana	Grey Box
Angophora floribunda	Rough-barked Apple
Acacia spectabilis	Mudgee Wattle
Daviesia genistifolia	Broom Bitter Pea
Themeda australis	Kangaroo Grass
Middle Banks	
Species	**Common Name**
Melaleuca thymifolia	Thyme Honey Myrtle (clayey soils only)
Leptospermum polygalifolium	Tantoon (sandy soils only)
Dichelachne micrantha	Short-haired Plumed Grass
Lomandra confertifolia	Mat-rush
Themeda australis	Kangaroo Grass
Eucalyptus blakelyi	Blakely's Red Gum
Angophora floribunda	Rough-barked Apple
Lower Banks	
Species	**Common Name**
Arundinella nepalensis	Reed Grass
Melaleuca thymifolia	Thyme Honey Myrtle
Lomandra confertifolia	Mat-rush

Various techniques exist for seeding and planting of rehabilitation areas and have been investigated during the early years of rehabilitation at the MCC, with the best techniques being carried through for ongoing use. Consideration is given to site conditions, including soil type and condition, landform, time of year, climate, water availability and vegetation community establishment outcomes and also the best methods of rehabilitation application.

Native Vegetation Seeding and Cover Crops

Native vegetation seed will be sown simultaneously with non-persistent cover crop species, preferably in the warmer months between late September and March. All vegetation stratum including groundcovers, native grasses, shrubs and canopy species will be included in the seed mix. Sowing will occur as soon as possible after seedbed preparation to optimise the conditions for germination prior to surface crust development.

Specific vegetation community mixes based on comparison with local vegetation communities have been developed for each targeted final land use area. Each mix is consistent with the local remnant and analogue vegetation communities present with the MCC. Seed is harvested from offset and buffer land owned by MCO. Locally collected seed is supplemented with seed purchased from external suppliers when necessary. Only native seed with provenance from the NSW Central Western region will be used in rehabilitation mixes at the MCC.

In addition to the targeted vegetation community, native seed mixes are blended with a cover crop to provide initial erosion protection and organic matter. A typical cover crop for native vegetation areas would comprise:

a) Spring/Summer season sowing - Japanese millet – 5kg/ha and 3kg/ha Oats

b) Autumn/Winter season sowing - Oats – 5kg/ha and 3kg/ha Japanese millet

c) All seasons - Couch – 1kg/ha

Tubestock Planting

Native vegetation establishment in rehabilitation areas may be supplemented with tubestock, where required. The need for tubestock planting will be informed by the various monitoring programs that are conducted within the rehabilitation areas. If needed, appropriate tubestock species will be nursery grown from MCO seed stock and planted in the rehabilitation in accordance with the target vegetation communities.

Revegetation of Degraded Land and Riparian Areas

Consistent with the rehabilitation objectives, MCO will remediate cleared and degraded areas on MCO-owned land outside the mine disturbance footprint. For these areas, natural regeneration of native species will be supported and will include implementing relevant land management measures to improve degraded and eroding areas for example. Measures may include:

- Fencing and exclusion of stock from larger vegetation remnants on its land leased to agricultural users (note in some cases stock may not be able to be excluded due to the need/use of vegetation patches as shade for stock, etc.)
- Revegetation or regeneration of areas not required for agricultural purposes
- Fencing and exclusion of stock along strategic and/or degraded sections of Moolarben Creek
- Riparian corridor enhancement along degraded areas of Moolarben Creek, Wilpinjong Creek and Murragamba and Eastern Creeks on MCO-owned land (measures may include restoring channel stability, planting riparian vegetation, placement of large woody debris, etc to improve the riparian and aquatic ecosystem function and provide compensatory aquatic habitat)
- Creation of new areas/patches of trees in consultation with lessees in areas that complement their agricultural enterprises (e.g. shade and shelter belts)
- Weed and pest control on vegetation remnants and revegetation areas
- Bushfire management measures.

Riparian corridor enhancement[2] along selected degraded areas of Moolarben Creek, Wilpinjong Creek and Murragamba and Eastern Creeks would be undertaken with consideration of the rehabilitation principles within the NOW's *Guideline for Riparian Corridors on Waterfront Land* and *Guideline for Vegetation Management Plans on Waterfront Land*.

[2] Note that a number of the above investigative actions (where considered practical and feasible to implement) would need to be undertaken in consultation with and the agreement of the lessee.

Implementation of these measures would lead to improved connectivity between the Munghorn Gap Nature Reserve (MGNR) and surrounding biodiversity offset areas by improving or creating "stepping stones" and refuges for fauna such as birds and mammals. Ecological connectivity is also important for enhancing the colonisation of native species, particularly fauna, into rehabilitation areas.

Weed Control activities implemented across the MCC are described in detail in **Section 6.2.1.2**.

6.2.6 Ecosystem Land Use Development

The ecosystem and land use development phase represents those activities required to develop sustainable ecosystems that have characteristics comparable to similar undisturbed vegetation in the area.

Activities associated with the ecosystem and land use development phase of rehabilitation are generally ongoing maintenance, land management activities and rehabilitation monitoring. Maintenance within rehabilitated areas will include, but not be limited to:

- Ongoing environmental management to minimise risks to rehabilitation
- Comparing specific ecosystem characteristics such as soil profile development, floristic composition and structure, faunal diversity and abundance with the characteristics of appropriate analogue sites
- Undertaking adaptive management and remedial works where characteristics of the rehabilitation are not trending towards desired outcomes

Weed Control

Weed Control activities implemented across the MCC are described in **Section 6.2.1.2**.

Vertebrate Pest Control

Management of pest animals across the MCC are described in **Section 6.2.1.3**.

Erosion and Sediment Control

Potential erosion and sedimentation will be monitored during post rehabilitation inspections. Erosion and sediment controls will be implemented on an as needed basis and will be generally aligned in accordance with the controls outlined in **Section 6.2.1.10.**

Ecosystem Development Monitoring

Ecosystem development monitoring will be conducted generally in accordance with the methodology outlined in **Section 8.0**. Monitoring of the rehabilitation throughout the ecosystem and land use development phase will continue until it can be demonstrated that rehabilitation areas have met completion criteria and all conditions for relinquishment. Rehabilitation maintenance requirements will be identified by rehabilitation monitoring, with actions and activities reported annually in the Annual Review, Annual Rehabilitation Report and Forward Program.

Management and mitigation responses for rehabilitation areas across the MCC are described in **Section 10.0.**

6.2.7 Rehabilitation Completion

MCO will seek RR signoff of rehabilitation areas as they meet the rehabilitation objectives and completion criteria as outlined in Appendix B, in accordance with the *Guideline: Achieving Rehabilitation Completion (Signoff).*

Final completion criteria are yet to be submitted for approval by the RR.

6.3 REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE

Rehabilitation of areas affected by subsidence is described in **Section 6.2.1.12**

7.0 REHABILITATION QUALITY ASSURANCE PROCESS

MCO has implemented a Quality Assurance / Quality Control (QA/QC) process to identify and manage risks associated with the rehabilitation process across the site. The QA/QC process aims to ensure that key rehabilitation methodologies and controls have been implemented as planned, and records are stored for verification purposes.

MCO's QA/QC methodology for rehabilitation implementation is driven by an Inspection Test Plan (ITP) process. The ITP is broken up into four stages that are aligned with the phases of rehabilitation, with each stage having defined hold points that must be achieved prior to moving on to the next stage of the process.

Each rehabilitation area on site has a specific ITP which requires signoff before progressing to the following stage. Records are kept for the key components of the ITP process. The ITP process ensures key records are stored to verify that the activity has been completed.

The ITP will be reviewed and refined over time to promote continuous improvement in the QA/QC process.

The process flow for the MCO rehabilitation ITP is detailed in **Figure 11**.

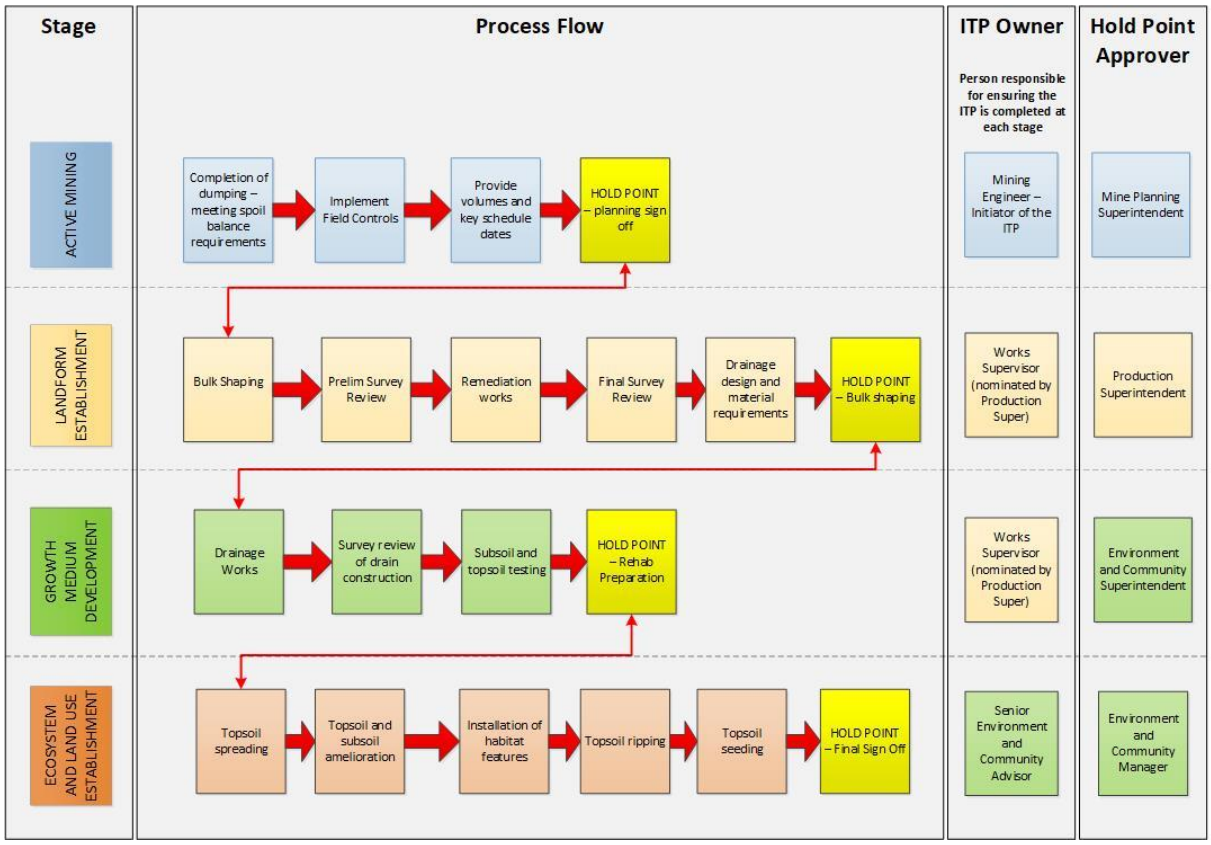

Figure 11: Workflow diagram for the MCO rehabilitation ITP process

The MCO QA/QC process includes inspections and documentation to verify that each phase of the rehabilitation process has been completed in accordance with the site rehabilitation procedures. Documentation to be maintained includes (but not limited to):

Phase 1 – Active Mining

- Documentation of pre-clearance surveys and Ground Disturbance Permits
- Resource salvage records (topsoil, habitat trees)
- Dumping plans and surveys
- Detailed landform designs
- Inspection and test plan

Phase 2 – Decommissioning

- Documentation of borehole sealing and signoff by RR
- Inspection and demolition reports to confirm that all infrastructure to be demolished has been removed
- Documentation to identify future landowner responsibilities for management of any retained infrastructure
- Validation testing to ensure any contamination has been appropriately remediated and/or removed

Phase 3 – Landform Establishment

- Survey and preparation of as constructed drawings of final constructed slopes, landforms and water drainage structures
- Verification reporting to confirm that the specified depth of capping has been implemented
- Inspection and test plan

Phase 4 – Growth Medium Development

- Maintenance of a topsoil inventory to document stripped, stockpiled and spread resources
- Site records of re-spread topsoil and ameliorants
- Soil testing to confirm appropriate soil geochemical parameters for amelioration requirements and healthy vegetation establishment
- Inspection and test plan

Phase 5 – Ecosystem and Land Use Establishment

- Documentation of reseeding or planting activities undertaken, such as date of seeding/planting, weather conditions, seeding rates, species mixes, cover crops and source of seeds
- Site inspections and monitoring of rehabilitated areas to allow for early identification of any emerging threats to rehabilitation
- Inspection and test plan
- Rehabilitation establishment methodology report

Phase 6 – Ecosystem and Land Use Development

- Inspections of temporary and permanent erosion and sediment controls
- Regular inspections to identify potential weed infestations
- Documentation of weed and feral animal management activities
- Annual rehabilitation monitoring program and reporting

7.1 QA/QC PROCESS REVIEW

A review of the QA/QC process will be triggered under the following circumstances:

- Changes to rehabilitation methodologies
- New risks identified in the rehabilitation process requiring additional controls, or
- Revision/update of project approvals requiring alternative rehabilitation outcomes.

8.0 REHABILITATION MONITORING PROGRAM

MCO has a comprehensive rehabilitation monitoring program to track the establishment and progress of rehabilitated areas towards completion criteria. The overall objectives of the rehabilitation monitoring program are to:

- Assess the long-term stability, functioning and resilience of re-established ecosystems on mined land
- Assess rehabilitation performance against the completion criteria

- Facilitate continuous improvement in rehabilitation practices

Monitoring of analogue and rehabilitation sites will continue until the site can demonstrate that rehabilitation completion criteria has been met, and rehabilitation signoff achieved. Monitoring criteria for each domain have been developed to demonstrate that selected indicators have achieved or are on a demonstrated trajectory towards achieving the approved completion criteria that will result in a self-sustaining and functional ecosystem.

The annual rehabilitation monitoring program consists of the following elements:

- Analogue site baseline monitoring
- Annual rehabilitation walkover inspection
- Initial establishment monitoring
- Long term rehabilitation monitoring
- Fauna monitoring

Management actions are informed by the rehabilitation monitoring program, and may include weed and vertebrate pest control, re-seeding or infill planting, erosion and sediment control works.

Rehabilitation monitoring program results will be reported and assessed within an annual rehabilitation monitoring report. A summary of the monitoring results, including any trend analysis and any proposed modifications to the monitoring program will be reported in the Annual Review.

8.1 ANALOGUE SITE BASELINE MONITORING

A total of 15 analogue sites representative of the Domain A vegetation communities of Box Gum Shrubby Woodland, Box Gum Grassy Woodland and Sedimentary Ironbark Forest areas have been established in the Durridgere State Conservation Area, Goulburn River National Park, MCO Redhills Offset Cluster, Dexter Mountain Offset Cluster and Bobadeen Offset Cluster, as shown in Error! Reference source not found.. These sites have been established in remnant native vegetation areas and are used for benchmarking the assessment of rehabilitation establishment performance.

The rehabilitation outcomes for the Domain D vegetation communities do not require reference to analogues, as they rely on published benchmark conditions for the target BVTs/PCTs.

Prior to commencement of rehabilitated creek and riparian areas, representative analogue sites will be established by MCO in consultation with a suitably qualified person.

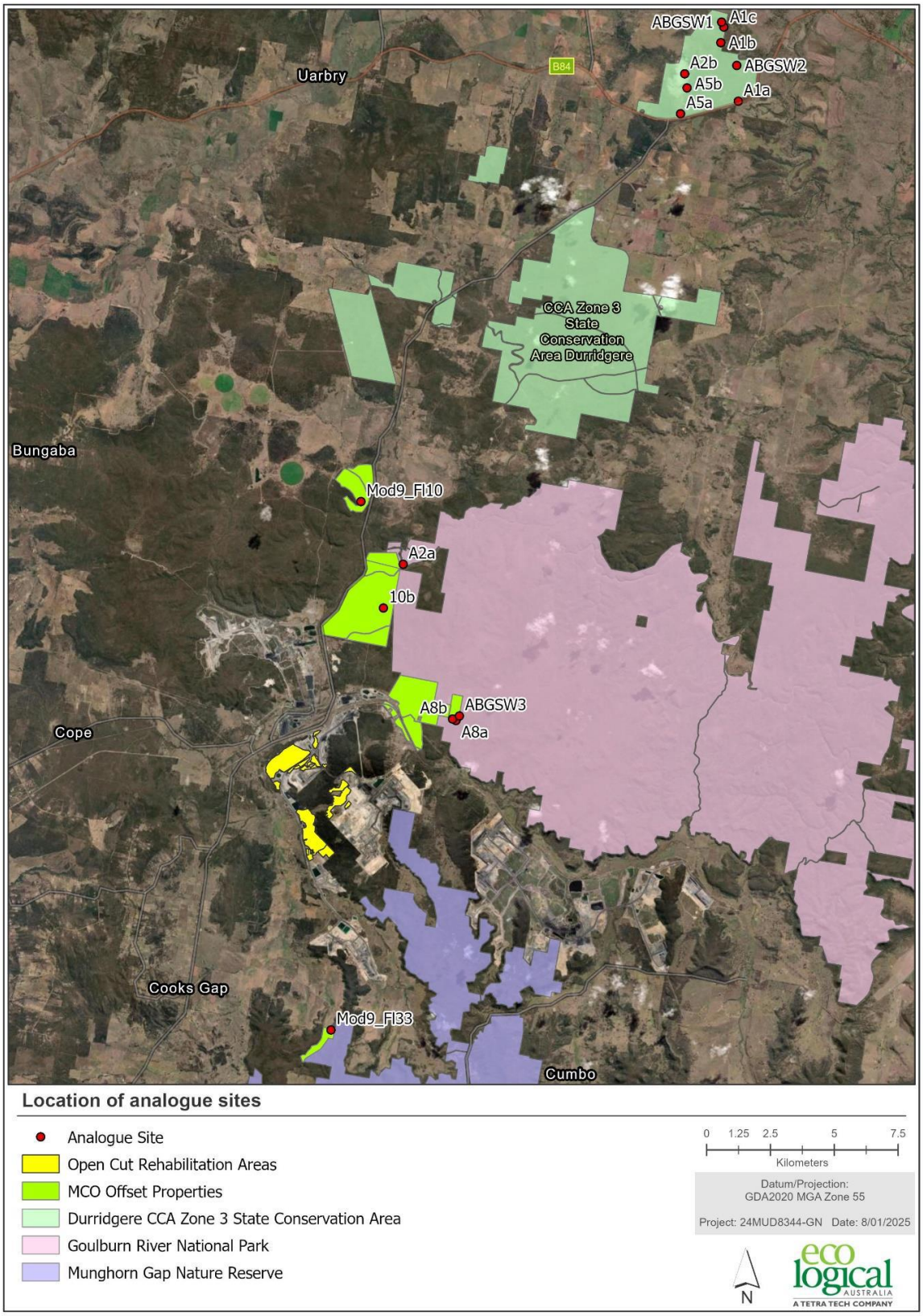

Figure 12: Location of Analogue Sites

8.2 REHABILITATION MONITORING

A description of the rehabilitation monitoring program aims and methodologies is provided in the sections below.

As part of regular review and improvements to this Plan, updates were made to the rehabilitation monitoring methodology from 2024 onwards. Monitoring methodology changes were recommended by Eco Logical Australia (ELA) in order to achieve:

- Improvement in data integrity by monitoring in consistent seasons (spring)
- Removing monitoring that is not related to rehabilitation objectives
- Removing monitoring that is redundant (such as the Ecosystem Function Analysis/Landscape Function Analysis) as this information is already being collected via detailed floristic monitoring under the Framework for Biodiversity Assessment (FBA) methodology.

Current rehabilitation monitoring sites are shown in **Figure 13**.

8.2.1 Annual rehabilitation (walkover/flyover) inspection

The annual rehabilitation inspection is designed to evaluate the success of rehabilitation operations and review the broad trajectory towards meeting the rehabilitation completion criteria.
The annual rehabilitation inspection encompasses a rapid style assessment via a walkover or remote sensing flyover of all existing rehabilitation areas on site. The primary objective is to identify any areas of rehabilitation failures or maintenance issues that could hinder success or require extensive remediation if left unchecked. The inspection includes:

- The identification of erosion
- Stability and functioning of water management and erosion and sediment control structures
- Visual assessment of vegetation (cover, species diversity, vegetation health, growth rates)
- The presence of weeds and pests.

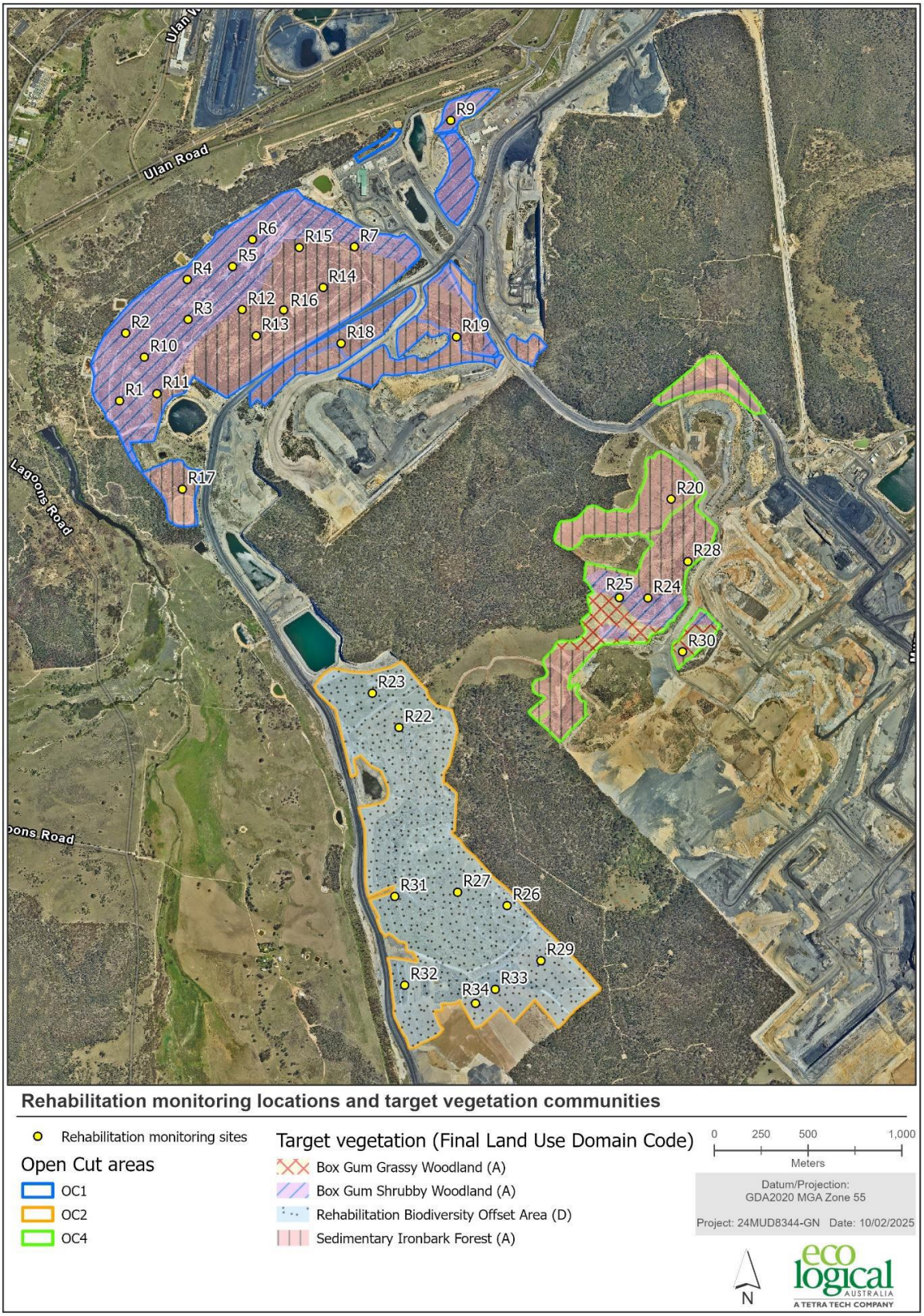

Figure 13: Rehabilitation Monitoring Sites

8.2.2 Initial establishment monitoring

The IEM is a rapid style assessment of young (≤3 years old) rehabilitated areas, principally to determine germination success, landform stability, and early threats to the rehabilitation. Monitoring methods and aspects for IEM are detailed in **Table 22.**

Table 22: IEM Monitoring Parameters

Initial Establishment Monitoring for Native Vegetation	
Rehabilitation age	≤ 3 years old
Monitoring site dimensions	20m x 20m

Monitoring Attribute	Data Collection Method	Deliverable
General	Year 1: Walkover only Years 2-3: Plots established, photo reference points taken and general monitoring site information recorded.	Year 1: Year 1 areas to be covered by the annual rehabilitation walkover inspection, and any relevant observations included in the Rehabilitation Walkover Monitoring Report Years 2-3: Rapid assessment plots to be established with wooden pegs at each corner, labelled with site name on durable tag. Photo reference points are to be taken from each of the four sides of the plot, equidistant from the two closest corner points, facing the opposite side of the plot. Within the 20m x 20m plot note general comments such as rocks present, presence/absence of topsoil, significant weed infestations, evidence of fire or drought and other factors likely to influence rehabilitation development.
Erosion	Note presence and maximum depth of erosion gullies or rills within the 20m x 20m plot. Note whether erosion gullies or rills are active or stable.	Presence of erosion in the following categories, with reference to maximum observed depth: • Minor sheet erosion or rills (<100 mm) • Sheet erosion or rills (100 mm -<300 mm) • Rills (300 mm - <500 mm) • Gullies (500 mm -<1m) • Major gully (⩾1m)
Bare ground	Visually estimate the proportion of the 20m x 20m plot containing bare ground (i.e. the proportion of the ground where vegetation, litter, logs and rocks (>5cm diameter) are absent.	Total bare ground as a percentage (%).
Weed cover	Rapid Assessment: within the 20m x 20m plot note presence of “high threat exotic” weed species (as defined in BAM), "Priority Weeds" for the LLS region (as identified in relevant Regional Strategic Weed Management	Total weed cover (High Threat Exotic, ‘Priority Weeds’ and ‘Other Exotics’) to be provided as a percentage (%).

	Plan) and other exotics that occur in high density/abundance and require management. Estimate foliage cover of each species recorded.	
Native species richness	Rapid Assessment (approx. 15 minutes): within the 20m x 20m plot record native species present and note whether they are “dominant”, “common” or “uncommon”.	Determine the proportion (%) of all flora species recorded in the rapid assessment that are native.
Tree stem density	Record number of tree stems in the 20m x 20m plot (‘tree’ species consistent with BAM definition)	Determine tree stem density as stems/ha.

8.2.3 Long Term Monitoring

The objective of the more detailed LTM program for older rehabilitation areas (≥4 years old) is to evaluate progress of rehabilitation towards fulfilling agreed or proposed completion criteria, and ultimately the targeted post mining land use. Monitoring methods and aspects for LTM are detailed in **Table 23**.

Table 23: LTM Monitoring Parameters

Long Term Monitoring for Native Vegetation	
Rehabilitation age	≥ 4 years old
Monitoring site dimensions	20m x 50m (extension of the 20m x 20m plot used for IEM)

Monitoring Attribute	**Data Collection Method**	**Deliverable**
General	Plots established, photo reference points taken and general monitoring site information recorded. Monitoring to be undertaken in accordance with the NSW Biodiversity Offsets Policy for Major Projects *Framework for Biodiversity Assessment* (FBA) (OEH 2014).	As a minimum, start and end points of 50m transect to be established with star pickets (min 135cm length), corners of 20m x 20m plot marked with wooden pegs, and transect start labelled with site name on durable tag. As a minimum photo reference points taken from the start and end points of the 50m transect. Within the 20m x 50m plot note general comments such as rocks present, presence/ absence of topsoil, significant weed infestations, evidence of fire or drought and other factors likely to influence rehabilitation development
	Within 20m x 20m quadrat: Species name Cover Abundance Reproductive status	A list of all vascular plant species observed An assessment of projected foliage cover (pfc) for all vascular plant species (1 – 5% and then increments of 5%) An assessment of abundance (density) for each vascular plant species in intervals of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100, 500, 1000, 2000 etc.

	Fauna (Koala habitat)	An assessment of the reproductive status (i.e. presence of flowers, flower buds or fruits) of midstorey and overstorey species^ Koala habitat assessment (OC2 area) ^
	Along 50m transect: Groundcover Midstorey and overstorey cover	Litter, rock, bare soil, cryptogram, exotic, native grass, native shrub (<1m) and native other groundcover is recorded at every 1m along the 50m transect. Record presence and foliage cover of each High Threat Exotic weed species (i.e. consistent with Biodiversity Assessment Methodology) Midstorey and overstorey cover is recorded at every 5m along the 50m transect
	Within 20m x 50m plot: Regeneration Large woody debris Trees with hollows Structure	Proportion of overstorey species that are regenerating Total length of large woody debris >10cm diameter Total number of trees with hollows Structural assessment identifying the dominant species (maximum three) for each vegetation stratum along with heights and pfc^
	Zone surrounding the 20m x 50m plot: Regeneration Fauna habitat	Proportion of overstorey species that are regenerating Presence of *Loranthaceae* sp. (mistletoe species), maximum and minimum heights of canopy stratum and presence of *Allocasuarina* spp. stands^
Erosion	Note presence and maximum depth of erosion gullies or rills within the 20m x 50m plot. Note whether erosion gullies or rills are active or stable.	Presence of erosion in the following categories, with reference to maximum observed depth: • Minor sheet erosion or rills (<100 mm) • Sheet erosion or rills (100 mm -<300 mm) • Rills (300 mm - <500 mm) • Gullies (500 mm -<1m) • Major gully (≥1m)

^ This assessment is completed in addition to the FBA (OEH 2014) methodology

OC2 / OC3 Rehabilitation Monitoring (Ecosystem and Species Credits)

For the rehabilitated areas in the OC2 and / or OC3 landforms which will generate specific residual ecosystem and species credits, MCO will track performance every three years' post landform establishment by conducting the following monitoring:

Years 1 to 10	Walkover/flyover inspections to monitor for any material areas of vegetation establishment failure.
Years 3 to 5	Single FBA plot* in each PCT (randomly selected).
Years 6 to 9	FBA plots required in accordance with the vegetation zone size (i.e. 4 plots in PCT 618 and 5 plots in PCT1696).

* Refer to Section 5.3.2 of the FBA (OEH, 2014).

In addition to the above, the following sampling method will be used to identify *highly suitable koala habitat* as per the *Koala Habitat Protection Guideline: Implementation the State Environmental Planning Policy (Koala Habitat Protection) 2019* (DPIE, 2020):

> *Quadrats can be selected within each PCT either randomly or along a selected transect. Quadrats need to be of sufficient size to enable a minimum of at least 20 trees to be counted (at least 20 x 20 metres) and of sufficient number to allow a robust statistical determination of the percentage of tree species present in the lower, mid and upper stratum. The number and size of quadrats chosen will depend on the size of the site and the vegetation present …*
>
> *Results of the sampling within each PCT must be shown separately and not summed for the overall site...*
>
> *Notes about the vegetation survey:*
> - *A "tree" is taken to be a plant with a diameter at breast height over bark (DBHOB) of 10 cm or greater.*
> - *Appendix A of this Guideline provides a list of the tree species as per Schedule 2 of the SEPP.*
> - *Only the trees listed for the relevant region must be surveyed for.*
> - *The calculation of the percentage of tree species must be completed within each vegetation community present on the site area and not averaged or totalled across the site. A result of 15% or greater in any individual vegetation community meets the definition of highly suitable koala habitat.*

It is anticipated that the performance and completion criteria for the generation of credits would be subject to change over the life of the operation based on increased knowledge and feedback from monitoring.

Ephemeral Drainage Line Assessment and Monitoring

Prior to the completion of the realigned Murragamba and Eastern Creeks, in consultation with suitably qualified specialists MCO will develop a methodology for monitoring and assessment of the reconstructed creeks.

8.2.4 Fauna monitoring

Fauna monitoring is undertaken to demonstrate the presence of suitable fauna habitat and utilisation of rehabilitation areas by fauna species as rehabilitation progresses. Fauna monitoring is undertaken at specific monitoring sites established to ensure a survey effort appropriate to the age and complexity of the rehabilitation across all target vegetation communities. The location of monitoring sites in rehabilitation and reference areas will be selected by considering a range of attributes that are considered to influence or determine the type of fauna species present, including but not limited to vegetation structure, presence of key plant species (e.g. flowering eucalypts for birds) and habitat structures.

Similar to native vegetation, monitoring of fauna should commence in rehabilitation areas when the vegetation has reached a level of maturity, or otherwise provides potential foraging or breeding habitat features for target fauna group or threatened species. Hence, timing for the commencement of fauna monitoring will be specific to the target fauna group or species. Timing may be accelerated by the placement of nest boxes, log piles, rock piles and other fauna structures within rehabilitation areas.

Fauna monitoring techniques are summarised in **Table 24**. The exact number and location of data collection points (e.g., trap sites) are subject to modification based on site constraints and suitability as appropriate.

Table 24: Fauna Monitoring Techniques

Method	Details	Effort
Camera traps	Each camera left *in-situ* for a minimum of 10 days with a bait chamber positioned between 1 to 3 m from the camera.	At each site: Each camera left *in-situ* for a minimum of 10 days.
Nest Box inspections	A series of nest boxes are to be installed across the Moolarben Coal Complex area. These will each requirea one-off inspection to check for use and if possible identify what species are using them.	Inspect nest box established inrehabilitation areas.
Bat detection	Anabat recordings to identify microbats.	Two at each site over two nights.
Bird survey	Timed, fixed area surveys for diurnal birds, observingand listening (consistent with Birdlife Australia standard survey methodology).	20-minute observation at each site.
Herpetological searches	Direct searches for reptiles, scanning surfaces, rollinglogs and rocks and raking leaf litter.	0.5 hours searching at each site.
Dam Inspection – permanent water storage features	Dams and waterways will be inspected for frogs, once by day and once by night.	Effort will be dependent on the extentof the habitat.
Habitat assessment	Assessment of fauna habitat values and signs (scats,scratches, diggings, etc.) at each site using standardised pro-forma.	One survey will be completed at eachsite based on the methodology as described in other sections of this RMP.
Impact/damage caused by feral animals	GIS data and photos of scratching's, location of scats,warrens, browsing damage to seedlings etc.	To be undertaken concurrently withother components of the field work.
Opportunistic observations	All opportunistic observations of fauna will be recorded.	To be undertaken concurrently withother components of the

		field work.

The timing for the fauna component of the monitoring program is outlined in **Table 25**.

Table 25: Fauna Monitoring Program Timing

Fauna	Monitoring Program Timing
Diurnal birds	Spring (October/November)
Nocturnal birds	Spring (October/November)
Mammals	Spring (October/November)
Bats	Spring (October/November)
Reptiles	Spring to Summer (November to March)
Amphibians	Late Spring (November)

Fauna monitoring techniques will be:

- Consistent with industry standards
- Scientifically robust (methodology will be repeatable)
- Compliant with legislation regarding animal ethics and welfare
- Safe for operators and site staff
- Cost effective for collecting data appropriate for monitoring needs.

8.2.5 Rehabilitation Monitoring Records

Active Mining Records

MCO will maintain active records related to processes that may impact upon rehabilitation of the site. These will provide the basis for interpretation of later rehabilitation monitoring outcomes.

Records to be maintained include the following:

- Detailed rehabilitation procedures
- Register of contaminated sites
- Records of production wastes and other waste streams and where they are located on site
- Environmental monitoring records, including surface and groundwater quality
- A topsoil and/or soil substitute stockpile register which includes the date stockpiles were formed, maintenance works undertaken (e.g., weed control, planting with native legumes to maintain microbes etc.), and amelioration prior to re-use; and
- Environmental incident records.

Rehabilitation Methodology Records

MCO will also record the details of each rehabilitation campaign (including mapping) to provide context for rehabilitation monitoring results and assist the continuous improvement process. The key monitoring parameters to be included in the program are:

- Landform design details
- Drainage design details

- Substrate geology (i.e., geology of overburden directly below topsoil)
- Site preparation techniques (e.g., topsoil and source, time of sowing, soil ameliorants used)
- Revegetation methodologies (e.g., rate and type of fertiliser, cover crop species, seeding rates, native seed viability, native seed sources/location, seedling sources, revegetation contractors)
- Weather conditions
- Photographic records; and
- Initial follow-up care and maintenance works and any ongoing maintenance works required.

8.3 MEASURING PERFORMANCE AGAINST REHABILIATATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

The combination of monitoring methodologies described in **Section** Error! Reference source not found. allows the site to be assessed over time to:

- Measure the progress and success of the rehabilitation program against performance indicators and completion criteria
- Inform the continuous improvement process and refine rehabilitation methodologies and completion criteria
- Identify when rehabilitation is not trending toward completion criteria in an appropriate timeframe, triggering adaptive management.

8.3.1 Annual rehabilitation walkover inspections

The annual rehabilitation walkover inspection provides a general assessment on rehabilitation health and potential emerging issues that require maintenance. The walkover inspection does not review rehabilitation areas against the completion criteria but provides management recommendations to assist the rehabilitation in moving towards the criteria (such as presence of weeds, erosion, poor growth rates).

8.3.2 Initial establishment rehabilitation monitoring

The initial establishment monitoring is a rapid style assessment of young (≤ 3 years old) rehabilitated areas, principally to determine germination success, presence of weeds and landform stability. Monitoring initial establishment provides early indicators on the progression towards meeting completion criteria.

8.3.3 Long term rehabilitation monitoring

The long-term rehabilitation monitoring program utilises biometric monitoring to compare rehabilitation areas (≥ 4 years old) with the targeted analogue vegetation communities. The objective of the long-term monitoring is to evaluate progress of the rehabilitation towards meeting the completion criteria and targeted post-mining land use. The methods described for long term rehabilitation monitoring apply to both rehabilitation and reference monitoring sites, to enable valid comparisons to be made.

The results of monitoring campaigns will be submitted as part of annual rehabilitation reporting requirements, including for the Annual Review and Annual Rehabilitation Report.

9.0 REHABILITATION RESEARCH, MODELLING AND TRIALS

9.1 CURRENT REHABILITATION RESEARCH, MODELLING AND TRIALS

Investigations into the suitability/effectiveness of using tuffaceous claystone material (contained in the coal seam profile) to assist with the re-establishment of Box Gum Woodland communities at the MCC have been previously undertaken. The investigation found the material in its present form, is considered to not be comparable to 'topsoil materials' at MCO. Potentially the fine textured materials could be converted into a primary growth media by further addition of organic matter and fertiliser (Landloch 2019).

9.2 FUTURE REHABILITATION RESEARCH, MODELLING AND TRIALS

Rehabilitation trials and studies will be undertaken to refine the rehabilitation methodologies and validate rehabilitation performance indicators and completion criteria as required.

In 2025 MCO plan to undertake some thinning trials of canopy species in more established areas of the OC1 rehabilitation.

Further landform stability modelling will be undertaken to determine the scope (if any) of management/maintenance requirements that me be required to address potential erosion or settlement.

Investigations into suitable rock mulch / topsoil ratios for application on steep slopes to ensure stability of growth medium will be undertaken as rehabilitation progresses on steeper slope areas.

The outcomes of any future rehabilitation trials will be reported in the MCC Annual Reviews and Annual Rehabilitation Reports.

10.0 INTERVENTION AND ADAPTIVE MANAGEMENT PLAN

Rehabilitation monitoring results will be assessed annually to identify if rehabilitation is trending towards the preliminary completion criteria. In the event that rehabilitation monitoring results indicate a significant risk of rehabilitation failure, MCO will respond with a series of actions to investigate the cause(s) for the unsatisfactory rehabilitation performance and take any corrective steps necessary. Monitoring results will be used to refine rehabilitation methodology (if appropriate) in the continual improvement process.

Where rehabilitation monitoring results indicate the potential for rehabilitation failure, MCO will undertake a review of all site monitoring data to determine the extent and causes of the unsatisfactory performance. MCO will review the rehabilitation monitoring results, active mining records (including weather records) and rehabilitation establishment methodology records to identify possible relationships between rehabilitation monitoring results, site conditions and rehabilitation practices.

Site Investigations

Additional site investigations may be required if the contributing factors, and extent of rehabilitation failure are not clearly understood using the annual rehabilitation monitoring results. The scope of any additional site investigations should be adequate to:

- Define the areas where rehabilitation results are not satisfactory
- Identify specific site characteristics (such as topsoil and subsoil geochemical properties) that may be contributing to rehabilitation underperformance; and
- Develop recommendations for site-specific management and mitigation actions or more broad amendments to rehabilitation methodologies.

Management and Mitigation Responses

Following site investigations, MCO will undertake appropriate management actions to mitigate the identified contributing factors. Mitigation measures may include:

- Weed or feral animal control works to improve vegetation survival
- Additional soil amelioration to improve vegetation establishment
- Implementing additional erosion and sediment controls to minimise erosion.

Following implementation of mitigation measures, MCO may undertake remedial works (such as remedial earthworks to regrade rills and gullies) or repeat rehabilitation works such as re-seeding/re-planting areas.

MCO has developed a Rehabilitation Trigger Action Response Plan (TARP) to provide a framework to manage potential risks to rehabilitation. The Rehabilitation TARP includes:

- Identification of the principal contributing factors and impacts for each major risk to rehabilitation
- Identification of upper limits (trigger values) for causes and impacts that are considered to represent an unacceptable level of risk
- Identification of appropriate responses to mitigate or remediate the causes and impacts, including a notification protocol.

The Rehabilitation TARP provides management responses for lower (first tier) and upper (second tier) trigger values. First tier trigger values identify opportunities for closer monitoring or early intervention that may mitigate potential issues before notable impacts to rehabilitation occur. Second tier trigger values identify when indicators have reached a threshold that requires more substantial remedial actions to remediate or mitigate rehabilitation failure.

Should any trigger conditions be met resulting in the requirement for intervention or adaptive management, actions will be reported in the Annual Review and Annual Rehabilitation Report.

The Rehabilitation TARP is provided in **Table 26**.

Table 26: Trigger Action Response Plans at MCO

Aspect/ Category	Item	Element	Trigger	Action/Response
Landform Stability	1	Water Management Structures	Water management structures (sediment dams, channels, contour banks) erosion &/or scouring	Tier 1 - An inspection of the site will be undertaken by a suitably trained person. Undertake remedial actions such as amelioration, revegetation or alternative scour protection as required. Tier 2 - For significant failures or repeat minor failures conduct review of design criteria and construction standards.
	2	Conventional Landform Slope Gradient	Overall slopes > 14 degrees unless otherwise agreed.	Undertake a review of the landform design, including survey if required. Undertake re-grading, surface treatment and revegetation of the area, if required. Note that localised steepening of slopes will occur due to contour bank construction where required.
	3	Conventional Landform Slope Gradient – Low Walls into voids	Overall slopes > 18 degrees unless otherwise agreed.	Undertake a review of the landform design, including survey if required. Undertake re-grading, surface treatment and revegetation of the area, if required.
	4	Micro-Relief and Geofluv Landform Slope Gradient	Active rill/gully erosion	Tier 1 - Undertake a review of the landform design, including survey if required. Undertake re-grading, surface treatment and revegetation of the area, if required. Tier 2 - For widespread erosion activity review methods for erosion risk assessment and control measures.
	5	Micro-Relief and Geofluv Landform Drainage Lines	Drainage line erosion &/or scouring	Tier 1 – An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as amelioration, revegetation or alternative scour protection as required. Tier 2 - For significant failures or repeat minor failures conduct review of design criteria or construction standards.
	6	Batter Slopes – Final Void	Failure of final void batter slopes	Undertake a review of final void design, including survey if required. Undertake remedial blasting and/or regrading of the area if required.

Aspect/ Category	Item	Element	Trigger	Action/Response
Spontaneous Combustion		Carbonaceous Material on Surface of Rehabilitation	Active spontaneous combustion within rehabilitation areas.	Tier 1 – An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as extinguishment by watering, capping with inert material or excavation and removal as required. Tier 2 – for widespread spontaneous combustion activity review management measures for carbonaceous material.
		Exposed Coal Seams	Active spontaneous combustion from exposed coal seams	Tier 1 – An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as extinguishment by watering, capping with inert material or excavation and removal as required. Tier 2 – for widespread spontaneous combustion activity review management measures for managing exposed coal seams.
Growth Medium Suitability		Chemical and Nutritional Properties	Soil properties atypical for the surrounding landscape &/or outside desirable ranges for the growth of native vegetation and agricultural pastures.	Engage a consultant to recommend appropriate soil/spoil amelioration. Undertake amelioration and revegetation in accordance with the consultant recommendations as required.
		Growth Medium Depth	Soil depth (topsoil and ameliorates) is less than adequate in areas in the Growth Medium Development phase.	Tier 1 - Top dress with additional suitable topsoil resource and /or ameliorants if required. Tier 2 - For repeat topsoil thickness issues conduct review of topsoil placement procedures and operational practices.
Vegetation Establishment		Weed Levels	>15% High Threat Exotic (HTE) cover Ecosystem Establishment phase.	Engage land management contractor to control HTE's using methods such as removal, biological control, herbicide application and/or slashing. Treatment of infestations as appropriate to the species. Conduct follow-up inspections to assess the effectiveness of weed management measures.
		Bushfire Resilience	Rehabilitation areas not able to recover in a reasonable time from effects of bushfire.	Tier 1 - An inspection of the site will be undertaken by a suitably trained person. Undertake remedial actions such as re-seeding affected area as required.

Aspect/ Category	Item	Element	Trigger	Action/Response
				Tier 2 - Review bushfire management plan and procedures particularly with a view to protecting young rehabilitation areas.
		Uncontrolled Entry of Livestock or Vehicles	Damage to vegetation caused by uncontrolled access by livestock or vehicles.	An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as fence installation or repairs, maintaining access tracks and sign posting.
		Understorey Species Diversity	Understorey species diversity not trending towards completion criteria.	Tier 1 - An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as controlled burning, soil amelioration and reseeding as required. Tier 2 - For widespread low understorey diversity review seed mix understorey species composition and seeding rates. Review monitoring results to determine rates of successful establishment for various understorey species in seed mixes.
		Tree and Shrub Species Diversity	Tree and shrub species diversity not trending towards completion criteria.	Tier 1 - An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as cultivation or spraying to reduce grass competition, reseeding and fertilising as required. Tier 2 - For widespread low tree and shrub diversity review seed mix tree/shrub species composition and seeding rates. Review monitoring results to determine rates of successful establishment for various tree/shrub species in seed mixes.
		Tree Density	Tree density is not trending towards completion criteria.	Tier 1 - An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as reseeding (for low density) and thinning (for high density) as required. Tier 2 - For widespread tree density outside analogue site ranges: Review seed mix tree species composition and seeding rates. Review monitoring results to determine rates of successful establishment for various tree species in seed mixes. Review seed bed preparation, weed/grass control and sowing procedures.

Aspect/ Category	Item	Element	Trigger	Action/Response
		Ground cover	Total ground cover <70% during ecosystem establishment phase	Tier 1 - An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as soil amelioration, soil aeration and reseeding as required. Tier 2 – For widespread low results for total ground cover review seed mixes and seeding rates.
		Vertebrate Pest Levels	Vertebrate pest species is increasing in monitoring events or causing significant damage to rehabilitation.	Consult with relevant stakeholders (including LLS) to develop and implement appropriate vertebrate pest control programme.
Fauna Recolonisation	14	Habitat for Native fauna species – fallen logs and ground timber	No ground timber habitat present for native fauna species	An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as introducing additional fallen timber (consider pruning or thinning standing trees) or rock as required.
		Habitat - hollows	No tree hollow habitat present for native fauna species	An inspection of the site will be undertaken by a suitably qualified person. Undertake remedial actions such as introducing stag trees or nest boxes as required.

11.0 REVIEW, REVISION, AND IMPLEMENTATION

11.1 REVIEW

In accordance with Clause 11 of Schedule 8A to the Mining Regulation 2016, Moolarben Coal Operations will amend this RMP in the following circumstances:

- an amendment has been made to the rehabilitation objectives, rehabilitation completion criteria or final landform and rehabilitation plan
- changes to the risks, risk control measures or rehabilitation strategies identified during the completion of the rehabilitation risk assessment or additional investigations
- whenever directed in writing to do so by the RR Secretary
- If necessary, within three months of:
    - The submission of an annual review
    - The submission of an incident report
    - The submission of an audit report
    - Any modification of PA 05_0117 or PA 08_0135

11.2 IMPLEMENTATION

The process for ensuring that mining and rehabilitation are conducted in accordance with the RMP is the preparation and implementation of an Annual Rehabilitation Report and Forward Program. The Annual Rehabilitation Report and Forward Program are prepared and managed by the MCO Environment and Community Manager, with approval by the Mine Manager.

11.3 REPORTING

The following documents will be made publicly available on the MCO website (https://www.yancoal.com.au/our-sites/moolarben/):

- The RMP (this Plan)
- The Annual Review
- The Annual Rehabilitation Report and Forward Program

The Annual Review, which is submitted to relevant government agencies, reports on the following information relating to rehabilitation:

- A summary of rehabilitation activities undertaken for the year
- Results of annual rehabilitation monitoring and inspections
- Any TARP triggers and management actions undertaken
- Progress against the projected rehabilitation forecast in the previous years Annual Review

The Annual Rehabilitation Report and Forward Programs are prepared annually and report on:

- Description of the rehabilitation undertaken during the annual reporting period
- Progress made through the phases of rehabilitation provided for in the Forward Program
- A schedule of mining and rehabilitation activities for the next three-year period
- A summary of spatial progression of rehabilitation through its various phases for the next three years.

11.4 ROLES AND RESPONSIBILITIES

MCO personnel responsible for the monitoring, review and implementation of this RMP are listed in in **Table 27**.

Table 27: Rehabilitation Implementation Responsibilities

Role	Responsibilities
General Manager	Take overall leadership and responsibility for compliance with all environmental approvals.
	Provide adequate resourcing (personnel and financial) to enable full implementation of the RMP.
	Approve subsequent revisions of the RMP.
Environment and Community Manager	Report any land related incidents in accordance with legal requirements.
	Identify rehabilitation risks and budget for sufficient resources to effectively manage those risks.
	Effectively implement the GDP and VCP procedures.
	Provide training to all employees and contractors in environmental awareness, legal responsibilities and MCO's rehabilitation requirements.
	Restrict access to rehabilitation areas.
	Oversee communication of conditions of approval to relevant site personnel and contractors.
	Oversee implementation of the RMP.
	Oversee all regulatory reporting in relation to the RMP.
	Oversee relevant reviews of the RMP.
Environment and Community Superintendent	Oversee all monitoring in relation to the RMP.
	Evaluate results of monitoring programs and longer trends and where appropriate, advise the Environmental and Community Manager of changes to management measures and controls
	Approve GDPs.
	Coordinate progressive site rehabilitation as final landforms become available.
	Coordinate topsoil management strategies.
	Coordinate all regulatory reporting in relation to the RMP.
	Coordinate relevant reviews of the RMP.
Environmental and Community Advisor(s)	Coordinate implementation of the RMP.
	Coordinate regulatory reporting and monitoring reporting in relation to the RMP.
	Check GDPs are effectively completed by relevant site personnel or contractors and approved by the Environmental and Community Manager or delegate prior to surface disturbance.
	Coordinate internal reporting on the performance of rehabilitation.
	Coordinate pre-clearance surveys.
	Coordinate implementation of fauna impact mitigation actions.
	Coordinate native seed collection and planting.

Role	Responsibilities
	Coordinate monitoring of rehabilitation and regeneration areas.
	Coordinate weed and pest control for rehabilitation areas (where required).
Open Cut Technical Services Manager	Oversee planning and scheduling of clearing, topsoil stripping, and topsoil stockpiling
	Develop dumping strategies to allow for progressive rehabilitation of mined land.
	Implement the procedures reference in the RMP
OC Mine Manger	Implement the procedures reference in the RMP
	Provide resources required and support to implement these procedures
	Oversee overburden placement and reshaping design.
	Oversee clearing, topsoil stripping, and topsoil stockpiling and habitat/resource salvage
	Oversee implementation of landform shaping and establishment
	Oversee topsoil placement
Project Manager	Delineate areas to be cleared/disturbed.
	Initiate GDP approval process.
	Implement VCP procedure.
	Implement fauna habitat salvage strategies.
	Implement topsoil management strategies.

12.0 REFERENCES

Australian and New Zealand Minerals and Energy Council and the Minerals Council of Australia (2000) The Strategic Framework for Mine Closure.

Breed, M.F., Stead, M.G., Ottewell, K.M., Gardner, M.G., and Lowe, A.J. (2012) Which provenance and where? Seed sourcing strategies for revegetation in a changing environment. Conservation Genetics (2013) 14:1-10.

Burrows, G.E (1999) A survey of 25 remnant vegetation sites in the South Western Slopes, New South Wales. Cunninghamia 6: 283– 314.

Commonwealth Department of Industry, Tourism and Resources (2016a) Leading Practice Sustainable Development Program for the Mining Industry – Mine Rehabilitation.

Commonwealth Department of Industry, Tourism and Resources (2016b) Leading Practice Sustainable Development Program for the Mining Industry – Mine Closure and Completion.

Cumberland Ecology (2011) Moolarben Coal Project Stage 2 Biodiversity Offset Strategy.

Department of Environment and Climate Change (2008) Managing Urban Stormwater – Soils and Construction Volume 2.

Department of Environment, Climate Change and Water NSW (2010) National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland - Draft for public comment, March 2010.

Department of Mineral Resources (2007) Guidelines for Mine Closure and Lease Relinquishment.

Department of Primary Industries (2009) Saving soil – A landholder's guide to preventing and repairing soil erosion. NSW Department of Primary Industries, Northern Rivers Catchment Management Authority.

Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (2013) ESG3: Mining Operations Plan (MOP) Guidelines September 2013.

Department of Trade and Investment, Regional Infrastructure and Services Mine Safety Operations (2012) Mine Design Guideline 6001 Guideline for the Permanent Filling and Capping of Surface Entries to Coal Seams.

Eamus, D., Froend, R., Loomes, R., Hosea, G., and Murray, B. (2006) A functional methodology for determining the groundwater regime needed to maintain the health of groundwater-dependent vegetation. Australian Journal of Botany, 54, 97–114.

EcoLogical Australia (2015a) MCO OC4 South-West Modification Flora and Fauna Impact Assessment.
EcoLogical Australia (2015b) Moolarben Coal Complex – UG1 Optimisation Modification Flora and Fauna Impact Assessment.

EcoLogical Australia (2017) Moolarben Coal Complex Open Cut Optimisation Modification Biodiversity Assessment Review and Biodiversity Offset Strategy.

Ecovision Consulting (2008) Ecological Impact Assessment – Stage 2 of the Moolarben Coal Project.

Ecovision Consulting (2009) Ecological Impact Assessment – Northern Borefield Stage 1 of the Moolarben Coal Project.

EMGA Mitchell McLennan (2013a) Ecological Assessment – Moolarben Coal Project Stage 1 Optimisation Modification.

EMGA Mitchell McLennan (2013b) Moolarben Coal Project Stage 1 Optimisation Modification Environmental Assessment.

Florabank (2000) Flora Bank Guidelines 1-10.

Hannan, J.C. (1995) Mine Rehabilitation: a handbook for the coal mining industry, 2nd edn, NSW Coal Association, Sydney.

HMS Consultants Australia Pty Ltd (2012a) Moolarben Coal Operations Pty Ltd Review of Broad Brush Risk Assessment.

HMS Consultants Australia Pty Ltd (2012b) Coal Handling Preparation Plant Broad Brush Risk Assessment.

JAMMEL Environmental & Planning Services Pty Ltd (2006) Moolarben Coal Project Appendix 9 Soil, Rural Land Capability and Agricultural Suitability Assessment

JAMMEL Environmental & Planning Services Pty Ltd (2008) Moolarben Coal Project Stage 2 Appendix 11 Stage 2 Soil, Rural Land Capability and Agricultural Suitability Assessment.

Keith (2004) Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT. NSW Department of Environment and Conservation. Hurstville, NSW.

Landcom (2004) Managing Urban Stormwater – Soils and Construction Volume 1.

Mine Subsidence Engineering Consultants (2011) Moolarben Coal Project Stage 2 Preferred Project Report Subsidence Impact Assessment.

Mine Subsidence Engineering Consultants (2015) Moolarben Coal Complex UG1 Optimisation Modification Subsidence Assessment.

Moolarben Biota (2006) Moolarben Coal Project Flora, Fauna and Aquatic Ecology Assessment.

Moolarben Coal Mines Pty Limited (2006) Moolarben Coal Project Environmental Assessment Report.

Moolarben Coal Mines Pty Limited (2011) Rehabilitation Strategy – Moolarben Coal Project Stage 2 Preferred Project Report.

Moolarben Coal Mines Pty Limited (2012) Moolarben Coal Project Stage 2 Preferred Project Report.

Moolarben Coal Mines Pty Ltd (2017) Moolarben Coal Complex UG1 Longwalls 101 to 103 Extraction Plan.

Murphy, B.W and Lawrie, J.M (1998) Landscapes of Dubbo 1:250,000 Sheet.

Office of Environment and Heritage (2014), Framework for Biodiversity Assessment, NSW Biodiversity Offsets Policy for Major Projects. Office of Environment and Heritage for the NSW Government. Sydney, NSW.

Pitt & Sherry (2019) Independent Environmental Audit – Moolarben Coal Project

Rutherford, J (2000) A rehabilitation manual for Australian streams. Cooperative Research Centre for Catchment Hydrology.

Tongway, D. and Ludwig, J. (2011) Restoring Disturbed Landscapes: Putting Principles into Practice.

Island Press, Washington and Society for Ecological Restoration International.

Wells Environmental Services (2006) Moolarben Coal Project Environmental Assessment Report.

Wells Environmental Services and Coffey Natural Systems (2009) Moolarben Coal Project Stage 2 Environmental Assessment Report.

Worley Parsons (2011) Moolarben Coal Project Stage 2 PPR Concept Design for Proposed Diversions of Murragamba & Eastern Creeks.

APPENDIX A – LAND OWNERSHIP TABLE

Lot/Deposited Plan	Land Ownership	Land Tenure	Overlapping Lease
1//1214133	Yancoal	Freehold	ML1605
1//182395	Ulan Coal Mines Limited	Freehold	
44//736630	Ulan Coal Mines Limited	Freehold	
1//1069300	Ulan Coal Mines Limited	Freehold	
2//1237411	Crown		
88//755442	Yancoal	Freehold	
152//755442	Crown		ML1691
290//704098	Crown		
65//755442	Yancoal	Freehold	
4//575167	Yancoal	Freehold	
51//755442	Yancoal	Freehold	
64//755442	Yancoal	Freehold	
96//755454	Yancoal	Freehold	ML1715, ML1691
248//755442	Yancoal	Freehold	ML1691
229//755442	Yancoal	Freehold	ML1691
125//755442	Yancoal	Freehold	ML1691
139//755442	Yancoal	Freehold	
98//755442	Yancoal	Freehold	ML1691
91//755442	Yancoal	Freehold	ML1606
42//755454	Yancoal	Freehold	ML1715
19//755442	Yancoal	Freehold	ML1691
170//755442	Yancoal	Freehold	ML1691
44//755442	Yancoal	Freehold	ML1691
62//755442	Yancoal	Freehold	ML1691
74//755442	Yancoal	Freehold	
157//755442	Yancoal	Freehold	ML1691
204//755442	Yancoal Interest - Crown		ML1691
223//755442	Yancoal	Freehold	ML1715, ML1691
61//755454	Yancoal	Freehold	ML1715
228//755442	Yancoal	Freehold	ML1691
4//115031	Yancoal	Freehold	
45//755442	Yancoal	Freehold	ML1691
40//755442	Yancoal	Freehold	ML1691
234//755442	Yancoal	Freehold	ML1715, ML1691
53//755442	Yancoal	Freehold	ML1691
172//755442	Yancoal	Freehold	ML1691
37//755442	Yancoal	Freehold	ML1691
203//755442	Yancoal	Freehold	
193//755442	Yancoal	Freehold	ML1691

Lot/Deposited Plan	Land Ownership	Land Tenure	Overlapping Lease
17//755442	Yancoal	Freehold	ML1691
167//755442	Yancoal	Freehold	ML1691
3//115031	Yancoal	Freehold	
89//755442	Yancoal	Freehold	ML1691
242//755442	Yancoal	Freehold	ML1628
7009//1025321	Yancoal Interest - Crown		ML1691
110//755442	Yancoal	Freehold	ML1691
205//755442	Yancoal	Freehold	
16//755442	Yancoal	Freehold	ML1691
1//115031	Yancoal	Freehold	ML1691
18//755442	Yancoal	Freehold	ML1691
2//115031	Yancoal	Freehold	ML1691
140//755442	Yancoal	Freehold	ML1691
91//755454	Yancoal	Freehold	ML1715
113//755454	Yancoal	Freehold	ML1715
6//115031	Yancoal	Freehold	ML1691
218//755442	Yancoal	Freehold	ML1715, ML1691
145//755442	Yancoal	Freehold	ML1691
109//755442	Yancoal	Freehold	ML1691
102//755442	Yancoal	Freehold	ML1691
176//755442	Yancoal Interest - Crown		ML1691
36//755442	Yancoal	Freehold	
146//755442	Yancoal	Freehold	ML1691
52//755442	Yancoal	Freehold	ML1691
260//755442	Yancoal	Freehold	ML1691
238//755442	Yancoal	Freehold	ML1691
183//755442	Yancoal	Freehold	ML1691
261//755442	Yancoal	Freehold	ML1691
54//755442	Yancoal	Freehold	
63//755442	Yancoal	Freehold	ML1691
192//755442	Yancoal	Freehold	ML1691
7//755442	Yancoal	Freehold	
1//575167	Yancoal	Freehold	
99//755454	Yancoal	Freehold	ML1715
105//755454	Yancoal	Freehold	ML1715
1//803204	Yancoal	Freehold	ML1691
28//755454	Yancoal	Freehold	ML1715
36//755454	Yancoal	Freehold	ML1715
80//755454	Yancoal	Freehold	ML1715
60//755442	Yancoal	Freehold	ML1691
65//755454	Yancoal	Freehold	ML1715

Lot/Deposited Plan	Land Ownership	Land Tenure	Overlapping Lease
3//206588	Ulan Coal Mines Limited	Freehold	
2//755454	Yancoal	Freehold	ML1715
8//755454	Yancoal	Freehold	ML1715
57//755454	Yancoal	Freehold	ML1715
75//755454	Yancoal	Freehold	ML1715
1//755454	Yancoal	Freehold	ML1715
99//755442	Yancoal	Freehold	
33//755454	Yancoal	Freehold	ML1715
79//755454	Yancoal	Freehold	ML1715
54//755454	Yancoal	Freehold	ML1715
12//755454	Wilpinjong Coal Mine		
38//755454	Yancoal	Freehold	ML1715
272//755442	Yancoal	Freehold	ML1628
82//755454	Yancoal	Freehold	ML1715
7//755454	Yancoal	Freehold	ML1715
119//755442	Yancoal	Freehold	ML1691
92//755454	Yancoal	Freehold	ML1715
41//755454	Yancoal	Freehold	ML1715
97//755454	Yancoal	Freehold	ML1715
277//755442	Yancoal	Freehold	ML1606
61//755442	Yancoal	Freehold	ML1691
76//755454	Yancoal	Freehold	ML1715
289//704098	Yancoal	Freehold	
1//206588	Ulan Coal Mines Limited	Freehold	
4//206588	Ulan Coal Mines Limited	Freehold	
119//724657	Crown		
86//755454	Yancoal	Mineral	ML1715
262//755442	Yancoal	Freehold	ML1691, ML1715
95//755442	Yancoal	Freehold	ML1691
2//206588	Ulan Coal Mines Limited	Freehold	ML1628
117//705226	Yancoal	Freehold	ML1715
71//755454	Yancoal	Freehold	ML1715
116//705226	Crown		ML1715
6//206588	Ulan Coal Mines Limited	Freehold	
93//755454	Yancoal	Freehold	ML1715, ML1691
58//755454	Yancoal	Freehold	ML1715
53//755454	Yancoal	Freehold	ML1715
253//755442	Yancoal	Freehold	ML1628, ML1715
63//755454	Yancoal	Freehold	ML1715
30//755454	Yancoal	Freehold	

Lot/Deposited Plan	Land Ownership	Land Tenure	Overlapping Lease
32//633148	Yancoal	Freehold	
43//755454	Yancoal Interest - Crown		ML1715
90//755454	Yancoal	Freehold	ML1715
34//755454	Yancoal	Freehold	ML1715
7010//1025345	Crown		ML1628
92//755442	Yancoal	Freehold	ML1606
50//755442	Yancoal	Freehold	
77//755454	Yancoal	Freehold	ML1715
40//755454	Yancoal	Freehold	ML1715
62//755454	Yancoal	Freehold	ML1715
85//755454	Yancoal	Mineral	ML1715
29//755454	Yancoal	Freehold	ML1715
8//626648	Yancoal	Freehold	
7//206588	Ulan Coal Mines Limited	Freehold	
5//206588	Ulan Coal Mines Limited	Freehold	
120//724656	Yancoal	Freehold	ML1715
93//755442	Yancoal	Freehold	ML1715, ML1691
4//755454	Yancoal	Freehold	ML1715
74//755454	Yancoal	Freehold	ML1715
107//755454	Yancoal	Freehold	ML1715
21//755454	Yancoal	Freehold	ML1715
112//755454	Yancoal	Freehold	ML1715, ML1691
50//755454	Yancoal	Freehold	ML1715
123//724655	Crown		
1//1089166	Yancoal	Freehold	ML1628
1//1099037	Yancoal	Freehold	ML1606
2//1143354	Yancoal	Freehold	ML1715
44//755454	Yancoal Interest - Crown		ML1715
179//755442	Yancoal	Freehold	ML1606
121//724656	Crown		
118//724657	Yancoal	Freehold	
5//750773	Ulan Coal Mines Limited	Freehold	
2//722882	Yancoal	Freehold	ML1715
56//722795	Crown		
20//755439	Yancoal	Freehold	ML1605
33//755439	Crown		
2//750773	Ulan Coal Mines Limited	Freehold	
55//722794	Crown		
75//750773	Ulan Coal Mines Limited	Freehold	
45//736630	Yancoal	Freehold	ML1605
26//755439	Privately Owned	Freehold	

Lot/Deposited Plan	Land Ownership	Land Tenure	Overlapping Lease
1//720334	Ulan Coal Mines Limited	Freehold	
1//720332	Ulan Coal Mines Limited	Freehold	
1//750773	Ulan Coal Mines Limited	Freehold	
7005//1096180	Crown		ML1605
7004//1116207	Crown		ML1605
7302//1143562	Crown		
7303//1143562	Crown		
5//878678	Yancoal	Freehold	ML1715
13//1152406	Yancoal	Freehold	ML16036, ML1715
178//755442	Yancoal	Freehold	ML1606
16//1140073	Yancoal	Local Government Authority	ML1606
1//722881	Yancoal	Freehold	ML1606
3//722880	Ulan Coal Mines Limited	Freehold	
2//722880	Ulan Coal Mines Limited	Freehold	
2//182395	Ulan Coal Mines Limited	Freehold	
4//182395	Ulan Coal Mines Limited	Freehold	
3//182395	Ulan Coal Mines Limited	Freehold	
292//719007	Crown		
2//432146	Ulan Coal Mines Limited	Freehold	
95//755454	Yancoal	Freehold	ML1715
78//755454	Yancoal	Freehold	ML1715
106//755454	Yancoal	Freehold	ML1715
4//1214133	Ulan Coal Mines Limited	Freehold	
34//755439	Crown		
1//1246895	Yancoal		ML1691
2//1246895	Yancoal		
1//817487	Yancoal	Freehold	ML1715
3//722882	Yancoal	Freehold	ML1715
17//1140073	Yancoal	Local Government Authority	ML1715
20//1140073	Yancoal	Local Government Authority	ML1715
3//1214133	Yancoal	Freehold	ML1606
2//1246858	Yancoal	Freehold	ML1605, ML1715
5//1246858	Yancoal	Freehold	ML1715
8//1246858	Yancoal	Freehold	ML1715
9//1246858	Yancoal	Freehold	ML1715
11//1246858	Yancoal	Freehold	ML1715
6//878678	Yancoal	Freehold	ML1715
7//878678	Yancoal	Freehold	ML1715

Lot/Deposited Plan	Land Ownership	Land Tenure	Overlapping Lease
208//755442	Yancoal	Freehold	
2//1023568	Yancoal	Freehold	ML1715
1//1023568	Yancoal	Freehold	ML1715
43//736630	Crown		
2//1214133	Ulan Coal Mines Limited	Freehold	
1//1237411	Crown		
1//1246858	Yancoal	Freehold	ML1715
4//1246858	Yancoal	Freehold	ML1715
108//755442	Yancoal	Freehold	
107//755442	Yancoal	Freehold	
7008//1128119	Crown		
7009//1128119	Crown		
32//755454	Yancoal	Freehold	ML1715
Munghorn Gap Nature Reserve	Nature Reserve		
	Yancoal Interest - Crown	Crown	ML1715
4226 - 2125 R	Yancoal Interest - Crown	Crown	ML1605
	Yancoal Interest - Crown	Crown	ML1715
31//755439	Yancoal Interest - Crown		ML1628
UNIDENTIFIED	Yancoal Interest - Crown		ML1628
1//1266407	Yancoal	Freehold	ML1715
2//1266407	Yancoal	Freehold	
3//1266407	Yancoal	Freehold	
5//1266407	Yancoal	Freehold	
6//1266407	Yancoal	Freehold	
4//1266407	Yancoal	Freehold	ML1715
5//1240416	Yancoal		ML1605
Goulburn River State Conservation Area	State Conservation Area		
Goulburn River National Park	National Park		

APPENDIX B – DRAFT COMPLETION CRITERIA

Rehabilitation Objective Category	Rehabilitation Objectives	Spatial Ref	Proposed Indicator	Proposed Completion Criteria	Proposed Validation Method
Agricultural revegetation	Land use capability is capable of supporting the target agricultural land use	B1	Land and soil capability classification/agricultural land classification is consistent with Environmental Assessments	Land and soil capability classification or agricultural land classification criteria is met	Rehabilitation monitoring report Independent agronomist/soil reports
Agricultural revegetation	Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.	B1	Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use.	For Grassland areas, groundcover targets: - 0-20% canopy - 70-100% groundcover	Rehabilitation monitoring report
Agricultural revegetation	Land use capability is capable of supporting the target agricultural land use	B3	Land and soil capability classification/agricultural land classification is consistent with Environmental Assessments	Land and soil capability classification or agricultural land classification criteria is met	Rehabilitation monitoring report Independent agronomist/soil reports
Agricultural revegetation	Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.	B3	Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use.	For Grassland areas, groundcover targets: - 0-20% canopy - 70-100% groundcover	Rehabilitation monitoring report
Agricultural revegetation	Land use capability is capable of supporting the target agricultural land use	B4	Land and soil capability classification/agricultural land classification is consistent with Environmental Assessments	Land and soil capability classification or agricultural land classification criteria is met	Rehabilitation monitoring report Independent agronomist/soil reports
Agricultural revegetation	Revegetation is sustainable for the long term and only requires maintenance that is consistent with the intended final land use.	B4	Revegetation is progressing towards a sustainable ecosystem and only requires maintenance that is consistent with the intended final land use.	For Grassland areas, groundcover targets: - 0-20% canopy - 70-100% groundcover	Rehabilitation monitoring report
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	A1	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	A3	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	A4	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	B1	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey

Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	B3	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	B4	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	D1	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	D3	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	D4	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	A7	NSW Rural Fire Service to provide comments on MCO's Bushfire Management Plan or the bushfire management plan has been developed using the relevant NSW Rural Fire Service guidelines.	Appropriate bushfire hazard controls (where required) have been implemented on the advice from the NSW Rural Fire Service.	Bushfire management inspection Records of fire trail maintenance and clearing of understorey
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Shrubby Woodland** found in the local area.	A1	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Sedimentary Ironbark Forest** found in the local area.	A1	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Shrubby Woodland** found in the local area.	A1	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Sedimentary Ironbark Forest** found in the local area.	A1	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Shrubby Woodland** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A1	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Sedimentary Ironbark Forest** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A1	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area and include specific species for the Regent Honeyeater.	A1	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area and include specific species for the Regent Honeyeater.	A1	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area.	A1	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area.	A1	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A1	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A1	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Sedimentary Ironbark Forest** found in the local area.	A3	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Shrubby Woodland** found in the local area.	A3	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Sedimentary Ironbark Forest** found in the local area.	A3	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Shrubby Woodland** found in the local area.	A3	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Sedimentary Ironbark Forest** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A3	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Shrubby Woodland** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A3	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area and include specific species for the Regent Honeyeater.	A3	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area and include specific species for the Regent Honeyeater.	A3	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area.	A3	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Box **Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area.	A3	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A3	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A3	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Shrubby Woodland** found in the local area.	A4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Sedimentary Ironbark Forest** found in the local area.	A4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Shrubby Woodland** found in the local area.	A4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Sedimentary Ironbark Forest** found in the local area.	A4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Shrubby Woodland** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Sedimentary Ironbark Forest** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association)** found in the local area and include specific species for the Regent Honeyeater	A4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area and include specific species for the Regent Honeyeater.	A4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area and include specific species for the Regent Honeyeater.	A4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area.	A4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association)** found in the local area.	A4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area.	A4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (White box-narrow leaved ironbark shrubby open forest on hills of the central Hunter Valley, Sydney Basin association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	A4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **Box Gum Shrubby Woodland** found in the local area.	A7	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Box Gum Shrubby Woodland** found in the local area.	A7	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of **Box Gum Shrubby Woodland** have been established to demonstrate the eco-system is self-sustainable.	A7	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of the **Riparian zone of Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area and include specific species for the Regent Honeyeater.	F4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of the **Riparian zone of Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area and include specific species for the Regent Honeyeater.	F4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species are characteristic of the target vegetation community when compared to the analogue sites.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Riparian **zone of the Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** found in the local area.	F4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the Riparian **zone of the Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** found in the local area.	F4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Cover, abundance and height range of native plants growth forms are characteristic of, or trending towards of the target vegetation community	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function of the **Riparian zone of the Box Gum Woodland (White box-yellow box grassy woodland on basalt slopes in the Upper Hunter Valley, Brigalow Belt South association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	F4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	Levels of ecosystem function of the **Riparian zone of the Box Gum Woodland (Blakely's red gum-yellow box grassy open forest or woodland on the New England Tablelands association)** vegetation have been established that demonstrate the rehabilitation is self-sustainable.	F4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **PCT1696** found in the local area.	D1	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species richness is ≥ 20.5 at year 10 post mining. ≥15% of the total number of trees are the regionally relevant species within koala FBA credit areas.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **PCT1696** found in the local area.	D1	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Native overstorey cover is between 3.75 and 80% at year 10 post mining operations. Native mid storey cover is between 1.25 and 40% at year 10 post mining operations. Native ground cover, grass is between 3 and 100% at year 10 post mining operations. Native ground cover, shrubs is between 0.5 and 20% at year 10 post mining operations. Native ground cover, other is between 2 and 80% at year 10 post mining operations. Total length of fallen logs (m) is 1.25 at year 10 post mining operations. Exotic plant cover is <45% at year 10 post mining operations. Overall Site Value Score (OEH,2015) (average of plots in vegetation zone) is ≥13.8 at 10 years post mining operations.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation of **PCT1696** is self-sustainable.	D1	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **PCT1696** found in the local area.	D3	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species richness is ≥ 20.5 at year 10 post mining. ≥15% of the total number of trees are the regionally relevant species within koala FBA credit areas.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **PCT1696** found in the local area.	D3	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Native overstorey cover is between 3.75 and 80% at year 10 post mining operations. Native mid storey cover is between 1.25 and 40% at year 10 post mining operations. Native ground cover, grass is between 3 and 100% at year 10 post mining operations.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

				Native ground cover, shrubs is between 0.5 and 20% at year 10 post mining operations. Native ground cover, other is between 2 and 80% at year 10 post mining operations. Total length of fallen logs (m) is 1.25 at year 10 post mining operations. Exotic plant cover is <45% at year 10 post mining operations. Overall Site Value Score (OEH,2015) (average of plots in vegetation zone) is ≥13.8 at 10 years post mining operations.	
Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation of **PCT1696** is self-sustainable.	D3	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **PCT618** found in the local area.	D4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species richness is ≥ 20.5 at year 10 post mining. ≥15% of the total number of trees are the regionally relevant species within koala FBA credit areas.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of **PCT1696** found in the local area.	D4	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species richness is ≥ 20.5 at year 10 post mining. ≥15% of the total number of trees are the regionally relevant species within koala FBA credit areas.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **PCT618** found in the local area.	D4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Native overstorey cover is between 3.75 and 80% at year 10 post mining operations. Native mid storey cover is between 1.25 and 40% at year 10 post mining operations. Native ground cover, grass is between 3 and 100% at year 10 post mining operations. Native ground cover, shrubs is between 0.5 and 20% at year 10 post mining operations. Native ground cover, other is between 2 and 80% at year 10 post mining operations. Total length of fallen logs (m) is 1.25 at year 10 post mining operations. Exotic plant cover is <45% at year 10 post mining operations. Overall Site Value Score (OEH,2015) (average of plots in vegetation zone) is ≥13.8 at 10 years post mining operations.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **PCT1696** found in the local area.	D4	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.	Native overstorey cover is between 3.75 and 80% at year 10 post mining operations. Native mid storey cover is between 1.25 and 40% at year 10 post mining operations. Native ground cover, grass is between 3 and 100% at year 10 post mining operations. Native ground cover, shrubs is between 0.5 and 20% at year 10 post mining operations. Native ground cover, other is between 2 and 80% at year 10 post mining operations. Total length of fallen logs (m) is 1.25 at year 10 post mining operations. Exotic plant cover is <45% at year 10 post mining operations. Overall Site Value Score (OEH,2015) (average of plots in vegetation zone) is ≥13.8 at 10 years post mining operations.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation of **PCT618** is self-sustainable.	D4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met

Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation of **PCT1696** is self-sustainable.	D4	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation composition of the rehabilitation contains species that are commensurate with native vegetation communities of the **Riparian variant of PCT1696** found in the local area.	D1	Native plant species recorded from 0.04-hectare fixed monitoring plots are characteristic of target vegetation community.	Native plant species richness is ≥ 20.5 at year 10 post mining. ≥15% of the total number of trees are the regionally relevant species within koala FBA credit areas.	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	The vegetation structure of the rehabilitation is similar to that of native vegetation communities of the **Riparian variant of PCT1696** found in the local area.	D1	Cover and abundance of plant growth forms recorded from 0.04-hectare fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data.		Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation of the **Riparian variant of PCT1696** is self-sustainable.	D1	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Rehabilitation monitoring report Photos Independent ecological reports that validate completion criteria have been met
Groundwater	Impacts to groundwater regime are within predicted drawdown range as per the development consents and environmental assessments.	A4	Groundwater quality both on and off the mining lease represent an acceptable level of change from a defined reference condition.	Groundwater levels, groundwater flow.	Independent hydrological assessment report. Groundwater monitoring program
Groundwater	Groundwater quality is within the range predicted in the relevant Moolarben environmental assessments and does not present a risk of environmental harm.	A4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000.	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and/or ANZECC guidelines for specific environment.	Independent hydrological assessment report. Groundwater monitoring program

Groundwater	Impacts to groundwater regime are within predicted drawdown range as per the development consents and environmental assessments.	B4	Groundwater quality both on and off the mining lease represent an acceptable level of change from a defined reference condition.	Groundwater levels, groundwater flow.	Independent hydrological assessment report. Groundwater monitoring program
Groundwater	Groundwater quality is within the range predicted in the relevant Moolarben environmental assessments and does not present a risk of environmental harm.	B4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000.	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and/or ANZECC guidelines for specific environment.	Independent hydrological assessment report. Groundwater monitoring program
Groundwater	Impacts to groundwater regime are within predicted drawdown range as per the development consents and environmental assessments.	J5	Groundwater quality both on and off the mining lease represent an acceptable level of change from a defined reference condition.	Groundwater levels, groundwater flow.	Independent hydrological assessment report. Groundwater monitoring program
Groundwater	Groundwater quality is within the range predicted in the relevant Moolarben environmental assessments and does not present a risk of environmental harm.	J5	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000.	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and/or ANZECC guidelines for specific environment.	Independent hydrological assessment report. Groundwater monitoring program
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	A1	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	A3	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.

Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	A4	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	A7	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	B1	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.

Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	B3	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	B4	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	D1	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.

Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	D3	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	D4	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Land contamination	There is no residual surface soil contamination on site as a result of mining operations, that is incompatible with the final land use or that poses a threat of environmental harm.	J5	Waste material and/or visible contamination areas on site surface. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	There are no visible signs of contamination following the removal of plant, equipment and materials. All rubbish/waste materials have been removed from site. Soil testing for contaminant of concern as listed by Health Investigation Level of the National Environment Protection (Assessment of Site Contamination) Measure (1999) applicable to land use type.	Statement provided and before/after photos Carbonaceous material dumping and capping strategy and records. Site inspection records Contamination remediation report prepared by land contamination consultant. Site contamination audit report and site audit statement prepared by EPA accredited auditor.
Landform stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.	B1	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structure are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion

			(tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landforms are safe, stable, non-polluting and drain to the natural environment	B1	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structure are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

Landform stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.	B3	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structure are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landforms are safe, stable, non-polluting and drain to the natural environment	B3	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures,	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

				major drains and creek diversions) have been constructed in accordance with hydrological design.	
Landform stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.	B4	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landforms are safe, stable, non-polluting and drain to the natural environment	B4	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

				use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	
Landform stability	Final landforms are safe, stable, non-polluting and drain to the natural environment	D1	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.	D1	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

				drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	
Landform stability	Final landforms are safe, stable, non-polluting and drain to the natural environment	D3	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.	D3	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have

				Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	been constructed in accordance with hydrological design.
Landform stability	Final landform will be suitable for the intended land use and consistent with the surrounding landscape.	D4	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landforms are safe, stable, non-polluting and drain to the natural environment	D4	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform.

			Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	The final landform is commensurate with the surrounding natural landform and where appropriate, incorporate geomorphic design principles.	A1	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landforms are safe, stable, non-polluting and drain to the local environment	A1	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that

			Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	The final landform is commensurate with the surrounding natural landform and where appropriate, incorporate geomorphic design principles.	A3	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

Landform stability	Final landforms are safe, stable, non-polluting and drain to the local environment	A3	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	The final landform is commensurate with the surrounding natural landform and where appropriate, incorporate geomorphic design principles.	A4	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures,	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

				major drains and creek diversions) have been constructed in accordance with hydrological design.	
Landform stability	Final landforms are safe, stable, non-polluting and drain to the local environment	A4	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	The final landform is commensurate with the surrounding natural landform and where appropriate, incorporate geomorphic design principles.	F4	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.

				Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	
Landform stability	Final landforms are safe, stable, non-polluting and drain to the local environment	F4	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	The size and depth of final voids will be minimised so far as is reasonable and feasible.	J5	Minimisation of final void size so far is reasonable and feasible.	Details to be refined in final closure plan	Details to be refined in final closure plan Final void water modelling Survey records for as-built final landform
Landform stability	The final void will be constructed to have negligible high wall instability risk.	J5	Long term stability of final void batter slopes	Final void batter slopes will be designed to ensure the long-term stability of the landform.	Engineering design records. Records of overburden emplacement.
Landform stability	The final void is safe, stable and non-polluting.	J5	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform.

			Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	The final landform is commensurate with the surrounding natural landform and where appropriate, incorporate geomorphic design principles.	A7	General landform public safety impacts are remediated. Identified slope instability issues are managed. Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed. Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Subsidence monitoring inspection results indicate no public safety hazards post mining. Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement. Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	Subsidence monitoring reports End of panel reports Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Landform stability	Final landforms are safe, stable, non-polluting and drain to the local environment.	A7	Visual - indicators of erosion and land instability. Visual - indicators that surface water management structures are functioning as designed.	Visual- minimal erosion that would not require moderate to significant ongoing management and maintenance works. Visual – no signs of land instability such as mass movement.	Before and after photos, rehabilitation monitoring reports, as constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion

			Measured – erosion rates from field trials and or surveys on both target analogue sites (representative of final land use) and rehabilitated profiles (tonnes / ha). Measured - Survey of rehabilitated landform to verify final landform construction in accordance with Final Landform and Rehabilitation Plan Measured - survey of rehabilitated landform to specifically monitor settlement and/or material loss via erosion. Modelled – long term erosional stability (e.g. Landform Evolution Modelling) to verify the long-term stability of rehabilitated landform. Modelled – long term geotechnical stability (e.g. stability analysis) to verify the long-term stability of rehabilitated landform.	Visual - no areas of active gully erosion. Visual - no evidence of tunnel erosion. Visual – no evidence of active scour likely to compromise surface water management structure. Survey verifies final landform complies with final landform construction in accordance with Final Landform and Rehabilitation Plan. Survey verifies that settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Erosion rate monitoring verifies that erosion levels are within the range of target analogue sites representative of final land use. Significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.	modelling reports (where required) that indicate long-term stability of rehabilitated landform. An engineering assessment undertaken by a suitably qualified person concludes that significant surface water management structures (e.g. spillways, drop structures, major drains and creek diversions) have been constructed in accordance with hydrological design.
Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.	B4	Visual –capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modelling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material losses within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use.	Photos, rehabilitation monitoring reports, as constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports.
Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.	D4	Visual –capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modelling and capping function	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material losses within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design	Photos, rehabilitation monitoring reports, as constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports.

			Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	specifications relevant to site risks and target final land use.	
Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.	A7	Visual –capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modelling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material losses within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use.	Photos, rehabilitation monitoring reports, as constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports.
Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended final land use.	A4	Visual –capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modelling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material losses within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use.	Photos, rehabilitation monitoring reports, as constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	A3	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan.

			Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	Sealing completed and verified by suitably qualified engineer.	Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	B1	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	B3	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos.

			Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.		Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	B4	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	D1	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power).	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from

			All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.		storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	D4	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	A7	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power).	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location.

			All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.		Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	A1	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	A4	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location.

			Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.		Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Removal of infrastructure	All surface non-heritage mining infrastructure within the identified disturbance area removed to ensure that the sites is safe and free of hazardous materials	F4	Removal of all services (power, water, communications) that have been connected on the site as part of the operation. Heritage obligations (e.g. development consent under the Environmental Planning and Assessment Act 1979, approvals under the Heritage Act 1977, etc.) have been met (e.g. archival recording, building retention or building demolition with footings preserved). Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, rail infrastructure and loading facilities, underground hydrocarbon storage tanks, office complex, portable offices, exploration core samples, camp facilities, storage racks, samples. Removal of all footings or removal to a certain depth. Removal of all water management infrastructure (including pumps, pipes and power). All drill cores have been removed and taken either to an authorised storage or a disposal location. Surveying and sealing of all drill holes, boreholes and gas wells in accordance with departmental guidelines and relevant standards.	All utility infrastructure removed. Permits and approval documents issued. All archival reports required are complete and submitted. Infrastructure removed Footings removed and or removed to specified depths to avoid exposure pathways to subsequent final land use. Cores removed and relocated. Sealing completed and verified. Sealing completed and verified by suitably qualified engineer.	Statement provided, utility service disconnection record / notification. Copy of any relevant approval documentation and archival reports/records. As-constructed final landform plan, photos, decommissioning reports etc. Surveyed and marked on the as-constructed final landform plan. Statement provided and before/after photos. Statement provided, receipt records from storage or disposal location. Engineering report/statement, plug and abandonment log, photos, as-constructed drawings, records of fill materials and concrete plugs, filling methods etc.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	A7	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.

Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	A7	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	A1	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	A1	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.

Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	D1	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	F4	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	F4	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.

Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	J5	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	J5	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	B1	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.

Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	B1	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	B3	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	B3	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.

Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe, does not pose any hazard to the community	B4	Potential hazards (e.g. electrical, mechanical) have been effectively isolated and secured. Damage to access tracks has been repaired and stabilised. The structural integrity of the infrastructure is suitable and safe for use as part of the intended final land use Infrastructure is in a condition (e.g. structural, electrical, other hazards) that is suitable for the intended final land use. If any underground pipelines or other infrastructure are to remain in situ, they do not pose a hazard for the intended final land use. Note: If any underground pipelines or other infrastructure are to remain in situ in areas to be returned for Agriculture – cropping they are at a depth Xm nominated depth (e.g. >1m).	Hazards isolated and secured. Repairs complete. The structural integrity of the infrastructure has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use.	Statement provided by suitably qualified engineer. As-constructed final landform plan, photos etc. Engineering report/statement, photos, risk assessment verifying modes of failure are adequately addressed to minimise risks to public safety or the environment.
Retention of infrastructure	All infrastructure that is to remain as part of the final land use benefits from the relevant approvals (e.g. development consent and / or licence/lease/binding agreement, etc)	B4	Where applicable, necessary approvals are in place (e.g. development consent under the Environmental Planning and Assessment Act 1979) where buildings and infrastructure are to be retained as part of final land use. Heritage obligations as required under the Environmental Planning and Assessment Act 1979, Heritage Act 1977, etc. have been met (e.g. archival recording, building retention and restoration).	Permits and approval documents issued; archival reports (where required) complete and submitted. Formal acceptance from the subsequent landowner that infrastructure is in a condition that is suitable for the intended final land use in accordance with formal agreement. The location of the infrastructure has been marked on a plan and registered with the relevant local authority (e.g. local Council) and Dial Before You Dig. Formal acceptance from the subsequent landowner that underground infrastructure has been left in a condition that is suitable for the intended final land use in accordance with formal agreement.	As-constructed final landform plan, photos etc. Formal acceptance from landowner. Surveyed and marked on the as-constructed final landform plan. Copy of notification to local Council and Dial Before You Dig. Identified on an appropriate legal instrument associated with the land title. Copy of any relevant approvals and associated reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s).	A1	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	A1	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.

Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s).	A3	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	A3	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s).	A4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	A4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s).	A7	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	A7	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	B1	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.

Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s)	B1	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	B3	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s)	B3	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	B4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s)	B4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	D1	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s)	D1	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	D3	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.

Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s)	D3	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	D4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s)	D4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s).	F4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Surface water	Runoff water quality from mine site meets the requirements of the relevant development consent(s) / Environment Protection Licence and does not present a risk of environmental harm.	F4	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operations meet specifications in Environment Protection Licence and or ANZECC guidelines for specific environment.	Water quality monitoring reports.
Surface water	The drainage catchment of the final void will be minimised so far is reasonable and feasible.	J5	Catchment area of the final void	Minimisation of drainage catchment	Details to be refined in final closure plan Final void water modelling Survey records for as-built final landform
Surface water	Water retained in surface water storages is fit for the intended land use (s) for the post-mining domain(s).	J5	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality retained in water storages on site meet specifications for intended land use and ANZECC guidelines for specific environment.	Water quality monitoring reports. Independent hydrological assessment report.
Water approvals	Structures that take or divert water such as final voids, dams, levees etc are appropriately licensed (e.g. under the Water Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.	A7	Final landform considers advice from relevant Government Agency whether sufficient licence shares are available in the water source to account for water stored in voids and dams in the proposed final landform.	Water approvals / licences are granted by the relevant NSW Government Agency	Confirmation from relevant Government Agency that relevant water approvals licences are able to be granted.

Water approvals	Structures that take or divert water such as final voids, dams, levees etc. are appropriately licensed (e.g. under the Water Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.	J5	Final landform considers advice from relevant Government Agency whether sufficient licence shares are available in the water source to account for water stored in voids and dams in the proposed final landform.	Water approvals / licences are granted by the relevant NSW Government Agency	Confirmation from relevant Government Agency that relevant water approvals licences are able to be granted.